Terrorism preparedness in Canada: a public survey on perceived institutional and individual response to terrorism

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Abstract: Although much effort has recently been expended on evaluating and improving terrorism preparedness among Canadian federal, provincial, and local institutions, less attention has been given to understanding the public's view of these initiatives. The national public survey of perceived chemical, biological, radiological, and nuclear terrorism threat and preparedness was conducted specifically with this aim. Since emergency preparedness is considered a shared responsibility between governments, communities, and individuals in Canada, the survey assessed Canadians' views regarding the level of preparedness of institutions at all levels, as well as the extent to which they have personally taken measures to prepare for a possible attack. Findings reveal that respondents perceived governmental institutions as less prepared for terrorist events than emergency or response institutions. Respondents also reported having taken few measures to prepare for themselves. Perceptions of institutional preparedness and individual preparedness differed significantly by demographic groups, with many observed gender differences.

Keywords: terrorism; Chemical, Biological, Radiological and Nuclear; CBRN; preparedness; emergency management; Canada; government; socio-demographics.

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1 Introduction

In recent years, an increasing acknowledgement of terrorism as a global threat has brought preparedness to the forefront of public health planning in Canada. Given the emotionally charged nature of this threat, terrorism risk decision-making has the potential to evoke great public disagreement and debate, favouring more participative risk management approaches (Covello *et al*., 2001). Understanding how Canadians perceive existing preparedness plans is an important step in addressing their needs in policy and planning.

In North America, the events of 11 September 2001 raised awareness not only of the need to consider terrorism as a possible disaster scenario, but also of the need to increase preparedness among authorities at all levels. A 2001 assessment of the preparedness of Canadian emergency departments indicated that these were ill-equipped to deal with terrorist events, particularly those of chemical nature (Kollek, 2003). Since then, the Canadian federal government implemented a number of initiatives to help improve the management of Chemical, Biological, Radiological and Nuclear (CBRN) threats, the core objectives of which included the improvement of preparedness and response to terrorism at all levels of government (PSEPC, 2005a).

Although the importance of a prepared government is clear, the role of other institutions and individuals in the broader realm of disaster preparedness has become increasingly salient (Larsson and Enander, 1997). Indeed, emergency preparedness is considered a shared responsibility between governments, communities, and individuals within Canada (PSEPC, 2006). Acknowledgement of a potential wait period of up to 72 hours for authorities to activate emergency plans further stresses the importance of individual preparedness (PSEPC, 2006). Yet, preliminary research suggests that levels of preparedness for terrorism remain low in Canada (Lemyre *et al*., 2004a), as do levels of preparedness for other types of disasters (Duval and Mulilis, 1999; Lindell and Whitney, 2000; Mulilis and Duval, 1995; 1997; Paton, 2003). Such findings are not encouraging given that the extent to which individuals feel prepared for a disaster can play a significant part in helping them maintain perspective and thereby facilitate community resilience. Addressing this issue requires a thorough assessment of Canadians' perceptions of the level of preparedness of institutions other than government, as well as their levels of individual preparedness.

Given the diversity of the Canadian population, it is particularly important to consider how specific segments of the Canadian population might differ with respect to their perceptions of institutional and individual preparedness. Lindell and Whitney (2000) noted that identifying demographic correlates of preparedness can be useful in allowing risk managers to identify population segments in need of special attention in programmes aimed at improving preparedness. On a similar note, identifying the demographic correlates of perceptions surrounding the preparedness and ability of various institutions to respond to terrorism can provide insight about the specific institutions on which particular segments of the population are likely to rely. The current paper therefore seeks to describe Canadians' perceptions of institutional (both governmental and non-governmental) and individual preparedness as well as their demographic correlates.

2 Methods

2.1 Participants

A sample of 1502 Canadians aged at least 18 years (731 men and 771 women) participated in telephone interviews as part of the national public survey of perceived CBRN threat and preparedness. The sample was weighted to be representative of the Canadian population in terms of region (Atlantic: Newfoundland, Prince Edward Island, Nova Scotia, and New Brunswick; Quebec; Ontario; Prairies: Manitoba and Saskatchewan; Alberta; and British Columbia), and in terms of age group (18–34 years, 35–54 years, and 55 years or greater) and gender within region according to 2001 Census data. One-thousand one-hundred and forty-three (1143) respondents were identified as residing in an urban area and 359 were identified as residing in a rural area.[1] Surveys were available in the respondent's official language of preference. One-thousand one-hundred and fifty-nine (1159) respondents completed the survey in English and 343 completed it in French.

2.2 Materials

The survey included three main sections designed to assess:

1 public perceptions of CBRN terrorism and its related impacts on communities

2 opinions on preparedness initiatives and level of individual preparedness

3 CBRN terrorism information gathering practices.

The content of the questionnaire was largely based on findings in pilot work (Lee *et al*., 2004), on concepts emerging in focus groups (Lemyre *et al*., 2004a), as well as findings from a previous national health risk perception survey focusing on a wide range of health hazards (Krewski *et al*., 2005; 2006). Only those sections of interest to the current paper are presented here (a more complete description of other survey components is provided by Lemyre *et al*., 2005b; 2006). All questions were presented in the form of statements to be rated on a 5-point Likert-type scale. Anchors of 1 = not at all, 2 = a little, 3 = moderately, 4 = very much, and 5 = extremely were used in all sections of the survey reported here.

2.2.1 Perceived institutional terrorism preparedness and response

Respondents rated the following institutions in terms of *level of preparedness* and the amount of *confidence they have in their ability to respond to terrorism*:

- the federal government
- the provincial government
- the municipal government
- hospital and healthcare services
- first responders
- non-governmental organisations
- local community organisations.

Interviewers provided all respondents with examples of first responders, non-governmental organisations, and local community organisations to better guide their ratings. For first responders, respondents were given the examples of the police, paramedics, and fire department; for non-governmental organisations, they were given the examples of the Red Cross, St-John Ambulance, and the Salvation Army; and, for local community organisations, they were given the examples of community clubs and churches.

2.2.2 Personal Response to Terrorism

Since preliminary findings suggest that few individuals have changed their behaviours in response to terrorism (Lemyre *et al*., 2004a), respondents were asked to indicate the degree to which they have both *thought about doing* and *have actually done* the following:

- consulting others for preparedness advice
- establishing an emergency plan
- putting together an emergency supply kit
- receiving emergency first aid or CPR training
- obtaining information about potential shelters in their community
- establishing a meeting area or method of contact with loved ones
- learning about evacuation plans of buildings occupied frequently
- learning about differences and similarities between different types of terrorism
- reading up on the topic of terrorism.

In order to assess the extent to which Canadians' response to terrorism might have manifested itself as anxious behaviour, the extent to which they have thought about doing and have actually done the following was also assessed:

- avoiding public places
- refraining from watching the news to avoid coverage on terrorism issues
- being nervous around certain people
- seeking social support.

2.3 Procedure

The survey was administered by a consulting firm between 15 November and 15 December 2004. A stratified random sampling procedure was employed with random digit dialing. Once a household was contacted, the adult whose birthday was closest to the day of the call was selected for the interview. Of the total 28 648 phone numbers dialled, 4910 were not valid and 8284 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%).

During administration of the survey, lists of items within sections were sequenced randomly to balance for possible order effects. Interviews were approximately 35 minutes in length.

2.4 Analyses

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 for a randomly selected subset of variables and found to be close to 1 (greater than 0.99 but less than 1.00), indicating that analysis of the data using simple random sample variance would result in reliable inferences. Within-subjects Multivariate Analyses of Variance (MANOVAs) were performed in order to compare respondents' preparedness ratings of each institution, respondents' confidence in the ability of each institution to respond to terrorism, the extent to which respondents have thought about engaging in various behaviours in response to terrorism, and the extent to which they have actually engaged in these same behaviours in response to terrorism. A series of between-subjects MANOVAs were performed to examine differences by gender, age (<35 years versus >55 years), education (High school or less versus Post-secondary), visible minority status, and urban versus rural area of residence. Since the number of survey respondents differed greatly by province, between-subjects MANOVAs were run by region (*i.e.*, Atlantic, Quebec, Ontario, Prairies, Alberta, and British Columbia) rather than province.[2]

3 Results

3.1 Perceived institutional terrorism preparedness and response

Mean ratings of respondents' perceived level of preparedness and level of confidence in the ability of each institution to respond to terrorism are presented in Figures 1 and 2, respectively, along with 95% confidence intervals. Ratings of preparedness differed significantly according to the type of institution, $F(6, 1372) = 405.63$, $p < .001$. *Post-hoc* pairwise comparisons with Bonferroni adjustment indicated that all pairs were rated significantly differently (p-values ranging from <.001 to <.01). As depicted in Figure 1, respondents tended to assign lower ratings to governmental institutions (particularly lower levels of government) as well as local community organisations, whereas first responders, non-governmental organisations, and hospital and healthcare services were assigned higher ratings.

As did ratings of preparedness, ratings of confidence in the ability to respond to terrorism differed by type of institution, $F(6, 1405) = 345.21$, $p < .001$. Indeed, all pairs were rated significantly differently with the exception of provincial government and local community organisations, as well as non-governmental organisations and first responders. Typically, ratings of confidence were similar to those of preparedness: first responders, non-governmental organisations, as well as hospital and healthcare services were assigned higher ratings, whereas governmental institutions and local community organisations were assigned lower ratings.

Figure 1 Mean ratings of perceived preparedness by type of institution

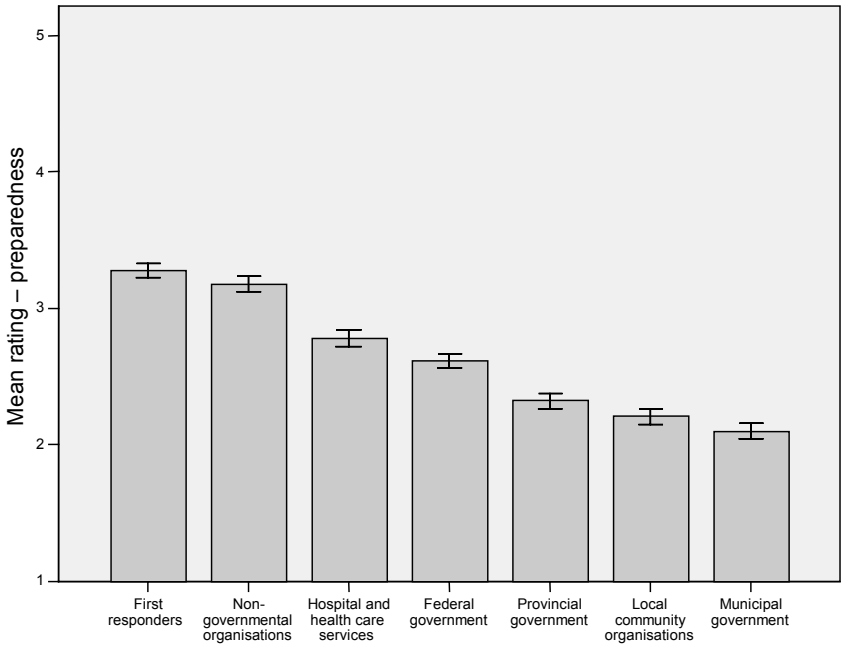
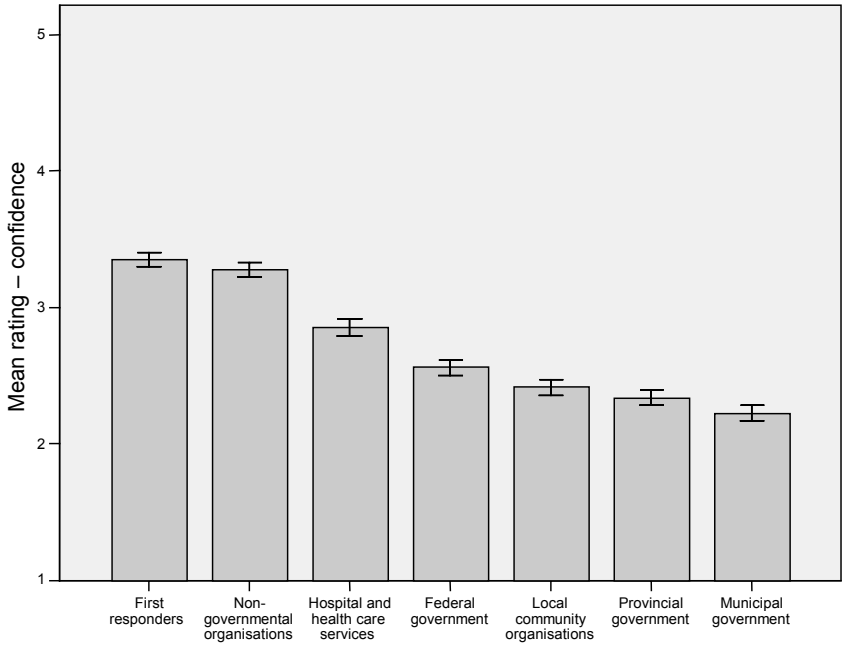


Figure 2 Mean ratings of confidence in the ability to respond to terrorism by type of institution



3.1.1 Socio-demographic comparisons

A series of between-subjects MANOVAs revealed that ratings of institutional preparedness varied by gender, $F(7, 1370) = 5.09$, $p < .001$; age, $F(7, 773) = 3.44$, $p < .001$; education, $F(7, 1365) = 3.64$, $p < .001$; urban/rural area of residence, $F(7, 1370) = 3.12$, $p < .01$; and region, $F(35, 5748.67) = 4.29$, $p < .001$. Mean ratings are presented in Table 1 for each demographic group. Follow-up univariate analyses demonstrated that men rated all institutions but hospitals and healthcare services as significantly less prepared relative to women (p-values ranging from <.001 to .02). Although multivariate analyses were significant for the remaining demographic variables, few other follow-up univariate analyses reached significance: older respondents rated the federal government as less prepared, $F(1, 779) = 3.75$, $p = .05$ and the municipal government as more prepared, $F(1, 779) = 5.97$, $p < .05$; respondents with a higher level of education rated local community organisations as less prepared, $F(1, 1371) = 18.29$, $p < .001$; and respondents living in rural areas rated their municipal government as less prepared than those living in urban areas, $F(1, 1376) = 5.56$, $p < .05$. Finally, preparedness ratings varied according to region for the federal government, $F(5, 1372) = 2.87$, $p < .05$; provincial government, $F(5, 1372) = 4.13$, $p < .001$; municipal government, $F(5, 1372) = 5.52$, $p < .001$; hospital and healthcare serves, $F(5, 1372) = 4.62$, $p < .001$; and non-governmental organisations, $F(5, 1372) = 2.81$, $p < .05$.

Confidence ratings varied by gender, $F(7, 1403) = 6.46$, $p < .001$; age, $F(7, 799) = 2.34$, $p < .05$; education, $F(7, 1397) = 3.13$, $p < .01$; and region, $F(35, 5887.49) = 3.32$, $p < .001$ (Table 2). Follow up analyses revealed that men had significantly less confidence in the ability of all institutions to respond to terrorism, but the provincial government compared to women (p-values ranging from <.01 to .03). Again, few of the univariate analyses involving the remaining demographic variables reached significance: respondents with a higher level of education had less confidence in the ability of local community organisations to respond, $F(1, 1403) = 13.62$, $p < .001$. Finally, preparedness ratings varied according to region for the federal government, $F(5, 1405) = 4.73$, $p < .001$; provincial government, $F(5, 1405) = 5.33$, $p < .001$; municipal government, $F(5, 1405) = 3.49$, $p < .01$; hospital and healthcare workers, $F(5, 1405) = 2.41$, $p < .05$; and non-governmental organisations, $F(5, 1405) = 3.13$, $p < .01$.

3.2 Personal response to terrorism

Mean ratings of the extent to which respondents have thought about engaging in various behaviours in response to terrorism are presented in Figure 3. Respondents reported having thought about engaging in each behaviour to a different extent, $F(12, 1442) = 165.00$, $p < .001$, with many of the pairwise comparisons achieving statistical significance. Specifically, respondents reported having thought most often about receiving first aid or CPR training, reading up on the topic of terrorism, and putting together an emergency supply kit, whereas they reported having thought least often about seeking social support.

Mean ratings of the extent to which respondents have actually engaged in each of the behaviours in response to terrorism are presented in Figure 4. It was found that respondents engaged in each behaviour to a different extent, $F(12, 1428) = 154.84$, $p < .001$, with many of the pairwise comparisons achieving statistical significance.

Table 1 Mean preparedness ratings (standard deviations) of different institutions by demographic groupings

Grouping variable	*N*	*FG*	*PG*	*MG*	*HHS*	*NGO*	*FR*	*LCO*
Gender								
Men	679	2.54 (1.05)	2.26 (1.02)	2.02 (1.04)	2.79 (1.09)	3.06 (1.09)	3.19 (1.02)	2.11 (1.06)
Women	699	2.69 (.98)	2.38 (.98)	2.18 (1.06)	2.76 (1.08)	3.29 (1.03)	3.37 (1.00)	2.30 (1.13)
Age								
<35 years	400	2.71 (1.02)	2.37 (1.02)	2.03 (1.04)	2.80 (1.10)	3.23 (.99)	3.31 (.96)	2.21 (1.08)
>55 years	381	2.57 (1.00)	2.32 (1.01)	2.22 (1.11)	2.79 (1.10)	3.13 (1.10)	3.35 (1.05)	2.19 (1.14)
Education								
High school or less	392	2.63 (1.10)	2.40 (1.08)	2.15 (1.12)	2.78 (1.14)	3.21 (1.10)	3.31 (1.11)	2.41 (1.21)
Post-secondary	981	2.61 (.98)	2.29 (.97)	2.09 (1.02)	2.79 (1.06)	3.17 (1.04)	3.27 (.97)	2.13 (1.04)
Visible minority								
Yes	83	2.43 (.97)	2.24 (.92)	2.06 (.95)	2.54 (1.04)	3.02 (1.06)	3.11 (.99)	1.95 (.90)
No	1272	2.62 (1.01)	2.33 (1.01)	2.10 (1.06)	2.80 (1.09)	3.19 (1.06)	3.29 (1.01)	2.21 (1.10)
Area of residence								
Urban	1052	2.59 (1.02)	2.31 (1.01)	2.14 (1.07)	2.77 (1.09)	3.18 (1.05)	3.29 (1.01)	2.20 (1.09)
Rural	326	2.71 (1.02)	2.35 (.99)	1.98 (.99)	2.81 (1.07)	3.16 (1.10)	3.25 (1.04)	2.24 (1.14)
Region								
Atlantic provinces	111	2.76 (.98)	2.10 (.94)	1.91 (.95)	2.96 (1.19)	3.40 (.99)	3.23 (.96)	2.37 (1.21)
Quebec	353	2.67 (1.04)	2.40 (1.01)	2.03 (.95)	2.68 (1.08)	3.30 (1.06)	3.24 (1.00)	2.26 (1.11)
Ontario	507	2.65 (1.03)	2.42 (1.03)	2.26 (1.03)	2.92 (1.08)	3.12 (1.10)	3.34 (1.03)	2.17 (1.07)
Prairies	95	2.60 (.97)	2.12 (1.01)	1.77 (1.00)	2.64 (1.00)	3.09 (1.17)	3.09 (1.08)	2.04 (1.07)
Alberta	134	2.40 (1.06)	2.27 (.94)	2.10 (1.06)	2.75 (1.09)	3.11 (1.03)	3.42 (1.00)	2.20 (1.16)
British Columbia	178	2.46 (.91)	2.17 (.96)	2.08 (1.02)	2.57 (1.02)	3.06 (.94)	3.22 (.98)	2.21 (1.08)

Notes: FG = federal government; PG = provincial government; MG = municipal government; HHS = hospital and healthcare services; NGO = non-governmental organisations; FR = first responders; LCO = local community organisations.

Table 2 Mean ratings (standard deviations) of confidence in the ability of different institutions to respond to terrorism by demographic groupings

Grouping variable	*N*	*FG*	*PG*	*MG*	*HHS*	*NGO*	*FR*	*LCO*
Gender								
Men	695	2.48	2.29	2.15	2.92	3.19	3.29	2.33
		(1.11)	(1.08)	(1.10)	(1.12)	(1.10)	(1.04)	(1.13)
Women	716	2.64	2.39	2.30	2.79	3.37	3.41	2.50
		(1.08)	(1.04)	(1.11)	(1.14)	(1.04)	(1.02)	(1.15)
Age								
<35 years	409	2.69	2.42	2.21	2.96	3.37	3.41	2.40
		(1.09)	(1.06)	(1.08)	(1.12)	(1.04)	(1.00)	(1.13)
>35 years	398	2.58	2.37	2.35	2.88	3.23	3.37	2.39
		(1.09)	(1.10)	(1.17)	(1.14)	(1.10)	(1.06)	(1.18)
Education								
High school or less	406	2.62	2.41	2.27	2.86	3.35	3.34	2.59
		(1.17)	(1.16)	(1.18)	(1.20)	(1.14)	(1.14)	(1.24)
Post-secondary	999	2.54	2.31	2.21	2.85	3.25	3.36	2.34
		(1.06)	(1.02)	(1.08)	(1.10)	(1.04)	(.98)	(1.09)
Visible minority								
Yes	87	2.43	2.25	2.15	2.54	3.10	3.17	2.15
		(1.13)	(1.09)	(1.01)	(1.10)	(1.11)	(1.05)	(1.07)
No	1299	2.57	2.34	2.22	2.88	3.29	3.37	2.42
		(1.09)	(1.06)	(1.11)	(1.13)	(1.07)	(1.02)	(1.14)
Area of residence								
Urban	1066	2.55	2.35	2.27	2.85	3.27	3.35	2.40
		(1.10)	(1.08)	(1.11)	(1.14)	(1.07)	(1.03)	(1.13)
Rural	345	2.59	2.30	2.10	2.87	3.32	3.36	2.45
		(1.10)	(1.01)	(1.11)	(1.12)	(1.10)	(1.04)	(1.19)
Region								
Atlantic provinces	113	2.64	2.17	2.04	2.98	3.40	3.33	2.61
		(.98)	(.97)	(1.04)	(1.22)	(1.04)	(.99)	(1.20)
Quebec	358	2.71	2.49	2.28	2.83	3.44	3.39	2.52
		(1.05)	(1.02)	(1.08)	(1.11)	(1.02)	(.95)	(1.12)
Ontario	523	2.61	2.41	2.28	2.94	3.22	3.38	2.35
		(1.11)	(1.10)	(1.12)	(1.13)	(1.12)	(1.08)	(1.12)
Prairies	99	2.33	2.04	1.85	2.69	3.23	3.17	2.29
		(1.23)	(1.10)	(1.06)	(1.08)	(1.18)	(1.16)	(1.21)
Alberta	134	2.28	2.31	2.22	2.87	3.20	3.45	2.34
		(1.13)	(1.03)	(1.13)	(1.18)	(1.07)	(1.02)	(1.25)
British Columbia	184	2.44	2.15	2.28	2.66	3.14	3.24	2.39
		(1.06)	(1.02)	(1.14)	(1.09)	(.99)	(.97)	(1.06)

Notes: FG = federal government; PG = provincial government; MG = municipal government; HHS = hospital and healthcare services; NGO = non-governmental organisations; FR = first responders; LCO = local community organisations.

Figure 3 Mean ratings for having thought about engaging in various behaviours in response to terrorism

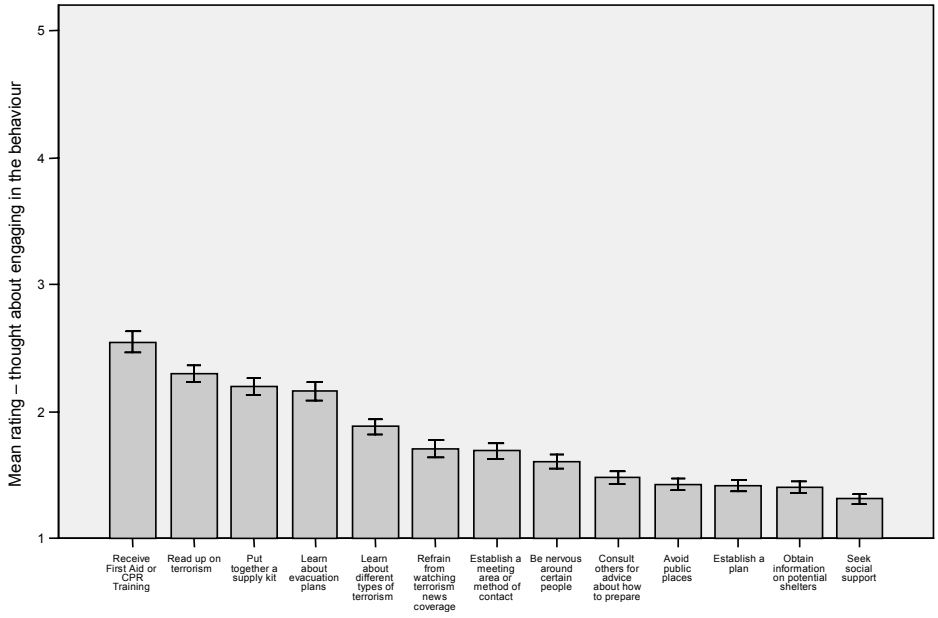


Figure 4 Mean ratings for having actually engaged in various behaviours in response to terrorism

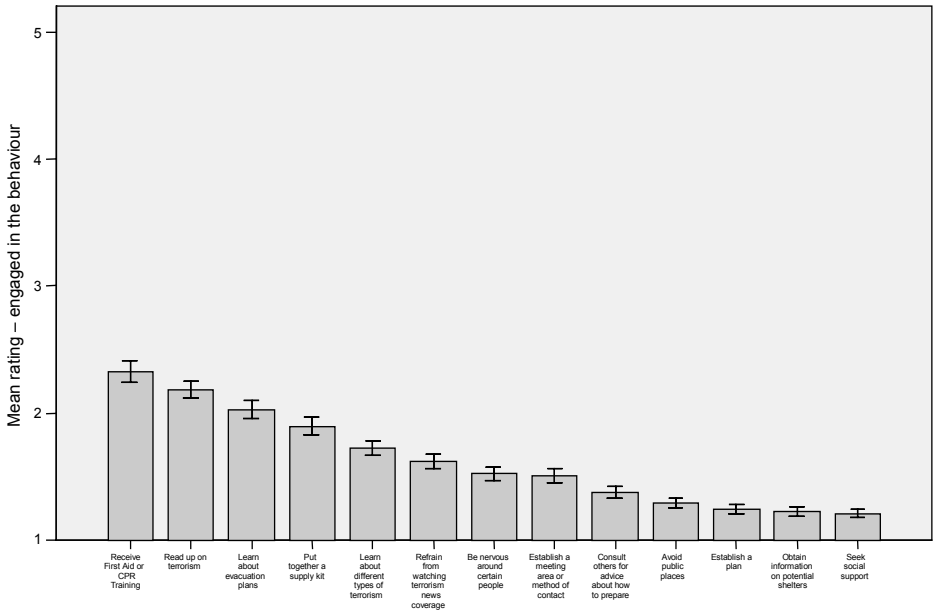


Table 3 Mean ratings (standard deviations) for having thought about engaging in various behaviours in response to terrorism by demographic groupings

Grouping variable	*N*	*Consult others for advice*	*Establish emergency plan*	*Put together emergency supply kit*	*First aid or CPR training*	*Obtain information on shelters*	*Establish meeting area*	*Learn evacuation plans*	*Learn about terrorism types*	*Read up on terrorism*	*Nervous around certain people*	*Avoid public places*	*Avoid news coverage on terrorism*	*Seek social support*
Gender														
Men	713	1.46	1.39	2.12	2.53	1.37	1.60	2.08	1.99	2.40	1.52	1.37	1.56	1.25
		(0.93)	(0.86)	(1.36)	(1.52)	(0.84)	(1.10)	(1.32)	(1.21)	(1.35)	(0.95)	(0.84)	(1.09)	(0.66)
Women	741	1.50	1.45	2.28	2.57	1.44	1.79	2.24	1.78	2.21	1.70	1.49	1.85	1.37
		(0.98)	(0.95)	(1.44)	(1.59)	(0.93)	(1.26)	(1.41)	(1.06)	(1.27)	(1.12)	(0.99)	(1.32)	(0.86)
Age														
<35 years	417	1.46	1.40	2.09	2.88	1.37	1.71	2.18	1.96	2.41	1.65	1.38	1.76	1.33
		(0.89)	(0.87)	(1.33)	(1.60)	(0.85)	(1.17)	(1.33)	(1.11)	(1.29)	(1.08)	(0.86)	(1.26)	(0.77)
>55 years	418	1.49	1.39	2.20	2.19	1.42	1.63	2.04	1.74	2.12	1.56	1.51	1.62	1.32
		(0.97)	(0.87)	(1.43)	(1.45)	(0.89)	(1.15)	(1.39)	(1.11)	(1.27)	(1.01)	(1.02)	(1.13)	(0.77)
Education														
High school or less	419	1.46	1.42	2.22	2.37	1.49	1.68	2.00	1.74	2.11	1.68	1.48	1.70	1.36
		(0.93)	(0.93)	(1.42)	(1.48)	(0.96)	(1.19)	(1.31)	(1.06)	(1.21)	(1.09)	(1.01)	(1.21)	(0.83)
Post-secondary	1027	1.48	1.42	2.18	2.63	1.37	1.70	2.23	1.94	2.38	1.58	1.41	1.71	1.29
		(0.95)	(0.90)	(1.39)	(1.58)	(0.85)	(1.18)	(1.39)	(1.16)	(1.35)	(1.02)	(0.87)	(1.23)	(0.74)
Visible minority														
Yes	91	1.49	1.69	2.32	2.90	1.42	1.70	2.21	2.03	2.42	1.64	1.66	1.71	1.44
		(1.00)	(1.15)	(1.56)	(1.61)	(1.00)	(1.23)	(1.41)	(1.32)	(1.46)	(1.06)	(1.19)	(1.28)	(1.00)
No	1339	1.47	1.40	2.19	2.53	1.40	1.70	2.17	1.87	2.29	1.60	1.41	1.71	1.30
		(0.94)	(0.88)	(1.39)	(1.56)	(0.88)	(1.19)	(1.37)	(1.13)	(1.30)	(1.04)	(0.89)	(1.22)	(0.75)
Area of residence														
Urban	1107	1.46	1.40	2.15	2.54	1.38	1.68	2.17	1.89	2.32	1.61	1.45	1.74	1.33
		(0.92)	(0.89)	(1.37)	(1.56)	(0.86)	(1.19)	(1.36)	(1.15)	(1.32)	(1.05)	(0.93)	(1.24)	(0.78)
Rural	347	1.56	1.47	2.35	2.58	1.48	1.73	2.16	1.85	2.25	1.61	1.36	1.63	1.27
		(1.04)	(0.96)	(1.50)	(1.55)	(0.96)	(1.17)	(1.41)	(1.12)	(1.28)	(1.02)	(0.89)	(1.14)	(0.75)
Region														
Atlantic provinces	120	1.43	1.39	2.12	2.51	1.41	1.65	2.08	1.69	2.33	1.48	1.30	1.49	1.22
		(0.90)	(0.94)	(1.44)	(1.59)	(0.90)	(1.13)	(1.42)	(1.01)	(1.35)	(0.88)	(0.71)	(1.12)	(0.68)
Quebec	361	1.40	1.35	2.02	2.60	1.45	1.55	2.12	1.97	2.33	1.53	1.41	1.56	1.36
		(0.84)	(0.83)	(1.36)	(1.56)	(0.94)	(1.08)	(1.36)	(1.17)	(1.30)	(0.97)	(0.91)	(1.09)	(0.85)
Ontario	543	1.53	1.45	2.24	2.40	1.36	1.71	2.16	1.88	2.34	1.71	1.50	1.79	1.30
		(1.02)	(0.96)	(1.42)	(1.52)	(0.83)	(1.20)	(1.33)	(1.15)	(1.35)	(1.12)	(0.99)	(1.26)	(0.75)
Prairies	100	1.49	1.39	2.19	2.60	1.39	1.73	2.38	1.90	2.08	1.58	1.54	1.66	1.37
		(0.85)	(0.78)	(1.35)	(1.54)	(0.84)	(1.24)	(1.43)	(1.19)	(1.22)	(1.11)	(1.00)	(1.19)	(0.81)
Alberta	135	1.49	1.31	2.02	2.70	1.32	1.59	2.10	1.78	2.20	1.59	1.33	1.70	1.24
		(0.98)	(0.79)	(1.34)	(1.69)	(0.81)	(1.14)	(1.42)	(1.13)	(1.29)	(1.07)	(0.83)	(1.25)	(0.74)
British Columbia	195	1.53	1.56	2.58	2.79	1.53	2.01	2.24	1.91	2.30	1.60	1.37	1.94	1.33
		(1.00)	(1.01)	(1.39)	(1.53)	(1.01)	(1.32)	(1.41)	(1.10)	(1.29)	(0.99)	(0.92)	(1.32)	(0.77)

Table 4 Mean ratings (standard deviations) for having actually engaged in various behaviours in response to terrorism by demographic grouping

Grouping variable	*N*	*Consult others for advice*	*Establish emergency plan*	*Put together emergency supply kit*	*First aid or CPR training*	*Obtain information on shelters*	*Establish meeting area*	*Learn evacuation plans*	*Learn about terrorism types*	*Read up on terrorism*	*Nervous around certain people*	*Avoid public places*	*Avoid news coverage on terrorism*	*Seek social support*
Gender														
Men	707	1.39	1.25	1.88	2.36	1.23	1.47	1.98	1.87	2.32	1.44	1.27	1.50	1.18
		(0.88)	(0.72)	(1.31)	(1.61)	(0.71)	(1.01)	(1.32)	(1.18)	(1.35)	(0.93)	(0.75)	(1.02)	(0.58)
Women	733	1.36	1.23	1.92	2.29	1.22	1.54	2.06	1.58	2.05	1.60	1.31	1.74	1.23
		(0.87)	(0.74)	(1.36)	(1.64)	(0.69)	(1.12)	(1.41)	(0.94)	(1.22)	(1.06)	(0.82)	(1.27)	(0.64)
Age														
<35 years	416	1.35	1.18	1.65	2.58	1.18	1.46	1.99	1.73	2.23	1.55	1.22	1.64	1.18
		(0.83)	(0.61)	(1.14)	(1.71)	(0.61)	(1.01)	(1.30)	(1.03)	(1.27)	(1.00)	(0.68)	(1.17)	(0.57)
>55 years	411	1.37	1.23	1.96	2.02	1.24	1.46	1.84	1.63	2.08	1.47	1.34	1.52	1.24
		(0.86)	(0.70)	(1.38)	(1.46)	(0.73)	(1.03)	(1.34)	(1.05)	(1.27)	(0.95)	(0.85)	(1.06)	(0.68)
Education														
High school or less	414	1.34	1.25	1.84	2.12	1.27	1.46	1.80	1.52	1.98	1.61	1.33	1.64	1.22
		(0.84)	(0.76)	(1.28)	(1.52)	(0.77)	(1.04)	(1.26)	(0.94)	(1.18)	(1.09)	(0.86)	(1.18)	(0.65)
Post-secondary	1018	1.39	1.24	1.91	2.41	1.21	1.52	2.11	1.80	2.26	1.48	1.27	1.61	1.20
		(0.89)	(0.72)	(1.35)	(1.65)	(0.67)	(1.08)	(1.40)	(1.12)	(1.33)	(0.95)	(0.75)	(1.15)	(0.62)
Visible minority														
Yes	89	1.36	1.37	2.07	2.70	1.15	1.58	2.09	1.89	2.42	1.62	1.52	1.58	1.29
		(0.88)	(0.91)	(1.45)	(1.72)	(0.58)	(1.19)	(1.44)	(1.24)	(1.50)	(1.06)	(1.06)	(1.19)	(0.81)
No	1328	1.38	1.23	1.88	2.30	1.23	1.50	2.02	1.71	2.17	1.51	1.27	1.62	1.20
		(0.87)	(0.71)	(1.33)	(1.62)	(0.71)	(1.06)	(1.37)	(1.07)	(1.28)	(0.99)	(0.76)	(1.16)	(0.61)
Area of residence														
Urban	1092	1.35	1.22	1.85	2.32	1.20	1.49	2.03	1.72	2.20	1.53	1.29	1.64	1.22
		(0.85)	(0.68)	(1.28)	(1.62)	(0.66)	(1.06)	(1.37)	(1.09)	(1.31)	(1.00)	(0.78)	(1.19)	(0.65)
Rural	348	1.44	1.31	2.05	2.36	1.30	1.54	1.99	1.71	2.13	1.51	1.28	1.56	1.17
		(0.94)	(0.86)	(1.48)	(1.62)	(0.81)	(1.09)	(1.38)	(1.05)	(1.24)	(0.99)	(0.81)	(1.06)	(0.58)
Region														
Atlantic provinces	118	1.31	1.19	1.89	2.26	1.29	1.37	1.98	1.53	2.17	1.36	1.19	1.34	1.15
		(0.82)	(0.72)	(1.40)	(1.64)	(0.83)	(0.97)	(1.48)	(0.95)	(1.24)	(0.78)	(0.59)	(0.85)	(0.56)
Quebec	358	1.28	1.23	1.79	2.26	1.23	1.38	2.01	1.79	2.18	1.47	1.22	1.48	1.26
		(0.72)	(0.66)	(1.28)	(1.62)	(0.70)	(0.91)	(1.33)	(1.08)	(1.27)	(0.94)	(0.69)	(1.04)	(0.73)
Ontario	539	1.41	1.24	1.92	2.24	1.19	1.53	1.97	1.73	2.24	1.58	1.36	1.70	1.18
		(0.93)	(0.76)	(1.33)	(1.56)	(0.63)	(1.09)	(1.32)	(1.10)	(1.34)	(1.05)	(0.87)	(1.21)	(0.58)
Prairies	100	1.44	1.21	1.68	2.48	1.18	1.52	2.18	1.69	1.99	1.59	1.34	1.61	1.30
		(0.84)	(0.61)	(1.18)	(1.63)	(0.59)	(1.11)	(1.42)	(1.10)	(1.18)	(1.19)	(0.84)	(1.15)	(0.79)
Alberta	134	1.37	1.17	1.80	2.57	1.16	1.43	2.03	1.65	2.06	1.53	1.28	1.69	1.16
		(0.89)	(0.64)	(1.33)	(1.76)	(0.64)	(1.02)	(1.41)	(1.11)	(1.27)	(0.99)	(0.78)	(1.25)	(0.60)
British Columbia	191	1.47	1.36	2.21	2.49	1.34	1.78	2.14	1.75	2.19	1.51	1.27	1.78	1.19
		(1.01)	(0.88)	(1.46)	(1.66)	(0.87)	(1.30)	(1.44)	(1.03)	(1.31)	(0.96)	(0.78)	(1.27)	(0.57)

3.2.1 Socio-demographic comparisons

The extent to which respondents have thought about engaging in the behaviours was also found to vary by gender, $F(13, 1440) = 5.67$, $p < .001$; age, $F(13, 821) = 6.36$, $p < .001$; education, $F(13, 1432) = 4.25$, $p < .001$; visible minority status, $F(13, 1416) = 1.87$, $p < .05$; urban/rural area of residence, $F(13, 1440) = 2.04$, $p < .05$; and region, $F(65, 6790.22) = 2.01$, $p < .001$. Mean ratings are presented in Table 3 by each demographic grouping. Follow-up univariate analyses demonstrated that, compared to women, men reported having thought significantly less about engaging in all behaviours but consulting others for preparedness advice, establishing an emergency plan, receiving first aid or CPR training, and obtaining information on shelters (p-values ranging from <.001 to .04). Older respondents reported having thought significantly less about receiving first aid or CPR training, $F(1, 835) = 42.19$, $p < .001$; learning about the differences and similarities between different types of terrorism, $F(1, 835) = 8.03$, $p < .01$; reading up on terrorism, $F(1, 835) = 10.55$, $p < .001$; and significantly more about avoiding public places, $F(1, 835) = 4.15$, $p < .05$. Respondents with a lower level of education reported having thought less about receiving first aid or CPR training, $F(1, 1444) = 7.74$, $p < .01$; learning evacuation plans, $F(1, 1444) = 7.80$, $p < .01$; learning about differences and similarities between types of terrorism, $F(1, 1444) = 10.10$, $p < .01$; reading up on terrorism, $F(1, 1444) = 12.38$, $p < .001$; and more about obtaining information on shelters, $F(1, 1444) = 5.68$, $p < .05$) compared to those with more education. Respondents who were not visible minorities indicated having thought significantly less about establishing an emergency preparedness plan, $F(1, 1428) = 9.15$, $p < .01$; receiving first aid or CPR training, $F(1, 1428) = 4.90$, $p < .05$; and avoiding public places, $F(1, 1429) = 6.39$, $p < .05$. Residence of urban areas reported having thought significantly less about putting together an emergency supply kit, $F(1, 1452) = 5.34$, $p < .05$. Finally, residents of different regions only varied in terms of the extent to which they reported having thought about putting together an emergency supply kit, $F(5, 1448) = 4.68$, $p < .001$; receiving first aid or CPR training, $F(5, 1448) = 2.29$, $p < .05$; establishing a meeting area or method of contact with loved ones, $F(5, 1448) = 4.27$, $p < .001$; and refraining from watching terrorism-related news coverage, $F(5, 1448) = 3.86$, $p < .01$.

The degree to which respondents have actually engaged in the behaviours varied by gender, $F(13, 1426) = 5.37$, $p < .001$; age, $F(13, 813) = 5.41$, $p < .001$; education, $F(13, 1418) = 5.11$, $p < .001$; visible minority status, $F(13, 1403) = 1.88$, $p < .05$; urban/rural area of residence, $F(13, 1426) = 1.96$, $p < .05$; and region, $F(65, 6724.05) = 1.77$, $p < .001$. Table 4 presents mean ratings by each demographic grouping. Follow-up univariate analyses demonstrated that women reported having learned about the different types of terrorism, read up on the topic of terrorism, and been nervous around certain people to a significantly lesser degree, whereas they reported having refrained from watching terrorism news coverage to a higher degree compared to men (p-values ranging from <.001 to .003). Younger respondents reported having put together an emergency supply kit, $F(1, 827) = 12.16$, $p < .001$, and avoided public places, $F(1, 827) = 4.22$, $p < .05$, to a lesser extent than older respondents, whereas they reported having received more first aid or CPR training, $F(1, 827) = 25.70$, $p < .001$. Respondents with a lower level of education reported having received first aid or CPR training, $F(1, 1430) = 9.17$, $p < .01$; learned evacuation plans, $F(1, 1430) = 15.93$, $p < .001$; learned about differences and similarities between types of terrorism, $F(1, 1430) = 20.86$, $p < .001$; and read up on

terrorism to a lesser extent, $F(1, 1430) = 13.91$, $p < .001$, whereas they reported having been more nervous around certain people, $F(1, 1444) = 4.67$, $p < .05$, compared to those with higher education. Respondents who were not visible minorities indicated having received less first aid or CPR training, $F(1, 1415] = 4.92$, $p < .05$, and having avoided public places, $F(1, 1415) = 8.10$, $p < .01$, to a lesser degree than visible minorities. Residents of urban areas reported having established an emergency plan, $F(1, 1438) = 4.34$, $p < .05$; put together an emergency supply kit, $F(1, 1438) = 6.50$, $p < .05$; and obtained information about potential shelters in their community, $F(1, 1438) = 4.73$, $p < .05$, to a lesser extent than residents of rural areas. Finally, residents of different regions varied in terms of the extent to which they reported having put together an emergency supply kit, $F(5, 1434) = 3.27$, $p < .01$; established a meeting area or method of contact with loved ones, $F(5, 1434) = 4.06$, $p < .001$; and refrained from watching terrorism-related news coverage, $F(5, 1434) = 3.88$, $p < .01$.

4 Discussion

The extent to which members of the public feel prepared to face a disaster can play a significant part in helping them maintain perspective with regards to the threat, thereby facilitating resilience among communities. With the aim of shedding light on potential strategies to improve terrorism preparedness, the current paper examined the degree to which Canadians perceive various institutions as prepared and able to respond as well as the level at which they have individually prepared for a possible scenario. Overall, findings reveal that institutions were perceived as only moderately prepared and that individuals have taken few measures to prepare, confirming preliminary findings (Lemyre *et al*., 2004a). On the other hand, Canadians have not felt overly nervous around certain people nor have they avoided public places to a high degree because of terrorism, suggesting that they likely do not perceive it as an overt threat. Indeed, findings from a recent national survey on health risk perception reveal that Canadians do not perceive terrorism as posing much of a risk to health (Krewski *et al*., 2005).

Among the institutions perceived by Canadians as most prepared for terrorism were first responders, non-governmental organisations, and hospital and healthcare services. In contrast, governmental institutions were perceived as the least prepared, particularly at the local level. This finding may reflect the fact that the role played by front-line workers in response to disasters is often more visible than that of the government. While first responders may clearly benefit from receiving training and new equipment, less evident is the fact that government policies enabled it. Indeed, the federal government has committed $59 million over six years (2002–2007) for the design and delivery of CBRN training programmes, and an additional $12 million in annual funding beginning in 2007–2008 (PSEPC, 2005b). It may be that the public is simply not aware of these policies or may not see their impact on actual preparedness. Accordingly, some participants in Lemyre *et al*.'s (2004a) consultations with members of the public indicated that they were not aware of any plans or procedures that were in place to deal with attacks on the part of the Canadian government. It may help to make this information known by a wider spectrum of people. Greater transparency on the part of government regarding what is currently being done to ensure the safety of Canadians may help improve public trust in governmental institutions. Moreover,

members of the public may be more inclined to participate in preparedness efforts on a personal level if they perceive the government as trustworthy in its role in terrorism risk management.

Undoubtedly, emergency management communications are needed from local governments to increase awareness about relevant initiatives. Emphasis could be placed on the role of individuals as a critical component of emergency management. While information on emergency management and individual preparedness is available on many government websites, the extent to which these specific resources are actually consulted by the public remains uncertain. Evidence suggests that the media may be a preferred source of information on terrorism (Lemyre *et al*., 2006). In addition, access to internet-based information sources is not equal. Over-reliance on this tool may therefore run the risk of creating a gap between individuals of higher and lower socioeconomic status in terms of their awareness of emergency management and preparedness. On the other hand, interactive approaches such as community-based emergency drills and exercises could prove to be useful as a channel of communication on government initiatives. Within the context of earthquake preparedness, community-based drills and exercises have been found to have a "profound and encouraging effect on the individual participants" (Simpson, 2002, p.57). To add, this approach has been found to be equally appreciated by individuals of diverse ethnic backgrounds (Nelson and Perry, 1991; Simpson, 2002), suggesting that a broad array of individuals might benefit from any information disseminated as part of the exercise.

Although Canadians have taken few measures to personally prepare for a possible terrorist event, it is of interest to note that the behaviours in which they reported having engaged the most (*e.g.*, receiving first aid or CPR training, putting together an emergency supply kit, learning about evacuation plans of buildings) are typically those that would be useful in a wide variety of emergency situations. These findings suggest that an all-hazards approach may be best suited to promoting individual preparedness. Indeed, people tend to be pragmatic in their decisions and behaviours about issues that affect their health, opting for those that are easy and effective (Larsson and Enander, 1997; Neuwirth *et al*., 2000; Whitney *et al*., 2004). Emphasising those behaviours that are useful in a wide variety of situations may represent a potential strategy to encourage members of the public to prepare for terrorism-related disasters.

In addition to examining overall trends in perceptions of preparedness at different institutional levels and various types of individual responses to terrorism, socio demographic differences were also examined. In general, these analyses revealed that institutions were rated as less prepared by men, older respondents, respondents with more education, and rural residents. The finding that rural residents perceived their municipal government, in particular, as less prepared may reflect the fact that local rural governments often have fewer available resources (Haque, 1999; 2002). Since resources are readily depleted, rural communities commonly rely on provincial or federal assistance in extreme emergencies. Unfortunately, there is a perception among rural communities that policy design and implementation at higher levels of government is subject to urban bias, which then leads to command-control emergency management approaches (Haque, 1999; 2002). The inclusion of guidelines to improve cooperation between local and higher levels of government in the hazard mitigation plans of rural communities may prove to be an effective alternative.

Group comparisons on individual preparedness revealed that women, younger respondents, respondents with lower education, respondents who were not visible minorities and urban residents have prepared to a lesser degree for a possible scenario. The lack of proximity or accessibility to emergency services among rural residents may explain the fact that they were more apt to having established an emergency plan, put together an emergency supply kit, and obtained information about potential shelters in their community. Often, it takes longer for authorities to respond to the needs of rural residents, forcing these individuals to rely on each other for support. Additionally, rural residents may feel as though they should take more personal responsibility for preparedness since their local governments are more likely to have limited resources. Instilling a sense of responsibility and urgency for preparedness among urban residents likely represents a challenge to overcome.

Although similar trends were observed with regards to respondents' thoughts and actual engagement in preparedness behaviours, one exception was noted for gender. Specifically, women reported having prepared to a lesser extent than men, despite the fact that they indicated having thought more about preparing. A similar observation was made in a study by Larsson and Enander (1997) regarding individual preparedness for general disasters among Swedes. It is possible that women's intentions are less likely to translate into action because of their appraisals of the ease and effectiveness of preparedness behaviours (for a description of a stages of change model of preparedness, see Paton, 2003). Also, findings of a number of studies suggest that terrorism is a greater source of worry for women compared to men (Lemyre *et al*., 2006; Lerner *et al*., 2003; Sjöberg, 2002). This heightened worry about terrorism may also act as a barrier to action as individuals may feel overwhelmed by the threat.

While the above findings are informative about those population segments in need of programmes aimed at increasing individual preparedness, further studies are required to identify barriers to their engagement in preparedness activities. For instance, some population segments may be poorly positioned to respond to the call for improved individual preparedness despite potential intentions to do so due to a limited access to required resources. Therefore, future research should not only identify the thought processes associated with lower individual preparedness, but also focus on the contribution of structural factors such as the availability or accessibility of proper resources across different population segments. Ultimately, knowledge of these factors will be critical to the development of programmes that better meet the specific needs of vulnerable populations.

In sum, the present findings indicate that Canadians do not perceive governmental institutions as highly prepared for terrorism despite increased attention and effort put on the issue by policymakers since 2001, nor have they exhibited a high level of individual preparedness. Although fear and anxiety are acknowledged as normal adaptive responses to CBRN events (Lemyre *et al*., 2005a), a perceived lack of preparedness may compound such reactions, rendering their management particularly challenging. Greater communication about current governmental efforts to improve preparedness may help improve perceptions of governmental institutions. At the same time, members of the public need to be reminded of the role they can play in the resilience of their communities by individually preparing for possible scenarios.

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Notes

1 Urban or rural classification was based on Forward Sortation Areas for all provinces but New Brunswick. Specifically, postal codes with the second character having a value higher than zero were coded as urban, whereas postal codes with the second character having a value of zero were coded as rural. For New Brunswick, urban or rural classification was based on Geocodes from Census. Geocodes of 1 to 3, (which indicate the record is inside the Census metropolitan area) were coded as urban, while Geocodes of 4 and 5 (which are considered to be outside the metropolitan area) were coded as rural.

2 Comparisons across provinces would not yield reliable findings because markedly unequal sample sizes jeopardise the reliability of statistical tests for group comparisons such as MANOVAs (Tabachnick and Fidell, 2001).