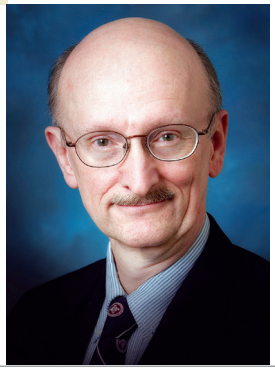

PERSPECTIVES

# Shale Gas (Methane) Extraction and Public Health:

## *Why Doctors Should Be Concerned*

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### INTRODUCTION

In the last few years, more evidence has accumulated about the health dangers of natural gas and fracking. The oil and gas industry annually dumps more than 9 million tons of methane and other pollutants like benzene, a carcinogen, into the air.[1] The U.S. oil and gas industry is this country's largest source of methane.

These pollutants have multiple harmful effects. First, regarding greenhouse gases and climate change, methane is 86 times more potent than carbon dioxide from coal-fired power plants in driving climate change in the first 20 years after it is emitted. Second, many of the toxic air pollutants from oil and gas are linked to increased risks of cancer and respiratory disorders, as well as to other medical conditions. Third, these pollutants contribute to ozone (smog) pollution that is particularly prevalent in warmer months.

Methane and volatile organic compounds (VOCs), vented and leaked from the gas and oil supply chain, as well as nitrogen oxides ($NO_2$) produced by gas flaring and engines, react together with sunlight to form ozone (smog). Methane's effect on global warming also worsens smog levels by causing historically high heat levels and stagnant air. (A recent article in JLGH describes a unique health hazard from global warming.[2])

### SCIENTIFIC STUDIES OF POLLUTANTS AND HEALTH

In Utah, one of America's most productive oil and gas fields emits dangerously high levels of VOCs and ozone.[3] In Colorado, dangerously high airborne levels of benzene from unconventional natural gas (fracking) resources have been documented.[4] And in northern Texas, excessive ambient levels of benzene and carbon disulfide have been measured near gas drilling operations.[5]

In 2014, research demonstrated a statistical association between the density and proximity of natural gas wells within a 10-mile radius of mothers' homes and the incidence of congenital heart defects.[6]

In 2015 an association was proven between the density of gas wells and increased rates of hospitalization for cardiac, neurological, urological, cancer-related, and skin-related problems.[7]

The year 2016 provided three important additions to the evidence of a relation between fracking and health problems. Proximity to natural gas and fracking operations was proven to worsen symptoms of asthma;[8] expectant mothers living in active fracking areas were shown to have an increased risk of premature delivery;[9] and endocrine-disrupting chemicals were documented in surface waters near disposal sites for fracking wastewater in West Virginia. (Such chemicals can have potent effects on human development at exceedingly low concentrations, if they occur during critical developmental windows.[10])

In a study published in 2017, increases in infant mortality averaging 29% were seen in 10 counties in Pennsylvania with fracking operations, while the rest of the state saw a decrease in infant mortality of 2.4%.[11]

Recent data show that 1.5 million Pennsylvanians live within a half-mile of active gas and oil operations. Children are especially vulnerable to air pollution, and over 1,300 schools are located within a half-mile of oil and gas operations. More than 31,000 Pennsylvania children will suffer asthma attacks due to ozone from this industry. Adults are also harmed by ozone exposure, with 67,000 person-days of restricted activity in Pennsylvania linked to breathing higher levels of pollution from this industry.[12]

Penn Environment has reported that methane emissions increased at least 20% between 2014 and 2015. Pennsylvania has become the nation's No. 2 producer of natural gas, and it's now responsible for 1% of *global* greenhouse gas emissions.

In June of this year, a NEJM study of more than 60 million people showed that long-term exposure to even the lowest levels of air pollution (well below EPA standards), is associated with increased mortality.[13] Racial minorities and those with low incomes are particularly vulnerable. The overall mortality rate from pollutants

was computed to be equal to a jumbo jet crashing every 12 days.

Gov. Tom Wolf has pledged to implement measures to control methane emissions from new sources, and require gas wells, pipelines and processing plants to comply.[14] The industry is pushing back, and health professionals are advocating that these prevention measures should be enacted. Please forward your thoughts to the governor and your state senators and state representatives.

On the national scene, the new EPA Administrator Scott Pruitt has proposed delaying a federal air pollution rule for two years, despite acknowledging that children may be harmed disproportionately by the decision. The regulation would apply to about 18,000 oil and gas facilities in 22 states. Please contact the U.S. EPA and your U.S. senators and representatives with your thoughts.

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