



# Kara A Keeton, MPH

## Current Position

Senior Health Scientist

## Discipline Areas

- > Environmental Epidemiology
- > Occupational Epidemiology
- > Monitoring and Evaluation

## Years' Experience

5

## Joined Cardno

2014

## Education

- > MPH, Epidemiology, the University of Louisville, 2014
- > BA, Anthropology, Biology, the University of Louisville, 2012

## Summary of Experience

Ms. Kara Keeton is a Health Scientist with Cardno ChemRisk. Her primary areas of training and expertise include epidemiology, statistical analyses, and human health risk assessment. She received her undergraduate training in anthropology and biology from the University of Louisville and completed her Master of Public Health degree in Epidemiology from the University of Louisville in 2014. She conducted her graduate practicum at the Tanzania Marketing and Communications Company, where she developed study designs, monitored surveillance data, and evaluated HIV/AIDS behavior change communication programs. Her main project focused on analyzing trends in HIV/AIDS survey data and HIV test results. In her current position, Ms. Keeton applies epidemiological concepts and methods to explore human health risks from environmental, occupational, and consumer product exposures. Specifically, she has research and consulting experience evaluating the relationship between nicotine and tobacco products, asbestos, talc, ethylene oxide, ethylene glycol ethers, and lead, and a variety of clinical and behavioral health outcomes.

## Significant Projects

### Regulatory Support

Provided regulatory support, which includes assistance with clinical study and research strategy oversight as well as preparation of submission documents, for electronic nicotine delivery systems (ENDS) and oral nicotine product companies submitting a Pre-Market Tobacco Application (PMTA) to the U.S. Food and Drug Administration (FDA). Lead a team of epidemiologists through a state-of-the-science evaluation of behavioral and clinical outcomes associated with tobacco and nicotine product usage and the impact of tobacco products of population health.

### Epidemiology and Statistical Analysis

Assessed and compared U.S. pleural mesothelioma incidence rates and trends in men and women residing in urban versus rural areas using the National Cancer Institute's (NCI's) Surveillance Epidemiology and End Results (SEER) database and NCI's Joinpoint Regression software.

Conducted a quasi-experimental design using logistic and Poisson regression to determine the impact of potential exposures to crude 4-methylcyclohexanemethanol (MCHM) by potentially exposed pregnant women had on adverse birth outcomes.

Performed a systematic literature review and meta-analysis of non-occupational exposure to asbestos and the risk of mesothelioma. Pooled mesothelioma risk estimates were calculated and stratified for type of non-occupational asbestos exposure and/or predominant fiber type.

Performed a literature review and meta-analysis of occupational exposures to ethylene oxide and the risk of lymphohematopoietic and breast cancers. Pooled risk estimates

were calculated and stratified by type of cancer, occupational groups, types of cancers within occupational groups, and decade of publication.

Analyzed cancer registry data to determine whether there was an elevated incidence of various cancers in a population surrounding a medical sterilization plant using ethylene oxide.

#### Exposure Assessments

Assisted in preparation of asbestos exposure assessments for a variety of products, including joint compound and friction products. Participated in a simulation study to characterize potential exposures to diacetyl in a small coffee shop during the preparation and consumption of unflavored coffee to determine if exposures exceed recommended occupational exposure limits. Prepared reports and publications based on findings of simulation studies.

#### Litigation Support

Reviewed and summarized case materials relating to environmental and occupational exposures to asbestos, occupational exposures to industrial solvents, and consumer exposures to cosmetic talcum products. Conducted literature reviews, provided support in the interpretation of relevant epidemiological studies, and reviewed government documents related to the products in preparation of expert testimony and support.

Provided and managed litigation support for cases involving potential occupational and non-occupational asbestos exposures resulting from the use or handling of historical asbestos-containing products, including joint compound, phenolic molding products, and friction products. Reviewed asbestos literature and case materials for use in the preparation of expert reports, testimony, and trial directs.

#### Membership to Professional Societies

- > Society for Epidemiologic Research (SER)
- > American Industrial Hygiene Association (AIHA)

#### Professional Honors/Awards

- > Recipient of American Industrial Hygiene Conference & Expo (AIHce)
  - > "Best of Session" Poster Award. Session 403. 2016 - Characterization of Naturally Occurring Airborne Diacetyl Concentrations Associated with the Preparation and Consumption of Unflavored Coffee

#### Invited Peer Reviewer

- > Journal of Exposure Science and Environmental Epidemiology, 2016
- > International Archives of Occupational and Environmental Health, 2019
- > International Journal of Environmental Analytical Chemistry, 2020

## Publications

### Peer-Reviewed Publications

- > Pierce, J.S., B. Roberts, D.G. Kougias, C.E. Comerford, A.S. Riordan, K.A. Keeton, H.A. Reamer, N.F.B. Jacobs, and J.T. Lotter. 2020. Pilot study evaluating inhalation and dermal glyphosate exposure resulting from simulated heavy residential consumer application of Roundup®. *Inhal Tox*. Advance online publication, Sept. 6, 2020. doi: 10.1080/08958378.2020.1814457.
- > Marsh, G.M., K.A. Keeton, A.S. Riordan, E.A. Best, and S.M. Benson. 2019. Ethylene oxide and risk of lympho-hematopoietic cancer and breast cancer: A systematic literature review and meta-analysis. *Int Arch Occup Env Health*. Advance online publication, May 20, 2019. doi: 10.1007/s00420-019-01438-z.
- > Keeton, K.A., M.E. Glynn, S.H. Gaffney, and J. Sahmel. 2018. Response to letter to the editor regarding "Ambient asbestos fiber concentrations and long-term trends in pleural mesothelioma incidence between urban and rural areas in the United States (1972-2012)" by Finkelstein. *Risk Anal*. 38(8):1524-1528.
- > Marsh, G.M., A.S. Riordan, K.A. Keeton, and S.M. Benson. 2018. Response to: 'Reanalysis of non-occupational exposure to asbestos and the risk of pleural mesothelioma' by Finkelstein. *Occup Env Med*. Advance online publication, March 24, 2018. doi: 10.1136/oemed-2018-105020.
- > Glynn, M.E., K.A. Keeton, S.H. Gaffney, and J. Sahmel. 2018. Ambient asbestos fiber concentrations and long-term trends in pleural mesothelioma incidence between urban and rural areas in the United States (1973-2012). *Risk Anal*. 38(3):454-471.
- > Marsh, G.M., A.S. Riordan, K.A. Keeton, and S.M. Benson. 2017. Non-occupational exposure to asbestos and risk of pleural mesothelioma: Review and meta-analysis. *Occup Env Med*. 74:838-846.
- > Benson, S. M., P. Ruestow, K. A. Keeton, R. M. Novick, G. M. Marsh, and D. J. Paustenbach. 2017. The 2014 crude 4-methylcyclohexanemethanol chemical release and birth outcomes in West Virginia. *Arch Environ Occup Health*:1-10.
- > Pierce, J. S., A. Abelmann, J. T. Lotter, C. Comerford, K. Keeton, and B. L. Finley. 2015. Characterization of naturally occurring airborne diacetyl concentrations associated with the preparation and consumption of unflavored coffee. *Toxicology Reports* 2:1200-1208.

## Presentations

- > Benson, S.M., A. Bowman, K.A. Keeton, R.C.D Reid, E.S. Fung, N.S. Egnot. 2019. The Risk of Lung Cancer Due to Occupational Exposure to Talc: A Meta-Analysis of Miners and Millers. Poster presentation at Society of Toxicology annual meeting. May 10-14, 2019. Baltimore, MD.
- > Marsh, G.M., K.A. Keeton, A.S. Riordan, E.A. Best, S.M. Benson. 2018. Ethylene Oxide and Risk of Lympho-hematopoietic Cancer and Breast Cancer: A Systematic Review and Meta-Analysis. Poster presentation at American Industrial Hygiene Conference & Exposition. May 21-23, 2018. Philadelphia, PA.
- > Keeton, K.A., S.M. Benson, R.M. Novick, G.M. Marsh and D.J. Paustenbach. 2017. The 2014 Crude 4-Methylcyclohexanemethanol Chemical Release and Birth Outcomes in West Virginia. Poster presentation at Society of Epidemiologic Research annual meeting. June 20-23, 2017. Seattle, WA.
- > Riordan, A.S., S. Selix, P. Ruestow, K.A. Keeton, and G.M. Marsh. 2016. Risk Comparison of Malignant Mesothelioma in Industrial Versus Shipyard Pipefitters and

- Plumbers: A Preliminary Meta-Analysis. Poster Presentation at Epidemiology Congress of the Americas meeting. June 21-24, 2016. Miami, FL.
- > Pierce, J.S., A. Abelmann, J.T. Lotter, C.E. Comerford, K.A. Keeton and B.L. Finley. 2016. Characterization of Naturally Occurring Airborne Diacetyl Concentrations Associated with the Preparation and Consumption of Unflavored Coffee. Poster Presentation at American Industrial Hygiene Conference & Exposition. May 21-26, 2016. Baltimore, MD.
  - > Glynn, M.E., K.A. Keeton, S.H. Gaffney, J. Sahmel. 2016. Ambient asbestos and long-term trends in pleural mesothelioma incidence between urban and rural areas in the United States (1973 to 2012). Poster presentation at Society of Toxicology annual meeting. March 13- 17, 2016. New Orleans, Louisiana
  - > Keeton, K., M.E. Glynn, S.H. Gaffney, J. Sahmel. 2015. Ambient Asbestos and Long-Term Trends in Pleural Mesothelioma Incidence between Urban and Rural Areas in the United States. Poster presentation at Society of Epidemiologic Research annual meeting. June 16-19, 2015. Denver, CO.
  - > Pierce, J.S., A. Abelmann, J. Lotter, C. Comerford, K. Keeton and B.L. Finley. 2015. Characterization of Diacetyl Exposures Associated with the Preparation and Consumption of Unflavored coffee. Poster presentation at Society of Toxicology annual meeting. March 22-26, 2015. San Diego, CA.
  - > Short N., K. Keeton, R.F. Botran, and F. Crespo. 2013. Phenotypic Plasticity in Humans: Lessons from the Immune System. Podium presentation at the American Association of Physical Anthropologists annual meeting. April 2013. Knoxville, TN.
  - > Keeton, K., Short, S. R.F. Botran, F. Crespo. 2012. Differential Immune Responses in Human Populations: Searching for Evolutionary Clues. Poster presentation at the American Association of Physical Anthropologists annual meeting. April 2012. Portland, OR.
  - > Keeton, K., F. Crespo. 2011. Cytokine Expression Diversity in Human Populations and Their Implications in Population Health History. Poster presentation at the University of Louisville's Summer Research Program Symposium. Louisville, KY; 2011.