



Posttraumatic Stress Disorder in Manhattan, New York City, After the September 11th Terrorist Attacks

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ABSTRACT *Estimates of acute mental health symptoms in the general population after disasters are scarce. We assessed the prevalence and correlates of acute posttraumatic stress disorder (PTSD) in residents of Manhattan 5–8 weeks after the terrorist attacks of September 11, 2001. We used random-digit dialing to contact a representative sample of adults living in Manhattan below 110th Street. Participants were interviewed about prior life events, personal characteristics, exposure to the events of September 11th, and psychological symptoms after the attack. Among 988 eligible adults, 19.3% reported symptoms consistent with PTSD at some point in their life, and 8.8% reported symptoms consistent with a diagnosis of current (within the past 30 days) PTSD. Overall, 57.8% of respondents reported at least one PTSD symptom in the past month. The most common past-month symptoms were intrusive memories (27.4%) and insomnia (24.5%). Predictors of current PTSD in a multivariable model were residence below Canal Street, low social support, life stressors 12 months prior to September 11th, perievent panic attack, losing possessions in the attacks, and involvement in the rescue efforts. These findings can help guide resource planning for future disasters in densely populated urban areas.*

INTRODUCTION

The North Tower of the World Trade Center (WTC) in Manhattan, New York City, was hit by an American Airlines Boeing 767 passenger plane at 8:45 AM on Tuesday, September 11, 2001. New York City residents learned of the crash in near real time via the Internet or television or by looking up to see the WTC burning on their morning commute. Many New Yorkers, while watching early reports of the first attack, saw the second plane strike the WTC South Tower. In the hours that followed, two other airplanes crashed, the WTC towers collapsed, and thousands escaped from lower Manhattan, while others searched for missing family and

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friends and assisted in the rescue efforts.¹ In New York City, the days and weeks after September 11th were characterized by shock at the magnitude of the loss of life and fear of other potential terrorist attacks. Approximately 3,000 people died in the attacks on the WTC, 18 times more than in the Oklahoma City, Oklahoma, bombing of 1995, which was previously the most severe incident of terrorism on US soil.^{1,2}

Posttraumatic stress disorder (PTSD) is the most commonly studied mental health problem after trauma and disasters.³ Early PTSD research focused on Vietnam War combat veterans. Recent epidemiologic research has studied PTSD among victims of traumatic events such as crime and disasters. Most postdisaster research has focused on PTSD among persons directly affected, such as persons who were injured in the event or immediate relatives of those who died. Our study addressed a population associated by proximity to the disaster (residents of Manhattan living below 110th Street) to understand more fully the scope of the psychological consequences of the September 11th attacks. Both the magnitude of the immediate events (including damage to property and loss of life) and their economic consequences suggested that there might be substantial, and lasting, psychological sequelae of the disaster among the general population of New York City.⁴

We carried out a survey of residents of Manhattan 5 to 8 weeks after the September 11th attacks. We have previously reported the prevalence of current PTSD specifically linked to the September 11th attacks.⁵ Here, we report prevalences of lifetime PTSD, current PTSD, and PTSD symptoms in the Manhattan population. We also report the factors that increased the likelihood of PTSD in the population studied. These results can help guide mental health intervention during this and future early postdisaster periods in urban areas.

METHODS

The data were collected by telephone interview with a random sample of adults living in Manhattan south of 110th Street. We chose to sample only Manhattan south of 110th Street to provide a rapid needs assessment in the areas likely most affected by the September 11th attacks. Interviews were conducted by Schulman, Ronca, and Bucuvalas, Incorporated (New York, NY) using experienced interviewers, many of whom had conducted surveys in previous studies of PTSD. A computer-assisted telephone interviewing system was used to minimize coding and question-order errors while allowing the interviewers to concentrate on the survey. Interviews were conducted in English and Spanish; 18 interviews (1.8%) were conducted in Spanish. Respondents were not identified by name in the survey, and telephone numbers were deleted from the survey data prior to analysis.

The investigators trained the interviewers in the particulars of the study and supervised the interviewing process. A protocol was in place to provide assistance to participants who requested mental health counseling. Any participant who wished to terminate a survey midinterview and all participants who finished the interview were asked if they would like the opportunity to talk to a mental health professional that same evening or to be called back during the next business day. Mental health professionals were available on pager to assist persons requesting immediate assistance. Any contact information collected for the purposes of referral was passed on to the mental health professional and destroyed on termination of participant contact. Median duration of interviews was 35 minutes. The Institutional Review Board of the New York Academy of Medicine reviewed and approved the study protocols.

SAMPLE

All English- or Spanish-speaking adults (persons 18 years of age or older) who were living in Manhattan south of 110th Street in households with telephones at the time of the study were potential study participants. The sample was implemented using random-digit dialing for telephone households. All working banks for telephone exchanges south of 110th Street in Manhattan were selected, and random numbers were generated within each bank of numbers. When we reached a person at a residential telephone number, we first obtained verbal consent and then determined the area of Manhattan where the respondent was living (screening out those north of 110th Street). The number of adults in each household was then determined, and one adult per household was randomly selected for interviewing. We used the most recent birthday method to select the respondent to interview; this procedure has been shown to produce a random distribution of respondents.⁶ We made up to 10 attempts for numbers selected before considering them as permanent nonanswers. Households with more than one telephone were more likely to be dialed, so weighting techniques were applied to correct potential biases related to number of household telephones and for number of adults in households.

We dialed a total of 11,757 phone numbers during the study. Among these, 2,815 were identified as not in service, and 3,177 numbers were not valid for other reasons (e.g., fax lines or businesses). Of the 5,765 valid numbers, 2,220 were not answered on any of the 10 calls. From the remaining 3,545 numbers, 361 were never answered except by answering machines (messages were left), and 326 numbers were not eligible for other reasons (mainly languages other than Spanish or long-term health problems). We spoke with a total of 2,858 households; 846 were callbacks still not reached at the end of the study to complete the screening for eligibility. Among the 2,012 households with a resolved contact, 538 refused to conduct the initial screening for the interviewing. Among the 1,474 screened, 234 persons screened out of the survey, and 1,240 were eligible for the study. We completed interviews with 1,008 of these persons, 153 refused after qualifying, and 79 were in callback status at study completion. The overall cooperation rate for the survey, calculated according to industry standards, was 64.3%. This cooperation rate is based on the sum of the number of completed interviews and screen-outs (i.e., 234 + 1,008) divided by the sum of completed interviews, screen-outs, refusals, and premature terminations (i.e., 234 + 1,008 + 538 + 153).

INSTRUMENT

Respondents were asked questions using a structured questionnaire. The survey instrument consisted of items from previous surveys that assessed the mental health consequences of natural disasters. Pilot testing was conducted prior to the start of the project to determine the length of the interview and to clarify any confusing or misleading items. We asked questions about demographic variables including age, race/ethnicity, gender, yearly household income, education, and marital status. Age, income, and education variables were grouped into categories. To assess their proximity to the disaster site, we collected information from respondents about two locations: where the respondent was living prior to September 11th and where the respondent was on hearing about the September 11th attacks. To preserve participant anonymity, we asked for the street intersection closest to the location of interest. We mapped these intersections using a geographic information systems pro-

gram, grouping the locations into two zones within the sampling frame (below Canal Street, above Canal Street, and below 110th Street). The WTC is part of the first zone.

Modified questions from the Medical Outcomes Study were used to measure social support.⁷ Respondents were asked three questions about emotional, instrumental, and appraisal social support available to them in the 6 months before the events of September 11th. Responses were recorded on a 4-point scale, ranging from “none of the time” to “all of the time.” Scores were added to give a total social support score ranging from 0 to 9. Social support was divided into thirds, representing “low,” “medium,” and “high” social support. To measure traumatic life events, we asked about eight events that a person could have experienced in the year before September 11th; these included having a spouse or mate die, divorce, having a close friend die, being seriously injured or ill, getting married, having family problems, having problems at work, and having emotional problems.⁸ We summed the traumatic events reported during the year before September 11th; we divided response into groups of none, one, or two or more past-year stressors.

We asked about a range of September 11th event experiences. We present results on the following: if the respondents had witnessed the attacks of September 11th, if the respondent was afraid for her or his life during the attacks, if friends or relatives were killed during the attacks, if the respondent was displaced from home as a result of the attacks, if the respondent was involved in the rescue efforts, and if the respondent lost a job or possessions as a result of the September 11th attacks. Perievent panic attack was measured using a modified version of the Diagnostic Interview Schedule (DIS) measure for panic attack (phrased to assess symptoms that occurred during or shortly following the terrorist attacks).⁹ We asked about panic symptomatology specifically in the “first few hours after” the events of September 11th; the presence of at least four or more symptoms contributed to a diagnosis of a perievent panic attack.

We measured PTSD using a modified version of the DIS measure, based on the *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV)*.¹⁰ This PTSD scale has a coefficient of agreement with clinician-administered structured clinical interviews of 0.71 for current PTSD.^{11,12} We measured current PTSD and lifetime PTSD. Current PTSD was based on prevalence of necessary PTSD criteria B, C, and D symptoms within the previous 30 days. For lifetime PTSD, respondents were required to report the co-occurrence of at least one re-experiencing symptom, three avoidance symptoms, and two arousal symptoms sometime throughout their lives. For the diagnoses of current and lifetime PTSD, each symptom was required to have been present for at least a 2-week period.

STATISTICAL ANALYSES

We report the prevalences of lifetime and current PTSD. Two-tailed chi-square tests were used to determine the associations between the covariates of interest and current PTSD. Multiple logistic regression was used to determine covariates that were predictive of current PTSD in adjusted models. Variables that were associated with current PTSD ($P < .1$) in bivariate analyses were considered for the final multivariable model. We used stepwise backward regression and retained in the final multivariable model variables that improved model fit assessed by the log-likelihood test ($P < .05$). We used Taylor series linearization to estimate standard errors and to correct statistical test for weighting.¹³ The 95% sampling error for reported preva-

lences was no more than 3.1 percentage points for this survey. No imputation of missing values was performed.

RESULTS

Sample Description

Among 988 adults eligible for this analysis, 52.1% were women; mean age was 42 years (standard deviation 15.4 years). Table 1 shows that age, gender, and race/ethnicity distribution in our sample were comparable to estimates from the 2000 census.¹⁴ Most respondents (71.6%) were white; 7.3% of respondents were Asian, 5.3% were African American, and 14.3% were Hispanic. We slightly undersampled Asians. Since our survey was only administered in English and Spanish, the under-sampling of Asians was expected. Overall, 38.9% of persons sampled had a yearly household income of more than \$100,000 per year, and only 25.8% of respondents had less than a college degree. Of respondents, 35.8% were married or part of an unmarried couple, and 42.3% were never married. Distribution of where respondents lived in Manhattan (5.2% below Canal Street, and 94.8% between Canal Street and 110th Street) was also comparable to US census population estimates.¹⁴

Disaster Event Experiences

As the September 11th events unfolded, 11.1% of respondents were below Canal Street. Overall, 38.2% of respondents witnessed the attacks of September 11th, 15.8% feared personal injury or death, and 11.1% had a friend or relative killed

TABLE 1. Comparison of sample population with 2000 census data from Manhattan, New York City, below 110th Street

	Weighted percentage from sample*	Percentage from 2000 US census	χ^2	<i>P</i> †
Age, years				
18–24	9.5	10.4	3.1	.69
25–34	31.2	27.3		
35–44	20.0	19.9		
45–54	18.0	16.3		
55–64	12.2	11.3		
≥65	9.1	14.8		
Gender				
Male	48.0	47.2	0.02	.88
Female	52.0	52.8		
Race				
White	71.6	63.9	3.9	.42
African American	5.3	6.5		
Asian	7.3	12.8		
Hispanic	14.3	14.4		
Other	1.5	2.5		

*Sample weighted to account for number of adults and number of telephones in household.

†Two-tailed χ^2 *P* value.

during the attacks. Among respondents interviewed, 3.1% lost possessions, and 6.3% lost a job as a result of the September 11th attacks. Of respondents, 11.1% were involved in the rescue efforts.

Prevalence of Posttraumatic Stress Disorder

The prevalence of current PTSD in this sample was 8.8% (95% confidence interval [CI] 7.0–10.8), and the prevalence of lifetime PTSD was 19.3% (95% CI 16.7–22.0). Thus, the prevalence of baseline prior lifetime PTSD in the population surveyed could be estimated to be as high as 10.5% based on subtraction of current PTSD prevalence from lifetime prevalence. Current PTSD symptoms arranged by *DSM-IV* symptom groups are given in the Figure. The most common current PTSD symptoms reported were intrusive memories (27.4%), insomnia (24.5%), jumpiness/easily startled (23.6%), and a sense of foreshortened future (21.2%). Overall, 57.8% of respondents reported at least one PTSD symptom.

Bivariate Relations Between Covariates and Current Posttraumatic Stress Disorder

Tables 2 and 3 present the bivariate associations between demographic characteristics and event experiences and current PTSD. Variables that were significantly associated with current PTSD in bivariate analyses were gender ($P = .002$), race/ethnicity ($P = .05$), household income ($P = .04$), marital status ($P = .05$), social support ($P = .004$), life stressors 12 months before the September 11th attacks ($P < .001$), having seen the attacks in person ($P = .02$), experiencing a perievent panic attack ($P < .001$), losing possessions in the attack ($P = .01$), being involved in the rescue effort ($P = .01$), and losing a job due to the attacks ($P = .003$).

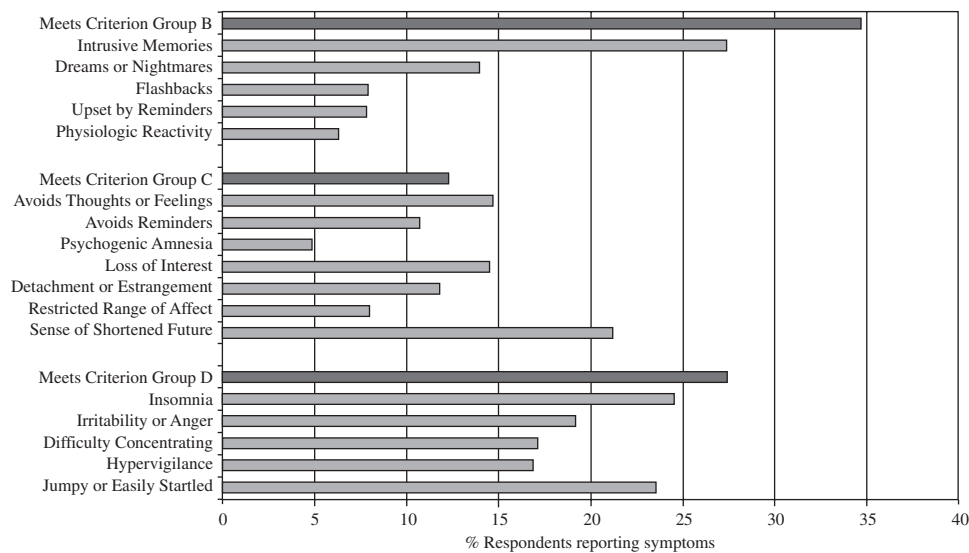


FIGURE. Frequency of symptoms and frequency of respondents meeting DSM-IV criterion group definitions.

TABLE 2. Bivariate relations between demographic covariates and current posttraumatic stress disorder*

	N†	% PTSD	P‡
Total	988	8.9	
Age, years			
18–24	70	12.3	.20
25–34	294	9.8	
35–44	193	9.8	
45–54	187	7.2	
55–64	122	9.6	
≥65	106	3.8	
Gender			
Male	469	5.8	.002
Female	519	11.7	
Race			
White	702	8.3	.05
African American	49	9.3	
Asian	67	3.2	
Hispanic	114	13.8	
Other	17	19.1	
Income§			
≥\$100,000	308	5.8	.04
\$99,999 to \$75,000	96	10.9	
\$74,999 to \$40,000	178	11.6	
\$39,999 to \$20,000	135	15.3	
<\$20,000	93	11.8	
Education			
Graduate degree	313	6.3	.15
College degree	441	10.2	
<College	229	9.5	
Marital status			
Married	302	5.7	.05
Divorced, separated, or widowed	165	11.0	
Never married	443	9.0	
Unmarried couple	70	16.8	
Where lived before September 11th attacks			
110th to Canal Streets	938	8.2	.07
Below Canal Street	50	20.0	
Social support			
High	313	5.5	.004
Medium	267	8.7	
Low	358	13.0	

TABLE 2. Continued

	N†	% PTSD	P‡
Life stressors 12 months before September 11th attacks			
0	554	4.4	<.001
1	251	10.0	
≥2	183	21.9	

*Bivariate relations between covariates and current PTSD; current denotes symptoms consistent with a diagnosis of PTSD within the 30 days prior to the interview.

†Number of respondents in covariate category. Numbers may not add to 988 due to missing values.

‡Two-tailed χ^2 *P* value.

§Yearly household income.

||Thirds of total social support available to respondents in 6 months prior to September 11th.

Multivariable Model Predicting Current Posttraumatic Stress Disorder

Table 4 shows a final multivariable logistic model predicting current PTSD. Variables that were significantly associated with current PTSD in the final model were living below Canal Street (odds ratio [OR] 3.1 vs. living above Canal Street), having low social support (OR 2.4 vs. high social support), one life stressor or two life stressors in the 12 months before September 11th (OR 1.7 and 2.4, respectively, vs. having no life stressors), experiencing a perievent panic attack (OR 5.8 vs. no panic attack), losing possessions in the attack (OR 3.3 vs. not losing possessions), and being involved in rescue efforts (OR 2.3 vs. not being involved in rescue efforts).

DISCUSSION

We documented substantial psychological symptoms in the general population of Manhattan, New York City, residents 5 to 8 weeks after the September 11th attacks: 8.8% reported symptoms consistent with current PTSD, and 19.3% reported symptoms consistent with lifetime PTSD. The most common reported psychological symptoms were intrusive memories and insomnia, and more than half of respondents reported at least one symptom of PTSD. Residence close to the WTC site, low social support, prior life stressors, perievent panic attack, losing possessions in the attacks, and being involved in the rescue efforts were significant predictors of current PTSD in multivariable adjusted models.

The unprecedented scope of the September 11th attacks on New York City suggested that there would be considerable psychological sequelae among the general population. Research suggests that the prevalence of PTSD we documented is about two to three times higher than the baseline PTSD prevalence in nondisaster samples.¹⁵ We have previously shown⁵ that the majority of the PTSD symptoms documented here can be associated with the events of September 11th. Excluding current PTSD, our estimate of pre-event lifetime PTSD was 10.5%. This is higher than the 7.8% prevalence of lifetime PTSD in US residents documented by the National Comorbidity Study, suggesting that baseline levels of PTSD in the area sampled may be higher than national estimates.¹⁶ In the long term, our results

TABLE 3. Bivariate relations between disaster experience covariates and current posttraumatic stress disorder*

	N†	% PTSD	P‡
Total	988		
Where respondent was during September 11th attacks			
110th Street to Canal Street	690	9.1	.55
Below Canal Street	103	11.1	
Saw attacks in person			
No	611	6.9	.02
Yes	370	11.9	
Fear of personal injury or death			
No	812	8.1	.11
Yes	162	12.8	
Perievent panic attack§			
No	864	5.4	<.001
Yes	124	33.1	
Friend or relative killed			
No	880	8.4	.22
Yes	108	12.5	
Displaced from home			
No	924	8.3	.10
Yes	64	16.2	
Lost possessions			
No	949	8.1	.01
Yes	362	8.4	
Involved in rescue effort			
No	877	7.6	.01
Yes	111	19.3	
Lost job due to September 11th attacks			
No	924	7.5	.003
Yes	64	29.1	

*Bivariate relations between covariates and current PTSD; current denotes symptoms consistent with a diagnosis of PTSD within the 30 days prior to the interview.

†Number of respondents in covariate category. Numbers may not add to 988 due to missing values.

‡Two-tailed χ^2 *P* value.

§Symptoms consistent with a panic attack in the first few hours after the September 11th attacks.

would indicate a doubling of lifetime PTSD among persons who were living in New York City and experienced the September 11th attacks.

There is a relative paucity of postdisaster studies that have studied PTSD in the general population. In addition, it is difficult to compare prevalences among postdisaster studies in the general population because of differences in disaster situations, diagnostic measures, and postdisaster research time frames. Prospective research after an earthquake in Australia ($n = 3,484$) estimated prevalence of PTSD

TABLE 4. Multivariable relations between disaster experience covariates and current posttraumatic stress disorder*

	OR	95% CI	P
Where lived before September 11th attacks			
110th to Canal Streets	1.0	—	—
Below Canal Street	3.1	1.3–7.4	.01
Social support†			
High	1.0	—	—
Medium	1.7	0.8–3.5	.20
Low	2.4	1.2–4.5	.009
Life stressors 12 months before September 11th attacks			
0	1.0	—	—
1	3.0	1.5–5.9	.001
2	5.1	2.7–9.5	<.001
Perievent panic attack‡			
No	1.0	—	—
Yes	5.8	3.4–10.1	<.001
Lost possessions			
No	1.0	—	—
Yes	3.3	1.5–7.0	.002
Involved in rescue effort			
No	1.0	—	—
Yes	2.3	1.2–4.3	.02

CI, confidence interval; OR, odds ratio.

*Multivariable model with current PTSD as outcome; current denotes symptoms consistent with a diagnosis of PTSD within the 30 days prior to the interview.

†Tertiles of total social support available to respondents in 6 months prior to September 11th.

‡Symptoms consistent with a panic attack in the first few hours after the September 11th attacks.

as 18.3% among those exposed to a high level of threat to safety and 2.0% among the general population 6 months after the event.¹⁷ A survey of the residents of Los Angeles County after the 1992 civil disturbances (n = 1,200) using similar outcome measures as those used in our research documented a 4.1% overall prevalence of current PTSD 6 months after the event; rates of PTSD were higher among persons who were in the central city area closer to the disturbances.¹⁸ Prevalence of PTSD in the general population after the Oklahoma City bombing was not documented. However, one population survey after that event found that residents of the Oklahoma City metropolitan area had twice the psychological distress than did residents of a control community.¹⁹ Our finding that 8.8% of the general population of Manhattan had symptoms consistent with a diagnosis of PTSD 1 month postdisaster may then be particularly important for postdisaster resource planning, especially in densely populated urban areas.

Research has consistently demonstrated that rates of PTSD are higher among persons who were directly exposed to disaster-event experiences. For example, prospective research after an earthquake in Armenia found that as many as 86.7% (26/30) of residents with severe earthquake trauma, and that 13.8% (4/29) of residents with mild earthquake trauma had symptoms consistent with PTSD 1.5 years after

the earthquake.²⁰ A study of employees of a hotel that was hit by a plane in 1987 found an overall prevalence of PTSD of 22% at 4–6 weeks postdisaster; this prevalence was 29% among those who were in the hotel at the time of the event and 17% among those who were not.²¹ Similarly, in our study we documented a greater likelihood of PTSD among persons who lost possessions in the attacks, who lived close to the WTC, or who were subsequently involved in the rescue efforts.

The relations of PTSD with Hispanic ethnicity and gender are controversial.^{22–24} We have previously documented a greater likelihood of PTSD specific to the September 11th attacks among Hispanics than among other ethnic/racial groups in this survey sample.⁵ In this analysis, however, we demonstrate that Hispanics did not have a higher overall rate of current PTSD in adjusted multivariable models. One hypothesis to explain this discrepancy is that specific types of event experiences are more likely to trigger PTSD among Hispanics because of related ethnic experiences. Further research in the area should consider the factors that mediate the relation between race/ethnicity and PTSD. Although women have been shown to have higher rates of PTSD in some research,^{16,25} other studies, particularly studies of uniform personnel and persons assisting disaster victims, have not demonstrated this association.^{26,27} In our study, women had a higher likelihood of PTSD in bivariate, but not in multivariable, analyses, suggesting that other factors may be important mediators of the association between PTSD and gender after disasters.

We demonstrated a strong relation between life stressors in the previous 12 months and likelihood of PTSD. Consistent with this analysis, previous mental health disorders have been documented as predictors of future psychopathology.^{28,29} We also observed a relation between low social support and PTSD. Social ties, including social networks and social supports, have been shown to play a positive role in mental health.³⁰ In the postdisaster situation, low social support has been shown to be related to PTSD,³¹ higher level of depressive symptoms,³² and emotional distress.^{33,34} Interventions that have attempted to increase social support, and hence improve mental health in nondisaster situations, have had mixed results.³⁰ The strong relation between low social support and PTSD documented in our study suggests that increasing social support may represent one effective avenue of postdisaster intervention.

Our study provides evidence for the relation between peritraumatic panic symptomatology and subsequent psychopathology. Although the role of peritraumatic symptoms in determining PTSD cannot be assessed using a cross-sectional survey, our findings are consistent with research that has demonstrated relations between peritraumatic emotional responses and PTSD.³⁵ Early reports of an intervention with rape victims have demonstrated a reduction in longer-term PTSD in persons who are administered a cognitive intervention aimed at explaining panic symptomatology soon after the trauma.³⁶ These findings may hold promise for development of intervention strategies in future disaster situations.³⁷

There were a number of limitations to our study. At the time of this study, residents of New York City were on heightened alert due to the discovery of anthrax in the postal system and the concern about possible further terrorist attacks. A growing economic recession was an additional stressor faced by New York City residents at the time. Thus, the extent of the psychological symptoms documented in this study may have been affected by stressors other than the events of September 11th. Sample demographics in our study were representative of the Manhattan population, suggesting that results described here reflect the level of psychological symptoms in Manhattan. However, the population of Manhattan is substantially

different from the rest of New York City (e.g., in race/ethnicity and socioeconomic status), and as such, we cannot extrapolate from these results to estimates of PTSD prevalence in the rest of New York City. Although we have focused our analyses on the proportion of the population meeting diagnostic criteria for PTSD, we note that many thousands of Manhattan residents, while not meeting diagnostic criteria for PTSD, were also experiencing distress in terms of loss of sleep, intrusive memories, and symptoms consistent with other diagnostic conditions such as depression⁵ or generalized anxiety.

Other research after the attacks of September 11th has documented significant distress throughout the United States,³⁸ substantial PTSD specifically related to the September 11th attacks,⁵ and an increase in use of cigarettes, alcohol, and marijuana after the attacks.³⁹ This study was carried out as part of an effort to obtain early estimates of the scope of psychopathology in New York City and to assist in postdisaster resource planning. Prospective evaluations of PTSD in trauma victims and in the general population suggest that up to a third of PTSD cases may persist more than 3 months after the traumatic event,^{16,40} and that a substantial proportion of persons may continue to suffer symptoms in the long term.⁴¹ The course of the psychological sequelae of the September 11th attacks is unknown, and it will be particularly important to determine the prognostic role of the factors that were significant predictors of PTSD and depression in this study. Further research in the New York City area that identifies predisposing factors for long-term mental health sequelae can guide clinical care and mental health resource allocation in the years ahead and help in planning for future disasters in densely populated urban areas.

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