

ARE LONDONERS PREPARED FOR AN EMERGENCY? A LONGITUDINAL STUDY FOLLOWING THE LONDON BOMBINGS

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The UK government sees increasing individual preparedness as a priority, but the level of preparedness of people in the UK for a large-scale emergency is not known. The London bombings of July 7, 2005, affected many Londoners and may have altered their sense of vulnerability to a future terrorist attack. We used a longitudinal study design to assess individual preparedness within the same sample of Londoners at 2 points in time: immediately after the bombings (T_1) and 7 to 8 months later (T_2). A demographically representative sample of 1,010 Londoners participated in a phone interview at T_1 . Subsequently, at T_2 , 574 of the same people participated in a follow-up phone interview. At T_1 51% of Londoners had made 4 or more relevant emergency plans; 48% had gathered 4 or more relevant supplies in case of emergency. There was evidence of increased preparedness at T_2 , by which time 90% had made 4 or more emergency plans. Ethnicity, low social status, and having felt a sense of threat during the bombings predicted increased preparedness between T_1 and T_2 . Women in general, and women of low social status in particular, perceived themselves to be unprepared in the event of a future terrorist attack. In summary, Londoners show moderate levels of emergency preparedness, which increased following the London bombings. Although we cannot know whether this association is causal, the prospective nature of the study increases the likelihood that it is. However, preparedness is still patchy, and there are important demographic associations with levels of preparedness and perception of vulnerability. These findings have implications for future development of individual and community emergency preparedness policy.

INDIVIDUAL EMERGENCY PREPAREDNESS is of considerable interest to public health and government agencies. In both the United States and the United Kingdom, agencies have produced detailed guidance about emergency preparations for members of the public in an attempt to increase individual and household preparedness for future terrorist incidents and other disasters.¹⁻⁴ Despite these efforts, preparedness of individuals does not appear to have substan-

tially improved in the U.S. during the past 5 years,⁵⁻⁸ while in the UK individual preparedness has never been evaluated.

Recently, there has been increasing interest in community and citizen response to civil emergencies,^{9,10} and particularly to terrorism, while preparedness in the face of (nonterrorist) technological and natural disasters has been of interest to researchers since the latter part of the last century.¹¹ Individual preparedness is an important component

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of community preparedness,¹² because people's ability to remain at home is crucial to the concept of "community shielding."⁹ Lack of essential items such as food, water, and medication reduces the length of time that people could stay at home and increases the urgency with which government and other agencies would need to deliver supplies.⁹ Engaging the public in preparation for a major incident is a challenge that faces emergency planners, and there have been calls for increased attention to be paid to enlisting the public as "capable allies."¹³ Enabling families to stay together, or at least remain in contact, is also likely to improve adherence with requests to shelter in place.^{9,14}

The extent to which individuals are prepared is an important consideration for a variety of emergency scenarios. For example, the ability of people to safely undergo periods of quarantine at home will be partly related to their preexisting levels of preparedness: running out of supplies was a reason for breaking home quarantine during the SARS outbreak.¹⁵

In the UK, several large-scale civil emergencies or near misses have threatened regional populations in recent years, including the London bombings, the failed attacks on London's public transport network in July 2005, and the Buncefield fire in December 2005. Future large-scale emergencies are inevitable, and yet there is little information on how prepared individual members of the UK public are for such eventualities.

Survey data from the U.S. suggest that levels of individual preparedness are relatively low, with only 30% to 40% of people having prepared emergency supplies or a plan for maintaining contact with family members in the event of an emergency.^{6,7,16} In areas that are believed to be at relatively high risk of a civil emergency—for example, New York or Los Angeles—individual preparedness may be even lower.^{6,17}

Likewise, recently published survey work from Canada implies that few Canadians have made emergency plans in the event of a terrorist attack.¹⁸ Individual or household preparedness may be higher in regions that have experienced prolonged conflict: for example, in 2001 the vast majority of Israelis indicated they knew how to use their gas masks and had previously created a sealed room in their home.¹⁹

There is some evidence that major incidents may lead to an increase in future preparedness,^{20,21} possibly by increasing feelings of vulnerability, but the effect of a terrorist incident on emergency preparedness has never been evaluated using a longitudinal (cohort) design. Previous work suggests that emergency preparedness is affected by certain sociodemographic variables. In particular, ethnic minority groups have been shown to be less prepared than majority groups,²² as have people with low incomes²³—this despite risk perception usually being higher in these groups.^{22,23} Following disasters, there is likely to be an interaction be-

tween poverty and ethnic minority status,²⁴ with those from both groups typically living in more risky housing and having difficulty receiving and complying with warning communications.²³ The reasons for lower levels of preparedness among ethnic minorities are likely to be multifactorial and include greater skepticism of official warnings,²⁵ and financial constraints.²² These issues have never been investigated before in the UK.

In 2004, the UK government sent every household a booklet entitled *Preparing for Emergencies: What You Need to Know*.⁴ The booklet gave advice on general strategies to adopt in case of an emergency (eg, "Go in, Stay in, Tune in") and on what to do during specific scenarios (eg, a chemical, biological, or radiologic incident requiring decontamination). The booklet also included a section on suggested preparations that the general public should make in advance of an emergency. Some of these preparations involved planning (eg, learning how to turn off gas and electricity supplies), and others involved the acquisition of emergency supplies (eg, preparing a home first aid kit). Finally, the booklet included information on how government agencies are preparing for emergency scenarios in the UK. Although this booklet was sent to every household in the country, the impact of the undertaking was not empirically assessed.

The London bombings occurred on July 7, 2005, approximately 1 year after the distribution of the *Preparing for Emergencies* booklet. Fifty-two commuters were killed in the bombings, and many Londoners were affected directly and indirectly by these events.²⁶ A longitudinal dataset measuring the response and behavior of Londoners following the incident has been collected, eliciting information on mental health outcomes, behavioral change, and preparedness.^{26,27} In this article we use the London bombings dataset to determine levels of preparedness among ordinary Londoners in the immediate and medium-term aftermath of the London bombings. Secondary objectives were: to determine whether levels of preparedness changed during the 7 months separating the 2 surveys, whether demographic or psychological variables were associated with preparedness, and whether receiving government information on emergencies was associated with greater levels of preparedness.

METHODS

In July 2005, a random sample of 1,010 Londoners participated in a telephone survey to assess their psychological and behavioral responses to the July 7 London bombings. This first survey (T₁) took place 11 to 13 days after the bombings and was completed 1 day before a second, failed series of attacks occurred on July 21, 2005. Proportional quota sampling was used to ensure that survey respondents were demographically representative of London residents.

Quota sampling was deemed necessary to ensure rapid data collection, given that the primary purpose of the survey was to assess immediate response to a terrorist incident.²⁸ Random digit dialing of all London telephone numbers was used, and people over the age of 18 who were residents of any London borough were eligible for inclusion. In order to achieve a demographically representative sample, quotas were set for sex, location of residence, age, housing tenure, and ethnicity as reflected in the 2001 census in London (see Rubin et al.²⁶ for details). A second telephone survey (T₂) took place between February 3 and March 5, 2006 (ie, 7 to 8 months after the bombings). Of the participants from the original sample, 815 had given permission to be contacted again, and 574 of these participants were successfully contacted at T₂, representing a response rate of 70.4%.

Preparedness Measures

Participants were asked in both surveys about various preparations that they may have made in anticipation of future emergencies; this was in addition to questions about stress levels and travel intentions, the results of which are reported elsewhere.^{26,27} Preparedness measures consisted of whether emergency plans had been made (7 items: see Table 2 for wording) and which, if any, emergency supplies they had gathered (5 items: see Table 2).

All items were taken from the *Preparing for Emergencies* booklet.⁴ Concerning both emergency plans and supplies, participants responded “yes” or “no” for each item depending on whether they had made that particular preparation. At T₂ participants were also asked to list any other (extra) emergency supplies that they may have gathered, and their answers were recorded verbatim. At both surveys, participants also were asked, “How much do you believe that you would know what best to do if you were caught in a terrorist attack?” with responses given on a numbered scale of 0 (not at all) to 4 (very much); those that scored 0 or 1 were coded as having low levels of perceived preparedness. At T₁ participants were asked whether they felt the emergency services would cope well in the event of another terrorist attack.

Threat and Mental Health Measures

Threat to self or close others on the day of the London bombings was assessed at T₁ by asking whether participants felt they or others emotionally close to them might have been killed or injured on that day. Stress resulting from the bombings was assessed in both surveys using 5 items that asked about stress symptoms experienced over the past 3 weeks “as a result of the London bombings.” Participants were recorded as having “substantial stress” if they reported experiencing 1 or more of these symptoms “quite a bit” or “extremely.” Depression was measured at T₂ using the 9-item Patient Health Questionnaire.²⁹

Sociodemographic Measures

Demographic variables assessed at T₁ included sex, age, working status, religion, and socioeconomic status (SES). In order to measure SES, the Registrar General’s Social Class (RGSC) classification was used (see Figure 1). The RGSC uses occupation to measure social standing or class, and it has been widely used for many years in the UK in studies of social and health inequality.³⁰ All participants were asked at T₁ if they had received and/or read the government booklet *Preparing for Emergencies*.

Ethical approval for the study was granted by the South London and Maudsley NHS Trust Research Ethics Committee.

Analysis Strategy

Only individuals who completed the survey at T₁ and T₂ were included in the analysis. Basic tabulation of individual emergency plans and gathering of emergency supplies was undertaken, with a breakdown of how these indicators had changed between the 2 time points. For both planning and gathering of emergency supplies, summary and then binary scores were produced (based on an *a priori* median split), which indicated whether respondents had made 0-3 or 4 or more preparations. Comparisons were made between the 2 time points using a paired Student’s *t*-test. Variables also were created to represent respondents who had gathered new emergency supplies between the 2 time points and to represent those who reported gathering any extra emergency supplies (ie, supplies additional to those named in the *Preparing for Emergencies* booklet) at T₂.

Initially, Mantel-Haenszel (MH) odds ratios were calculated against these binary summary scores and used to explore associations between these outcome variables and demographic, perceived threat, stress/depression variables, and whether the government booklet had been received and/or read. Following this, logistic regression was used to further explore several specific findings—namely, the relationship between gathering new emergency supplies between the 2 surveys, experiencing a sense of threat on July 7, social class, and ethnicity. Logistic regression also was used to further clarify the relationship between perceived pre-

Figure 1. Measurement of Social Standing: The Registrar General’s Social Class (RGSC)

- | | |
|-----|------------------------------------|
| I | Professional occupations |
| II | Managerial & technical occupations |
| III | Skilled occupations |
| | (N) Nonmanual |
| | (M) Manual |
| IV | Partly skilled occupations |
| V | Unskilled occupations |

paredness, gender, and social class. In both regression analyses a hierarchical approach was used, such that demographic variables were added in sequentially according to predicted importance, with tests for interactions at each stage.

RESULTS

A total of 574 people participated in both telephone surveys. People who participated at T_1 but did not participate at T_2 (either because they refused or were not contactable) were more likely to be younger, of Muslim religion, and of lower SES. The demographic profile of the responders and nonresponders is shown in Table 1. Of the respondents, 300 (52.3%) recalled receiving the *Preparing for Emergencies* booklet issued by the UK government, and 239 (41.6%) said they had read the leaflet.

Emergency Planning

There was evidence that the majority of respondents had emergency plans in place at both time points (see Table

2). Some emergency plans had been made by respondents at T_2 that had not been made at T_1 (between 8.4% and 23.0% for each item). However, it is also evident that a proportion of respondents had made plans at T_1 but no longer recalled these at T_2 (between 6.3% and 14.5% for each item). Fewer than half (38.7%) of respondents with children under the age of 18 knew what emergency procedures were in place at the child's school. Summary scores showed that significantly more people had made 4 or more emergency plans by T_2 when compared with T_1 (86.8% vs. 50.9%; t -test = 8.05; $p < 0.001$). Having received or read the *Preparing for Emergencies* booklet was not associated with having made emergency plans. The association between having made emergency plans and demographic, threat, and mental health variables is presented in Table 3.

Gathering Emergency Supplies

Once again there was evidence of respondents having gathered items by T_2 that they did not have at T_1 (between 8.5% and 17.4% for each item), but also some respondents no longer had items at T_2 that they had had at T_1 (between

Table 1. Basic Demographics of Responders and Nonresponders at the Second Survey (T_2) in 2006

Demographic variable		Total sample at $T_1 = 1,010$		Chi-squared	p-value
		Responders at T_2	Nonresponders at T_2		
Sex	Male	$n = 574$ 258 (45.0%)	$n = 436$ 186 (42.6%)	0.5	0.5
	Female	316 (55.1%)	250 (57.3%)		
Age/years	18-24	$n = 572$ 48 (8.4%)	$n = 425$ 76 (17.9%)	33.8	<0.001
	25-44	272 (47.6%)	216 (50.8%)		
	45-64	175 (30.6%)	76 (17.9%)		
	>65	77 (13.5%)	57 (13.4%)		
Religion	Christian	$n = 572$ 308 (53.8%)	$n = 436$ 218 (50.0%)	11.7	0.008
	Muslim	35 (6.1%)	53 (12.2%)		
	Other	97 (17.0%)	75 (17.2%)		
	None	132 (23.1%)	90 (20.6%)		
Social Class	I & II	$n = 557$ 188 (33.8%)	$n = 415$ 109 (26.3%)	15.3	<0.001
	III (N & M)	284 (51.0%)	204 (49.2%)		
	IV & V	85 (15.3%)	102 (24.6%)		
Work Status	Full-time	$n = 573$ 279 (48.7%)	$n = 432$ 197 (45.6%)	0.9	0.3
	Part-time or not working	294 (51.3%)	235 (54.4%)		

Table 2. Emergency Plans and Supplies Gathered at the First (T₁) and Second Surveys (T₂). Items were selected to reflect the advice contained in the UK government's booklet *Preparing for Emergencies*.

Emergency Plans <i>n</i> = 574	Responses <i>n</i> (%)					
	"yes" at T ₁	"yes" at T ₂	"yes" in both surveys	"no" in both surveys	"no" at T ₁ and "yes" at T ₂	"yes" at T ₁ and "no" at T ₂
In the case of an emergency, which of the following do you know about?						
Where and how to turn off water, gas, and electricity at home	448 (78.1)	460 (80.1)	412 (71.8)	78 (13.6)	48 (8.4)	36 (6.3)
Emergency procedures for your children at school ^a	67 (38.7)	63 (36.4)	42 (24.3)	85 (49.1)	21 (12.1)	25 (14.5)
Emergency procedures at your workplace ^b	279 (71.7)	305 (78.4)	245 (63.0)	50 (12.9)	60 (15.4)	34 (8.7)
How your family would stay in contact in the event of an emergency	372 (64.8)	426 (74.2)	307 (53.5)	83 (14.5)	119 (20.7)	65 (11.3)
If you had any elderly or vulnerable neighbors who might need your help	330 (57.5)	392 (68.3)	260 (45.3)	112 (19.5)	132 (23.0)	70 (12.2)
How to tune in to your local radio station	450 (78.4)	483 (84.2)	407 (70.9)	48 (8.4)	76 (13.2)	43 (7.5)
How to search the internet for emergency advice or information	320 (55.8)	378 (65.9)	284 (49.5)	160 (27.9)	94 (16.4)	36 (6.3)
Gathering of Emergency Supplies <i>n</i> = 574	Responses <i>n</i> (%)					
Which of the following have you gathered at home in case of an emergency?	"yes" at T ₁	"yes" at T ₂	"yes" in both surveys	"no" in both surveys	"no" at T ₁ and "yes" at T ₂	"yes" at T ₁ and "no" at T ₂
List of useful phone numbers	450 (78.4)	460 (80.1)	388 (67.6)	52 (9.1)	72 (12.5)	62 (10.8)
Toiletries, sanitary supplies, and regular medication	289 (50.4)	314 (54.7)	214 (37.3)	185 (32.2)	100 (17.4)	75 (13.1)
Battery radio with spare batteries	231 (40.2)	261 (45.5)	169 (29.4)	251 (43.7)	92 (16.0)	62 (10.8)
First-aid kit	397 (69.2)	385 (67.1)	336 (58.5)	128 (22.3)	49 (8.5)	61 (10.6)
Candles and matches	422 (73.5)	464 (80.8)	383 (66.7)	71 (12.4)	81 (14.1)	39 (6.8)

^aOnly 173 respondents with children younger than 18 were surveyed.

^bOnly 389 respondents who work were surveyed.

6.8% and 13.1% for each item). Close to half (43.7%) of respondents did not possess a battery radio (with spare batteries) at either time point, while 32.2% did not have toiletries, sanitary supplies, and medications gathered at home. There was no evidence of an increase in the number of emergency supplies gathered between the 2 surveys (47.9% versus 50.7%; *t*-test = 1.30; *p* = 0.195). People who could recall having received the *Preparing for Emergencies* booklet were more likely to have gathered 4 or more of these items, although this association was less robust

for those who actually recalled reading the booklet (see Table 3).

After excluding the 115 respondents who had already gathered all 5 of the items suggested in the *Planning for Emergencies* booklet at T₁, 259 (56.4%) respondents had gathered new emergency supplies by T₂. Gathering new supplies was associated with having felt a sense of threat to self or close friends or relatives on the day of the bombings, which remained after controlling for social class and ethnicity (adjusted OR 1.50 [95% CI 1.00-2.26] *p* = 0.05).

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Table 3. The Relationship between Sociodemographic, Threat, and Mental Health Variables and Preparedness Measures (*N* = 574 except where otherwise stated)

<i>Exposure Variable</i>		<i>OR^a (95% CI) for Having Made ≥ 4 Emergency Plans at T₁</i>	<i>OR^b (95% CI) for Having Gathered ≥ 4 Emergency Supplies at T₁</i>	<i>OR^c (95% CI) for Gathering New Emergency Supplies between T₁ and T₂ n = 459</i>
Sex	Male	Ref	Ref	Ref
	Female	1.35 (0.97-1.89)	1.04 (0.75-1.45)	1.12 (0.77-1.62)
Ethnicity	White	Ref	Ref	Ref
	Other	0.83 (0.55-1.24)	0.71 (0.47-1.07)	1.77 (1.10-2.82)*
Religion	Other	Ref	Ref	Ref
	Muslim	0.52 (0.25-1.08)	1.03 (0.52-2.04)	0.89 (0.41-1.92)
Social class (<i>n</i> = 557)	I & II	Ref	Ref	Ref
	III (N & M)	0.89 (0.62-1.29)	0.75 (0.52-1.08)	1.58 (1.04-2.40)*
	IV & V	0.64 (0.38-1.09)	0.92 (0.55-1.53)	1.71 (0.96-3.08)
Children <18	None	Ref	Ref	Ref
	At least 1 child	0.71 (0.50-1.03)	1.18 (0.82-1.68)	1.15 (0.77-1.73)
Received government booklet	No	Ref	Ref	Ref
	Yes	1.30 (0.94-1.81)	1.54 (1.10-2.14)*	0.77 (0.53-1.11)
Read government booklet	No	Ref	Ref	Ref
	Yes	0.92 (0.52-1.61)	1.68 (0.95-2.99)	0.92 (0.50-1.71)
Felt sense of threat to self or others on July 7, 2005	No	Ref	Ref	Ref
	Yes	1.05 (0.75-1.49)	0.73 (0.52-1.03)	1.57 (1.05-2.32)*
Stress at T ₁	No	Ref	Ref	Ref
	Yes	1.01 (0.69-1.46)	1.32 (0.91-1.91)	1.90 (0.59-1.36)
Stress at T ₂	No	—	—	Ref
	Yes	—	—	1.36 (0.76-2.45)
Depression at T ₂	No	—	—	Ref
	Yes	—	—	0.77 (0.32-1.81)

^a= Unadjusted Mantel-Haenszel odds ratio expressed for those having made > 4 plans vs. < 4 plans.

^b= Unadjusted Mantel-Haenszel odds ratio expressed for those having made > 4 emergency supplies vs. < 4 emergency supplies.

^c= Unadjusted Mantel-Haenszel odds ratio expressed for those having made new preparations between the 2 surveys vs. those who had not.

**p* = ≤ 0.03.

Gathering new emergency supplies was associated with lower social class, and respondents were more likely to have gathered new supplies if they were from a nonwhite ethnic group, even after controlling for social class (adjusted OR 1.73 [95% CI 1.08-2.78] *p* = 0.02). Making new preparations

was not associated with gender, age, religion, having children under the age of 18, scoring positively for stress at either survey, or depression at T₂. The association between gathering new supplies between the 2 surveys and demographic, threat, and mental health variables is presented in Table 3.

At T_2 (although not at T_1), respondents were asked to list verbatim any emergency supplies they had gathered that were extra (additional) to those mentioned in the *Planning for Emergencies* booklet. Table 4 lists the frequency with which items were mentioned. One hundred fifteen people (20.0%) had made 1 or more extra preparations. There was a trend for this “extra prepared” group to be associated with lower social class (OR 1.44 [95% CI 1.06-1.97] $p = 0.02$), but it was not associated with ethnicity, gender, age, religion, having children under the age of 18, having felt a sense of threat to self or close others on the day of the bombings, scoring positively for stress at either survey, or depression at T_2 (results not shown).

Perception of Preparedness if Caught in a Terrorist Attack

The overwhelming majority of respondents (97.0%) felt that the emergency services would cope well in the event of another terrorist attack on London. At both time points there were a substantial number of respondents who indicated that they would know either “little” or “not at all” what to do if caught in an attack, although this proportion showed signs of having diminished between the 2 time points: 41.6% at T_1 versus 35.9% at T_2 (t -test = 1.89; $p = 0.06$). Respondents who were least likely to know what to do in the event of a terrorist attack (at T_2) were more likely to be female, with evidence for an interaction with social class (see Table 5). There was no evidence that those who did not believe they would know what to do in a terrorist attack had felt more threat to self or close others on the day of the bombings (OR 1.36 [95% CI 0.94-1.96] $p = 0.10$).

DISCUSSION

We found evidence of moderate levels of emergency preparedness among Londoners, with 51% having in place at least 4 out of 7 suggested emergency plans and 48% having gathered at least 4 out of 5 recommended emergency supplies at the first survey. Only a small proportion (8%) had made no preparations at all. Due to the longitudinal design of the study, we were able to show evidence of increased preparedness between the 2 time points. For example, by the second survey, 87% of the sample who were re-contacted had made 4 or more of the emergency plans outlined in Table 2. However, it was also apparent that some people failed to maintain previously made preparations and plans.

Recollection of having received the *Preparing for Emergencies* booklet was associated with having gathered more emergency supplies, though recollection of reading the booklet was not. Feeling personally threatened by the London bombings predicted increased preparedness in the ensuing months, and it seems likely that the overall increase in

preparedness over time is at least partly as a result of the bombings. Making preparations between the 2 time points was associated with being from a lower social class, being from an ethnic minority, and having felt a sense of threat on the day of the bombings. The perception of being unprepared was higher for women than men, and particularly so for women from lower social classes.

Previous studies suggest that between 31% and 42% of demographically representative samples in the U.S. have put together an emergency supplies kit,^{6,7} while only 26% of New Yorkers have done so.⁶ It may be that our sample of Londoners is better prepared than their U.S. counterparts, or this may reflect differences in the way preparedness was assessed between the 2 populations. Specifically, the U.S. surveys asked about preparedness based on U.S. guidance, which emphasizes gathering food supplies, a flashlight, a battery-operated radio, and spare batteries.^{1,2} Our study assessed guidance from the *Preparing for Emergencies* booklet,⁴ which includes gathering a first aid kit, phone numbers, and medication. When items are compared directly between the 2 surveys, results appear more similar. For example, in our study a battery-operated radio proved to be

Table 4. Extra Emergency Supplies Gathered and Listed by Participants by the Second Survey (T_2) ($N = 574$)

	n (%) ^a
None	459 (80.0)
Got extra supplies of food	47 (8.2)
Have stored water/bottled water at home	36 (6.3)
Got a torch	15 (2.6)
Got a fire extinguisher/fire blanket/fire alarm	6 (1.0)
Updated my contacts/keep them in safe place/got numbers of relatives/friends/colleagues	5 (0.9)
Wrote a will	4 (0.7)
Got camping equipment	4 (0.7)
Personal documents/paperwork stored in a safe place	4 (0.7)
Have got warm/extra clothing at home	3 (0.5)
Bought a gas mask	3 (0.5)
Got batteries	3 (0.5)
Got blankets	3 (0.5)
Other	12 (2.1)

^aTotal numbers add up to more than 574 as some participants gathered extra supplies of more than one type.

Table 5. Summary of Odds Ratios for Lack of Perceived Preparedness in Females

		<i>Females vs. Males (95% CI)</i>	<i>Wald Test p-value</i>	<i>Test for Interaction^a p-value</i>
Unadjusted OR		1.84 (1.30-2.62)	0.001	—
Adjusted ^b OR		1.85 (1.29-2.65)	0.001	—
Social class stratum specific adjusted ^b OR	I & II	0.86 (0.46-1.59)	0.622	0.01
	III (N & M)	2.80 (1.67-4.69)	<0.001	
	IV & V	2.64 (0.91-7.62)	0.072	

^a= Likelihood ratio test.

^b= Adjusted for ethnicity, age, religion, depression, and stress at 2005 survey using logistic regression.

the emergency supply people were least likely to possess, with only 46% of the sample having one at T₂, a proportion in line with overall U.S. results. It may be that the high levels of confidence in the emergency services in the event of future terrorist attack ameliorated some people's perceived need to personally prepare.

Contacting Family Members

Being unable to contact loved ones was associated with distress in the immediate aftermath of the London bombings,²⁶ so it is encouraging that by T₂ over 70% of our sample had made plans about how to contact family members in a future emergency. However, there are significant gaps in people's plans should an emergency occur; for example, nearly two-thirds of people with school-age children were unaware of the school's procedures in a large-scale emergency. Yet, ensuring the well-being of their children is a major concern for parents during an emergency. For example, on the day of the London bombings, 26% of parents of school-age children made efforts to collect their children from school early.²⁶ Had these attacks included a chemical, biological, or radiological component, then this behavior would have been contrary to official advice to "go in, stay in, and tune in," and may have exposed both parents and children to greater risk. Focus groups from the U.S. have suggested that if people can be assured that their children are safe then they are less likely to leave shelter in order to find them.³¹ Although we did not specifically examine this issue, it seems likely that making parents aware of the emergency procedures in place at their child's school will reduce the urge to collect them in the event of a disaster.³² We therefore suggest that ensuring that schools circulate their

emergency plans to parents is an important component of emergency preparedness.

How Effective Was the Government Booklet?

We found that remembering having received the *Preparing for Emergencies* booklet was associated with having gathered emergency supplies, although this was not associated with having made emergency plans. Because the booklet was sent some time before either of our surveys took place, we are not able to say for certain that receiving the booklet led to greater preparedness. It may be that those more concerned about (and more prepared for) civil emergencies were more likely to notice the booklet (ie, reverse causality). Nevertheless, we do know that fewer than half of our respondents recalled receiving the booklet, despite the fact that every household in the country was sent a copy. Our results therefore illustrate the difficulty in delivering such information to the public and suggest that multiple methods of communication are probably needed. The importance of repeatedly presenting public health information is underscored by the substantial number of emergency plans or supplies that were lost or forgotten between the 2 surveys.

Demographic Predictors of Preparedness

Our results show that being from an ethnic minority predicted making new basic preparations between T₁ and T₂. This is in line with the association found between ethnicity and preparedness in the post-September 11 literature from the U.S.^{6,7,20} We also found that lower SES independently

predicted making new preparations for emergencies between T_1 and T_2 , as well as being associated with gathering extra emergency supplies, such as storing bottled water or keeping camping equipment at home. These findings are notable, as historically it has been considered that those from ethnic minorities and other socially disadvantaged groups were less likely to be prepared for disaster than other sectors of society.^{22,23}

Taken together, our findings of increased preparedness of ethnic minority and lower SES Londoners suggest that those who are socially disadvantaged may have felt more personally threatened and this in turn may have precipitated action toward increased personal preparedness for the future. In the U.S., high levels of fearfulness about future terrorist attacks have been found to be associated with similar demographic predictors to ours, which include being African American or Hispanic or having a low income or a low level of education.³³ The reasons for this sense of threat are not clear, but one explanation may be that ethnic minorities are less trusting that they will be treated fairly in the event of a major incident^{6,34,35} and often perceive official sources as lacking in credibility.²⁴ Certainly, ethnic minorities continue to be more vulnerable in the event of disaster for a range of sociocultural reasons.^{24,36,37}

We did not find evidence that bombing-related distress was associated with increased preparedness, implying that psychological symptoms do not clearly translate into protective behavior for future events. However, it may be that heightened fear of future attacks is an important cognitive mediator and does precipitate action to prepare oneself and one's family. This is consistent with our finding that those who felt a greater sense of threat to themselves or close others on July 7 were more likely to make new preparations between the 2 surveys, which agrees with work from Israel and the U.S.^{19,33} Nevertheless, the relationship between fearfulness and increased action toward preparedness needs further research. It seems probable that a sense of efficacy is required at an individual and also community level to encourage behaviors that are adaptive in response to the threat of terrorism.¹²

Perceptions of Preparedness

Perception of preparedness in the event of a terrorist attack was lower in women, although there was no evidence that they were in fact less prepared. Women are consistently reported as being more distressed in the aftermath of terrorist events,^{38,39} and this was shown with this dataset in an earlier publication.²⁶ It is plausible that distress may be linked to the perception of being inadequately prepared. We found a striking interaction between SES and gender, suggesting that women of low SES feel particularly unprepared for an emergency. It seems that women of lower social status feel vulnerable at the prospect of civil emergency, in a

way that women of higher occupational standing do not. Women and people who are less educated are more fearful and concerned about technological hazards,⁴⁰ and this may be due to a lack of power in civil society. In the context of terrorist incidents, it seems plausible that women of lower SES may have different perceptions of the likely severity of a future terrorist attack, feel less engaged with the government agencies, and/or feel an overarching lack of control over their lives.

Study Limitations

Although the survey done at T_1 used quota-sampling to obtain a demographically representative sample of Londoners, the survey at T_2 was limited to those that (a) had given their permission to be re-contacted and (b) it was possible to contact. Quota sampling is a survey strategy that enables researchers to collect data from a large demographically representative sample, within a short period of time, and within the constraints of a relatively modest budget. However, although widely used in public opinion polls and political surveys, there are concerns that this technique may introduce greater bias than a traditional probability sample.²⁸ Our analysis was restricted to those who had completed the survey at both time points, so it is possible that selection bias was introduced by this approach. The results of this study cannot exactly reflect the preparedness of Londoners, as those that were older, from higher SES, and from white ethnic backgrounds were over-represented in our sample. If those from lower SES and/or ethnic minorities who did not participate in the follow-up study were systematically different from those who did participate, then our results could be biased.

More generally, it is known that survey respondents tend to score more highly on ratings of civic duty than nonrespondents.⁴¹ At the same time, there is also a tendency for participants in any survey to simply agree with whatever the interviewer is saying, particularly when saying "yes" to a question might portray the respondent in a more socially desirable light (see, eg, Bishop⁴²). Both effects make it possible that our results represent overestimations of the preparedness of the London population. Also, not all the emergency supplies that we questioned respondents about would always be held in the household solely for emergencies (eg, candles and matches); however, those who responded positively would nonetheless be prepared for an emergency. It is no surprise that such items have the highest positive responses.

The survey at T_1 was conducted between 1 and 2 weeks after the London bombings, so it is possible that, as a result of the incident, changes to preparedness had already occurred. However, participants were specifically asked to comment on their emergency preparations just prior to the

incident, in order to elicit a measure of pre-incident preparedness. Participating at T₁ may have influenced participants' preparedness behavior before T₂—that is, having a stranger asking about whether they had taken various emergency preparations led them to take steps they would not otherwise have taken. If this were the case, then our preparedness results at T₂ are artificially inflated. Our measures of preparedness and threat have face validity, but we did not attempt to gauge further the validity of these measures. Neither did we formally assess the test-retest reliability of our measures, which could feasibly have accounted for some of the changes that we noted between T₁ and T₂.

Finally, occupation as a measure of SES has been much more commonly used in the UK and Europe than in the U.S., where income and education level are favored.⁴³ Occupational status reflects only one aspect of a person's social status and may be particularly prone to error in women and those who are outside the labor market.³⁰ For this reason it would have been preferable to have several measures of SES to confirm our findings in relation to SES and preparedness.

CONCLUSIONS

We have shown that Londoners are moderately prepared for future emergencies, with 51% having in place at least 4 out of 7 suggested emergency plans and 48% having gathered at least 4 out of 5 recommended emergency supplies immediately following the London bombings. The bombings appear to have increased Londoners' preparedness, but receiving the *Preparing for Emergencies* booklet in 2004 had little effect on gathering emergency supplies. Feeling threatened on the day of the London bombings was associated with increased preparedness in the ensuing months, while important demographic associations with increased preparedness may be due to increased feelings of vulnerability amongst socially disadvantaged groups.

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