Xin Zhang, PhD, MPH, MS

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Summary

Research fellow with 5+ years of experience in occupational health, environmental epidemiology, exposure assessment and biostatistics. Investigated how the environmental and occupational noise disproportionally impact health trajectories, with a focus on hearing loss and dementia. Conducted field research, human subject research and managed large-scale data from a nationwide longitudinal digital cohort. Seeking to use affordable wearable and mobile technologies to collect and translate real-life data into healthy aging insights.

Education

University of Michigan (U of M) School of Public Health — Ann Arbor, MI, US

PhD, Environmental Health Sciences and Scientific Computing — Aug 2022 – Dec 2025

– Dissertation Title: Wearable sensor-based observation of noise impact on cardiovascular and auditory systems

Master of Science (MS), Biostatistics — Feb 2023 – May 2025

Master of Public Health (MPH), Industrial Hygiene — Aug 2018 – Apr 2020

Peking University (PKU), School of Nursing, School of Psychology and Cognitive Science — Beijing, China

Bachelor of Science in Nursing, dual degree in Psychology — Sept 2014 – Jul 2018

– Thesis Title: Work stress, burnout and organizational commitment among operating room nurses: a cross-sectional study

Research Experience

Research Fellow, U of M, Dept. of Env. Health Sci. — Ann Arbor, MI, US

Supervisor: Rick Neitzel, PhD, MS, CIH, FAIHA — Jan 2026 – present

Key Projects: The Interaction Among Noise, Hearing and Sleep; Occupational Noise Exposure at Ear; Hearing Age Index

- Establish 2 collaborative research projects with 2 external hearing conservation professionals by coordinating data sharing, analysis planning, and preparing grant application materials.
- Present at international conferences to advocate for noise control, and proper wearable sensor adoption in the workplace.

Graduate Student Research Assistant, U of M, Dept. of Env. Health Sci. — Ann Arbor, MI, US

Supervisor: Rick Neitzel, PhD, MS, CIH, FAIHA — Aug 2022 – Dec 2025

Key Projects: Daily Noise and Early Onset of Hearing Difficulties; Noise and Prolonged Stress Response; App-based Hearing Tests Validation; Mobile Sampling for Traffic Noise Assessment.

- Designed and constructed novel noise metrics to account for the temporal distribution of hazardous noise in hearing loss prediction.
- Investigated early onset of hearing loss and speech recognition given real-life excessive daily noise exposure for a longitudinal digital cohort.
- Investigated a lagged temporal relationship of loud sound and physiological stress using distributed lag models under hierarchical Bayesian framework.

- Led an in-person study to validate 2 app-based hearing tests against the clinical gold standards. Generated adjustment models to narrow the bias of app-based hearing tests.
- Constructed study data pipeline to process more than 200,000 participants' survey data and wearable sensor data over 5 years, culminating in 3 co-authored manuscripts and 3 first-authored manuscripts.
- Co-designed novel mobile noise sampling study protocol and conducted field work in Detroit Black Bottom neighborhood to investigate the environmental noise impact brought by a proposed urban renewal.
- Mentored 2 undergraduate students in literature review processes, and trained one student to conduct the in-person hearing validation study; nominated by students and received Outstanding Mentor Award.

Research Scholar, Johns Hopkins Bloomberg School of Public Health — Baltimore, MD, US
Supervisor: Jennifer Deal, PhD; Nicolas Reed, PhD — Jun 2024 – Jul 2024

Key Projects: Noise Exposure and Cognitive Decline Among Elderly Population.

- Investigated the role of hearing loss, as an effect modifier, in the causal relationship between noise and dementia using mixed linear effect models in Atherosclerosis Risk in Communities Neurocognitive Study (ARIC-NCS).
- Co-presented an award-winning poster at the American Auditory Society (AAS) conference and authored 1 manuscript to interpret the findings.

Research Associate, U of M, Dept. of Env. Health Sci. — Ann Arbor, MI, US
Supervisor: Rick Neitzel, PhD, MS, CIH, FAIHA — Aug 2020 – Aug 2022

Key Projects: Field SARS-CoV-2 Exposure Assessment; Cardiovascular Effect of Occupational Noise; Digital Study Survey Design; Data Enrichment for NoiseJEM.

- Led field bio-aerosol and surface sampling of SARS-CoV-2 during the pandemic, quantified viral concentration using RT-qPCR, conducted data analysis, and presented weekly reports.
- Investigated COVID-19 infection risk via bio-aerosol inhalation or surface contact using Quantitative Microbial Risk Assessment (QMRA).
- Authored 1 peer-reviewed manuscript on estimated infection risks using real-life data, which provided timely evidence for safe back-to-school guidelines during the pandemic.
- Investigated the cardiovascular effect of occupational noise exposure among e-waste recycling workers, and presented an award-winning talk at the National Hearing Conservation Association (NHCA) Conference.
- Designed comprehensive occupation surveys for a digital cohort study to efficiently classify occupational information and to assess perceived occupational noise exposure.
- Led the noise record request in the US and Canada for *NoiseJEM* – a free-public tool for real-life occupational noise exposure data.

Selected Publications

8 **Zhang, X.**, Alves, S., Jiang, K., Myers, C. A., Reed, N. S., & Deal, J. A. **The association between excessive noise exposure and cognitive decline in ARIC-NCS.** *Manuscript in preparation*
Investigation, Methodology

7 **Zhang, X.**, Allerton, T., & Neitzel R. L. **The impact of noise on speech recognition difficulties in the absence of hearing threshold shifts.** *Manuscript in preparation*
Conceptualization, Investigation, Formal Analysis

6 **Zhang, X.**, Smith, L. M., Graham, Z., & Neitzel R. L. **Examination of the use of booth-less smartphone-based hearing tests using personal headphones.** *Manuscript in preparation*
Conceptualization, Investigation, Formal Analysis

5 **Zhang, X.**, Park, S.K., Smith, L.M., & Neitzel, R. L. **Association between environmental and headphone noise and heart rate variability: a longitudinal study.** *Manuscript under review*
Conceptualization, Investigation, Formal Analysis

4 Tang, Y., **Zhang, X.**, Smith, L. M., Shkembi, A., Green, G. E., & Neitzel, R. L. (2026). **Tinnitus prevalence and characteristics in the United States: insights from the 2019–2022 Apple Hearing Study cohort.** *BMC Public Health*. doi: 10.1186/s12889-026-27048-2.
Validation, Review & Editing

3 Fan, Y., Döring, T., Li, S., **Zhang, X.**, Fang, M., & Yu, Y. (2024). **Energy poverty and public health vulnerability: A multi-country analysis.** *Sustainable Development*, 32(5), 5161-5180. doi: 10.1002/sd.2965.
Visualization, Review & Editing

2 Fan, Y., Fang, M., **Zhang, X.**, & Yu, Y. (2023). **Will the economic growth benefit public health? Health vulnerability, urbanization, and COVID-19 in the USA.** *The Annals of regional science*, 70(1), 81-99. doi: 10.1007/s00168-021-01103-9
Conceptualization, Investigation, Data Curation, Original Draft, Review & Editing

1 **Zhang, X.**, Wu, J., Smith, L. M., Li, X., Yancey, O., Franzblau, A., Dvonch, J. T., Xi, C. & Neitzel, R. L. (2022). **Monitoring SARS-CoV-2 in air and on surfaces and estimating infection risk in buildings and buses on a university campus.** *Journal of exposure science & environmental epidemiology*, 32(5), 751-758. doi: 10.1038/s41370-022-00442-9
Conceptualization, Investigation, Formal Analysis

Presentations

4 **Zhang, X.** National Hearing Conservation Association 50th Annual Conference (February 2026). Fort Worth, TX, USA. "Association of environmental and headphone sound exposure with heart rate variability".

3 **Zhang, X.**, Alves, S. American Auditory Society Scientific and Technology Meeting (February 2025). Scottsdale, AZ, USA. "Noise exposure and cognitive decline in ARIC-NCS".

2 **Zhang, X.** National Hearing Conservation Association 47th Annual Conference (February 2023). Jacksonville, FL, USA. "Noise Exposure and Acute Changes to Monitored Heart Rate among Electronic Waste Recycling Workers".

1 **Zhang, X.** American Industrial Hygiene Conference and Expo 2022 (May 2022), Nashville, TN, USA. "Infection Risk Modeling of SARS-CoV-2 in Air and on Surfaces on a University Campus".

Awards and Scholarships

2025 – The Warren A. Cook Award by U of M Center for Occupational Health and Safety Engineering, for outstanding research in industrial hygiene (IH)
2024 – U of M Rackham International Students Fellowship / Kan-Chuang Fellowship ($14,596), for outstanding female students from Asia
2024 – U of M Undergraduate Research Opportunity Program Outstanding Mentor Award, for providing excellent mentorship
2023,2024 – U of M Rackham Graduate Student Research Grants ($1000 each), for supporting research project
2021 – The Michigan Industrial Hygiene Merit Society Scholarship by Michigan Industrial Hygiene Society, for recognizing the academic achievements of IH students from Michigan
2017 – PKU Student of Merit, for outstanding academic achievement and social engagement

Professional Service

Ad hoc Peer Reviewer

- Journal of Exposure Science and Environmental Epidemiology (2022, 2025)
- Journal of Occupational and Environmental Medicine (2022)
- International Journal of Occupational Safety and Ergonomics (2021, 2022, 2025)

Taskforce Chair, Student and Early-career Professional Network (SEPN), NHCA (2026)

Exit Interviewer, Industrial Hygiene Masters Program, U of M (2021–2025)

Professional Experience

Statistical Consultant Ann Arbor, MI, US
STATCOM, U of M (STATCOM@UMICH) Jan 2024 – Oct 2024

- Provided data visualization solutions for a non-profit organization advocating for equitable youth justice policies and practices.
- Established a data repository to store web-scraped reports for clients and built a self-updating information dashboard.

Industrial Hygienist Ann Arbor, MI, US
U of M, Dept. of Environment, Health & Safety Apr 2019 – Apr 2020

- Conducted the Hearing Conservation Program and designed extended noise monitoring study to investigate the typical exposure level by occupation.
- Inspected food safety compliance during NCAA football seasons in the Michigan Stadium; assessed indoor air quality for lead, asbestos, and mold.
- Managed multiple regulatory datasets/repositories including confined space permits, Safety Data Sheets, and new lockout/tagout program.
- Designed occupational health and safety monthly training curricula for employees.

Nurse Intern Beijing, China
PKU People's Hospital, Department of Surgery Jul 2017 – May 2018

- Investigated work stress, burnout and organizational commitment among operating room nurses in a cross-sectional study.
- Completed clinical trial coordinator certificate training.

Extracurricular Activities and Leadership

- **Co-Chair**, U of M EHS Doctoral Student Peer Mentoring Program (DSPMP) (2023–2025)
- **Mentor**, Undergraduate Research Opportunity Program (UROP) (2023–2025)
- **Member**, U of M Industrial Hygiene Students Association (UMIHSA) (2018–present)
- **Member**, American Industrial Hygiene Association (AIHA) (2020–present)
- **Service Chair**, U of M Environmental Health Students Association (EHSA) (2022–2023)
- **Chair**, PKU Health Science Center Student Union (2017–2018)

Certifications

Certified Occupational Hearing Conservationist (COHC) by Council for Accreditation in Occupational Hearing Conservation

Skills

Programming Languages: R, Python, Spark, STAN, SQL, SAS, SPSS
Statistical Methods: Mixed-effects models, time-series analysis, survival analysis, Bayesian hierarchical models, tree-based methods, clustering, dimensionality reduction.
Data Visualization & Tools: ArcGIS, R Shiny