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# Public Perception of Terrorism Threats and Related Information Sources in Canada: Implications for the Management of Terrorism Risks

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**ABSTRACT** A national survey of terrorism-related risk perceptions was recently conducted in Canada, with a total of 1,502 adult Canadians interviewed by telephone. This paper provides a descriptive account of the perception of terrorism threats in Canada, specific types and effects of terrorism, as well as information sources on terrorism. Overall, respondents reported that terrorism was a low to moderate threat to the Canadian population and an even lower threat to themselves as individuals. They also indicated that they currently worry little about terrorism in Canada. The Canadian media was cited as the source most often referred to when seeking credible information about terrorism, whereas elected politicians and government officials were referred to the least. Demographic differences in perceptions of terrorism were examined, with gender representing an important determinant. Survey results are discussed in relation to their implications for addressing and managing the risks of terrorism as well as preparedness planning in Canada.

**KEY WORDS:** Terrorism, threat, risk perception, information sources, Canada

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1366-9877 Print/1466-4461 Online/06/070755-20 © 2006 Taylor & Francis

DOI: 10.1080/13669870600924477

## Introduction

In recent years, increasing acknowledgement of terrorism as a global threat has established preparedness as a priority in public health planning in Canada. Terrorism has some unique features as a risk management issue, being characterized by significant uncertainty in both the likelihood of occurrence as well as the extent of its consequences (Kunreuther, 2002). These attributes render risk assessment and risk management increasingly complex, particularly when finite resources need to be allocated among competing priorities (Kunreuther, 2002). Increasingly, public perception of risk is viewed as an integral component of public and population health risk management decision-making. A thorough understanding of how the public perceives risks associated with terrorism, as well as its expectations of terrorism preparedness, is essential to the assessment and management of terrorism risks in Canada, and to the promotion of behavioral change that fosters preparedness (Fischhoff *et al.*, 2003a).

Research on the public perception and psychological impact of terrorist attacks has increased in recent years due to the occurrence of a number of high profile events such as the terrorist attacks of September 11, 2001 and the Madrid and London bombings of 2004 and 2005, respectively. A survey conducted by Schuster *et al.* (2001) immediately following the terrorist attacks of September 11, 2001 revealed substantial psychological stress among the U.S. public, particularly among women, visible minorities, and residents of close proximity to the attacks. Another survey conducted shortly after, in November 2001, revealed that almost half of respondents perceived the average American as likely to be hurt in a terrorist attack within the coming year (Lerner *et al.*, 2003). A fifth of respondents perceived themselves as being likely to be personally hurt in a terrorist attack over the next year. When respondents were revisited one year later, perceptions of being personally hurt in a terrorist attack over the upcoming year remained high (19.2%) (Fischhoff *et al.*, 2005).

Clearly, terrorism has the potential to evoke strong psychological reactions. Nonetheless, the extent to which it may do so can vary according to context. For example, a recent survey on Londoners' reactions to the July 7, 2005 bombings revealed that they experienced less psychological stress immediately following the attacks than did U.S. respondents after the September 11, 2001 attacks (Rubin *et al.*, 2005). Nevertheless, a majority (86%) believed that another attack was likely in the near future. While this finding may reflect differences in the nature of attack or timing of the survey (with a shorter delay of conduct of the U.S. survey after the attack), it may also relate to Londoners' greater relative experience with terrorism (e.g., IRA terrorism or the World War II Blitz) or to enhanced preparedness as exemplified by the delivery of leaflets providing guidance on terrorism preparedness to all British households (Rubin *et al.*, 2005).

The importance of considering the broader context in research on perceptions of terrorism is further underscored by recent Canadian findings

(Krewski *et al.*, 2005). As no terrorist attacks have taken place on Canadian soil in recent years, the Canadian context can be expected to distinguish itself from that in the U.S. and U.K. Indeed, findings from a national survey suggested that few Canadians perceived terrorism as posing a significant risk to the health of Canadians or to their personal health (only 13.3% of respondents indicated that terrorism posed a 'high risk' to the Canadian public and only 5.7% of respondents indicated that it posed a high risk to their personal health). In spite of this, Canadians also acknowledged risks associated with terrorism as uncertain (with 67.6% of respondents indicating that terrorism risks entail a moderate or high level of uncertainty), difficult to control personally (73.5% of respondents reported 'almost no' personal control over terrorism risks), and unacceptable (60.7% of respondents reported that 'almost no' level of risk from terrorism is acceptable). These findings have important implications for the management of terrorism risks in Canada. Additionally, it should be noted that the effects of terrorism are not limited to those directly associated with the occurrence of an attack. With terrorism, perceptions of a threat itself can lead to adverse effects on psychological well-being, the economy, or inter-group relations, rendering indirect effects of concern as well (Slovic, 2002; Lemyre *et al.*, 2004a).

Together, these findings highlight the complex nature of terrorism risks and their potential to evoke great public concern (Jarrett, 2005). It has been argued that management of such complex risks should include efforts to enhance transparency and dialogue, as well as engagement of the public as an active partner in terrorism risk management (Fischhoff *et al.*, 2003a; Jones *et al.*, 2006; Rubin *et al.*, 2005). This may be particularly difficult to achieve with an indifferent public, such as in Canada. Nonetheless, understanding Canadians' perceptions of a broad range of terrorism-related issues is a necessary step in identifying ways to effectively implement initiatives aimed at the management of terrorism risks in the Canadian context.

Motivated by these concerns, a national survey of perceptions of terrorism and terrorism preparedness was conducted in Canada. This paper presents a descriptive account of perceptions of terrorism threat and its effects on communities, as well as terrorism information gathering practices. Implications for the management of terrorism risks in Canada are also discussed.

## **Methods**

### *Materials*

The findings presented in the current paper were obtained as part of the national public survey of perceived chemical, biological, radiological, and nuclear (CBRN) terrorism threat and preparedness. The survey instrument was designed to ascertain the opinions of respondents on a variety of issues

related to terrorism and terrorism preparedness (Lemyre *et al.*, 2004b). Content was based largely on a previous pilot study, on concepts emerging in group interviews (Lemyre *et al.*, 2004a), and on a previous national health risk perception survey (Lemyre *et al.*, 2005; Krewski *et al.*, 2005, 2006). The study protocol was reviewed and approved by the Research Ethics Board of the University of Ottawa.

Respondents were first asked to indicate their opinions about the general threat of terrorism in Canada. Specifically, respondents were asked to indicate the extent to which a) they perceive terrorism to be a threat to Canadians, b) they perceive terrorism to be a threat to themselves and to their family, c) they currently worry about terrorism in Canada, and d) they think it is likely that terrorism would be carried out in Canada by various persons/groups (i.e., a group of Canadian origin, a group from another country, or an individual without any group involvement). Respondents were also asked to indicate e) how much they have thought about the possibility of specific terrorism scenarios occurring in their community (e.g., specific CBRN threats), f) how much they have thought about the occurrence of specific effects of terrorism in their community (e.g., discrimination, casualties, economic losses), as well as g) the extent to which they turn to different information sources when seeking credible information about terrorism (e.g., media, health professionals, government officials). All responses were provided using a five point scale: not at all (1), a little (2), moderately (3), very much (4), extremely (5). Respondents could also decline to respond (do not know/no opinion), thus providing a sixth choice.

In addition to the above, information was collected on respondents' demographic background, permitting an examination of differences in perceptions of terrorism risks among population subgroups. Results from other survey components are reported elsewhere (Lemyre *et al.*, 2004b).

### *Procedure*

A sample of 1,502 adult Canadians was interviewed by telephone between November 15 and December 15, 2004. Respondents were identified by random digit dialing, using a sample selection procedure stratified by region (Atlantic, Quebec, Ontario, Prairies, Alberta, and British Columbia), age, and gender according to the 2001 Canadian census population. Telephone interviews were conducted in the official language of the respondents' choice, and were approximately 35 minutes in length. Once a household was contacted, the adult whose birthday was closest to the day of the call was selected for the interview. Lists of items associated with particular questions were administered in a random sequence in order to avoid potential ordering effects. Of the total 28,648 phone numbers dialled, 4,910 were not valid and 8,284 were unanswered. Completed interviews represented 9.7% of the 15,454 valid answered calls. Remaining calls either resulted in a refusal

(77.9%), required a call back (9.6%), or were addressed to individuals with demographic characteristics of quotas already met (2.8%).

### *Participants*

The final sample was comprised of a similar proportion of men (48.7%) and women (51.3%). The majority of respondents lived in urban (76.1%) as opposed to rural (22.8%) areas. A total of 28.4% of participants were between 18–34 years of age, 42.1% were between 35–54 years of age, and 29.2% were over 55 years of age. A total of 29.0% of respondents had at most a high school education, and 70.4% had greater than a high school education. Most respondents were born in Canada (85.2%) and did not consider themselves a member of a visible minority group (91.8%). A total of 77.2% of respondents completed the survey in English and 22.8% completed the survey in French.

### *Statistical Analysis*

A series of within-subjects multivariate analyses of variance (MANOVAs) were performed in order to examine whether perceptions of terrorism threat, perceptions of specific types of terrorism scenarios, perceptions of specific effects of terrorism, and use of information sources differed. *Post-hoc* paired *t* tests were used to examine pairwise differences if a significant within-group effect was observed. A series of between-subjects multivariate analyses of variance (MANOVAs) were also performed to examine demographic differences in perceptions (gender, age group, educational status, area of residence, place of birth, and visible minority status). A significance level of  $p < 0.01$  was used throughout the analysis.

Survey weights were used in the analysis in order that the sample be representative of the Canadian population. Design effects due to the stratified sampling procedure were examined and found to be close to 1 (greater than 0.99 but less than 1.00), indicating that analysis of the data with variances estimated assuming a simple random sample would be reliable.

## **Results**

### *General Perceptions of Terrorism Threat in Canada*

Table 1 provides general information about public perceptions of the threat and worry about terrorism in Canada, both overall and by demographic subgroup. Overall, respondents perceived terrorism as a low to moderate threat to Canadians and an even lower threat to themselves as individuals (pairwise comparison,  $p < 0.0001$ ). Respondents reported that they worry little about terrorism in Canada.

**Table 1.** Mean scores for general perceptions of terrorism threat in Canada (standard deviation (SD) shown in parentheses)

Item	Overall	Gender	Age Group	Education	Area of Residence	Born in Canada	Visible Minority
		Men, Women	<34, 55+ years of age	HS, College	Urban, Rural	Yes, No	Yes, No
To what extent do you think that terrorism is a threat to Canadians in general?	2.56 (0.99)	2.41 (0.97), 2.70 (0.99)	2.33 (0.95), 2.69 (1.06)	2.74 (1.04), 2.48 (0.96)	2.52 (0.98), 2.67 (1.01)	2.60 (0.98), 2.32 (0.99)	2.66 (1.19), 2.55 (0.98)
To what extent do you think that terrorism is a threat to you and your family?	1.80 (1.00)	1.66 (0.93), 1.93 (1.05)	1.62 (0.88), 1.83 (1.04)	1.86 (1.07), 1.77 (0.97)	1.79 (1.00), 1.83 (1.01)	1.81 (0.99), 1.71 (1.04)	2.01 (1.19), 1.77 (0.98)
To what extent do you currently worry about terrorism in Canada?	1.87 (1.04)	1.74 (0.94), 1.99 (1.12)	1.76 (0.99), 1.90 (1.12)	2.11 (1.20), 1.78 (0.96)	1.84 (1.03), 1.97 (1.07)	1.88 (1.04), 1.81 (1.07)	2.03 (1.21), 1.86 (1.03)

Mean (SD) based on positive responses only.

HS: at most some/completed high school.

College: at least some/completed college.

General perceptions of terrorism threat varied by gender,  $F(2,1483)=17.61$ ,  $p<0.0001$ ; age group,  $F(2,847)=13.79$ ,  $p<0.0001$ ; educational attainment,  $F(2,1475)=11.29$ ,  $p<0.0001$ ; and place of birth,  $F(2,1483)=8.74$ ,  $p<0.001$ . Specifically, women perceived terrorism as posing a greater threat to themselves,  $F(1,1489)=26.18$ ,  $p<0.0001$ ; and to Canadians,  $F(1,1492)=32.34$ ,  $p<0.0001$ ; than did men. Women also reported that they worry more about terrorism,  $F(1,1498)=21.81$ ,  $p<0.0001$ . Older respondents perceived terrorism as a greater threat to Canadians,  $F(1,855)=28.52$ ,  $p<0.0001$ ; and to themselves,  $F(1,853)=10.09$ ,  $p<0.01$ ; than did younger respondents. Respondents with a higher level of educational attainment perceived terrorism as a greater threat to Canadians,  $F(1,1484)=20.01$ ,  $p<0.0001$ ; and also worried about terrorism to a greater extent,  $F(1,1490)=31.53$ ,  $p<0.0001$ ; than did respondents with less education. Lastly, respondents born in Canada perceived terrorism as a greater threat to Canadians than did respondents born outside of Canada,  $F(1,1492)=15.52$ ,  $p<0.0001$ .

Respondents believed that terrorism is more likely to be carried out in Canada by a group from another country ( $M=3.15$ ,  $SD=1.17$ ) than an individual without any group involvement ( $M=2.17$ ,  $SD=1.18$ ), or a group of Canadian origin ( $M=2.01$ ,  $SD=1.06$ ),  $F(2,1447)=609.26$ ,  $p<0.0001$  (pairwise differences all significant,  $p<0.0001$ ).

### *Perceptions of Specific Types of Terrorism Scenarios*

Table 2 summarizes the extent to which respondents have thought about the possibility of specific types of terrorism scenarios occurring in their community. Overall, the extent to which they reported having thought about each scenario varied,  $F(9,1432)=189.09$ ,  $p<0.0001$ . Respondents reported having thought most frequently about the possibility of computer viruses, followed by water contamination, agricultural terrorism, and hostage situations. They reported having thought the least about the possibility of a dirty bomb, nuclear blast, chemical/gas attack, or smallpox (CBRN treats).

Perceptions of specific types of terrorism scenarios varied by gender,  $F(10,1430)=3.72$ ,  $p<0.0001$ ; age group,  $F(10,811)=11.32$ ,  $p<0.0001$ ; level of educational attainment,  $F(10,1423)=6.69$ ,  $p<0.0001$ ; and urban vs rural residence,  $F(10,1430)=4.16$ ,  $p<0.0001$ . Women reported having thought more frequently about all terrorism scenarios with the exception of hostage situations, bombings, and dirty bombs compared to men ( $p$  values ranging from  $<0.0001$  to  $0.004$ ). Younger respondents reported having thought more frequently about computer viruses,  $F(1,840)=46.27$ ,  $p<0.0001$ ; and hostage situations,  $F(1,859)=13.35$ ,  $p<0.001$ ; while older respondents reported having thought more frequently about dirty bombs,  $F(1,852)=9.41$ ,  $p<0.01$ . Respondents with lower educational attainment reported having thought more frequently about the possibility of most scenarios relative to those with higher educational attainment (with the

Table 2. Mean scores for the perception of the occurrence of specific types of terrorism (standard deviation (SD) shown in parentheses)

Hazard	Overall	Gender	Age Group	Education	Area of Residence	Born in Canada	Visible Minority
		Men, Women	<34, 55+ years of age	HS, College	Urban, Rural	Yes, No	Yes, No
Computer viruses	3.25 (1.42)	3.12 (1.42), 3.37 (1.42)	3.48 (1.37), 2.82 (1.47)	3.03 (1.49), 3.34 (1.39)	3.33 (1.40), 2.97 (1.48)	3.26 (1.42), 3.20 (1.44)	2.43 (1.52), 3.24 (1.42)
Water contamination	2.56 (1.31)	2.43 (1.26), 2.68 (1.34)	2.56 (1.30), 2.59 (1.37)	2.74 (1.37), 2.48 (1.27)	2.55 (1.29), 2.57 (1.36)	2.57 (1.29), 2.47 (1.38)	2.71 (1.45), 2.55 (1.29)
Agricultural terrorism	2.18 (1.25) <sub>a</sub>	2.08 (1.20), 2.28 (1.29)	2.14 (1.22), 2.21 (1.30)	2.42 (1.36), 2.08 (1.18)	2.14 (1.22), 2.30 (1.33)	2.20 (1.25), 2.05 (1.27)	2.32 (1.41), 2.17 (1.24)
Hostage situations	2.09 (1.21) <sub>a,b</sub>	2.02 (1.16), 2.17 (1.25)	2.24 (1.23), 1.94 (1.22)	2.20 (1.29), 2.05 (1.17)	2.14 (1.21), 1.95 (1.18)	2.12 (1.20), 1.94 (1.24)	2.18 (1.23), 2.09 (1.21)
Anthrax	2.06 (1.17) <sub>b,c</sub>	1.93 (1.10), 2.18 (1.23)	2.05 (1.12), 2.06 (1.25)	2.23 (1.27), 1.98 (1.11)	2.07 (1.16), 2.01 (1.20)	2.07 (1.16), 2.00 (1.24)	2.21 (1.26), 2.05 (1.16)
Bombings (non-nuclear explosives)	2.00 (1.16) <sub>c</sub>	1.96 (1.15), 2.03 (1.16)	2.06 (1.16), 1.92 (1.16)	2.07 (1.23), 1.96 (1.12)	2.01 (1.16), 1.94 (1.16)	2.02 (1.15), 1.88 (1.19)	2.24 (1.33), 1.98 (1.14)
Smallpox	1.87 (1.12) <sub>d</sub>	1.76 (1.02), 1.98 (1.19)	1.76 (1.03), 1.92 (1.19)	2.03 (1.22), 1.80 (1.06)	1.85 (1.11), 1.93 (1.15)	1.88 (1.12), 1.84 (1.14)	2.07 (1.24), 1.85 (1.10)
Chemical/gas attacks	1.86 (1.10) <sub>d</sub>	1.77 (1.03), 1.94 (1.16)	1.76 (1.02), 1.94 (1.16)	2.02 (1.22), 1.79 (1.03)	1.86 (1.09), 1.87 (1.12)	1.88 (1.10), 1.75 (1.13)	2.06 (1.23), 1.84 (1.09)
Nuclear blast	1.76 (1.12) <sub>e</sub>	1.67 (1.07), 1.84 (1.17)	1.65 (1.03), 1.84 (1.21)	1.94 (1.26), 1.68 (1.04)	1.73 (1.10), 1.84 (1.19)	1.78 (1.12), 1.66 (1.13)	1.81 (1.17), 1.76 (1.12)
Dirty bomb	1.75 (1.07) <sub>e</sub>	1.71 (1.02), 1.78 (1.12)	1.67 (0.98), 1.89 (1.18)	1.93 (1.22), 1.67 (0.99)	1.74 (1.05), 1.78 (1.13)	1.76 (1.08), 1.69 (1.03)	1.86 (1.16), 1.74 (1.06)

Similar subscripts indicate no-significant difference in *post-hoc* paired *t* test found ( $p > 0.01$ ).

Mean (SD) based on positive responses only. HS: at most some/completed high school. College: at least some/completed college.

Examples of chemical terrorism (chemical/gas attacks), biological terrorism (anthrax, smallpox), radiological terrorism (dirty bomb), and nuclear terrorism (nuclear blast) included.



exception of hostage situations and bombings) ( $p$  values ranging from  $<0.0001$  to  $0.001$ ); however, they reported having thought less frequently about the possibility of computer viruses,  $F(1,1466)=14.58$ ,  $p<0.0001$ . Urban residents reported having thought more frequently about computer viruses only,  $F(1,1474)=17.32$ ,  $p<0.0001$ .

### *Perceptions of Specific Effects of Terrorism*

Mean scores reflecting the extent to which respondents reported having thought about the occurrence of specific effects of terrorism in their community are presented in Table 3. Overall, the extent to which they have thought about the specific effects of terrorism varied,  $F(11,1362)=31.51$ ,  $p<0.0001$ . Respondents reported having thought most frequently about a lowered sense of security and safety, economic losses, and the loss of a loved one. They reported having thought least frequently about loss of employment, poorer mental health status, and increased political involvement.

Perceptions of the specific effects of terrorism varied by gender,  $F(12,1360)=6.38$ ,  $p<0.0001$ ; age group,  $F(12,765)=3.83$ ,  $p<0.0001$ ; level of educational attainment,  $F(12,1352)=4.86$ ,  $p<0.0001$ ; and urban vs rural residence,  $F(12,1360)=3.51$ ,  $p<0.0001$ . Specifically, women reported having thought more frequently about the majority of specific effects of terrorism considered ( $p$  values ranging from  $<0.0001$  to  $0.001$ ) with the exception of a lowered sense of security and safety, discrimination, loss of civil liberties, and increased political involvement. Other significant differences included a higher reported frequency of thinking about discrimination among younger respondents,  $F(1,856)=16.06$ ,  $p<0.0001$ ; and respondents living in urban areas,  $F(1,1490)=17.54$ ,  $p<0.0001$ ; while respondents with a lower level of educational attainment reported having thought more frequently about the loss of a loved one,  $F(1,1483)=14.07$ ,  $p<0.001$ ; and the loss of employment,  $F(1,1474)=31.83$ ,  $p<0.0001$ .

### *Sources of Information about Terrorism*

The degree to which respondents reported turning to different sources to obtain credible information about terrorism varied,  $F(7,1441)=181.26$ ,  $p<0.0001$ . Specifically, respondents reported turning most often to the Canadian media, first responders, and health professionals to obtain credible information about terrorism (Table 4). They reported turning the least often to elected politicians and government officials. Demographic differences were observed for age group,  $F(8,818)=5.59$ ,  $p<0.0001$ ; level of educational attainment,  $F(8,1433)=6.28$ ,  $p<0.0001$ ; and place of birth,  $F(8,1439)=4.22$ ,  $p<0.0001$ . Older respondents reported turning to first responders,  $F(1,856)=23.32$ ,  $p<0.0001$ ; and health professionals,  $F(1,850)=9.40$ ,  $p<0.01$ ; more often than younger respondents. Respondents with a higher level of educational attainment reported turning more often to university scientists,  $F(1,1473)=8.37$ ,  $p<0.01$ ; but less often

**Table 3.** Mean scores for the perception of the occurrence of specific effects of terrorism (standard deviation (SD) shown in parentheses)

Effect	Overall	Gender		Age Group	Education	Area of Residence	Born in Canada	Visible Minority
		Men, Women	<34, 55+ years of age		HS, College	Urban, Rural	Yes, No	Yes, No
Lowered sense of security and safety	2.99 (1.41) <sub>a</sub>	2.77 (1.33), 3.19 (1.45)	2.96 (1.35), 2.92 (1.51)	3.02 (1.46), 2.97 (1.38)	3.00 (1.39), 2.95 (1.45)	3.02 (1.40), 2.80 (1.44)	3.05 (1.55), 2.98 (1.40)	
Economic losses	2.96 (1.37) <sub>a,b</sub>	2.84 (1.35), 3.07 (1.38)	2.95 (1.31), 2.85 (1.44)	3.02 (1.40), 2.93 (1.36)	2.94 (1.35), 3.01 (1.43)	2.97 (1.37), 2.89 (1.38)	3.07 (1.49), 2.94 (1.36)	
Loss of loved one	2.87 (1.49) <sub>b,c</sub>	2.62 (1.41), 3.11 (1.53)	2.92 (1.49), 2.84 (1.56)	3.09 (1.54), 2.77 (1.46)	2.85 (1.49), 2.94 (1.51)	2.90 (1.49), 2.68 (1.52)	2.83 (1.50), 2.87 (1.49)	
Casualties	2.85 (1.42) <sub>c,d</sub>	2.66 (1.38), 3.02 (1.44)	2.91 (1.40), 2.78 (1.47)	2.93 (1.47), 2.81 (1.40)	2.88 (1.42), 2.74 (1.41)	2.88 (1.42), 2.67 (1.43)	2.80 (1.44), 2.84 (1.42)	
Lowered quality of life	2.84 (1.36) <sub>c,d</sub>	2.68 (1.30), 2.98 (1.40)	2.80 (1.29), 2.75 (1.42)	2.89 (1.38), 2.82 (1.35)	2.84 (1.37), 2.83 (1.31)	2.86 (1.35), 2.69 (1.37)	3.02 (1.52), 2.82 (1.35)	
Discrimination	2.82 (1.43) <sub>c,d</sub>	2.75 (1.39), 2.90 (1.47)	3.03 (1.44), 2.63 (1.46)	2.72 (1.44), 2.87 (1.42)	2.91 (1.43), 2.55 (1.41)	2.81 (1.43), 2.89 (1.44)	3.16 (1.45), 2.80 (1.43)	
Limited resources for social and health services	2.80 (1.36) <sub>c,d</sub>	2.57 (1.31), 3.02 (1.37)	2.78 (1.29), 2.82 (1.43)	2.93 (1.38), 2.75 (1.35)	2.80 (1.35), 2.80 (1.41)	2.83 (1.36), 2.63 (1.35)	3.08 (1.46), 2.78 (1.35)	
Increased community solidarity	2.77 (1.35) <sub>c,d</sub>	2.63 (1.31), 2.90 (1.38)	2.67 (1.29), 2.85 (1.40)	2.76 (1.34), 2.77 (1.36)	2.75 (1.35), 2.84 (1.35)	2.78 (1.34), 2.71 (1.43)	2.70 (1.39), 2.78 (1.35)	

Table 3. Continued.

Effect	Overall	Gender	Age Group	Education	Area of Residence	Born in Canada	Visible Minority
		Men, Women	<34, 55+ years of age	HS, College	Urban, Rural	Yes, No	Yes, No
Loss of civil liberties	2.75 (1.40) <sub>d</sub>	2.69 (1.37), 2.81 (1.42)	2.63 (1.34), 2.75 (1.46)	2.71 (1.47), 2.77 (1.37)	2.77 (1.39), 2.69 (1.42)	2.77 (1.39), 2.65 (1.43)	2.84 (1.47), 2.74 (1.39)
Increased political involvement	2.58 (1.30) <sub>e</sub>	2.52 (1.26), 2.64 (1.33)	2.58 (1.24), 2.63 (1.35)	2.57 (1.35), 2.58 (1.28)	2.59 (1.31), 2.53 (1.27)	2.61 (1.30), 2.41 (1.30)	2.71 (1.34), 2.57 (1.29)
Poorer mental health	2.53 (1.37) <sub>e</sub>	2.27 (1.27), 2.78 (1.41)	2.50 (1.31), 2.59 (1.42)	2.65 (1.41), 2.48 (1.35)	2.55 (1.38), 2.47 (1.33)	2.55 (1.36), 2.44 (1.39)	2.60 (1.40), 2.53 (1.36)
Loss of employment	2.51 (1.41) <sub>e</sub>	2.34 (1.36), 2.66 (1.44)	2.61 (1.37), 2.40 (1.45)	2.83 (1.50), 2.38 (1.36)	2.48 (1.40), 2.60 (1.45)	2.51 (1.41), 2.46 (1.44)	2.59 (1.47), 2.50 (1.41)

Similar subscripts indicate no-significant difference in *post-hoc* paired *t* test found ( $p < 0.01$ ).

Mean (SD) based on positive responses only.

HS: at most some/completed high school.

College: at least some/completed college.

**Table 4.** Mean scored for the reported use of credible information sources on terrorism (standard deviation (SD) shown in parentheses)

Source	Overall	Gender	Age Group	Education	Area of Residence	Born in Canada	Visible Minority
		Men, Women	<34, 55+ years of age	HS, College	Urban, Rural	Yes, No	Yes, No
Canadian Media	3.06 (1.26) <sub>a</sub>	3.00 (1.27), 3.12 (1.25)	3.07 (1.32), 2.99 (1.32)	3.00 (1.29), 3.09 (1.25)	3.07 (1.26), 3.03 (1.26)	3.06 (1.27), 3.08 (1.25)	2.97 (1.31), 3.07 (1.26)
First Responders	3.00 (1.38) <sub>a,b</sub>	2.97 (1.39), 3.02 (1.37)	2.73 (1.34), 3.18 (1.46)	3.05 (1.40), 2.97 (1.38)	2.97 (1.39), 3.10 (1.36)	2.92 (1.38), 3.45 (1.34)	3.00 (1.47), 2.99 (1.38)
Health professionals	2.94 (1.36) <sub>b</sub>	2.89 (1.35), 3.00 (1.37)	2.74 (1.34), 3.03 (1.45)	2.95 (1.39), 2.94 (1.35)	2.93 (1.36), 2.98 (1.37)	2.91 (1.35), 3.12 (1.38)	2.94 (1.40), 2.93 (1.36)
Canadian National Defense/Military	2.64 (1.41) <sub>c</sub>	2.63 (1.41), 2.65 (1.42)	2.59 (1.41), 2.61 (1.49)	2.65 (1.45), 2.64 (1.40)	2.64 (1.41), 2.64 (1.40)	2.60 (1.41), 2.87 (1.42)	2.55 (1.47), 2.65 (1.41)
Friends and relatives	2.63 (1.29) <sub>c,d</sub>	2.51 (1.24), 2.74 (1.34)	2.69 (1.30), 2.63 (1.37)	2.86 (1.35), 2.54 (1.26)	2.61 (1.30), 2.68 (1.28)	2.60 (1.29), 2.78 (1.30)	2.41 (1.23), 2.64 (1.29)
University scientists	2.53 (1.33) <sub>d</sub>	2.51 (1.29), 2.54 (1.38)	2.48 (1.36), 2.47 (1.38)	2.37 (1.37), 2.59 (1.31)	2.57 (1.35), 2.38 (1.26)	2.48 (1.32), 2.79 (1.36)	2.62 (1.39), 2.52 (1.33)
Government officials within Canada	2.28 (1.19)	2.20 (1.14), 2.35 (1.23)	2.26 (1.17), 2.29 (1.28)	2.16 (1.23), 2.33 (1.17)	2.29 (1.19), 2.25 (1.18)	2.24 (1.18), 2.50 (1.22)	2.27 (1.26), 2.27 (1.18)
Elected politicians within Canada	2.06 (1.12)	1.98 (1.10), 2.14 (1.13)	2.06 (1.09), 2.11 (1.22)	2.09 (1.21), 2.05 (1.08)	2.06 (1.12), 2.07 (1.10)	2.05 (1.11), 2.15 (1.15)	2.14 (1.19), 2.05 (1.11)

Similar subscripts indicate no-significant difference in *post-hoc* paired *t* test found ( $p < 0.01$ ).

Mean (SD) based on positive responses only.

HS: at most some/completed high school.

College: at least some/completed college.

to friends and relatives,  $F(1,1486)=19.02$ ,  $p<0.0001$ . Respondents born outside of Canada reported turning to government officials,  $F(1,1484)=9.28$ ,  $p<0.01$ ; university scientists,  $F(1,1480)=10.27$ ,  $p<0.01$ ; the Canadian military,  $F(1,1480)=6.74$ ,  $p<0.01$ ; and first responders,  $F(1,1492)=28.75$ ,  $p<0.0001$ ; more often relative to those born in Canada.

The degree to which respondents reported turning to different forms of media for credible information about terrorism also varied,  $F(4,1470)=278.38$ ,  $p<0.0001$ . Television ( $M=3.48$ ,  $SD=1.22$ ) ranked the highest, followed by newspapers/magazines ( $M=3.19$ ,  $SD=1.18$ ), radio ( $M=2.98$ ,  $SD=1.27$ ), the internet ( $M=2.58$ ,  $SD=1.44$ ), and public information brochures/pamphlets ( $M=2.28$ ,  $SD=1.16$ ) (all pairwise comparisons significant,  $p<0.0001$ ). Additionally, the degree to which respondents reported turning to media from different areas of the world varied,  $F(2,1447)=346.54$ ,  $p<0.0001$ , with Canadian media ranking highest ( $M=3.42$ ,  $SD=1.15$ ) followed by the American ( $M=2.82$ ,  $SD=1.31$ ) and European media ( $M=2.30$ ,  $SD=1.19$ ) (all pairwise comparisons significant,  $p<0.0001$ ).

### Summary and Discussion

Overall, results of the present survey suggest that Canadians do not consider terrorism to be a large threat to the Canadian public, nor do they perceive it as a great threat to themselves. Among the specific types of terrorism scenarios considered, Canadians were less likely to have thought about the possibility of CBRN terrorism scenarios as compared to computer viruses, water contamination, or agricultural terrorism. Also, significant gender differences were observed, with women reporting greater feelings of threat and worry than men. Interestingly, no differences were observed between urban and rural residents with respect to perceived threat or worry. Finally, elected politicians and government officials were the least consulted for credible information about terrorism, while the media remained the preferred source.

The fact that Canadians generally did not consider terrorism a threat has a number of implications both for the political analysis of risk management options and priority setting, and for the public's motivation to engage in terrorism preparedness. It is possible that massive investments framed as general counter-terrorism efforts may not be well perceived by the public. However, results in a companion paper also revealed that the Canadian public perceived government institutions as little prepared for terrorism and had little confidence in their ability to respond to a terrorist attack (Lemyre *et al.*, 2004b). This may suggest alternatively that certain targeted investments in terrorism preparedness may be perceived as relevant and necessary. The public's motivation towards individual preparedness may be difficult to mobilize if terrorism threats are perceived as irrelevant. Indeed, Canadians have reported low levels of personal terrorism preparedness (Lemyre *et al.*, 2004b). Developing strategies to increase motivation without

increasing fear remains a challenge. Further understanding of the relationship between perceived threat, fear and worry would aid in the development of effective risk communication strategies.

The fact that Canadians perceived terrorism as posing a low level of threat is in contrast to findings among U.S. and U.K. studies (Lerner *et al.*, 2003; Fischhoff *et al.*, 2005; Rubin *et al.*, 2005), but consistent with the findings of a Swedish study (Sjöberg, 2002). As in Canada, no wide scale terrorist events had occurred in Sweden prior to the study. Indeed, the low perception of terrorism threats among Canadians may in part relate to not having experienced an attack on their homeland. In this regard, a U.S. study revealed that respondents perceived less personal risk from terrorism if they resided farther from the location of the September 11, 2001 attacks (Fischhoff *et al.* 2003b). Much as living in close proximity to an attack may render terrorism threat more salient among the U.S. public, the absence of an attack in Canada may have contributed to the Canadian public's impression that attacks are not likely to occur here.

In a series of interviews with Canadians, Dallaire *et al.* (2005) found that many individuals were not concerned about terrorism because they felt attacks were more likely to occur elsewhere, as in other countries or regions of Canada other than where they resided. It may be that vulnerability to terrorism threats is not of great salience to Canadians. The fact that respondents of the current survey perceived terrorism as posing a greater threat to Canadians in general, compared to themselves as individuals, would support this. Labeled the optimistic bias (Lerner *et al.*, 2003; Sjöberg, 2002; Weinstein, 1980), the tendency for people to perceive themselves as invulnerable has been found to be related to a number of factors, including perceived control, personal experience, and perceived frequency of occurrence of the adverse advent (Sjöberg, 2002; Weinstein, 1987; Klein and Helweg-Larsen, 2002; Price *et al.*, 2002).

Additionally, respondents may have considered a different set of factors in making judgments about terrorism threat to themselves compared to Canadians in general, with individual-level consequences factoring into the former perception and societal-level consequences factoring into the latter (Sjöberg, 2002). A parallel phenomenon was observed in Canadians' perceptions of specific effects of terrorism on their community, where respondents thought more frequently about the effects of terrorism on others (such as casualties and the loss of loved ones) as compared to its effects on their own quality of life. These observations can inform ways to present the need for preparedness. Emphasizing the public's need for the protection of others and underscoring benefits for family members may be particularly relevant for CBRN preparedness. Indeed, the primary motivator for compliance with quarantine orders during the 2003 SARS outbreak in Toronto was precisely the fear of passing the infection to loved ones and a "civic duty" (DiGiovanni *et al.*, 2004).

Among the list of agents and vectors, Canadians reported having thought less about CBRN terrorism than computer viruses, water contamination, or

agricultural terrorism. Research has demonstrated that the public's perceptions of risk can vary according to familiarity with the agent, the extent and type of media coverage surrounding it, or simply differences in the perceived likelihood of occurrence of an adverse event. Although unrelated to terrorism, events such as contamination of the public water supply with pathogenic *E. Coli* 0157 in Walkerton, Ontario in the year 2000 (Krewski *et al.*, 2002; 2004) and the identification of the first cases of mad cow disease in Alberta in 2003 (Bradley and Liberski, 2004) represent hazards that Canadians have actually experienced in recent years, the latter with major financial disruption. The above findings may therefore reflect the availability bias that Tversky and Kahneman (1973) have long documented.

Again, such observations might also inform risk communication strategies. For example, scenarios that Canadians have thought of more frequently (computer terrorism, water contamination, and agricultural terrorism), could serve as hooks for public interest in preparedness for a broader set of issues. In this regard, Jhangiani (2005) has provided evidence suggesting that interest in preparedness in one domain can generalize to other domains. More importantly, such scenarios also reflect issues that require systematic attention at the national level. As Jones *et al.* (2006) argue, targeted communications that provide information about the true nature of such threats can help calm public fears.

Consistent with previous findings (Slovic *et al.*, 1995; Finucane *et al.*, 2000; Dosman *et al.*, 2001), gender was an important demographic factor affecting public perception of terrorism threats (Lerner *et al.*, 2003; Sjöberg, 2002). Gender was also found to predict distress following an attack in other studies (Rubin *et al.*, 2005; Silver *et al.*, 2002; Schuster *et al.*, 2001; Schlenger *et al.*, 2002). Although the reasons for this are not clear, this phenomenon may involve the interplay of a variety of socio-political or emotional factors (Finucane *et al.*, 2000; Lerner *et al.*, 2003). Greater worry expressed by women may also lead to enhanced perceptions of terrorism threat by way of stress-related differences in information processing, including greater awareness of threatening messages and over-representation of negative outcomes (Mogg *et al.*, 1990; Constans, 2001). A study by Lerner *et al.* (2003) highlights the importance of gender differences in specific emotions about terrorism. Specifically, women reported greater levels of fear (which was associated with pessimism and higher perceived risk), whereas men reported greater levels of anger (which was associated with optimism and lower perceived risk) in relation to terrorism. Such gender differences in perceptions of and emotional response to terrorism may lead to differential acceptance and expectations surrounding terrorism risk management and risk communication initiatives. However, the suggested tendency of men to underreport levels of perceived threat and worry in surveys of this type must also be considered.

In contrast with most risk assessments that emphasize major cities as the most likely targets of possible terrorist attacks, no differences were observed between rural and urban residents on perceived threat and worry. This was

the case for virtually all specific terrorism scenarios considered. This finding might also enlighten risk management and risk communication efforts, as it suggests that terrorism-related risk communication might entail quite distinct goals for rural as opposed to urban residents (Lemyre *et al.*, 2004b).

As sources of credible information about terrorism, the Canadian media, first responders, and health professionals, were most often consulted, while government officials and elected politicians were consulted least often. The importance of first responders and health professionals as sources of information about terrorism underscores the need for training programs, for both these and other non-traditional responders, so that they can be better equipped to satisfy the information needs of the public. Likewise, the public's reliance on the media as information sources about terrorism and broader risk issues (Krewski *et al.*, 1995, 2006) stresses the need for reform in the dissemination of information about such risks by the media. Given the convenience and rapid availability of information they afford, the media are likely to play an ever more important role in providing information on terrorism to the public. Yet, tensions in the relationship between the media and governmental communication apparatus have undermined the necessary alliance between these two important sources of information required for proper, accurate, and timely knowledge transfer to the public.

More often than not, the media's preoccupation with dramatic, exceptional, and negative aspects of events has been deemed responsible for the public's elevated concern over risk issues (Wiegman and Gutteling, 1995). Indeed, experimental evidence has demonstrated that media information highlighting the negative aspects of environmental chemicals increased the likelihood of developing psychosomatic symptoms following exposure to innocuous odorous chemicals (Winters *et al.*, 2003). Communication research has shown that the news media can also affect people's emotions, and thereby influence risk judgements and policy preferences (Fischhoff *et al.*, 2005; Lerner *et al.*, 2003), highlighting the need to protect people from emotional manipulation (Fischhoff *et al.*, 2005). Marsden and Attia (2005) suggested that guidelines be established for media reporting of terrorism in order to avoid such problems. Improving relationships between the media and government and engaging the media as explicit stakeholders in the risk management process may prove a very efficient vector of preparedness.

Despite the fact that government officials and elected politicians are consulted least often for information about terrorism, much can be learned by the public from existing government websites, pamphlets, or brochures. Indeed, survey findings following the London bombings may reinforce the utility of government information initiatives in that respondents who had read the leaflet distributed by the government reported that they intended making fewer travel alterations because of the bombings (Rubin *et al.*, 2005). The Canadian public's seemingly limited use of information provided by the government about terrorism may relate to a lack of awareness its existence. In a related study using group interviews, respondents indicated



that they were not aware of the existence of information about CBRN terrorism and preparedness provided by governmental agencies (Lemyre *et al.*, 2004a). Alternatively, the public's limited use of government as a source of credible information about terrorism could relate to the central issue of trust and confidence. However, a national survey conducted at approximately the same time as the present survey revealed that Canadians' trust in risk management by the government was fairly high, and actually increased dramatically in comparison with a previous survey conducted 12 years earlier (Krewski *et al.*, 2005). Additionally, a study by Lee and Rao (2005) found that trust in the supreme government was less important for trust of government websites than system quality of the website (including such factors as loading speed). In any case, making the promotion of government resources as a risk communication priority may serve to improve knowledge transfer to the public. Engagement of the public may help improve its trust in government (Jones *et al.*, 2006). The importance placed on friends and relatives as sources of information as well as support systems following terrorism attacks (Rubin *et al.*, 2005; Schuster *et al.*, 2001) should not be underestimated, and may further help to engage the public in terrorism risk management processes.

In concluding, it should be noted that the present survey was conducted following the bombings of the rail system in Madrid, but prior to the public transit system attacks in London. No major terrorist attack occurred directly prior to the survey or at the time of its administration thus minimizing the potential of response bias due to a recent attack. Although the survey focused on public perceptions of terrorism more generally, there was an emphasis on how those who play a part in the management or communication of terrorism risks can learn from its findings. In view of the apparent magnitude of gender-based differences in terrorism-related information needs and risk management requirements, it is recommended that future work in this area explore gender differences in greater detail. The administration of follow-up surveys among the Canadian public may also be of value in order to shed light on variations in perceptions, information gathering practices, levels of preparedness, and terrorism-related knowledge over time. Monitoring such changes represents a crucial component of sound risk management practices.

### **Acknowledgements**

Dr. L. Lemyre is Professor of Psychology and the McLaughlin Chair in Psychosocial Aspects of Risk and Health at the University of Ottawa. Jennifer E.C. Lee is a doctoral candidate at the School of Psychology, University of Ottawa. Dr. D. Krewski is Professor of Epidemiology and the NSERC/SSHRC/McLaughlin Chair in Population Health Risk Assessment at the University of Ottawa. This research was supported by the Chemical, Biological, Radiological & Nuclear (CBRN) Research and Technology Initiative (CRTI) of Canada project # CRTI02-0080RD. The authors would

also like to acknowledge the contributions of Dr. M. Clément, Dr. W. Corneil, Dr. T. Ramsay, Dr. M. Tyshenko, and Ms. S. Gibson in the conduct of this work.

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