John C. Halifax

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Education

University of California, Berkeley, Berkeley, CA — started
PhD, Epidemiology — August 2024
Advisor: Professor Jennifer Ahern, PhD, MPH

University of California, Berkeley, Berkeley, CA — May 2024
MS, Epidemiology
Graduate Certificate, Applied Data Science
Capstone: "Evaluating the Predictive Performance of Different Data Sources to Forecast Overdose Deaths in Rhode Island at the Neighborhood Level With Machine Learning in Rhode Island"
Advisor: Professor Jennifer Ahern, PhD, MPH

Haverford College, Haverford, PA — May 2018
BS, *magna cum laude,* Chemistry with Biochemistry Concentration
Thesis: "Exploring the Hendra Virus Replicative Complex Using Thiocyanate IR Probes"
Advisor: Professor Casey Londergan, PhD

Current Research Role

Graduate Student Researcher — August 2023-Present
Ahern Research Group, University of California, Berkeley — Berkeley, CA

- Investigating the effect of acute community violence at the census tract level on maternal and infant health and racial/ethnic health disparities as part of NIH R01 HD098138. Processing data for over 6 million study individuals as part of a birth registry comprehensive for California 2007-2018. Implementing novel longitudinal targeted maximum likelihood estimation (LTMLE) and marginal structural models (MSM) methods for causal inference, and using plasmode simulations for estimator evaluation.

- Independently evaluated the predictive performance of different administrative data sources to forecast fatal overdoses at the neighborhood level with machine. Performed analysis in collaboration with research teams at Brown and New York University within the context of the PROVIDENT randomized control trial in Rhode Island (NIH R01 DA046620). Established an accessible template for non-technical stakeholders to utilize machine learning to forecast fatal overdoses to allocate overdose prevention resources published as a peer reviewed article in *Preventive Medicine*.

Peer-Reviewed Publications

First-Author, Corresponding Author: **Halifax JC,** Allen B, Pratty C, Jent V, Skinner A, Cerdá M, Marshall BDL, Neill DB, Ahern J. Evaluating the predictive performance of different data sources to forecast overdose deaths at the neighborhood level with machine learning in Rhode Island. *Prev Med* **2025.** doi: 10.1016/j.ypmed.2025.108276.

First-Author, Corresponding Author: **Halifax, J.C.;** Lim, L.; Ciccarone, D.; Lynch, K.L. Testing the Test Strips: Laboratory Performance of Fentanyl Test Strips. *Harm Reduction J.* **2024.** https://doi.org/10.1186/s12954-023-00921-8

Co-Author: Soni, I.; Chinn, G.; **Halifax, J.C.;** Lynch, K.L.; Sall, J. The Effect of Route of Administration and Vehicle on the Pharmacokinetics of THC and CBD in Adult, Neonate, and Breastfed Sprague-Dawley Rats. *Cannabis Cannabinoid Res* **2023.** http://doi.org/10.1089/can.2023.0121

Co-Author: Zhang, Y.; **Halifax, J. C.;** Tangsombatvisit, C.; Yun, C.; Pang, S.; Hooshfar, S.; Wu, A. H. B.; Lynch, K. L. Development and Application of a High-Resolution Mass Spectrometry Method for the Detection of Fentanyl Analogs in Urine and Serum. *J. Mass Spectrom. Adv. Clin. Lab* **2022**. https://doi.org/10.1016/j.jmsacl.2022.07.005.

Honors and Awards

Research Fellowships

Computational Social Science Training Fellow, NIH T32 Grant, UC Berkeley	2025

Merit-Based Awards

Young Investigator Educational Grant, Mass Spectrometry & Advances in the Clinical Laboratory Annual Conference	2024
Young Investigator Educational Grant, Mass Spectrometry & Advances in the Clinical Laboratory Annual Conference	2023
Magna cum laude, Haverford College	2018
Honors in Chemistry, Department of Chemistry, Haverford College	2018

Presentations

Conference Presentations:

Balzer L, **Halifax JC**, Montoya L. Conference Workshop on Causal Inference for Time-varying (Longitudinal) Exposures. *Society for Epidemiological Research Annual Meeting*. Boston, MA; June 2025.

Halifax JC, Allen B, Goedel W, Hallowell B, Krieger M, Skinner A, Cerdá M, Marshall M, Neill D, Ahern J. Evaluating the Predictive Performance of Different Data Sources to Forecast Overdose Deaths in Rhode Island at the Neighborhood Level With Machine Learning in Rhode Island. *Society for Epidemiological Research Annual Meeting*. Austin, TX; June 2024.

Halifax JC, Lim L, Steiger S, Shapiro S, Lynch KL**.** Monitoring the San Francisco Drug Supply: Results from a Bio-Surveillance Project of Opiate Treatment Patients Using High Resolution Mass Spectrometry. *Mass Spectrometry & Advances in the Clinical Laboratory Annual Conference*. Monterrey, CA; March 2024.

Lim L, **Halifax JC,** Lynch KL. The Utility of High Resolution Mass Spectrometry in Cases of Acute Polydrug Exposure: A Case of Flubromazepam and Fentanyl Overdose. *Mass Spectrometry & Advances in the Clinical Laboratory Annual Conference*. Monterrey, CA; March 2024.

Halifax JC, Lynch KL**.** Evaluation of Analytical Methods for Drug Checking. *Mass Spectrometry & Advances in the Clinical Laboratory Annual Conference*. Monterrey, CA; April 2023.

Conference Posters

Halifax JC, Chan C, Jung S, Ahern J. Community Violence and Adverse Maternal and Infant Outcomes: Census Tract Homicides and Preterm Birth in California 2007-2018. *Society for Epidemiologic Research Annual Meeting*. Boston, MA; June 2025.

Skinner A, Li Y, Hallowell BD, Pratty C, Goedel WC, Allen B, **Halifax JC**, Macmadu A, Ahern J, Cerdá M, Marshall BDL. Association of non-fatal overdose surveillance data with concurrent and future overdose deaths in Rhode Island. *Council of State and Territorial Epidemiologists Annual Conference*; Grand Rapids, MI; 2025.

Skinner A, Li Y, Hallowell BD, Pratty C, Goedel WC, Allen B, **Halifax JC**, Macmadu A, Ahern J, Cerdá M, Marshall BDL. Association of non-fatal overdose surveillance data with concurrent and future overdose deaths in Rhode Island. *Society for Epidemiologic Research Annual Meeting*. Boston, MA; June 2025.

Orahoske C, **Halifax JC**, Lynch KL. A Quantitative LC-MS/MS Method for Xylazine and Metabolites in Urine. *Academy of Clinical Laboratory Physicians and Scientists Annual Meeting*. New York, NY; June 2024.

Orahoske C, **Halifax JC**, Lynch KL. A Quantitative LC-MS/MS Method for Xylazine and Metabolites in Urine. *Mass Spectrometry & Advances in the Clinical Laboratory Annual Conference*. Monterrey, CA; March 2024.

Mejia E, Lim L, Maamou M, **Halifax JC**, Lynch KL. A Novel Method for Simultaneous Targeted LC/MSMS Quantification of THC and Nicotine Metabolites in Human Urine. *Mass Spectrometry & Advances in the Clinical Laboratory Annual Conference*. Monterrey, CA; March 2024.

Donaire SBM, Coirada FC, Kim SJ, Sarvadhavabhatla S, Pae V, Barbehenn A, Yun C, **Halifax JC**, Kumar NA, Lum PJ, Lynch KL, Yukl SA, Sekaly RP, Ribeiro SP, Lee SA. Methamphetamine Use in PWH on ART is Associated with Inflammation and Residual HIV Transcription. *Conference on Retroviruses and Opportunistic Infections*. Denver, CO; March 2024

Nirkhe S, Roberts T, Zhang L, **Halifax JC**, Liu JY, Eveland J, Giuliano R, Clark K, ChiChian C, Jeffries J. Anti-Stigma and Harm Reduction Training for Primary Care Staff: A Crucial Step in Addressing the Overdose. *Association for Medical Education and Research in Substance Use Annual Conference*. Boston, MA; November 2022.

Halifax JC, Roberts T, Liu JY, Zhang L, Eveland J, Giuliano R, Nirkhe S, Nguyen S, Clark K, ChiChian C, Jeffries, J. Centering Communities in Clinical Education to Address Substance Use Stigma and the Overdose Crisis. *National Health Care for the Homeless Conference and Policy Symposium*. Seattle, WA; May 2022.

Roberts T, **Halifax JC**, Liu JY, Zhang L, Eveland J, Giuliano R, Nirkhe S, Nguyen S, Clark K, ChiChian C, Jeffries, J. The Opioid Overdose Crisis: Centering Communities in Clinical Education. *Society for the Teachers of Family Medicine Annual Spring Conference*. Indianapolis, IN; April 2022.

Nguyen S, Liu JY, Roberts T, Eveland J, Giuliano R, **Halifax JC**, Katz S, Chichian C, Clark K, Jeffries J. Collaborating with Community Partners to Develop a Harm Reduction and Stigma Curriculum for Primary Care Clinic Teams. *Stigma of Addiction Summit*. Hosted Online; June 2021.

Halifax JC, Khromava M, Londergan CL. Exploring the Hendra Virus Replicative Complex Using Thiocyanate IR Probes. *62nd Biophysical Society Annual Meeting*. San Francisco, CA; February 2018.

Previous Experience

Assistant Specialist Step 2, Academic Researcher Series	June 2024-June 2024
Assistant Specialist Step 1, Academic Researcher Series	July 2022-May 2024
Junior Specialist Step 2, Academic Researcher Series	October 2021-June 2022
Lynch Laboratory Group, University of California San Francisco	San Francisco, CA

- Developed and coordinated a bio-surveillance project to monitor the San Francisco drug supply for emerging psychoactive drugs and adulterants in collaboration with the Opiate Treatment Outpatient Program at SF General Hospital. Performed toxicological analysis by high-resolution mass spectrometry, developed an interactive web-based dashboard to communicate results to diverse stakeholders, and produced weekly updated patient education materials.
- Developed quantitative high-resolution LC-QTOF-MS method for confirmatory analysis of drug samples to support and augment community drug checking efforts in collaboration with Bay Area community-based organizations and researchers at UCLA.
- Led data analysis efforts within the group to produce data pipelines, visualizations, and multivariate statistical analyses.
- Assessed lateral flow immunoassay test strip sensitivity, specificity, and cross-reactivity performance in the context of community drug checking
- Developed other mass spectrometry small molecule detection methods for a variety of clinical, toxicological, and pharmacokinetic research projects.

Drug Checking Program Coordinator January 2022-June 2022
Health Educator II October 2020-December 2022
Health Educator I December 2019-September 2020
Syringe Access Services, San Francisco AIDS Foundation San Francisco, CA

- Designed and implemented a community-based drug checking Service utilizing FTIR spectroscopy to facilitate overdose prevention and drug supply surveillance. Executed a comprehensive literature review, successful local government grant acquisition, program budgeting, equipment procurement, data capture system development, and successful IRB exemption application. Established partnerships with UC San Francisco and Research Triangle International (RTI) researchers and San Francisco Department of Public Health stakeholders.
- Co-designed and implemented an interactive HTML map coded in R to coordinate mobile outreach to participants experiencing homelessness
- Designed and evaluated an anti-stigma training curriculum with UCSF physicians as part of the SF Health Network's Primary Care Safe Supply Pilot to incorporate harm reduction supply access within San Francisco safety net primary care clinics
- Prepared program design, budgets, and operating protocols for a proposed supervised consumption space
- Provided harm reduction services and health education directly to program participants as an essential healthcare worker all throughout COVID-19 shelter-in-place orders

Clinical Informatics Specialist October 2018-May 2019
Oak Street Health Philadelphia, PA

- Provided onsite expertise for electronic health record system. Prepared and led morning meetings to preview scheduled patients' needs and highlight missing preventative interventions for clinicians. Reviewed local hospital EMRs for record collation and linkage.

Student Research Assistant May 2017-May 2018

Londergan Laboratory Group, Haverford College Haverford, PA

- Researched intrinsically disordered proteins involved in the Hendra virus' replication mechanism using IR spectroscopy and Isothermal Titration Calorimetry.

Intern June 2016-August 2016

Chemistry Department, Cleave BioSciences Burlingame, CA

- Performed small scale organic syntheses and chemical purifications using HPLC and column chromatography. Performed general lab maintenance and developed and organized new CMC system.

Intern June 2015-August 2015

Ruggero Laboratory Group, University of California, San Francisco San Francisco, CA

- Carried out a cloning protocol to build a vector tagging GFP to the translation initiation factor eIF4E, performed general tissue culture jobs, and genetically sequenced mouse specimens.

Professional Service

Peer Review

Drug and Alcohol Dependence 2024
American Journal of Public Health 2024

Scientific Working or Discussion Groups

Laboratory-based Drug Checking Working Group September 2023-Present
UCSF Drug Use Research Group (DURG) August 2021-Present

Technical Skills

Software and Programming

Proficient: R, R markdown
Competent: SAS, Git, Github, Bash Scripting
Familiar: Python, SQL

Analysis and Theory

- Implementation and community health science and evaluation
- Epidemiological study design
- Linear models, generalized linear models, longitudinal estimators
- Causal inference theory and analysis
- Statistical learning (cross-validation, regularization, boosting, bagging, ensemble methods, dimensional reduction, unsupervised learning)
- Data wrangling, data visualization

Teaching Experience

Graduate Student Instructor Fall 2025
Division of Epidemiology, UC Berkeley Berkeley, CA

- Served as teaching assistant to Professor Patrick Bradshaw for course PH252 Epidemiological Methods. Course topics include generalized linear models, Kaplan-Meier estimation, survival distributions, and models for parametric and semi-parametric survival analysis, as well as methods for confounder selection, dose-response modeling, and interaction and effect modification.

Conference Workshop Co-Instructor June 2025
Society for Epidemiologic Research Annual Meeting Boston, MA

- Co-instructed a workshop applying the Causal Roadmap to estimate causal effects with multiple intervention variables, such as the cumulative effect of an exposure over time and the effects on survival-type outcomes with right-censoring. Covered longitudinal causal models, identification in the presence of time-dependent confounding, and estimation of joint treatment effects using G-computation, inverse probability weighting (IPW), and targeted minimum loss-based estimation (TMLE) with Super Learner. Led participants through the Roadmap using an applied example and implementation of these estimators with the ltmle package in R.

Teaching Assistant Fall 2017
Department of Chemistry, Haverford College Haverford, PA

- Served as a teaching assistant in an undergraduate organic chemistry and organic syntheses lecture and laboratory course

Peer Tutor August 2015-May 2018
Office of Academic Resources, Haverford College Haverford, PA
Department of Chemistry, Haverford College

- Tutored fellow students in first and second year chemistry and calculus I and II

Service and Activities

Fundraising Participant September 2022-July 2022
AIDS LifeCycle San Francisco, CA

- Cycled 545 miles from San Francisco to Los Angeles to fundraise for the San Francisco AIDS Foundation and the Los Angeles LGBT Center

Fundraising Participant March 2021-July 2021
TogetheRide San Francisco, CA

- Cycled 1,500 miles in 15 weeks to raise funds for the San Francisco AIDS Foundation and the Los Angeles LGBT Center

Syringe Access Services Volunteer August 2019-February 2020
Glide Memorial Foundation San Francisco, CA

- Volunteered to provide harm reduction supplies and education to program participants

Player 2014-2017
Haverford College Men's Varsity Soccer Team Haverford, PA

- Ranked 6th in the nation in 2015, 2015 and 2016 Centennial Conference Champions, 2014 Conference finalists

Peer Awareness Facilitator February 2015-May 2016
Haverford College First Year Orientation Program Haverford, PA

- Facilitated first year students discussions on controversial topics such as: race, religion, sexual misconduct, gender, and ableism.