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Broadening the Mandate of the Incident Command System to Address Community Mental and Behavioral Health Effects as Part of the Federal Response to Disasters

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Abstract

Purpose of Review In the United States, the Federal Incident Command System (ICS) directs response to major oil spills. Its initial imperative is to prevent immediate impacts on human health and safety. Subsequently, the ICS primarily turns its attention to environmental concerns, including considering vulnerable ecosystems. There is a growing body of evidence that disasters such as major oil spills lead to adverse psychosocial effects; yet, preventing such effects has not been formally incorporated into ICS disaster mitigation considerations.

Recent Findings Community mental and behavioral effects are increasingly recognized as a significant impact of disasters. Standardized ecosystem analytical frameworks are key to ICS responses to its mandate for environmental protection. Similar frameworks have only begun to be developed for mental and behavioral effects.

Summary Providing the ICS with a formal mandate would likely lead to the prevention of community mental and behavioral effects being more systematically incorporated into ICS disaster responses.

Keywords Disaster response · Incident command system · Mental and behavioral health · Deepwater horizon oil spill · Community health

Introduction

Every disaster is disastrous in its own way [1]. But there are a few common threads. One is the requirement for rapid reaction, including quickly obtaining the information that helps guide effective response. Another is the growing evidence of significant mental and behavioral impacts in affected communities.

Among the very positive advances in the U.S. disaster response has been the development of the incident command system (ICS) [2–5]. This centralized authority has improved clarity and efficiency through providing authority for galvanizing and distributing potential response elements. For many foreseeable disasters, the ICS role in leading the disaster response has been worked out in advance, including assigned leadership roles, functions, and priorities.

Human health and safety has highest priority for the ICS. But the concern is usually limited to the immediate health and safety implications of the disaster, such as explosions and fires, rather than to the less dramatic but potentially long-term mental and behavioral impacts that have been commonly found in oil spills affecting workers and communities [6, 7]. However, it has become increasingly evident that these less dramatic disaster impacts are highly significant and deserve further consideration. I discuss how this could be accomplished through formal inclusion in the ICS decision process.

To make this case, many topics will be touched upon that are considered in far greater depth as part of this Journal's series on Environmental Disasters. Galea et al. have summarized the published findings demonstrating the mental and psychosocial health impacts evident in major disasters, such as hurricanes, terrorist events, and oil spills [8]. Major challenges to performing community-based studies following a disaster will be covered in separate articles by Kwok et al. and by Packenham et al. [9, 10]. Abramson is reviewing the community issues [11]. Mental and behavioral effects in

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response workers, reviewed by Dr. Friedman-Jiminez, will only be lightly touched upon in the present paper, in part because they already receive significant consideration in ICS decision making [12].

The focus will be on the Deepwater Horizon (DWH) oil spill. Evaluation of its aftermath has led to a greatly expanded literature on the community mental and behavioral aspects of disaster response. I will discuss the following:

(1) The role of the incident command system (ICS) in the response to disasters;
(2) Examples of how ICS decisions might affect community mental and behavioral impacts;
(3) The need to further develop and utilize tools that can rapidly provide relevant mental and behavioral health information usable by the IC team for current or future disasters;
(4) The importance of input from the locally affected communities;
(5) The path forward

The Role of the Incident Command System in the Response to Disasters

The incident command system, initially developed to fight forest fires, has evolved in recent years, particularly following the September 11, 2001 terrorist attacks. It is the common approach to manage oil spills and many other types of disasters.

In the case of oil spills, at the federal level, the ICS structure and function have to a large extent been codified by laws and administrative decisions [4, 13]. The Clean Water Act (CWA) mandates EPA to develop Area Contingency Plans to deal with emergency releases of pollutants to water. Following the Exxon Valdez disaster, the CWA was amended by the Oil Pollution Act (OPA) of 1990. OPA establishes the role of the On-Scene Coordinator working through an incident command structure. The act also specifies protecting public health as a key goal. Elements of the Superfund Act can also come into play as part of EPA's response authority. However, due to the great variability in the challenges posed, much is left up to the ICS and corresponding state or local response elements.

The geographic breadth of the DWH oil spill resulted in an organizational structure that included a National Incident Commander, Admiral Thad Allen of the US Coast Guard who was the designated Federal On-Scene Coordinator. He managed the activities of three Incident Command Centers located in Louisiana, Alabama, and Florida, including coordinating the information released to the public.

The advantages of the ICS include better coordination of response elements, particularly when there are multiple overlapping authorities with different priorities and with different organizational or governmental responsibilities. Central to the success of the ICS has been its ability to get agreement on the objectives of the response. It has also helped by standardizing terminology as well as measurement methodology and reporting. Establishing a provisional ICS in advance of a potential disaster provides a nidus around which table top exercises and other advance response planning activities can be developed [13]. Advanced planning promotes development of a community of responsible authorities and experts who are comfortable in working together during the inherently stressful situation of a disaster response, including responding to the likelihood that the unexpected will occur. Planning is not just about mitigation measures but extends to how information is to be gathered and communicated to help guide the response. Having one or more representatives of the relevant scientific community on or closely associated with the IC response team has been suggested [14–16].

EPA has the principal ICS role for oil spills and other significant releases of potentially harmful agents which do not occur off shore. Illustrative of the relative absence of planning for mental and behavioral health and other community health issues is the 2018 updated version of EPA's handbook on Area Contingency Planning. It includes specific planning to take into account regional issues related to endangered species or to historic preservation sites as well as environmentally sensitive or culturally sensitive areas [17••]. The analyses include a detailed Fish and Wildlife and Sensitive Environments Plan, in consultation with the Department of Interior's Fish and Wildlife Service, NOAA, and other pertinent natural resource management agencies and parties. Environmental tradeoffs are considered, as is the use of analytic techniques that are part of Net Environmental Benefit Analysis (NEBA). Although the Handbook also describes EPA's legal authority to consider public health, including the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), the Emergency Planning and Community Right-to-Know Act, and the National Oil and Hazardous Substances Pollution Contingency Plan, it contains no specific planning approaches to identify existing population health issues, or otherwise to consider public health vulnerabilities, such as evacuation routes.

Examples of how IC Information Gathering and Decisions Can Affect Community Health

At first glance, mental and behavioral health might seem far removed from the province of factors affecting Incident Command decisions. However, the ICS decision process can have substantial impact on community mental and behavioral

health, which can be a major impact of a disaster. Decisions as to response approaches do take into account the rapidity of ending the disaster. But after immediate health and safety issues are considered, further discussion of the potential impacts of response alternatives tends to focus on the relative importance and vulnerability of the different ecosystems or historical areas at risk, and on the health and safety of response workers.

Time is of the essence. It seems evident that the lengthier the community impacts of an oil spill, the greater the psychosocial effect. People are out of work longer; concern grows about the future of their families and their communities, social relations are disrupted, and routine planning for family and community events is shadowed by uncertainty. For Louisiana, it is estimated that following the DWH spill, there was a 28% decrease in employment for those involved in the seafood industry, including harvesters, restaurant workers, grocers, etc. [18].

The disaster response effort appropriately focuses on stopping release of the crude oil and lessening its impact on offshore and onshore resources. For example, the decision as to the relative value of administering dispersants through aerial spraying or directly into the subsurface plume was partially dependent on considerations of directions of movement of the oil components in relation to vulnerable ecosystems [19]. These discussions do not necessarily include debating the option that will put the majority of vulnerable community members back to work. During an oil spill, relatively highly paid workers in the oil industry may be less vulnerable to long-term loss of their jobs than lower paid workers in the fisheries industry—particularly as the latter often have multigenerational roots in specific communities and are perhaps less likely to be able to move in search of jobs.

A related example of how the ICS could have decreased behavioral stress factors is the use during the DWH oil spill of a dispersant with a "secret ingredient". The initial frightening accounts of the oil spill included the death of workers, well-publicized disagreements about the extent of crude oil released, and unfulfilled prospects of quick control. ICS discussions about the potential use of unprecedented volumes of an oil dispersant became publicly known through media coverage that raised concern. Subsequent to the selection of Corexit 9500, the dispersant used in the largest volume, the public became further alarmed about the listing on its material safety and data sheet of an "Organic sulfonic acid salt (Proprietary)", i.e., a "secret ingredient". The concern was almost totally unwarranted—but not surprising. The organic sulfonic acid salt turned out to be dioctyl sodium sulfosuccinate, a publicly available product used for a variety of purposes, including as a common laxative. Its chemical identity was known to the EPA and other decision makers, and its potential for adverse effects was considered in the decision process. Further, public exposure was restricted by US rules that limit the release of a dispersant within three miles from the shore. But public trust that the right decision was being made was not fully forthcoming. For example, when one in February 2020 googles "Deepwater Horizon oil spill secret ingredient", the top placement is an article titled "Secret ingredients: corexit oil dispersant are carcinogenic and absorbed through the skin" [20]. In fact, there is no evidence of dispersant carcinogenicity. The second is to a New York Times Greenwire piece that describes how EPA eventually put the information on its web site without telling the company [21]. Unfortunately, in my experience, I found almost no area residents who knew that this information had become available, and none who admitted knowledge about the relatively benign nature of the compound. The third highest google placement is given to the Kid Safe Chemical blog of the Environmental Working Group which is titled "Why are dispersant chemicals secret?" [22]. This is a good question. The competitors of the company producing the dispersant mixture almost certainly knew what was in it. If they did not, it would require a trivial amount of chemical analysis to find out. In hindsight, had the IC considered the possible implications of secrecy on community mental and behavioral health, it seems likely that the company who was selling this unprecedented amount of dispersant, if requested by the IC, would have been fully willing to disclose this component. But, in the absence of formal direction to consider community mental and behavioral health, no one asked. The secrecy issue is reflected in the recommendation of the recent NASEM committee considering dispersant use in oil spills that the presence of an unrevealed proprietary agent be considered in the choice of which dispersant to use [19].

How the public perceives disasters has been a topic of substantial interest among scientists involved in risk assessment, risk communication, and related disciplines. Lack of trust in the information source is a major factor in what is known as the social amplification of risk [23]. Apparent secrecy about a dispersant component inevitably decreased trust and contributed to the public concern about the use of dispersants that continues. Note that for much of the public, the US oil and gas industry starts with the reputation of being overly secret and untrustworthy, as exemplified by concern about secret fracking agents [24]. Further, the DWH oil spill occurred despite oft-repeated assurances from industry and government that off shore oil drilling was safe. The lack of public trust extends well beyond industry sources. Simon-Friedt et al., in a survey of women in Southeastern Louisiana, found that nearly half felt that they lacked information about the disaster. Many had less trust in information provided by officials and scientists than they did friends and family [18].

The lack of formal inclusion of community health in the ICS decision process also may partially account for the lack of enthusiasm shown by the Gulf of Mexico Research Initiative (GOMRI) to fund research on this topic. GOMRI began in 2010 as a $500 million 10-year multi-disciplinary research

program, funded by BP, which thereafter took a hands off approach [25]. Human health was listed as one of its five major areas. A recent review, co-authored by the very respected head of GOMRI, paints a positive picture of the GOMRI effort related to public health by claiming that GOMRI greatly increased the extent of human health research related to oil spills [26]. But the data primarily tell the story of a missed opportunity. Of the 1747 GOMRI-supported publications published or in-press by Fall of 2019, only 44 (2.5%) fit their broad definition of human health [26]. The funding tells the same story, including the almost complete absence of projects directly related to seafood safety or originating in academic health centers. While I personally did not submit a grant proposal, I was among those responding in detail to a request from GOMRI leadership for advice about obtaining health-related research proposals, advice which was not heeded. Toward the end of its 10-year funding period, GOMRI is showing more interest in public health, including adding the term to its masthead and providing productive funding for the single one of its 12 consortia evaluating a human health topic [27, 28••]. But this major research program, which accomplished much on topics such as oceanography, petroleum degradation pathways, and ecology, added relatively little to the critical mass of research or of researchers on the health impacts of the oil spill. It seems likely that more support for mental and behavioral health research would have occurred had the ICS process formally listed community health as among its decision-making considerations.

Other than GOMRI, research following the DWH oil spill very strongly supported and expanded upon previous findings that major disasters are likely to result in community mental and behavioral effects. The National Institute of Environmental Health Sciences (NIEHS) moved rapidly to fund relevant research programs and centers with activities including research into psychosocial effects [29]. Of particular pertinence to future information gathering has been the development of the National Institutes of Health (NIH) Disaster Research Response (DR2) Program, led by NIEHS and the National Library of Medicine [30, 31]. As described below, National Institute for Occupational Safety and Health (NIOSH) was heavily involved, as well as other Centers for Disease Control and Prevention (CDC) components [32].

More recently, the National Academies of Sciences, Engineering and Medicine has established the multidisciplinary 30-year, $500 million, Gulf Research Program. Its decision to support a significant number of activities involving community health and resilience, including mental and behavioral health, is a further validation of the importance of this subject area to disaster response [33].

Further evidence of the importance of the community mental and behavioral health impacts of the DWH oil spill came from the impetus leading to the formation of an unusual organization, the Gulf Region Health Outreach Program (GRHOP) [34]. This $105 million 5-year program was part of the $7.6 billion Medical Benefits Class Action Settlement tort case. It was described as

> "...intended to expand capacity for and access to high quality, sustainable community-based healthcare services, including primary care, behavioral and mental health care, and environmental medicine, in the Gulf Coast." [34, 35]

The major thrust of GRHOP was in support of Federally Qualified Health Centers servicing disadvantaged communities in the four-state areas affected by the spill, particularly by enhancing their strengths in mental and behavioral health and in environmental health. GRHOP was not formally a research program. However, its activities led to well over 50 scientific publications including a special supplement of the Journal of Public Health Management and Practice [34–36, 37••, 38, 39, 40]. These studies included evaluation of the needs of the affected communities and of the approaches used by the mental and behavioral health programs of the four state universities involved in that aspect of GRHOP. Publications also considered the role of environmental health, community resilience, the training of community health workers, and of environmental justice [34, 41, 42••, 43]. Also involved in GRHOP were community-based organizations and the Louisiana Public Health Institute. Particularly pertinent to future disaster response was the linkages achieved within the affected communities of environmental health and mental and behavioral health with resilience [42••].

ICS decisions also can have other health impacts unrelated to community mental and behavioral health. As just two examples, using a dispersant can change the amount of oil droplets reaching the surface and thereby affect the rate of evaporation of benzene and of aromatic hydrocarbons and resultant response worker and community exposure [20]. During the summer in certain areas of the US, the evaporated petroleum hydrocarbons can increase ozone formation in the downwind community which could lead to adverse respiratory effects, particularly in children and senior citizens.

Tools Needed if the ICS Were to Further Consider Community Mental and Behavioral Health in Its Decision Processes

In oil spills and other disasters in which there are significant risks to flora and fauna, attention is appropriately placed on preventing and mitigating ecological effects. A number of relatively well-established methodological frameworks have been developed that foster obtaining the necessary information about ecosystems at risk and their particular vulnerabilities. This information aids in choosing remedies and in

evaluating tradeoffs, and to some extent promotes community involvement in the decision processes. The overall approach to considering environmental tradeoffs began in the 1970s as Net Environmental Benefit Analysis (NEBA) [44, 45].

NEBA contains environmental analyses suitable for considering the tradeoffs among the alternative management options in responding to an oil spill. The approach used in Consensus Ecological Risk Assessment (CERA) is to convene knowledgeable local participants as well as federal, state, and local agency experts to develop a consensus ranking of ecological risks related to response options. By doing so at a non-emergency deliberative workshop, it is hoped that there will be more effective and rapid response during an emergency. As is not uncommon, one of the most challenging parts of these exercises has been to obtain involvement by community representatives in the absence of an immediate threat [46–48]. Another NEBA-related tool is Comparative Risk Assessment which focuses on integrating exposure, susceptibility, and the relative importance of the ecosystem resources at risk [49].

Growing recognition of non-ecological factors in oil spill response has led in recent years to the addition of socioeconomic and cultural factors to NEBA. This extended approach, known as "Spill Impact Mitigation Assessment" (SIMA), provides a qualitative or semi-quantitative assessment of a much wider range of potential oil spill impacts than the ecological effects traditionally considered during response option discussions [50, 51]. As discussed below, although the methodology remains somewhat controversial, further extending SIMA could provide an avenue to incorporating mental and behavioral effects into the ICS discussions.

Health impact assessment (HIA) is a potential tool for measuring the community health effects of a disaster. Its development has attempted to follow the path of the environmental impact assessment (EIA), which was required for major federal projects under the National Environmental Policy Act of 1970. An EIA is now required by many countries and international development organizations, and in some instances includes an HIA [52–54].

Importance of Involving the Affected Community

It is hard to imagine two more disparate geographical contexts within the US than the Exxon Valdez and BP Deepwater Horizon disasters—yet in both settings, community mental health concerns were among the paramount effects A breached tanker on the surface of subarctic waters presents very different technical challenges than a blown out oil well deep in the waters of the semitropical Gulf of Mexico. Similarly, the community challenges for the affected Alaskan communities also differed greatly from those for the affected Gulf communities—and both sets of communities are far from homogenous. Like the technical response to oil spills, there can be no "one size fits all" approach to communities. Careful consideration of the specific socioeconomic and cultural aspects of the affected communities is needed [11, 34, 43, 55, 56]. Similarly, just as the vulnerabilities of local ecosystems to crude oil and its byproducts need to be addressed in response decisions, so too do the vulnerabilities of the different local communities. For example, the local counties affected by the DWH disaster demonstrate poorer health statistics even in comparison with other US counties with similar levels of known determinants of health, such as poverty and education levels [43]. Community members are less likely to have the resources to deal with the health effects of disasters and also suffer from the cumulative impact of multiple recent disasters [28••, 37••, 57••].

Terminology exemplifies how the DWH event was looked at differently by the community than by those directly involved in the technical response. To many in the community, even the use of term "spill" was offensive as it appeared to intentionally minimize the impact. The preferred term was "Deep Water Horizon disaster", and those speaking to community members were well-advised to describe it as such.

The role of communities in planning for and responding to disasters is well recognized nationally and globally [58]. Studies following the DWH spill focused on various aspects of community resilience, including techniques to develop community-based response groups and to improve community interaction with academia [34, 37••, 41, 59–62]. The community role goes beyond merely listening to being involved in the decision process. To maximize such involvement, it is important that planning for disasters involves community members and organizations. For example, FEMA has instituted a community-based approach, Threat and Hazard Identification and Risk Assessment (THIRA) [63].

The Path Forward to Enhanced Consideration of Community Mental and Behavioral Health in the ICS Decision Process

The immediate response period following a disaster is busy and stressful. It is not realistic or appropriate to assume that any major change in the ICS mandate or focus would occur without being carefully evaluated in advance. Acceptance by FEMA would be necessary as would involvement by many of the other federal organizations involved in disaster response, including EPA and NOAA. Government health-based programs active in disaster response would need to be involved. For the Department of Health and Human Services (HHS), a major focal point is the Office of the Assistant Secretary for Preparedness and Response which has a broad range of activities preparing for and responding to public health needs relating to disasters. This includes having responsibility for

Emergency Support Function 8 (Public Health and Medical Services) of the National Response Framework [64]. HHS includes NIEHS as well as CDC components that are increasingly active in disaster response, as well as working with state authorities to beef up local public health infrastructure.

The National Academies of Sciences, Engineering and Medicine (NASEM) through its convening function and its ability to organize multi-disciplinary expert report committees, would perhaps provide an optimal path forward. A formal NASEM committee organized by the Gulf Research Program and the Ocean Studies Board, funded by the relevant federal agencies, would provide the necessary breadth and depth of expertise. Such a committee should be tasked to evaluate whether and how best to incorporate formal recognition of the importance of community mental and behavioral health into ICS decision processes.

The committee would need to consider major impediments toward this goal. One is the lack of full standardization and validation of the various techniques used to rapidly assess mental and behavioral function in community members [65, 66]. For example, a relatively recent study used different short-form survey tests as measures for general anxiety, depression, post-traumatic stress disorder, and physical symptoms [57••]. Consideration of whether these short-form approaches should be further standardized and validated is needed to ensure that their findings are sufficiently robust to be used for disaster response decisions.

The difficulties of getting health research into the field are another major impediment to obtaining information useful for ICS decision response. Spurred by recent disasters, much attention has been given to better accomplish pertinent research and data-gathering activities during the active period of responding to an oil spill or similar disaster [15, 16, 17••, 30, 31, 67–69]. NIEHS responded rapidly to the DWH oil spill. Yet, despite intensive efforts, epidemiological study of response workers could not begin until many months later. Among the problems caused by the delay was that it became too late to obtain useful exposure biomarkers, including to benzene, a known human carcinogen that is part of crude oil. Delay in obtaining information from workers about their exposure to dispersants has also heightened concern that recall bias was responsible for the reported association of dispersants with symptoms [19, 70, 71]. Subsequently, attention to health research needs has led to the NIH DR2 Program efforts in developing research-ready protocols, including practices and checklists needed to speed consideration of human research by Institutional Review Boards who must assure compliance with HIPAA and with important ethical considerations [30, 31, 72–75].

Central to providing expertise on mental and behavioral health would be the presence of an expert who works closely with the ICS. This already is occurring for the health and safety of response workers. FEMA specifies that the Incident Command leadership structure include a Safety Officer who is responsible for monitoring cleanup [5]. In the case of oil spills, it is usually a senior NIOSH official who has been trained in the responsibility of advising the Incident Commander on all matters relating to health and safety of emergency responders. An assistant safety officer may also be designated to help with the broad range of public health issues, including behavioral health. For a community issue, such as mental and behavioral health, familiarity with local resources is valuable as is knowledge about local issues related to risk perception.

The FEMA IC organizational chart does include "Senior Advisors" [5]. Accordingly, there is the opportunity to either broaden the described duties of the Safety Officer to include community mental and behavioral health or to require that when there is the potential for significant community impact, there should be a specified Community Health Officer.

Importantly, the most recent FEMA ICS document contains language specific to "mental health services", as follows:

> "a Medical Advisor may be designated and assigned directly to the Command Staff to provide advice and recommendations to the Incident Commander in the context of incidents involving medical and **mental health services**, mass casualty, acute care, vector control, epidemiology, and/or mass prophylaxis considerations, particularly in the response to a bioterrorism event." (my emphasis [5].

While this reflects FEMA's recognition of mental health as an endpoint of concern, the provision of services is not the major thrust of this paper. Instead, the focus is on primary prevention, in much the same way that the Safety Officer is directly involved in preventing acute health effects to workers or community—such as result from fires or explosions. In fact, the Safety Officer has the option to "Exercise emergency authority to stop and prevent unsafe acts" [5].

Another potential route toward systematically incorporating community psychosocial impacts into disaster response is through its routine addition to evaluation. A major step forward in disaster response evaluation has been the recent publication: "Disaster Evaluation Research, a Field Guide" [76]. Ricci and his colleagues provide a systematic methodology for evaluating disaster responses. Notable, however, is that there is almost no mention of mental health issues in their otherwise extensive coverage of disaster management. Using logic models and other public health evaluation methods, such as enterprise evaluation, to evaluate the effectiveness of disaster response on post-disaster mental and behavioral health could be a major step forward [76, 77].

Training has been an integral result of being associated with the Incident Command system. NIOSH has worked hard

and effectively on the training of emergency responders and in responding to the challenges of worker health and safety during disaster response [78, 79]. NIEHS also has an important worker training component [80]. Another example of training programs being spurred by involvement in the ICS is that of hospital epidemiologists who participate in managing infectious disease outbreaks [81]. If community psychosocial impacts become a more formal part of the ICS response, similar investment in training of mental and behavioral health professionals in disaster response might be expected.

Particularly important to the success of the ICS has been the establishment of a "management by objectives" approach. In essence, what is being advocated is that when a disaster puts communities at risk, the prevention of mental and behavioral effects will be routinely incorporated within the list of objectives.

The ICS currently tends to be a vertical structure suited to a rapid decision process in a fluctuating emergency situation. The potential benefits of using a more horizontal networking approach have been considered [82]. This would include greater involvement of communities and attention to environmental justice issues. Presumably, if adopted, it would facilitate embracing community mental and behavioral health issues, including accepting the recommendation of Palinkas that trained community leaders be part of the ICS [61].

The recent NASEM Dispersants committee report provides further evidence of the current lack of consideration of mental and behavioral health tools in the decision process, as well as providing a target for the future [19]. In a chapter titled "Tools for Decision-Making," no consideration is given to the various psychometric tools used to assess mental and behavioral health and which could conceivably be useful for decision makers. This is not surprising. The NASEM dispersants committee was not tasked or constituted to have the expertise to consider this question. Evidence of heightened recognition of the impact of disasters on community mental and behavioral health would include a similar NASEM committee having the charge and the expertise to include psychometric methods suitable for community evaluation within its chapter on "Tools for Decision-Making".

One approach to consider is to expand NEBA by adding tools to evaluate mental and behavioral health to those that are now routinely used for ecosystem evaluation. Relevant to this broader approach has been the increasing recognition of the close relationship between ecological health and human health [83••, 84••] For example, Sandifer et al. have developed a conceptual model linking ecosystem services and human health primarily through the lens of the Gulf impacts of Hurricane Katrina and the Deepwater Horizon oil spill [84••]. SIMA, which expands on NEBA, might better describe an overall analytical framework toward mitigating oil spills that is more likely be inclusive of mental and behavioral health, and of HIA [50, 51].

A number of frameworks have been developed to consider the mental health impact of oil spills and other disasters [85–87]. Palinkas has developed a three tier approach to the psychological impacts of natural and technological disasters [61, 85]. It distinguishes between direct biopsychosocial impacts in tier I, intrapersonal impacts in tier II, and the intrapersonal or behavioral impacts that are its further consequences in tier III. In essence, the proposal in this paper is for a tier 0 which places responsibility for primary prevention of mental and behavioral health impacts on the initial approach to disaster response, including planning and training efforts.

The path forward toward heightening the inclusion of mental and behavioral health would also require the health community to become more familiar with the workings of the ICS. For example, review of a 183 page summary report of a June, 2010 Institute of Medicine Workshop considering the then ongoing DWH spill, suggests that the ICS was not discussed [88].

Conclusions

Health prevention activities in the immediate aftermath of a disaster focus primarily on acute threats to human health and safety, such as fire, explosions, electrocution, collapse of infrastructure, drowning, and worker safety. Much also has been done to prepare for and improve emergency management of casualties. But less attention is paid by the incident command system (ICS) to other less acute health impacts which could be mitigated by their decisions.

Studies following the DWH oil spill have added to a growing literature on the significant impact of disasters on mental and behavioral health. It is proposed that the language directing the activities of the ICS should be altered to include specific wording addressing attention to the community mental and behavioral health impacts of a disaster. The goal is to have mitigation of these impacts taken into consideration when response decisions are made.

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