



Exponent[®]
Engineering & Scientific Consulting

Benjamin Davis, Ph.D.

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Professional Profile

Dr. Davis is a multidisciplinary environment health scientist with expertise in food safety, exposure assessment, health risk assessment, and applied statistical and epidemiological analysis. Dr. Davis has conducted several complex and multifaceted systematic reviews and risk assessments related to the safety and critical control points of regularly-consumed food products in the United States, including raw cow's milk and oysters. Dr. Davis has extensive experience in applied statistics, with an emphasis on geospatial analysis of microbial and chemical contaminants in pre-harvested food products. Dr. Davis is also well-versed in complex epidemiological research, including investigating the cognitive effects of alcohol consumption in a large cohort study.

Prior to joining Exponent, Dr. Davis was a faculty member at the Johns Hopkins Bloomberg School of Public Health, Department of Epidemiology, managing a large, multi-year research project on the environmental variation and subsequent health risks of the bacterium *Vibrio parahaemolyticus* among oyster consumers in the United States. Dr. Davis was awarded his Ph.D. from the Johns Hopkins Department of Environmental Health and Engineering. During his Ph.D., Dr. Davis received a certificate in risk sciences and public policy from the University, and was a fellow at the Johns Hopkins Center for a Livable Future, and at the National Science Foundation's Integrative Graduate Education & Research Traineeship program in Water, Climate, and Health. His previous experience also includes conducting epidemiological research at the National Institute of Aging.

Dr. Davis has collaborated with scientists from a broad range of disciplines, from engineers to social scientists, and has regularly interacted with federal and state risk policy managers and food industry stakeholders. He has co-authored several peer-reviewed scientific articles related to food safety and risk assessment based on his years of research and has presented his work at numerous scientific conferences. Dr. Davis has also been an instructor for multiple courses concerning geospatial analysis and public health.

Academic Credentials & Professional Honors

Ph.D., Environmental Health Science, John Hopkins Bloomberg School of Public Health, 2017

B.A., Neuroscience and Behavior, Vassar College, 2010

Delta Omega Public Health Honor Society Member, 2018

Johns Hopkins Center for a Livable Future (CLF) - Lerner Fellowship, 2012-2017

National Science Foundation (NSF) Integrative Graduate Education & Research Traineeship in Water, Climate and Health. 2015-2017

Johns Hopkins Environment, Energy, Sustainability and Health Institute (E2SHI) Fellowship, 2014-2015

Academic Appointments

Associate Faculty, Epidemiology, Johns Hopkins Bloomberg School of Public Health, 2020

Prior Experience

Research Associate, Department of Epidemiology, Johns Hopkins Blomberg School of Public Health, 2017-2019

Post-baccalaureate Intramural Research Training Award (IRTA) Fellow, National Institute of Aging, NIH. 2010-2012

Professional Affiliations

Society for Risk Analysis

International Epidemiological Association

International Society for Environmental Epidemiology

Publications

Davis BJK, Corrigan AE, Sun Z, Atherly E, DePaola A, Curriero FC. A case-control analysis of traceback investigations for *Vibrio parahaemolyticus* infections (vibriosis) and pre-harvest environmental conditions in Washington State, 2013–2018. *Science of The Total Environment*. 2020; 752:141650. <https://doi.org/10.1016/j.scitotenv.2020.141650>

Spaur M, Davis BJK, Kivitz S, DePaola A, Bowers JC, Curriero FC, Nachman KE. A systematic review of post-harvest interventions for *Vibrio parahaemolyticus* in raw oysters. *Science of The Total Environment*. 2020; 745:140795. <https://doi.org/10.1016/j.scitotenv.2020.140795>

DeLuca NM, Zaitchik BF, Guikema SD, Jacobs JM, Davis BJK, Curriero FC. Evaluation of remotely sensed prediction and forecast models for *Vibrio parahaemolyticus* in the Chesapeake Bay. *Remote Sensing of Environment*. 2020; 250:112016. <https://doi.org/10.1016/j.rse.2020.112016>

Davis BJK, Jacobs JM, Zaitchik B, DePaola A, Curriero FC. Operational in-situ Prediction and Forecast Models for *Vibrio parahaemolyticus* in the Chesapeake Bay Are Attainable and Can Benefit from Including Lagged Water Quality Measurements. *Applied and Environmental Microbiology*. 2019; 85(17):e01007-19. doi: 10.1128/AEM.01007-19.

Davis BJK, Curriero FC. Development and Evaluation of Geostatistical Methods for Non-Euclidean-Based Spatial Covariance Matrices. *Mathematical Geosciences*. 2019; 51(6):767-791. <https://doi.org/10.1007/s11004-019-09791-y>.

Flynn A, Davis BJK, Atherly E, Olson G, Bowers JC, Depola A, Curriero FC. Associations of Environmental Conditions and *Vibrio parahaemolyticus* Genetic Markers in Washington State Pacific Oysters. *Frontiers in Microbiology*. 2019; 10:2797. doi: 10.3389/fmicb.2019.02797.

Kvit A, Davis BJK, Jacobs J, Curriero FC. Adjusted, non-Euclidean cluster detection of *Vibrio parahaemolyticus* in the Chesapeake Bay, USA. *Geospatial Health*. 2019; 14(2). <https://doi.org/10.4081/gh.2019.783>.

Love DC, Kuehl LM, Lane RM, Fry JP, Harding J, Davis BJK, Clancy K, Hudson B. Performance of cold chains and modeled growth of *Vibrio parahaemolyticus* for farmed oysters distributed in the United States and internationally. *International Journal of Food Microbiology*. 2019; 313(16):108378.

Love DC, Lane RM, Davis BJK, Clancy K, Fry JP, Harding J, Hudson B. Performance of Cold Chains for Chesapeake Bay Farmed Oysters and Modeled Growth of *Vibrio parahaemolyticus*. *Journal of Food Protection*. 2018; 82(1):168-178.

Davis BJK, Jacobs JM, Davis MF, Schwab KS, DePaola A, Curriero FC. Environmental determinants of *Vibrio parahaemolyticus* in the Chesapeake Bay. *Applied and Environmental Microbiology*. 2017; 83(21):e01147-17.

Albanese E, Davis B, Jonsson PV, Chang M, Aspelund T, Garcia M, ... & Launer LJ. Overweight and Obesity in Midlife and Brain Structure and Dementia 26 Years Later: The AGES-Reykjavik Study. *American Journal of Epidemiology*, 2015; kwu331.

Davis BJK, Vidal JS, Garcia M, Aspelund T, van Buchem MA, JonsdottirMK, ... & Launer LJ. The Alcohol Paradox: Light-to-Moderate Alcohol Consumption, Cognitive Function, and Brain Volume. *The Journals of Gerontology Series A: Biological Sciences and Medical Sciences*; 2014; glu092.

Presentations

Davis B, Corrigan A, Sun Z, Atherly E, DePaola A, Curriero FA case-control analysis of traceback investigations for *Vibrio parahaemolyticus* infections (vibriosis) and pre-harvest environmental conditions in Washington State, 2013–2018. Poster presentation, 32nd Annual Conference of the International Society of Environmental Epidemiology, Virtual, 2020

Davis B, Kvit A, DeLuca N, Curriero F. Characterizing the Spatial-Temporal dynamics and human health risks of *Vibrio parahaemolyticus* bacteria in estuarine environments. Invited Seminar, Geographic Analysis Working Group, Division of Cancer Epidemiology & Genetics, National Cancer Institute, U.S. National Institutes of Health, Rockville, MD, 2019.

Davis B, Sun J, Flynn A, Bowers J, Atherly E, Curriero F. Environmental and Genetic Determinants of *Vibrio parahaemolyticus* abundance and vibriosis in Washington State. Invited speaker, Aquaculture 2019, New Orleans, LA, 2019.

Spaur M, Davis B, Depaola A, Bowers J, Curriero F, Nachman K. Identification of post-harvest inputs for *Vibrio parahaemolyticus* Quantitative Microbial Risk Assessment in Chesapeake Bay and Washington State. Poster presentation, Aquaculture 2019, New Orleans, LA, 2019.

Davis B, Jacobs J, DePaola A, Curriero FC. Spatial and temporal characteristics of *Vibrio parahaemolyticus* in the Chesapeake Bay. Poster presentation, International Society of Exposure Sciences and International Society of Environmental Epidemiology Joint Conference, Ottawa, Canada, 2018.

Davis B, Jacobs J, DePaola A, Curriero FC. Developing space-time prediction models of *Vibrio parahaemolyticus* in the Chesapeake Bay. Oral presentation, Chesapeake Community Research & Modeling Symposium, Annapolis, MD, 2018.

Davis B, Jacobs J, DePaola A, Curriero FC. Environmental determinants of *Vibrio parahaemolyticus* in the Chesapeake Bay: Current and Future Work. Oral presentation, National Shellfisheries Association, Seattle, WA, 2018.

Davis B, Jacobs J, Davis M, Curriero FC. Environmental determinants of *Vibrio parahaemolyticus* in the

Chesapeake Bay. Poster presentation, 17th National Conference and Global Forum on Science, Policy, and the Environment: Integrating Environment and Health, Arlington, VA, 2017.

Davis B, Jacobs J, Zaitchik B, Curriero FC. Non-Euclidean distance-based Kriging, water quality monitoring, and remote sensing data to predict *Vibrio parahaemolyticus* in the Chesapeake Bay. Poster presentation, International Society of Exposure Sciences, Utrecht, The Netherlands, 2017.

Davis B. Food safety, statistical prediction & risk assessment. Oral presentation, Risk Analysis Branch, Division of Risk Decision Analysis, Office of Analytics and Outreach, Center for Food Safety and Applied Nutrition, U.S. Food and Drug Administration, College Park, MD, 2016.

Davis BJK. Use of Spatial Statistics to Predict *Vibrio parahaemolyticus* in the Chesapeake Bay. Oral Presentation, 67th Annual Interstate Seafood Seminar, Ocean City, MD, 2015.

Davis B, Vidal JS, Zhang J, Launer L. The alcohol paradox: The effects of alcohol consumption on brain volume and cognitive function in an aging Icelandic population. Poster Presentation, National Institutes of Health Research Festival, Bethesda MD, 2011.

Project Experience

Conducted case-control epidemiological research and analysis to identify environmental and microbial risk factors for gastrointestinal illness caused by *Vibrio parahaemolyticus* among oyster consumers in Washington state.

Performed transparent and reproducible literature review of the health benefits and risks of unpasteurized and pasteurized cow's milk. Presented findings to the Maryland General Assembly.

Developed geostatistical methods to create unbiased spatial interpolations in complex, non-convex domains when using non-Euclidean interpoint distances.

Additional Education & Training

Gordis Teaching Fellow, Johns Hopkins University, 2015.

Research Grants

Co-Investigator. Characterizing The Spatial-Temporal Dynamics and Human Health Risks of *Vibrio parahaemolyticus* Bacteria in Estuarine Environments. National Institute of Allergy and Infectious Diseases, 2016-2021.

Principal Investigator. Mapping Aquaculture in Maryland and the Chesapeake Bay. Johns Hopkins Center for a Livable Future. 2013-2014.

Peer Reviewer

Mathematical Geosciences

Marine Environment Research

International Society for Photogrammetry and Remote Sensing (ISPRS) International Journal of Geo-Information.