

Contact Information

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Education

- B.S., Mathematics. Northeastern University, Boston, MA, 2011
- M.S., Biostatistics. University of Washington, Seattle, WA, 2015
- Ph.D., Biostatistics. University of Washington, Seattle, WA, 2016

Academic Appointments

- Assistant Professor of Biostatistics, Vanderbilt University, 2018–

Employment

- Research Assistant, Beth Israel Deaconess Medical Center, 2010–2012
- Research Assistant, Collaborative Health Studies Coordinating Center, 2012–2015
- Research Assistant, Fred Hutchinson Cancer Research Center, 2015–2016
- Postdoctoral Researcher, University of Pennsylvania, Department of Biostatistics, Epidemiology, and Informatics, and Center for Causal Inference, 2016–2018
- Associate Fellow, Leonard Davis Institute of Health Economics, 2017–2018

Awards and Honors

- University of Washington Department of Biostatistics Retreat: Best Research Poster Award (as selected by incoming students), 2013
- University of Washington Department of Biostatistics: Outstanding Teaching Assistant Award, 2014
- WNAR Student Paper Competition: Most Outstanding Paper Award, 2015
- WNAR Student Paper Competition: Most Outstanding Oral Presentation Award, 2015
- Atlantic Causal Inference Conference: Thomas R. Ten Have Poster Presentation Award Runner-up, 2017

Peer-Reviewed Publications

1. Wang, L., **Spieker, A.J.**, Li, J., and Rutkove, S.B. (2011). Electrical impedance myography for monitoring motor neuron loss in the SOD1 G93A amyotrophic lateral sclerosis rat. *Clinical Neurophysiology* 122(12), 2505-2511. [link](#).
2. Nodera, H., **Spieker, A.J.**, Sung, M., and Rutkove, S.B. (2011). Neuroprotective effects of Kv7 channel agonist, retigabine, for cisplatin-induced peripheral neuropathy. *Neuroscience Letters* 505(3), 223-227. [link](#).
3. Narayanaswami, P., **Spieker, A.J.**, Mongioli, P., Keel, J.C., Muzin, S.C., and Rutkove, S.B. (2012). Utilizing a handheld electrode array for localized muscle impedance measurements. *Muscle and Nerve* 46(2), 257-263. [link](#).
4. Li, J., Staats, W., **Spieker, A.J.**, Sung, M., and Rutkove, S.B. (2012). A technique for performing electrical impedance myography in the mouse hind limb: data in normal and ALS SOD1 G93A animals. *PLoS One* 7(9), e45004. [link](#).
5. Sung, M., **Spieker, A.J.**, Narayanaswami, P., and Rutkove, S.B. (2013). The effect of subcutaneous fat on electrical impedance myography when using a handheld electrode array: the case for measuring reactance. *Clinical Neurophysiology* 124(2), 400-404. [link](#).
6. Li, J., **Spieker, A.J.**, Rosen, G.D., and Rutkove, S.B. (2013). Electrical impedance alterations in the rat hind limb with unloading. *Journal of Musculoskeletal and Neuronal Interactions* 13(1), 37-44. [link](#).
7. **Spieker, A.J.**, Narayanaswami, P., Fleming, L., Keel, J.C., Muzin, S.C., and Rutkove, S.B. (2013). Electrical impedance myography in the diagnosis of radiculopathy. *Muscle and Nerve* 48(5), 800-805. [link](#).
8. Sung, M., Li, J., **Spieker, A.J.**, Spatz, J., Ellman, R., Ferguson, G., Bateman, T., Rosen, G.D., Bouxsein, M., and Rutkove, S.B. (2013). Spaceflight and hind limb unloading induce similar changes in electrical impedance characteristics of mouse gastrocnemius muscle. *Journal of Musculoskeletal and Neuronal Interactions* 13(4), 405-411. [link](#).
9. **Spieker, A.J.**, Delaney, J.A.C., and McClelland, R.L. (2015). Evaluating the treatment effects model for estimation of cross-sectional associations between risk factors and cardiovascular biomarkers influenced by medication use. *Pharmacoepidemiology and Drug Safety* 24(12), 1286-1296. [link](#).
10. Hsi, R.S., **Spieker, A.J.**, Stoller, M.L., Jacobs, D.R., Jr., Reiner, A.P., McClelland, R.L., Kahn, A.J., Chi, T., Szklo, M., and Sorensen, M.D. (2015). Coronary artery calcium score and association with recurrent nephrolithiasis: the Multi-Ethnic Study of Atherosclerosis. *Journal of Urology* 195(4), 971-976. [link](#).

11. Johnson, M., Pierson, E.R., **Spieker, A.J.**, Nielsen, S., Posso, S., Kita, M., Buckner, J., and Goverman, J. (2016). Distinct T cell signatures define subsets of multiple sclerosis patients. *Neurology: Neuroimmunology & Neuroinflammation* 3(5):e278. [link](#).
12. **Spieker, A.J.** and Huang, Y. A method to address between-subject heterogeneity for identification of principal surrogate markers in repeated low-dose challenge HIV vaccine studies. (2017). *Statistics in Medicine*, 36(26), 4167-4181. [link](#).
13. Stephens-Shields, A.J., **Spieker, A.J.**, Yang, W., Anderson, A., Drawz, P., Fischer, M., Sozio, S.M., Feldman, H., Joffe, M., Green, T., and the CRIC Study Investigators. (2017). Blood pressure and the risk of chronic kidney disease progression using multistate marginal structural models in the CRIC study. *Statistics in Medicine*, 36(25), 4071-4080. [link](#).
14. **Spieker, A.J.**, Roy, J.A., and Mitra, N. (2018). Analyzing medical costs with time-dependent treatment: The nested g-formula. *Health Economics*, 27(7), 1063-1073. [link](#).
15. **Spieker, A.J.**, Delaney, J.A.C., and McClelland, R.L. (2018). A method to account for covariate-specific treatment effects when estimating biomarker associations in the presence of endogenous medication use. *Statistical Methods in Medical Research*, 27(8), 2279-2293. [link](#).

Papers in Preparation and Technical Reports

16. **Spieker, A.J.**, Oganisian, A., Ko, E., Roy, J.A., and Mitra, N. A causal approach to analysis of censored medical costs in the presence of time-varying treatment. Pending submission to *Journal of the American Statistical Association*, [arXiv:1705.08742](#).
17. **Spieker, A.J.**, Roy, J.A., and Mitra, N. The determination curve: a new framework for cost-effectiveness estimation and subgroup discovery. Pending submission to *Annals of Applied Statistics*.
18. Wan, J., Oganisian, A., **Spieker, A.J.**, Hoffstad, O., Mitra, N., Margolis, D., and Takeshita, J. Healthcare utilization for pediatric atopic dermatitis: a cohort study using the Pediatric Eczema Elective Registry. Pending submission to *JAMA Pediatrics*.
19. **Spieker, A.J.**, Small, D.S., and Mitra, N. I'm not ignoring "U": A sensitivity analysis approach for g-computation. *In preparation*.

Conference Papers

1. Rutkove, S.B., Caracciolo, J., Mongiovi, P.C., **Spieker, A.J.**, and Darras, B.T. (2010). Assessing Duchenne muscular dystrophy with electrical impedance myography. *39th Annual Meeting of the Child Neurology Society*, Volume 68.

2. Jafarpoor, M., **Spieker, A.J.**, Li, J., Darras, B.T., and Rutkove, S.B. (2011). Assessing electrical impedance alterations in spinal muscular atrophy via the finite element method. *Conference Proceedings: IEEE Engineering in Medicine and Biology Society 2011*, 1871-1874.
3. Li, J., **Spieker, A.J.**, Rosen, G., and Rutkove, S.B. (2012). Electrical impedance alterations in muscle induced by hindlimb unloading. *137th Annual Meeting of the American Neurological Association*, Volume 72.
4. Rutkove, S.B., **Spieker, A.J.**, Sung, M., and Li, J. (2013). Electrical impedance myography for high throughput drug screening in ALS mouse models. *Conference Proceedings, Neurology*, Volume 80 (7 Supplement), P02.169.

Presentations

Invited Conference and Workshop Presentations

1. Computing session for propensity score methods. First Causal Inference and Big Data Summer Institute. Philadelphia, PA, July 24, 2017.
2. Causal approaches to cost and cost-effectiveness analysis with time-dependent treatment regimes. ENAR: Atlanta, GA, March 26, 2018.
3. Computing session for propensity score and matching methods. Second Causal Inference and Big Data Summer Institute. Philadelphia, PA, June 25, 2018.
4. Approaches to cost-effectiveness analysis based on individual monetary benefit. ENAR: Philadelphia, PA, March, 201.

Invited Seminars

1. Flexible modeling of biomarker associations in the presence of endogenous treatment. Collaborative Health Studies Coordinating Center. Seattle, WA, March 20, 2015.
2. Extending Heckman's treatment effects model to allow heterogeneity in the effects of medication use. FDA Center for Drug Evaluation and Research. Silver Spring, MD, September 28, 2015.
3. Understanding natural history in the presence of endogenous medication use. Weill Cornell Medical College Division of Biostatistics and Epidemiology. New York, NY, January 14, 2016.
4. Accounting for endogenous medication use when estimating natural biomarker associations using observational data. Stanford Medicine Quantitative Sciences Unit. Palo Alto, CA, March 16, 2016.

5. Recovering natural history: Modeling biomarker age trends in the presence of endogenous medication use. University of Pennsylvania Division of Biostatistics. Philadelphia, PA, October 18, 2016.
6. The nested g-formula: A causal approach to analysis of medical cost data in the presence of censoring. University of Washington, Collaborative Health Studies Coordinating Center. Seattle, WA, May 11, 2017.
7. Analyzing medical cost outcomes with time-dependent treatment. New York University Department of Population Health. New York, NY, October 25, 2017.
8. The nested g-formula: A causal approach for analyzing medical cost outcomes. New York University Division of Biostatistics. New York, NY, January 9, 2018.
9. The nested g-formula: A causal approach for analyzing medical cost outcomes. University of Pennsylvania Division of Biostatistics. Philadelphia, PA, January 17, 2018.
10. The nested g-formula: A causal approach for analyzing medical cost outcomes. University of British Columbia Department of Statistics. Vancouver, BC, January 23, 2018.
11. Analyzing medical cost outcomes with time-dependent treatment. British Columbia Children's Hospital Research Institute. Vancouver, BC, January 24, 2018.
12. The nested g-formula: A causal approach for analyzing medical cost outcomes. University of Utah Department of Population Health. Salt Lake City, UT, February 1, 2018.
13. Analyzing medical cost outcomes with time-dependent treatment. Huntsman Cancer Institute. Salt Lake City, UT, February 2, 2018.
14. Analyzing medical cost outcomes with time-dependent treatment. University of Massachusetts Amherst Department of Biostatistics. Amherst, MA, February 6, 2018.
15. The nested g-formula: A causal approach for analyzing medical cost outcomes. Vanderbilt University Department of Biostatistics Seminar. Nashville, TN, February 16, 2018.
16. Analyzing cost outcomes with time-varying treatment: Guidance for resource allocation and health policy decisions. Drexel University Biostatistics Seminar. Philadelphia, PA, February 20, 2018.
17. Analyzing cost outcomes with time-varying treatment: Guidance for resource allocation and health policy decisions. State University of New York at Albany Epidemiology and Biostatistics Seminar. Albany, NY, February 26, 2018.

Contributed Conference Presentations

1. (Oral) A comparison of methods for biomarker associations with endogenous treatment. ENAR: Baltimore, MD, March 17, 2014.
2. (Oral) Extending Heckman's treatment effects model to allow for treatment heterogeneity. WNAR: Boise, ID, June 15, 2015. (WNAR Most Outstanding Oral Presentation Award).
3. (Oral) Extending Heckman's treatment effects model to non-additive treatment effects. Joint Statistical Meetings: Seattle, WA, August 13, 2015.
4. (Oral) Accounting for heterogeneity when evaluating surrogate endpoints in a discrete-time survival model. ENAR: Austin, TX, March 8, 2016.
5. (Oral) A constrained covariance modeling approach for estimation of marginal age trends in the presence of endogenous medication use. ENAR: Washington, D.C., March 14, 2017.
6. (Poster) A nested g-computation approach for analysis of censored medical cost data. Atlantic Causal Inference Conference: Chapel Hill, NC, May 24, 2017. (Thomas R. Ten Have Poster Session Runner-up).
7. (Oral) A nested g-computation approach to analyze medical cost outcomes in the presence of censoring. WNAR: Santa Fe, NM, June 29, 2017.
8. (Oral) A new direction for health policy decisions based on subgroup discovery: The cost-effectiveness determination curve. Joint Statistical Meetings: Vancouver, BC, August, 2018.

Statistical Software Packages (R)

- `uwIntroStats`: Emerson, S.S., **Spieker, A.J.**, Williamson, B.D., Hee Wai, T., Lim, S. Descriptive Statistics, Inference, Regression, and Plotting in an Intro Stats. Course
- `endogenous`: **Spieker, A.J.** Classical Simultaneous Equation Models

Professional Activities

Conference Sessions Chaired

1. Survival Analysis and Semi-parametric and Non-parametric Models. ENAR: Washington D.C., March 13, 2017.
2. Recent Developments in Observational Data. WNAR: Santa Fe, NM, June 28, 2017.
3. Comparative Effectiveness Research. ENAR: Atlanta GA, March 26, 2018.

Editorial and Referee Service

- Reviewer, *PLOS ONE* (2018)
- Reviewer, *Journal of the American Statistical Association* (2017, 2018)
- Reviewer, *American Journal of Epidemiology* (2015, 2016, 2017, 2018)
- Reviewer, *International Journal of Biostatistics* (2017)
- Reviewer, *Biostatistics* (2016, 2017)
- Reviewer, *Journal of the Royal Statistical Society, Series C* (2016)
- Reviewer, *Pharmacoepidemiology and Drug Safety* (2016, 2017)
- Reviewer, *British Medical Journal* (2016)

Professional Memberships

- Member, International Biometric Society (Eastern North American Region)
- Member, American Statistical Association
- Advanced Tutor Certification, College Reading and Learning Association

Teaching History

Instructor (University of Pennsylvania)

- Health Policy Research 604 - Introduction to Statistics for Health Policy (Autumn 2017)
Enrollment: 24; Mean evaluation: 4.7/5.0

Instructor (University of Washington)

- Biostatistics 311 - Regression Methods in the Health Sciences (Spring 2016)
Enrollment: 7; Median evaluation: 4.7/5.0

Advising and Formal Mentoring

- Marlena Norwood (*Ad hoc* undergraduate honors project)
Topic: Simulation studies and nonparametric bootstrapping methods
- Nicholas Illenberger (Ph.D. lab rotation)
Topic: Statistical methods for health policy guidance

Teaching Assistantships (University of Washington)

- Biostatistics 524 - Design of Medical Studies (Spring 2014)
Enrollment: 34; Median evaluation: 4.9/5.0
- Biostatistics 570 - Advanced Regression Methods I (Autumn 2014)
Enrollment: 44; Evaluation not conducted

- Biostatistics 571 - Advanced Regression Methods II (Winter 2015)
Enrollment: 36; Median evaluation: 4.2/5.0
- Biostatistics 524 - Design of Medical Studies (Spring 2015)
Enrollment: 38; Median evaluation: 4.9/5.0

Instructor (Massachusetts Institute of Technology Educational Studies Program)

- Counting Principles (Summer 2009)
- AP Calculus AB (September 2009 - May 2010)
- Multivariable Calculus (Summer 2010)
- Counting Principles (Summer 2011)
- AP Calculus BC (September 2010 - May 2011)
- AP Calculus BC (September 2011 - May 2012)

Short Courses (Massachusetts Institute of Technology Educational Studies Program)

- Introduction to Calculus (2008, 2009)
- Group Theory (2008, 2009)
- Number Theory (2008, 2009)
- Stochastic Processes (2009)
- Introduction to Topology (2009)
- Introduction to Real Analysis (2009)
- Complex Variables (2009, 2010)

Service and Committees

Service at University of Pennsylvania

- Member, Department of Biostatistics, Epidemiology, and Informatics Post-Doc Training Task Force, 2017-present

Service at University of Washington

- Student Representative, Departmental Self-Study Committee, 2012-2013
- Facilitator, Center for Teaching and Learning Annual TA/RA Conference, 2015
- Member, Educational Policy and Teaching Evaluation Committee, 2014-2016
- Member, Faculty/Student Relations Committee, 2015-2016

Other Service

- Mentor/Tutor, St. Peter's Teen Center, Dorchester, MA, 2008-2009