

# Brian D. Segal

New York, NY • 202-870-4049 • [bsegal@flatiron.com](mailto:bsegal@flatiron.com)  
<https://bdsegal.github.io>

## EDUCATION

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<b>Ph.D. in Biostatistics</b> , University of Michigan, Ann Arbor, MI	July 2017
<b>M.S. in Biostatistics</b> , University of Michigan, Ann Arbor, MI	May 2013
<b>B.S. in Biology</b> , Virginia Tech, Blacksburg, VA, <i>summa cum laude</i>	May 2007

## RESEARCH INTERESTS

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Computationally efficient resampling methods; nonparametric and semiparametric regression; longitudinal analysis; estimation-based alternatives to hypothesis testing; applications in the life sciences, sociology, psychology, medicine, and the environment

## POSITIONS

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<b>Flatiron Health</b> , New York, NY Quantitative Scientist	Aug 2017 – present
<b>Google, Advanced Measurement Technologies</b> , New York, NY Intern	May 2016 – Aug 2016
<b>University of Michigan, Department of Orthopaedic Surgery</b> , Ann Arbor, MI Research Associate II	Sep 2015 – Nov 2016
<b>University of Michigan, Institute for Social Research</b> , Ann Arbor, MI Graduate Student Research Assistant	Sep 2014 – Aug 2015
Regents' Fellow	Sep 2013 – Aug 2014
<b>University of Michigan, Department of Biostatistics</b> , Ann Arbor, MI Graduate Student Research Assistant	Jan 2012 – Aug 2013
<b>Abt Associates, Environment and Resources Division</b> , Bethesda, MD Analyst	Jun 2010 – Mar 2011
Associate Analyst	Jun 2008 – May 2010
Research Assistant	Jul 2007 – May 2008
<b>Virginia Tech, Department of Civil and Environmental Engineering</b> , Blacksburg, VA Research Assistant	Aug 2006 – May 2007
<b>Environmental Protection Agency, Office of Pesticide Programs, Communication Services Branch</b> , Crystal City, VA Intern	May 2006 – Aug 2006
<b>Virginia Tech, Department of Biological Sciences</b> , Blacksburg, VA Research Assistant	May 2005 – Aug 2005

## PUBLICATIONS

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### *Accepted*

Burgard, S. A., Lin, K. Y., **Segal, B. D.**, Elliott, M. R., and Seelye, S. S. (2018). Stability and change in health risk behavior profiles of U.S. adults. *Journal of Gerontology: Series B*. [doi.org/10.1093/geronb/gby088](https://doi.org/10.1093/geronb/gby088).

**Segal, B. D.**, Braun, T., Elliott, M. R. and Jiang, H. (2018). Fast approximation of small p-values in permutation tests by partitioning the permutations. *Biometrics*, 74: 196–206. [doi:10.1111/biom.12731](https://doi.org/10.1111/biom.12731).

**Segal, B. D.**, Bennette, C. S. Re: “Transportability of trial results using inverse odds of sampling weights.” *American Journal of Epidemiology* (In press).

### *Under review*

**Segal, B. D.**, Elliott M., Braun T., and Jiang, H. P-splines with an  $\ell_1$  penalty for repeated measures. [arXiv:1707.08933](https://arxiv.org/abs/1707.08933) (Under second round of review).

**Segal, B. D.**, Braun, T., Gonzalez, R., and Elliott, M. R. Tests of matrix structure for construct validation (Under second round of review).

### *In preparation*

**Segal, B. D.** Exceedance probability for parameter estimates. [arXiv:1803.03356](https://arxiv.org/abs/1803.03356).

## TALKS AND POSTERS

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Contributed talk: “Exceedance probability for parameter estimates.” JSM, July 2018.

Invited talk: “P-splines with an  $\ell_1$  penalty for repeated measures.” Statistical learning and data science/nonparametric statistics conference, June 2018.

Contributed poster (winner of best poster from Biostatistics department): “Tests of matrix structure for construct validation.” Michigan Student Symposium for Interdisciplinary Statistical Sciences, Mar 2017.

Contributed poster: “P-splines with an  $\ell_1$  penalty for repeated measures.” ENAR, Mar 2017.

Contributed talk (winner of travel award): “Fast approximation of small p-values in permutation tests by partitioning the permutation space.” JSM Biometrics section student paper awards session, Aug 2016.

Contributed poster: “Fast approximation of small p-values in permutation tests by partitioning the permutation space.” ENAR, Mar 2016.

## TECHNICAL REPORTS

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Amarakoon, S., Smith, J., **Segal, B. D.** Lithium-ion batteries and nanotechnology for electric vehicles: life cycle assessment study. U.S. Environmental Protection Agency, Office of Pollution Prevention and Toxics, Design for the Environment Program. EPA 744-R-08-001, Apr 2012.

Socolof, M., Amarakoon, S., Smith, J., **Segal, B. D.** Life-cycle assessment of plenum space communication cable. The Society of the Plastics Industry, Oct 2009.

Greco, S., Smith, J., **Segal, B. D.**, Post, E., Lynch, M., Hattis, D. Evaluating methods for quantifying human noncancer health risks: case study application, draft report. US EPA, Mar 2009.

Greco, S., Acquaye, A., Peak, K., **Segal, B. D.**, Rast, M. Framework for estimating costs and benefits associated with changes in the reference dose at federal facility hazardous waste sites. US EPA, Oct 2008.

**Segal, B. D.** Biofilm forming properties of the ammonia oxidizing bacteria *Nitrosomonas europaea*. Undergraduate research project. Department of Civil and Environmental Engineering, Virginia Tech, May 2007.

## SOFTWARE

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**fastPerm**: R package for quickly approximating small permutation p-values for the difference and ratio of means. Available at <https://github.com/bdsegal/fastPerm>.

**gammaDist**: R package for computing the distribution and density of the difference of two gamma random variables under the null of equal distributions. Includes a saddlepoint approximation to the density. Available at <https://github.com/bdsegal/gammaDist>.

### *In development*

**matrixTest**: R package for testing symmetric matrices for block-diagonal structure under the null of exchangeable off-diagonal elements. Based on a permutation test with Hubert's gamma and a t-statistic. Available at <https://github.com/bdsegal/matrixTest>.

**psplines11**: R package for fitting additive mixed models with P-splines and an  $\ell_1$  penalty using alternating direction method of multipliers and cross validation. Available at <https://github.com/bdsegal/psplines11>.

## TEACHING EXPERIENCE

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Instructor: Statistical Programming Workshop, University of Michigan, Winter 2016. Notes available at <https://bdsegal.github.io/BSA-computing-workshop>.

Grader: Introduction to Public Health (PUBHLTH 610), University of Michigan, Fall 2014

Graduate Student Instructor: Introduction to Biostatistics (BIOSTAT 503), University of Michigan, Fall 2011

## HONORS AND AWARDS

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Best Poster from Biostatistics Departments at Michigan Student Symposium for Interdisciplinary Statistical Sciences, "Tests of matrix structure for construct validation" 2017

Rackham Predoctoral Fellowship 2016

Travel Award for JSM, Biometrics Section, "Fast approximation of small p-values in permutation tests by partitioning the permutation space" 2016

Rackham Graduate Student Research Grant	2014
Regents' Fellowship	2013
Phi Beta Kappa	2005
Virginia Tech Paul Dirksen Smith Cycling Scholarship	2004

## **PROFESSIONAL SERVICE AND INVOLVEMENT**

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Reviewer for:

Biometrics

Journal of the American Statistical Association

Statistical Methods in Medical Research

Chaired sessions at JSM on data science and statistical challenges in the analysis of EHR data 2018

Member, Eastern North American Region International Biometric Society 2015 – present

Volunteer, Statisticians Without Borders, response to Ebola outbreak Oct 2014

Member, American Statistical Association 2012 – present

Committee Member, Abt Associates Community Engagement Program 2009 – 2010

## **COMMUNITY INVOLVEMENT**

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Volunteer Juggling Instructor, Zip Zap Circus, Washington, DC Apr 2011 – Aug 2011

Volunteer, Al-Rowwad Children's Art Center, Bethlehem, West Bank Jul 2010

Participant, Service learning project to help recent immigrants adjust to life in the United States, Roanoke, VA Jan 2006 – May 2006

Volunteer English Teacher, Salomon Kim School, Quito, Ecuador Sep 2005 – Dec 2005

President, Virginia Tech Cycling Club, Blacksburg, VA Aug 2004 – May 2005

Sponsorship Officer, Virginia Tech Cycling Club, Blacksburg, VA Aug 2003 – May 2004

## **COMPUTER SKILLS**

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Proficient: R, SAS,  $\text{\LaTeX}$

Familiar: Python, C, Unix, SQL, Git/GitHub, Mplus

## **REFERENCES**

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Available upon request