

Mental Health Effects of the Gulf Oil Spill

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From multiple perspectives, the current mental health concerns in the Gulf communities began significantly earlier than the Deepwater Horizon oil spill, when Hurricane Katrina hit much of the area now affected by the oil blowout. The major impact of Hurricane Katrina on mental health reflected the enormity of the devastation, including destruction of the infrastructure resulting in a dramatic and tragic loss of an entire system of care: hospitals, clinics, doctors, nurses, and therapists among others. During the past five years, only a partial recovery has occurred; many people have persistent mental health symptoms, and others find that old symptoms are easily reawakened.

After Hurricane Katrina, Kessler and colleagues demonstrated an increase in frequency and severity of mental health symptoms¹ along with a concomitant decrease in utilization of services and prescribed medications.² The Centers for Disease Control and Prevention (CDC) household needs assessment revealed that half of adults residing in New Orleans after the hurricane experienced psychological distress.³ Surveys of first responders by Louisiana State University Health Sciences Center (LSUHSC) from 2006-2009 found persistently elevated symptoms of posttraumatic stress disorder (PTSD) and depression, along with increased use of alcohol and rising levels of partner conflict.⁴ LSUHSC also performed over 25 000 assessments on students between 2005 and 2010 returning to New Orleans, St Bernard, and Plaquemines Parish schools.⁵ While the prevalence declined from 45% in 2005-2006 to 30% in 2006-2007, it has remained at that rate since. This persistently high level of distress has been attributed in part to the evacuation in 2008 for Hurricane Gustav; the economy; personal, family, and community complexities; and the persistent challenges of recovery from Katrina. Complex or repeated traumatic experiences, such as those occurring prior to and resulting from Hurricane Katrina, can lead to increased vulnerability. The Center of the Developing Child at Harvard describes such traumatic experiences as “toxic trauma” (<http://developingchild.harvard.edu>).

MENTAL HEALTH SEQUELAE OF PREVIOUS OIL SPILLS

Natural disasters like Katrina are not unique in traumatizing affected communities. In a community survey 1 year after the 1989 *Exxon Valdez* oil spill, Palinkas et al found a 2- to 3-fold increase in rates of anxiety disorder, posttraumatic stress disorder, and depression among residents reporting a high level of exposure to the oil spill and subsequent cleanup efforts.⁶ Exposure was also associated with significantly increased rates of alcohol and substance use, domestic vio-

lence, symptoms of chronic physical conditions, and a significant decline in social relations. Commercial fisherman, Alaska Natives who relied on the region for subsistence activities, cleanup workers, and families and children were particularly vulnerable to these outcomes.⁷ Eight years after the spill, Picou and Arata⁸ reported elevated symptoms of depression, intrusive stress, avoidance, and family conflict in the same population. In a 2009 Minerals Management Service report, Picou et al⁹ described continuing economic losses for fishermen and support businesses, increased social conflict, declines in community cohesiveness and sense of safety, long-term uncertainties, loss of trust in responsible parties, feelings of hopelessness, betrayal, and anger along with an increased prevalence of depression, anxiety, avoidance, posttraumatic stress symptoms, and alcohol and drug abuse. In children, associated declines in school performance were reported.

Similar patterns of increased anxiety and depression were noted in communities near the *Sea Empress* oil spill in Wales in 1996. Oil exposure, per se, was not related to anxiety or depression; rather, the social and economic consequences manifested as concerns about health, financial issues, and perceived environmental risk were related to mental health symptoms.^{10,11} While mental health of the overall population affected by the *Prestige* oil spill off the Galician coast in northwestern Spain in 2002 was similar to that of a comparison population, those with greater levels of exposure were found to be at greater risk for mental health symptoms.^{12,13} In a preliminary white paper published after the *Deepwater Horizon* oil spill, Redlener and Abramson found that almost 20% of parents reported that their children experienced mental health symptoms, either alone or in combination with physical health symptoms, that they attributed to the oil spill.¹⁴

Oil spills also bring with them a unique set of stressors. Unlike natural disasters where recovery can begin in a matter of hours after the events, oil spills persist for an extended period of time—sometimes even decades, as in the case with the *Exxon Valdez* oil spill. The destruction of the ecosystem may last even longer, with significant effects on communities that rely on natural resources for their social, economic, and cultural livelihood.¹⁵ As noted, the effects of the *Deepwater Horizon* disaster are likely to be influenced by the impacted population still recovering from Hurricane Katrina and other recent traumas.¹⁶⁻¹⁸ In the case of *Deepwater Horizon*, there was also significant uncertainty regarding how long the spill would persist, how much oil would reach shore, and how quickly. Susceptibility to mental health effects of disasters may be increased by a variety of factors, including extent of

exposure, female gender, middle age, ethnicity or minority status, pre-existing mental and physical health, and economic and psychosocial resources.¹⁹ One profound impact is the disruption of traditional networks of social support that communities rely upon to cope with traumatic events. Research in the impacted areas also needs to take into account the unique history and potential strengths and vulnerabilities of ethnic and cultural minorities in the population most affected; for example, Vietnamese fishing communities.²⁰⁻²²

METHODOLOGICAL CONCERNS

There have been significant methodological concerns noted related to disaster evaluations in the past. For example, Kessler and colleagues describe methodological challenges in implementing mental health needs assessments following disasters. They have found that prior studies often reveal varying degrees of rigor in their assessments of disaster-related stressors and postdisaster mental health symptoms.²³ Masten and Osofsky²⁴ and Pfefferbaum and North²⁵ raise similar questions related to child and adolescent assessments, with additional concerns related to comparison studies and based on parental reports rather than information obtained directly from children and adolescents. Galea, Maxwell, and Norris²⁶ discuss defining, finding, and sampling populations. Raphael²⁷ expands the concerns in describing difficulties in comparing results of studies related to different measures of exposure and mental health disasters, as well as range of population groups and diversity of research approaches. These lessons are of significance as we examine the long-term effects of the Gulf oil spill and, as importantly, develop future mechanisms for integration of data developed during preparedness, response, and subsequent evaluations in other emergencies. Frequently, predisaster baseline data are not available, measures are not validated, studies are cross-sectional, and postdisaster sampling times miss important contributing variables.

GULF OIL SPILL MENTAL HEALTH NEEDS ASSESSMENTS

While several post-*Deepwater Horizon* mental health assessments are under way, we will focus on two: the efforts of the Department of Health and Human Services (HHS), including the work of CDC, the National Institutes of Health (NIH), and the Substance Abuse and Mental Health Services Administration (SAMHSA); and the Louisiana Department of Social Services, with Louisiana State University Health Sciences Center Department of Psychiatry (LSUHSC).

During the spill itself, CDC provided a Community Assessment for Public Health Emergency Responders within Alabama to assess gulf community health concerns to guide the Federal efforts. The initial results of this assessment provided guidance to the local and state public and behavioral health efforts, as well as the ongoing Federal response. SAMHSA

and the state health departments were instrumental in developing and coordinating funding for behavioral health services. SAMHSA is currently implementing, with CDC, a long-term assessment of the mental health aspects of the *Deepwater Horizon* event across the gulf. Finally, within the NIH, a major long-term assessment of the health of the oil-spill workers has been funded and is under way, and will include assessments of behavioral health.

Currently, in Louisiana, with funding from the Louisiana Department of Social Services, LSUHSC is carrying out the mental health needs assessment of the most affected parishes in the state. The quantitative assessment, developed with consultations from stakeholders, local leaders, and state and national consultants, includes: demographics (including Hurricane Katrina experiences, oil spill experiences, and impact), physical health, mental health, substance abuse, anger and conflict, stressful experiences, quality of life, and impact on children.

In addition, since July, qualitative assessments have included fishermen and other community stakeholders. These assessments indicate that symptoms identified from prior research are already being seen, including suspiciousness and mistrust; the beginnings of dissent within communities; uncertainties about the future; anger, anxiety, symptoms of generalized anxiety disorder; acute stress reactions with early symptoms of posttraumatic stress disorder; increased use of alcohol, drugs, and cigarettes; more impatience and, at times, harsher behavior toward children; and increased fighting and domestic violence. Many worry that symptoms will increase over time—for example, when BP-funded cleanup jobs are terminated, if tourism doesn't return, or if oil industry jobs are lost as a result of the moratorium. Many also describe strengths and the desire to support programs that aid in building individual, family, and community resilience.

SUMMARY

The well causing the *Deepwater Horizon* oil spill has been capped. However, the mental health effects of the oil spill are far from over and are likely to be enduring. Whether they will be similar to those seen after other oil spills, especially the *Exxon Valdez* spill, is not known at this time. Early mental health symptoms being reported are consistent with those reported after the *Exxon Valdez* oil spill. Furthermore, in this event many of those most affected were still recovering from Hurricane Katrina's severe devastation. Stakeholders and local leaders worry that the ill effects will increase substantially over time.

In designing assessments and services, it will be important to be sensitive to the many ethnic and cultural differences between and within communities, direct exposure, economic

impact, and factors that have been supportive or divisive, in other oil spills. It will also be important to be attentive to the interdependence of mental health and medical issues, as well as concerns about possible toxicology effects.

Despite multitudes of oil spill emergencies in the past 30 years, there has been little in the way of effective long-term mental and physical health research (with the notable exceptions listed previously). The efforts highlighted in this editorial are evidence that this omission is being addressed for the *Deepwater Horizon* event. This will yield significant information to guide future events.

In public health emergencies, our major efforts at long-term evaluations typically begin following the emergency response, after the lives have been saved and the crisis mitigated. One lesson we have learned from this tragedy is the importance of designing our evaluations *prospectively* into our immediate response efforts at the local, state, and national levels.¹⁶

Providers from all disciplines need to be attentive to individual and family medical, mental health, substance abuse, and behavioral concerns/symptoms, especially if they have emerged or increased since the oil spill. Resilience building and self-care, too, will be very important on individual, family, and community levels. It should be stressed that, for providers, compassion fatigue and vicarious traumatization, at times referred to as secondary traumatic stress, are continuing concerns.^{15,28,29} For all providers, self-care, time off, and structured support should be built into their work. Much can be learned from the Gulf oil spill that will help those currently affected and will be beneficial in preparing for future oil spills that will undoubtedly occur.

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REFERENCES

1. Kessler RC, Galea S, Gruber MJ, Sampson NA, Ursano RJ, Wessely S. Trends in mental illness and suicidality after Hurricane Katrina. *Mol Psychiatry*. 2008;13(4):374-384.
2. Wang PS, Gruber MJ, Powers RE, et al. Mental health service use among hurricane Katrina survivors in the eight months after the disaster. *Psychiatr Serv*. 2007;58(11):1403-1411.
3. Centers for Disease Control and Prevention. Assessment of health-related needs after Hurricane Katrina and Rita- Orleans and Jefferson Parishes, New Orleans area, Louisiana, October 17-22, 2005. *MMWR Morb Mortal Wkly Rep*. 2006;55:38-41.
4. Osofsky HJ, Osofsky JD, Hansel TC. American Psychiatric Association Presentation May 24, 2010.
5. Kronenberg ME, Hansel TC, Brennan AM, Osofsky HJ, Osofsky JD, Lawrason B. Children of Katrina: lessons learned about postdisaster symptoms and recovery patterns. *Child Dev*. 2010;81(4):1241-1259.
6. Palinkas LA, Petterson JS, Russell J, Downs MA. Community patterns of psychiatric disorders after the Exxon Valdez oil spill. *Am J Psychiatry*. 1993;150(10):1517-1523.
7. Palinkas LA, Downs MA, Petterson JS, Russell J. Social, cultural and psychological impacts of the Exxon Valdez oil spill. *Hum Organ*. 1993;52(1):1-13.
8. Picou S, Formichella C, Marshall B, Arata C. Community Impacts of the Exxon Valdez Oil Spill: A Synthesis and Elaboration of Social Science Research. In: Braund SR, Krause J, eds. *Synthesis: Three Decades of Research on Socioeconomic Effects Related to Offshore Petroleum Development in Coastal Alaska*, MMS OCS study no. 2009-006. Minerals Management Service, Alaska OCS Region, Environmental Studies; Anchorage, Alaska, 2009:279-307.
9. Picou S, Formichella C, Marshall B, Arata C. A Synthesis and Elaboration of Social Science Research. In: *Minerals Management and Service Report 2009*. Community Impacts of the Exxon Valdez Oil Spill; 2009:279-307.
10. Lyons RA, Temple JM, Evans D, Fone DL, Palmer SR. Acute health effects of the Sea Empress oil spill. *J Epidemiol Community Health*. 1999; 53(5):306-310.
11. Gallacher J, Bronstering K, Palmer S, Fone D, Lyons R. Symptomatology attributable to psychological exposure to a chemical incident: a natural experiment. *J Epidemiol Community Health*. 2007;61(6):506-512.
12. Carrasco JM, Lope V, Pérez-Gómez B, et al. Association between health information, use of protective devices and occurrence of acute health problems in the Prestige oil spill clean-up in Asturias and Cantabria (Spain): a cross-sectional study. *BMC Public Health*. 2006;6:1.
13. Sabucedo JM, Arce C, Senra C, Seoane G, Vázquez I. Symptomatic profile and health-related quality of life of persons affected by the Prestige catastrophe. *Disasters*. 2010;34(3):809-820.
14. Redlener I, Abramson D. *Impact on Children and Families of the Deepwater Horizon Oil Spill, Preliminary Findings of the Coastal Population Impact Study*. National Center for Disaster Preparedness, Mailman School of Public Health Columbia University; 2010.
15. Palinkas LA. The Exxon-Valdez oil spill. In: Neria Y, Galea S, Norris F, eds. *Mental Health Consequences of Disasters*. New York: Cambridge University Press; 2009:454-472.
16. Yun K, Lurie N, Hyde PS. Moving mental health into the disaster preparedness spotlight. <http://www.nejm.org/doi/pdf/10.1056/NEJMp1008304>. Published August 11, 2010.
17. Galea S, Tracy M, Norris F, Coffey SF. Financial and social circumstances and the incidence and course of PTSD in Mississippi during the first two years after Hurricane Katrina. *J Trauma Stress*. 2008;21(4):357-368.
18. King FT IV, Steinmann WC. Why current medical management is failing victims of Hurricane Katrina: a review of past successes and failures in postdisaster psychosocial treatment. *South Med J*. 2007;100(10):991-998.
19. Norris FH, Friedman MJ, Watson PJ, Byrne CM, Diaz E, Kaniasty K. 60,000 disaster victims speak: Part I. An empirical review of the empirical literature, 1981-2001. *Psychiatry*. 2002;65(3):207-239.
20. Palinkas LA, Petterson JS, Russell JC, Downs MA. Ethnic differences in symptoms of post-traumatic stress after the Exxon Valdez oil spill. *Prehosp Disaster Med*. 2004;19(1):102-112.

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21. Do MP, Hutchinson PL, Mai KV, Vanlandingham MJ. Disparities in health care among Vietnamese New Orleanians and the impacts of Hurricane Katrina. *Res Sociol Health Care*. 2009;27:301-319.
22. Norris FH, Vanlandingham MJ, Vu L. PTSD in Vietnamese Americans following Hurricane Katrina: prevalence, patterns, and predictors. *J Trauma Stress*. 2009;22(2):91-101.
23. Kessler RC, Keane TM, Ursano RJ, Mokdad A, Zaslavsky AM. Sample and design considerations in post-disaster mental health needs assessment tracking surveys. *Int J Methods Psychiatr Res*. 2008;17(Suppl 2):S6-S20.
24. Masten AS, Osofsky JD. Disasters and their impact on child development: introduction to the special section. *Child Dev*. 2010;81(4):1029-1039.
25. Pfefferbaum B, North CS. Research with children exposed to disasters. *Int J Methods Psychiatr Res*. 2008;17(Suppl 2):S49-S56.
26. Galea S, Maxwell AR, Norris F. Sampling and design challenges in studying the mental health consequences of disasters. *Int J Methods Psychiatr Res*. 2008;17(Suppl 2):S21-S28.
27. Raphael B. The challenges of purpose in the face of chaos: commentary paper by Professor Beverley Raphael. *Int J Methods Psychiatr Res*. 2008;17(Suppl 2):S42-S48.
28. Calderón-Abbo J, Kronenberg M, Many M, Osofsky HJ. Fostering health-care providers' post-traumatic growth in disaster areas: proposed additional core competencies in trauma-impact management. *Am J Med Sci*. 2008;336(2):208-214.
29. Osofsky JD. Vicarious traumatization and the need for self care working with traumatized young children. In: Osofsky JD, ed. *Clinical Work with Traumatized Young Children: helping them regain their futures*. New York: Guilford Press; 2010, in press.