

September 23, 2014

Clifford S. Mitchell, M.D.  
Director, Environmental Health Bureau  
Maryland Department of Health and Mental Hygiene  
201 W. Preston Street, Room 327  
Baltimore, MD 21201

Comment and Reply to:

**Potential Public Health Impacts of Natural Gas Development and Production in the Marcellus Shale in Western Maryland**

Maryland Institute for Allied Environmental Health, School of Public Health, University of Maryland, College Park

Dear Dr. Mitchell:

**There is a fundamental factual deficiency relating to lung cancer in the report.**

The authors of this letter have extensive experience in lung cancer screening, lung cancer risk assessment and the use of medical and scientific evidence in public safety regulation. We believe the scientific error in the report to be so severe that any reliance on the report without adequate correction of the scientific error would be fundamentally detrimental to the public health in Maryland. We are not describing *nuance* or judgment or opinions on which reasonable people could differ. We are describing straightforward scientific error of the type that would get a textbook recalled.

**Section 9.5.3 Major Causes of Morbidity and Mortality** Subsection 9.5.3.1 lists what purport to be the top three cancers in Allegany and Garrett counties that result in the highest rates of death as *colorectal, breast and prostate cancer*.

This is a clear scientific error. Contrary to the report **lung cancer** is the cancer with the highest death rate in the state of Maryland accounting for 26.7% of all cancer deaths in 2010 and it is especially high in Allegany and Garrett counties. This is clearly referenced in the sources the authors claim that they used and from other readily available public health sources. (See appendix) What is most surprising is that lung cancer is not even mentioned when describing the cancers they evaluated. This is especially perplexing because in Appendix 1, Section 15.5.4, Subsection 15.5.4.1 page 148 *malignant neoplasms of the trachea, bronchus and lung* (C33-C44) are mentioned and those numbers contribute substantially to the combined numbers of deaths from cancer in Allegany and Garrett counties.

Lung cancer is obviously relevant to the public policy debate on natural gas production. . There are many toxins released during the entire cycle of unconventional natural gas development (UNGD) that are known to increase the risk of lung cancer both in occupationally exposed cohorts and in the public exposed to specific concentrations. Two well-known examples are diesel fumes and radon. Radon is the second leading cause of lung cancer in the United States. Radon is a decay product of Ra<sup>226</sup> and Ra<sup>228</sup> which are Technologically Enhanced Naturally Occurring Radioactive Materials that the authors review as being contained in wastewater from UNGD. Also, on page 130, the authors cite a study which indicates that they are aware of the potential for risk of lung cancer in non-smokers. This study

indicated enhanced individual susceptibility to toxic pollutants when an individual has GSTM1 and GSTT1 genetic polymorphisms.

This report is obviously the result of a dedicated team doing extensive reviews of the available research. However, such a fundamental factual deficiency in ignoring lung cancer as the leading cause of cancer death, calls into question the credibility and reliability of the entire effort.

Dr. Berg raised this issue at the September 12 working symposium on **Public Health and the Marcellus Shale in Western Maryland** sponsored by the Maryland Environmental Health Network and held at the University of Maryland School of Nursing. During the discussion period, the presenter Dr. Donald Milton, the lead author of the report from University of Maryland Institute for Applied Environmental Health, had NO response to the objection. As a result, the report's authors are on notice of the problem.

Clearly, understanding the health effects of UNGD requires the assessment of the baseline risk of lung cancer and the subsequent enhanced risk from toxic exposures. Without such analysis any report on public health impacts is scientifically unreliable and should simply be discarded. We look forward to this error being rectified.

Sincerely yours,



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Department of Radiation Oncology  
Johns Hopkins Medicine



Vincent Brannigan, JD  
Professor Emeritus  
Clark School of Engineering  
University of Maryland

cc:

David Vanko, PhD  
Donald Milton, MD  
Amir Sapkota, PhD

#### About the letter authors

Dr. Berg is an internationally recognized authority in lung cancer screening and lung cancer risk assessment. She served as the lead NCI investigator for the National Lung Screening Trial, a 53,454 person study which was the first trial to ever demonstrate a mortality reduction from screening for lung cancer. Professor Emeritus Vincent Brannigan has taught Law and Technology for 40 years, with a special emphasis on the proper use of medical and scientific evidence in safety regulation. He was an advisor to the National Lung Cancer Screening trial.

See for example:

N Engl J Med. 2011 Aug 4;365(5):395-409

Reduced lung-cancer mortality with low-dose computed tomographic screening National Lung Screening Trial Research Team, Aberle DR, Adams AM, **Berg CD**, Black WC, Clapp JD, Fagerstrom RM, Gareen IF, Gatsonis C, Marcus PM, Sicks JD.

N Engl J Med. 2013 Feb 21;368(8):728-36

Selection criteria for lung-cancer screening. Tammemägi MC, Katki HA, Hocking WG, Church TR, Caporaso N, Kvale PA, Chaturvedi AK, Silvestri GA, Riley TL, Commins J, **Berg CD**.

N Engl J Med. 2013 Jul 18;369(3):245-54.

Targeting of low-dose CT screening according to the risk of lung-cancer death. Kovalchik SA, Tammemagi M, **Berg CD**, Caporaso NE, Riley TL, Korch M, Silvestri GA, Chaturvedi AK, Katki HA.

Risk Anal. 1992 Sep;12(3):343-51.

Risk, statistical inference, and the law of evidence: the use of epidemiological data in toxic tort cases. **Brannigan VM**, Bier VM, **Berg C**.

2010 Eur. J. Risk Reg. 107 (2010)

Alice's Adventures in Volcano Land: The Use and Abuse of Expert Knowledge in Safety Regulation; **Brannigan, Vincent M**.

Paradigms Lost: Emergency Safety Regulation under Scientific and Technical Uncertainty

**Vincent Brannigan** Chap 7 in Governing Disasters: The Challenges of Emergency Risk Regulation

Edited by Alberto Alemanno Edward Elgar Publishing, Jan 1, 2011