Emma J. Wu, M.S.
Epidemiologist

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Academic and Professional Profile

Emma J. Wu is an epidemiologist with Paustenbach and Associates, based in Colorado. Emma is driven by a passion in regulatory policy surrounding the role of business and farming practices in climate change, planetary deterioration, and transmission of human and animal diseases and their associated health and economic consequences. She brings experience in data management, graphics generation, compartmental models of infectious disease transmission, epidemiological study design, and teaching. Emma earned her Master of Science in Epidemiology from the University of Colorado Anschutz Medical Campus in 2021; her thesis work focused on the impact of COVID-19 restrictions at high-visit Colorado ski areas.

Education and Degrees Earned

- M.S., Epidemiology, University of Colorado Anschutz Medical Campus, 2021
- M.A., Education & Human Development, University of Colorado Denver, 2017
- B.A., Biochemistry, University of Colorado Boulder, 2015

Experience Summary (Professional Career)

Paustenbach and Associates; Boulder, CO
Epidemiologist
August 2021 – Present

- Currently serving as the primary epidemiology consultant for this firm.
- Investigating epidemiological studies used in court cases, and evaluating their strengths and limitations in establishing causal links between chemical exposures and disease.
- Reviewing literature on the toxicology and carcinogenicity of compounds and the epidemiology of their associated diseases.
- Supporting toxic tort litigation efforts and assisting with the preparation of expert reports.
- Supporting efforts in COVID-19 litigation using current knowledge of SARS-CoV-2 biology and epidemiology.

Colorado COVID-19 Modeling Group; Aurora, CO
Modeling Research Assistant
June 2020 – June 2021

- Conducted weekly optimization model fitting and outbreak trajectory simulations in R to inform the public and the state governor on the status of COVID-19 in Colorado.
- Visualized line list data from the Colorado Department of Public Health & Environment (CDPHE) to quantify infection prevalence, prior and current hospitalization trajectories, trends in immunity, and detection of infections by statewide surveillance systems.
- Generated long-term projections of SARS-CoV-2 infections, COVID-19 hospitalizations, and COVID-19 deaths under different scenarios that included reduced transmission control, vaccine rollout strategies, and new variants.

Colorado School of Public Health; Aurora, CO
Teaching Assistant, Data Management Using SAS Course
September 2020 – December 2020

- Facilitated question-driven weekly office hours to assist with homework, enhance student understanding of SAS concepts, and troubleshoot student code.
- Evaluated students for their performance on written programs to import, manipulate, and analyze datasets while avoiding common problems such as missing or truncated observations.

United States Army Reserve, 91st Training Division; Denver, CO
Human Resources Officer
February 2019 – September 2020

- Performed administrative duties at the brigade level including managing personnel metrics and data quality for reserve unit readiness.

University of Colorado School of Medicine; Aurora, CO
Assistant Clinical Research Coordinator
November 2019 – March 2020

- Supported a family-based screening study on the genetics of Idiopathic Pulmonary Fibrosis (IPF) including assembling and distributing materials to study participants across the United States.
- Performed lab bench work isolating DNA/RNA for genotyping of single nucleotide polymorphisms (SNP's) in the MUC5B gene.

United States Army Space & Missile Defense Command; Colorado Springs, CO
Human Resources Officer
May 2015 – February 2019

- Supported personnel actions and mission-essential tasks to ensure deployment readiness for three Army Space companies.

Arvada West High School; Arvada, CO
Teacher, Algebra I/Algebra II
August 2017 – May 2019

- Facilitated instruction of high cognitive depth in a fast-paced classroom environment, mentoring students in developing problem-solving, critical thinking, and quantitative skills, including basic statistical analysis and algebraic reasoning.
- Provided academic and career guidance to upperclassmen during their transitions from high school to college, employment, or military service.

University of Chicago Medical Center; Chicago, IL
Laboratory Research Assistant
June 2012 – August 2012

- Supported efforts in utilizing murine models to better understand the role of the dopamine D3 receptor in cocaine addiction. Used Western blots to detect molecular changes in brain tissue.
- Assisted with *in vivo* behavioral and pharmacological studies to further research in potential treatments for addiction.

Key Projects (Partial List)

1. **Potential for SARS-CoV-2 transmission in the workplace.** Using knowledge of the biology and epidemiology of SARS-CoV-2 and COVID-19, characterized the risks of workplace exposure and effectiveness of occupational control measures.

2. **Health effects of exposures to chemicals following a spill.** Interpreting the results of animal toxicology studies to characterize health risks of oral, dermal, and inhalation exposures to chemicals in waterways.

3. **Characterizing the risks of *Legionella* exposure in the workplace.** Supported efforts in assessing certain occupational environments that may give rise to *Legionella* bacteria exposure and development of Legionnaires' disease.

4. **Nitrosamine impurities in pharmaceuticals.** Provided guidance to a large pharmaceutical company on contamination by *N*-nitrosodimethylamine (NDMA) and *N*-nitrosodiethylamine (NDEA) in their products. Through assembly of toxicological and epidemiological literature and a thorough review of methods used by agencies to establish acceptable daily intake, we evaluated the human cancer risks from intake of potentially contaminated pharmaceuticals relative to ingestion of nitrosamines (including NDMA and NDEA) from everyday sources.

5. **Health effects of e-cigarettes on adults and adolescents, including EVALI.** Crafted original opinions using findings from clinical and epidemiological literature on acute lung injury linked to e-cigarettes. Conducted literature reviews to support efforts in characterizing the behavioral elements of e-cigarette use, their risks and benefits, and their role in potential harm reduction.

6. **Sarcoidosis and occupational exposures to air pollution.** Following a tank farm fire, reviewed clinical and epidemiological literature to describe the impacts of acute exposure to air pollution.

7. **Bladder cancer and occupational exposure to chemicals in hair dye.** Conducted reviews of epidemiological literature to assess bladder cancer risk from exposure to hair dye chemicals.

8. **Assessment of soil samples at a former naval base.** Supported efforts in quantifying and characterizing the risks of exposure to radionuclides.

9. **Mesothelioma and occupational and nonoccupational asbestos exposure.** Currently supporting ongoing research efforts in the genetic, environmental, occupational, and non-occupational underpinnings of mesothelioma.

Research

1. **Wu E.J.**, Buchwald A.G., Carlton E.J., Crume T.L. Mathematical Modeling of COVID-19 Transmission at High-Visit Colorado Ski Areas and Deterministic Simulation of Outbreak Trajectories During the 2020-21 Ski Season. Department of Epidemiology Master of Science Thesis. Defended 12 February 2021.

Scientific Conference Presentations

1. 2021 (May). Mathematical Modeling of Viral Transmission and Deterministic Simulation of Outbreak Trajectories at High-Visit Colorado Ski Areas During COVID-19 and Beyond. MIDAS Network Annual Meeting. 10-13 May 2021. Virtual Presentation.

Publications [Peer-Reviewed]

1. Yan Y., Kong H., **Wu E.J.**, Newman A.H., Xu M. Dopamine D3 receptors regulate reconsolidation of cocaine memory. *Neuroscience*. 2013;241:32-40. doi:10.1016/j.neuroscience.2013.03.005

Preprints

1. **E.J. Wu,** J. Bayham, E. Carlton, J. Samet, A.G. Buchwald. Modeling SARS-CoV-2 transmission at a winter destination resort region with high outside visitation. medRxiv preprint. doi: 10.1101/2021.08.18.21262227

Certifications

*   Base Programming Using SAS 9.4, January 2020

Membership to Professional Societies

*   Models of Infectious Disease Agent Study (MIDAS) Network, October 2020 – Present