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Gina Solomon's Blog

Seafood Safety: Lessons Learned from Exxon Valdez

Posted ***August 30, 2010*** in Health and the Environment

Tags: contamination, fda, fishermen, gulfspill, noaa, oil, oysters, PAHs, seafood, shrimp

After the Exxon Valdez oil spill, the scientific Society of Environmental Toxicology and Chemistry (SETAC: http://www.setac.org/) issued a technical publication, *Evaluating and Communicating Subsistence Seafood Safety in a Cross-Cultural Context: Lessons Learned from The Exxon Valdez Oil Spill*.

Let's look at how many of these "*lessons learned*" from the Exxon Valdez spill have actually been incorporated into the current response to the Gulf oil spill:

Lesson #1: The initial response should include a detailed sampling and analysis plan. The plan should include:

The types and numbers of samples needed;

Sample collection criteria;

Chain of custody procedures;

Quality assurance procedures;

Data time requirements, data reporting format, and extent of data interpretation;

Statistical power;

Criteria for selection of sample stations and collection.

Current situation: The full sampling plan that NOAA and FDA are using to collect seafood samples has still not been made public. The protocol (http://www.herbogeminis.com/IMG/pdf/protocol.pdf) that has been made public does not discuss how many samples are taken, where the samples are being taken, chain of custody procedures, quality assurance procedures, or statistical power.

Lesson #2: Create formal mechanisms for soliciting feedback and evaluating how many people are getting health-safety information and how many people found it adequate.

Current situation: This has not been implemented.

Lesson #3: Designate an existing agency with a clear mandate to address the questions of subsistence food safety and develop an adequate response to people's concern and fears.

Current situation: NOAA, FDA, and EPA, have been working together on the risk assessment, but it has been unclear which agency has the ultimate responsibility and mandate over the risk assessment for seafood safety.

Lesson #4: Identify priority subsistence fishing areas and resources.

Current situation: This information has not been made public.

Lesson #5: If oil is observed during sampling, samples of oil or oil materials should be taken.

Current situation: It is unclear from the seafood safety protocol if NOAA is taking samples of the oil.

The Exxon Valdez oil spill offered an important opportunity to learn how to protect subsistance or frequent fish consumers from health hazards. The SETAC recommendations are not difficult to implement, and these should form part of the basis for the FDA and NOAA response. Instead, it appears that the agencies have not learned history's lessons.

Reference: Field LJ, Fall JA, Nighswander TS, Peacock N, Varanasi U: Evaluating and Communicating Subsistence Seafood Safety in a Cross-Cultural Context: Lessons Learned from the Exxon Valdez Oil Spill. 1999:

Evaluating and Communicating Subsistence Seafood Safety in a Cross-cultural Context: Lessons Learned from the Exxon Valdez Oil Spill

The Exxon Valdez oil spill caused many residents of Prince William Sound, Lower Cook Inlet, and Kodiak Island villages to question whether their traditional subsistence shellfish, fish, and marine mammal resources were contaminated and no longer safe to eat. This book addresses the response to the disaster by Native Alaskans and documents the response to the multidisciplinary issues relating to subsistence food safety, including approaches to risk assessment and risk communication. The contributors to this book share their firsthand experiences in tackling the subsistence seafood-safety issues that arose from the spill and the important lessons learned.

Editor(s): L. Jay Field, James Fall, Thomas Nighswander, Nancy Peacock, Usha Varanasi

978-1-880611-29-6, 338 pp, 1999

Order #: TP00-1

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Oil Spills and Human Health: Lessons from History

Posted ***May 9, 2010*** in Health and the Environment

Tags: gulfspill, headache, health, illness, occupation, oil, rash, respiratory, workerprotection

Oil spill clean-up brings workers and volunteers into close contact with chemicals that are known to be hazardous to human health. As we deal with the oil spill in the Gulf, it helps to brush up on history.

After the Exxon Valdez disaster, the National Institute for Occupational Safety and Health (NIOSH) reported an increase in respiratory symptoms, headaches, throat and eye irritation, rashes and other skin problems among the clean-up workers. More recently, a study of beach clean-up workers and volunteers in Spain after a 2002 oil spill found an increase in DNA damage. The long-term significance of this finding is not yet known. In Alaska, a mental health study of residents one year after the spill found that exposed individuals were more likely to suffer from anxiety, post traumatic stress disorder (PTSD) and depression.

Here's a summary of some of the scientific studies of the health effects to workers, volunteers, and local residents associated with five previous oil spills:

Exxon Valdez (1989)

According to NIOSH there were 1.811 compenstation claims filed by people involved with the spill. Claims were related to cuts, sprains, contusions, respiratory problems, and dermatitis.

599 local residents were surveyed one year after the spill. They found that exposed individuals were 3.6 more likely to have anxiety disorder, 2.9 times more likely to have post-traumatic stress disorder, and 2.1 times more likely to be depressed.

The Braer oil spill (1993)

People living in a 5 kilometer radius 1 to 2 weeks after the oil spill had a high prevalence of headache, throat irritation, dermatitis, and itchy eyes. One week after the accident, 97% of symptoms were resolved. No differences were found in the lung function, blood, or urine tests.

Another study quantified DNA adducts and other genetic abnormalities in local residents after the accident. There was found to be no difference in the control and exposed group.

The Sea Empress oil spill (1996)

There was an association between exposure to the spill and headaches, sore eyes, and sore throats.

Environmental levels of hydrocarbons, suspended particles, and sulfur were below accepted occupational limits. Twenty days after the spill, 282 residents were interviewed about their work with the spill, exposure to fuel oil, and health; urine samples were also taken. Symptoms that were reported included back and leg pain, headache, itchy eyes, and irritated throat. There was a positive correlation between the number and duration of symptoms and the number of days worked on the accident.

The Erika oil spill (1999)

Information was collected from 1.465 people who participated in the cleanup activities. The most common symptoms that were reported were back pain, headache, and dermatitis.

The Prestige oil spill (2002)

A study of paid and volunteer workers in a highly polluted area five days after the accident reported headache, back pain, dizziness, dermatitis, respiratory problems, irritated eyes and throat. This study also investigated genetic toxicity in volunteers, paid beach cleaners, and paid hose operators. There was an increase in DNA damage in all three groups; however, more was observed in the volunteers working on the beaches. The type of DNA damage that was observed can be repaired by the body.

Toxic effects were observed more frequently among workers working more than 20 days in highly polluted areas, performing 3 or more tasks, having skin contact with oil, or eating while in contact with oil.

Throat and respiratory problems were most frequent in seaman and workers who had worked more than 20 days in highly polluted areas.

These studies show that workers and local residents can suffer from health effects after oil spills. The main symptoms are acute headaches, dizziness, skin rashes, irritation of the eyes and throat, and breathing problems. Genetic abnormalities (which are potentially repairable) were also found in some studies but not others. One study reported mental health effects in local residents. These are the health issues we should be watching out for - and protecting against - in the Gulf Coast during the current oil disaster.

The review in this blog comes primarily from a study by Rodriguez-Trigo, et al. Arch Bronconeumology 2007; Vol 43(11): Pages 628-35.

Years After Oil Spill, Report Finds Increase in Respiratory Problems & Cancer Risk in Workers

Posted ***August 23, 2010*** in Health and the Environment

Tags: breathing, chromosomaldamage, gulfspill, inflammation, mutagens, oil, prestigeoilspill, respiratory, workerprotection

In November 2002, the oil tanker *Prestige* broke apart and sank (http://edition.cnn.com/2010/WORLD/europe/05/09/spain.black.tide/index.html), spilling about 20 million gallons of bunker oil off the coast of northern Spain. Workers, many of whom were local fishermen, participated in a massive clean-up effort. The ***Prestige oil spill*** is unique among the 38 supertanker oil spills over the past 50 years -- this is the only oil spill in which workers have been studied long-term for illnesses.

Today, in the Annals of Internal Medicine (http://www.annals.org/), a well-respected Spanish research team has published their latest findings. Their paper is worth reading (http://www.annals.org/content/early/2010/08/23/0003-4819-153-8-201010190-00279.1.full), since it sheds some light on the health effects in oil spill clean-up workers, and may be relevant to the men and women working to clean up the BP Gulf oil spill.

This study, entitled "*Health Changes in Fishermen Two Years After Clean-up of the Prestige Oil Spill*" (abstract (http://www.annals.org/content/early/2010/08/23/0003-4819-153-8-201010190-00279.1.abstract) | full text (http://www.annals.org/content/early/2010/08/23/0003-4819-153-8-201010190-00279.1.full)), evaluated 678 exposed and unexposed fishermen and women. The main findings include:

· Oil-exposed study participants are significantly more likely to have persistent lower respiratory symptoms (such as cough and shortness of breath), and also on average have more than a two-fold higher level of an inflammatory biological marker (8-isoprostane) in their exhaled breath (smokers and asthmatics were not included in this test to avoid confounding the results).

· Oil-exposed non-smoking participants have significantly higher rates of chromosomal abnormalities in their white blood cells, including chromosomal deletions and translocations. This type of chromosomal damage has been associated with increased cancer risk

(http://ehp03.niehs.nih.gov/article/fetchArticle.action?articleURI=info:doi/10.1289/ehp.6925) and has been reported previously in other workers exposed to benzene, which is a constituent of oil.

· The longer workers were involved in oil clean-up activities, the more likely they were to have elevated levels of inflammatory markers in their exhaled breath, respiratory symptoms, and more chromosomal abnormalities in their blood cells.

There are differences between the ***Prestige oil spill*** and the ***BP Gulf oil spill***. First, the Gulf spill is much larger -about 10-times more oil spilled into the Gulf compared with the Spanish oil spill, and fresh oil was continuing to emerge and evaporate (contaminating the air) for months. Second, dispersant chemicals were heavily used in the Gulf (about 2 million gallons), whereas these chemicals were not used in large amounts during the Prestige clean-up. Third, the Gulf spill involved light crude oil whereas the Prestige spill was heavy bunker oil -the ingredients of the two are mostly the same, but the relative proportions of those ingredients differ a lot. Fourth, the Gulf clean-up involved burning oil on the water surface, whereas the Prestige spill did not. Finally, some of the Prestige workers used pressure hoses to clean rocky beaches, potentially creating an oily aerosol in the air, whereas that technique has not been used in the marshes and sandy coastline of the Gulf.

The bottom line is that we can't assume that all the findings of this study will necessarily apply to workers in the Gulf, but the study certainly raises serious concern about long term respiratory and cancer risks to oil spill clean-up workers, and underscores the need to protect workers, provide them with access to medical care, and follow-up their health status in the future. It also adds to a growing body literature identifying the increased risks to fishermen working on oil-spill clean-ups. That's why it is so important that the new Gulf Worker Study (http://www.niehs.nih.gov/about/od/programs/gulfstudy.cfm) that is being launched by the *National Institute of Environmental Health Sciences* (NIEHS) is fully-funded and successful. We need to know if these workers are getting sick.