

## New study reviews needs for research on health effects of fracking

By Eddy Ball

A new paper by a working group of NIEHS grantees echoes prior recommendations for fracking research, but adds a novel twist with a call for community engagement, to frame the development of credible science as a foundation for evidence-based decision-making.

Led by [Trevor Penning, Ph.D.](#),

(<http://www.med.upenn.edu/apps/faculty/index.php/g275/p12620>)

of the University of Pennsylvania (UPenn), the Inter-Environmental Health Sciences Core Center Working Group on Unconventional Natural Gas Drilling Operations issued its recommendations for research on fracking in a commentary published July 18 in the journal *Environmental Health Perspectives*.

### Weighing benefits with potentially adverse health effects

Natural gas is a much cleaner fossil fuel than oil or coal and can be extracted from tight shale formations through unconventional natural gas drilling operations (UNGDO), known as fracking. The review begins with a description of the many potential benefits of the operation. "[UNGDO] creates jobs, provides a potential route to energy independence, and may increase national security," the authors wrote.

However, they also observe that some advocacy groups, such as Physicians for Social Responsibility, have serious environmental health concerns. The authors argue for a precautionary approach, with a moratorium on UNGDO, until the potential health effects of fracking and related activities, such as transportation and silica mining, are better understood.

The authors identified 111 studies, only a handful of which were peer-reviewed environmental health studies. They also considered reports by government, health agencies, nonprofits, and the gas and oil industry.

### Recommendations for research on fracking

According to the authors, their recommendations (see [text box](#)) are similar to those proposed by others, including the Union of Concerned Scientists in its 2013 [report](#),

(<http://www.ucsusa.org/assets/documents/center-for-science-and-democracy/fracking-report-full.pdf>)

with one significant difference. The working group makes a strong case for emphasizing community-based participatory research to inform debate over the potential adverse health effects of fracking.

Referring to the Community First communication model (see [story](#)) developed for a team led by NIEHS grantee [Edward Emmett, M.D.](#),

(<http://www.med.upenn.edu/oem/emmett.shtml>)

the authors argued, "Communities should be engaged in determining the most effective ways to disseminate research findings, and there should be timely and transparent dissemination and access to aggregated data."

Variations on this communication model have become an important part of the NIEHS Partnerships for Environmental Public Health programs and clinical research involving human subjects. NIEHS currently funds a study designed along these lines, which is headed by working group member Erin Haynes, Dr.P.H., of the University of Cincinnati (see [story](#)).

In their conclusion, the authors also called for measures to harmonize study design, data collection, and analytical procedures, as well as reduce the possibility of conflict of interest. "Oversight by a single organization would avoid duplication of effort and unnecessary expenditure of resources," they wrote.

### Formation of the working group

NIEHS provides funding for scientific equipment, facilities, and other resources that are shared among researchers at [EHSCCs](#) affiliated with universities throughout the U.S. tackling related environmental health questions.

"The working group was convened following presentations on the potential of natural gas drilling to adversely affect public health at the 2012 annual Environmental Health Sciences Core Centers meeting at Harvard School of Public Health," Penning said in a press release by Karen Kreeger of UPenn.

Sixteen of the twenty core centers funded by NIEHS joined the working group to review the literature on the potential public health impact of UNGDO and make recommendations for research. As a follow-up to the working group's formation, Penning and colleagues also hosted a symposium on fracking in February of this year (see [story](#)).

**Citation:** [Penning TM, Breyse PN, Gray K, Howarth M, Yan B.](#)

(<http://www.ncbi.nlm.nih.gov/pubmed/25036093>)

2014. Environmental Health Research Recommendations from the Inter-Environmental Health Sciences Core Center Working Group on Unconventional Natural Gas Drilling Operations. *Environ Health Perspect* [doi.org/10.1289/ehp.1408207; online 18 July 2014]



*Penning heads the NIEHS-funded Center of Excellence in Environmental Toxicology at UPenn. EHSCCs conduct the kind of federally funded academic research the study singled out as one trusted model for future directions in studies of fracking. (Photo courtesy of UPenn)*

### Reinforcing earlier recommendations

The Inter-EHSCC Working Group looked at the state of the science in research on water contamination, air pollution studies, design of epidemiological studies, and integrating community perspectives.

As summarized in the UPenn press release, key recommendations include the following:

- Baseline ground water quality data should be taken before drilling begins, and be monitored over the lifetime and abandonment of the gas-producing well.
- Ambient and occupational air quality should be measured at active drilling sites, and be compared with baseline measurements in adjacent areas without drilling operations.
- An environmental epidemiological study should be performed to determine whether an association exists between health outcomes data and water quality in private drinking wells, in communities with and without hydraulic fracturing.
- An environmental epidemiological study should be performed to determine whether air pollution associated with UNGDO increases the incidence of respiratory illness and cardiovascular disease.
- Community-based participatory research principles should be embraced in designing and conducting studies on environmental and health impacts of UNGDO, so that a range of community perspectives is addressed. All stakeholders, including individuals, communities, industry, advocacy groups, and decision-makers, should be engaged early, to foster multidirectional communication and accountability.

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