Hemali H. Oza, PhD MS

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EDUCATION

Rollins School of Public Health, Emory University, Atlanta, Georgia — August 2023-Present
Postdoctoral Training, Environmental Health Sciences
Program: NIH (K-12 Award) IRACDA Emory FIRST Postdoctoral Fellowship
Focus: Climate resilience, wastewater surveillance, science communication
Mentors: Dr. Marlene Wolfe and Dr. Matthew Freeman

Doctor of Philosophy, Environmental Health Sciences — August 2019-August 2023
Dissertation: Development of Resilience Measurement Tool to Assess the Impact of RISE Interventions on Household and Community Resilience in Informal Settlements
Committee: Dr. Sheela Sinharoy (co-chair), Dr. Matthew Freeman (co-chair), Dr. Thomas Clasen, Dr. Noah Scovronick, and Dr. Lance Gunderson

Gillings School of Global Public Health, University of North Carolina-Chapel Hill — August 2018-August 2019
Master of Science, Environmental Sciences and Engineering
Thesis: Physical characterization of flocs and assessment of microbial reductions with the use of chitosan acetate as a cloth filter aid
Advisor: Dr. Mark Sobsey

Bachelor of Science in Public Health, Environmental Health Sciences — August 2014-May 2018
Highest Honors (GPA: 3.75)
Thesis: Chitosan acetate coagulation as a cloth filter aid for improving drinking water quality
Advisor: Dr. Mark Sobsey

PROFESSIONAL EXPERIENCE

Rollins School of Public Health, Emory University
Postdoctoral Fellow

Wastewater Surveillance Epidemiology of Infectious Disease & Implementation Science — August 2023-Present
Supervisor: Dr. Marlene Wolfe (marlene.wolfe@emory.edu, (617) 583-2401)
Atlanta, Georgia

- Leading syndemic analyses to investigate the co-occurrence and seasonal circulation patterns of acute respiratory infections (HMPV, RSV, SARS-CoV-2, Influenza A, and Influenza B) across Greater Atlanta during the 2022-2023 and 2023-2024 seasons; presenting findings at national conferences and preparing a manuscript for publication.
- Conducting epidemiological analyses to establish onset and offset periods of infectious diseases using multiple clinical health and high throughput wastewater surveillance datasets, creating data visuals, and presenting findings at conferences.
- Leveraging R software for data management, analyses, and visualization.
- Leading an evaluation and implementation science investigation to identify drivers and barriers to participation in the national WastewaterSCAN program by publicly owned treatment works and utilities, as well as assessing the adoption of wastewater surveillance data by public health departments for actionable policy decisions.
- Developing fact sheets and science communication materials for WastewaterSCAN, translating complex wastewater surveillance findings into accessible resources for utilities and public health departments across the U.S.

- Managing a public-facing science communications team, focused on demystifying wastewater surveillance, interpreting local and national data, and educating communities on infectious disease prevention, transmission pathways, and social determinants of health.

Peoplestown Flood and Drinking Water Investigation through Community Engagement — June 2024 - Present
Supervisor: Dr. Marlene Wolfe (marlene.wolfe@emory.edu, (617) 583-2401)
Atlanta, GA

- Engaging with the Peoplestown community in Atlanta, Georgia, to address concerns about tap water quality during flooding and heavy precipitation in a lower-income area experiencing frequent combined sewer overflow events.
- Managing the collection of flood and household tap water samples, testing for *E. coli* fecal indicators and additional physical characteristics to assess water safety and quality.
- Ensuring transparent communication by sharing water quality findings with the community, empowering residents with critical information and scientific advice about their environment.
- Fostering strong relationships and trust with community members through ongoing collaboration and communication.
- Using foundational public health principles to communicate to community members the concerns for combined sewer water overflows, and implications for health and alternative water sources.

Household Climate Resilience Assessment (Child Investment Fund Foundation) — August 2023- Present
Supervisor: Dr. Matthew Freeman (matthew.freeman@emory.edu, (404) 449-3636)
Atlanta, GA; Isiolo and Homa Bay County, Kenya

- Co-led formative research and contributed to grant writing for a household resilience investment feasibility study across five counties in Kenya, managing the project and facilitating coordination among multi-institutional and multi-cultural teams to ensure successful completion of grant deliverables.
- Investigated the impacts of droughts and floods on access to safe water, energy for cooking and lighting, and nutritious food using a mixed-methods approach, including 75+ focus group discussions and key informant interviews and 400+ household surveys.
- Conducted survey-weighted analyses to generate county-level estimates of resource disturbances and applied generalized estimating equations to evaluate differences based on aridity and regional contexts.
- Identified drivers and barriers to household resilience by examining how households prepare for, cope with, and recover from droughts and floods.
- Created data visualizations and logic models to present theories of change related to climate resilience, key findings, and evidence to support decision-making and policy development.
- Presented findings at professional meetings and conferences to disseminate scientific information and inform public health practice.
- Used findings to guide the design of targeted interventions and inform future investments and county-level policies aimed at enhancing community preparedness and adaptation to climate change.

Rollins School of Public Health, Emory University
Doctoral Research Fellow

Revitalizing Informal Settlements and their Environments (RISE) Study — January 2021 - August 2023
Supervisor: Dr. Sheela Sinharoy (Sheela.sinharoy@emory.edu, (404) 398-4881)
Atlanta, GA; Makassar, Indonesia; Suva, Fiji

- Developed, validated, and implemented measurement scales to assess economic and social resilience to floods in urban coastal informal settlements in Suva, Fiji, and Makassar, Indonesia, within the framework of an ongoing intervention aimed at reducing floodwater exposure and improving human health outcomes.
- Conducted a scoping review on resilience measurement tools, resulting in the creation of a resilience measurement framework.
- Designed and refined household surveys using cognitive interviews with in-country staff to ensure accuracy and relevance in measuring social and economic resilience.
- Analyzed data from 882 household surveys across 24 informal urban coastal communities in Indonesia and Fiji using factor analysis and item response theory to develop and validate resilience measurement scales.
- Developed and validated a method to measure the performance and efficacy of intervention designs in reducing the impacts of disturbances like flooding, with these scales incorporated into subsequent data collection phases post-intervention to assess sustainable impacts on informal communities in Fiji and Indonesia.

Occupational Health Outcomes among Sanitation Workers: a Systematic Review — August 2019- August 2021
Supervisor: Dr. Thomas Clasen (thomas.f.clasen@emory.edu)
Atlanta, GA

- Led a systematic review and meta-analysis on the global burden of disease among sanitation workers, culminating in a first-author manuscript published in 2022.
- Developed and registered the systematic review protocol, ensuring adherence to rigorous research standards.
- Established a collaboration with library staff to refine and execute the search strategy across multiple academic databases.
- Supervised a graduate research assistant, providing guidance on data extraction and analysis.

University of North Carolina, Department of Environmental Science and Engineering — August 2017- August 2019
Graduate Research Assistant, Chapel Hill, North Carolina
Supervisor: Dr. Mark Sobsey (mark_sobsey@unc.edu)

- Led a laboratory-based project to optimize the dose and application of a novel organic coagulant with cloth filters to maximize the removal of bacteria and viruses.
- Conducted jar tests to determine the optimal coagulant dose, followed by laboratory testing with spiked test water containing fecal-associated bacteria, viruses, and the waterborne pathogen *V. cholerae*, to assess the treatment's pathogen reduction performance.
- Utilized the single agar spread plate method and the double agar layer method for bacterial and viral enumeration.
- Performed analyses to assess whether the treatment achieved pathogen removal in accordance with World Health Organization standards for household water treatment systems.
- Conducted particle size analysis to evaluate the size distribution of coagulated particles (flocs).
- Led and trained a team of four undergraduate research assistants in aseptic techniques, scientific methodology, and laboratory procedures.
- First-authored a manuscript on the findings, which was published in 2022.

The Water Institute at UNC August 2018-
Graduate Research Assistant, Chapel Hill, North Carolina August 2019
Supervisor: Dr. Jamie Bartram (j.k.bartram@leeds.ac.uk)

- Led the analysis of a mixed-methods dataset from Malawian maternity wards to assess infection prevention and control measures in relation to environmental health conditions, resulting in a publication in 2020.
- Supported qualitative data analysis of key informant interviews focused on childbirth experiences in Malawian maternity wards and their connection to environmental health.
- Performed qualitative data coding and enhanced analytical skills in processing and interpreting interview data.

Center for Disease Control and Prevention (CDC) June - August
ORISE Research Fellow, Atlanta, Georgia 2017
Supervisor: Rob Blake (robert.blake@transylvaniacounty.org)

- Contributed to updating and revising the 2011 Emergency Water Supply Planning Guide for healthcare facilities.
- Played a key role in transforming a 200+ page document into a user-friendly guide to help healthcare facilities prepare for water outages.
- The updated guide was successfully released in the summer of 2019, providing practical solutions for healthcare facilities in emergency water management.

University of North Carolina, Department of Undergraduate Research June - August
SMART Research Fellow, Chapel Hill, North Carolina 2015
Supervisor: Dr. Emily Bailey (ebailey@campbell.edu), Dr. Mark Sobsey (mark_sobsey@unc.edu)

- Conducted research in the Science and Math Achievement and Resourcefulness Track (SMART) program to identify presumptive positive colonies of *Salmonella* spp. in raw sewage, reclaimed, and surface water samples.
- Gained experience in biochemical identification techniques and the analysis of presumptive positive *Salmonella* isolates.
- Developed skills in microbial detection and environmental water sample testing, enhancing laboratory research expertise.
- Contributed to shaping North Carolina policies on water resource management by providing evidence-based inputs on the decision not to pursue the use of Type II reclaimed water for potable reuse.

TEACHING

Co-Instructor, Environmental Studies Spring 2025
Department of Biology, Morehouse College, Atlanta, GA

Co-Instructor, Research Methods and Statistics II and Lab Fall 2024
Department of Psychology, Morehouse College, Atlanta, GA

Guest Lecturer, Research Methods for Studies of Water and Health Spring 2024
Gangarosa Department of Environmental Health, Emory University, Atlanta, GA

Co-Instructor, Scholarly Inquiry and Research Experience Spring 2023
Department of Biology, Emory University, Atlanta, GA

Co-Instructor, Integrated Learning Experience in Environmental Health Fall 2022
Gangarosa Department of Environmental Health, Emory University, Atlanta, GA

Teaching Assistantship, Research Development in Environmental Health Spring 2022
Gangarosa Department of Environmental Health, Emory University, Atlanta, GA

Teaching Assistantship, Environmental Law and Policy Spring 2021
Gangarosa Department of Environmental Health, Emory University, Atlanta, GA

Teaching Assistantship, Human Toxicology Fall 2020
Gangarosa Department of Environmental Health, Emory University, Atlanta, GA

Teaching Assistantship, Principles of Biology Fall 2018
Department of Biology, University of North Carolina, Chapel Hill, NC

MENTORSHIP

- Mentored 1 undergraduate student, 8 graduate students, and 1 doctoral student during my time at Emory University on various undergraduate and graduate research projects and theses. August 2021-Present
- Mentored and trained 4 undergraduate students on water and microbiology-based research methods and lab techniques at the University of North Carolina at Chapel Hill. August 2017-May 2019

COMPETENCIES

- **Analysis:** quantitative data analysis, qualitative data analysis, observational and experimental study design, factor analysis, item response theory approaches, systematic review and meta-analysis, and data quality appraisal
- **Data Collection:** survey instrument development (including validation and refinement through cognitive interviews), qualitative data instrument development, training and coordinating with in-country research assistants, multi-institutional ethics approvals and compliance, data cleaning and quality assessment
- **Laboratory:** microbial and physical water quality assessment for bacteria and viruses using a variety of methods including spread plate, double-agar layer technique, membrane filtration, and compartment bag tests in low-resource settings
- **Software:** R, ODK, Covidence, MAXQDA, SAS (basic)

CERTIFICATES & TRAININGS

- **FEMA IS-100.C:** Introduction to Incident Command System (August 2024)
- **FEMA IS-700.B:** An Introduction to the National Incident Management System (August 2024)
- **NSF CONVERGE:** Broader Ethical Considerations for Hazards and Disaster Researchers (July 2024)
- **NSF CONVERGE:** Collecting and Sharing Perishable Data (August 2024)
- **NSF CONVERGE:** IRB Procedures and Extreme Events Research (August 2024)
- **NSF CONVERGE:** Positionality in Hazard and Disaster Research and Practice (July 2024)
- **NSF CONVERGE:** Reciprocity in Hazards and Disaster Research (August 2024)

LEADERSHIP & SERVICE

- Department Student Government Outreach Chair, Emory University, 2021-2022
- Department Student Government Secretary and Social Chair, 2020-2021
- Captain of the competitive classical Indian dance Team, UNC-Chapel Hill, 2015-2019
- SMART Research Fellow Program Mentor, UNC-Chapel Hill, Summer 2018
- Covenant Scholar Mentor, UNC-Chapel Hill, 2017-2018
- Department Undergraduate Student Representative, UNC-Chapel Hill, 2016-2018
- Volunteer teacher at Shanti Bhavan Children's Project, Tamil Nadu, India, Summer 2016

AWARDS & HONORS

- Institutional Research and Academic Career Development Awards (IRACDA) (NIH-K12 Award), August 2024-Present
- Increasing Diversity in and Equitable Access to Applied Learning in Disaster Research Response (IDEAAL DR2) Fellowship, August 2024

- Achievement Rewards for College Scientists (ARCS) Foundation Herz Global Impact Scholar, 2021-2023
- Laney Graduate Fellow, 2019-2023
- Hazen & Sawyer Scholarship from the American Water Works Association, Summer 2018
- Science and Math Achievement and Resourcefulness Track (SMART) Fellowship, Summer 2015
University of North Carolina Covenant Scholar, 2014-2018

PUBLICATIONS

* indicates equal contribution

1. **Oza, H. H.**, Nanavati, A., Clasen, T., Salinger, A. P., Freeman, M., & Sinharoy, S. (2025). A Critical Review on Measurement Tools of Urban Household and Community Resilience to Disasters and Environmental Shocks and Stressors among Low-and Middle-Income Countries: Theory, Application, and Guidance. International Journal of Disaster Risk Reduction, 105267. https://doi.org/10.1016/j.ijdrr.2025.105267
2. Hubbard, S., Wolf, J., **Oza, H. H.**, Arnold, B. F., Freeman, M. C., & Levy, K. (2025). Differential Effectiveness of Water, Sanitation, and Handwashing Interventions to Reduce Child Diarrhea in Dry and Rainy Seasons: A Systematic Review and Meta-Analysis of Intervention Trials. Environmental health perspectives, 133(2), 26001. https://doi.org/10.1289/EHP14502
3. Coleman, C.K.; Oza, H.H.; Bailey, E.S.; Sobsey, M.D. A Review of Chitosan as a Coagulant of Health-Related Microorganisms in Water and Wastewater. Environments 2024, 11, 211. https://doi.org/10.3390/environments11100211
4. Holmes, E. B., **Oza, H. H.**, Bailey, E. S., & Sobsey, M. D. (2023). Evaluation of Chitosans as Coagulants-Flocculants to Improve Sand Filtration for Drinking Water Treatment. International journal of molecular sciences, 24(2), 1295. https://doi.org/10.3390/ijms24021295
5. **Oza, H. H.**, Holmes, E. B., Bailey, E. S., Coleman, C. K., & Sobsey, M. D. (2022). Microbial reductions and physical characterization of chitosan flocs when using chitosan acetate as a cloth filter aid in water treatment. PloS one, 17(1), e0262341. https://doi.org/10.1371/journal.pone.0262341
6. **Oza, H. H.***, Lee, M. G.*, Boisson, S., Pega, F., Medlicott, K., & Clasen, T. (2022). Occupational health outcomes among sanitation workers: A systematic review and meta-analysis. International Journal of Hygiene and Environmental Health, 240, 113907. https://doi.org/10.1016/j.ijheh.2021.113907
7. Bailey, E. S., Beetsch, N., Wait, D. A., **Oza, H. H.**, Ronnie, N., & Sobsey, M. D. (2021). Methods, Protocols, Guidance and Standards for Performance Evaluation for Point-of-Use Water Treatment Technologies: History, Current Status, Future Needs and Directions. Water, 13(8), 1094. https://doi.org/10.3390/w13081094
8. Coleman, C. K., Mai, E., Miller, M., Sharma, S., Williamson, C., **Oza, H.**, Holmes, E., Lamer, M., Ly, C., Stewart, J., Sobsey, M. D., & Abebe, L. S. (2021). Chitosan Coagulation Pretreatment to Enhance Ceramic Water Filtration for Household Water Treatment. International journal of molecular sciences, 22(18), 9736. https://doi.org/10.3390/ijms22189736
9. **Oza, H. H.**, Fisher, M. B., Abebe, L., Cronk, R., McCord, R., Reuland, F., Behnke, N., Kafanikhale, H., Mofolo, I., Hoffman, I., & Bartram, J. (2020). Application of tools to monitor environmental conditions, identify exposures, and inform decision-making to improve infection prevention and control practices in Malawian maternity wards. Environmental monitoring and assessment, 192(2), 1-11. https://doi.org/10.1007/s10661-020-8089-5

Manuscripts Under Review or in Preparation

1. **Oza, H.H.**, Salinger, A., Taruc, R., Tela, A., Barker, F., Leder, K., Freeman, M., Clasen, T., & Sinharoy, S. Resilience Measurement for Environmental Shocks and Stressors: Scale Development and Validation for Urban Areas in Low- and Middle-Income Countries.
2. **Oza, H.H**, Hilton, S., Boehm, A., & Wolfe, M. Flushing out the Details: Unraveling Respiratory Virus Dynamics in Atlanta's Wastewater.

Other Publications

1. Ogutu, E., **Oza, H.,** Muga, R., Freeman, M. Resilient Household Investment Feasibility Assessment (RHIFA): Work Package 3a Evidence Generation and Documentation—Qualitative Component. July 2024. Nairobi, Kenya. [Report submitted to CIFF]
2. **Oza, H.,** Ogutu, E., Muga, R., Freeman, M. Resilient Household Investment Feasibility Assessment (RHIFA): Work Package 3b Evidence Generation and Documentation—Quantitative Component. August 2024. Nairobi, Kenya. [Report submitted to CIFF]

PRESENTATIONS

Oza, H.H, Hilton, S., Boehm, A., & Wolfe, M. "Flushing out the Details: Unraveling Respiratory Virus Dynamics in Atlanta's Wastewater." Verbal presentation at UNC Water and Health Conference, Chapel Hill, NC Fall 2024.

Oza, H.H.; Salinger, A.; Taruc, R.; Barker, F.; Leder, K.; Freeman, M.; Clasen, T.; Sinharoy, S.. "Development of Resilience Measurement Tool to Assess the Impact of RISE Interventions on Household and Community Resilience in Informal Settlements." Poster presentation at the UNC Water and Health Conference, Chapel Hill, NC. Fall 2023.

Oza, H.H.; Lee, M.G.; Boisson, S.; Pega, F.; Medlicott, K.; Clasen, T. "Occupational Health Outcomes among Sanitation Workers: A Systematic Review and Meta-Analysis." Poster presentation at the UNC Water and Health Conference, Chapel Hill, NC. Fall 2020.

Oza, H.H.; Holmes, E.B.; Miller, M.; Lafontaine, S.; Patel, S.; Edward, B.; Coleman, C.K.; Sobsey, M.D. "Evaluation of chitosan as a transformative coagulant-flocculant to improve cloth and sand filter drinking water treatment." Poster presentation (presented by Sobsey, M.D.) at the International Water Association Conference, Geneva, Switzerland. Fall 2019.

Oza, H.H.; Holmes, E.B.; Sobsey, M.D. "Physical characterization of chitosan flocs during coagulation-flocculation procedures using a particle size analyzer." Poster presentation at the UNC Water Microbiology Conference, Chapel Hill, NC. Spring 2019.

Lafontaine, S.*; Patel, S.*; **Oza, H.H.**; Holmes, E.B.; Sobsey, M.D. "Microbial reductions from water using chitosan and cloth filtration." Poster presentation at the UNC Water Microbiology Conference, Chapel Hill, NC. Spring 2019.

Oza, H.H.; Fisher, M.B.; Cronk, R. "The Causes and Consequences of Inadequate Environmental Health Conditions in Maternity Wards in Health Care Facilities in Malawi." Verbal presentation at the UNC Water and Health Conference, Chapel Hill, NC. Fall 2018.

Holmes, E.B.*; Coleman, C.K.; **Oza, H.H.**; Sobsey, M.D. "Summary of work with chitosan and various filtration technologies" Side event verbal presentation at the UNC Water and Health Conference, Chapel Hill, NC. Fall 2018.

Oza, H.H.; Holmes, E.B.; Coleman, C.K.; Abebe, L.; Sobsey, M.D. "Microbial and turbidity removal by chitosan coagulation in natural waters to optimize cloth water filtration for household drinking water treatment." Verbal presentation at the UNC Water Microbiology Conference, Chapel Hill, NC. Spring 2018.

Oza, H.H.; Holmes, E.B.; Coleman, C.K.; Abebe, L.; Sobsey, M.D. "Microbial and turbidity removal by chitosan coagulation in natural waters to optimize saree cloth water filtration for household drinking water treatment." Poster presentation at UNC Water Microbiology Conference, Chapel Hill, NC. Spring 2017.

Oza, H.H.; Bailey, E.; Sobsey, M.D. "Identifying presumptive positive colonies of Salmonella spp. In raw sewage, reclaimed, and surface water sources." Poster presentation at the SMART Fellow Symposium, Chapel Hill, NC. Summer 2015.

INVITED

Panel Discussion at UNC Chapel Hill Water and Health Conference 2021: Looking Deeper: A research agenda to advance health, safety, and dignity of sanitation workers. Convening Organizations: WHO, WaterAid, ILO, World Bank, SNV, **Emory University**