

Department of Biostatistics & Epidemiology  
School of Public Health & Health Sciences  
University of Massachusetts - Amherst  
416 Arnold House, 715 North Pleasant St.  
Amherst, MA 01003-9304  
☎ 1-413-545-9464  
✉ lbalzer@umass.edu  
Twitter: LauraBBalzer  
[https://works.bepress.com/laura\\_balzer/](https://works.bepress.com/laura_balzer/)

# Laura Balzer, PhD

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## INTERESTS

- Causal inference and machine learning
- Design and analysis of cluster randomized and pragmatic trials
- Development, evaluation, and implementation of data-driven solutions in Public Health
- Analyses with complex measurement, missingness, and dependence
- Applications: global health, social determinants of health, human-animal interaction

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## APPOINTMENT

2017–Present **Assistant Professor of Biostatistics**, *University of Massachusetts, Amherst.*  
Department of Biostatistics and Epidemiology  
School of Public Health and Health Sciences

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## EDUCATION

- 2010–2015 **PhD in Biostatistics**, *University of California, Berkeley.*
- Design and analysis of cluster randomized trials with application to HIV prevention and treatment
  - Advisors: Drs. Maya Petersen and Mark van der Laan
  - Berkeley Fellowship: “Awarded to outstanding applicants to doctoral programs in all fields”
- 2008–2009 **MPhil in Computational Biology**, *University of Cambridge, UK.*
- Director’s Award for outstanding performance; Graduated 1<sup>st</sup> in the class
- 2004–2008 **BS in Applied Mathematics**, *University of Vermont.*
- Barry M. Goldwater Scholarship Award: “The most prestigious undergraduate scholarship in the natural sciences, mathematics and engineering in America”

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## POST-DOCTORAL TRAINING

- 2015–2017 **Post-Doctoral Fellow in Biostatistics**, *Harvard School of Public Health.*
- Advisor: Dr. Victor DeGruttola
  - Harnessing social network information to target interventions and to improve study designs for program and policy evaluation

## HONORS & AWARDS

- 2017 **Postdoctoral Association 2017 Spring Travel Award**, *Harvard*.
- 2015 **Chin Long Chiang Biostatistics Student of the Year**, *UC Berkeley*.  
 “For her innovative research in HIV prevention and treatment and her many contributions to the Biostatistics Program”
- 2015 **Travel Award: Infectious Disease Research Conference**, *NIAID/NIH*.
- 2014 **Gertrude M. Cox Scholarship**, *ASA*.  
 “For outstanding academic achievement in the University of California, Berkeley biostatistics program, significant contributions to methodological development of causal inference for group-randomized studies, inter-departmental cooperation as demonstrated by effective collaborations with epidemiology students and faculty, and exceptional commitment to ambitious, engaging, creative and superhero-studded teaching”
- 2014 **Causality in Statistics Education Award**, *ASA*.  
 Jointly with Dr. Maya Petersen to the “individual or team that does the most to enhance the teaching and learning of causal inference in introductory statistics courses”
- 2014 **Travel Award: Joint Statistical Meetings**, *ASA - San Francisco Bay Area Chpt*.
- 2014 **Russel M. Grossman Endowment Award**, *UC Berkeley*.
- 2013 **3<sup>rd</sup> place poster**, *Society for Epidemiologic Research*.
- 2012 **Outstanding Graduate Student Instructor**, *UC Berkeley*.
- 2012 **2<sup>nd</sup> place at School of Public Health Research Symposium**, *UC Berkeley*.
- 2012 **Lois Rifkin Scholarship**, *UC Berkeley*.
- 2012–2014 **Division of Biostatistics stipend for scholastic achievements**, *UC Berkeley*.
- 2010–2012 **Berkeley Fellowship**, *UC Berkeley*.  
 “Awarded to outstanding applicants to doctoral programs in all fields”
- 2009 **Director’s Award for outstanding performance**, *Cambridge, UK*.  
 Equivalent to Distinction; Graduated 1<sup>st</sup> in the class
- 2008 **Summa Cum Laude**, *University of Vermont*.  
 Graduated 1<sup>st</sup> in the class
- 2008 **Honors College Scholar**, *University of Vermont*.
- 2008 **Mathematics Senior Award**, *University of Vermont*.
- 2008 **Statistics Departmental Senior Award**, *University of Vermont*.
- 2007 **Sang Kil Nam Scholarship in Mathematics**, *University of Vermont*.  
 “In recognition of the value of education as a path toward the betterment of mankind”
- 2007 **Barry M. Goldwater Scholarship Award**.  
 “The most prestigious undergraduate scholarship in the natural sciences, mathematics and engineering in America”
- 2006 **Chemistry Rubber Company Award for excellence in Chemistry**, *University of Vermont*.
- 2004–2008 **Presidential Scholarship for academic excellence**, *University of Vermont*.

## PROFESSIONAL EXPERIENCE

- 2015–2017 **Consultant**, *SEARCH Collaboration*, Makerere University - UC San Francisco.
- 2012–2014 **Graduate Student Instructor**, *UC Berkeley*, Berkeley, CA.
- 2010–2015 **Graduate Student Researcher**, *UC Berkeley*, Berkeley, CA.
- 2009–2010 **Biostatistician**, *UC Irvine*, Irvine, CA.
- 2009 **Computational Biologist**, *Human Epidemiology Nutrition Growth Ecology (HENGE)*, University of Cambridge, UK.
- 2006–2008 **Undergraduate Researcher**, *Interdisciplinary Training in Mathematics and Biology Program*, University of Vermont.

## RESEARCH SUPPORT

### ONGOING

- 2016–2021 **Simplified Isoniazid Preventive Therapy Strategy to Reduce TB Burden (SPIRIT)**
  - Funding: NIH-NIAID R01AI125000 (PI: Havlir)
  - Role: Sub-Award Principal Investigator
- 2017–2020 **ACTG: Sustainable East Africa Research in Community Health (SEARCH)**
  - Funding: NIH-NIAID 5UM1AI068636-12 (PI: Kuritzkes/Havlir)
  - Role: Sub-Award Principal Investigator

### COMPLETED

- 2012–2017 **Reducing Failure-to-Initiate ART: Streamlined ART Start Strategy (START)**
  - Funding: NIH-NIAID U01AI099959 (PI: Havlir)
  - Role: Co-Investigator
- 2014–2018 **Causal Inference Methods for Implementation Science**
  - Funding: NIH-NIAID R01AI074345 (PI: van der Laan)
  - Role: Graduate student researcher
- 2012–2014 **Causal Inference Controversies**
  - Funding: UC Berkeley Committee on Research (PI: Ahern)
  - Role: Graduate student researcher

## PUBLICATIONS & MANUSCRIPTS - Also on Google Scholar

### PEER-REVIEWED PUBLICATIONS

- [1] **L.B. Balzer**, W. Zheng, M.J. van der Laan, M.L. Petersen, and the SEARCH Collaboration. A new approach to hierarchical data analysis: Targeted maximum likelihood estimation for the causal effect of a cluster-level exposure. *Statistical Methods in Medical Research*, OnlineFirst, 2018.

- [2] S.B. Shade, T. Osmand, A. Luo, R. Aine, E. Assurah, B. Mwebaza, D. Mwai, A. Owaraganise, F. Mwangwa, J. Ayieko, D. Black, L.B. Brown, T.D. Clark, D. Kwarisiima, H. Thirumurthy, C.R. Cohen, E.A. Bukusi, E.D. Charlebois, **L. Balzer**, et al. Costs of streamlined HIV care delivery in rural Ugandan and Kenyan clinics in the SEARCH study. *AIDS*, In Press, 2018.
- [3] A. Jakubowski, K. Snyman, D. Kwarisiima, N. Sang, R. Burger, **L. Balzer**, et al. High CD4 counts associated with better economic outcomes for HIV-positive adults and their HIV-negative household members in the SEARCH trial. *PLoS ONE*, 13(6):e0198912, 2018.
- [4] A.I. Naimi and **L.B. Balzer**. Stacked generalization: An introduction to Super Learning. *European Journal of Epidemiology*, 33(5):459–464, 2018.
- [5] J.A. Labrecque, J.K. Kaufman, **L.B. Balzer**, R.F. Maclehose, E. Strumpf, A. Matijasevich, I.S. Santos, and A.J.D. Barros. Effect of a conditional cash transfer program on length-for-age and weight-for-age in Brazilian infants at 24 months using doubly-robust, targeted estimation. *Social Science & Medicine*, 2011:9–15, 2018.
- [6] J. Ayieko, M.L. Petersen, E. Wafula, A. Van Rie, W. Opudo, T.D. Clark, M.R. Kamya, **L.B. Balzer**, et al. Effect of a patient-centered phone call by a clinical officer at time of HIV testing or re-contact on linkage to care in rural Kenya. *Open Forum of Infectious diseases*, 5(1):ofy126, 2018.
- [7] C.A. Koss, J. Ayieko, F. Mwangwa, A. Owaraganise, D. Kwarisiima, **L.B. Balzer**, et al. Early adopters of HIV preexposure prophylaxis in a population-based combination prevention study in rural Kenya and Uganda. *Clinical Infectious Diseases*, EpubMay, 2018.
- [8] D. Perriat, **L. Balzer**, R. Hayes, S. Lockman, F. Walsh, et al. Comparative assessment of five large-scale studies of universal HIV testing and treatment in Sub-Saharan Africa. *Journal of the International AIDS Society*, 21(1), 2018.
- [9] W. Zheng, **L. Balzer**, M. van der Laan, M. Petersen, and the SEARCH Collaboration. Constrained binary classification using ensemble learning: an application to cost-efficient targeted PrEP strategies. *Statistics in Medicine*, 37(2):261–279, 2018.
- [10] **L.B. Balzer**. “All generalizations are dangerous, even this one.” - Alexandre Dumas [Commentary]. *Epidemiology*, 28(4):562–566, 2017.
- [11] M. Petersen, **L. Balzer**, D. Kwarisiima, N. Sang, et al. Association of implementation of a universal testing and treatment intervention with HIV diagnosis, receipt of antiretroviral therapy, and viral suppression among adults in East Africa. *JAMA*, 317(21):2196–2206, 2017.
- [12] **L. Balzer**, P. Staples, J. Onnela, and V. DeGruttola. Using network-based simulations to evaluate the effect of adding targeted PrEP to an ongoing treatment-as-prevention trial. *Clinical Trials*, Jan:1–10, 2017.
- [13] **L. Balzer**, M. van der Laan, M. Petersen, and the SEARCH Collaboration. Adaptive pre-specification in randomized trials with and without pair-matching. *Statistics in Medicine*, 35(25):4528–4545, 2016.
- [14] M.A. Gianfrancesco, **L. Balzer**, K.E. Taylor, L. Trupin, et al. Genetic risk and longitudinal disease activity in systemic lupus erythematosus using targeted maximum likelihood estimation. *Genes and Immunity*, 17:358–362, 2016.
- [15] **L. Balzer**, M. Petersen, M.J. van der Laan, and the SEARCH Collaboration. Targeted estimation and inference of the sample average treatment effect in trials with and without pair-matching. *Statistics in Medicine*, 35(21):3717–3732, 2016.

- [16] **L. Balzer**, J. Ahern, S. Galea, and M.J. van der Laan. Estimating effects with rare outcomes and high dimensional covariates: Knowledge is power. *Epidemiologic Methods*, 5(1):1–18, 2016.
- [17] M. Pearl, **L. Balzer**, and J. Ahern. Targeted estimation of marginal absolute and relative associations in case-control data: An application in social epidemiology. *Epidemiology*, 27:512–517, 2016.
- [18] D. Kwarisiima, **L. Balzer**, D. Heller, P. Kotwani, et al. Population-based assessment of hypertension epidemiology and risk factors among HIV-positive and general populations in rural Uganda. *PLoS ONE*, 11(5):e0156309, 2016.
- [19] G. Chamie, T.D. Clark, J. Kabami, K. Kadde, E. Ssemmondo, R. Steinfeld, G. Lavoy, D. Kwarisiima, N. Sang, V. Jain, H. Thirumurthy, T. Liegler, **L. Balzer**, et al. A hybrid mobile HIV testing approach for population-wide HIV testing in rural East Africa. *Lancet HIV*, January, 2016.
- [20] J. Ahern, **L. Balzer**, and S. Galea. The role of outlet density and norms in alcohol use disorder. *Drug and Alcohol Dependence*, 151:144–150, 2015.
- [21] **L.B. Balzer**, M.L. Petersen, M.J. van der Laan, and the SEARCH Consortium. Adaptive pair-matching in randomized trials with unbiased and efficient effect estimation. *Statistics in Medicine*, 34(6):999–1011, 2015.
- [22] P. Kotwani, **L. Balzer**, D. Kwarisiima, T.D. Clark, et al. Evaluating linkage to care for hypertension after community-based screening in rural Uganda. *Tropical Medicine & International Health*, 19(4):459–468, 2014.
- [23] G. Chamie, D. Kwarisiima, T.D. Clark, J. Kabami, V. Jain, E. Geng, **L.B. Balzer**, et al. Uptake of community-based HIV testing during a multi-disease health campaign in rural Uganda. *PLoS ONE*, 9(1):e84317, 2014.
- [24] V. Jain, D.M. Byonanebye, T. Liegler, D. Kwarisiima, G. Chamie, J. Kabami, M.L. Petersen, **L.B. Balzer**, et al. Changes in Population HIV RNA Levels in Mbarara, Uganda During Scale-Up of HIV Antiretroviral Therapy Access. *JAIDS*, 65(3):327–332, 2014.
- [25] M. van der Laan, **L. Balzer**, and M. Petersen. Adaptive Matching in Randomized Trials and Observational Studies. *Journal of Statistical Research*, 46(2):113–156, 2012.

## BOOK CHAPTERS

- [26] **L.B. Balzer**, M.L. Petersen, and M.J. van der Laan. The sample average treatment effect. In M.J. van der Laan and S. Rose, editors, *Targeted Learning in Data Science*. Springer, 2018.
- [27] **L.B. Balzer**, M.J. van der Laan, and M.L. Petersen. Data-adaptive estimation in cluster randomized trials. In M.J. van der Laan and S. Rose, editors, *Targeted Learning in Data Science*. Springer, 2018.
- [28] **L. Balzer**, M. Petersen, and M.J. van der Laan. Tutorial for causal inference. In P. Buhlmann, P. Drineas, M. Kane, and M. van der Laan, editors, *Handbook of Big Data*. Chapman & Hall/CRC, 2016.

## MANUSCRIPTS UNDER PEER-REVIEW OR REVISION

- [29] K. Becofsky, B. Masteller, and **L. Balzer**. Findings from a stealth physical activity intervention targeting dog owners. 2018.
- [30] Y. Chen, W. Zheng, L.B. Brown, G. Chamie, D. Kwarisiima, J. Kabami, T.D. Clark, N. Sang, J. Ayieko, E.D. Charlebois, V. Jain, **L. Balzer**, et al. Semi-supervised record linkage for construction of large-scale sociocentric networks in resource-limited settings: An application to the SEARCH study in rural Uganda and Kenya. 2018.
- [31] H. Saddiki and **L.B. Balzer**. A primer on causality in Data Science. 2018.
- [32] D.V. Havlir, **L.B. Balzer**, E. Charlebois, T.D. Clark, D. Kwarisiima, J. Ayieko, J. Kabami, N. Sang, et al. A cluster randomized trial of universal antiretroviral treatment using a community health model in rural Uganda and Kenya. 2018.

## SELECTED TECHNICAL REPORTS

- [33] **L.B. Balzer**, D.V. Havlir, J. Schwab, M.J. van der Laan, M.L. Petersen, and the SEARCH Collaboration. Statistical analysis plan for search phase i: Health outcomes among adults. Technical report, SEARCH Study Team, 2018: <https://arxiv.org/abs/1808.03231>.
- [34] **L.B. Balzer**, J. Schwab, M.J. van der Laan, and M.L. Petersen. Evaluation of progress towards the UNAIDS 90-90-90 HIV care cascade. Technical Report 357, UC Berkeley, 2017: <http://biostats.bepress.com/ucbbiostat/paper357/>.

## INVITED SEMINARS & RESEARCH COLLOQUIUM

1. University of Massachusetts, Amherst - Data Science for Health Lab: “Ensemble & Targeted Learning for HIV Prevention & Treatment”, Jul2018.
2. University of Massachusetts, Amherst - Statistics & Probability Seminar: “A new approach to hierarchical data analysis: Targeted maximum likelihood estimation for the causal effect of a cluster-level exposure”, Apr2018.
3. University of Massachusetts Medical School - Quantitative Methods Core Methods Seminars: “Targeted Learning to evaluate the effects of community-based interventions: the SEARCH trial & HIV prevention in East Africa”, Feb2018.
4. Amherst College Statistics & Data Science Colloquia: “Estimating the Impact of Cluster-Based Interventions: the SEARCH trial and HIV prevention in East Africa”, Feb2018.
5. Yale University - Public Health Modeling Concentration Seminar Series: “Causal inference with cluster-level exposures: HIV prevention in East Africa”, Jan2018.
6. University of Massachusetts, Amherst - Computational Social Science Institute: “Estimating the Effects of Community-based Interventions: SEARCH Trial & HIV prevention in East Africa”, Dec2017.
7. 5College Stats & Data Science Research Bytes (Amherst, MA): “Machine Learning & Causal Inference for HIV Prevention & Treatment, Nov2017.

8. University of Massachusetts, Amherst - Statistics Working Group: “Why Bother with Causal Inference?”, Sept2017.
9. Yale University - Workshop on Quantitative Research Methods: “Targeted Learning in the SEARCH trial and HIV prevention in East Africa”, Mar2017.
10. Harvard School of Public Health - Quantitative Group for Research on Infectious Diseases: “Targeted Learning in the SEARCH trial and HIV prevention in East Africa”, Sep2016.
11. Université de Montréal - Faculté de Pharmacie: “Estimating the Impact of Community-Based Interventions: the SEARCH Trial and HIV Prevention in East Africa”, Oct2016.
12. McGill University - Department of Epidemiology, Biostatistics & Occupational Health: “Estimating the Impact of Community-Based Interventions: the SEARCH Trial and HIV Prevention in East Africa”, Oct2016.
13. Harvard University - The Institute of Quantitative Social Science: “Targeted Learning in the SEARCH trial and HIV prevention in East Africa”, Mar2016.
14. University of California, Berkeley - School of Social Welfare Research Colloquium: “Introduction to Causal Inference: A roadmap of research in social welfare and public health”, Feb2016.
15. University of Vermont - Statistics Colloquium: “Estimating the Impact of Community-Based Interventions: the SEARCH Trial and HIV Prevention in East Africa”, Oct2014.

## ACADEMIC INSTRUCTION

### • Graduate Course - Introduction to Causal Inference

This course presents a general framework for causal inference: 1) clear statement of the scientific question, 2) definition of the causal model and parameter of interest, 3) assessment of identifiability - that is, linking the causal effect to a parameter estimable from the observed data distribution, 4) choice and implementation of estimators including parametric and semi-parametric methods, and 5) interpretation of findings. The estimation methods include G-computation, inverse probability of treatment weighting (IPTW), and targeted maximum likelihood estimation (TMLE) with Super Learning.

- *ASA's Causality in Statistics Education Award* - “individual or team that does the most to enhance the teaching and learning of causal inference in introductory statistics courses”
- Course materials available at [www.ucbbiostat.com](http://www.ucbbiostat.com)

2018 **Instructor** - *UMass Amherst* [3 credits]

- Overall course rating: pending

2017 **Instructor** - *UMass Amherst* [3 credits]

- Overall course rating: 4.1/5.0

2013 **Graduate student instructor** - *UC Berkeley* [3 credits]

- Instructor rating: 6.83/7.00

2012 **Graduate student instructor** - *UC Berkeley* [3 credits]

- Instructor rating: 6.84/7.00

- **Undergraduate Seminar - Data Science to Improve Public Health**

Ever wonder why Data Scientists have been labeled the “sexiest job of the 21st Century”? Is Big Data really a revolution or simply hype? Why is it so hard to move from correlation to causation? Drawing on real examples from Public Health, this course will answer these and other pressing questions. Students will be introduced to a formal research framework, including specifying a well-defined scientific question, formally representing background knowledge and uncertainties, and finally answering their question using modern methods in machine learning and causal inference.

2018 **Instructor** - *UMass Amherst* [1 credit]

- **Graduate Seminar - Hot Topics in Data Science**

The seminar will be a mixture of guest lectures from leading researchers in academia and industry (e.g. Google) as well as group presentations on top papers in Machine Learning and Causal Inference. We will also have dedicated time for professional development, including an interactive workshop “Professional and Multi-disciplinary Communication Strategies” and the discussion of tenure-track job searches.

2018 **Instructor** - *UMass Amherst* [1 credit]

- **Graduate Course - Causal Inference II**

This course covers more advanced causal topics: longitudinal causal models, identifiability, and estimation; direct and indirect effects; dynamic treatment regimes; stochastic interventions; community-based interventions; semi-parametric approaches to hierarchical data; and Collaborative targeted maximum likelihood estimation.

2014 **Instructor** - *UC Berkeley* [2 credits]

- Instructor rating: 7.00/7.00

2013 **Graduate student instructor** - *UC Berkeley* [2 credits]

- Instructor rating: 6.55/7.00

## WORKSHOPS & SHORT COURSES

- **Estimation and Interpretation: Introduction to Parametric and Semi-parametric Estimators for Causal Inference**

This workshop introduces a “causal roadmap” approach to scientific questions. The focus is on estimation with a simple substitution estimator (parametric G-computation), inverse probability of treatment weighting, and targeted maximum likelihood estimation with Super Learner. Using an applied example, participants implement these estimators in R.

- Youtube video of the workshop available [here](#)
- Workshop rating: 9.33/10.00

2018 **Instructor** - *SERtalks*, Boston, MA [Upcoming]

**Instructor** - *Society for Epidemiologic Research*, Baltimore, MD

**Instructor** - *32<sup>nd</sup> New England Statistics Symposium*, Amherst, MA

**Instructor** - *SERtalks*, Los Angeles, CA



- 2017 **Instructor** - *X Congresso Brasileiro de Epidemiologia*, Florianópolis, Brazil  
**Instructor** - *Society for Epidemiologic Research*, Seattle, WA  
**Instructor** - *SERtalks*, New York, NY  
**Instructor** - *University of Utah, School of Medicine*, Salt Lake City, UT
- 2016 **Instructor** - *Society for Epidemiologic Research*, Miami, FL  
**Instructor** - *SERtalks*, Minneapolis, MN  
**Instructor** - *University of California, San Francisco*, San Francisco, CA
- 2015 **Instructor** - *Society for Epidemiologic Research*, Denver, CO

• **Big data, machine learning techniques to investigate health effects in environmental health studies**

This course will present key methodological challenges that arise in environmental health and provide recent methods that can be used to deal with these challenges. The focus is on modern solutions to multiple testing, model misspecification, and causal inference as applied to environmental health data, with a focus on assessing health effects of chemical mixtures. Participants will gain both a theoretical understanding as well as practical experience with a hands-on session using R software.

- Over 175 participants

- 2018 **Instructor** - *International Society of Exposure Science & the International Society for Environmental Epidemiology (ISES-ISEE)*, Ottawa, Canada

## ■ GUEST LECTURES

1. University of Massachusetts, Amherst - Advanced Epidemiological Methods (Spr2018): “Integrating Causal Modeling and Statistical Estimation”.
2. University of California, Berkeley - Methods in Social Epidemiology (Spr2018): “Introduction to Targeted Learning”.
3. Mount Holyoke College - Topics in Biostatistics (Spr2018): “Targeted maximum likelihood with Super Learning to evaluate progress towards HIV care cascade goals: an example from the SEARCH “test and treat” study”.
4. University of California, Berkeley - Methods in Social Epidemiology (Spr2017): “Introduction to Targeted Learning”.
5. Harvard School of Public Health - Methods I (Fa2016): “Introduction to Targeted Learning”.
6. University of California, Berkeley - Methods in Social Epidemiology (Spr2016): “Introduction to Targeted Learning”.
7. Harvard School of Public Health - Statistical Inference I (Spr2016): “Introduction to Targeted Learning”.
8. Harvard School of Public Health - Quantitative Group for Research on Infectious Diseases (Fa2015): “Introduction to Longitudinal Causal Models, Marginal Structural Models and Longitudinal IPTW”.
9. Harvard School of Public Health - Quantitative Group for Research on Infectious Diseases (Fa2015): “Introduction to Targeted Learning”.
10. University of California, Berkeley - Methods in Social Epidemiology (Spr2015): “Introduction to Targeted Learning”.

11. University of California, Berkeley - Introduction to Causal Inference (Fa2014): “Estimating the Impact of Community-Based Interventions: the SEARCH Trial and HIV Prevention in East Africa”.
12. University of California, Berkeley - Methods in Social Epidemiology (Spr2014): “Introduction to Targeted Learning”, 2014.
13. University of California, Berkeley - Epidemiologic Methods II (Fa2013): “Designing the SEARCH trial: Ph250b in Practice”.
14. University of California, Berkeley - Introduction to Causal Inference (Fa2013): “Adventures in Linking the SCM and the Observed Data”.
15. University of California, Berkeley - Methods in Social Epidemiology (Spr2013): “Introduction to Targeted Learning”.
16. University of California, Berkeley - Causal Consulting (Fa2012): “Do-Si-Do: A Two-Stage Design and TMLE for Estimating Causal Effects of Community-Based Interventions”.
17. University of California, Berkeley - Special Topics in Biostatistics: Adaptive Designs (Fa2012): “Pair Matching in Randomized Trials: Fairy Tales & Super Heroes”.
18. University of California, Berkeley - Methods in Social Epidemiology (Spr2012): “Introduction to Targeted Learning”.

## MENTORSHIP

Current **Stephen Lauer**, *Doctoral committee member*, Biostatistics.

**Julianne Higgins**, *William Lee Science Impact Program (Lee-SIP) Scholar & Commonwealth Honors College Honors Research Assistant Fellowship*, Mathematics (Undergraduate).

Past **Caroline Kusiak**, *Master’s committee member*, Biostatistics, Sept2018.  
Verily (Google)

## REVIEW OF SCIENTIFIC GRANTS & REPORTS

- 2018 Netherlands Organisation for Health Research and Development (ZonMw) Health Care Efficiency Research Programme  
Patient-Centered Outcomes Research Institute
- 2017 Medical Research Council (UK), Methodology Research Panel  
Patient-Centered Outcomes Research Institute

## REVIEW FOR SCIENTIFIC JOURNALS

**Editorial Board:** *Journal of Causal Inference*

**Reviewer:** *American Journal of Epidemiology*  
*Annals of Epidemiology*  
*BMJ Open*  
*Clinical Infectious Diseases*  
*Epidemiology*  
*International Journal of Epidemiology*  
*Journal of Causal Inference*  
*Journal of the International AIDS Society*  
*Journal of Rheumatology*  
*PLoS ONE*  
*Social Science & Medicine - Population Health*  
*Statistics and Probability Letters*  
*Statistics in Medicine*  
*Statistical Methods in Medical Research*

## DEPARTMENTAL & UNIVERSITY SERVICE

2017–2018 **Committee member**, *Admissions*.  
**Committee member**, *Student outreach*.  
**Co-organizer**, *Departmental seminar series*.  
**Poster judge**, *21<sup>st</sup> Annual SPHHS Research Day*.  
**Abstract judge**, *Delta Omega Public Health Honorary Society*.

## EXTERNAL SERVICE

2017–2018 **Representative**, *Universal Test & Treat Trials Consortuim (UT3C)*, Bordeaux-London-Boston-San Francisco.  
**Board member**, *Honors College Advisory Board*, University of Vermont.  
**Invited session organizer**, *New England Statistics Symposium*, Amherst, MA.  
**Poster judge**, *New England Statistics Symposium*, Amherst, MA.  
**Abstract review**, *Society of Epidemiologic Research Conference*, Baltimore, MD.  
**Poster judge**, *Society of Epidemiologic Research Conference*, Baltimore, MD.

2016–2017 **Organizer**, *Quantitative Group for Research on Infectious Diseases*, Harvard T.H. Chan School of Public Health.  
**Representative**, *Universal Test & Treat Trials Consortuim (UT3C)*, Bordeaux-London-Boston-San Francisco.  
**Board member**, *Honors College Advisory Board*, University of Vermont.  
**Poster judge**, *Society of Epidemiologic Research Conference*, Seattle, WA.

2015–2016 **Organizer**, *Conference on Causal Inference with Highly Dependent Data in Communicable Disease Research*, Cambridge, MA.  
**Representative**, *Universal Test & Treat Trials Consortuim (UT3C)*, Bordeaux-London-Boston-San Francisco.

**Board member**, *Honors College Advisory Board*, University of Vermont.

**Invited session organizer**, *Conference on Causal Inference with Highly Dependent Data in Communicable Disease Research*, Cambridge, MA.

**Mentored poster chats**, *Society of Epidemiologic Research Conference*, Miami, FL.

**Abstract review**, *Society of Epidemiologic Research Conference*, Miami, FL.

2014–2015 **Member**, *Tenure-track Biostatistics search committee*, UC Berkeley.

**Board member**, *Honors College Advisory Board*, University of Vermont.

**Member**, *School of Public Health Graduate Recruitment & Diversity Services*, UC Berkeley.

**Invited session organizer**, *Atlantic Causal Inference Conference*, Philadelphia, PA.

**Representative**, *Honors College Alumni Panel*, University of Vermont.

2013–2014 **Member**, *School of Public Health Graduate Recruitment & Diversity Services*, UC Berkeley.

2012–2013 **Member**, *School of Public Health Graduate Recruitment & Diversity Services*, UC Berkeley.

2011–2012 **Elected representative**, *School of Public Health Student Government*, UC Berkeley.

## MEMBERSHIPS

2018–Present New England Statistical Society (NESS)

2016–Present International AIDS Society (IAS)

2013–Present Society of Epidemiologic Research (SER)

2012–Present American Statistical Association

2012–2015 Western North American Region of the International Biometric Society

2008–Present Phi Beta Kappa

## SELECTED CONFERENCE PRESENTATIONS (\*denotes mentee)

1. **L. Balzer**. Big Data Overview: Identifying the advantages and limitations of Big Data.  
2019 *The Association for Research in Vision and Ophthalmology (ARVO) Conference 2019*,  
[Upcoming] Vancouver, Canada (**Keynote Speaker**)
2. **L. Balzer**. The Promises & Challenges of Cluster Randomized & Pragmatic Trials.  
2018 *HIV prevention efficacy trials design of the future (HVTN Conference)*, Seattle, WA  
[Upcoming] (**Plenary Speaker**)
3. J. Higgins\*, **L. Balzer**. Towards Generalizability: Recovering from Non-Random Participant Selection and Measurement  
2018 *Research Experiences for Undergraduates (REU) Poster Symposium*, Amherst, MA (Poster)
4. D. Havlir, E. Charlebois, **L. Balzer** T. Clark, D. Kwarisiima, J. Ayieko, J. Kabami, N. Sang, *et al.* SEARCH community cluster randomized study of HIV “test and treat” using multi- disease approach and streamlined care in rural Uganda and Kenya.

2018 22<sup>nd</sup> *International AIDS Conference*, Amsterdam, Netherlands (Late-breaker Oral)

5. B. Jewell, **L. Balzer**, T. Clark, E. Charlebois, S.R. Maddali, M. Kamya, D.V. Havlir, M.L. Petersen, A. Bershteyn. Modeling Projected HIV Incidence in the SEARCH Study of Treatment as Prevention in East Africa.

2018 22<sup>nd</sup> *International AIDS Conference*, Amsterdam, Netherlands (Poster)

6. S. Lauer\*, **L. Balzer**, E. Ray, S. Iamsirithaworn, J. Lessler, N. Reich. Building on forecasting models to assess the impact of an intervention.

2018 *Society for Epidemiologic Research*, Baltimore, MD (Poster)

2018 *New England Statistics Symposium*, Amherst, MA (Poster)

2018 *MIDAS Networking Meeting*, Bethesda, MD (Poster)

2017 *Epidemics* 6, Sitges, Spain (Poster)

7. **L. Balzer**. Introduction to and overview of the distinction between generalizability and transportability.

2018 *Society for Epidemiologic Research*, Baltimore, MD (Invited Talk)

8. **L. Balzer**. Multilevel Madness.

2018 *Society for Epidemiologic Research*, Baltimore, MD (Poster)

9. **L. Balzer**. Discussant: Modern Methods for Missingness.

2018 *New England Statistics Symposium*, Amherst, MA (Invited Talk)

10. D. Kwarisiima, J. Kabami, N. Sang, K. Kadde, A. Mucunguzi, K. Snyman, T. Clark, E. Bukusi, T. Liegler, E. Charlebois, **L. Balzer**, *et al.* Who remains untested following near-universal (>95%) population HIV testing?

2018 *Conference on Retroviruses and Opportunistic Infections*, Boston, MA (Invited Talk)

11. C. Marquez\*, A Mucunguzi, G. Chamie, **L. Balzer**, *et al.* Mobility predicts incident TB infection in children & adults in rural Uganda

2018 *Conference on Retroviruses and Opportunistic Infections*, Boston, MA (Poster)

12. J. Ayieko, E. Wafula, W. Opudo, C. Cohen, E. Bukusi, T. Clark, **L. Balzer**, *et al.* Phone call from clinical officer at HIV testing/re-contact improves linkage to care

2018 *Conference on Retroviruses and Opportunistic Infections*, Boston, MA (Poster)

13. **L. Balzer**. Causal inference in a big data world - The roadmap

2017 *X Congresso Brasileiro de Epidemiologia*, Florianópolis, Brazil (Invited Talk)

14. **L. Balzer**. The roadmap - a systematic approach from the causal question through the statistical analysis and to impact.

2017 *Joint Statistical Meetings*, Baltimore, MD (Invited Talk)

15. **L. Balzer**, W. Zheng, M. van der Laan, M. Petersen. A new approach to hierarchical data analysis:

targeted maximum likelihood estimation of cluster-based exposures under interference.

2017 *Society for Epidemiologic Research*, Seattle, WA (Poster)

16. **L. Balzer**, M. van der Laan, M. Petersen. Targeted Maximum Likelihood with Super Learning to evaluate progress towards HIV care cascade goals: An example from the SEARCH “test and treat” study.  
2017 *Society for Epidemiologic Research*, Seattle, WA (Contributed Talk)
17. W. Zheng, N. Sang, G. Chamie, **L. Balzer**, *et al.* Social networks and HIV prevalence in Kenya in the SEARCH study.  
2017 *Conference on Retroviruses and Opportunistic Infections*, Seattle, WA (Invited Talk)
18. **L. Balzer**, N. Sang, A. Plenty, T. Liegler, *et al.* Baseline population HIV cascade and 2-yr outcome of HIV+ children in the SEARCH trial.  
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19. C. Marquez\*, A. Mucunguzi, G. Chamie, D. Kwariisima, T. Ruel, **L. Balzer**, *et al.* High TB infection rate in children & young adults in rural Uganda in the SEARCH trial.  
2017 *Conference on Retroviruses and Opportunistic Infections*, Seattle, WA (Poster)
20. M. Petersen, **L. Balzer**, D. Kwarsiima, N. Sang, *et al.* SEARCH test and treat study in Uganda and Kenya exceeds the UNAIDS 90-90-90 cascade target by achieving 81% population-level viral suppression after 2 years.  
2016 *21<sup>st</sup> International AIDS Conference*, Durban, South Africa (Late-breaker Oral)
21. **L. Balzer**, W. Zheng, T. Ruel, E.D. Charlebois, *et al.* Changing social networks and increased HIV prevalence in Kenyan adolescent women.  
2016 *21<sup>st</sup> International AIDS Conference*, Durban, South Africa (Poster)
22. **L. Balzer**. Why bother with TMLE (targeted maximum likelihood estimation)?  
2016 *Society for Epidemiologic Research*, Miami, FL (Poster)
23. **L. Balzer**, P. Staples, J. Onnela, V. DeGruttola. Using Network-based Simulations to Evaluate the Effect of Adding Targeted PrEP to an Ongoing Treatment-as-Prevention Trial.  
2016 *Society for Epidemiologic Research*, Miami, FL (Poster)  
2015 *Infectious Disease Research Conference (NIAID/NIH)*, Bethesda, MD (Invited Talk)
24. W. Zheng, **L. Balzer**, L. Brown, N. Sang, *et al.* Local social network features predict HIV testing uptake in a rural Ugandan community.  
2016 *Conference on Retroviruses and Opportunistic Infections*, Boston, MA (Poster)
25. **L. Balzer**, M. van der Laan, M. Petersen, the SEARCH Consortium. Adaptive Pre-specification in Randomized Trials With and Without Pair-Matching.

- 2015 *Infectious Disease Research Conference (NIAID/NIH)*, Bethesda, MD (Poster)  
*Society for Epidemiologic Research*, Denver, CO (Poster)  
*Atlantic Causal Inference Conference*, Philadelphia, PA (Poster)
26. **L. Balzer**, M. Petersen, M. van der Laan, the SEARCH Consortium. Estimating the Sample Average Treatment Effect in the SEARCH trial.  
2015 *Society for Epidemiologic Research*, Denver, CO (Poster)
27. M. van der Laan, **L. Balzer**, M. Petersen. Estimation and Inference for the Sample Average Treatment Effect in Cluster Randomized Trials.  
2015 *Atlantic Causal Inference Conference*, Philadelphia, PA (Invited Talk)
28. **L. Balzer**, M. Petersen, M. van der Laan. Pair-Matching & Estimation of the Intervention Effect in the SEARCH trial.  
2014 *Joint Statistical Meetings*, Boston, MA (Contributed Talk)  
*SFASA Student Travel Awards Seminar*, Boston, MA (Invited Talk)  
*Atlantic Causal Inference Conference*, Providence, RI (Poster)
29. J. Ahern, **L. Balzer**, M. van der Laan. A rigorous system to determine the health impacts of policies and programs: Simulations to optimize study design and analysis.  
2013 *Berkeley Data Science Initiative Symposium*, Berkeley, CA (Poster)  
*NIH High Risk-High Reward Research Symposium*, Bethesda, MD (Poster)
30. **L. Balzer**, M. Petersen, M. van der Laan. Pair-Matching - Theory vs. Practice: Adaptive Matching in the SEARCH trial.  
2013 *Society for Epidemiologic Research*, Boston, MA (Poster)  
*Western North American Region of IBS*, Los Angeles, CA (Invited Talk)  
2012 *School of Public Health Research Symposium*, Berkeley, CA (Poster)
31. **L. Balzer**, M. Pearl, J. Ahern, M. van der Laan. Estimating Effects on Rare Outcomes: Knowledge is Power.  
2013 *Western North American Region of IBS*, Los Angeles, CA (Invited Talk)  
*Atlantic Causal Inference Conference*, Boston, MA (Poster)
32. M. Pearl, **L. Balzer**, J. Ahern. Low-income neighborhoods and very preterm birth: an application of case-control-weighted targeted maximum likelihood estimation.  
2013 *Society for Epidemiologic Research*, Boston, MA (Contributed Talk)  
*Society for Pediatric & Perinatal Epidemiologic Research (SPER)*, Boston, MA (Contributed Talk)
33. **L. Balzer**, M. Petersen, J. Schwab, M. van der Laan. Estimating the impact of community-level interventions: The SEARCH Trial and HIV Prevention in Sub-Saharan Africa.  
2012 *Western North American Region of IBS*, Fort Collins, CO (Invited Talk)
34. **L. Balzer**, M. Petersen, M. van der Laan. Why Match in Individually and Cluster Randomized Trials?  
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35. **L. Balzer**, D. Bentil. Minimal Mathematical Model for Activated Protein C Regulation of Factor Va  
2008 *Student Research Conference, University of Vermont, Burlington, VT* (Invited Talk)

## IN THE NEWS & MEDIA

- Balzer, International Team Lead Community-Based HIV Trial in East Africa, by Patrick Freeman, Inside UMass, August 7, 2018.
- ‘Test and Treat’ Programs Reduce HIV Infections: Multi-disease attack shows benefits across the board, by Ed Susman, MedPage Today, July 27, 2018.
- Multi-disease health fairs, universal “test and treat” help East African communities achieve HIV benchmarks, by National Institutes of Health, July 25, 2018.
- Balzer Examines Super Learning Prediction Methodology, by Patrick Freeman, The SPHHS E-Newsletter, July 23, 2018.
- African study exceeds U.N. ‘test and treat’ goal for ending HIV pandemic, by Katy Migiro, Reuters, July 20, 2016.
- SEARCH study exceed 90-90-90 targets after 2 years of ‘test and treat’ for HIV in rural East Africa, by Keith Alcorn, aidsmap, July 20, 2016.
- How a remote Kenyan island is helping create world-class HIV care, by William Brangham, PBS NewsHour, July 15, 2016.



- Strength and Solutions In Numbers: SEARCH channels the power of group science and community engagement to guide a global effort to end AIDS, by Linda Anderberg, UC Berkeley School of Public Health, June 2015.
- Biostatistics teaching team receives ASA education award for innovative excellence, by UC Berkeley School of Public Health, August 2014.
- American Statistical Association Announces Recipients of 25th Annual Gertrude M. Cox Scholarships, by Jeffrey A. Myers, ASA News, August 2014.
- Cal Berkeley Petersen, Balzer To Be Presented 2014 Causality in Statistics Education Award, by Jeffrey A. Myers, ASA News, July 2014.
- Top Honors, by Thomas Weaver, Vermont Quarterly, Fall 2007.
- Creating a Global Impact - CEMS Student Wins Highly Competitive Goldwater Scholarship, by The University of Vermont, April 2007.