

# ENVIRONMENTAL HEALTH PROJECT

DEFENDING PUBLIC HEALTH SINCE 2012

## Mental Health in Communities with Unconventional Oil and Gas Development (UOGD): A Summary for Health Care Providers

“Almost all participants reported that they suffered from health impacts such as fear, anxiety, and stress brought about by the uncertainty related to fracking.”

– Sangaramoorthy, et al., 2016

### INTRODUCTION AND ASSESSMENT OF THE PROBLEM

Clients who live or work in a community with unconventional oil and gas development (UOGD), often called “fracking”, may experience environmental stressors including:

- noise, light, and vibration that accompanies drilling, often lasting days or weeks at a time;
- air or water quality changes;
- uncertainty regarding toxic exposures;
- increased emissions, noise, dust, and travel delays caused by truck traffic; and
- uncertainty over their health and that of their families.

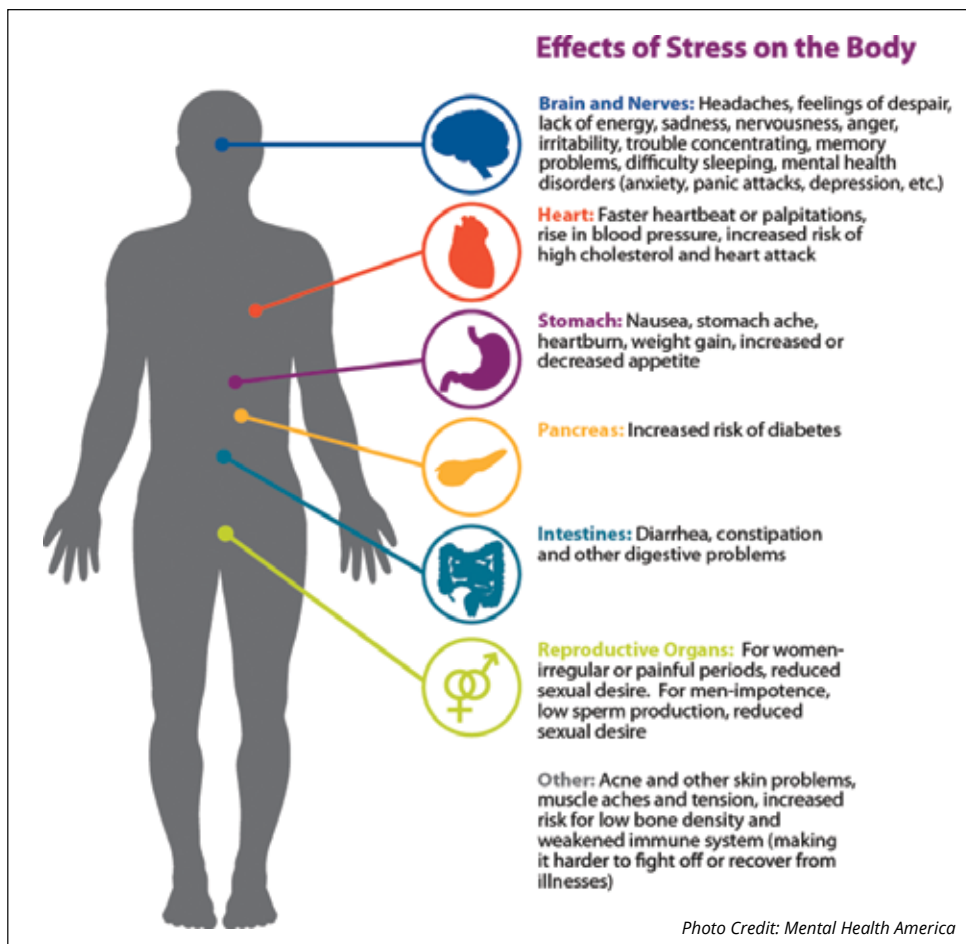
Virtually all EHP clients have reported some level of stress associated with fracking in their communities. We have found that their stress falls in one or more of the following categories:

- **Physical stressors:** environmental pollution (water, air, noise), illness, and fatigue
- **Psychological stressors:** fears, frustration, sadness, anger, anxiety, worry, loss of control
- **Psychosocial stressors:** lack of social support, lack of resources for adequate survival, isolation

Living with prolonged stress may lead to feelings of irritability, anxiety, or depression. In addition, chronic stress can lead to developing or worsening physical health effects, such as high blood pressure and decreased resistance to infections.

### WHAT THE RESEARCH SAYS

This handout summarizes the growing body of literature that contributes to our understanding of the mental health impacts of unconventional oil and gas development (UOGD) activities. More research is needed to fully understand the mental health impacts associated with UOGD.



## SUMMARY OF MENTAL HEALTH RESEARCH

Casey, J.A., Wilcox, H.C., Hirsch, A.G., Pollak, J., & Schwartz, B.S. (2018). Associations of unconventional natural gas development with depression symptoms and disordered sleep in Pennsylvania. *Scientific Reports*, 8, 11375. doi: [10.1038/s41598-018-29747-2](https://doi.org/10.1038/s41598-018-29747-2)

The purpose of this quantitative study was to evaluate the association of unconventional natural gas development (UNGD) with depression symptoms and disordered sleep diagnoses using the Patient Health Questionnaire-8 and electronic health record data from Geisinger adult primary care patients in Pennsylvania. Analyses included 4,762 participants with no, mild, moderate, moderately severe, or severe depression symptoms in 2014–2015. Associations were observed between living closer to more and bigger wells and depression symptom.

Fisher, M.P., Mayer, A., Vollet, K., Hill, E.L., & Haynes, E.N. (2018). Psychosocial implications of unconventional natural gas development: Quality of Life in Ohio's Guernsey and Noble Counties. *Journal of Environmental Psychology*, 55, 90-98. doi: [10.1016/j.jenvp.2017.12.008](https://doi.org/10.1016/j.jenvp.2017.12.008)

This qualitative study examined the quality of life impacts on residents who lived and work amid UNGD. Semi-structured interviews were conducted with 34 residents in Guernsey and Noble counties in Appalachian Eastern Ohio. The authors reported quality of life impacts in five categories – psychological stress, social stress, environment, physical health, and traffic. Psychological stress was a significant theme for residents living near UNGD. Quality of life impacts included in psychological stress are: concern for the future related to UNGD; frustration with interactions with industry officials; stress about noise or light pollution; and the need to leave the region or adapt to changes.

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**Hirsch, J.K., Smalley, K., Selby-Nelson, E.M., Hamel-Lambert, J.M., Rosmann, M.R., Barnes, T.A., Abrahamson, D.J., Meit, S.S., GreyWolf, I., Beckmann, S., & Lafromboise, T. (2017). Psychosocial impact of fracking: A review of the literature on the mental health consequences of hydraulic fracturing. *International Journal of Mental Health and Addiction*, 16, 1-15. doi: [10.1007/s11469-017-9792-5](https://doi.org/10.1007/s11469-017-9792-5)**

Hirsch and colleagues reviewed existing scientific literature to summarize what is known about fracking and psychological function. They reviewed 23 articles published between 2012 and 2017 and concluded that they consistently showed that residents of communities with UNGD experience worry, anxiety, and depression related to a number of factors associated with fracking. These factors included: lifestyle; health; safety; financial security; exposure to neurotoxins; changes to landscape; fear of outsiders; and crime related to the influx of workers.

**Weinberger, B., Greiner, L.H., Walleigh L., & Brown, D. (2017). Health symptoms in residents living near shale gas activity: a retrospective record review from the Environmental Health Project. *Preventive Medicine Reports*, 8, 112-115. doi: [10.1016/j.pmedr.2017.09.002](https://doi.org/10.1016/j.pmedr.2017.09.002)**

This descriptive study was to characterize the health of adults living in southwestern Pennsylvania communities with UNGD. The authors retrospectively reviewed records of 135 structured health assessments conducted between February 2012 and October 2015. The authors report on 51 adults in the sample who lived within 1 km (0.6 miles) of an unconventional natural gas well. Symptoms reported in this sample are consistent with those reported in other self-report studies; 37% reported symptoms of stress/anxiety.

**McDermott-Levy, R., & Garcia, V. (2016). Health concerns of northeastern Pennsylvania residents living in an unconventional oil and gas development county. *Public Health Nursing*, 33(6), 502-510. doi: [10.1111/phn.12265](https://doi.org/10.1111/phn.12265)**

This qualitative study was to describe the health concerns of residents experiencing unconventional oil and gas development (UOGD) in Wyoming County, Pennsylvania. Between July 2014 and May 2015, the authors conducted five

focus groups with 27 residents. Residents' responses reflected two broad themes: changing community and powerlessness. Related to powerlessness, residents expressed stress and anxiety about not knowing what to expect; powerlessness related to community changes, and lack of trust in local policymakers and protective agencies, and concerns about health.

**Sangaramoorthy, T., Jamison, A.M., Boyle M.D., Payne-Sturges, D.C., Sapkota A., Milton, D.K., & Wilson, S.M. (2016). Place-based perceptions of the impacts of fracking along the Marcellus shale. *Social Science & Medicine*, 151, 27-37. doi: [10.1016/j.socscimed.2016.01.002](https://doi.org/10.1016/j.socscimed.2016.01.002)**

Sangaramoorthy et. al. investigated potential health impacts of fracking. In 2013, they conducted two focus groups with residents in Doddridge County, West Virginia, where communities had been impacted by fracking operations. The authors identified that focus group members reported distress over the transformation of the physical and natural environment, which led to conflicted meanings of place and compromised social identities as landowners and West Virginians. These changes negatively impacted residents' sense of belonging and attachment to place. Residents also expressed concern about environmental changes brought about by fracking such as increased traffic, land erosion and mudslides, wastewater, chemical runoff, and changes in air and water quality. Lastly, almost all participants reported that they suffered from health impacts such as fear, anxiety, and stress brought about by the uncertainty related to fracking.

**Steinzor, N., Subra, W., & Sumi, L. (2013). Investigating links between shale gas development and health impacts through a community survey project in Pennsylvania. *New Solution*, 23(1), 55-83. doi: [10.2190/NS.23.1.e](https://doi.org/10.2190/NS.23.1.e)**

This community-based participatory research study described the health symptoms of adults and children living near shale gas operations. Between August 2011 and July 2012, semi-structured interviews were conducted with 108 residents of 14 counties in Pennsylvania. Steinzor and colleagues stated that 37% of residents reported depression and 35% reported severe anxiety. These symptoms were reported more frequently in households closer to the gas facilities than those farther away.

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**Resick L.K., Knestrick J.M., Counts M.M., & Pizzuto L.K. (2013). The meaning of health among mid-Appalachian women within the context of the environment. *Journal of Environmental Studies and Sciences*, 3(3), 290-296. doi: [10.1007/s13412-013-0119-y](https://doi.org/10.1007/s13412-013-0119-y)**

This qualitative study was conducted to understand the meaning of health within the context of the environment among women living in mid-Appalachia. In 2012, 14 women were individually interviewed using open-ended questions to elicit their perspectives about health and the environment. Analysis of the data revealed an overarching theme of a sense of powerlessness over changes in the environment experienced by women living closest to natural gas drilling. This perceived sense of powerlessness influenced the women's experience of health and affected their immediate living space.

**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. *International Journal of Occupational and Environmental Health*, 19(2), 104-112. doi: [10.1179/2049396713Y.0000000024](https://doi.org/10.1179/2049396713Y.0000000024)**

This descriptive study characterized the health impacts in a sample of community residents living near shale gas development. Interviews were conducted in 2010 and again in 2012, with a sample of community members living near Marcellus shale gas development in

Pennsylvania. Study participants attributed 59 unique health impacts, with stress being the most frequently-reported symptom. They identified 13 stressors: among the leading causes of stress reported were feelings of being taken advantage of, having their concerns and complaints ignored, and being denied information or misled by government agencies and industry. Overall, psychological symptoms were reported by 79% of respondents.

**Perry, S.L. (2012). Development, land use, and collective trauma: The Marcellus shale gas boom in rural Pennsylvania. *Culture, Agriculture, Food and Environment*, 34, 81-92. doi: [10.1111/j.2153-9561.2012.01066.x](https://doi.org/10.1111/j.2153-9561.2012.01066.x)**

This qualitative study documented a place and people undergoing rapid transition related to rapid development of UNGD development in a rural Pennsylvania county. The author reported her preliminary findings from two years of ethnographic field work conducted from 2009-2011. Her data suggested significant psychosocial stress associated with Marcellus shale gas development. Perry reported that residents expressed feelings of stress due to changes in their physical environment, community culture, and an increased sense of community conflict. Many residents felt that their sense of place (in terms of home, security, connection to history, and hope for the future) was threatened as the rural community became industrialized.

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