Tyler J. S. Smith, PhD, MPH

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Summary

I am a data scientist with a PhD and 13 years of research experience. I sharpen ambiguous questions, develop scalable and reproducible data analysis workflows, and report actionable results to decision-makers. I am expert in building and maintaining complex data sets; applying a wide variety of statistical and machine learning algorithms; programming with Python, R, and SQL; and visualizing data. I work comfortably with leaders and stakeholders at all levels and communicate effectively with technical and non-technical audiences.

Education

2023	**PhD, Exposure Science and Environmental Epidemiology**	Baltimore, MD
	Johns Hopkins University	

2015	**MPH, Epidemiologic and Biostatistical Methods**	Baltimore, MD
	Johns Hopkins University	

2011	**BA, History**	Baltimore, MD
	Johns Hopkins University	

Professional Experience

2023-Present — Postdoctoral Research Fellow — New York, NY
Icahn School of Medicine at Mount Sinai

- Developing software to implement causal inference techniques with parametric and nonparametric models to quantify improvements in child development under simulated reductions in air pollution across 12 countries.
- Training Bayesian machine learning models to estimate associations between air pollution mixtures and folate metabolism among pregnant women in Canada to inform revisions to national folate supplementation recommendations.
- Disseminating research via journal articles (career total: 9) and international and national conference presentations (12), and sharing code via GitHub.

2019-2023 — Doctoral Researcher — Baltimore, MD
Johns Hopkins University

- Applied g-computation with Poisson regression models to quantify reductions in respiratory infections among infants in Bangladesh under simulated interventions to reduce arsenic exposure in pregnancy.
- Used principal components analysis (PCA) for dimensionality reduction and self-organizing maps for cluster analysis to identify 11 environmental exposure patterns among pregnant women and infants in Bangladesh.
- Fitted linear, beta, and Dirichlet regression models to estimate associations between anthropometric measures (*e.g.*, BMI) and arsenic metabolism to identify pregnant women in Bangladesh at greater risk of arsenic toxicity.
- Implemented inverse probability weights derived using logistic regression models to reduce selection bias in analysis of arsenic exposure, hemoglobin, and anemia among pregnant women in Bangladesh.
- Developed static and interactive data visualizations for journal articles and presentations using ggplot2, plotly, and other packages.
- Designed scalable and reproducible data analysis pipelines with SQL, Python, and R and organized data systematically for efficient collaboration among team members.

| 2016-2019 | **Staff Scientist** | New York, NY |

Earthjustice
- Partnered with senior leadership to address scientific and technical issues underlying legal advocacy related to antibiotic use in food animals, foodborne chemicals, agricultural greenhouse gas emissions, and other topics.
- Communicated scientific issues to technical audiences (*e.g.*, organized and presented in scientific conference sessions) and non-technical audiences (*e.g.*, prepared memoranda for attorneys, testified before state legislatures, wrote op-eds).
- Briefed United Nations member-states on antibiotic use in food animals at the 2016 UN General Assembly High-Level Meeting on Antimicrobial Resistance.

| 2015-2016 | **Manager and Consultant** | Yonkers, NY |

Consumer Reports
- Analyzed datasets on antibiotic use in food animals, arsenic in food, and other food system topics for publication in *Consumer Reports*.
- Ensured technical accuracy of content published in *Consumer Reports*, upholding the stringent editorial standards of a prominent brand in a litigious environment.
- Represented organization to foreign governments at meetings of the World Health Organization's Codex Alimentarius Commission on international trade standards.

| 2013-2014, 2020-2023 | **Teaching Assistant** | Baltimore, MD |

Johns Hopkins University
- Assisted in three graduate courses on quantitative risk analysis and three graduate courses on environmental, occupational, and molecular epidemiology, lecturing in review sessions, grading assignments and exams, and answering student questions.

| 2011-2015 | **Program Officer** | Baltimore, MD |

Johns Hopkins Center for a Livable Future
- Developed deterministic and probabilistic process-based models of environmental exposure and risk, including cancer risks associated with food additives in soft drinks, and documented models for non-technical industry clients.
- Led outreach to policymakers on antibiotic use in food animals, organizing Capitol Hill briefings, representing the organization in Congressional and agency meetings, drafting op-eds, and advising advocacy coalitions on scientific and technical questions.

Select Publications and Presentations

2023	Estimating Causal Effects of Interventions on Early-life Environmental Exposures Using Observational Data. *Current Environmental Health Reports* [Link]
2023	Anthropometric Measures and Arsenic Methylation among Pregnant Women in Rural Northern Bangladesh. *Environmental Research* [Link]
2022	Drinking Water Arsenic, Hemoglobin, and Anemia among Pregnant Women in Rural Northern Bangladesh. *International Society for Environmental Epidemiology Annual Meeting* [Link]
2021	Using Self-organizing Maps to Identify Metal Mixture Exposures in Pregnant Women in Rural Northern Bangladesh. *International Society of Exposure Science Annual Meeting*.

Technical Skills

| Analysis | R (tidyverse, ggplot2, tidymodels), SQL, Python (NumPy, pandas, scikit-learn), Tableau, Power BI |
| Infrastructure | AWS, dbt, Docker, Git/GitHub, Markdown, Microsoft Office, MLflow, Shell |