

# Joshua R. Nugent, PhD

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Department of Biostatistics and Epidemiology  
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pronouns: he / him / his

## Interests and expertise

- Causal inference with applications to public health, medicine, public policy
- Nonparametric statistics
- Integrating machine learning and statistical inference
- Design and analysis of cluster randomized trials
- Statistical analyses with complex missingness and dependence
- Interpretation and communication of statistical results
- Teaching statistical concepts
- Anti-racism, equity, inclusion, social justice, conflict resolution

## Education

PhD\*, Biostatistics, University of Massachusetts Amherst, 2018 - 2022\* (\*anticipated).

Dissertation: *Estimating causal effects with complex clustered data.*

Advisor: Dr. Laura Balzer

Dissertation committee: Dr. Laura Balzer (chair), Dr. Raji Balasubramanian, Dr. Ted Westling

M.Ed. Secondary Mathematics Education, University of Massachusetts, 2014.

A.B. Urban Studies, Brown University, 2003.

Study abroad at the Universidad de las Américas, Puebla, Mexico, Spring 2002.

## Research experience

Graduate Research Assistant, University of Massachusetts Amherst, Department of Biostatistics and Epidemiology, Fall 2018 - Summer 2022. Research areas included:

- Nonparametric statistics with discrete or continuous exposures
- Ensemble machine learning
- Targeted learning
- Missing data
- Comparative methods for clustered and longitudinal data
- Approaches for small sample cluster randomized trials
- Bias in mixed model fitting algorithms
- Multilevel mixed modeling with Cox survival analysis models
- Assistance with development of **clusterPower** R package for sample size calculation under complex cluster randomized trial designs

## Publications

### Peer-reviewed

1. **Nugent, J**, Balzer, L. Evaluating associations between shifts in mobility and COVID-19 case rates in U.S. counties: A demonstration of modified treatment policies for causal inference with continuous exposures. (*Under review at the American Journal of Epidemiology.*)
2. Kakande E, Christian C, Balzer LB, Owaraganise A, **Nugent J**, Dileso W, Rast D, Kabami J, Johnson J, Camlin CS, Shade SB, Geng E, Kwarisiima D, Kamya MR, Havlir DV, Chamie G. Cluster RCT of a mid-level manager intervention to promote IPT uptake in Uganda. (*Under review at The Lancet HIV.*)
3. **Nugent, J**, Kleinman, K. Type I error control for cluster randomized trials under varying small sample structures. BMC Med Res Methodol 21, 65 (2021). <https://doi.org/10.1186/s12874-021-01236-7>
4. Koss CA, Havlir DV, Ayieko J, Kwarisiima D, Kabami J, Chamie G, Atukunda M, Mwinike Y, Mwangwa F, Owaraganise A, Peng J, Olilo W, Snyman K, Awuonda B, Clark TD, Black D, **Nugent J**, Brown LB, Marquez C, Okochi H, Zhang K, Camlin CS, Jain V, Gandhi M, Cohen CR, Bukusi EA, Charlebois ED, Petersen ML, Kamya MR, Balzer LB. HIV incidence after pre-exposure prophylaxis initiation among women and men at elevated HIV risk: A population-based study in rural Kenya and Uganda. PLOS Med. 2021 Feb 9;18(2):e1003492. <https://doi.org/10.1371/journal.pmed.1003492>

### Pre-registered statistical analysis plans

1. **Nugent J**, Balzer L. Statistical Analysis Plan for Tuberculosis Outcomes in SEARCH TB Study. (2022). *Link forthcoming.*
2. Balzer L, **Nugent J**, Havlir D, Chamie G. Statistical Analysis Plan for Health Outcomes in Phase 1 of the SEARCH-IPT Study. (2021). <https://arxiv.org/abs/2111.10467>

## Awards and fellowships

University of Massachusetts Amherst, Graduate School

Dissertation Completion Fellowship, Spring 2022

University of Massachusetts Amherst, School of Public Health and Health Sciences

Outstanding Graduate Student Teaching Award, 2020

University of Massachusetts Amherst, School of Education

Camby Scholarship, 2009

## Conference presentations

1. Kakande E, Christian C, Balzer LB, Owaraganise A, **Nugent J**, Dileso W, Rast D, Kabami J, Johnson J, Camlin CS, Shade SB, Geng E, Kwarisiima D, Kamya MR, Havlir DV, Chamie G. Cluster RCT of a mid-level manager intervention to promote IPT uptake in Uganda.

February 2022: Conference on Retroviruses and Opportunistic Infections (Oral presentation)

2. **Nugent J** & Balzer L. *Modified treatment policies for causal inference with continuous exposures*. Presentation of key results of accompanying paper.

October 2021: Session: Statistics in the COVID-19 pandemic, New England Statistical Symposium (Oral presentation)

June 2021: Society for Epidemiologic Research (Poster presentation)

3. Koss CA, **Nugent J**, Balzer L. Social networks predict PrEP uptake in SEARCH study in rural Kenya and Uganda.

March 2021: Conference on Retroviruses and Opportunistic Infections (Oral presentation)

4. **Nugent J**. *Improving Instruction at the University Level*. High-leverage changes faculty can make to improve student learning undergraduate and graduate-level classes.

Spring 2020: University of Massachusetts Amherst (Oral presentation)

## Journal review service

Reviewer for *The International Journal of Biostatistics* (1), *The Journal of Causal Inference* (1).

## University service

University of Massachusetts Amherst, Department of Biostatistics and Epidemiology

Organizer, Bio-Epi Student Action Group, Spring 2020 - Fall 2021

Organized a group of department graduate students to move department-wide anti-racism and equity initiatives forward. Focus areas included diversity in the student body (recruitment, admissions, retention), faculty diversity (hiring and retention), inclusive teaching practices, and statistical ethics course development. Conducted research on best practices, strategized on implementation, and worked with faculty and administrators to implement our recommendations.

Graduate Student Representative, Fall 2019 - Summer 2021

Served as liaison between graduate students and faculty. Helped troubleshoot student problems and make suggestions for programmatic improvement. Organized community-building events and helped with new student onboarding. Led initiative to recruit a more diverse applicant pool.

Team Lead, COVID-19 Academic Public Health Volunteer Corps, Spring 2020

Organized a team of graduate student volunteers to provide support services to the Peabody (Massachusetts) Health Department (PHD) in the midst of the COVID-19 pandemic, including contact tracing, phone counseling, and data aggregation. Worked closely with the director of the PHD to assess needs, train volunteers, and adapt resources as needs changed.

## University-level teaching

University of Massachusetts Amherst, School of Public Health and Health Sciences

Teaching assistant for Dr. Laura Balzer, Biostatistics 683: Introduction to Causal Inference, Fall 2021.

Teaching assistant for Dr. Scott Chasan-Taber, Public Health 223: Introduction to Biostatistics, Fall 2018 - Spring 2020.

## Consulting clients & projects

Statistical Consultant, Statistical Consulting & Collaboration Services, University of Massachusetts Amherst, Department of Mathematics and Statistics, June 2020 - June 2021

EnCompass, LLC: External review of statistical analysis in a study to determine prevalence of and risk factors for forced labor among migrant workers in southeast Asia.

Franklin County Council of Governments Health Equity Working Group: Statistical analysis of impacts of COVID-19 pandemic in western Massachusetts.

University of Massachusetts Amherst College of Natural Sciences: Development of two survey instruments and analysis / interpretation / communication of results.

## Software & other skills

Software expertise: R, R Markdown

Software fluency: Python, GitHub, Shiny, Stan, SAS, Stata, LSF

Language proficiency: English, Spanish

## Pre-doctoral work experience

Mathematics Teacher, Amherst Regional High School, September 2010 - June 2018

Taught students in all grades at the AP, honors, college prep, and developmental level. Updated curricula, planned and executed lessons, assessed student work, communicated with parents about student progress. Led on-site professional development courses for colleagues focused on differentiated instruction. Worked with the department head to lead the transition to a discovery-based core curriculum. Worked with the principal on assessment modernization initiatives. Contributed to the development of Advisory curriculum focused on issues of social justice and social-emotional learning. Developed and piloted new discovery-based Statistics II course. Supervised and mentored pre-service teachers. Advised the Women's Rights Club as they prepared the "Consent Week" peer education event. Coached the national championship-winning girls varsity Ultimate Frisbee team.

Ombuds Assistant, University of Massachusetts Amherst, September 2009 - August 2010

Fielded and investigated complaints from various members of the University community, resolved conflicts and mediated disputes between faculty and students, oversaw academic honesty and academic grievance hearings, referred students to appropriate campus resources, oversaw the implementation of a new web site, led on-campus outreach.

Director, Peace from A to Z After-School Program at P.S. 24, September 2006 - June 2008

Oversaw all facets of a 350-student, 45-staff member after-school program at a public elementary school in Brooklyn, NY. Hired and trained staff, oversaw curriculum development in the arts, conflict resolution, and social justice, generated reports and data for funding agencies, communicated with families and teachers regarding students' academic and social-emotional progress, coordinated closely with the school administration to set goals and resolve problems, arranged for continuing professional development for staff, assisted in writing grant applications, led budgeting process, kept program in compliance with local, state, and federal reporting requirements and regulations, successfully led program through severe financial crisis in my first months as director.