

# Xin Zhang, PhD, MPH, MS

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Let's brew some ideas [Click for Google Calendar]

## Summary

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Research Fellow in Environmental Health Sciences, starting new direction in noise research with a focus on non-auditory impacts, such as sleep disturbance, cognitive decline. Ultimately, my goal is to build and maintain longitudinal digital cohorts with rich time-series data collected from mobile devices and wearable sensors to support modern environmental epidemiology.

## Education

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**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  
Master of Science (MS), Biostatistics Feb 2023 – May 2025  
Master of Public Health (MPH), Industrial Hygiene Aug 2018 – Apr 2020

- Certified Occupational Hearing Conservationist (COHC)

**Peking University, School of Nursing, School of Psychology & Cognitive Science** Beijing, China  
Bachelor of Science in Nursing, dual degree in Psychology Sept 2014 – July 2018

## Research Experience

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**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: Exposure-response relationship of noise exposure and hearing loss measured by consumer wearables; temporal relationship between excessive noise exposure and heart rate variability change using free-living health wearable data; app-based hearing test validation on consumer headphones for more accessible hearing health monitoring.*

- Processed and constructed novel noise metrics to characterize the temporal distribution of hazardous noise (programming skills: python with SQL and pySpark, R)
- Examined the temporal relationship of loud sound and psychophysiologic changes using distributed lag models and hierarchical Bayesian models (programming skills: R with Stan)
- Conducted validation and performance analysis of the app-based hearing tests against clinical gold standard. Tuned adjustment models to narrow the bias of app-based hearing tests (programming skills: R)
- Constructed end-to-end data pipeline to process and manage participants' hearing test records, and generate hearing reports with customized visualization (programming skills: python with SQL and pySpark, R)

**Research Scholar**, Johns Hopkins Bloomberg School of Public Health Baltimore, MD, US  
*Supervisor: Jennifer Deal, PhD; Nicolas Reed, PhD* June 2024 – July 2024

*Key Projects: Evaluating noise exposure and cognitive decline in Atherosclerosis Risk in Communities Neurocognitive Study (ARIC-NCS).*

- Examined the role of hearing loss, as an effect modifier, in the causal relationship between noise and dementia (cognitive decline rate) using mixed linear effect models with data from a multi-center longitudinal cohort
- Innovatively used audiogram noise notches to quantify noise exposure history
- Co-first authorship on a hearing conference poster and a manuscript

**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: Assessment of exposure risks to SARS-CoV-2 in public buildings; relationship between noise exposure and heart rate in E-waste recycling workers; survey design for a nationwide longitudinal cohort study; data enrichment for NoiseJEM.*

- Estimated COVID-19 infection risk via bioaerosol inhalation or surface contact using quantitative microbial risk

assessment (QMRA) (programming skills: R)

- Led field bioaerosol and surface sampling during the pandemic, quantified viral concentration using RT-qPCR, conducted data analysis, and presented weekly reports to the study team
- Published first-authored peer-reviewed paper on estimated infection risks through two routes of exposure, which provided timely evidence for safe back-to-school guidelines during the pandemic
- Conducted literature review and time-series analysis to examine the causality between noise exposure and various heart rate metrics for E-waste recycling workers (programming skills: R)
- Designed systematic occupation surveys in a nationwide longitudinal cohort study to efficiently classify occupational information and to assess perceived occupational noise exposure
- Collected noise exposure data through Freedom of Information Act (FOIA) requests for *NoiseJEM*, a valuable data repository and visual dashboard for noise exposure recordings by occupations (programming skills: R)
- Assisted with grant writing for research projects

## Professional Service and Experience

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### Ad hoc Peer Reviewer

- Journal of Exposure Science and Environmental Epidemiology
- Journal of Occupational and Environmental Medicine
- International Journal of Occupational Safety and Ergonomics

**Statistical Consultant** STATCOM at the University of Michigan  
(STATCOM@UMICH)

Ann Arbor, MI, US  
Jan 2024 – Oct 2024

- Visualized data on the yearly use of restraints in juvenile justice center for project client, a non-profit organization advocating for equitable youth justice policies and practices
- Established data repository to store web-scraped reports for clients and built an information dashboard that automatically updates with new data (programming skills: R)

**Industrial Hygienist (Facilities & Operation)**, U of M, Dept. of Environment,  
Health & Safety

Ann Arbor, MI, US  
Apr 2019 – Apr 2020

- Conducted the Hearing Conservation Program and designed extended noise monitoring study by trades to determine the typical exposure level by occupation; monitored indoor air quality for lead, asbestos, and mold
- Worked as a food safety inspector during NCAA football seasons in the Michigan Stadium
- Managing multiple regulatory datasets or repositories including confined space permits, Safety Data Sheets (SDS), new lockout/tagout (LOTO) program for student machine shop
- Designed occupational health and safety monthly training curricula for employees

**Medical Student Intern**, Peking University People's Hospital, Department of  
Surgery

Beijing, China  
July 2017 – May 2018

- Completed clinical practices with a focus on peri-operative nursing coordination, clinical trial coordinator certificate training
- Evaluated work stress, burnout and organizational commitment among operating room nurses

## Skills

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**Programming Languages:** R, Python, Spark, STAN, SQL, SAS, SPSS

## Awards and Scholarships

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- The Warren A. Cook Award (2025)
- American Auditory Society Mentored Student Research Presentation Travel Award (2025)
- Rackham International Students Fellowship/Chia-Lun Lo Fellowship (2024)
- Undergraduate Research Opportunity Program Outstanding Mentor Award (2024)
- Rackham Graduate Student Research Grants (2023, 2024)
- National Hearing Conservation Association Scholarship Foundation Student Conference Award (2023)

- International Society for Environmental Epidemiology Poster Award (2023)
- The Michigan Industrial Hygiene Merit Society Scholarship (2021)
- Peking University Student of Merit (2017)

## Selected Publications

C=Conference, D=Dissertation, J=Journal, P=In Preparation

- [P.1] Zhang, X., Alves, S., Jiang, K., et al. **The association between excessive noise exposure and cognitive decline in Atherosclerosis Risk in Communities Neurocognitive Study (ARIC-NCS)**. *Manuscript in preparation*
- [P.2] Tang, Y, Zhang, X., Smith, L.M. et al. **Tinnitus Prevalence, Characteristics in the United States – Insights from Apple Hearing Study**. *Manuscript in preparation*
- [D.1] Zhang, X., et al. **The prolonged physiological responses to environmental noise and headphone audio using Bayesian distributed lag model**. *Manuscript in preparation*
- [D.2] Zhang, X., et al. **The impact of noise on speech recognition difficulties in the absent of hearing threshold shifts**. *Manuscript in preparation*
- [D.3] Zhang, X., et al. **Examine the use of booth-less smartphone-based hearing tests using personal headphones**. *Manuscript in preparation*
- [J.1] Zhang, X., Wu, J., Smith, L.M. et al. (2022). **Monitoring SARS-CoV-2 in air and on surfaces and estimating infection risk in buildings and buses on a university campus**. *J Expo Sci Environ Epidemiol*. DOI: 10.1038/s41370-022-00442-9
- [J.2] Fan, Y., Fang, M., Zhang, X. et al. (2022). **Will the economic growth benefit public health? Health vulnerability, urbanization, and COVID-19 in the USA**. *Ann Reg Sci*. DOI: 10.1007/s00168-021-01103-9
- [J.3] Fan, Y., Döring, T., Li, S., Zhang, X. et al. (2024). **Energy poverty and public health vulnerability: A multi-country analysis**. *Sustainable Development*, 1–20. DOI: 10.1002/sd.2965
- [C.1] Zhang, X., Wu, J., Smith, L.M., et al (2022). **Infection Risk Modeling of SARS-CoV-2 in Air and on Surfaces on a University Campus**. *AIHexp2022*
- [C.2] Neitzel R.L., Shkempi A., Wang L., Smith L.M., Zhang, X. (2023). **Update on The Apple Hearing Study**. *NHCA Spectrum*
- [C.3] Zhang, X., Shkempi, A., Smith, L.M., & Neitzel, R.L. (2023). **Noise Exposure and Acute Changes to Monitored Heart Rate among Electronic Waste Recycling Workers**. *NHCA Spectrum*
- [C.4] Zhang, X., Alves, S., Jiang, K., Myers, C., Reed, N., Deal, J. (2025). **Noise exposure and cognitive decline in ARIC-NCS**. *American Auditory Society Scientific and Technology Meeting*

## Service and Leadership

- **Co-Chair**, UM EHS Doctoral Student Peer Mentoring Program (DSPMP) (March 2023-present)
- **Mentor**, Undergraduate Research Opportunity Program (UROP) (September 2023-present)
- **Marketing Core**, National Hearing Conservation Association (NHCA) (February 2023-present)
- **Member**, UM Industrial Hygiene Students Association (UMIHSA) (September 2018-present)
- **Member**, American Industrial Hygiene Association (AIHA) (April 2020-present)
- **Service Chair**, UM Environmental Health Students Association (EHSA) (Aug 2022-May 2023)
- **Chair**, PKU Health Science Center Student Union (January 2017-May 2018)