

OIL SPILLS AND HEALTH DON'T MIX

FACT SHEET



Drilling for oil in the Great Australian Bight remains a real and dangerous possibility, with Norwegian company Equinor planning to commence exploratory drilling in 2020.

While proponents claim the risk to the Bight is small, history demonstrates a concerning frequency of oil spills in Australian waters, with numerous major incidents involving oil tankers reported since the early 20th century and one from a mobile drilling unit in 2009 (Australian Maritime Safety Authority 2018).



Limits of the Great Australian Bight
Cape Otway (Victoria), Cape Wickham (King Island), Stokes Point (King Island), Cape Grim (Tasmania), South West Cape (Tasmania), West Cape Howe (Western Australia).

Any oil spill during exploratory drilling or subsequent oil extraction and transport would be catastrophic for the region. Pollution from an oil spill could extend across the Bight involving the coasts of South Australia, Victoria and the west of Tasmania.

Oil spills pose serious risks to the physical and mental health of people exposed to oil, their families and their communities.

This fact sheet outlines the known health impacts of oil spills according to research performed at a range of sites globally, for example following the Deepwater Horizon incident in the Gulf of Mexico in 2010 in which more than 5 million barrels of oil were spilled (Griffiths 2012).

Various detrimental health impacts have been identified: some are direct effects of exposure to oil, while others are indirect effects caused by damage to the local environment, disruption of communities, and shocks to the economy.

The environmental, economic and health impacts of oil spills are closely related to one another (Reddy 2014). Furthermore, the detrimental and unjust impacts of a spill on the health of communities and the environment can persist for decades (Elliott and Penaloza 2014).

HOW EXPOSURE HARMS HEALTH

Physical effects

People may be exposed to oil via several routes including direct contact, inhalation, or ingestion of contaminated food or water (Rodríguez-Trigo, Zock and Isidro Montes 2007).

Spill effects are not limited to people directly involved in oil clean-up; people living nearby may also be exposed to harmful agents during clean-up activities, such as chemicals used to disperse spilled oil, and gases and particulate matter produced during intentional oil burning (Reddy 2014). Research demonstrates adverse health effects among people living near oil spill sites (Janjua *et al.* 2006; Lyons *et al.* 1999).

Oil contains a range of potentially harmful components including volatile organic compounds (VOCs), polycyclic aromatic compounds, and heavy metals (Rodríguez-Trigo Zock and Isidro Montes 2007; Pérez-Cadahía *et al.* 2006).

Among these are endocrine disruptors (chemicals that can disturb hormone systems) and carcinogens (which cause cancer). For example, benzene (a VOC) is a known carcinogen (World Health Organization: International Agency for Research on Cancer 2018), while polycyclic aromatic hydrocarbons include probable carcinogens (National Toxicology Program).

Oil may release hydrogen sulphide gas which is neurotoxic and life-threatening at high concentrations (The National Institute for Occupational Safety and Health 2014; Solomon and Janssen 2010).

Research to date also suggests a risk of genotoxicity (damage to DNA and other genetic material that can cause cells to mutate) and immunotoxicity (damage to the immune system) with exposure to spilled oil (Laffon *et al.* 2016).

Numerous acute health problems have been reported following exposure to oil, including:

- Respiratory problems (e.g. cough, shortness of breath)
- Irritation of the skin, eyes, nose and throat
- Gastrointestinal problems (e.g. abdominal pain, nausea, vomiting)
- Neurological symptoms (e.g. headache, dizziness, fatigue, weakness, memory impairment)
- Abnormal liver and kidney function tests
- Abnormal blood cell counts (Reddy 2014; Rodríguez-Trigo Zock and Isidro Montes 2007; Laffon *et al.* 2016; D'Andrea and Reddy 2014; Cheong *et al.* 2011)

Other health problems may occur due to the demands of oil clean-up activities, for example musculoskeletal injuries and the effects of exposure to extreme weather conditions such as heat or cold (Kwok *et al.* 2017).

Oil can contaminate marine plants and animals, and there is evidence of gradual build up or bioaccumulation of oil compounds and transference into the human food chain. This poses risks to human health, particularly among those who consume fish or shellfish on a regular basis (Aguilera *et al.* 2010), and may negatively impact key local marine industries.

Health effects may persist for years after exposure to oil (D'Andrea and Reddy 2018; Zock *et al.* 2007; Zock *et al.* 2012; Rodríguez-Trigo *et al.* 2010), with the potential development of cancers a particular concern.

Psychological impacts

The effects of oil spills on the psychological wellbeing of individuals and communities are equally concerning, if not more so.

Psychological distress is caused by the environmental, economic, health and social effects of spilled oil, the clean-up process, and spill after-effects such as ongoing disruption of local economic activities (e.g. fisheries, tourism). Multiple generations may be affected by a spill.

Among clean-up workers, their families, and local communities, oil spills have been associated with increased rates of:

- Depression
- Anxiety
- Post-traumatic stress disorders

- Social conflict, substance abuse
- Domestic violence

(Laffon *et al.* 2016; Osofsky H *et al.* 2011; Palinkas 2012; Gill *et al.* 2012; Carrasco *et al.* 2007)

The effects on the mental health of clean-up workers have flow-on effects to their families and communities (Reddy 2014; Rung *et al.* 2015).

Mental health impacts are particularly noted among people suffering the economic consequences of a spill; for example, those working in commercial fisheries whose livelihoods are impacted by oil and the clean-up process (Grattan *et al.* 2011; Picou and Gill 1996).

The greatest effects are felt by low income families and communities, who are more likely to report lost income and/or adverse health outcomes as a result of a spill (Abramson *et al.* 2010).

CHILDREN ARE MOST VULNERABLE

Adverse effects of oil spills on children and adolescents are a particular concern and include both mental and physical health impacts.

Children are more vulnerable to toxins than adults, due to their large body surface area to weight ratio, immature immune and metabolic systems, and rapid growth and development (Landrigan and Goldman 2011).

Following the Deepwater Horizon disaster in the Gulf of Mexico, more than one third of parents reported that their children had, as a consequence of the spill, experienced either:

- physical symptoms (e.g. respiratory symptoms, skin irritation)
- or psychological distress (e.g. feeling sad, nervous or afraid, difficulties sleeping, problems getting along with other children)

(Abramson *et al.* 2010)

Children living or attending school close to a spill site are most likely to be affected, as are those who have experienced previous disaster events (Osofsky, J *et al.* 2016; Ha *et al.* 2013).

After-effects of exposure to toxins in childhood may not be evident for years or even decades (Landrigan and Goldman 2011), a critical point when considering the potentially devastating legacy effect of oil spills.

DOCTORS FOR THE ENVIRONMENT AUSTRALIA CALLS FOR URGENT ACTION TO PREVENT DRILLING IN THE BIGHT

We cannot risk the potential for an oil spill in the Great Australian Bight—Equinor’s proposed drilling (or any other future oil extraction activities) must not go ahead.

Rather, documented impacts of oil spills on human health highlight the urgent need for a rapid, just transition to reliable, safe and sustainable forms of energy (Trevors and Saier 2010).

Independent and stringent regulation of exploration for, and extraction of, oil and other fossil fuels in Australia must be an immediate priority, to protect the health of people and the environment (Shearman and Lyne 2019).

Doctors for the Environment Australia is a voluntary, independent medical group which uses an evidence-based approach to address climate change and other environmental challenges that threaten public health and wellbeing.

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FURTHER READING

This Fact Sheet is one of a series which summarise the salient facts on environmental issues that affect human health which can be found at <https://www.dea.org.au/fact-sheets/>