

Natural Gas & Fracking: An Unsolved Mystery

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It is unclear how much hydraulic fracturing is polluting our air and waterways, and that is what makes this environmental issue so controversial (Thompson, 2012). Hydraulic fracturing, or “fracking,” is the process of extracting natural gas from shale rock formations deep below the earth’s surface. In an effort to wean off petroleum dependency, the government has supported the boom of the natural gas industry. Natural gas is plentiful and “clean,” but because of the unsafe measures taken to retrieve the gas, it also produces a potential danger to the environment.

The reason why the degree of pollution caused by fracking is so unclear is because federal agencies and the natural gas industry are withholding data (Thompson, 2012). In the fracking process, a high precision drill makes a well in the ground. Then a high pressure fluid is sent through the well, to the shale rock formations deep below the ground. This fluid causes the rock to break and create fissures. When this break occurs, natural gas is released (Howarth, Ingraffea, Engelder, 2011). The ingredients for the fracking fluid have not been made public knowledge because the industry has it protected as a “trade secret” (Thompson, 2012). In effect, it works as trademark and copyright laws do. The natural gas industry is a business and is therefore attempting to protect its product. This is an issue because others feel that they have the right to know what chemicals may or may not be harming their health and environment.

John Balbus, a senior advisor on public health at the National Institute of Environmental Health Sciences, in Bethesda, M.D. believes that without knowing what chemicals are being

used, there could be detrimental effects. He explains that specific mixtures can only be used on specific geology, and without knowledge of what they're using and where they're using it, there is no saying what could happen. What *has* been made apparent is that the fluid used for fracking is mainly made up of water and sand (Thompson, 2012). It has been reported that coffee grounds and citric acid have also been used in combination. Though those are benign, the problem is that chemicals such as benzene and toluene have also been used and can cause chronic health issues in certain quantities (Thompson, 2012).

These harmful chemicals have the potential to contaminate the soil, water, and air, which will directly affect human and environmental health. When natural ground water mixes with fracking fluid, it is called, "waste water." The ground water can be contaminated by things such as, brine or radioactive material, which can rise to the surface. This is a major threat to public health because when collections of waste water accumulate, it creates waste water pits. Also a problem, the storage and transportation of these contaminants have the potential to spill, or leak (Thompson, 2012). A case study performed by pharmacologist, Robert Oswald of Cornell's College of Veterinarian Medicine in Ithaca, N.Y., found a relation between mortality and gas-drilling activities. In the study, they monitored the health of cows near and far from sites of water waste. Half of the cows were located surrounding a water waste pit, and the other half of the cows were located far away from the waste water pit. Though the experiment did have other variables, such as different farmers, other toxic non-drilling related materials, and sample size, there were two occasions of cow death in the group located near the pit (Thompson, 2012).

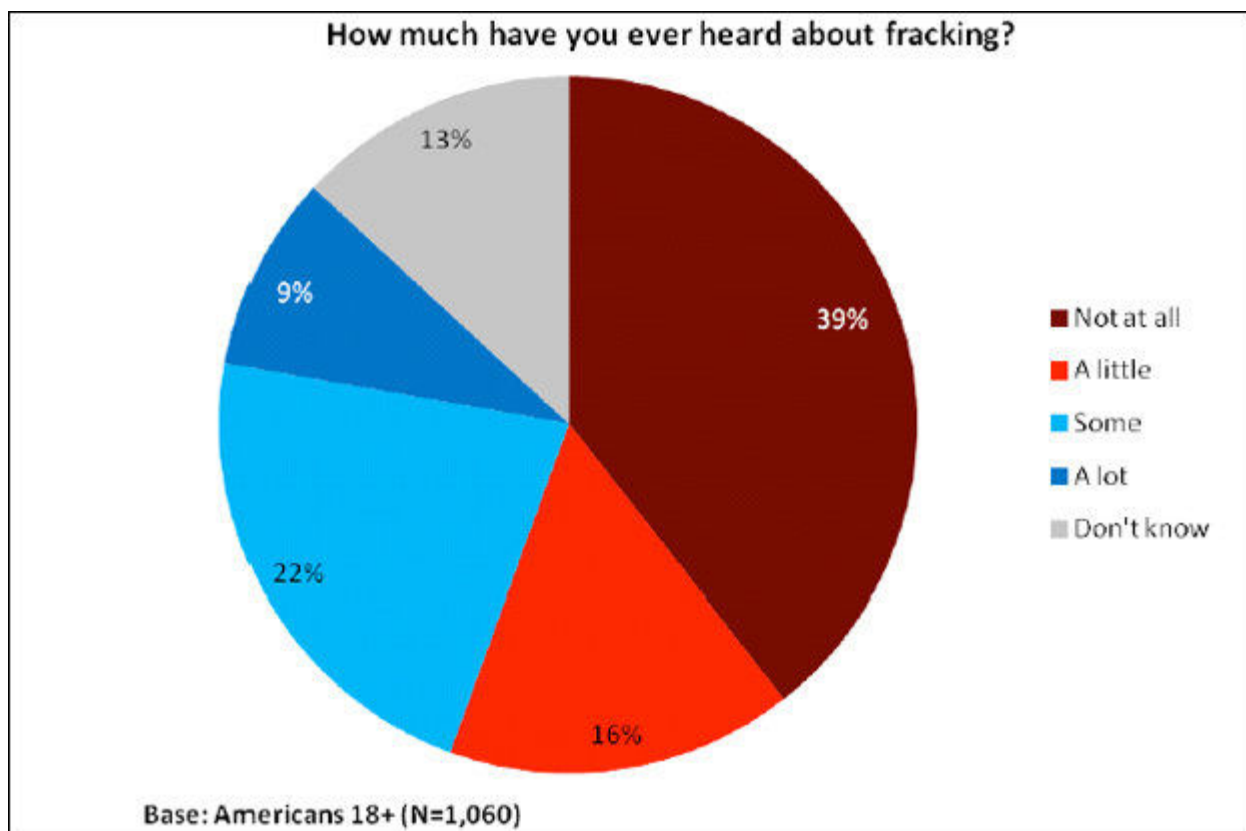
Duke University performed a study in northeastern Pennsylvania, and New York to measure contaminants in drinking & ground water. In these areas they surveyed 68 drinking water wells in correlation to their proximity to fracking wells. The results showed an enormous spike of methane contamination the closer they moved toward the gas wells. However, they did not find any traces of fracking fluid in the water. Flammable levels of methane are frequent in waterways surrounding fracking sites, even in the drinking water. Although there is proof that fracking does contaminate local water with methane, there has not been extensive peer-reviewed research on the long-term effects of methane exposure. John Hanger, of the Department of Environmental Protection does not blame fracking for the methane contamination in waterways. He believes that the cause is from poor gas well construction or design. He sighted proof that in 14/19 repairs to gas wells, they were successfully patched. That being said, he also does not want to rule fracking out as a factor for contamination because of the high pressure it functions in (Holzman, 2011).

The most alarming part of this issue is the lack of data that can be shared and collected. Even the Environmental Protection Agency, EPA, have limited research. Currently the EPA is performing a case study surveying five states that have fracking sites. The study will conduct toxicity tests as well as assessing sites before and after drilling to measure the difference in soil, air, and water content. Additionally, well construction and design will also be studied. Other health systems are stepping forward in order to diagnose health effects related to fracking. Geisinger Health Systems in Pennsylvania is planning to use their electronic health records to map the progression of health along with the boom of fracking in Pennsylvania. The database holds records for the past ten years. With the lack of epidemiological studies, this could be an

asset to public health professionals. Based on EPA monitoring data and the Geisinger database, epidemiologist, Brian Schwartz plans to monitor asthma cases to indicate air pollution changes prior and during the fracking surge. Schwartz's efforts are a great example of, "when life gives you lemons, make lemonade". It is important to utilize whatever resources are available despite how limited they may be. Madelon Finkle, epidemiologist at the Weill Cornell Medical College in N.Y.C., says that the questions revolving hydraulic fracturing are too important to dismiss, and "living in blissful ignorance isn't a solution."

Communities across the country have taken a stand against hydraulic fracturing. The people of Mora County, N.M., feared that the community's best interest was not a concern of the oil and natural gas industries, so they banned fracking completely. The ban was passed after a review of federal and state laws. It was concluded that the people were not adequately protected, and the potential health impact was uncertain. Dryden, N.Y., has also banned fracking (Handley, 2013). Larger areas such as Ohio and federal properties including Indian reservations have passed bills with increased regulations. Companies in these states are mandated to divulge chemicals used in the construction and servicing of the gas wells. The bill also contains a section where doctors can request proprietary information for fracking fluid if they have a patient(s) that has exhibited symptoms of chemical exposure related to fracking. The only stipulation is that the information the doctor receives is to be confidential. Fortunately, this section of the bill was amended so that they doctor *may* share this information if they are bound by ethics to do so (Thompson, 2012). Finally, on an even larger scale, in order to maintain public confidence, the Obama administration proposed to require companies to divulge the formula of chemicals used in the process of fracking (Handley, 2013).

Despite the controversy in affected areas and on Capitol Hill, there are still many people who have missed the drama. A study done by George Mason University's Center for Climate Change Communication surveyed people's awareness of hydraulic fracturing. The results showed that a small 9% of people had heard "a lot" about fracking, 38% had heard "a little" to "some" about fracking, leaving over half of people surveyed having heard nothing about fracking (Handley, 2013).



(Handley, 2013)

The issue seems to be a paradox. Advanced data is being protected by federal agencies and the natural gas industry. This data will not be released unless fracking is proven to be harmful to environmental health, but that cannot be proven without providing scientists,

epidemiologists, and public health workers access to advanced data collection. There are thousands of gas wells, but very few monitoring sites (Handley, 2013). Additionally, companies will not supply their ingredient list for fracking fluid, so even when tests are conducted, things may be overlooked. Several communities have taken a stand and recognize that they cannot allow fracking in their counties without proper research. Those who do not oppose fracking either do not consider the long term risks to be substantial or are unaware of the debate completely. It is my opinion that without government support, big businesses will continue to win. We will become dependent on natural gas, while our safe drinking water depletes. And lastly, the big businesses will eat up our planet's resources till they're dry, and then there will be no trees to make their precious paper money out of.



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(US News, 2014)

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