



HORIZONS

P O L I C Y R E S E A R C H I N I T I A T I V E

A New World of Risk?

Welcome to the 2002 National Policy Research Conference issue of Horizons! This year's conference looks to both the present and future of Canada and the world through the lens of risk.

The idea of adopting 'risk' as the focus for the 2002 National Policy Research Conference took shape against the backdrop of the globally significant events of the fall of 2001. The topic of risk seemed an appropriate focus for our annual gathering in a world that suddenly seemed less certain. Following a summer that saw (again) extreme weather across Canada, increased cases of West Nile Virus in North America and the first Canadian death as a consequence of Bovine Spongiform Encephalopathy, the importance of collective thinking on risk is clear.

It is impossible to overstate the importance of the idea of risk to current policy debates. Just some of our most pressing policy questions reveal the centrality of risk: How do we manage the threat from infectious diseases? How will the war on terrorism shape geopolitics and Canadian foreign policy? How will the biotechnology revolution unfold? What is at stake in the North-South debate especially in Africa?

The language of risk has spread throughout modern society and indeed now dominates the language of governance. What is risk? Simply put, risk is the chance of loss or gain (see William Leiss' article). Risk analysis (or assessment) is the technique by which the probability that a particular adverse event will occur is measured, and risk management is our capability of responding to a particular risk.

In his book *Against the Gods*, Peter Bernstein argues that the "revolutionary idea that defines the boundary between modern times and the past is the mastery of risk: the notion that the future is more than a whim of the gods." Bernstein rightly credits the creation of new institutions in the public (democratic institutions) and private sectors (insurance, accounting and capital markets) for enabling an entrepreneurial ethos to emerge, leading in turn to an acceleration of economic and social development. Appropriately the researchers who developed probability analysis and established the foundations of modern economics, democratic theory and statistics are the heroes of Bernstein's story.

That said the acceptability of risk has become increasingly contested in recent years. Writing in the 1970s, economic historian John Kenneth Galbraith branded the late twentieth century the "age of uncertainty" primarily because of the threat of nuclear war. Between 1968 and 1990 the doomsday clock, perhaps the most

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HORIZONS

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INTRODUCTION (CONTINUED)

recognized measures of global risk, was at 10 minutes or closer to midnight for all but two years. The post-Cold War era opened with the clock at 17 minutes to midnight. Today, following the terrorist attacks, the collapse of peace talks in the Middle East, the end of the Anti-Ballistic Missiles Treaty and the tense nuclear stand-off between India and Pakistan the clock sits at 7 minutes to midnight.

At the same time that risk in the international system has exploded there has been a steady growth in critical, if not cynical, attitudes toward our principal institutions for risk assessment and management. Whereas decision makers have traditionally tolerated a certain degree of uncertainty (this is after all the meaning of risk), it is more and more the case that the public is less risk tolerant. On issues as different as warfare, environmental pollution and biotechnology, the demand of the public is for a present and future that are 'risk-free.' This is most acute on public policy issues that impact on public health and safety but is present as well on nearly every policy issue where the potential for uncertainty or rapid and unexpected change exists. In other words, the fear of risk pervades nearly every policy debate.

This combination of a real world full of risk and the decline of deference (Nevitte) toward risk managers has catalyzed a new risk adverse culture and led directly to the formulation of the precautionary principle, which states that if our best predictions turn out to be in error it is better to error on the side of safety. The precautionary approach offers at least a conceptual solution to the challenges of modern risk management. In practice, however, it has frequently led to confusion precisely because the assessment of risk remains uncomfortably subjective.

It is not at all clear that precaution is always the best solution. Social and technological innovation requires a healthy societal tolerance of risk. In a recent online article (www.spiked-online.com) British scientist Sir Colin Berry writes that the modern obsession with risk has reached "a stage that results in damage to society." The tendency to focus on the often extremely remote risks associated with every technology (new and old) blinds us to existing and potential benefits. He cites new evidence showing that in several European countries there is potential for a damaging outbreak of preventable diseases (such as measles) as a consequence of significant public opting out of immunization programs based on the very statistically remote chance of sickness or death following immunization. As another example of this phenomenon, one could point to public hostility in certain quarters to innovations in biotechnology, despite the many potential benefits accompanying the expanded application of biotechnology to agriculture and health.

The public service of Canada is on the front-line of shaping public debate and in interpreting and responding to a myriad of risks and opportunities. There are no quick fixes to dealing with the risk issues of today and tomorrow. Still, the need for a capable and confident policy research community able to support evidence-based decision-making and rational public debate is more critical than ever. In keeping with the tradition of National Policy Research Conferences we have built an excellent program – one that reflects the diversity of policy experience on a host of risk of risk topics. We have worked hard to engage the science and security communities in this year's conference and we hope to keep them involved with the Policy Research Initiative. Do we confront a new world of risk? The 2002 National Conference gives us an opportunity to explore this question.

UPCOMING EVENTS ON RISK

December 8–11, 2002

2002 Annual Meeting of the Society for Risk Analysis

(New Orleans, USA)

The Society for Risk Analysis brings together individuals from diverse disciplines and from different countries and provides them opportunities to exchange information, ideas and methodologies for risk analysis and risk problem-solving; facilitates the dissemination of knowledge about risk and risk methods and their applications; and promotes advancement of the state-of-the-art in research and education on risk analysis. Further information may be found at www.sra.org

February 19–22, 2003

In Search of Security: An International Conference on Policing and Security

Law Commission of Canada (Montréal)

This international conference will bring together the world's leading experts on policing and security to examine the complex relationship between public and private police, from a variety of disciplines and through both theoretical and empirical lenses. The conference will be convened at the Hotel Wyndham in Montreal. For more information, contact the LCC at (613) 946-8980, via email at policing@lcc.gc.ca or through their website at www.lcc.gc.ca

September 17–19, 2003

Environmental Health Risk: Second International Conference on The Impact of Environmental Factors on Health

Wessex Institute of Technology and the University of Catania (Catania, Italy)

This event brings together experts from academia and industry to discuss the environmental determinants of health. Health problems related to the environment are becoming a source of major concern all over the world. The interrelation between environmental risk and health is often complex and can involve a variety of social, occupational and lifestyle factors. The conference will provide a forum for the dissemination and exchange of information on the impacts of environmental factors on health, their interpretation and risk assessment. For more information, please see www.wessex.ac.uk/conferences/2003/healthrisk03/

Risk Management in the Public Service

“Departments whose core mandate focuses on public health and safety have traditionally been very proactive in practicing systematic risk management. These departments have a long history of addressing the public’s low risk tolerance in the areas of health and safety and have, as a result, developed an effective risk management culture. The emerging trends in the public sector environment and challenges associated with the need to adapt to change and uncertainty are contributing to the increased interest in risk management in other public policy areas. The higher level of awareness around risk management and the need to better understand and manage different types of risks in addition to health and safety risks requires a cultural shift. The aim of this cultural shift is to develop a risk-smart workforce throughout the Public Service by ensuring that public servants at all levels are more risk aware and risk attentive, that mitigation measures are proportionate to the issue at hand, and that the necessary tools and processes are in place to support them.”

Treasury Board of Canada Secretariat, *Integrated Risk Management Framework*, (February 2001), p. 5.

Available at http://www.tbs-sct.gc.ca/pubs_pol/dcgpubs/RiskManagement/rmf-cgr_e.html

The Concept of Risk

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...despite the fact that citizens are becoming more and more educated about risk, they also have a long way to go, both in understanding the nature of risk and in deciding how their governments should regulate or control risk-taking activity.

“Risk” is best described as “the chance of loss (or gain).” I put the aspect of “gain” in parentheses for the simple reason that, when most people think of risks, they think of what worries them most. That is, they think about the bad things that might happen to them, especially to their children, as a result of health problems or environmental pollution. But above all, risk is “chance.” When asked whether an uncertain outcome is going to happen or not, the risk expert must reply: “Maybe.”

If people are engaged more fully on this subject, most of them will also readily acknowledge that they willingly participate in risk-taking activities, not just to prevent losses, but to achieve gains. For most, this involves buying lottery tickets or spending limited amounts of their money playing various games of chance at casinos or the racetrack, or in friendly games of poker at home. In fact, playing games of chance is where most people actually encounter the concept of probability or chance in their daily lives. Most will also be aware that they purchase insurance as a “hedge” against the chance that many events which occur randomly in the population may happen to them. Even the most cautious (risk-averse) homeowners or vehicle drivers can wind up inadvertently causing a fire in their home or an accident on the road.

The language of risk is, however, gradually spreading throughout various domains of our everyday life, because it is such a useful language. Think about weather forecasts, which are now given in probability terms. (“There is a 50 percent chance of showers today.”) This is a relatively

recent development. It is likely that, if asked, many people would still struggle to articulate what a “chance of rain” really means. Using this language competently expands with repeated use, and we can expect many more such uses in the future, simply because it is the best way to express the fact that reality is made up of a range of possibilities at any moment in time.

Because the language of risk is spreading, more and more people are becoming aware that their country depends on an economy which has entrepreneurial risk taking at its heart. Obviously, in this domain the “chance of gain” predominates and is the main motivator of behaviour; great economic wealth has been created under its aegis. Alas, more recent news from financial markets has made many aware that there can be large downsides to entrepreneurial activity as well. This is an aspect of the system that can affect them directly. The largest headlines have been devoted to the shenanigans of corrupt and unprincipled corporate executives, but the reality is that, behind the headlines, tens of thousands of employees have lost well-paying jobs and, in some cases, their entire pension assets as well. Yet this too is a consequence of working in an economy founded on risk taking.

In part, this has happened because risk-taking activities get more complicated every day. Thus, at the same time as the citizen becomes more educated, the subject becomes harder to understand, requiring continuous attentiveness. For example, in financial risk management, new devices for hedging risks have been invented,

but they are poorly understood, even by market regulators. In the case of the Enron collapse, it became clear after the fact that what appear to be very clever and sophisticated financial instruments were elaborately masked frauds. In the case of the earlier collapse of Long-Term Capital Management, it emerged too late that market regulators, as well as the very intelligent investment bankers who had lent vast sums to the firm, had no idea the firm had found ways to increase the leverage on its capital far beyond any definition of “rational” risk taking.

In an entirely different domain — the regulation of the environmental and health risks associated with chemicals — continuous improvement in detection methods means scientists can find traces of many substances at minute concentrations. Indeed, it is safe to say that we will continue to detect them, no matter how small the concentrations become. But should we worry about that? What it means is that the citizen has to be able to trust in the credibility of some very complex statistical manipulations done by the practitioners of risk assessment, who try to figure out whether it makes sense to require some party to spend money to make certain small concentrations even smaller. The problem is, trust is in short supply these days.

The paucity of trust makes risk assessment controversial. Also, many citizens look at risk rather differently than professional risk managers do. Many feel much more comfortable with the hazards that are familiar to them, such as car accidents on roads, as opposed to unfamiliar things, such as radiation, and they appear

willing to tolerate much higher risks for the former than for the latter. Many do not react in the same way to all consequences, such as fatalities. Deaths of children seem particularly troublesome, for example, as do deaths of large numbers of people simultaneously, as in airplane crashes. Not all ways of dying or falling ill are regarded as equal, with cancer or slow neurodegenerative disease being more dreaded than sudden accidental death. Many are offended if, in response to an expression of concern

reaping benefits (the “upside”) from basing our economy and policy on a risk-based approach, there are equally demonstrable chances of experiencing harms (the “downside”). In fact, if we imagine this as a “game of life,” with the aggregate size of the benefits and losses as the stakes on the table, it is clear the stakes on both sides (upside and downside) increase as we get wealthier. Simply put, we have more to gain if we play the game well, but we also have much more to lose if we play it poorly.

...generally many do not understand why, with all the resources of modern science at their disposal, risk managers cannot give clear and unequivocal responses to their concerns, but instead, couch their answers in terms of probabilities...

about a particular hazard, such as radiation from nuclear power plants, they are told that, by comparison with many other things that people cheerfully indulge in daily, there is nothing to worry about. And generally many do not understand why, with all the resources of modern science at their disposal, risk managers cannot give clear and unequivocal responses to their concerns, but instead, couch their answers in terms of probabilities, that is, the chances that something bad may or may not happen.

And so, despite the fact that citizens are becoming more and more educated about risk, they also have a long way to go, both in understanding the nature of risk and in deciding how their governments should regulate or control risk-taking activity. For while it is true there are significant and demonstrable probabilities of

I use two extended cases to illustrate these difficulties. The first is climate change risk. The risk itself is characterized by the highly probable impact of human emissions of greenhouse gases (GHGs) on the climate system, including long-term temperature trends (especially where we live, in northern latitudes) and many other impacts. GHGs are produced by our use of fossil fuels and other activities, and we are very dependent on these fuels, for our cars and many other things. If we need to reduce climate change risk by limiting our use of fossil fuels, as climate scientists strongly urge, we will have to make some important changes in the way we live. But do we really need to do so? The assessment of climate change risk is a very difficult and complex business, with many uncertainties, and with probabilities of outcomes that extend forward many centuries

in time. We are not very good at managing risks that have such characteristics. As our governments dither about whether or not to ratify the Kyoto Protocol, a very small first step in addressing this risk, many citizens are unsure about what to think and what to do.

How do we even begin to assess the risks, especially if we only discover what they are once we are already well down that path?

The other is genetic engineering, especially of the human genome. When we contemplate such things as gene therapy, gene enhancement and cloning, we come face to face with issues we have never confronted before, about whether we should even be contemplating such radical steps. At the same time, biotechnology

companies and scientists tell us it would be unthinkable to pass up the benefits that could flow from manipulations of our DNA, including the eradication of inherited disease and effective treatments for many other feared diseases. The temptation has been laid before us. How do we even begin to assess the risks, especially if we only discover what they are once we are already well down that path?

The very nature of risk forces us to balance competing types of uncertainties. This can be a difficult and even unpleasant business, but it seems we are well along the path anyway, so we shall just have to make the best of it.

Author of *Risk and Responsibility* (1994), *Mad Cows and Mother's Milk: The Perils of Poor Risk Communication* (1997), and *In the Chamber of Risks: Understanding Risk Controversies* (2001), all published by McGill-Queen's University Press.

UPCOMING EVENT

November 26–28, 2002

Aboriginal Policy Research Conference

Indian and Northern Affairs Canada, and the University of Western Ontario (Ottawa)

This conference aims to bring attention to the wide body of research available on Aboriginal issues, move away from the victimization model with which Aboriginal issues are often framed and integrate the different research areas on Aboriginal issues – such as social, economic, and health – which have too often evolved in isolation from one another. More information and registration at www.ssc.uwo.ca/sociology/aprc-crmpa/

The Precautionary Principle

“The Precautionary Principle is a rule about handling uncertainty in the assessment and management of risk, and the rule recommends that the uncertainty be handled in favour of certain values – health and environmental safety – over others. Uncertainty in science produces the possibility of error in the prediction of risks and benefits. The Precautionary Principle makes the assumption that if our best predictions turn out to be in error it is better to err on the side of safety. That is to say, all other things being equal, it is better to have foregone important benefits of a technology by wrongly predicting risks of harm to health or the environment than to have experienced those serious harms by wrongly failing to predict them.”

Expert Panel on the Future of Food Biotechnology, *Elements of Precaution: An Expert Panel Report on the Future of Food Biotechnology*, The Royal Society of Canada, (February 2001), pp.198-199.

Available at www.rsc.ca

Can Democracy Survive the War between Globalization and Terrorism? :

A presentation by Benjamin Barber

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In his May 2, 2002, keynote address to the Thinkers' Retreat: Clash of Civilizations? at the Department of Foreign Affairs and International Trade, Benjamin Barber returned to the central themes of his often-cited 1992 article and 1995 book, *Jihad vs. McWorld*. While "McWorld" refers to the forces of economic integration brought on by economic globalization, technological advancements and the encroachment of Western popular culture, "Jihad" represents reactionary "national, subnational, religious and tribal particularisms." He believes September 11th was a manifestation of an intersection of these opposing forces.

Barber argues that democracy can only survive the war between globalization and terrorism if the United States and other Western countries make radical changes to their response to terrorism and the forces that nurture it.

To deal with terrorism, we must understand the context within which it operates. The new global anarchy resulting from the globalization of economic markets in capital, goods, and labour creates conditions for terrorism to thrive. When Barber elaborated on the key aspects of globalization, he painted a disturbing picture of a new world of risk: the spread of AIDS and other infectious diseases, a globalized sex trade, exploitation of women and children, the possibility of environmental collapse and the proliferation of light weapons and child soldiers. His point was not that this was all there is to globalization but, rather, that for much of the non-Western world, these have been its primary manifestations. This painful experience has created the climate for anti-Westernism and terrorism. Western democracies, increasingly unwilling or unable to regulate capitalism and redress excessive market imbalances, have contributed directly to the same global anarchy in which terrorism and other forms of disorder operate. If we wish to find ways to bring to justice the disorderly coterie of international terrorism, then it will be necessary to create a "global, democratic and civic order" to regulate international capitalist investors and banks.

Furthermore, we must understand that terrorism emanates from a sense of powerlessness. To respond to this powerlessness, we need to support democratization abroad. For more nations to democratize and to create a global democratic society, we must emphasize the need for a strong civil society and for education. The cornerstone of democracy building is a commitment to citizenship, and education is the foundation for citizenship. However, the central problem is that many see democratization as a threat to diversity and their way of life. We must therefore allow democracy to develop indigenously and slowly, in ways that make sense to local cultures, and allow time for democratic institutions to take root.

In conclusion, Barber contends that democratic realists must recognize that if the only choice we have is between the hegemony of religious absolutism and the hegemony of market determinism, neither liberty nor the human spirit will flourish. In our interdependent world, we must find a third, democratic alternative to Jihad and McWorld.

Risk and Genetic Engineering

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Deeply affected by rapid advancements in science and technology, modern societies are grappling with the sensitive issues of reproductive cloning, gene therapy, cell reprogramming, chimeras, xenotransplants and genetically modified foods. At the heart of the debate lie the “risks” associated with these new biological tools.

Over the last 30 years, we have witnessed what can only be described as a biological revolution. Advancements in technoscience, which began with the understanding of the structure of DNA and the mastery of genetic engineering, today enable us to change living things — plant, animal and human.

This ability is a source of controversy rather than consensus. Deeply affected by rapid advancements in science and technology, modern societies are grappling with the sensitive issues of reproductive cloning, gene therapy, cell reprogramming, chimeras, xenotransplants and genetically modified foods. At the heart of the debate lie the “risks” associated with these new biological tools. These tools make us hope for the best and fear the worst. Some people, for example, fear the unknown effects that transgenic plants may have on the fragile “balance” of nature; others are concerned that our social identity may disintegrate. Opponents point out that eating genetically modified foods poses no risk to human health and that any argument not based on measurable or scientific data is irrational.

This kind of atmosphere quickly leads to an impasse: discussion becomes polarized and emotional, opinions become entrenched, and the true nature and complexity of the issues are obscured. The resulting confusion serves no one’s interests and makes any in-depth analysis difficult.

Out of these conflicting opinions emerge two distinct perceptions of risk that are worth consideration. The first, usually held by experts in

biological science, focuses on the safety of biotechnology products for humans, animals and the environment. In this case, “risk” is synonymous with “safety.” More specifically, this point of view focuses on the lack of physical or material danger. Risk assessment is based on environmental, toxicology and other studies that assess the possibility of injury and measure its degree of probability.

People who take this view of risk feel the only pertinent factors are the ones that could affect safety. Therefore, if the risk to humans, animals or the environment is considered low or non-existent, then we have a solid basis for rejecting the criticisms that hinder future progress. In medicine, the benefits to the patient also affect the perception of risk. This first view of risk, therefore, provides a criterion for measuring its acceptability and guides strategies for minimizing its impact.

The second view of risk encompasses a much broader series of factors. It goes beyond safety to include religious, cultural, esthetic and ethical issues. Its boundaries are therefore not as clear cut, and they shift depending on the ideas being expressed.

For example, the birth of Dolly the sheep, the first animal to be cloned by nuclear transfer based on an adult cell line, highlighted the extraordinary reprogramming ability of a mammal’s ovum. When an adult cell is injected or combined with an ovum which has previously been stripped of its chromosomes, the ovum wipes out the programming of all of the cell’s genes. The cell gains the potential to generate not only a new individual, but also

any other tissue in the human body if it is given the right signals. Combined with transgenesis, the ovum's reprogramming ability is extremely promising.

For some, the risk posed by cell reprogramming has nothing to do with the procedure's safety. Instead, it relates to the anticipated benefits. If the promises of cell reprogramming were realized, would we eventually see our bodies as machines? Would our perception of what it means to be human change in some way? Would our identity be threatened? And what value would we place on life if our bodies were just a series of parts that we could reshape and replace? With the growing ability to shape the evolution of our species, will we not slowly but inexorably move toward a form of eugenics and the "social management" of illness, creating new problems worldwide?

These are all legitimate, if not necessarily well-founded, questions that express, in a more general way, people's thoughts on the risk surrounding the social and cultural consequences of our actions. This broader view of risk emphasizes the profoundly ethical side of genetic engineering. However, by focusing exclusively on the safety of biotechnology products, we too often overlook the ethical side. As a result, discussion tends to focus on analyzing and interpreting measurable data. An ethical examination of genetic engineering must include, but not be limited to, the potential impact on humans, animals and the environment. Too often, debate focuses on the wrong subject — safety — and conceals the real debate about fear of change.

Therefore, taking a broader view of risk clearly establishes the ethical nature of the issues and forces stakeholders, particularly government, to recognize it as well. Stakeholders then have a responsibility to deal with issues concerning genetic engineering in a way that respects their ethical nature and is part of a broader and more complete ethical examination. Any choice or public policy direction they adopt will reflect an ethical posi-

We must identify our respective viewpoints and our areas of disagreement if we are to understand each other better.

tion. In our democratic society, where many points of view are expressed, taking on this responsibility will be very challenging and will demand integrity and transparency. The challenges also raise complex issues where ethics, moral philosophy, political science and legal theory meet.

To summarize, two distinct perceptions of risk emerge from the debate surrounding the genetic engineering of organisms. The first is synonymous with safety; the second concerns the social and cultural consequences of our actions. This distinction is important in two respects. First, it lets us conduct an initial analysis of opinions in the marketplace of ideas and helps us to better understand them and the debate. These differing views also help to explain the dialogue of the deaf that we often encounter in public forums or at learned conferences. We must identify our respective viewpoints and our areas of disagreement if we are to understand each other better. The two distinct perceptions of risk also show how biological sciences and

social sciences each contribute to the critical analysis of issues surrounding genetic engineering.

There are also two attitudes toward risk that we need to understand and be able to identify. These attitudes apply to either perception of risk.

The first can be summed up as "there is no zero risk." This fairly liberal attitude accepts that, in an uncertain world, we cannot avoid taking risks.

People with this outlook are open to new technoscientific advancements provided that the related risks do not exceed the risks they are exposed to daily. We see this attitude among people who support genetically modified foods, which experts say are less risky to human health than the use of pesticides.

The second attitude toward risk has two sides. It is more conservative and is characterized by a reluctance to change established ways of doing things. However, while some people want to maintain "natural" processes and methods of production, others want to enhance scientific research and technological development. This disagreement within one branch of conservative thought is not surprising. It highlights the fact that we live in societies with diverse values, leading to conflicting opinions on genetic engineering even though we do not actually discuss the values at issue.

1 Carlo C. Jaeger and Alois J. Rust, "Ethics as Rule Systems: The Case of Genetically Engineered Organisms," *Inquiry*, 37 (1994), pp. 65-84.

ANNOUNCEMENT

The Gee! In Genome: Canada's first travelling, national exhibition on genomics

Putting the *Gee! In Genome*, Canada's first travelling, national exhibition on genomics, will open at the Canadian Museum of Nature in spring 2003 before beginning its three-year, cross-Canada tour. Sponsored by the Canadian Museum of Nature, in partnership with Genome Canada and the Canadian Institutes of Health Research (CIHR), the exhibition will be supplemented by teaching materials, a Web site component and a lecture series to explore in more depth the impact this new field of research is having on society.

This unique and innovative exhibition will present Canadians with a broad spectrum of information about genomics research (the study of genes and their functions in all living organisms). It will explore topics ranging from the mapping of the human genome and its implications for the health of Canadians, to the use of genomics in agriculture, forestry and the preservation of wild species. Throughout, the exhibition will celebrate Canadian discoveries and facilitate discussion on this emerging scientific discipline.

"Science belongs to, and is meant for, everyone — not just scientists", said Dr. Henry Friesen, Chair of Genome Canada and an internationally renowned scientist. "At the same time, genomics brings with it new concerns, concerns that must be addressed. And the best way to address them is through education and information. Providing Canadians with the opportunity to learn more about genomics, in their own communities, will enable all of us to make better decisions. I am very proud that Genome Canada is a partner in this exhibit. It is a marvellous initiative. It is an important initiative. And it is a timely initiative."

"Driven by the genomics revolution, we are entering a golden age in health research and health care. Our ability to diagnose, prevent and treat disease will be profoundly transformed over the next 10 years based on our ability to understand the molecular alterations that underlie disease", said Dr. Alan Bernstein, President of CIHR. "These profound advances raise complex ethical, legal and social issues. I hope that *Putting the Gee! In Genome* will provide Canadians with some of the tools and information needed to tackle these important issues."

The Coming Plague

"Ultimately, humanity will have to change its perspective on its place in Earth's ecology if the species hopes to stave off or survive the next plague. Rapid globalization of human niches requires that human beings everywhere on the planet go beyond viewing their neighborhoods, provinces, countries or hemispheres as the sum total of their personal ecospheres. Microbes, and their vectors, recognize none of the artificial boundaries erected by human beings. Theirs is the world of natural limitations: temperatures, pH, ultraviolet light, the presence of vulnerable hosts, and mobile vectors. ... While the human race battles itself, fighting over ever more crowded turf and scarcer resources, the advantage moves to the microbes' court. They are our predators and they will be victorious if we, *Homo sapiens*, do not learn how to live in a rational global village that affords the microbes few opportunities. It's either that or we brace ourselves for the coming plague."

From Laurie Garrett, *The Coming Plague*, New York: Penguin Books, 1994, pp. 618, 620.

Public Confidence in the Police in Canada, 1981-2000: Evidence from the World Values Survey

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Using World Values Survey (WVS) data, Dr. Neil Nevitte and Barbara Ellard of the University of Toronto undertook a research study on behalf of the Strategic Policy and Planning Branch of the RCMP to examine levels of public confidence in the police in Canada. The research concluded that, while there has been a slight decline since 1980, levels in public confidence in the police in Canada have remained high and stable over the last two decades (i.e., 85% in 1981, 84% in 1990 and 79% in 2000 expressed a great deal or quite a lot of confidence in the police). Moreover, these confidence levels are high in comparison to other government institutions (e.g., the armed forces, the civil service, Parliament). Canadian confidence levels are significantly higher when compared to other industrialized states. Only Norwegian (89%) and British (87%) citizens expressed higher levels of confidence, while Italy (67%), France (66%), Spain (64%) and Belgium (62%) expressed the lowest confidence.

Attitudinal variables, such as political orientations (left), church attendance (less), civil permissiveness (high) and protest behaviour (high), as well as socio-demographic variables, such as gender (male), age (younger), education (more educated), tend to be stronger predictors of low confidence in police in Canada.

Particularly striking are the regional variations. The aggregate national decline in police confidence can almost entirely be attributed to a decline in Quebec (11%) and British Columbia (12%). The descent in Quebec is consistent with structural changes in that society — declining church attendance and life satisfaction as well as declining public confidence in governmental institutions across the board. The decline in British Columbia appears to be less stable, potentially a response to immediate contextual factors, such as the Asia-Pacific Economic Co-operation (APEC) Inquiry. Also striking, is the widening gender gap among the young in confidence in police.

The analysis suggests that Canada's population is increasingly post-materialistic. For example, Canadians are shifting their priorities from physical and material security to issues such as civil rights, greater lifestyle freedoms and the environment. This shift in priorities results in an increased expectation that government institutions (including police) will be more responsive, an increased inclination toward protest behaviour, declining deference to authority and changing community standards of acceptable behaviour.

While confidence levels in police have remained fairly high and stable, there is no guarantee this will continue. A key challenge for policing organizations will be responding to shifts in social structure and attitudes. This includes higher levels of education, rising civil permissiveness and post-materialist orientations.

Two areas, in particular, require further research: the way attitudes about the police are formed, especially among young males, and the implications of rising civil permissiveness, particularly as it may pertain to issues such as white-collar crime.

Risk and the Intelligence Community

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At the heart of the problem of reforming intelligence is an understanding of risk.

In the aftermath of the terrorist attacks of September 11, 2001, the performance of intelligence communities has come under increased, sometimes intense, scrutiny. The harshest of spotlights has been switched on in the United States, where the intelligence failure of September 11 has been likened to that suffered by the United States at Pearl Harbor in December 1941. Questions are being asked about whether the September 11 tragedy might have been prevented with better intelligence work. The United States Congress has taken up the challenge and is engaged in an unprecedented joint inquiry to evaluate the role of the American intelligence system. The Congressional report, when it emerges from an in camera process of fact-finding and hearings, will determine the future of the U.S. intelligence community. There is no similar probe under way in Canada, yet we share with the United States a need to re-examine and reform the intelligence function.

At the heart of the problem of reforming intelligence is an understanding of risk. But in the world of intelligence, risk comes with a plethora of meanings and implications, some better understood than others. There are at least three different conceptions of risk that merit exploration.

The first involves an understanding of risk as synonymous with threat. The role of intelligence communities is fundamentally to measure risks, to both national security and international stability. The modern era of intelligence, in fact, dates from the years before 1914, when various

European nations sent their neophyte spies out to determine who had what dangerous new weapons (dreadnoughts, submarines, flying machines) and what deadly ambitions. No state was very successful in understanding the risk environment in 1914; but a lot of history has accumulated since that time, and risk assessment, it is fair to say, is now a well-established art.

A well-established art is no guarantor of success. Threat assessment came of age during the Cold War. The question is whether the challenges of the present, especially regarding global terrorism, are qualitatively and quantitatively more demanding than those of the past. Certainly, terrorism poses a different kind of target for intelligence communities, compared with assessing the military, economic and political postures of foreign nation states. The key factors in any risk assessment regarding a terrorist organization include an understanding of its personnel strength, its weaponry, logistics, communications, finances, plans, leadership and ideology. Little of this bears more than superficial similarity to the task, say, of measuring the Soviet Union's first strike capability in the bygone days of the Cold War. While every element of a putative threat assessment involving a terrorist organization is significant, and interlocking, perhaps the greatest challenge is posed by the need to penetrate the collective mind of a terrorist entity and understand the leadership and its ideology. Added to the sheer complexity of such a task is the factor of unpredictability. No intelligence community, no matter how good, can predict the

unpredictable. Nor is it an easy matter to gauge the extent to which unpredictability might characterize the leadership of a terrorist group. Summoning the best thinking on the ideological outlook of a terrorist organization and on the extent of its predictability in action will be an achievement. But even that degree of risk assessment will be blunted if an intelligence system is unable to go further and adapt the complex art of “net assessment” to the task.

Net assessment, first refined by the Pentagon under the watchful eye of defence guru Andy Marshall as a way of evaluating complex military scenarios, stands as one of the great advances in the art of threat assessment. It acknowledged that measurable threats and perceptions of threats on the part of both sides to a conflict were inextricably connected. Applied to a terrorist threat, net assessment requires knowledge not just of the ideological outlook of a terrorist organization, but of ways in which such an entity understands its enemies, and the ways in which it calculates responses to its own acts. To put this in concrete terms, a risk assessment of al-Qaida today requires knowledge of its surviving leadership, and their collective mentality, goals, understanding of the West as a target and an enemy, potential choice of weapons and methods of attack, and views on how the West might respond to further terrorist acts. It is a very tall order, but without a capability to engage in risk assessment of this kind, any society is left shadow boxing with nightmares or, alternately, lapsing into complacency.

Assessing risks to peace and security is only part of the challenge for intelligence communities by the post-September 11 international environment. The business of doing risk assessments, often conducted within the relatively closed world of the intelligence community, sooner or later raises the question of warnings of risk, which can have a much more public face. We have seen the United States grope, not very successfully to date, toward a

the intelligence profession. All risk assessments are bound up with degrees of ambiguity which intelligence agencies struggle to convey without giving the appearance of indecision, fence sitting or sheer ignorance. Success in conveying ambiguity is embedded in the professional relationship between intelligence agencies and their political masters and consumers. As part of a long-term relationship between intelligence agencies and

All risk assessments are bound up with degrees of ambiguity which intelligence agencies struggle to convey without giving the appearance of indecision, fence sitting or sheer ignorance.

way of conveying intelligence alerts to the public. We have less experience of this in Canada and, presumably, have done even less to develop a system whereby future alerts might be issued. Trying to develop such a system for the public communication of risk assessments flies in the face of established habits of secrecy. Moreover, there is the lurking danger of a “cry wolf” syndrome, in which a cycle of warnings, followed by the non-appearance of predicted threats, leads to loss of reputation and credibility on the part of intelligence agencies, conceivably just at that moment when a dire prediction comes true. On the other hand, maintaining high states of anxiety by taking the cry of wolf seriously would quickly erode the normalcy of any society.

Translating risk assessments into warnings of risk also confronts one of the hardest dilemmas of

their consumers, understanding of the potentialities and limits of intelligence grows, or should do so. An understanding of threat assessment as an art, rather than as a science, and of the fallible judgments built into the process, becomes clear. No such relationship exists, by definition, between intelligence communities and the public. There are barriers other than the claims of secrecy and tradition that make it difficult for intelligence communities to communicate with the public at large. Intelligence agencies may not know how to speak effectively to a non-traditional consumer, while the public may not understand the message. Trying to convey warnings of risks to the public is, itself, a risky business.

A third conception of risk as it relates to the intelligence profession essentially turns the matter inside out. It poses the uncomfortable

question of the extent to which intelligence communities must take risks to fulfill their role. The more difficult and elusive the intelligence target, the more obscure the evidence, the greater this problem becomes. Terrorism as an intelligence target stands at the pinnacle of elusiveness; as a challenge, it demands risk taking. It is not a matter of taking risks in the realm of illegal acts, of the sort that once plagued the RCMP Security Service during the 1970s. Canada has developed an effective system of checks and balances to prevent the

security consciousness of others. Risks have to be run in setting acceptable limits of knowledge and ignorance in the course of creating threat assessments. Risks have to be faced in the willingness of an intelligence system to admit failure, weakness or inability. There is a constant risk in the intelligence business of folding in the face of a potentially insidious form of self-censorship. Intelligence agencies would like to hold high as their banner the requirement to “speak truth to power,” but this can be a

Risk taking as an integral part of the culture of the intelligence world is an unfamiliar concept. It is one we are going to have to get used to.

recurrence of such problems. Rather, the issue is one of honing a culture of intellectual risk taking within the intelligence community. Such a culture is needed to ensure some golden mean of responsible risk taking can be achieved.

Risks have to be run in the process of recruitment, to try to ensure the highest quotient of talent and knowledge, sometimes unusual talent and knowledge, is secured. Risks have to be run in sharing intelligence across hierarchical boundaries within individual intelligence agencies, and across jurisdictional boundaries within intelligence communities. Sharing intelligence is often about risking the dissemination of fragmentary and specialized intelligence, and about trusting the expertise and

lonely and unrewarding job. Intelligence agencies have to be able to risk speaking unpopular truths. They have to rely on the willingness of decision makers to risk hearing unpalatable truths.

Risk taking as an integral part of the culture of the intelligence world is an unfamiliar concept. It is one we are going to have to get used to. Twenty-first century intelligence communities, in Canada and elsewhere, must be willing and able to explore not just the threat of the moment, but the risks of the future and that will require a new spirit. It may also require rethinking more mundane matters, such as organizational structures. Among the many risks that must be faced is the risk of change.

Risk-Free Warfare

“The Yale legal philosopher, Paul Kahn, has argued that ‘riskless warfare in pursuit of human rights’ is a moral contradiction. The concept of human rights assumes that all human life is of equal value. Risk-free warfare presumes that our lives matter more than those we are intervening to save. Does this mean then that we have to lay down our lives in order to prove moral seriousness? ... Surely not. Interventions which minimize casualties to both sides must be the better strategy. Evidently, there is no virtue in risk for the sake of risk, and no commander worth his stars will do anything other than seek victory with minimum loss to his own troops. The real question is whether risk-free warfare can work.”

From Michael Ignatieff, *Virtual War*, Toronto: Viking Books, (2000), p. 162.

The Border Papers: J.L. Granatstein on a Realist Canadian Foreign Policy

Paul Halucha
Policy Research Initiative

President Bush's doctrine, which states that countries are either with or against the United States in its permanent war on terror, is unassailable in its clarity. American exceptionalism is a natural corollary of the doctrine with implications for the liberal internationalist agenda (International Criminal Court), past commitments which could constrain Washington's room to manoeuvre (1972 *Antiballistic Missile Treaty*) and multi-lateralism in general.

The 1990s now look to have been an interim era between the Cold War and the War on Terrorism. As was the case with all U.S. allies, the immediate ramifications of September 11 on Canada were swift and have been well documented (new spending, new legislation and new decision-making structures). But, Canadian foreign policy (including defence policy) has been slow to adapt to the new reality, particularly the need to adopt an ethos of pragmatism. This is the argument by J.L. Granatstein in *A Friendly Agreement in Advance* prepared as part of the C.D. Howe Institute's Border Papers series.

At the heart of all foreign policy debates is the struggle to define and defend Canadian sovereignty. A major contribution of Granatstein's paper is to show how the defence of sovereignty has led to the sacrifice of Canadian national interest. Far from enhancing sovereignty, Granatstein argues, the real cost of constant opposition to U.S. foreign policy is reduced Canadian power in North America and globally. This he demonstrates with great effect in an assessment of Canadian policy toward Nuclear Missile Defense (NMD) and the issue of Northern Command.

Critics of the NMD are sceptical that the system will ever work but fear that its pursuit will trigger a new arms race. In either case, they argue, Canada should distance itself from this 21st century Regan-style initiative. Granatstein focuses instead on the question of what Canada hopes to change through opposition. His answer: we will change nothing. Moreover, we run the risk that command of NMD will be placed outside of the North American Aerospace Defence Command (NORAD). Should this occur, NORAD might be gutted and Canada could lose influence over continental air defence.

The Northern Command (NORTHCOM) includes all of North America and has responsibility for homeland defence. The policy choice for Canada is whether to remain aloof or join the United States in security co-operation and military co-ordination under NORTHCOM. Critics again raise the spectre of the loss of Canadian sovereignty. Granatstein points out that Canada has successfully partnered with the United States for 45 years in NORAD. Moreover, as with NMD, the United States is committed with or without Canada.

Granatstein is on familiar territory with these arguments, but his case for a new era of Canadian foreign policy, founded in an ethos of pragmatism, has only become more compelling as global instability has grown, as American unilateralism has increased and as the capability of the Canadian Armed Forces has been eroded.

The full paper is available at www.cdhowe.org.

Building Risk Management Capacity in the Public Service

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“Effective risk management is becoming critically important for the public service; the ability to make good decisions about policies, programs and services where future uncertainties are significant is paramount. With increasing frequency, the public service is facing difficult decisions about health and environmental risks, risks to economic well-being, technology risks, and risks to service delivery, among many others. The government’s responsibility and duty of care to the public requires that the practices and lessons of good risk management be followed” (CCMD, A Foundation for Developing Risk Management Learning Strategies in the Public Service, 2001, p. v).

Risk taking is a necessary precondition for human development. Without it, the technical and social innovations required to solve many of the world’s problems would never emerge. Public servants play a critical role in helping to shape societal response to risks. Public servants deal regularly with risks from many domains such as financial, environmental, health and safety, and security. They are risk managers, conducting risk assessments and helping develop policy responses. They also help frame risk issues and contribute to informing the public about the characteristics surrounding risks, thereby influencing public demands placed on the government to manage risks.

The challenge for the public service is to optimize its ability to manage risks successfully, especially those risks that are highly uncertain, or with seemingly significant, yet unknown, consequences. The essential question then,

is: How can the public service better learn to manage risks?

Ideas surrounding this question were explored under the auspices of an Action-Research Roundtable co-ordinated by the Canadian Centre for Management Development (CCMD). Roundtable members included senior public servants, academics and private sector experts in risk. The Roundtable was chaired by Ian Shugart from Health Canada and we, the authors of this piece, were part of the secretariat that supported the Roundtable work.¹ The work of the CCMD Roundtable built on and complemented other work, particularly the Privy Council-sponsored Assistant Deputy Minister Working Group on Risk Management² and the Treasury Board Secretariat-led development of the Integrated Risk Management Framework³ for the public service.

Through its work, the Roundtable realized that it could make an important contribution by helping public service organizations build their risk management capacities. Its efforts resulted in a flagship document entitled A Foundation for Developing Risk Management Learning Strategies in the Public Service.

Challenges to Effective Risk Management

While conducting its work, the Roundtable was not surprised to find there are many challenges to effective risk management. Seemingly small things can derail risk management processes. For example, it is very easy to overlook major risks, particularly risks that experts warn of but that do not register in the public’s mind or the minds of decision

makers. The unfortunate result is exposure to risk that, although perhaps evident to a small number of people, is largely unknown to others. Terrorism is one possible example of this. Exacerbating this challenge is the fact that experts and the public often disagree on the nature of various risks because empirical and intuitive risk characterizations lead to dramatically different interpretations. Even experts can disagree on the seriousness of risks because of the human judgment required in making such assessments. These differences are often at the root of risk management failures, particularly when risk communication is lacking or absent.

Increasing the complexity of these challenges is the level of trust among stakeholders. The reality is that public trust in government has been in decline. Yet, when addressing issues of risk and uncertainty, citizens' trust in government to handle these situations with competence and integrity is critical. But, as the Roundtable noted, "there is no simple formula for building trust. It is hard to build, and easy to lose."

Interwoven throughout these challenges is the emerging notion of precaution in science-based risk decisions. The precautionary approach was famously defined in the 1992 Rio Declaration on Environment and Development: "In order to protect the environment the Precautionary Approach shall be widely applied by states according to their capabilities. Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation." Despite widespread

agreement on the general concept, there are many ambiguities — and hence debate — about particular applications, specifically regarding the nature of state capabilities, serious and irreversible damage, and cost effectiveness. Being wise before it is too late is an attractive-sounding

Experts and scientists play a key role in describing and assessing risks and relevant response strategies, but the ultimate responsibility for risk decisions lies with elected officials. Science and expertise for risk decisions should therefore strive to be relevant but not prescriptive.

Even experts can disagree on the seriousness of risks because of the human judgment required in making such assessments. These differences are often at the root of risk management failures, particularly when risk communication is lacking or absent.

idea, but it is far from a trivial achievement in practice.

Building Risk Management Learning Strategies: People and Process

Given the importance of good risk management, and the many challenges and barriers which must be addressed to achieve it, the Roundtable decided to organize its work around two cornerstones to good risk management: process and people. The rest of this article touches on particular aspects of these two cornerstones.

Ideal characteristics for the process

An ideal risk management process supports an explicit and transparent decision-making process. It provides clear direction for risk-based decisions, yet offers flexibility for monitoring, learning and improving. Clear accountability and responsibility for making risk decisions are also required, as well as effective incentives to ensure people are encouraged to be innovative, all the while being thoughtful of the risks of their actions.

With respect to the application of precaution in risk management decisions, there is also a need to provide explicit direction. Because of the gain-loss duality of risk, precaution can be a double-edged sword: too much of it can stifle innovation while too little can lead to recklessness. An important piece of federal work related to the emerging concepts that surround the precautionary approach is the Privy Council Office-sponsored work on the subject.

Overall, the elements of effective risk management cannot be constrained to the borders of an organization or discipline. It is horizontal work, and requires interdepartmental and interdisciplinary collaboration to ensure risk assessment and mitigation are holistic, integrated and complete.

Ideal characteristics of the people dealing with risk

Making the right decisions about risk is clearly not easy, but as the Roundtable's report fully explores, some important knowledge, competencies and values can help equip public servants for success.

First, a fundamental understanding of the concepts in risk management is required as well as knowledge of situations that create risk. This understanding can arise from conventional education programs, reading and discussion.

Second, a series of competencies around risk communication, systems thinking, scenario planning and interdisciplinary teamwork are required. Also of importance is openness and transparency in risk communication, which is a necessary, although not sufficient, competency for building

...public servants — and the culture they work within — should embrace exploratory learning and adaptive management, while encouraging tolerance for honest mistakes.

and maintaining trust. Trust also requires empathy, integrity and competency over a sustained period. With respect to anticipating and assessing risks, systems thinking, scenario planning and interdisciplinary teamwork are important.

Finally, with respect to values, public servants — and the culture they work within — should embrace exploratory learning and adaptive management, while encouraging tolerance for

honest mistakes. Doing this requires a proactive, rather than reactive, approach and attitude toward risk.

Conclusion

Risk management is not a casual undertaking, but should be a core, systematic and integrated function of government. Sustained effort is required to move the public service toward a culture that is more responsive to risk, and that continuously builds the knowledge and skills of its people to manage risks effectively. The path to better risk management will require effort, but it will be a worthwhile, necessary and ultimately rewarding journey.

To obtain the full report on which this article was based, please see CCMD's web site www.ccmd-ccg.gc.ca, telephone (613) 943-8370 or fax (613) 992-1736.

- 1 The reports produced by the CCMD Action Research Roundtable on Risk Management, including A Foundation for Developing Risk Management Learning Strategies in the Public Service, are available at www.ccmd-ccg.gc.ca/research/roundtables/2001reports_e.html.
- 2 Risk Management for Canada and Canadians: Report of the ADM Working Group on Risk Management, March 2000. Available at www.pco-bcp.gc.ca under Publications.
- 3 Integrated Risk Management Framework, April 2001. Available at www.tbs-sct.gc.ca/rm-gr/ under Policies and Publications.
- 4 Privy Council Office, Regulatory Affairs and Order in Council. Available at www.pco-bcp.gc.ca/raoics-srdc.

Risk and the Public Service

"Principle number one: mistakes are bad. I don't know where we got this notion that mistakes are a good thing. It's not like we say, "Hey! He made a mistake! All right!" Second principle: mistakes vary. Some mistakes are really profound. Mistakes of ethics, violations of the law; they're unacceptable. Other mistakes are inevitable. They're not good but they're inevitable and our job is to learn from them. Taking risks is okay if the risks are okay. Taking risks that are not okay: not okay. We've got to get clear and straight with each other, figure out which risks are okay. Don't lay it on employees to take the risk and make the mistake. Work it through. Our values have to be more powerful than hierarchy; our honesty has to be better than our rhetoric. This is a time for us to talk straight and work together, lean on each other, depend on each other."

From an Address by Alex Himelfarb, Clerk of the Privy Council, Secretary to the Cabinet and Head of the Public Service at the APEX Symposium 2002: The Intermestic Challenge, Ottawa, June 5, 2002.

Available at http://www.pco-bcp.gc.ca/default.asp?Language=E&Page=clerks_speechesmessages&Sub=ClerksSpeeches&Doc=20020605_apex_e.htm

Instrument Choice: A Toolkit for Effective Government Action

Michael Stevenson
Justice Canada

A related conference entitled Instrument Choice in Global Democracies was held at McGill University, September 26-28, 2002. Designed to bring together retrospective and new thinking on the choice of governing or policy instruments with a view to creating useful tools for policy makers, this conference was organized by the Policy Research Initiative and Justice Canada, Quebec Regional Office. Visit www.policyresearch.gc.ca for more information.

Instrument choice, the way governments identify and use various tools to realize their policies, can play a major part in determining the risks governments take. As a result, the federal government has begun to take the issue seriously, and is trying to improve our understanding of instrument choice and its relationship to governance. The Legal Risk Management Initiative (a joint initiative between the Department of Justice and the Treasury Board) is one aspect of this growing interest in instrument choice. As part of this initiative, the Department of Justice organized a major conference entitled Instrument Choice: A Toolkit for Effective Government Action, held March 26-27, 2002 in Ottawa. Primarily designed for lawyers within the Department of Justice, the conference also attracted policy researchers and practitioners from across Canada and around the world.

The conference began with a panel discussion on the types of instruments that are available in a society governed by the rule of law. One of the presenters, Pierre Issalys of Laval University, outlined five criteria that governments should use to choose one form of action over another: political control, quality of public space, equity, technical expertise and economy of means.

Sue Holmes of the Organisation for Economic Co-operation and Development discussed the issue of compliance — the effectiveness of regulation in meeting its stated policy objectives. Holmes described mechanisms that allow target groups at least two different methods of complying with a policy. Although still prescriptive, this approach can be more responsive to market demands, foster co-operation between government and business, and help maintain transparency in government.

As Associate Deputy Minister of Justice John Sims put it, “laws don’t always work.” Sims gave the classic example of drinking and driving: governments finally succeeded in reducing drinking and driving by combining laws with education and community involvement. W.A. Bogart of the University of Windsor presented a similar example with regard to smoking. Bogart argued that a combination of laws, public education, taxation and the prohibition of cigarette sales to youths eventually brought about a meaningful change in smoking behaviour.

The second day of the conference focused on alternative compliance measures, with a panel considering administrative sanctions in the Agriculture and Agri-Food Administrative Monetary Penalties Act, The Contravention Act, fines and multinational companies, and administrative monetary penalties. Another panel discussion showcased four different government departments’ perspectives on compliance policies.

Instrument Choice: A Toolkit for Effective Government Action provided a unique forum for scholars and policy makers to ponder emerging issues and new approaches to instrument choice. The Department of Justice hopes the conference gave attendees a better understanding of various instruments that governments may employ instead of laws and litigation, and a sense of these instruments’ advantages and disadvantages. Ultimately, the conference should facilitate the introduction of government policy that reduces legal risk.

Concepts and Analytical Tools for Risk Analysis and Management

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Introduction

Paraphrasing Zorba the Greek, one definition of being alive is to take risks. But we also try to stay alive by being careful. Avoiding danger by managing risks was one compelling reason for early humans to form societies, build settlements and create governments. Today, managing risks runs through every aspect of our lives, and our public and private organizations. Yet, despite its obvious importance, formalized thinking about analyzing and managing risk is likely to strike fear in some and confusion in many.

The challenges of everyday life and need for collective solutions to societal risk issues suggest that workable approaches for understanding risks will be welcome in the 21st century. This brief essay attempts to provide some introductions to the important approaches now shaping thinking and practice in risk management contexts.

People manage myriad risks in everyday life, including risks to their health, wealth and the well-being of loved ones, to name a few. Corporations and other organizations manage risks to their financial health, the health of their workers and the environments in which they operate. Governments have the broadest and most complex jobs of all, in setting regulatory frameworks and policy directions for managing and balancing complex threats to our collective environmental, social and economic well-being. With emerging threats like climate change, economic restructuring, new health concerns and terrorism, it is clear governments face profoundly complex and worrying risk management

responsibilities. Here we focus on approaches most often applied by governments or organizations, though the best mix between individual and social responsibility for risk management is widely debated.

Definitions

Some precise terms would help. Unfortunately, there are many definitions in use, with overlapping meaning. Risk analysis is often defined as efforts to characterize the specific likelihood of, and harm from, a hazard. What is the likelihood of a major earthquake (Richter level 6 or above), centred under downtown Vancouver, before 2050? If this event happens, what are the potential consequences? These are questions addressed by risk analysis. Risk management is often seen as a process for creating alternatives and making decisions about whether or how to control a hazard. Given the estimated risk, what should be done to better manage earthquake hazards in Vancouver over the next 50 years? Risk assessment is sometimes used to refer to both risk analysis and risk management, as well as the broader task of informing people about risks, often called risk communication. Yet, one can find many conflicting versions of the definitions for these terms.

In practice, this split between risk analysis and risk management is not clear-cut. Some see risk analysis as entirely a science-based enterprise. Yet in practice, every aspect of the risks is analyzed, as is how the analysis is done. The presented results are often value-laden. Some see risk management as entirely a political process, but the role of scientific and technical information is fundamental in making good risk management decisions.

Perhaps, the best approach would be to view risk analysis and management as components of an overall process of societal decision analysis, which attempts to make wise choices for managing uncertain risks.

Analytical tools

If risk management is simply decision making about how to respond to hazards, then some concepts for making good decisions should be a starting point. Decision analysis has evolved over the last 40 years as an approach to addressing complex decisions with multiple sources of uncertainty and conflicting values. Initially, decision analysis was cast as suitable for an individual (one decision maker) considering choices from one perspective. Applications

values as the primitive motivation for decision making. He argues that all decision making should start with an assessment of “what matters,” or the important values affected by a given decision. These values can then serve as the basis for identifying objectives and performance measures that are widely seen as relevant. This value-based information can help guide several key steps in a good decision process: defining the information needed to compare alternatives responsibly, creating better alternatives than the obvious ones, and providing the basis for qualitative or quantitative evaluation.

A recent book (*Smart Choices*, 1999, by J. Hammond, R. Keeney and H. Raiffa) stresses the elements, or kinds of

- deciding which alternatives are preferred, given different views on the value trade-offs involved.

These steps show that the role of technical information and of values is well recognized in decision analysis. Value judgments about what is important and preferred are considered from the perspectives of many interested parties. Technical judgments about possible alternatives and their potential consequences are considered from informed technical experts. The role of the decision analyst is to integrate this value-based and technical information to provide insight about the choices available in the decision at hand.

Risk analysis is the part of decision analysis that considers the uncertain consequences of alternatives, based on the objectives that matter to interested parties. The simplest, most widely used, and most immediately helpful version of risk analysis relies on scenarios (i.e., structured conjectures) about possible future events for a given hazard. For example, possible scenarios for an earthquake in Vancouver by 2050 could include a major earthquake (say, over Richter level 6), a minor earthquake or none. Often, scenarios are built around a small set of variables that represent the key uncertainties and suggest the range of possible outcomes for the hazard in question. But as soon as the number of scenarios increases beyond a small handful, decision makers and interested parties start to ask which is more likely. That step requires a new language.

Specifying the likelihood of uncertain outcomes leads us into the realm of probability. Most people learned the basics of probability in high school,

Over the last 25 years, decision analysis has evolved into an approach to help inform public sector decisions, in the vein of a heuristic framework for systematically considering decisions from many perspectives, and for fostering a good decision process.

in business and medicine were common. Over the last 25 years, decision analysis has evolved into an approach to help inform public sector decisions, in the vein of a heuristic framework for systematically considering decisions from many perspectives, and for fostering a good decision process.

Recent writing on decision analysis has stressed the importance of structuring any important decision well, recognizing that nearly everyone is “quite bad” at complex decisions without a framework to guide them. “Value-focused thinking” developed in the work of decision analyst Ralph Keeney, stresses the importance of

information and judgments, needed for good decisions, about risks or anything else. These steps include:

- defining the decision you are working on, in terms of who makes it and how broad or narrow it should be, given the problem at hand;
- clarifying objectives and performance measures;
- creating new attractive alternatives;
- clarifying the consequences of the alternatives, and the uncertainties regarding these consequences;
- considering the trade-offs among the objectives that arise in choosing among the alternatives; and

and those basics are often sufficient to gain real insight into the uncertainties and the merits of alternatives in a risky decision. Probability is effectively a formal language for communicating uncertainty. It is needed, because informal expressions of uncertainty, with everyday language, are too vague to be of real help in thinking through risks. What does “a reasonable chance” mean to you? In one study, participants thought it meant everything from a 20 percent probability to a 90 percent probability. Hence, numerical probabilities are needed to clarify degrees of belief or scientific confidence, and convey precisely how likely some outcome is, even though the knowledge basis is uncertain.

Influence diagrams comprise a recent innovation from decision analysis that has proven to be highly useful for risk analysis, risk management and risk communication. Influence diagrams are effectively maps showing someone’s cognitive model of a complex process involving uncertainties, or aspects of a decision to be made. Sometimes, influence diagrams are called “knowledge maps.” In their most formal version, influence diagrams show the structure of conditional probability among many related variables that contribute to a given uncertainty; decisions can be analytically solved like decision trees. An example might be the variables that contribute to the extent of health impacts from a major earthquake in Vancouver sometime before 2050. Whether the event would occur in the day or night surely is a major factor influencing (and thus affecting the conditional probability of) health impacts.

Influence diagrams are also used to develop cognitive maps of how experts view a given risk management decision, and how various stakeholders might view the same decision. The differences among expert and lay views form the basis for defining the content of risk communication messages. This view of influence diagrams has been termed the “mental models” approach by a group of researchers at Carnegie Mellon University. Still other uses of influence diagrams include structuring the assumptions, variables and scenarios used when eliciting probabilities from technical experts. Judgment-based probabilities comprise still another aspect of decision analysis that is particularly important for risk management decisions.

Conclusions

Good risk management rests on good decision making. In turn, good decision making rests on using judgments effectively and consistently, to gain insight into the complex trade-offs we all face in making choices about these issues. The concepts of decision analysis are uniquely suited to making the best possible use of judgments in these contexts, while recognizing that there is no single right answer. If we are to make progress in risk management efforts, at the societal, organizational or individual levels, then better understanding of these tools is the best way forward.

Risk Communication

“Since its early beginnings in the 1980s, risk communication has been used to solve the emerging controversies surrounding risk assessment and risk management where polarization of views, controversy and overt conflict have become pervasive. Reality dictates that while risk communication may not successfully resolve all risk management issues, inadequate risk communication will most certainly lead to failure to develop acceptable public policy. ... The food crisis in the UK has provided an important message to governments worldwide about the importance of proper risk communication. Risk communication can no longer be considered a simple “add-on” to risk assessment. Risk communication is an integral element of risk analysis in general and risk management decisions in particular; hence, it needs to inform thinking through the whole process of risk analysis. One of the challenges of implementing this philosophy is the need for a culture shift that embraces the concepts of openness, responsiveness, public perception, trust, participation and ethical issues at an early stage.”

From Jean Chartier and Sandra Gabler, *Risk Communication and Government: Theory and Application for the Canadian Food Inspection Agency*, Canadian Food Inspection Agency, Public and Regulatory Affairs Branch, (Spring 2001).

Available at
www.inspection.gc.ca/english/corpaffr/publications/riscomm/riscomme.shtml