

Health Impacts of Fracked Gas Infrastructure

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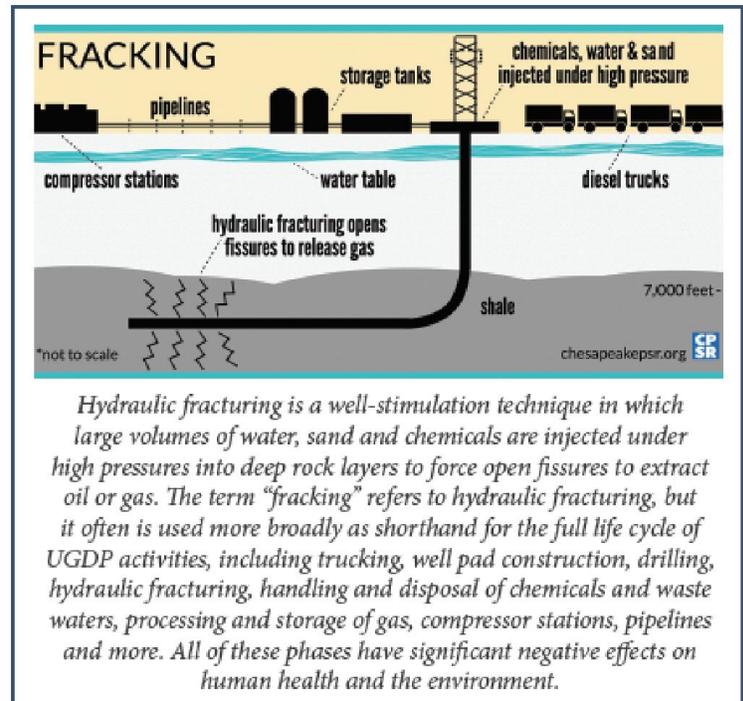
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Rapidly Growing Evidence

Mining, transport and storage of gas and oil have always had the potential for spills, air and water pollution and explosions. A growing body of scientific information suggests that unconventional gas and oil development and production (UGDP), commonly referred to as “fracking,” has its own broad array of negative impacts. In Colorado, the use of hydraulic fracturing has multiplied the number of fields mined and placed them closer to families and neighborhoods. Fracking uses hundreds of chemicals mixed with millions of gallons of water and sand to fracture deep rock formations to allow gas and oil to percolate out. Additional threats include soil and water spills of highly toxic fracking fluids, increased use of precious water, increased air pollution, and release of methane, a greenhouse gas that exacerbates climate change.



Three states, Maryland, New York, and Vermont, have concluded that it is too unsafe for public health to allow fracking in their states. Five countries have enacted bans along with six that call for a moratorium. The peer-reviewed scientific literature now includes more than 700 studies on the impacts of fracking; most were published in just the last three to five years. **Of the studies looking specifically at health impacts, more than 80 percent document risks or actual harms. (Hays, 2015 PlosOne)**¹

Fracking’s Health Impacts

Air Pollution Fracking operations release toxic gases. Among the most dangerous gases are certain volatile organic compounds (VOCs), which are released at every stage of methane gas drilling and transport. VOCs include the BTEX complex (benzene, toluene, ethylbenzene and xylene) which can cause cancer, affect the nervous system, or cause birth defects.² The EPA states that benzene is not safe at any level of exposure.

Besides risks, reports now show direct impacts from epidemiologic studies. The Colorado Department of Public Health and Environment evaluation of air toxics showed an elevated risk of neurologic

problems, eye, nose and throat symptoms and breathing risks when the levels of the multiple air pollutants from oil and gas wells were combined.³ Indeed, in July 2016, researchers at the Johns Hopkins Bloomberg School of Public Health and collaborating institutions analyzed medical records of more than 35,000 asthma patients, ages five to 90 years old, and found a statistically significant association between living close to active fracking operations and **mild to severe asthma exacerbations**.⁴

A study of births between 1996 and 2009 conducted by Dr. Lisa McKenzie and colleagues at the Colorado School of Public Health reported that mothers in rural Colorado who lived within the highest density and proximity of fracked wells were twice as likely to have babies born with neural tube defects and 30% more likely to have babies born with congenital heart defects compared to those with no wells within 10 miles.⁵

A more recent study conducted by researchers at the Colorado School of Public Health found that children and young adults diagnosed with acute lymphocytic leukemia were up to 4.3 times more likely to live in areas with the highest density/proximity of wells as compared to those not living within a 16 kilometer radius.⁶

All of these conditions can be fatal or cause lifelong disabilities.

In 2015, researchers at the University of Pennsylvania and Columbia University reported an increase in **cardiac and neurologic hospitalizations** in two Pennsylvania counties with active fracking operations, compared with a neighboring county where such operations had been banned.⁷

30-40% of front range ozone on bad air days is due to release of VOC's from oil and gas drilling and nitrous oxide from vehicles causing higher rates of asthma, chronic heart and lung disease exacerbations, especially harming those who work or play outside.⁸ Adams, Arapahoe, Boulder, Broomfield, Denver, Douglas and Jefferson counties, along with parts of Larimer and Weld counties have violated EPA ozone standards since they were set in the 1970s under the Clean Air Act.⁹

Likewise this noisy industry with mostly out-of-state workers and significant truck traffic cause community disruption and stress leading to significant health problems like heart disease, sleep disorders and depression.

Water Use, Spills, Fires and Explosions

Fracking Fluid: A typical frack uses 5,000,000 gallons of freshwater. If 2,500 wells are fracked each year, the amount of water could supply the entire city of Aurora annually. (Sierra Club Monograph) Each frack uses about 25,000 gallons of chemicals. A 2011 Congressional report states that between 2005 and 2009, 14 oil and gas service companies used more than 2,500 hydraulic fracturing products containing 750 chemicals and other components. Twenty-nine of those chemicals found in 650 products are known or possible human carcinogens, are regulated under the Safe Drinking Water Act or are listed as hazardous air pollutants under the Clean Air Act including formaldehyde, benzene and lead.¹⁰ Salts and toxic heavy metals, like arsenic and radioactive elements, also contaminate the flowback from deep deposits.

Spills: The Colorado Oil and Gas Conservation Commission requires documentation of all spills but doesn't aggregate the data nor evaluate ways to reduce spills. There are about two self-reported spills per day in Colorado. Of the 509 spills in 2016, 82% were on private land and over half was flowback

water. 32% were within 1500 feet of an occupied building but no distance was reported for 52% of the spills.¹¹ Data from COGCC was analyzed by researchers at the University of CO-Boulder showing that some spills didn't report amounts and less than half occurring in 2014 were "cleaned up" or closed by 2016. Spills from 2008-2011 had 16% that were not closed.¹²



Earthquakes: In Colorado, this very dirty flowback water is injected deep underground because it's too expensive to clean and it's removed from the water cycle at the same time that Colorado needs more water due to climate change. A recent study by researchers at the University of Colorado concluded that these waste water injection wells have caused earthquakes in the Colorado/New Mexico Raton Basin.¹³

Between 2006 and 2015, Colorado experienced at least 116 *reported* oil and gas fires and/or explosions.¹⁴ The actual number is larger as many incidents are unreported—the Colorado Oil and

Gas Conservation Commission (COGCC) requires reporting only in cases which requires medical treatment" or "significant damage to equipment or well site".

Pipelines & Export Facilities: Fracked gas is sometimes cooled to a liquid state for transport and export. Liquefied natural gas (LNG) infrastructure presents unique risks to public health and contributes even more heavily to global climate change. Methane is super cooled to -260°F and 1/600th the volume of regular gas and then transported thousands of miles, both energy-demanding steps that increase the carbon footprint of methane gas by 35-50% over domestic use. LNG terminals degrade local air quality at the terminal and in surrounding communities by contributing diesel emissions, carbon monoxide, nitrogen oxides, sulphur oxides, and polycyclic aromatic hydrocarbons (PAHs). Coastal LNG terminals and LNG pipelines contribute to increased risks of leaks, ruptures, fires, and explosions caused by corrosion, equipment failure, seismic events, tsunamis, and flooding. LNG is not scented, therefore, leaks would not be detected before ignition. Pipeline infrastructure and export facilities often disproportionately impact indigenous communities such as the Klamath Tribes of southern Oregon with the proposed Pacific Connector Pipeline and Jordan Cove export terminal.

Fracked Gas Contributes to Climate Change

Fracking also affects human health through its contribution to climate change. Fracked gas is largely methane, a greenhouse gas 86 times more potent than CO₂ in the 20-year timeframe. (IPCC) Recent studies show that large amounts of methane leak into the atmosphere throughout the lifecycle of gas production. As a result, fracking and burning methane gas for electricity is likely as bad as or worse for climate change than coal or oil especially in the short term.¹⁵

Climate disruption is a public health emergency. It affects human health and safety directly through extreme weather events including heatwaves, spread of infectious disease and exacerbation of underlying illnesses. In Colorado we have seen increases in wildfires, with 25% of the largest wildfires in the past 45 years occurring between 2010 and 2012.¹⁶ Smoke from wildfires increases ozone and particulate matter in the air.¹⁷ It also threatens food production, access to safe, clean water, social stability and global security.

Conclusion: Slowing climate change requires all sectors of society to transition rapidly to clean, renewable energy and to adopt land use practices that help stabilize the climate. Fracking blocks both goals and commits society to additional decades of fossil fuel dependence. We strongly recommend much stronger adherence to the current regulations, stiffer fines and adequate cleanup. Halting of new permits should occur immediately to protect health and safety.

For more information or to take action, join Oregon Physicians for Social Responsibility: www.oregonpsr.org

Information and first graphic was taken from Chesapeake PSR. More in depth information on health and fracking is found in PSR's report: *TOO DIRTY, TOO DANGEROUS*. February 2017
www.psr.org/resources/too-dirty-too-dangerous.html

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