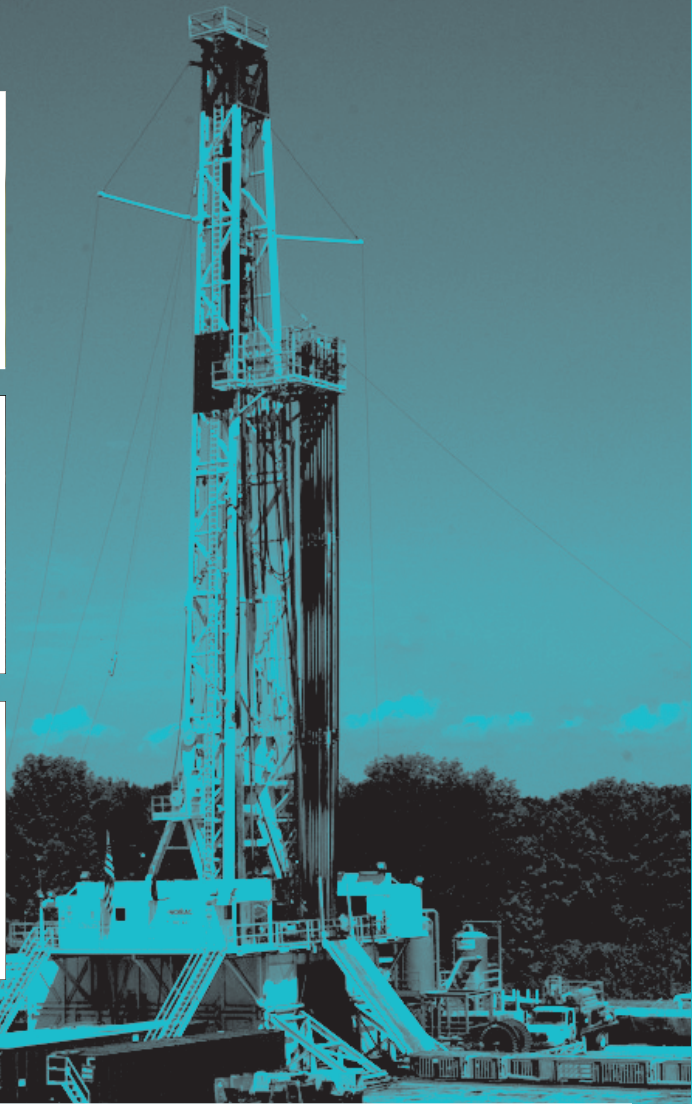


# FRACKING:



# the Health implications

[www.frackfreesussex.co.uk](http://www.frackfreesussex.co.uk)



*“ No long-term study has been done anywhere in the world on the health effects of chronic exposure of human populations to the emissions from gas/oil extraction. Hence, the long-term risk is not known. However, it is known that extended exposure to the radioactive and chemical emissions typically associated with gas/oil operations poses a serious mortality and morbidity risk. The risk to residents living within a few hundred metres of a well pad may be very significant. Of very considerable concern is the potential use of extremely toxic hydrofluoric acid for the extraction of tight-oil in the Sussex Weald. Very few politicians and councilors appreciate the risks involved.”*

**Professor Lawrence Dunne**

# FRACKING: The health implications

## High Volume Hydraulic Fracturing (HVHF)

HVHF or “fracking,” is a natural gas and oil extraction process, which brings the most difficult to access fossil fuel to the surface. The technique combines injecting high volumes of water, chemicals and sand at great pressure with horizontal drilling to get to places not reached previously. Fracking for shale gas extraction creates potentially harmful health effects during the hydraulic fracturing technique itself, and from associated processes; pad clearing, drilling, cementing, flowback waters, off-gassing, compressors, pipelines, road building and transport using many HGVs.

**Among the most serious sources of concern are:**

- **Toxic drilling fluids and fracturing fluids**, injected deep underground and then withdrawn, may contaminate underground aquifers and surface waters, (Even more so in the UK than the US due to our highly fractured geology.)
- **Air emissions including volatile organic compounds (VOCs)** threaten human health, especially of workers and residents in the immediate vicinity.
- **Diesel pollution and noise pollution** can be constant, as HGV traffic is intensive and fracking continues 24-7.
- **Methane leaks** accelerate climate change. Natural gas is primarily composed of methane, and methane is 86 times more potent at capturing heat in the atmosphere than carbon dioxide over its first 20 years in the atmosphere.

*This specific process for obtaining fossil fuels (HVHF) turns the earth inside out. It buries a surface resource – fresh water, which is vital for life – and brings toxic materials to the surface which were originally safely locked away underground...*

**Sandra Steingraber** - acclaimed US biologist, academic and science writer

**Health is defined by the World Health Organisation as the state of complete physical, mental and social well-being and not merely the absence of disease or infirmity. UK Government defines public health as helping people to stay healthy, and protecting them from threats to their health.**

Fracking has been linked to numerous health conditions, including asthma, headaches, high blood pressure, dizziness, nose-bleeds, sore eyes, anemia, neurological illness, pneumonia, premature birth, heart attacks and cancer.

**In the UK indirect health effects are already being felt in communities where there are unwanted fracking applications.** Stress, depression and anxiety affect residents and people in the locality, particularly the vulnerable and the elderly.

In November 2014 Lancashire County Council commissioned a Health Impact Assessment – ‘Potential Health Impacts of the Proposed Shale Gas Exploration Sites in Lancashire’ when determining Cuadrilla’s planning applications.

Dr Sakthi Karunanithi, The Lancashire Director of Public Health concluded that:

“that the key risks to the health and wellbeing of the residents who live near the two proposed sites in Lancashire include:

- **Lack of public trust and confidence, stress and anxiety from uncertainty that could lead to poor mental wellbeing**
- **Noise related health effects due to continuous drilling, and**
- **Issues related to capacity for flowback waste water treatment & disposal”**

“ *There is no evidence that... fracking can operate without risks to human health... Any claims of safety are based on wishful thinking.* ”

Esteemed pediatrician **Jerome Paulson-MD**

## Peer Reviewed Science

**High Volume Hydraulic Fracturing was developed in the USA in 1998. Since 2005 more than 137,000 wells drilled have been drilled there, compared with just one, at Preese Hall in Lancashire, in the UK.**

In October 2015 **Physicians for Social Responsibility**, a Nobel Peace Prize-winning organization of physicians, nurses, and other public health professionals, joined with **Concerned Health Professionals of New York** to produce a publicly available Compendium that identifies emerging trends in peer reviewed studies of HVHF (high volume hydraulic fracturing):

1. Fracking threatens drinking water.
2. Drilling and fracking emissions contribute to toxic air pollution and smog (ground-level ozone) at levels known to have health impacts.
3. Public health problems associated with drilling and fracking, including occupational health and safety problems, are increasingly well documented.
4. Natural gas is a bigger threat to the climate than previously believed.
5. Earthquakes are a consequence of drilling and fracking-related activities in many locations.
6. Fracking infrastructure poses serious potential exposure risks to those living near it.
7. Drilling and fracking activities can bring naturally occurring radioactive materials to the surface.
8. The economic instabilities of fracking further exacerbate public health risks.
9. Growing evidence shows that regulations are simply not capable of preventing harm. (Prof. Richard Davies pointed to gaps in UK regulations in the House of Commons.)

This report was sent with letters to President Obama and the Surgeon General, and various state governors **highlighting the significant health risks and calling for a moratorium on fracking.**

Search  Concerned Health Professionals of New York + fracking

Search  Physicians For Social Responsibility + fracking



## Medact

**Medact** is an independent UK charity that educates, analyses and campaigns for global health on issues related to conflict, poverty and the environment. They aim to mobilise the health community to support policy change and shift public attitudes. In 2015 Medact released a report entitled “**Health & Fracking - The impacts & opportunity costs**”

**Excerpt from the Executive summary:** “Fracking and its associated activities create multiple actual and potential sources of pollution. Leaks of gas can occur across the entire process of extraction, treatment, storage and transportation. There are also emissions from diesel engines, compressors and heavy transport vehicles; as well as the potential release of silica into the air. Oxides of nitrogen, hydrogen sulphide, formaldehyde, benzene, ethylene, toluene, particulate matter and ground-level ozone are among the more significant airborne health hazards. Surface and ground water can also be contaminated by gas, fracking fluid, or wastewater which consists of original fracking fluid combined with a range of new materials generated from underground (including lead, arsenic, chromium, cadmium; and naturally occurring radioactive material).

The health effects of these different hazards vary depending on the type and pattern of human exposure. But they include increased risks of cancer, respiratory disease and birth defects.”

Search 🔍 Medact report on health and fracking

Search 🔍 List of the harmed

“After years of exhaustive research and examination of the science and facts, prohibiting high-volume hydraulic fracturing is the only reasonable alternative. High-volume hydraulic fracturing poses significant adverse impacts to land, air, water, natural resources and potential significant public health impacts that cannot be adequately mitigated. Decision is consistent with Department of Environmental Conservation’s mission to conserve, improve and protect our state’s natural resources, and to enhance the health, safety and welfare of the people of the state.”

**Joe Martens** - Commissioner of the New York State DEC (June 2015)

## Mounting Evidence

**THE LIST OF THE HARMED** is an on-going document compiled by the Pennsylvania Alliance for clean water and air. The ever-growing list of the individuals and families that have been harmed by fracking (or shale gas production) in the USA **now exceeds 21,500 people.**

### USA: EXAMPLE CASE

In April 2014 a Dallas jury awarded the Parr family \$3 million in damages in the first US fracking trial (against Aruba Petroleum) after they experienced an array of health issues that their attorneys argued were the result of dozens of gas wells in the area.



Bob, Lisa and their young daughter, Emma, all noticed the deterioration of their health in the months after fracking operations begin in the immediate area, some time in 2008. Lisa reported breathing difficulties, nausea and headaches, while Bob said he began having about three nosebleeds per week. Young Emma Parr suffered nosebleeds, rashes, nausea and was diagnosed with asthma. The Parr's lawsuit certainly wasn't the first lawsuit brought against an energy company for fracking-related health issues, however most plaintiffs are paid off with **stern gag orders which prevent families discussing their health issues in public.**

*“ We find significant associations between shale gas development and hospitalizations for acute myocardial infarction (AMI), pneumonia, and upper respiratory infections (URI). In particular, we find that county-level hospitalization rates for AMI among young adults (aged 20-44) increased by 24 percent due to shale gas development. ”*

**The Health Implications of Unconventional Natural Gas Development in Pennsylvania. Agricultural and Applied Economics Association, 2016.**

“Fracking for shale gas is an inherently risky activity that generates various health hazards. Some degree of environmental pollution is inevitable. Among the important toxic pollutants are benzene (an example of a ‘non-threshold’ toxin for which there are no actual safe levels of exposure), formaldehyde, heavy metals, NORM, radon and methane” (Medact Report).

Pollutant	What is it?	Health Effect
Methane	Natural gas, can leak out of wells into the air and water, has no odor	When trapped in a house, can cause explosion & asphyxiation.
Hydrogen Sulfide	May be found in natural gas and can leak out during fracking process, has a rotten egg odor at low levels in the air	Low levels= lung irritation - coughing, tears from the eyes, skin irritation, dizziness, headache. High levels= odor goes away, difficulty breathing, unconsciousness, and even death.
Volatile Organic Compounds (VOC's)	Are found in the fluids used for fracking and can leak out during fracking process. These include chemicals such as benzene, ethylbenzene, toluene, & mixed xylenes.	Respiratory issues, eye and skin irritation, nausea, vomiting, dizziness. VOC's can mix with diesel fumes to make ozone (see below).
Particulate matter (PM 2.5)	PM 2.5 are small pieces of pollution in the air that can be found near roads, dusty areas, or in smoke.	When these are breathed in, they can get stuck in the lungs and cause problems. These include asthma, heart disease, chronic obstructive pulmonary disease (COPD), premature death and cancer. It can also increase the chance of premature birth, fetal growth restriction, and infant mortality.
Ground level ozone (smog)	Ozone is made when VOCs mix with nitrogen oxide (a chemical found near fracking operations and in diesel exhaust).	When ozone is breathed in, it can cause problems breathing and worsen asthma and emphysema. Children and pregnant women are at greatest risk for having problems.

In a 2015 study researchers at the **Johns Hopkins Bloomberg School of Public Health (USA)** found that expectant mothers living in the most active fracking areas were 40% more likely to give birth prematurely (less than 37 weeks) and were 30% more likely to have a high-risk pregnancy, a term that accounts for a variety of factors, including excessive weight gain and high blood pressure.

A 2014 study, led by researchers at Yale University, found that **people living in close proximity to a fracked natural gas well are twice as likely to suffer upper-respiratory or skin problems.**



The study (published by Environmental Health Perspectives) surveyed 492 people in 180 households with ground-fed water wells in Washington County, Pennsylvania, which is part of the Marcellus Shale. The authors concluded:

“proximity of natural gas wells may be associated with the prevalence of health symptoms including dermal and respiratory conditions in residents living near natural gas extraction activities. Further study of these associations, including the role of specific air and water exposures, is warranted.”

In April 2016 Environment America - Research and Policy centre produced the report **‘Fracking by the Numbers - The Damage to Our Water, Land and Climate from a Decade of Dirty Drilling.’** The Executive Summary concluded that- “Fracking [has] led to tremendous environmental harm and put the health and safety of communities across the country at risk... To protect the public and our environment, states should take action to ban Fracking.”

The Health and Environment Alliance (HEAL) has called for a **moratorium** on fracking throughout Europe on public health grounds.

Search 🔍 Fracking + Gag Orders

Search 🔍 The Endocrine Disruption Exchange - Natural Gas Operations from a Public Health Perspective

Search 🔍 Fracking + infant mortality + Colorado + Utah

“Keep in mind that both the ravages of climate change and the increasing endocrine related epidemics are intimately connected with the increasing use of fossil fuels and their by-products. By drilling deep into the bowels of the earth for coal, oil and natural gas we have unwittingly and catastrophically altered the chemistry of the bio-sphere and the human womb, and something must be done immediately.”

**Dr. Theo Colborn** - Founder and President of The Endocrine Disruption Exchange and Professor Emeritus of Zoology at the University of Florida

## Conclusion

All together, findings to date from scientific, medical, and journalistic investigations combine to demonstrate that **fracking poses significant threats** to air, water, health, public safety, climate stability, seismic stability, community cohesion, and long-term economic vitality.


Despite this, the current UK Conservative government wants to go ‘All out for shale.’ There are now over 300 community groups around the UK actively opposing the development of an onshore unconventional oil and gas industry at a time when we need to be investing in renewable energy. **We believe the risks to human and animal health, environment and community are far too great.**

Search  [www.frackfreesussex/public-health/](http://www.frackfreesussex/public-health/)

Search  [www.drillordrop.com](http://www.drillordrop.com)

Search  [www.frack-off.org.uk](http://www.frack-off.org.uk)

Search  Gasland - The Movie

Search  Friends of the Earth + Fracking

“ While offering economic and energy security benefits, UG (unconventional gas) production presents considerable environmental risks. These range from potential water and soil contamination from surface leaks or from improperly designed well-casing, to spills of improperly treated water, increased competition for water usage, and fugitive emissions of gas with implications for the global climate... air pollution from volatile contaminants, noise pollution, negative impacts on ecosystems, biodiversity losses and landscape disruption. ”

**UNITED NATIONS GLOBAL ENVIRONMENTAL ALERT - Issued Nov 2012**



“

*The arguments against fracking on public health and ecological grounds are overwhelming. There are clear grounds for adopting the precautionary principle and prohibiting fracking.*

”

**From an open letter to the British Medical Journal supporting the Medact report**

trucks of water for each well

200

# FRACKING

## HYDRAULIC FRACTURING

Fracturing fluid (a mix of water, sand, and chemicals) is pumped into the well

The pressure causes the rock surrounding the pipe to crack

The proppants hold open these cracks to allow the trapped natural gas to escape

Gas flows up the well to be collected

### POTENTIAL RISKS

groundwater contamination  
air quality degradation

WATER  
SAND  
CHEMICALS

**70 to 140 billion**

GALLONS of water used to fracture 35,000 wells in the U.S. each year

equals approximately the ANNUAL WATER CONSUMPTION of 40 to 80 cities with population 50,000

(sand or ceramic beads) **300,000 to 4 million** pounds of proppants used per well

various chemicals make up **0.5% to 2.0%** = **330 TONS** up to total volume of fracturing fluid



**FRACK FREE SUSSEX** - Working to protect the water, air, soil, ecology, homes and public health of Sussex. Raising awareness about the dangers of hydraulic fracturing or 'fracking'. Standing in solidarity with communities all over the world who are opposing unconventional fossil fuel extraction.



[www.frackfreesussex.co.uk](http://www.frackfreesussex.co.uk)