

Human exposures and health effects associated with unconventional oil and gas development

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Development of oil and natural gas from shale and other unconventional geologic formations across the U.S. has expanded rapidly since the early 2000s and its development is projected to continue. The Health Effects Institute (HEI) convened an Energy Research Committee to help ensure the protection of public health during such development. A symposium at the 2018 Society for Risk Analysis (SRA) Annual Meeting will summarize the Committee's review approach and preliminary findings and provide initial options for future research intended to fill knowledge gaps.

Questions remain regarding how well the existing literature characterizes the potential [exposure](#) that residents in close proximity to unconventional oil and gas [development](#) (UOGD) may face as chemical and non-chemical agents are released into the air, water and other environmental media. Judy LaKind, Ph.D., LaKind Associates, LLC, and other members of the Energy Research Committee are reviewing literature to understand potential pathways of exposure. LaKind will present their findings during her presentation, "Potential exposures to unconventional oil and gas operations in the United States: What do we know?"

The Committee sought to determine whether the literature addresses several questions raised by professionals and the public:

1. How might community members be affected by agents of

- exposure and how complete are the identification and understanding of potential exposure pathways?
2. How well have potential exposures been quantified for each pathway of exposure?
 3. Do potential exposures arise from permitted, accidental or unauthorized releases to the environment?

Between 2008 and 2018, at least 15 peer-reviewed publications and gray literature reports assessed the risks to [human health](#) from exposure that were attributed to UOGD operations in Colorado, Ohio, Pennsylvania and Texas. The Committee has been reviewing this literature to determine whether any exposures are a concern for human [health](#) and, if so, under which exposure conditions. Donna Vorhees, Ph.D., Health Effects Institute, has been working with the Committee and will describe the literature in the context of a conceptualized model linking potential sources of UOGD-related exposure to risk in exposed populations during her presentation, "Human health risk assessments of unconventional oil and gas operations in the United States." The model will include sensitive subpopulations and will account for how the physical and chemical properties of UOGD-related chemicals dictate their mobility if released to the environment.

A subsequent presentation by Anna Rosofsky, Ph.D., Health Effects Institute, titled "Potential health effects from unconventional oil and gas development: A systematic review of the epidemiology literature," will summarize the existing body of epidemiology [literature](#) in relation to UOGD. The studies report associations between UOGD and perinatal effects, asthma, cancer, hospitalizations and self-report health symptoms.

George Hornberger, Ph.D., Vanderbilt Institute for Energy and Environment will conclude the symposium session by summarizing the knowledge gaps identified by the Committee. Hornberger's presentation,

"Research priorities for understanding potential population level exposures to unconventional oil and [natural gas](#) development," will put forth describe preliminary research options with the goal of better understanding and preventing or minimizing potential exposures and effects.

These ongoing reviews will be presented during the Potential Exposure and Health Effects Related to the Development of Oil and Natural Gas from Unconventional Resources in the United States symposium on Wednesday, Dec. 5 from 1:30-3:00 p.m. at the 2018 SRA Annual Meeting at the New Orleans Marriott in New Orleans, Louisiana.

Provided by Society for Risk Analysis

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