

## Tracking Levels of Psychiatric Distress Associated With the Terrorist Events of September 11, 2001: A Review of the Literature

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**Background.**—Early publicized predictions of an onslaught of psychiatric distress following the terrorist events of September 11, 2001, have not materialized, and it remains unlikely at present that the medical and insurance communities will experience a significant increase in psychiatric utilization rates secondary to September 11. A handful of research studies have begun to characterize the psychiatric impact of the events associated with the September 11 terrorist attacks. Information related to the manifestation of psychiatric distress following disasters is of particular interest to the scientific, clinical and disability insurance communities given the ongoing threat of further terrorist attacks.

**Methods.**—A comprehensive literature search was completed to identify articles that address our current understanding of posttraumatic stress disorder (PTSD) and patterns of psychiatric distress that typically follow manmade disasters. To help in conveying such a conceptual framework, we integrated basic research relating to PTSD with epidemiological data relating to past disasters (eg, the Oklahoma City bombing) and the events of September 11.

**Results and Conclusions.**—A critical analysis of the September 11 research literature is offered with suggestions for research that would strengthen our understanding of the manifestation of psychiatric distress associated with manmade disasters.

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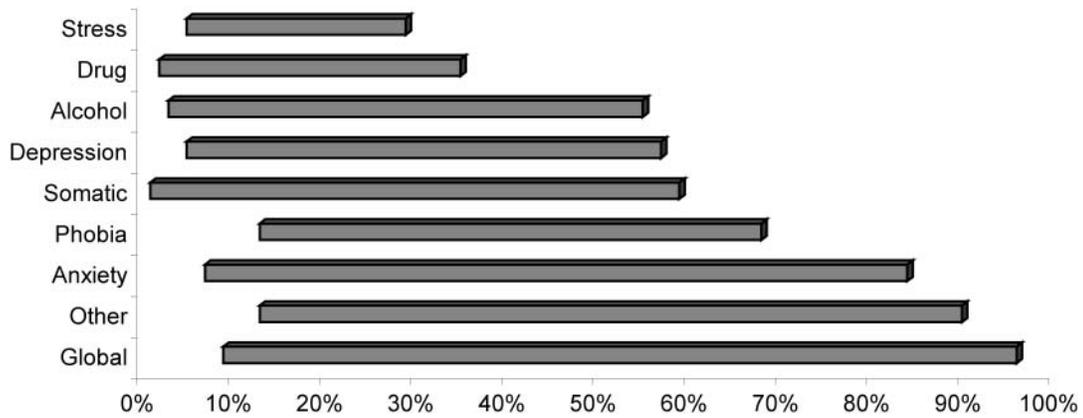
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### INTRODUCTION

On the morning of September 11, 2001, within a timeframe that spanned less than 120 minutes, 4 hijacked airliners laden with fuel and passengers crashed into the World Trade Center, the Pentagon and a rural area of Pennsylvania, killing over 3000 people. Graphic and repetitive media reports were broadcast across the nation. Initial estimates of lives lost and financial tolls associated with

the disaster seemed emotionally and intellectually incomprehensible. The unprecedented events left individuals and organizations without easily accessible internal, external or historical references from which to draw upon to regain bearing and stability.

The events of September 11 thrust the psychological and psychiatric treatment communities, as well as the insurance industry, into largely unexplored territory.<sup>1,2</sup> For the insur-



**Figure 1.** Estimates of the prevalence of psychiatric disorders associated with disaster.<sup>6</sup>

ance industry the primary concerns related to risk management, as the events of September 11 created the potential for increased claims across a variety of product lines. Short-term economic effects were easily assessed by life and casualty insurance carriers with the majority of claims filed in the days and weeks following the events of September 11. In contrast, the long-term economic impact of disability-spectrum insurance claims (eg, short term disability, long term disability, individual disability and workers' compensation insurance) related to September 11, particularly psychiatric disability claims, remain unknown.

In the weeks and months following September 11, the behavioral health community braced for the potential repercussions associated with the terrorist events. Numerous sources warned of an epidemic of psychiatric distress, particularly posttraumatic stress disorder (PTSD), that would follow in the wake of the disaster serving to inundate and potentially overwhelm an ill-prepared managed health care industry.<sup>3,4</sup> Predictions were also put forth that the impending mental health epidemic would take a delayed onset form, perhaps impacting the nation at some unknown point in the new year.<sup>3,5</sup> Of particular concern were assertions that individuals with current or past psychiatric disturbance would be vulnerable to either a recurrence or an exacerbation of psychiatric symptomatology.<sup>5</sup>

The range of aforementioned predictions relating to possible post-September 11 psy-

chiatric distress served to significantly expand the picture of psychiatric risk associated with the terrorist events, in terms of timeframe of onset, vulnerable populations and range of geographic impact. As a result, those within the fields of community, hospital and disability insurance risk management were forced to consider worst-case scenarios with regard to the reported potential epidemic of individuals suffering from significant psychiatric distress. Initial worst-case models included the possibility of a heavy first wave of individuals suffering from psychiatric distress from the New York City area, primarily involving those who suffered direct exposure to the terrorist events of September 11. As this scenario unfolded, a second and potentially larger wave of individuals suffering from psychiatric distress was anticipated within 5 to 7 months following the events. The second wave of individuals was expected to include those who struggled with PTSD-related symptoms during the initial months following the disaster and later realized (as others around them continued to improve emotionally) that their symptoms reflected a pattern of more significant and chronic psychiatric distress. Also included within the second wave of individuals would have been people who struggled with sub-clinical psychiatric difficulties (eg, depression or anxiety) prior to September 11 and experienced an acute exacerbation in symptoms after September 11. This group of individuals may also have included a subgroup of emotionally

fragile people who recently returned to work following a period of psychiatric disability.

To date, the concerns raised by initial publicized reports regarding an inundation of individuals suffering from significant post September 11 PTSD-related difficulties have not materialized. However, many questions remain unanswered for health care providers, as well as the insurance industry. Understanding the probable psychiatric impact of September 11, as well as predicting the likely vocational and economic implications, is critical to improving care, organizing rapid-response systems, and making key economic decisions related to disaster-related psychiatric disability. This paper reviews the current body of research associated with psychiatric distress following disasters, with particular emphasis on PTSD. Research related to symptom presentation and epidemiological tracking of psychiatric distress associated with September 11 was reviewed and integrated to provide answers to typical questions raised by medical specialists within the disability insurance and health care communities.

### What is the Most Common Form of Psychiatric Distress Associated With Disaster?

Estimates of the presence of psychological reactions following a disaster vary widely.<sup>6</sup> As shown in Figure 1, across studies, between 7% and 40% of those surveyed show some form of psychopathology. Anxiety shows the highest estimated prevalence, although it also shows the greatest variability across studies. Phobias, somatic complaints and alcohol abuse show somewhat lower rates, followed by depression, drug abuse and stress. This review, however, did not examine the prevalence of specific anxiety disorders such as posttraumatic stress disorder.

The relationship between terrorist attacks and PTSD was demonstrated after the Oklahoma City bombing, which remains the closest analogue to the events of September 11 available, with 34% of adults in Oklahoma City reporting significant PTSD symptom-

atology following the bombing.<sup>7</sup> Because of the apparently high prevalence of this specific disorder following acts of terrorism, we will focus on PTSD for the remainder of this paper.

The diagnostic criteria for PTSD are specified in the *Diagnostic and Statistical Manual of Mental Disorders (DSM-IV)*.<sup>8</sup> As shown in Table 1, the first criterion is the traumatic event itself. *DSM-IV* defines a trauma as experiencing, witnessing or being confronted with an event or events that involved actual or threatened death or serious injury, or a threat to the physical integrity of self or others. Note that in contrast to earlier versions of *DSM*, the person does not have to be directly involved with the trauma; rather, being "confronted with" an event (such as watching it on television) could be construed to represent a trauma. McNally<sup>9</sup> has drolly referred to this questionable expansion of the trauma definition as "bracket creep." *DSM-IV* also requires the person's response at the time of the trauma to involve intense fear, helplessness or horror. However, from a conceptual standpoint this subjective criterion confuses the event with the person's cognitive and emotional response to that event. Thus, "trauma" is defined in part by how the person responds to it, rather than by the features of the event itself.

The next criterion is that the person experiences repeated, intrusive cognitive and emotional re-experiencing of the traumatic event. These symptoms include intrusive memories, nightmares, flashbacks, or fear and panic-like symptoms when exposed to reminders of the event. Thus, a combat veteran might feel plagued by uncomfortable memories and images about his combat experience, have frequent nightmares in which he sees himself in combat, and starts to panic when a war documentary comes on the television.

Next, *DSM-IV* specifies that the person engages in avoidant behavior or mental activity, presumably in the effort to modulate emotional response to the trauma. These symptoms involve efforts to avoid thinking about,

**Table 1.** Diagnostic Criteria for Posttraumatic Stress Disorder (from *DSM-IV*)

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- A. The person has been exposed to a traumatic event in which both of the following were present:
- (1) the person experienced, witnessed, or was confronted with an event or events that involved actual or threatened death or serious injury, or a threat to the physical integrity of self or others
  - (2) the person's response involved intense fear, helplessness, or horror. Note: In children, this may be expressed instead by disorganized or agitated behavior
- B. The traumatic event is persistently re-experienced in one (or more) of the following ways:
- (1) recurrent and intrusive distressing recollections of the event, including images, thoughts, or perceptions. Note: In young children, repetitive play may occur in which themes or aspects of the trauma are expressed.
  - (2) recurrent distressing dreams of the event. Note: In children, there may be frightening dreams without recognizable content.
  - (3) acting or feeling as if the traumatic event were recurring (includes a sense of reliving the experience, illusions, hallucinations, and dissociative flashback episodes, including those that occur on awakening or when intoxicated). Note: In young children, trauma-specific reenactment may occur.
  - (4) intense psychological distress at exposure to internal or external cues that symbolize or resemble an aspect of the traumatic event
  - (5) physiological reactivity on exposure to internal or external cues that symbolize or resemble an aspect of the traumatic event
- C. Persistent avoidance of stimuli associated with the trauma and numbing of general responsiveness (not present before the trauma), as indicated by three (or more) of the following:
- (1) efforts to avoid thoughts, feelings, or conversations associated with the trauma
  - (2) efforts to avoid activities, places, or people that arouse recollections of the trauma
  - (3) inability to recall an important aspect of the trauma
  - (4) markedly diminished interest or participation in significant activities
  - (5) feelings of detachment or estrangement from others
  - (6) restricted range of affect (e.g., unable to have loving feelings)
  - (7) sense of a foreshortened future (e.g., does not expect to have a career, marriage, children, or a normal life span)
- D. Persistent symptoms of increased arousal (not present before the trauma), as indicated by two (or more) of the following:
- (1) difficulty falling or staying asleep
  - (2) irritability or outburst of anger
  - (3) difficulty concentrating
  - (4) hypervigilance
  - (5) exaggerated startle response
- E. Duration of the disturbance (symptoms in Criteria B, C, and D) is more than 1 month.
- F. The disturbance causes clinically significant distress or impairment in social, occupational, or other important areas of functioning.
- Specify if:
- Acute: if duration of symptoms is less than 3 months
- Chronic: if duration of symptoms is 3 months or more
- Specify if:
- With Delayed Onset: if onset of symptoms is at least 6 months after the stressor
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or being reminded of, the trauma. Thus, a rape victim might go to great lengths to avoid discussing the event, such as staying away from family and friends who might bring it up. She might also avoid men, even safe men, who look like her assailant. Also included in this criterion is a general numbing of emo-

tional responsiveness. These symptoms include decreased interest in activities, feeling distant from others, inability to feel the full range of emotions, and a sense of a foreshortened future. Thus, a motor vehicle accident survivor might feel as if no one understands him. He may have difficulty feeling good or

bad about anything and show decreased ability to think about future activities.

The final symptom criterion of the PTSD diagnosis is persistent signs of physiological arousal (sympathetic activation, or the "fight or flight" response). These symptoms may include disruptions of sleep and concentration, irritability, hypervigilance, or exaggerated startle response. Thus, a person who was mugged may have difficulty falling asleep, may be excessively wary of passersby on the street, and may be physically "jumpy" in response to sudden noise or movements.

In recognition of the fact that many of the above symptoms may well reflect a normal and healthy response to overwhelming trauma, *DSM-IV* also specifies that these symptoms must be long lasting (more than 1 month). Similarly, to be considered a psychiatric illness, these symptoms must be of sufficient magnitude to cause substantial functional impairment. Thus, PTSD is distinguished from a normal stress response by the fact that it is long lasting and creates noticeable impairment in social, occupational or other areas of functioning. In addition to these criteria, *DSM-IV* also allows for the specification of acute (less than 3 months), chronic (3 months or greater), or delayed onset (symptom onset at least 6 months after the trauma) subtypes of PTSD.

### Can PTSD Result in Significant Psychiatric Impairment?

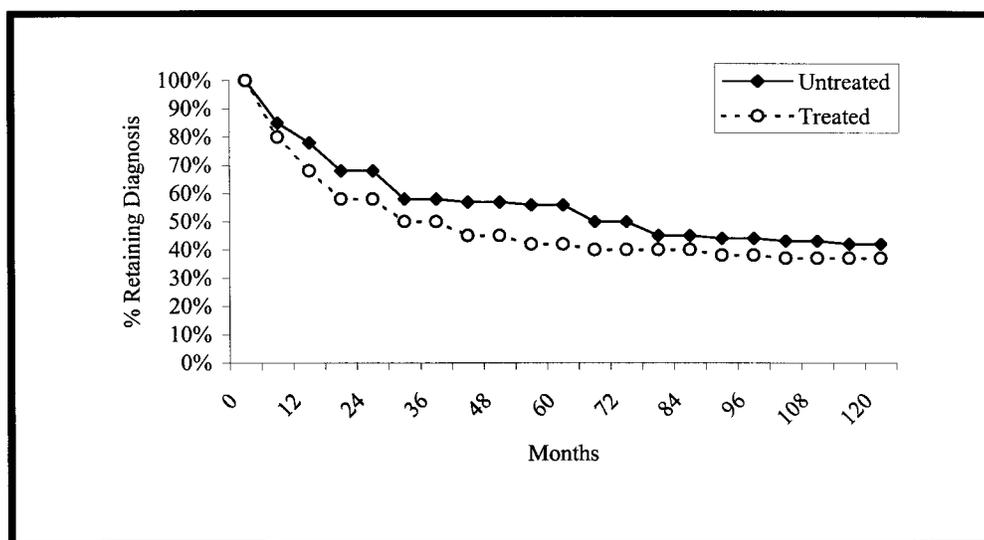
In a comparison between patients with PTSD and other anxiety disorders,<sup>10</sup> PTSD patients reported poorer functioning with regard to social life, suicide attempts, psychiatric hospitalization, alcohol and substance abuse, depression, and dissociation. Thus, PTSD may have potential effects on quality of life in multiple spheres. The high levels of depression, suicide attempts or gestures, and alcohol abuse are of particular concern. Other studies have shown that the degree of work impairment associated with PTSD is comparable to or greater than that seen in other severe psychiatric illnesses such as major de-

pressive disorder.<sup>11,12</sup> Even PTSD symptoms that do not meet full criteria for the DSM-IV diagnosis may also be associated with impairment. In a study of over 2000 questionnaire results from National Anxiety Disorders Screening Day,<sup>13</sup> self-reported work, social and family impairment, number of comorbid disorders, rates of comorbid major depressive disorder, and current suicidal ideation increased linearly and significantly with each increase in number of sub-threshold PTSD symptoms. Individuals with sub-threshold PTSD displayed a heightened risk for suicidal ideation even after the authors controlled for the presence of comorbid major depressive disorder.

Other studies have shown significant impairment in neurocognitive functioning among PTSD patients. A recent review of this topic<sup>14</sup> found that studies of PTSD patients generally reveal weaknesses in attention and immediate memory, although the inclusion of comorbid conditions (including substance abuse) confound our ability to attribute these weaknesses directly to PTSD. Another review<sup>15</sup> reported that PTSD is associated with excessive attention toward threat cues and impaired ability to relate personal memories and learning to new situations.

Not surprisingly, impairments in occupational functioning can be associated with PTSD. In an archival analysis of participants in the National Vietnam Veterans Readjustment Study, veterans with PTSD were significantly more likely than those without PTSD to report that they were not working.<sup>16</sup> Similarly, civilian epidemiological research indicates that participants with PTSD report a greater degree of occupational interference than do those with subsyndromal PTSD symptoms or those without PTSD symptoms.<sup>17</sup>

However, it should be noted that the threshold for filing a disability claim is probably higher than that for acknowledging vocational impairment in a research study. To date, no studies exist to document the incidence or timing of disability claims following disaster. In most studies of PTSD, participants



**Figure 2.** Survival curve of treated and untreated PTSD rates over time [Reprinted with permission, from Kessler et al, *Arch Gen Psychiatry*. 1995;52:1048(Fig 2), Copyright American Medical Association 1995].

are asked about the presence of symptoms but not about associated impairment. Thus, the number of truly impaired people is likely much lower than the number of people who meet symptom criteria for PTSD. Furthermore, it seems likely that only a minority of people with PTSD-related impairments are actually so impaired that they are unable to continue working.

### What is the Typical Course of PTSD?

Much of the research on the long-term course of PTSD was conducted using combat veterans. Because this group probably does not represent the general population in terms of gender, history or trauma experience, only studies that included civilian samples will be reviewed here.

Importantly, the vast majority of studies indicate that PTSD symptoms decrease over time, with a subset becoming chronic.<sup>18</sup> In a prospective study of adults who witnessed a mass shooting, 68% of those with PTSD at 6 to 8 weeks post-trauma reported that their symptoms began the day of the incident; an additional 22% reported onset during the week following the trauma.<sup>19</sup> Similar results were obtained following the Oklahoma City bombing, with 76% of PTSD cases reporting symptom onset the day of the bombing. Only

1% of new PTSD cases reported symptom onset more than 6 months after the bombing.<sup>7</sup>

In a large-scale retrospective study, the median time to remission was 36 months among subjects who sought mental health treatment, and 64 months among those who had not,<sup>20</sup> as shown in Figure 2. In a prospective series of studies of participants who were seeking emergency treatment for physical injuries, the PTSD rate was 30% at 1 month post-injury, 18% at 4 months post injury,<sup>21</sup> and 7 percent at 1-year post injury.<sup>22</sup> In considering this information, it is important to recall that the typical base rate of PTSD in the general population is 5.4%.<sup>20</sup> However, it should also be noted that "recovered subjects" still showed several PTSD symptoms that no longer reached full-diagnostic threshold for PTSD. When multiple predictors are taken into account, the best predictor of long-term (more than 4 years) PTSD is short-term (less than 1 year) PTSD.<sup>23</sup> That is, those who are symptomatic at 1 year are likely to remain so to at least some extent; those who are not currently symptomatic are unlikely to become symptomatic.

### What is the Typical Impact of PTSD Upon the General Health Care System?

PTSD has been demonstrated to negatively impact physical health status, resulting in

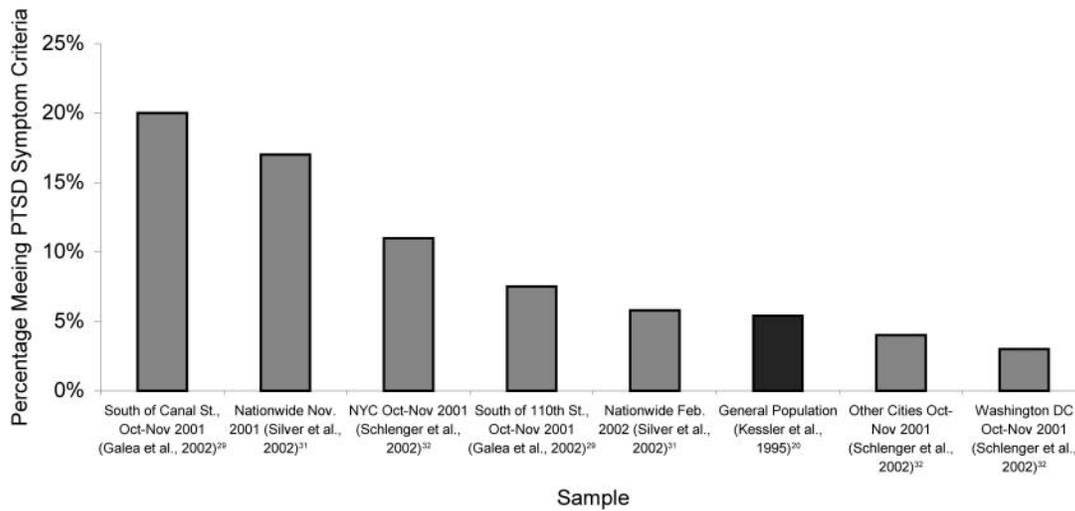


Figure 3. Rates of PTSD symptoms across multiple samples.

higher medical costs. Among veterans seen in a VA medical center, those suffering from PTSD demonstrated a greater number of medical conditions/complaints than did those without PTSD.<sup>24</sup> Individuals such as these were also more likely to have received more recent inpatient or outpatient medical treatment.<sup>25</sup>

In a comprehensive analysis of the economic burden of anxiety disorders, PTSD (along with panic disorder) had the highest rate of service utilization. Individuals with PTSD were significantly more likely than those without PTSD to utilize virtually all levels of mental health treatment, including psychiatric hospitalization.<sup>26</sup>

### What Have Been the Mental Health Consequences to Date Following September 11?

A national telephone survey of 560 US adults, conducted immediately following September 11 indicated that 44% of respondents reported “substantial reactions of stress.”<sup>27</sup> These included feeling upset when reminded of September 11, disturbing memories of September 11, difficulty concentrating, sleep problems, or irritability. Calls to a New York-based crisis hotline increased by 83% in the 5 months after September 11.<sup>28</sup> The most common complaints among these calls were posttraumatic stress, anxiety, and phobias; calls for depres-

sion and substance abuse did not show a clear increase over this time period. However, as discussed earlier, these reactions do not necessarily indicate the presence of PTSD. Feelings of distress, concentration problems and irritability, even those that prompt calls to a crisis line, may well be a normal and even adaptive response to situational stress. As is clear from the *DSM-IV* criteria, PTSD is not diagnosed unless the symptoms are both long lasting and are associated with significant functional impairment.

Findings of PTSD symptoms following September 11 are summarized and compared to the general population in Figure 3. Recent survey data indicated a PTSD prevalence rate in October–November of 2001 of 7.5% in Manhattan.<sup>29</sup> This is compared to a typical prevalence rate of 5.4% in the general population.<sup>20</sup> However, it is unclear whether the figure reported by Galea et al represents an additional 7.5% prevalence of PTSD (which would then raise the overall prevalence of PTSD in Manhattan to approximately 12.9%). Very preliminary results from a presently unpublished 4-month follow-up study conducted by Galea reportedly suggest high levels of “spontaneous resolution” of psychiatric symptomatology.<sup>30</sup> Thus, although some early research suggested widespread psychiatric distress, the PTSD rate in Manhattan does not appear particularly elevated.

In an internet-based survey, Silver and colleagues<sup>31</sup> reported that 2 months after September 11, 17% of respondents ( $n = 933$ ) met symptom criteria (*DSM-IV* criteria B, C, and D) for PTSD. Six months after September 11, that number had dropped to 6%, which is not different from the general population.

In a larger ( $n = 2273$ ) Web-based survey conducted 1–2 months after September 11, Schlenger and colleagues<sup>32</sup> found that 11% of New York City residents met symptom criteria for PTSD. In comparison, 3% of Washington, DC, residents and 4% of residents of other areas met symptom criteria for PTSD. In light of the previous study,<sup>31</sup> it is noteworthy that these data were collected very rapidly after September 11 and have probably decreased substantially since then. If the Schlenger et al rate of PTSD symptoms decreased at the same rate as those of Silver et al, we would expect a 6-month PTSD symptom rate of approximately 4%.

Also of note is that none of these studies examined whether the reported symptoms led to functional impairment. As described above, many of the “symptoms” of PTSD may in actuality be normal and adaptive responses to a traumatic event; it would not be appropriate to presume that these participants were suffering from psychiatric illness.

### **What was the Impact Upon the Health Care System in New York City Following September 11?**

A recent study within the New York VA system indicated that over the initial 19 days after September 11, medical treatment admissions rose 6% compared to the 19 days before September 11. Psychiatric admissions were reported to have risen 5%. However, it is important to note that these increases were less than those seen over the same August to September time period in 2000, but greater than those in 1999.<sup>33</sup> The authors felt that the primary reason for increased utilization in this period in each year was seasonal variation related to patients and staff returning from vacation. The use of anti-anxiety medications,

but not antidepressant medications, rose significantly from the previous year in October 2001, although by January 2002 the rate of medication use had returned to normal.<sup>34</sup> Another study of nationwide prescription rates found a small but significant increase in new prescriptions for anti-anxiety, antidepressant and anti-psychotic medications in the 7-week period after September 11, compared to the 6 months before September 11. However, the VA service utilization study<sup>33</sup> leads us to wonder whether these figures are higher than those obtained during the same period in previous years. It is also not clear whether any actual increase in the use of psychiatric medications resulted from an increase in PTSD or related symptoms, or from a decrease in stigmatization of post-September 11 symptoms or an increased awareness of available treatments.

In a telephone survey of 988 Manhattan residents 5–8 weeks after September 11, 17% reported using mental health services 30 days before the attacks, and 19% reported using these services 30 days afterwards. Of those using mental health services prior to September 11, 10% reported increasing their mental health utilization 30 days after the attacks, and 5% reported decreasing their utilization.<sup>35</sup> Thus, the increase in mental health service utilization in Manhattan after September 11 was quite modest.

### **Who is at Greatest Risk for Developing PTSD After September 11?**

Studies of other disasters have indicated that the mental health impact is greater when there is a high death rate and the disaster was manmade in nature,<sup>6</sup> both of which obviously apply to September 11. After the Oklahoma City bombing, individuals with a pre-disaster psychiatric history, who had experienced injury to themselves or to someone they knew, or were female were more likely to meet symptom criteria for PTSD than were those without these risk factors.<sup>7</sup> After September 11, the following risk factors for PTSD were identified: female sex; living close to the

World Trade Center; reporting poor social support; reporting a high number of ongoing life stressors; directly witnessing the attack; having a panic attack during the disaster; losing one's job, possessions, or a loved one; or participating in rescue efforts. Participants with any of these factors were at greater risk for PTSD than were those without the risk factors.<sup>27</sup> A review of the literature has indicated that in survivors of war, terrorism and other disasters, civilian females are more likely to meet criteria for PTSD than are males, with an approximate 2-fold increase in PTSD prevalence among females exposed to disaster.<sup>36</sup>

In Manhattan after September 11, risk factors associated with increased mental health utilization included being 45–64 years of age, female gender, experiencing 4 or more lifetime traumatic events, experiencing 2 or more stressful life events in the past year, and experiencing an acute panic attack during the disaster. Interestingly, neither PTSD nor depression was predictive of increased service utilization when panic attack was included in the analysis.<sup>35</sup> Thus, increased utilization of mental health services appears to have occurred among a highly vulnerable sub-population.

#### **What is the Probability of an Increase in Individuals Seeking Treatment or Making Disability Claims Associated With Delayed-Onset PTSD From September 11?**

The precise probability of claims of delayed-onset PTSD from September 11 is unknown. However, it is possible to make inferences based on current understanding of rates of delayed-onset PTSD in general. In a study of injured patients, 5% of subjects with sub-threshold PTSD symptoms at 4 months post injury met criteria for PTSD at 1 year post-trauma.<sup>22</sup> In a study of patients with anxiety disorders (but not PTSD), who had experienced a traumatic event of any kind, 3% showed a delayed onset of PTSD over a 7-year follow-up period.<sup>37</sup> It is noteworthy that the majority of these cases reported delayed-onset PTSD secondary to childhood

abuse, rather than adult traumas. It is important to recognize that abuse in childhood may represent a different entity and probably differs from other traumas in terms of the type, severity and course of associated symptoms.

Related to the issue of delayed-onset PTSD is the concept of anniversary reactions, ie, increases in psychological distress on anniversaries and other dates reminiscent of the trauma. Anniversary reactions have not been studied widely, although they are a well-known phenomenon clinically. Studies of combat veterans have shown a pattern of anniversary reactions lasting up to 6 years after the war.<sup>38,39</sup> Currently, there is little evidence to suggest that anniversary reactions commonly result in full-blown PTSD among individuals who do not have PTSD, but it may be possible that people with pre-existing PTSD (or sub-threshold PTSD) may show an exacerbation of symptoms. Anniversary reactions are generally elicited not only by a calendar date, but also by increased thinking and talking about the trauma (eg, increased media coverage associated with the 1-year anniversary of September 11).

#### **SUMMARY AND CONCLUSIONS**

The literature reviewed for this paper has important implications with regard to an ongoing understanding of how psychiatric distress manifests following disasters, particularly terrorist attacks. It is important to understand that although research directly related to terrorist attacks remains limited, the topic of disaster-related mental health continues to gain importance with the ongoing threat of future terrorist-related events.

Early predictions made within the popular media of an impending epidemic of post-September 11 psychiatric distress have not come to fruition. In fact, the handful of epidemiological surveys conducted thus far have suggested rates of psychiatric distress, following September 11 that are largely consistent with known base rates of psychiatric distress within the general population. Reports also suggest that prevalence rates of September 11-related psy-

chiatric distress continue to decline. In addition to the population survey data, research focusing upon post September 11 medical utilization rates amongst veterans; a group that would be hypothesized to have a heightened vulnerability to September 11-related psychiatric distress, revealed no significant increases in medical utilization rates for this group. As the research indicates that late onset PTSD appears to be a relatively rare phenomenon, it remains unlikely at present that the medical and insurance communities will experience a significant increase in psychiatric utilization rates secondary to September 11.

It is important to note that many of the studies reviewed within this paper have inherent methodological difficulties that impact their ability to accurately characterize PTSD-related phenomena. For instance, much of the epidemiological research conducted after September 11 relied upon screening measures for diagnosis of PTSD and other related psychiatric disturbances. The use of screening measures rather than comprehensive clinical assessment to identify psychiatric disorders and clinically meaningful psychiatric distress raises some concern in relation to the likelihood of diagnostic misclassification.

The failure of many of the epidemiological surveys to take into account current base rates of psychiatric distress within the general population is also problematic. Difficulties arise in this area when one attempts to interpret rates of post September 11 psychiatric distress as reflecting a significant increase in the prevalence of PTSD, without appropriate population-based comparison data. Also of concern are the differing criteria utilized across epidemiological studies to define PTSD. For instance, an earlier September 11-related epidemiological study focused upon general emotional distress across the country, rather than upon diagnostic criteria associated with particular disorders, such as major depression or PTSD. Unfortunately, the epidemiological research relating to September 11 has also failed to adequately address the issue of diagnosis-related impairments. Although evidence of significant functional im-

pairments (eg, impairment in social or occupational domains) is routinely required for diagnosis of a major psychiatric disorder, the group of September 11-related epidemiological studies failed to address factors such as the degree of occupational impairment associated with reported psychiatric distress. Unfortunately, variables that relate to functional impairment compose some of the most important information for medical specialists tasked with the evaluation of disability-related psychiatric claims.

Although there are a growing number of studies that shed light upon some of the critical questions surrounding September 11, the field is still quite “young” and many unanswered questions remain. For example, to our knowledge no studies have focused on the thousands of individuals who were caught at ground zero during the attacks. Understanding the mental health consequences and occupational impact among those individuals will likely enhance our ability to better predict and understand outcomes following future disasters. Furthermore, although there have been several studies that help illustrate why some people develop PTSD (ie, risk factors), we know relatively little about why the majority of people do not develop PTSD (ie, resiliency factors). Closer examination of how people rebound from a major disaster and continue to function may well hold tremendous value in our ability to minimize the adverse outcomes of future disasters for those who are at most risk.

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