

Perspective

Exposure to War as a Risk Factor for Mental Disorders

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While large-scale national psychiatric epidemiologic studies have been conducted in Western industrialized nations [1–3], studies in the Arab world have generally been limited to smaller populations [4–6]. In addition, while exposure to war as a risk factor for the development of mental disorders in military populations has previously been described [7,8], the effect of war upon first onset of a range of mental disorders in civilian populations at a national level has not been explored.

Over the last quarter-century, advances in psychiatric diagnostic classification, the development of fully structured diagnostic interviews, and the refinement of household survey technology have led to greater understanding of the epidemiology of psychiatric illness in the Western hemisphere. With the publication of the Diagnostic and Statistical Manual, 3rd edition [9], the American Psychiatric Association truly operationalized the diagnostic criteria for psychiatric disorders. Based on these criteria, Robins and colleagues created the Diagnostic Interview Schedule (DIS)—the first fully structured diagnostic interview that could be administered by trained lay persons [10]. The DIS was administered to over 20,000 individuals in the Epidemiologic Catchment Area Study, a landmark community-based survey of mental health disorders conducted in selected neighborhoods in five United States communities [1]. Widespread dissemination of the Epidemiologic Catchment Area study results led to replication studies in other countries and the development of other structured diagnostic interviews. The most widely used of these is the World Health

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Linked Research Article

This Perspective discusses the following new study published in *PLoS Medicine*:

Karam EG, Mneimneh ZN, Dimassi H, Fayyad JA, Karam AN, et al. (2008) Lifetime prevalence of mental disorders in Lebanon: First onset, treatment, and exposure to war. *PLoS Med* 5(4): e61. doi:10.1371/journal.pmed.0050061

In a survey of 2,857 adults in Lebanon, Elie Karam and colleagues found a lifetime prevalence of any DSM-IV psychiatric disorder of 25.8%.

Organization Composite International Diagnostic Interview (WHO CIDI), developed to encourage cross-national research by integrating the validated methodological approach of the DIS with the WHO's International Classification of Diseases [11].

The sophisticated study of disasters—war is one type of human-made disaster—and their impact on mental health is also relatively recent [12]. More than 29 armed conflicts are occurring now around the globe involving 25 countries [13]. The public health response to large-scale public health emergencies and catastrophes requires consideration of the mental disorders (e.g., post-traumatic stress disorder, depression), distress (e.g., sleep disturbance, fear, changes in economic behaviors such as purchasing houses), and health risk behaviors (e.g., increased alcohol and smoking, evacuation behaviors) of those exposed [14,15].

A New Population Survey in Lebanon

In this issue of *PLoS Medicine*, Elie Karam and colleagues use the WHO CIDI to address questions of lifetime prevalence, age of onset, and treatment delay for mental disorders in a nationally representative population survey of Lebanon [16]. They also

examine individual and cumulative war exposure as risk factors for the development of mental disorders. One hundred and sixteen trained interviewers administered the Arabic version of the CIDI 3.0 to a randomly selected non-institutionalized adult (age ≥ 18 years) family member ($n = 2,187$) in households across 342 geographical area segments of Lebanon. For all ($n = 1,031$) respondents who met lifetime criteria for any core mental disorder (and for a probability sample of those who did not), a secondary assessment of risk factors was conducted. Marital status, education, and war exposure were used as time-variant variables in the analysis, using discrete-time survival analysis to estimate the probability of the first onset of a disorder at each year of life up to and including age 74 years.

Investigators found that the lifetime prevalence of any DSM-IV (Diagnostic and Statistical Manual, 4th edition) disorder in Lebanon was 25.8%. Anxiety disorders (16.7%) and mood

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Abbreviations: DIS, Diagnostic Interview Schedule; DSM-IV, Diagnostic and Statistical Manual, 4th edition; WHO CIDI, World Health Organization Composite International Diagnostic Interview

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disorders (12.6%) were more common than impulse control disorders (4.4%) and substance use disorders (2.2%). Importantly, projecting lifetime risk, nearly one-third of the respondents were expected to meet criteria for one or more DSM-IV disorders over their lifetime. The most prevalent disorder was major depression (9.9% meeting criteria at some time in their lives). Less than half of the persons with mental disorders had ever received professional treatment, and the median delay between onset and first treatment was six years.

Nearly 70% of the population was exposed to one or more war events (such as being a civilian in a war zone, or being a refugee), including nearly 60% of children ages 0–10 years at the start of the war. About 38% of the population had been war refugees. Almost half of the Lebanese population was exposed to one or two of the ten war events; 21.8% were exposed to three or more war events. Those exposed to individual war events were at a higher risk for developing a mental disorder for the first time (after controlling for age, gender, marital status, and education). There was a cumulative effect of war exposures increasing the likelihood of developing anxiety disorders (including social anxiety disorder, post-traumatic stress disorder, and generalized anxiety disorder), mood disorders (dysthymia and major depressive disorder but not bipolar disorder), and impulse control disorders.

Implications for Health Care and Policy

The lifetime prevalence of any DSM-IV mental disorder varies greatly across the World Health Organization's World Mental Health surveys, from 47.4% for the US to 12.0% for Nigeria. The interquartile range (25th–75th percentiles) for this prevalence across these surveys was 18.1%–36.1% [17], and thus the lifetime prevalence for Lebanon (25.8%) lies within this range. Similarly, the projected lifetime risk of about one-third (32.9%) for one or more of the DSM-IV disorders in Lebanon is between the range of 17%–69% found in other World Mental Health surveys, although perhaps low compared to other nations with sectarian violence.

The delay in obtaining treatment—a common finding in nearly all such

studies—leads to increased burden for care and is a major target for health care policy and planning. Access to care may be one consideration in understanding the treatment-related finding. However, the fact that Lebanon has the highest per capita number of physicians in the Arab world [18] suggests that other factors, such as lack of public awareness (or physician vigilance) for mental disorders, cultural taboos, or stigma associated with these illnesses or their treatment may be important barriers to obtaining care. Primary care has a crucial role to play in providing effective treatment for mental disorders across the population.

The fact that exposure to war increased the risk of developing mental disorders may not be surprising, but quantifying the strength of this association in a nation historically torn by conflict serves as a guidepost for health policy makers in nations engaged in prolonged conflicts. The identification of unique risks associated with unique exposures may not be possible in a war zone because of the complexity of exposures. In addition, such fine-grained identification has not found much support in studies of exposures to other, less complex traumatic events, perhaps because the exposures share the overwhelming experience of life threat. Other adversities occurring after exposure to war, and disparities in resources to prevent and treat war-related health problems, require further study.

Future Directions

Given that this study was based on retrospective self-reports, the findings on the history of psychiatric disorder, age of onset, onset of treatment, and war exposure must be interpreted in light of the potential for recall bias. In addition, the low rates of some war exposure types (and/or low rates of specific disorders) lead to the confidence intervals on a number of the findings being quite wide. Thus the odds ratios may be subject to wide variation in future studies. Real-time health surveillance and prospective longitudinal studies—as are currently being conducted in the US in the wake of Hurricanes Katrina and Rita—may help to confirm or refute these findings. Health surveillance for mental disorders, as is done for other public health concerns, can bring real-time

information to health planning and delivery of services.

Addressing the barriers to care is an international need across oceans, nations, and cultures. Future exploration of the degree to which stigma and cultural factors present obstacles to diagnosis and treatment may guide public awareness initiatives. Karam and colleagues document that war has consequences for a nation's civilians as well as for those fighting. The social, psychological, and health burden of war is now closer to being measured. When this burden cannot be prevented, at least improved measurements will give the health community a better chance of addressing health care needs. ■

References

1. Robins LN, Regier DA, editors (1991) *Psychiatric disorders in America: The epidemiologic catchment area study*. New York: Free Press.
2. Henderson S, Andrew G, Hall W (2000) Australia's mental health: An overview of the general population survey. *Aust NZ J Psychiatry* 34: 197-205.
3. Bijl RV, Ravelli A, van Zessen G (1998) Prevalence of psychiatric disorder in the general population: Results of the Netherlands Mental Health Survey and Incidences Study (NEMESIS). *Soc Psychiatry Epidemiol* 33: 587-595.
4. Abou Saleh MT, Ghubash R, Daradkeh TK (2001) Al Ain Community Psychiatry Survey I. Prevalence and socio-demographic correlates. *Soc Psychiatr Epidemiol* 36: 20-28.
5. Rahim SI, Cederblad M (1989) Epidemiology of mental disorders in young adults of a newly urbanized area in Khartoum, Sudan. *Br J Psychiatry* 155: 44-47.
6. Karam EG, Howard D, Karam AN, Ashkar A, Shaaya M, et al. (1998) Major depression and external stressors: The Lebanon War. *Eur Arch Psychiatry Clin Neurosci* 248: 225-230.
7. Prigerson HG, Maciejewski PK, Rosenheck RA (2002) Population attributable fractions of psychiatric disorders and behavioral outcomes associated with combat exposures among U.S. men. *Am J Public Health* 92: 59-63.
8. Hoge CW, Castro CA, Messer SC, McGurk D, Cotting DI, Koffman RL (2004) Combat duty in Iraq and Afghanistan: Mental health problems and barriers to care. *N Engl J Med* 351: 13-22.
9. American Psychiatric Association (1980) *Diagnostic and statistical manual, 3rd edition*. Washington (D. C.): American Psychiatric Press.
10. Robins LN, Helzer JE, Croughan JL, Ratcliff KS (1981) National Institute of Mental Health diagnostic interview schedule: Its history, characteristics and validity. *Arch Gen Psychiatry* 38: 381-389.
11. Kessler RC, Ustun TB (2004) The World Mental Health (WMH) survey initiative version of the World Health Organization (WHO) Composite International Diagnostic Interview (CIDI). *Int J Methods Psychiatr Res* 13 :95-121.
12. Ursano RJ, Fullerton CS, Weisaeth L, Raphael B (2007) Individual and community responses to disasters. In: Ursano RJ, Fullerton CS, Weisaeth L, Raphael B, editors. *Textbook of disaster psychiatry*. Cambridge: Cambridge University Press. pp. 3-26.
13. Project Plowshares (2007) *Armed conflicts report*. Available: <http://www.plowshares.org>.

ca/libraries/ACRText/ACR-TitlePageRev.htm. Accessed 29 February 2008.

14. Institute of Medicine (2003) Preparing for the psychological consequences of terrorism: A public health strategy. Available: http://www.nap.edu/catalog.php?record_id=10717. Accessed 29 February 2008.
15. Ursano RJ, Fullerton CS, Weisaeth L, Raphael B (2007a). Public health and disaster mental health: Preparing, responding and recovering. In: Ursano RJ, Fullerton CS, Weisaeth L, Raphael B, editors. Textbook of disaster psychiatry. Cambridge: Cambridge University Press. pp. 311-326.
16. Karam EG, Mneimneh ZN, Dimassi H, Fayyad JA, Karam AN, et al. (2008) Lifetime prevalence of mental disorders in Lebanon: First onset, treatment, and exposure to war. PLoS Med 5: e61. doi:10.1371/journal.pmed.0050061
17. Kessler RC, Angermeyer M, Anthony JC, de Graaf R, Demyttenaere K, et al. (2007) Lifetime prevalence and age-of-onset distributions of mental disorders in the World Health Organization's World Mental Health Survey Initiative World Psychiatry 6: 168-176.
18. World Health Organization Report (2001) Global health atlas. Available: <http://www.who.int/globalatlas/DataQuery/default.asp>. Accessed 29 February 2008.

