

Oil spill clean-up: a trade-off between human health and ecological restoration?



Although the frequency and amount of spills have decreased in the past decade,¹ recent episodes of oil spills have been of an incomparable scale, such as the Gulf oil spill, or have occurred in a populated area with active fishing activities, such as the Hebei Spirit and Prestige oil spills. Too often the responses to disasters have been mainly focused on ecological and financial aspects,² and the consequences of such disasters to health have not received the attention they deserve.

Removal of spilled oil on the coast is mostly done manually, which requires the involvement of a large labour force over an extended period. Although its chemical composition changes over time, residual oil remnants still contain various toxic chemicals. Therefore, the health of the clean-up workers is of major concern.

So far, few studies on oil spills and health have been reported, and most have focused on acute symptoms immediately after exposure to spilled oil. Crude oil contains various toxic chemicals—such as human carcinogens—and long-term health effects, including the development of cancer and degenerative diseases from such exposure, could result in a substantial burden of disease on the exposed population.³

Regarding the effects on mental health, most studies⁴ on previous oil spills have investigated the indirect effects of the accident that damaged the livelihoods of people exposed, but not the direct toxic effects of oil chemicals. To this point, Richard K Kwok and colleagues' study⁵ in *The Lancet Public Health* offers important and novel insights. With data from more than 11 000 individuals from the GuLF STUDY, Kwok and colleagues assessed the psychological impact of the oil spill response and clean-up work from the Deepwater Horizon oil spill. They found that workers involved in the clean-up had a higher prevalence of depression (prevalence ratio 1.56, 95% CI 1.37–1.78) and post-traumatic stress disorder (PTSD; 2.25, 1.71–2.96) than non-workers. These findings suggest that exposure to chemicals in crude oil could affect mental health. A study⁴ on the Hebei Spirit oil spill showed increased symptoms of depression, anxiety, PTSD, and even suicidal ideation associated with proximity to the oil spill site. However, that study used distance from the spilled site to the residential area as a proxy for exposure.

In Kwok and colleagues' study,⁵ the exposure variable was a measurement of total hydrocarbons from the crude oil based on the job exposure matrix, thus advancing our understanding of the potential mechanism of the effect of the oil spill on mental health.

However, whether it is chemical exposure or superimposed socioeconomic factors that affect the mental health of participants is not evident from this report. From a public health perspective, identifying high-risk groups among the exposed population is important, particularly when implementing a post-response health service. The present study⁵ did not examine a possible synergy between experience of stressful clean-up work and total hydrocarbon exposure level on workers' adverse mental health, but rather an independent effect of each factor by mutual adjustment. Likewise, a possible synergistic interaction between the livelihoods that are vulnerable to oil spill damage and total hydrocarbon exposure could provide important information—including for the compensation of people affected by the accident.

Adverse health effects are a major, and too often neglected, consequence of oil spills, which develop from the earliest stages of the accident. Immediate responses are of crucial importance to prevent adverse health effects, including the evacuation of vulnerable populations, provision of adequate protective devices to the workers, and education of the potential health hazards of the oil spill. However, most response systems do not fully account for the toxic exposure to responders. It is essential that human health is set as a priority in the emergency responses for oil spill accidents. Furthermore, as Kwok and colleagues⁵ suggest, post-response health services in addition to a prescreening system should be implemented. Finally, long-term follow-up of the affected population should be done if we are to address the challenges ahead.

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- 1 The International Tanker Owners Pollution Federation Limited. Oil tanker spill statistics 2016. <http://www.itopf.com/knowledge-resources/data-statistics/statistics/> (accessed Oct 9, 2017).
- 2 Fingas M. *Oil Spill Science and Technology*, 2nd edn. Edmonton, AB: Elsevier, 2016.
- 3 Kim YM, Park JH, Choi K, et al. Burden of disease attributable to the Hebei Spirit oil spill in Taaean, Korea. *BMJ Open* 2013; **3**: e003334.
- 4 Choi KH, Lim MH, Ha M, et al. Psychological vulnerability of residents of communities affected by the Hebei Spirit oil spill. *Disaster Med Public Health Prep* 2016; **10**: 51–58.
- 5 Kwok R, McGrath JA, Lowe SR, et al. Mental health indicators associated with oil spill response and clean-up: cross-sectional analysis of the GULF STUDY cohort. *Lancet Public Health* 2017; **2**: e560–67.