

# Hydraulic Fracturing

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The only statement that we can make with certainty to date about the effects of hydraulic fracturing on the public's health is that there are multiple pathways for potential harm, and that none have been researched enough to definitively link the process to specific health impacts.

Researchers have begun to study the air and water pathways to

identify potentially dangerous chemicals released in areas surrounding drilling sites (e.g., Myers 2012; McKensie et al. 2012). When their findings are supplemented with baseline data on the health of nearby residents and on the doses of chemicals ingested from these sources, we can begin to define immediate and long-term effects on humans living and working adjacent to wells.

Another pathway through which potentially greater numbers of residents

may suffer adverse health effects is the socio-economic change experienced in communities where drilling occurs. An established "boomtown" literature analyzing the unexpected, fast economic development in areas where energy

identifies both positive and negative economic impacts on local residents, but particularly significant negative social impacts. (Markussen 1978; Freudenburg 1984; Seyfrit 1988; Perdue, et al 1999).

Linking this literature to recent studies on the relationship between social environmental factors and health impacts (Lantz 2010; Diez Roux 2001; Clougherty and Kubzansky 2009) suggests that the social impacts of shale gas drilling may have a considerable influence on community health.

Spending a few hours in towns in the active Marcellus Shale drilling region of Pennsylvania provides even a casual observer with sights and sounds of undeniable community change. Thousands of diesel-powered trucks carrying water, chemicals, and equipment to and from drilling sites roar through towns and rural landscapes, creating traffic jams and degrading already poor-quality road surfaces.

## Socioeconomic Change and Human Stress Associated with Shale Gas Extraction

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extraction occurs warns that these conditions contribute to psychosocial stress. While "boomtowns" enjoy the job and business activity growth touted as contributors to better well-being, they also face demographic changes, uncertainty, inadequate housing and infrastructure, and substandard social services (Davenport and Davenport 1980). Some research specifically ties increased mental health case loads, crime, divorce, suicide, and alcoholism to this rapid community development (Kohrs 1974). Overall the literature

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Local hotel, temporary industry-built “man camps,” and restaurants are filled with an influx of drilling teams from Texas, Oklahoma, and other points south and west, here only long enough to drill and frac, then move on to another site. A visitor who spends a little more time chatting with social service providers, town leaders, and long-time residents will hear about additional stressors that lie below the surface. Homelessness is on the rise among those who have long struggled near the economic margins, and are now forced from inexpensive housing by landlords seeking higher rents from gas workers. Tensions between the “mailbox millionaires” for whom leasing of mineral rights have created new economic



Heavy truck traffic in Towanda PA as a result of Marcellus Shale natural gas fracking.

opportunities and power, residents without the interest in or resources to lease, and short-term workers behaving recklessly in their time off are often palpable and unwelcome. Locals who once relished their lives in the sparsely-developed, quiet rural areas struggle with the industrial landscape that surrounds them and is beyond their control.

Social scientists have begun to document these sources of community stress. In key informant and survey research they have recorded complaints about traffic, roads and other infrastructure strained by the drilling industry, and concerns about the influx of short-term workers, their impacts on housing and lack of attachment to community. Through health impact assessments and analysis of governmental data, they have verified increases in crime in multiple shale gas drilling regions. Other studies confirm dissatisfaction related to newly-created income inequality in affected communities, emergence of industrial operations in rural landscapes, and distrust of gas industry representatives who promise positive outcomes while

failing to warn of negative impacts (Alter, et al. 2010; Brasier et al. 2011; Blevins et al. 2005; Anderson and Theodori 2009; Theodori 2009; Jacquet 2005 and 2009; Witter et al. 2008).

Research indicates that community members’ attitudes become more strongly negative during the most intense drilling phase of natural gas development (Brasier et al. 2011, Anderson and Theodori 2009). This, in turn suggests that stress and related illnesses might likewise occur at this stage, and so efforts to monitor the social impacts on health should begin early in the shale gas

development process. So far, researchers have not systematically studied the link between social impacts and health conditions. A promising first step in this direction has been taken by Colorado-based researchers. Witter (2012) reported that Colorado residents living within 1000 feet of drilling sites were subjected to noise levels (65-69 dB) that were associated with sleep disturbance, fatigue, cognition and mood changes and stress that has been linked to poor school performance. Other research in planning or initial phases could also incorporate links to social impacts. For example, medical research institutions in Pennsylvania are considering how to use thousands of electronic medical records and geographic shale drilling data to examine the health impacts of Marcellus Shale drilling. They should be encouraged to investigate social change in the patients’ community and potential links to stress-related illnesses. Likewise the longitudinal study of social impacts in four Pennsylvania shale drilling counties initiated by Pennsylvania State University social science researchers could add a health assessment of subjects to explore the

nexus between drilling-induced community change, stress, and health impacts.

None of these promising or possible research agendas should be seen as a substitute for a thorough, well-designed study incorporating both survey research identifying community change and self-reported stress and medical data registering increased stress and its health impacts. This is relatively uncharted territory in public health research. But it may well be the crux of the matter for public health in communities surrounded by shale gas drilling, so it must be addressed carefully and soon.

For more information, please visit <http://www.psr.org/environment-and-health/environmental-health-policy-institute/>

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