FRACKING OUR KIDS' FUTURE?

An overview of studies on the impacts of fracking on children

Compiled by Jennifer Weaver, Clean Water for NC

Over the past decade, numerous drilling and fracking operations have been placed close to children's playgrounds and schools, as well as residential areas. Air emissions from drilling, evaporation ponds, condensate tanks and compressor stations have caused neurological, skin and respiratory conditions in adults, and may have other acute and chronic effects on children. As more research reveals the adverse effects of fracking on humans and the environment, we must be especially concerned about children, whose bodies are even more vulnerable to the toxins and stressors associated with fracking. Because the oil and gas industry is exempted from important provisions of the federal Clean Water Act, Safe Drinking Water Act, Clean Air Act, and other laws, oversight of industry-caused exposures and adverse health outcomes has been challenging and sparse.

Air and Water Contamination

ShaleTest Environmental Testing conducted air quality tests near children's play areas located close to fracking sites in North Texas. The tests revealed three different known or suspected carcinogens, including high concentrations of benzene, that exceed Texas air quality standards for long-term health effects, and several other compounds with adverse health effects. Fracking sites in Colorado were found to be emitting toxic methylene chloride and several polycyclic aromatic hydrocarbons at levels above those shown in previous studies to be associated with lowered IQs and developmental delays among exposed children.

A SUNY-Albany study examined published reports on the health effects of chemicals that are often released during drilling and found that chemicals used in fracking can expose children – including prenatally– to a wide variety of contaminants in air and water. According to the authors, these include, "endocrine-disrupting chemicals potentially increasing reproductive problems, breast cancer, abnormal growth and developmental delays, and changes in immune function." The same survey study found that fetal exposure to endocrine disrupters has been linked to childhood cancers.

Most disturbingly, health professionals in Vernal, Utah noted that infant deaths rose to six times above normal in a span of just three years that coincided with the fracking boom. Before the advent of fracking, Vernal had excellent air quality, but now has unacceptable ozone levels. A 2013 white paper released by the Center for Environmental Health examining the harmful health effects of fracking cited studies showing that "Fracking exposes children and mothers to…substances such as methane, BTEX (benzene, toluene, ethyl benzene, and xylenes), arsenic, radium, ozone, formaldehyde, radon, nitrogen oxides, methylene chloride, and silica sand. These substances are associated with low birth weight, birth defects, respiratory problems, cancer, and fertility problems."

After a well has been fracked, 30 to 60 % of the fluids that were injected into the well (including diverse chemical additives) flow back to the surface. This "flowback" often brings up heavy metals and volatile organic compounds that occur naturally in shale. Toxic fluids then must be stored , often in holding tanks (which are not airtight) or open surface pits, or disposed of in injection wells (currently illegal in North Carolina), which have been found to contaminate groundwater and contribute to earthquakes in some cases. According to Dr. Allen J. Dozor, Director of the Children's Environmental Health Center of the Hudson Valley, infants and children are particularly susceptible to organic and metal contaminants in drinking water. "We know from decades of research that metals can have dramatic effects on impairing brain development. Not only is the brain rapidly growing in the fetus and young child, the ability of their bodies to handle exposures to toxicants is immature."

Not only is the brain rapidly growing in the fetus and young child, the ability of their bodies to handle exposures to toxicants is immature."

Birth Defects

A large scale study of 124,842 births in rural Colorado between 1996 and 2009 found a consistent association between the proximity within 10 miles of the birth mothers' residence to oil and gas facilities and well density and the prevalence of congenital heart defects and possibly neural tube defects.

Mental Health Problems Due to Physical and Social Stresses

People living in the Marcellus Shale area in Pennsylvania have experienced numerous stresses attributed to the fracking industry that affect their mental health, including some entirely rational responses: the feeling they're being taken advantage of, worries over their health, and being lied to by the industry and ignored by public officials. Additional stressors associated with the fracking industry are round the clock noise and noxious odors that cause sleeplessness and the disruption of family life and normal activities. Some of these pressures have been so high that people seek to leave their community. High levels of stress can magnify susceptibility to health impacts of pollution, which can begin in utero.

Child Prostitution and Human Trafficking

There are numerous news reports documenting the skyrocketing of prostitution and abductions in the Bakken region of western North Dakota, coinciding with the fracking boom and the large number of "man camps" associated with the industry. A report in the Bismark Tribune documented a low level of misdemeanor prostitution arrests from 2005 – 2010, followed by a steep climb as fracking increased through 2014.

The darkest part of these reports involves young girls abducted into the sex trade. "Seventy percent of the women who have gotten into prostitution [in North Dakota fracking towns] started at the age of 13 to 14, when they were recruited by pimps."

Assistant US Attorney Cyndee Peterson was quoted in an article about human trafficking: "Pimps follow the money, no questions asked. They move their girls around the county going to different locations – wherever the money is. That's why the Bakken is such a huge concern to us, because that's where the money is."

According to 2013 testimony to Congressional Committee by Lisa Brunner of the National Indigenous Women's Resource Center, "There have been documented increases in drug use and human trafficking, theft, alcohol related incidents and assaults within the last year.

This has resulted in 11 young native women ranging from the ages of 16-21 years of age reporting rape, gang rape and other sex acts; the majority of these victims are afraid to report due to fear and shame.....The Fort Peck Tribes SORNA program reports that one year ago there were forty- eight registered sex offenders and now there are over six hundred registered sex offenders."

A "man-camp" in a high density frackng area

Environmental Justice – Impacts on vulnerable communities

Minority children are often disproportionally impacted by oil and gas operations. In California, 353,000 students go to schools located a mile or less from an oil or gas well. "Of those students, 79.6 percent are racial minorities and 60.3 are Latinos. These communities are also frequently lower income, and lack the resources needed to combat the siting of a well or negotiate safer operations, or move to a safer area.

Two examples demonstrate a disparity in outcomes for communities seeking to protect themselves. in Erie, CO, with a 90% white population, median income of $108,058, 90% fluent English

speakers – parents were able to effectively organize and demand that the eight gas wells drilled 1,600 feet from two elementary schools be fracked with a "closed-loop" system (expensive to implement, but fewer toxic emissions), only drill during summer break when there were no children present, and divert truck traffic to avoid dangerous road conditions in front of the schools.

In contrast, the town of Shafter, CA has an elementary school with 3 fracking wells within 400 feet, with no evidence the gas company is using closed-loop, diverting traffic, or fracking outside

f school hours. That community is 82% Hispanic, and the median income for Hispanics in that area is $32,000. Parents of students at the school are complaining that their children have experienced headaches, nausea, and dizziness since fracking began – all symptoms reported by people living close to fracking wells across the country.

The Vast Unknown

As health impacts research struggles to catch up with the drilling of thousands of fracking wells, one of the biggest worries for parents in impacted communities is what we don't yet know. Researchers from the University of Texas found that much more information is needed on the effect of cumulative toxic emissions and children's exposures during critical developmental stages. They note that industry has likely been giving false assurances of the safety of drilling and fracking to the public, as these effects are not yet well-studied. Researchers from the University of Rochester came to similar conclusions after interviews in New York, North Carolina, and Ohio, and stress the importance of "incorporating the input of potentially affected community members" and diverse populations into future health impacts studies.

Sources

American Lung Association. (2013). American Lung Association state of the air 2013. http://www.stateoftheair.org/2013/states/utah/uintah-49047.html

Atkins, Emily. (2014, November 14). Fracking Boom Near Schools With Minority Students. Think Progress. http://thinkprogress.org/climate/2014/11/18/3475882/fracking-near-schools/

Boyce, Dan. (2014, February 1). Booming oil fields may be giving sex trafficking a boost. National Public Radio. http://www.npr.org/2014/02/01/265698046/booming-oil-fields-may-be-giving-sex-trafficking-a-boost

Brunner, Lisa (2013) National Indigenous Women's Resource Center, Congressional Testimony http://www.3generations.org/trafficking/fracking-and-trafficking-in-americas-heartland/

Catskill Mountainkeeper. Gas Drilling and Your Health http://www.catskillmountainkeeper.org/our-programs/fracking/whats-wrong-with-fracking-2/health-impacts/

Center for Environmental Health. (2013, June 14). Toxic & Dirty Secrets: The truth about fracking & your family's health. Retrieved from http://www.marcellusprotest.org/sites/marcellusprotest.org/files/ceh_family_health.pdf

Children's Environmental Health Center of the Hudson Valley. (2010, Oct 5). http://www.childrensenvironment.org/fracking.html

Colborn, T., Schultz, K., Herrick, L., & Kwiatkowski, C. (2014). An exploratory study of air quality near natural gas operations. Human and Ecological Risk Assessment: An International Journal, 20(1), 86-105.

Cooney, C.M. (2011). Stress–pollution interactions: An emerging issue in children's health research. Environ Health Perspect 119, a430-a435. http://dx.doi.org/10.1289/ehp.119-a430

Dalrymple, Amy and Katherine Lymn. (2015, January 24). Trafficking in North Dakota is on the rise, and often the victims can't escape. http://bismarcktribune.com/bakken/trafficking-in-north-dakota-is-on-the-rise-and-often/article_c7f42282-92b7-11e4-819f-5b05c8a62325.html

Ferrar, K.J., Kriesky, J., Christen, C.L., Marshall, L.P., Malone, S.L., Sharma, R.K., Michanowicz. D.R., Goldstein, B.D. (2013). Assessment and longitudinal analysis of health impacts and stressors perceived to result from unconventional shale gas development in the Marcellus Shale region. Int J Occup Environ Health. 19(2),104-112. doi: 10.1179/2049396713Y.0000000024.

Dalrymple, Amy and Katherine Lymn. (2015, January 24). Trafficking in North Dakota is on the rise, and often the victims can't escape. http://bismarcktribune.com/bakken/trafficking-in-north-dakota-is-on-the-rise-and-often/article_c7f42282-92b7-11e4-819f-5b05c8a62325.html

Kidston, Marty. (2014, April 17). Sex Trafficking easy to find in Montana, speakers at UM say. The Missoulian. Retrieved from: http://missoulian.com/news/local/sex-trafficking-easy-to-find-in-montana-speakers-atum/article_20203d8c-c5cd-11e3-bb23-0019bb2963f4.html

Korfmacher, K.S., Gray, K.M., and Haynes, E. (2014, September 15). Health impacts of unconventional natural gas development: A comparative assessment of community information needs in New York, North Carolina, and Ohio. Project Report, UR-UNC-UC Supplement 2012-13. http://www.urmc.rochester.edu/MediaLibraries/URMCMedia/environmental-health-sciences-center/COEC/documents/UNGD-information-needs-asssessment-Final-project-report-091514.pdf

McKenzie, Lisa M, Ruixin Guo, Roxana Z. Witter, David A. Savitz, Lee S. Newman, and John L. Adgate. Birth Outcomes and Maternal Residential Proximity to Natural Gas Development in Rural Colorado. Environmental Health Perspectives, April 2014, 122-4. http://ehp.niehs.nih.gov/1306722/

Rawlins, R. (2013). Planning for fracking on the Barnett shale: Urban air pollution, improving health based regulation, and the role of local governments. Virginia Environmental Law Journal, 31, 226-306. http://www.velj.org/uploads/1/2/7/0/12706894/2._rawlins_-_barnett_shale.pdf

Sample, I. (2014, December 5). Fracking chemicals could pose risks to reproductive health, say researchers. http://www.theguardian.com/environment/2014/dec/05/fracking-chemicals-could-pose-risks-to-reproductive-health-say-researchers

Schlanger, Z. (2014, May 21). In Utah boom town, a spike in infant deaths raises questions. http://www.newsweek.com/2014/05/30/utah-boom-town-spike-infant-deaths-raises-questions-251605.html

ShaleTest Environmental Testing. (2014, September). Project playground: Cleaner air for active kids.http://www.shaletest.org/wpcontent/uploads/2014/09/ProjectPlaygoundPatagoniaReport-5-1.pdf

University of Texas at Austin. (2014, March 27). Air pollution and hydraulic fracturing: Better monitoring, planning and tracking of health effects needed in Texas. Retrieved June 10, 2014, from http://www.utexas.edu/news/2014/03/27/hydraulic-fracturing-texas/

Vandenberg, Laura, Theo Colborn, Tyrone B. Hayes, Jerrold J. Heindel, David R. Jacobs, Jr., Duk-Hee Lee, Toshi Shioda, Ana M. Soto, Frederick S. vom Saal, Wade V. Welshons, R. Thomas Zoeller, and John Peterson Myers. "Hormones and Endocrine-Disrupting Chemicals: Low-Dose Effects and Nonmonotonic Dose Responses". *Endocrine Reviews*, Vol 33-3, March 14, 2012. http://press.endocrine.org/doi/full/10.1210/er.2011-1050.

Webb, E., Bushkin-Bedient, S., Cheng, A., Kassotis, C.D., Balise, V., and Nagel, S.C. (2014). Developmental and reproductive effects of chemicals associated with unconventional oil and natural gas operations. Reviews of Environmental Health 29 (4), 307-318.