

# Trauma and Posttraumatic Stress Disorder in the Community

## The 1996 Detroit Area Survey of Trauma

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**Background:** The study estimates the relative importance of specific types of traumas experienced in the community in terms of their prevalence and risk of leading to posttraumatic stress disorder (PTSD).

**Methods:** A representative sample of 2181 persons in the Detroit area aged 18 to 45 years were interviewed by telephone to assess the lifetime history of traumatic events and PTSD, according to *DSM-IV*. Posttraumatic stress disorder was assessed with respect to a randomly selected trauma from the list of traumas reported by each respondent, using a modified version of the Diagnostic Interview Schedule, Version IV, and the World Health Organization Composite International Diagnostic Interview.

**Results:** The conditional risk of PTSD following exposure to trauma was 9.2%. The highest risk of PTSD was associated with assaultive violence (20.9%). The trauma

most often reported as the precipitating event among persons with PTSD (31% of all PTSD cases) was sudden unexpected death of a loved one, an event experienced by 60% of the sample, and with a moderate risk of PTSD (14.3%). Women were at higher risk of PTSD than men, controlling for type of trauma.

**Conclusions:** The risk of PTSD associated with a representative sample of traumas is less than previously estimated. Previous studies have overestimated the conditional risk of PTSD by focusing on the worst events the respondents had ever experienced. Although recent research has focused on combat, rape, and other assaultive violence as causes of PTSD, sudden unexpected death of a loved one is a far more important cause of PTSD in the community, accounting for nearly one third of PTSD cases.

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**A**LTHOUGH posttraumatic stress disorder (PTSD) has been closely identified with Vietnam war veterans, there has been a growing interest in the disorder as it applies to a wide range of traumas experienced by individuals in the community.<sup>1-8</sup> The core features of PTSD consist of (1) the "stressor criterion" that defines the etiologic event in PTSD; and (2) the set of symptoms that defines the characteristic PTSD syndrome, ie, (a) reexperiencing the trauma, (b) numbing of responsiveness or avoidance of thoughts or acts related to the trauma, and (c) excess arousal.<sup>9</sup> Recent surveys in the general population have estimated that approximately 1 adult in 12 has experienced PTSD at any time in life, roughly 15% to 24% of those exposed to traumatic events.<sup>3,8</sup>

Previous epidemiological studies have focused on traumas nominated by respondents as the worst or most upsetting events they had ever experienced. The purpose has been to measure the lifetime prevalence of PTSD in the population, assuming that the worst trauma experienced by each respon-

dent is the one most likely to cause PTSD. Evidence supporting this assumption has been reported.<sup>4</sup> However, data on the worst trauma also have been used to estimate the conditional risk of PTSD across types of trauma (ie, the probability of PTSD among those exposed to trauma). The focus on the worst traumas has probably overstated the conditional risk of PTSD given exposure, because these traumas represent the extreme end of the distribution of experiences regarded as potential causes of PTSD, in terms of their objective features or the psychological distress in the aftermath.<sup>8</sup> It is reasonable to assume that traumas resulting in marked psychological distress would be more likely to be selected as the worst. A contamination of the selection of events by their psychological sequelae would result in a spuriously strong association between trauma and PTSD. An unbiased estimate of the conditional risk of PTSD can be obtained by eliciting complete accounts of all the traumas experienced by each respondent and assessing PTSD for a trauma randomly selected from each respondent's list.<sup>8</sup> To our knowledge, no survey of this type has yet been reported.

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## MATERIALS AND METHODS

### SAMPLE

The 1996 Detroit Area Survey of Trauma is a representative sample of 2181 persons 18 to 45 years of age in the Detroit primary metropolitan statistical area (PMSA). The cutoff age of 45 years was selected based on evidence that the onset of PTSD occurs primarily in early adulthood.<sup>4</sup> The Detroit PMSA is a 6-county area that contained 4 266 654 residents at the time of the 1990 census and 1 922 173 in the 18-to-45 age range.<sup>13</sup> A random-digit dialing method was used to select the sample.<sup>14,15</sup> A total of 6110 households were contacted. Screening for age eligibility was completed in 76.2% of households, of which 64.1% contained an age-eligible respondent. In households with more than 1 age-eligible respondent, a random respondent was selected. An intensive recruitment effort with a financial incentive (\$50) was made in a randomly selected subsample of initial nonrespondents (both those in which screening was not completed and in which eligibility was established but the predesignated respondent refused to participate). A 30% cooperation rate was obtained. These initial nonrespondents (n=295) were added to the final sample with a weight to adjust for their underrepresentation. Cooperation rate in eligible households was 86.8%. Additional weights were used to adjust for differences in number of age-eligible persons in the household, for oversampling of men (in anticipation of lower cooperation among men than women<sup>16</sup>), and for differences in the probability of completing the interview.<sup>17</sup> Finally, to approximate the sample distribution to the population, poststratification weights were applied based on the joint distribution

of age, sex, race, income, and education in the geographic area in the 1990 US census.<sup>13</sup>

**Table 1**, which presents the characteristics of the sample and the population of comparable age range in the Detroit PMSA in the 1990 census, suggests that we succeeded in getting a representative sample with respect to key characteristics.

### ASSESSMENT OF EXPOSURE TO TRAUMATIC EVENTS

Trained interviewers administered a computer-assisted telephone interview, averaging 30 minutes. The interview began with a complete enumeration of traumatic events, using a list of 19 types of traumatic events, which operationalized the *DSM-IV* definition as explicated in its accompanying text (**Table 2**). An endorsement of an event type was followed by questions on the number of times an event of that type had occurred and the respondent's age at each time. A special data collection strategy was developed to ensure that events occurring at the same age were distinct and that linked traumas occurring on the same occasion were not counted as multiple traumas.

### ASSESSMENT OF PTSD

A computer-assembled list of all the distinct events reported by the respondent was read by the interviewer and the respondent was asked to identify the 1 event that was most upsetting, the *worst trauma*. First, PTSD was evaluated in connection with this event, using the PTSD section of the Diagnostic Interview Schedule, Version IV (DIS-IV), and the World Health Organization Composite

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The present study examines traumatic events and PTSD in a representative sample of 2181 persons in the Detroit area. An important advance in this study is the collection of a complete history of traumatic events and information on PTSD linked to a randomly selected trauma from the list of all traumas reported by each respondent. We focus on PTSD as defined in the *DSM IV*.<sup>9</sup> Although the syndrome of PTSD has changed little from earlier *DSM* editions,<sup>10,11</sup> the stressor criterion that defines the etiologic event in PTSD changed materially. The new definition broadens the range of "qualifying" events beyond the core category that had initially been used to define PTSD, ie, military combat, war, disaster, and criminal violence. The revised definition also includes a subjective component, requiring that the "person's response involved intense fear, helplessness, or horror."<sup>9</sup> The revision aligns the stressor criterion with ongoing clinical practice, which is guided by the principle that people may perceive and respond differently to outwardly similar events.<sup>12</sup>

## RESULTS

### EXPOSURE TO TRAUMATIC EVENTS

The lifetime prevalence of exposure to trauma varied widely across traumatic events, with some occurring in less than 2% of the population (ie, held captive/tortured/kidnapped,

military combat) and others in more than 25% (eg, mugged, serious car crash) (Table 2). Sudden unexpected death of a close relative or friend was the most prevalent, with 60% of the sample having experienced an event of this type. The lifetime prevalence of exposure to any trauma was 89.6% (SE = 0.8). The mean number of distinct traumatic events reported by persons exposed to any trauma was 4.8 (SE = 0.1), and was significantly higher in men than in women, 5.3 vs 4.3, respectively (Student  $t = 5.6, P < .001$ ).

### SOCIODEMOGRAPHIC FACTORS ASSOCIATED WITH EXPOSURE TO TRAUMA

The distributions of exposure to traumatic events and the associations between exposure and key sociodemographic factors were examined in relation to the 4 classes of traumatic events (**Table 3**). Women were about half as likely as men to be exposed to assaultive violence and other injury or shocking experience, adjusted for sociodemographic factors. Sex comparisons of exposure to specific traumas within the assaultive violence class showed that women were more likely than men to report rape (9.4% vs 1.1%) and other sexual assault (9.4% vs 2.8%), whereas men were more likely than women to report other types of assaultive violence, including mugging or threatened with a weapon (34.0% vs 16.4%), shot or stabbed (8.2% vs 1.8%), and badly beaten up (13.1% vs 9.8%) (data not shown in a

International Diagnostic Interview (CIDI), Version 2.1. The DIS-IV and the CIDI, which is modeled on the DIS-IV, are fully structured diagnostic interviews designed to be administered by experienced interviewers without clinical training.<sup>18</sup> Second, a *computer-selected random event* from the complete list of distinct events reported by each respondent was then evaluated with respect to PTSD. Finally, PTSD was evaluated a third time for the earliest event reported by each respondent. In cases where respondents reported fewer than 3 lifetime events or where the randomly selected and/or earliest events were also the events nominated as most upsetting, fewer than 3 events were assessed. The responses were used to diagnose PTSD based on *DSM-IV* criteria.<sup>9</sup> Although the DIS-IV or CIDI version for *DSM-IV* PTSD diagnosis has not yet been validated, a validation of the DIS for *DSM-III-R* PTSD, which contained symptom questions similar to those used here, found good agreement between the DIS and independent clinical reinterviews.<sup>8</sup>

#### DATA ANALYSIS

Analysis of exposure to trauma was conducted on weighted data, as described above. In addition, analysis of the randomly selected traumas took into account the number of traumas reported by each respondent. Each randomly selected event from each respondent's list of events was weighted by the number of events reported by the respondent. The weighting adjusts for the variation in the selection probabilities of events due to differences in the number of events across respondents. As a result, the sample of randomly selected events is representative of the total pool of events reported by the respondents.

Data are presented on 19 specific types of events, as well as 4 classes of events into which they were grouped (Table 2). Direct personal traumas were divided into 2 classes, separating events that involved intentional violence, referred to as "assaultive violence," from other types of directly experienced traumas, referred to as "other injury or shocking experience." The third category covers traumas involving "learning about traumatic events experienced by others." "Learning about the sudden unexpected death of a family member or a close friend" was separated from the third category because of its high prevalence in the population.

We used a series of univariate analyses to depict the distributions of exposure to traumatic events and estimate the associations of classes of traumas with key sociodemographic factors. Adjusted odds ratios, estimated in multiple logistic regressions, reflect the odds of exposure for persons in a given category relative to a reference group, adjusted for other factors. Based on respondents' reports of their lifetime history of events, including the age at each event, we estimated the rates of exposure from the first decade to age 45 years, using standard life table methods.<sup>19,20</sup> At each age interval, the estimated rate represents the risk of exposure, using as a denominator total person-years at that interval. It is not the hazard rate of first exposure, which would be based on person-years at each specific age interval contributed only by those who had not been previously exposed. Commercially available software (SUDAAN, Research Triangle Park, NC) was used to take into account the sample weights and obtain SEs for estimates based on weighted data. Similar analyses were conducted to describe the risk of PTSD after exposure and estimate the associations with sociodemographic factors, using data on the randomly selected traumas.

table). The lifetime prevalence of assaultive violence was higher in nonwhites than whites, in persons with low education than college graduates, in those with low income than high income, in central-city residents than other-area residents, and in those previously married than married. The associations with place of residence and marital status disappeared when race, education, and income were controlled. The adjusted odds for assaultive violence was approximately 2-fold higher in nonwhites than whites, and in those with less than high school education and annual income of less than \$25 000, compared with college graduates and those with annual income of \$75 000 or above, respectively. In contrast with assaultive violence, other classes of trauma were only weakly or not at all associated with race and socioeconomic indicators (Table 3).

#### AGE-SPECIFIC RISK OF TRAUMA

**Figure 1** depicts the occurrence rates of exposure to trauma by age, using standard life table methods. The rates of occurrence of all 4 classes of trauma peaked sharply at age 16 to 20 years. However, marked differences were observed across classes of trauma in the pattern of the rates over the life span of the respondents. The probability of assaultive violence declined precipitously after age 20 years, continued to decline in the third and fourth decades of life, and remained low up to age 45 years. In contrast, the probabilities of other classes of trauma, which

also declined after age 20 years, did not continue to decline in the subsequent years. Sudden unexpected death of a loved one was the only trauma to remain at the high level it reached at the 16-to-20 age interval until age 40 years and to climax between 41 and 45 years of age.

#### THE CONDITIONAL RISK OF PTSD

The conditional probability of PTSD was estimated on the randomly selected traumatic events (**Table 4**). Overall, the probability of PTSD after exposure was 9.2% (SE=1.0)—13.0% (SE=1.6) in women and 6.2% (SE=1.2) in men. Assaultive violence had the highest probability of PTSD (20.9%). Learning about traumatic events experienced by others had the lowest probability of PTSD (2.2%). However, learning about the sudden unexpected death of a loved one was associated with a moderate probability of PTSD (14.3%).

#### PROPORTIONS OF PTSD CASES RESULTING FROM SPECIFIC TYPES OF TRAUMAS

As shown in the third part of Table 4, the single most important trauma as cause of PTSD was sudden unexpected death of a loved one, with 31.1% of all PTSD cases attributable to an event of this type. The prominence of unexpected death of a loved one reflects its high prevalence in the community and the moderate risk of PTSD associated with it. Assaultive violence as a category ac-

**Table 1. The Detroit Area Survey of Trauma: Comparisons With Data on the Area in the 1990 US Census**

|                            | n    | Unweighted % | Weighted %* | US Census %† |
|----------------------------|------|--------------|-------------|--------------|
| Sex                        |      |              |             |              |
| Male                       | 1107 | 50.8         | 48.6        | 48.6         |
| Female                     | 1074 | 49.2         | 51.4        | 51.4         |
| Race                       |      |              |             |              |
| White                      | 1549 | 71.8         | 74.7        | 76.3         |
| Nonwhite                   | 608  | 28.2         | 25.3        | 23.7         |
| Age, y                     |      |              |             |              |
| 18-25                      | 488  | 22.5         | 25.2        | 26.2         |
| 26-35                      | 838  | 38.6         | 40.3        | 39.7         |
| 36-45                      | 843  | 38.9         | 34.5        | 34.1         |
| Marital status             |      |              |             |              |
| Married                    | 972  | 44.7         | 49.2        | 49.8         |
| Separated/widowed/divorced | 335  | 15.3         | 11.6        | 12.9         |
| Never married              | 868  | 39.9         | 39.2        | 37.3         |
| Education                  |      |              |             |              |
| ≤High school               | 910  | 41.7         | 44.0        | 45.8         |
| Some college               | 707  | 32.4         | 31.7        | 36.3         |
| 4 y college                | 563  | 25.8         | 24.3        | 17.9         |
| Employment                 |      |              |             |              |
| Employed                   | 1726 | 79.5         | 77.8        | 72.3         |
| Not employed               | 445  | 20.5         | 22.2        | 27.6         |
| Household income, \$       |      |              |             |              |
| <10 000                    | 178  | 8.6          | 6.5         | 9.3          |
| 10 000-14 999              | 155  | 7.5          | 6.3         | 4.0          |
| 15 000-19 999              | 166  | 8.1          | 7.0         | 5.5          |
| 20 000-24 999              | 170  | 8.2          | 6.9         | 5.3          |
| 25 000-34 999              | 290  | 14.1         | 15.9        | 13.6         |
| 35 000-49 999              | 385  | 18.7         | 20.4        | 21.8         |
| 50 000-74 999              | 396  | 19.2         | 20.3        | 24.9         |
| ≥75 000                    | 322  | 15.6         | 16.8        | 15.7         |

\*Weights adjust estimates for sampling design and poststratification to census characteristics. Some of the variables have missing data and the numbers do not add up to the total.

†US Bureau of the Census (data on the Detroit primary metropolitan statistical area).<sup>13</sup>

counted for 39.5% of PTSD cases. However, each specific type of trauma subsumed under it accounted for a small proportion of PTSD cases.

#### DURATION OF PTSD

Kaplan-Meier survival methods<sup>21</sup> were used to estimate the time to remission of PTSD in persons who met criteria for the disorder (**Figure 2**). Approximately 26% of PTSD cases remitted by 6 months, and 40% by 12 months. From that point on, remission tapered off. The median time to remission was 24.9 months, and in more than one third of cases PTSD persisted for more than 60 months. Posttraumatic stress disorder persisted longer in women than men (log-rank  $\chi^2_1=10.568, P=.002$ ), with median duration of 48.1 months in women vs 12.0 months in men. Posttraumatic stress disorder persisted longer in cases resulting from traumas experienced directly, compared with learning about traumas to a loved one or a sudden unexpected death of a loved one (log-rank  $\chi^2_1=6.534, P=.01$ ) with median duration of 48.1 months vs 12.1 months, respectively. Using Cox proportional hazards model, no interaction was detected between sex and trauma type ( $\chi^2_1=.001, P=.99$ ).<sup>22</sup> Hazards ratios

**Table 2. Lifetime Prevalence of Specific Traumatic Events (N = 2181)**

| Type of Trauma  | % (SE)     |
|---|------------|
| Assaultive violence   | 37.7 (1.2) |
| Military combat   | 1.5 (10.3) |
| Raped   | 5.4 (0.6)  |
| Held captive, tortured, or kidnapped  | 1.8 (0.4)  |
| Shot or stabbed   | 4.9 (0.6)  |
| Other kind of sexual assault  | 6.2 (0.6)  |
| Mugged, held up, or threatened with a weapon  | 25.0 (1.1) |
| Badly beaten up   | 11.4 (0.8) |
| Other injury or shocking experience   | 59.8 (1.2) |
| Serious car or motor vehicle crash  | 28.0 (1.1) |
| Any other kind of serious accident or injury  | 13.9 (0.9) |
| Fire, flood, earthquake, or other natural disaster                                  | 16.6 (0.9) |
| Diagnosed with a life-threatening illness   | 4.7 (0.5)  |
| Child of yours diagnosed as having a life-threatening illness                       | 3.0 (0.4)  |
| Witnessed someone being killed or seriously injured                                 | 29.0 (1.1) |
| Unexpectedly discovering a dead body  | 7.6 (0.7)  |
| Learning about traumas to others  | 62.4 (1.2) |
| Learned that a close friend/relative was raped or sexually assaulted                | 32.6 (1.2) |
| Learned that a close friend/relative was seriously physically attacked              | 16.1 (0.9) |
| Learned that a close friend/relative was seriously injured in a motor vehicle crash | 39.4 (1.2) |
| Learned that a close friend/relative was seriously injured in any other accident    | 12.2 (0.8) |
| Sudden, unexpected death of a close friend or relative                              | 60.0 (1.2) |
| Any trauma  | 89.6 (0.8) |

for remission in women vs men was 0.53 (95% confidence interval [CI], 0.36-0.90), and for directly experienced trauma vs other trauma, 0.61 (95% CI, 0.41-0.90), with each variable adjusted for the effect of the other.

#### SOCIODEMOGRAPHIC FACTORS ASSOCIATED WITH THE RISK FOR PTSD AFTER EXPOSURE

Sex emerged as a significant risk factor for PTSD when other sociodemographic factors were controlled, with women's rate being 2-fold higher than men's (**Table 5**). The sex difference remained nearly the same when trauma type was controlled in a conditional regression in which respondents were grouped into risk sets based on specific trauma types. A considerable race difference was observed in the PTSD rate, a difference that was no longer significant when adjusted for other variables. Note that when central city was dropped from the model, the adjusted odds ratio for PTSD in nonwhites vs whites was 1.80 (95% CI, 1.11-2.94). A higher PTSD rate was observed also in the formerly married than the married, a difference that disappeared when race and socioeconomic factors were controlled.

#### ADDITIONAL ANALYSIS: PTSD FROM THE WORST EVENTS

The availability of data on traumas nominated by the respondents as the worst offers a direct comparison of the

**Table 3. Prevalence of Exposure to 4 Classes of Trauma by Sex, Race, Education, Income, Marital Status, and Residence (N = 2181)\***

|                            | Assaultive Violence |                  | Other Injury or Shock |                  | Trauma to Others |                  | Unexpected Death |                  |
|----------------------------|---------------------|------------------|-----------------------|------------------|------------------|------------------|------------------|------------------|
|                            | %                   | AOR (95% CI)     | %                     | AOR (95% CI)     | %                | AOR (95% CI)     | %                | AOR (95% CI)     |
| Total                      | 37.7                | ...              | 59.8                  | ...              | 62.4             | ...              | 60.0             | ...              |
| Sex                        |                     |                  |                       |                  |                  |                  |                  |                  |
| Female                     | 32.4                | 0.55 (0.45-0.69) | 52.0                  | 0.48 (0.38-0.59) | 61.8             | 1.01 (0.81-1.25) | 59.0             | 0.90 (0.73-1.12) |
| Male                       | 43.3                | 1.00             | 68.0                  | 1.00             | 63.1             | 1.00             | 61.1             | 1.00             |
| Race                       |                     |                  |                       |                  |                  |                  |                  |                  |
| Nonwhite                   | 54.7                | 1.97 (1.44-2.70) | 66.1                  | 1.31 (0.96-1.79) | 69.0             | 1.39 (1.02-1.90) | 66.4             | 1.32 (0.97-1.81) |
| White                      | 31.8                | 1.00             | 57.8                  | 1.00             | 60.8             | 1.00             | 58.2             | 1.00             |
| Education                  |                     |                  |                       |                  |                  |                  |                  |                  |
| <High school               | 52.3                | 2.03 (1.27-3.26) | 65.1                  | 1.57 (0.96-2.56) | 64.3             | 0.95 (0.59-1.52) | 63.6             | 1.49 (0.95-2.34) |
| High school                | 40.7                | 1.52 (1.11-2.08) | 60.7                  | 1.21 (0.90-1.62) | 59.4             | 0.84 (0.62-1.12) | 62.0             | 1.49 (1.11-2.00) |
| Some college               | 38.4                | 1.46 (1.09-1.96) | 61.2                  | 1.36 (1.02-1.83) | 64.6             | 1.04 (0.78-1.40) | 62.4             | 1.52 (1.16-2.00) |
| 4-y college                | 27.2                | 1.00             | 54.6                  | 1.00             | 63.5             | 1.00             | 52.8             | 1.00             |
| Household income, \$       |                     |                  |                       |                  |                  |                  |                  |                  |
| <25 000                    | 49.7                | 1.84 (1.22-2.78) | 65.6                  | 1.27 (0.86-1.88) | 63.2             | 1.14 (0.78-1.65) | 60.1             | 0.87 (0.60-1.26) |
| 25 000-34 999              | 38.5                | 1.36 (0.89-2.10) | 60.3                  | 1.03 (0.68-1.56) | 67.6             | 1.51 (1.00-2.27) | 62.4             | 0.98 (0.66-1.45) |
| 35 000-49 999              | 35.8                | 1.27 (0.86-1.88) | 63.8                  | 1.25 (0.86-1.81) | 65.9             | 1.45 (1.02-2.06) | 61.3             | 0.97 (0.68-1.38) |
| 50 000-74 999              | 33.4                | 1.15 (0.79-1.67) | 52.1                  | 0.78 (0.55-1.11) | 61.4             | 1.20 (0.84-1.70) | 58.0             | 0.89 (0.62-1.26) |
| ≥75 000                    | 27.3                | 1.00             | 56.7                  | 1.00             | 58.0             | 1.00             | 59.7             | 1.00             |
| Marital status             |                     |                  |                       |                  |                  |                  |                  |                  |
| Separated/widowed/divorced | 46.9                | 1.11 (0.78-1.57) | 64.5                  | 1.15 (0.82-1.61) | 58.5             | 0.82 (0.60-1.12) | 60.6             | 0.90 (0.64-1.25) |
| Never married              | 39.6                | 0.83 (0.63-1.09) | 61.3                  | 0.93 (0.71-1.23) | 65.2             | 1.11 (0.86-1.43) | 58.4             | 0.84 (0.65-1.09) |
| Married                    | 33.9                | 1.00             | 57.4                  | 1.00             | 61.1             | 1.00             | 61.1             | 1.00             |
| Residence                  |                     |                  |                       |                  |                  |                  |                  |                  |
| Central city               | 54.2                | 1.36 (0.98-1.90) | 65.5                  | 1.14 (0.82-1.59) | 67.1             | 1.11 (0.79-1.54) | 66.6             | 1.17 (0.84-1.64) |
| Other                      | 33.5                | 1.00             | 58.3                  | 1.00             | 61.2             | 1.00             | 58.4             | 1.00             |

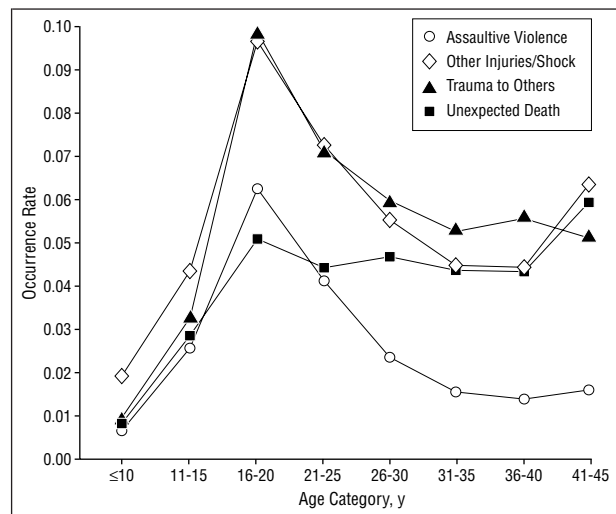
\*AOR indicates adjusted odds ratio, derived from logistic regression model in which exposure is the dependent variable and all listed variables are the independent variables; CI, confidence interval.

unbiased estimate of the conditional risk of PTSD based on the randomly selected traumas with the estimation approach used in previous studies. The probability of PTSD associated with the worst events was 13.6% (SE=0.9), 17.7% (SE=1.5) in women and 9.5% (SE=1.1) in men.

### COMMENT

Key findings from this study are as follows: (1) The lifetime prevalence of exposure to 1 or more traumatic events defined according to DSM-IV was 89.6%; the most prevalent trauma was sudden unexpected death of a close relative or friend (60%). (2) Assaultive violence was higher in men, nonwhites, and persons with low socioeconomic status; other classes of trauma showed weak or no relationship with race and socioeconomic status. (3) The conditional probability of PTSD after exposure to a representative sample of traumas experienced by the respondents was 9.2%; it was 2-fold higher in women than in men, controlling for type of trauma. (4) Assaultive violence had the highest risk of PTSD. (5) Sudden unexpected death of a loved one contributed a large proportion of PTSD cases (31%), because of its high rate in the population and a moderate risk of PTSD. (6) In most cases (74%), PTSD persisted for more than 6 months; the duration of PTSD was longer in women than in men and in cases resulting from trauma experienced directly than learning about trauma or sudden death of a loved one.

The lifetime prevalence of exposure to 1 or more traumatic events in this study was higher than in previous community surveys that have used the narrower definition of trauma. However, estimates from the National



**Figure 1. Age-specific occurrence rates of 4 classes of traumatic events. At each age interval, the occurrence rate is estimated from the number of exposures divided by the number of person-years at that interval.**

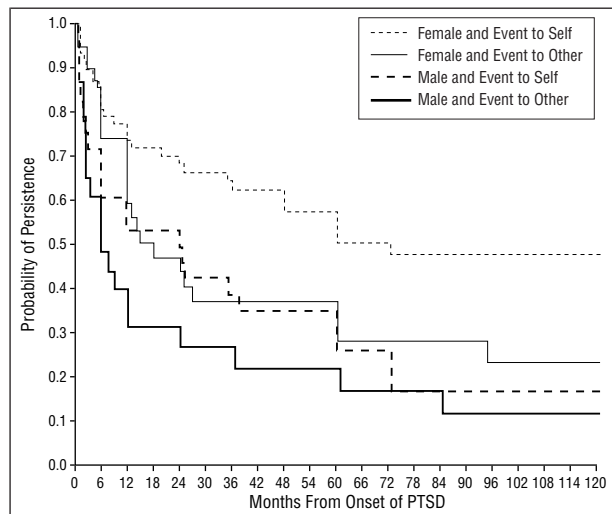
Comorbidity Survey of the prevalence of specific types of trauma with similar definition to those in this study, ie, rape, natural disaster, and witnessing a killing or serious injury, are close to the estimates in this study.<sup>8</sup> The prevalence of sudden unexpected death of a loved one, which was found to be higher than any other trauma, had not been estimated previously.

We found that the period of high risk of exposure to assaultive violence is limited to late adolescence and early

**Table 4. Posttraumatic Stress Disorder (PTSD) Risk Associated With Specific Traumas and the Proportion of PTSD Cases Resulting From Various Types of Traumas\***

|                                  | Distribution of Random Traumas,<br>No. (%) Exposed | Conditional Risk of PTSD Across<br>Specific Traumas, % PTSD (SE) | % (SE) of PTSD Cases<br>Due to Specific Traumas |
|----------------------------------|--|--|---|
| Assaultive violence              | 286 (17.5)   | 20.9 (3.4)   | 39.5 (5.5)                                      |
| Military combat                  | 8 (0.6)  | 0 (0.0)  | <b>0.0</b> (0.0)                                |
| Rape                             | 32 (1.8)   | 49.0 (12.2)  | 9.5 (2.9)                                       |
| Held captive/tortured/kidnapped  | 7 (0.5)  | 53.8 (23.4)  | 2.6 (2.0)                                       |
| Shot/stabbed                     | 21 (1.8)   | 15.4 (13.7)  | 3.0 (2.9)                                       |
| Sexual assault other than rape   | 27 (2.0)   | 23.7 (10.8)  | 5.0 (2.5)                                       |
| Mugged/threatened with weapon    | 138 (7.0)  | 8.0 (3.7)  | 6.1 (2.9)                                       |
| Badly beaten up                  | 53 (3.9)   | 31.9 (8.6)   | 13.3 (3.8)                                      |
| Other injury or shock            | 633 (34.0)   | 6.1 (1.4)  | <b>22.5</b> (4.6)                               |
| Serious car crash                | 168 (8.2)  | 2.3 (1.3)  | 2.0 (1.1)                                       |
| Other serious accident           | 87 (4.8)   | 16.8 (6.2)   | 8.6 (3.4)                                       |
| Natural disaster                 | 109 (6.0)  | 3.8 (3.0)  | 2.4 (1.9)                                       |
| Life-threatening illness         | 23 (1.4)   | 1.1 (0.9)  | 0.2 (0.1)                                       |
| Child's life-threatening illness | 18 (0.8)   | 10.4 (9.8)   | 0.9 (0.9)                                       |
| Witnessed killing/serious injury | 183 (10.4)   | 7.3 (2.5)  | 8.3 (2.8)                                       |
| Discovering dead body            | 45 (2.4)   | 0.2 (0.2)  | 0.1 (0.1)                                       |
| Learning about others            | 564 (28.4)   | 2.2 (0.7)  | <b>6.9</b> (2.2)                                |
| Close relative raped             | 186 (9.6)  | 3.6 (1.7)  | 3.8 (1.8)                                       |
| Close relative attacked          | 61 (3.8)   | 4.6 (2.9)  | 1.9 (1.2)                                       |
| Close relative car crash         | 249 (11.5)   | 0.9 (0.5)  | 1.1 (0.6)                                       |
| Close relative other accident    | 68 (3.5)   | 0.4 (0.4)  | 0.2 (0.2)                                       |
| Sudden unexpected death          | 474 (20.1)   | 14.3 (2.6)   | <b>31.1</b> (5.1)                               |
| Any trauma                       | 1957 (100.0)                                       | 9.2 (1.0)  | <b>100.0</b> (. . .)                            |

\*Labels of traumas are abbreviated; see Table 2 for more detail. Distributions of the randomly selected traumas appear in 2 forms: unweighted numbers of persons exposed to each trauma and weighted percentages.



**Figure 2.** Remission of posttraumatic stress disorder (PTSD) by sex and trauma type.

adulthood. In addition, while other classes of trauma were unrelated to race and social class, assaultive violence was more likely to occur in nonwhites and in persons in lower social classes. Inequality in the risk of assaultive violence was observed also in relation to central-city residence, although the relationship disappeared when race was controlled. As in many metropolitan areas in the United States, the subset of the sample with central-city residence was predominately nonwhite (78.4%), whereas the subset in the remaining PMSA was predominately white (87%). The finding that assaultive violence had a stronger link to race than to central-city residence might reflect the fact that, even within the central city, whites and nonwhites reside in sepa-

**Table 5. Conditional Risk for Posttraumatic Stress Disorder (PTSD) by Sex, Race, Education, Income, Marital Status, and Residence\***

|                            | %    | AOR (95% CI)     |
|----------------------------|------|------------------|
| Sex                        |      |                  |
| Female                     | 13.0 | 2.01 (1.23-3.29) |
| Male                       | 6.2  | 1.00             |
| Race                       |      |                  |
| Nonwhite                   | 14.0 | 1.52 (0.81-2.85) |
| White                      | 7.3  | 1.00             |
| Education                  |      |                  |
| <High school               | 7.2  | 0.90 (0.29-2.74) |
| High school                | 9.1  | 1.25 (0.57-2.73) |
| Some college               | 12.4 | 1.82 (0.87-3.84) |
| 4-y college                | 5.5  | 1.00             |
| Household income, \$       |      |                  |
| <25 000                    | 11.7 | 0.98 (0.41-2.37) |
| 25 000-34 999              | 9.6  | 0.85 (0.32-2.27) |
| 35 000-49 999              | 9.5  | 1.01 (0.41-2.49) |
| 50 000-74 999              | 6.1  | 0.64 (0.26-1.59) |
| ≥75 000                    | 8.5  | 1.00             |
| Marital status             |      |                  |
| Separated/widowed/divorced | 14.1 | 1.82 (0.90-3.69) |
| Never married              | 10.0 | 1.23 (0.63-2.40) |
| Married                    | 7.3  | 1.00             |
| Residence                  |      |                  |
| Central city               | 14.6 | 1.31 (0.67-2.56) |
| Other                      | 7.5  | 1.00             |

\*AOR indicates adjusted odds ratio, derived from logistic regression model in which PTSD is the dependent variable and all listed variables are the independent variables; CI, confidence interval.

rate neighborhoods that vary with respect to characteristics that correlate with assaultive violence.<sup>23-25</sup> Furthermore, nonwhites who resided outside the central city at the

time of the interview might have lived in the central city in the past; their lifetime risk for exposure to violence would reflect that experience. Similar findings on race, social class, sex, and age differences have been reported for exposure to criminal victimization.<sup>26-28</sup>

This analysis confirms the suspicions that previous studies, by focusing on the worst traumas, overestimated the conditional risk of PTSD. The conditional risk of PTSD based on the representative sample of traumas was approximately one third lower than that based on the worst traumas. The analysis indicates that sudden unexpected death of a loved one is a common experience and accounts for approximately one third of PTSD cases in the community. Its relative importance as cause of PTSD might be particularly prominent after young adulthood. Our findings suggest that the profile of PTSD in the community, in terms of the etiologic events that precipitate the disorder as well as its course, might vary with age. Posttraumatic stress disorder in late adolescence and young adulthood might be more likely than in later years to result from experiencing assaultive violence and be of longer duration. In later years, PTSD might more often result from experiencing a sudden unexpected death of a loved one and be of much shorter duration.

Women's risk of PTSD following exposure to trauma was approximately 2-fold higher than that of men, a finding consistent with previous reports.<sup>3,5,8,29,30</sup> The sex difference cannot be explained by differences in the type or number of traumas experienced by men and women and suggests a greater vulnerability to the PTSD effects of trauma in women. A similar conclusion was reached in the National Comorbidity Survey, in which the female-to-male relative risk, adjusted for trauma type, was 4.0.<sup>8</sup> Our analysis also revealed a sex difference in the chronicity of PTSD, with a considerably longer duration in women than men, independent of the type of trauma that gave rise to PTSD.

Recent research has focused on combat, rape, and sexual or physical assault as causes of PTSD. The evidence that the highest risk of PTSD is linked to these types of trauma underscores the importance of this focus in future research. However, our finding that sudden unexpected death of a loved one, despite a lower risk of PTSD, accounts for a large proportion of PTSD cases in the community has not been reported previously. It suggests the need for further research on this heterogeneous category of trauma.

The principal goal in this study was to provide an unbiased estimate of the conditional risk of PTSD in the general population and to describe the distribution of trauma and PTSD across subgroups of the population. Other suspected risk factors for exposure and PTSD, primarily preexisting psychiatric disorders shown previously to be associated with these phenomena,<sup>3,4,8,30</sup> have not been examined in this study. In view of our finding that the risk of PTSD following trauma is even lower than in recent studies that focused on the worst trauma, the continued investigation of vulnerability factors is essential for understanding why some of those who experience trauma develop PTSD.

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