



Physical health impacts

Oil spills can impact physical health of responders, volunteers, and nearby residents. The severity of effects depends on the type of oil, the way that people were exposed, and the extent of the exposure.

Different oils contain different mixtures of chemical compounds [1]. Some volatilize quickly, entering the air, where they may be breathed in. Some of the most dangerous compounds are polycyclic aromatic hydrocarbons (PAHs). PAH's range widely in toxicity, some are carcinogenic and mutagenic. They are also persistent and they bioaccumulate in food chains [1, 2]. *In situ* burning of oil can create particular matter that may pose a health risk [1]. Other materials used in response and clean-up, such as dispersants and degreasers/detergents, are also toxic [3]. Many response activities involve potential contact with these materials, including deployment of boom, skimming, shore cleaning, vessel and equipment cleaning, and animal rescue. Both acute and chronic health impacts arise from exposures to oil, clean-up related materials/products, particulates, and diesel fumes [4-9].

There are different pathways of exposure to oil; inhalation, ingestion, or dermal contact. The dose received depends on skill/experience and use of protective equipment [3-7, 12]. Residents nearby spills have been known to quickly go out in their vessels to assess the extent of the spill and begin recovery of oil without using protective equipment, thereby breathing or directly contacting oil [3]. Inter-individual variability in susceptibility is also a likely factor in the severity of effect experienced by different individuals to the same exposure [7].

Acute physical symptoms from exposure to oil, dispersants, and degreasers

- Headache
- Nausea
- Vomiting
- Diarrhea
- Sore eyes
- Runny nose
- Sore throat
- Cough
- Nose bleeds
- Rash
- Blisters
- Shortness of breath
- Dizziness

Acute health effects among cleanup volunteers: *M/V Nakhodka*



The cleanup operation at the coast of Anto, Japan Photo: Yomiuri Shimibun in (2)

On January 2, 1997, the Russian tanker *Nakhodka* ran aground near the shore of Anto, district of Mikuni town, Japan, and spilled more than 1.8 millions of gallons of oil into the Sea of Japan. Since the area was inaccessible to machinery, the cleanup was done by residents and volunteers from other parts of Japan using ladles and buckets. The volunteers faced stormy weather, strong waves and cold weather, which made the cleanup difficult and dangerous. Fortunately, the cold weather made the concentrations of volatile toxic compounds in the air low [5]. However, the workers were exposed directly to petroleum. Oil stuck to faces

and hands, despite almost 100% of the workers wearing gloves. The symptoms tended to be acute and the extent of harm increased with the number of hours a day and the number of days people worked on cleanup activities. During and after the cleanup, workers complained about low back pain and leg pain, headache, sore and teary eyes, jiggling of vision, and sore or scratchy throat, typical symptoms of exposure to volatile organic compounds. For most of the workers, symptoms decreased immediately after stopping the cleanup jobs [5].



Human Dimensions Impacts of Oil Spills

Short term respiratory problems among residents: *M/V Tasman Spirit*

On July 28, 2003, a Greek oil tanker grounded in the channel of the port of Karachi, Pakistan. On August 13, the tanker broke and released over 11 millions of gallons of crude oil, contaminating 8.6 miles of coast [11]. High temperatures, rough seas, and high speed winds made the oil evaporate quickly. Early assessment was that 3.5 millions of gallons of the spill volume evaporated at sea and drifted over the coastal population. The pungent odor was perceptible at a distance of about 1.3 to 2.5 miles from the beach area. The residents near the shore were exposed to high levels of VOCs for at least 15 to 20 days [11]. In the first few days after the spill, heavy fumes caused breathing problems and vomiting among many residents. People complained about irritation of eyes, skin rash, nosebleeds, nausea, fainting, memory loss, and chest pain [10]. Many people expressed concerns regarding the use of dispersant spraying. Authorities set up medical camps to address health problems attributed to hydrocarbon exposure. One of these camps provided treatment for about 250 persons who reported acute ailments [11]. A recent study revealed that Karachi residents exposed to polluted air for periods longer than 15 days showed significant impaired lung functions [12].



Oiled beaches of Karachi, Pakistan. 2003
<http://www.tribuneindia.com/2003/20030817/w3.jpg>

Chronic health effects: *M/V Exxon Valdez*

Chronic physical health effects among residents of Cordova who participated in the clean-up of the *Exxon Valdez* spill have been reported [3, 8]. When acute general effects, such as fatigue, nausea, and headache, do not improve they may be symptoms of chronic disease [5]. Reported effects include chemical sensitivity, ongoing dizziness, central nervous system damage, dermatitis, Leukemia and other blood disease, fetal defects, skin cancer, liver damage, damage to kidneys, chronic respiratory tract irritation and headaches. Lack of systematic exposure assessments and health surveillance have prevented studies of chronic impacts. Claimant settlements with the responsible party have also prevented disclosure of information relevant to understanding these impacts.

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