

Lisa Frueh, MPH

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Education

- PhD Drexel Dornsife School of Public Health** Philadelphia, PA
Department: Environmental and Occupational Health
Mentor: Jane E. Clougherty, MsC, ScD
Expected 2026
- MPH Harvard T.H. Chan School of Public Health** Boston, MA
Field of Study: Social and Behavioral Sciences
Concentration: Women, Gender, and Health
Sept. 2019 - March 2021
- BA Reed College** Portland, OR
Major: Chemistry
Thesis: A contribution to the fight against malaria: novel synthesis and characterization of 3-alkylarylether-4(1H)-quinolones with antimalarial properties
Sept. 2011 - May 2015

Research & Training Interests

- Environmental epidemiology
- Social epidemiology
- Spatial epidemiology
- Health disparities
- Neighborhoods and health
- Climate change and health
- Air pollution
- Heat
- Exposure science

Research Experience

- Drexel University Dornsife School of Public Health, Philadelphia, PA** Sep. 2022 – Present
Research Fellow, Jane E. Clougherty, Dept. of Environmental and Occupational Health (Sep. 2022 – Present)
Supporting research activities related to two climate-related projects: 1) developing and implementing a community-based air monitoring protocol in a South Philadelphia fenceline community; 2) identifying and analyzing GIS-based social stressors and asset indicators in upstate New York and assigning air pollution and temperature exposures to a large, geocoded health dataset. Performing epidemiologic analyses investigating the link between climate-related stressors and pediatric health and the role of social stressors/resilience factors in mediating or modifying the relationship.
- Inclusion, Diversity, Equity, & Antiracism (IDEA) Fellow* (May 2023 – Sep. 2023)
Developed online GIS-based resources for non-academics to visually explore select metrics of spatial social polarization. Contributed to the authorship of a systematic review on spatial social polarization measures [currently in submission]. Available at: https://drexel-uhc.shinyapps.io/SSP_Maps/
- Harvard T.H. Chan School of Public Health, Boston, MA** Feb. 2021 – Sept. 2022
Research Assistant, Francine Laden, Dept. of Environmental Health
Developed online GIS-based resources for community members about environmental racism in greater Boston across four domains: residential segregation, neighborhood exposures, household exposures, and personal care products.
- Brigham and Women's Hospital, Boston, MA** Nov. 2019 – May 2022
Research Assistant, Channing Division of Network Medicine
Wrote literature reviews, reviewed manuscripts, and supported research activities in the Nurses' Health Studies, which investigate diet, lifestyle, and social risk factors associated with major chronic diseases in women. Administrative duties included website maintenance (external and internal) and co-coordinating the annual newsletter.

Project Weber / RENEW (PWR), Providence, RI

May 2021 – May 2022

Research Team Volunteer

Extracted qualitative and quantitative data from police reports of overdose calls in 2019/2020 in Providence, RI. Worked with a team of researchers at Brown University School of Public Health and advocates from harm-reduction organization PWR to develop an evidence base for future policy recommendations to limit police response to overdose calls in favor of Fire/Rescue. Published findings in academic papers as well as policy briefs.

Massachusetts Department of Public Health, Boston, MA

May – Sept. 2020

Summer Intern, Bureau of Community Health and Prevention

Authored a report summarizing results of COVID-19 impact surveys with a health equity focus, including a repository of ongoing surveys and recommendations for equity-focused pandemic response. Presented findings to stakeholders at the Massachusetts Department of Public Health.

Oregon Health and Science University, Portland, OR

2012 - 2019

Research Assistant, Brandon Maughan, Dept. of Emergency Medicine (Sept. 2018 – Aug. 2019)

Built and managed online survey data collection and participant management database in REDCap for a study on quality of life after pulmonary embolism, collaborated with primary investigator on IRB applications and revisions, conducted qualitative interviews, and published a systematic review of relevant literature.

Research Assistant, Michael Riscoe, Dept. of Molecular Microbiology and Immunology (May 2014 – Aug. 2017)

Developed novel antimalarial drugs in a diverse team of chemists and biologists working toward a low-cost, single-dose cure for malaria, mentored summer interns and one undergraduate thesis.

Research Assistant, Mary Stenzel-Poore, Dept. of Molecular Microbiology and Immunology (May – Sept. 2012)

Studied blood-brain barrier inflammatory response pathways following ischemic injury.

Reed College, Portland, OR

May – Sept. 2013

Student Research Assistant, Aaron Nilsen, Dept. of Chemistry

Designed and synthesized six analogs of a promising anti-Dengue virus compound in a team of four undergraduate students, communicated results to chemistry department faculty in a written report and oral presentation at the end of the summer.

Teaching Experience

Drexel University, Philadelphia, PA

2023 – present

Teaching Assistant, Dept. of Environmental and Occupational Health (March – June 2024)

Assisted with syllabus design, assessment design, grading, and instruction of Exposure Science, a masters-level course.

Teaching Assistant, Dept. of Environmental and Occupational Health (Sept. – Dec. 2023)

Assisted with syllabus design, grading, and instruction of Introduction to Environmental and Occupational Health, a masters-level course.

Reed College, Portland, OR

2012 - 2014

Teaching Assistant, Dept. of Chemistry (Sept. 2012 – May 2014)

Assisted instruction of introductory (2012-2013) and analytical chemistry (2013-2014) laboratories.

Tutor, Head Tutor, Academic Support Services (Sept. 2012 – May 2014)

Instructed on an individual basis and in groups at the tutoring center; subjects taught included eight courses in chemistry, biology, and mathematics.

Grants

Mini-Grants

Build Up Peace Engineering Fellowship 2023 – 2024
“Evaluating report-back of results from an air monitoring network in industrialized South Philadelphia communities”

Awards

Mid-Atlantic Regional Public Health Training Center 2024
Faculty-Student Collaborative Project

Administered through the University of Pittsburgh, Collaborative Projects provide funding for students to work with faculty in practice-based research and evidence-based practice. This award provided funding for a summer-long project to work on data analysis and report-back materials for THRIVEair, an NIH-funded community-based participatory air monitoring study in South and Southwest Philadelphia.

Drexel University

Graduate College Doctoral Fellowship – Gold Level 2022 – 2024
University-wide, faculty-nominated fellowship for graduate students. Gold level funding (\$10,000 award) awarded to 2-3 students annually.

Dean’s Doctoral Fellowship 2022 – 2024
School-wide, faculty-nominated fellowship that provided full stipend support for the first two years of my doctoral training. I was the only recipient of this award in 2022 and was re-appointed for the 2023-2024 academic year.

Inclusion, Diversity, Equity & Antiracism (IDEA) Fellowship 2023
School-wide fellowship that funded work on a project to create interactive, GIS-based resources about measures of spatial social polarization.

Harvard University

MPH Scholarship 2019 – 2021
Merit-based scholarship covering 50% of tuition and fees.

Honors

Outstanding Promise Student Award, Drexel Dornsife School of Public Health 2024
School-wide that recognizes one student in each academic level (undergraduate, master’s, and doctoral) who has “exhibited great promise for regional or national societal impact, and accordingly, for enhancing Drexel’s reputation, now and in the future.”

Runner-Up, ArcGIS Online StoryMap Competition, ESRI 2022
The 2022 ArcGIS StoryMaps Competition “invited storytellers globally to build stories about an idea, challenge, or solution through innovative data visualization techniques using ArcGIS StoryMaps.” There was one winner and one runner-up in the Humanitarian and Social Justice category.

Phi Beta Kappa, Reed College 2015
National honors society, with membership based on recommendation from participating school.

Commendation for Excellence in Scholarship, Reed College 2011 – 2014
Faculty-nominated commendation for academic achievement, awarded annually.

Service

Public Health Doctoral Students Advisory Group Executive Board, Drexel University Dornsife School of Public Health

Co-President June 2024 – Present

Facilitating biweekly board meetings, quarterly meetings with administration, and regular organization events.

Event Coordinator June 2023 – June 2024

Organized events for doctoral students in the school, coordinating with other board members, submitting event documentation and budget requests. Attending biweekly board meetings and events.

Journal Club Committee, Drexel University Dornsife School of Public Health

April 2023 – Present

Co-Organizer

Organizing monthly journal clubs in Environmental and Occupational Health.

Seminar Committee, Drexel University Dornsife School of Public Health

Sept. 2022 – Present

Co-Organizer

Selecting speakers for seminars departmental seminars in Environmental and Occupational Health with two faculty members.

Professional Activities

Editorial Duties

Social Science and Medicine – Reviewer 2024

Environmental Justice Journal – Reviewer 2023

Science of the Total Environment (STOTEN) – Reviewer 2022

American Public Health Association – Abstract reviewer 2021

Media Exposure

1. Rowhomes versus refineries: Academics and community members are working together to tackle environmental hazards as part of Drexel's new Environmental Collaboratory, a pioneering initiative that funds research activism. *Drexel Magazine*. 2023. Available at: <https://drexelmagazine.org/2023/rowhomes-versus-refineries/>
2. Show and tell: Interactive map tells story of environmental racism in Boston. *HSPH Center for Health Communications Blog*. 2023. Available at: <https://www.hsph.harvard.edu/chc/2023/03/02/show-and-tell-interactive-map-tells-story-of-environmental-racism-in-boston/>
3. Project on racial residential segregation runner-up in data viz competition. *HSPH News*. 2023. Available at: <https://www.hsph.harvard.edu/news/hsph-in-the-news/project-on-racial-residential-segregation-runner-up-in-data-viz-competition/>
4. University research examines role of police at overdose incidents. *Brown Daily Herald*. 2022. Available at: <https://www.browndailyherald.com/article/2022/11/university-research-examines-role-of-police-at-overdose-incidents>
5. Get inspired by the 2022 ArcGIS StoryMaps Competition winners—a showcase of stunning data viz. *Esri ArcGIS Blog*. 2022 Available at: <https://www.esri.com/arcgis-blog/products/arcgis-storymaps/constituent-engagement/get-inspired-by-the-2022-arcgis-storymaps-competition-winners/>
6. At overdose events, arrests by police and combative behavior are rare, study finds. *Brown University News*. 2022. Available at: <https://www.brown.edu/news/2022-11-07/police-overdose>
7. Interactive series explores environmental racism. *HSPH News*. 2022. Available at: <https://www.hsph.harvard.edu/news/features/interactive-web-series-explores-environmental-racism/>

Professional Development

Columbia University, New York, NY

July 1-2, 2024

Skills for Health and Research Professionals (SHARP) Training | Code Rigor and Reproducibility in R

Columbia University, New York, NY (virtual)

Aug. 2-3, 2021

Skills for Health and Research Professionals (SHARP) Training | Environmental Justice Boot Camp: Theory and Methods to Study Environmental Health Disparities

Skills

Research: Literature review, project design, data science including regression analysis, spatial statistical methods, survey design, participant recruitment, qualitative interviewing

Computer: R, Python, SAS, ArcGIS

Languages: English (first language), German (intermediate), Spanish (novice)

Peer-Reviewed Publications

1. **Frueh L**, Sharma R, Sheffield PE, Clougherty JE. Community violence and asthma: A review. *Annals of Asthma, Allergy & Immunology* 2024 [in press].
2. Sharma R, Humphrey JL, **Frueh L**, Kinnee EJ, Sheffield PE, Clougherty JE. Neighborhood violence and socioeconomic deprivation influence associations between acute air pollution and temperature on childhood asthma in New York City. *Environmental Research* 2023;213(3):116235. doi:10.1016/j.envres.2023.116235
3. Zeleznik OA, Kang JH, Su J, **Frueh L**, Elze T, Khawaja A, Wiggs JL, Clish C, Rosner B, Pasquale L, Eliassen H. Plasma Metabolite Profile for Primary Open-angle Glaucoma in Three US Cohorts and the UK Biobank. *Nature Communications* 2023;14(1):2860. doi: 10.1038/s41467-023-38466-w
4. **Frueh L**, Collins AB, Newman R, Barnett NP, Rich JD, Clark MA, Marshall BDL, Macmadu A. Multi-level influences on increased overdose risk behaviors during the COVID-19 pandemic among people who use drugs in Rhode Island: a qualitative investigation. *Harm Reduction Journal*. 2023;20(1):14. doi:10.1186/s12954-023-00741-w
5. Zeleznik OA, Welling DB, Stankovic K, **Frueh L**, Balasubramaniam R, Curhan GC, Curhan SG. Association of Plasma Metabolomic Biomarkers With Persistent Tinnitus: A Population-Based Case-Control Study. *JAMA Otolaryngology–Head & Neck Surgery* 2023;149(5):404-415. doi:10.1001/jamaoto.2023.0052
6. Wang T, Heng YJ, Baker GM, Bret-Mounet VC, Quintana LM, **Frueh L**, Hankinson SU, Holmes MD, Chen WY, Willet WC, Rosner B, Tamimi RM, Eliassen HA. Loss of PTEN Expression, PIK3CA Mutations, and Breast Cancer Survival in the Nurses' Health Studies. *Cancer Epidemiol Biomarkers Prev*. 2022;31(10):1926-1934. doi:10.1158/1055-9965.EPI-22-0672
7. Macmadu A, Yolken A, **Frueh L**, Touissant JR, Newman R, Jacka BP, Collins AB, Marshall BDL. Characteristics of events in which police responded to overdoses: an examination of incident reports in Rhode Island. *Harm Reduct J*. 2022;19(1):1-10. doi:10.1186/s12954-022-00698-2
8. Kang JH, Zeleznik O, **Frueh L**, Lasky-Su J, Eliassen HA, Clish C, Rosner BA, Pasquale LR, Wiggs JL. Prediagnostic Plasma Metabolomics and the Risk of Exfoliation Glaucoma. *Investigative Ophthalmology & Visual Science*. 2022;63(9):15. doi:10.1167/iovs.63.9.15

9. Kang JH, Wang M, **Frueh L**, Rosner B, Wiggs JL, Elze T, Pasquale LR. Cohort Study of Race/Ethnicity and Incident Primary Open-Angle Glaucoma Characterized by Autonomously Determined Visual Field Loss Patterns. *Translational Vision Science & Technology*. 2022;11(7):21. doi:10.1167/tvst.11.7.21
10. Macmadu A, **Frueh L**, Collins AB, Newman R, Barnett NP, Rich JD, Clark MA, Marshall BDL. Drug use behaviors, trauma, and emotional affect following the overdose of a social network member: A qualitative investigation. *Int J Drug Policy*. 2022;107:103792. doi:10.1016/j.drugpo.2022.103792
11. Pal AC, Renard I, Singh P, Vydyam P, Chiu JE, Pou S, Winter RW, Dodean R, **Frueh L**, Nilsen AC, Riscoe MK, Doggett S, Mamoun BC. *Babesia duncani* as a model organism to study the development, virulence and drug susceptibility of intraerythrocytic parasites *in vitro* and *in vivo*. *Journal of Infectious Diseases*. Published online May 4, 2022;jiac181. doi:10.1093/infdis/jiac181
12. Mínguez-Alcarón L, **Frueh L**, Williams PL, James-Todd T, Souter S, Ford JB, Rexrode KM, Calafat AM, Hauser R, Chavarro JE, The Earth Study Team. Pregnancy urinary concentrations of bisphenol A, parabens and other phenols in relation to serum levels of lipid biomarkers: Results from the EARTH study. *Science of the Total Environment*. 2022;833(10):155191. doi: 10.1016/j.scitotenv.2022.155191
13. Pou S, Dodean RA, **Frueh L**, Liebman KM, Gallagher RT, Jin H, Jacobs RY, Nilsen A, Stuart DR, Doggett JS, Riscoe MK, Winter RW. A New Scalable Synthesis of ELQ-300, ELQ-316, and other Antiparasitic Quinolones. *Organic Process Research & Development*. 2021;25(8):1841-1852. doi:10.1021/acs.oprd.1c00099
14. Chiu JE, Renard I, Pal AC, Singh P, Vydyam P, Thekkiniath J, Kumar M, Gihaz S, Pou S, Winter RW, Dodean R, **Frueh L**, Nilsen AC, Riscoe MK, Doggett JS, Mamoun CB. Effective Therapy Targeting Cytochrome bc1 Prevents Babesia Erythrocytic Development and Protects from Lethal Infection. *Antimicrobial Agents and Chemotherapy*. 2021;65(9):e0066221. doi:10.1128/AAC.00662-21
15. Zeleznik OA, Balasubramanian R, Zhao Y, **Frueh L**, Jeanfavre S, Avila-Pachecho J, Clish CB, Tworoger S, Eliassen HA. Circulating amino acids and amino acid-related metabolites and risk of breast cancer among predominantly premenopausal women. *NPJ Breast Cancer*. 2021;7(1):1-10. doi:10.1038/s41523-021-00262-4
16. Zeleznik OA, Balasubramanian R, Ren Y, Tobias DK, Rosner BA, Peng C, Bever AM, **Frueh L**, Jeanfavre S, Avila-Pachecho J, Clish CB, Mora S, Hu FB, Eliassen HA. Branched-Chain Amino Acids and Risk of Breast Cancer. *JNCI Cancer Spectrum* 2021;5(5):pkab059. doi:10.1093/jncics/pkab059
17. Maughan BC, **Frueh L**, McDonagh MS, Casciere B, Kline JA. Outpatient Treatment of Low-risk Pulmonary Embolism in the Era of Direct Oral Anticoagulants: A Systematic Review. *Academic Emergency Medicine*. 2021;28(2):226-239. doi: 10.1111/acem.14108
18. Potharaju S, Mutyam SK, Liu M, Green C, **Frueh L**, Nilsen A, Pou S, Winter R, Riscoe MK, Shankar G. Improving solubility and oral bioavailability of a novel antimalarial prodrug: comparing spray-dried dispersions with self-emulsifying drug delivery systems. *Pharmaceutical Development and Technology*. 2020;25(5):625-639. doi:10.1080/10837450.2020.1725893
19. Smilkstein MJ, Pou S, Krollenbrock A, Bleyle LA, Dodean RA, **Frueh L**, Hinrichs DJ, Li Y, Martinson T, Munar MY, Winter RW, Bruzal I, Whiteside S, Nilsen A, Koop DR, Kelly JX, Kappe SH, Wilter BK, Riscoe MK. ELQ-331 as a prototype for extremely durable chemoprotection against malaria. *Malaria Journal*. 2019;18(1):291. doi:10.1186/s12936-019-2921-9
20. Smith JL, Sheridan K, Parkins CJ, **Frueh L**, Jemison AL, Strode K, Dow G, Nilsen A, Hirsch AJ. Characterization and structure-activity relationship analysis of a class of antiviral compounds that directly

bind dengue virus capsid protein and are incorporated into virions. *Antiviral Research*. 2018;155:12-19. doi:10.1016/j.antiviral.2018.04.019

21. **Frueh L**, Li Y, Mather MW, Li Q, Pou S, Nilsen A, Winter TW, Forquer IP, Pershing AM, Xie LH, Smilkstein MJ, Caridha D, Koop DR, Campbell RF, Sciotti RJ, Kreishman-Deitrick M, Kelly JX, Vesely B, Vaidya AB, Riscoe MK. Alkoxy carbonate Ester Prodrugs of Preclinical Drug Candidate ELQ-300 for Prophylaxis and Treatment of Malaria. *ACS Infectious Diseases*. 2017;3(10):728-735. doi:10.1021/acsinfecdis.7b00062

Other Publications

Theses

1. **Frueh L**. A contribution to the fight against malaria: novel synthesis and characterization of 3-alkylarylether-4(1H)-quinolones with antimalarial properties. Undergraduate thesis. Reed College, May 2015.

Patents

1. Riscoe M, Nilsen A, Stickles A, Miley G, Winter R, Pou S, Li Y, Jane XK, Forquer I, Doggett S, Bruzal I, **Frueh L**, Dodean R, Smilkstein M, Alday H, Koop D, Bleyle L, inventor; Oregon Health and Science University, US Departments of Veterans Affairs, assignee. Quinolone-3-diarylethers. U.S. Patent No. 10,584,098 March 10, 2020.

Teaching Resources

1. Moller B, **Frueh L**, DePietro J, Rushovich R. (2020). Gender Analysis of COVID-19 Response. Teaching example from Women, Gender, and Health course (WGH 207), Harvard T.H. Chan School of Public Health. Available from the Harvard Case-Based Learning Initiative: <https://caseresources.hsph.harvard.edu/case-library>.
2. **Frueh L**. (2020). Sex, Gender, COVID-19, and DAGs: A 60-Minute Teaching Module for Introductory Epidemiology Lab. Teaching example from Women, Gender, and Health course (WGH 300), Harvard T.H. Chan School of Public Health. Available from the Harvard Case-Based Learning Initiative: <https://caseresources.hsph.harvard.edu/case-library>.

Conference Abstracts and Presentations

1. Clougherty JE, **Frueh L**, Sheffield PE. Climate resilience. Panel discussion presented at: 2024 CAFÉ Climate and Health Conference; February, 2024; [virtual].
2. **Frueh L**, Sharma R, Kinnee EJ, Just AC, Sheffield PE, Clougherty JE. PM_{2.5} exposure is associated with an increased risk of pediatric ED visits in New York State, particularly at low concentrations. Poster presented at: 2023 International Society for Environmental Epidemiology (ISEE) Conference; September, 2023; Kaohsiung, Taiwan.
3. **Frueh L**. South Philadelphia Community Air Monitoring Project: Community-Based Participatory Study Design. Oral presentation at: 2023 International Society for Environmental Epidemiology North American Chapter (ISEE NAC) Conference; June, 2023; Corvallis, OR.
4. **Frueh L**. Climate change-related exposures and risk of hospitalization among children aged 0-17 in New York State, 2005-2019: Preliminary analyses from the Understanding Pediatric Susceptibility Across Temperature and Environment in New York (UPStATE NY) Study. Oral presentation at: 2023 Society for Epidemiologic Research Conference; June, 2023; Portland, OR.
5. **Frueh L**, Winter RW, Nilsen A, Kelly JX, Li Y, Smilkstein MJ, Potharaju S, Mutyam S, Shankar G, Riscoe MK. Novel prodrugs and formulations of antimalarial preclinical candidate ELQ- 300. Poster

presented at: 2016 American Society of Tropical Medicine and Hygiene 65th Annual Meeting; November, 2016; Atlanta, GA.

Invited Presentations

1. **Frueh L.** Communicating environmental health: from interactive web resources for broad audiences to targeted community air monitoring report-backs. Oral presentation at: OHSU-PSU School of Public Health; July 2024; Portland, OR.
2. **Frueh L.** Building an online interactive mapping resource to visualize spatial social polarization at varying scales: Challenges and opportunities. Oral presentation at: Drexel University Urban Health Collaborative GIS Day; November, 2023; Philadelphia, PA.
3. **Frueh L.** A Brief History of Redlining in Greater Boston. Oral presentation at: Metropolitan Area Planning Council; October, 2022; Boston, MA [held virtually].
4. **Frueh L.** Communicating Environmental Justice Research: The NIEHS Center Environmental Racism StoryMap. Oral presentation at: Harvard T.H. Chan School of Public Health Environmental Justice Student Organization; March, 2022; Boston, MA.
5. **Frueh L.** Development of an interactive, GIS-based online resource for a broad audience. Oral presentation at: Harvard Chan NIEHS-Center SPARC Session; February, 2022; Boston, MA [held virtually].