

## CONTACT INFORMATION

Health Sciences Building F-600      *Phone:* (206) 310-4888  
 Department of Biostatistics      *Email:* brianw26[at]uw[dot]edu  
 University of Washington      *Web:* <https://bdwilliamson.github.io>  
 Seattle, Washington 98195

## RESEARCH INTERESTS

Inference with high-dimensional data using targeted maximum likelihood estimation; data science;  
 statistical machine learning; statistical methods for HIV/AIDS research

## EDUCATION

Ph.D., Biostatistics, University of Washington      2014–2019 (expected)  
 Committee: Marco Carone (co-chair), Noah Simon (co-chair), Scott Emerson, Carey Farquhar,  
 Peter Gilbert

M.S., Biostatistics, University of Washington      2017

B.A., Mathematics, Pomona College      2014  
 Thesis adviser: Johanna Hardin

## FUNDING

**F31AI140836** (PI: Williamson)      09/2018–09/2020  
*Ruth L. Kirschstein Predoctoral Individual National Research Service Award*  
 Evaluating predictors of HIV vaccine efficacy: Statistical methods for estimation, testing, and  
 inference

## HONORS AND AWARDS

**University of Washington Department of Biostatistics:**

Excellence in Teaching Award      09/2018  
 ASA Biometrics Section Travel Award for JSM 2018      01/2018  
 WNAR Most Outstanding Oral Paper Award      06/2017  
 Biostatistics Department Conference Travel Award      06/2017  
 Graduate School Fund for Excellence and Innovation Travel Award      06/2017  
 Graduate and Professional Student Senate Travel Grant      06/2017  
 Top Scholar Incoming Student Award      09/2014

**Pomona College:**

Distinction in the Senior Exercise      05/2014  
 Inducted into Sigma Xi Scientific Research Honor Society      05/2014  
 Pomona-Pitzer Varsity Swimming and Diving Captain      2013–2014  
 All SCIAC Conference Academic Team      2013, 2014  
 All SCIAC Conference Swimmer      2013  
 UCLA DataFest Best Insight Award      06/2013

## RESEARCH EXPERIENCE

**Fred Hutchinson Cancer Research Center**, Seattle, Washington  
Statistical Center for HIV/AIDS Research & Prevention (SCHARP)  
*Graduate Research Assistant* 06/2015–Present  
Advisor: James Hughes

**Stanford University School of Medicine**, Stanford, California  
*Integrative Cancer Biology Program Research Fellow* 06/2013–08/2013  
Advisors: Benedict Anchang and Sylvia Plevritis

## TEACHING EXPERIENCE

**University of Washington**, Seattle, Washington  
*Pre-Doctoral Instructor (with Kelsey Grinde)*  
BIOST 311: Regression Methods in the Health Sciences 03/2018–06/2018  
12 students [Overall adjusted median score = 4.7 out of 5]  
Faculty advisors: James Hughes and Barbara McKnight

*Lead Graduate Teaching Assistant*  
BIOST 511: Medical Biometry I 09/2017–12/2017  
Instructor: James Hughes

*Co-instructor (with Gillian Tarr [2016], Jessica Williams-Nguyen [2017, 2018])*  
School of Public Health Math and R skills 09/2016, 09/2017, 09/2018  
preparatory workshop (first offered 2016)  
Advisor: Annette Fitzpatrick, Ph.D.

*Graduate Teaching Assistant*  
BIOST 311: Regression Methods in the Health Sciences 03/2017–06/2017  
Instructor: Anna Plantinga  
BIOST 571: Advanced Regression Methods for Dependent Data 01/2017–03/2017  
Instructor: Adam Szpiro  
R package development for introductory biostatistics courses 06/2014–06/2015  
Advisor: Scott Emerson

*Co-instructor*  
First Year Statistical Theory Exam Review Sessions 03/2016–06/2016  
Advisor: Scott Emerson

*Teaching Assistant*  
Summer Institute for Statistics for Big Data  
Module 3, Reproducible Research for Biomedical Big Data 07/2017  
Instructors: Keith Baggerly and Karl Broman  
Module 2, Visualization of Biomedical Big Data 07/2016, 07/2017  
Instructors: Dianne Cook and Heike Hofmann  
Module 1, Accessing Biomedical Big Data 07/2015  
Instructors: Jeff Leek and Raphael Gottardo

*Guest Lecturer*

BIOST 311: <i>Penalized regression and model selection</i>	06/2017
BIOST 561: <i>Unix, shell, and cluster computing</i>	10/2016, 10/2017
BIOST 511: <i>Lecture on regular course content</i>	11/2017

**Pomona College**, Claremont, California

*Mentor/Teaching Assistant*

MATH 58b: Introduction to Biostatistics	01/2014–05/2014
MATH 58: Introduction to Statistics	08/2013–12/2013
Instructor: Johanna Hardin	

*Grader*

MATH 58b: Introduction to Biostatistics	01/2013–05/2013
Instructor: Johanna Hardin	
MATH 31H: Honors Calculus II	08/2012–12/2012
Instructor: Shahriar Shahriari	

PUBLICATIONS

\* denotes joint first-author contribution

7. \*Magaret CA, \*Benkeser DC, \***Williamson BD**, Borate BR, Carpp LN, Georgiev IS, Setliff I, Dingens AS, Simon N, Carone M, Simpkins C, Montefiori D, Alter G, Yu WH, Juraska M, Edlefsen PT, Karuna S, Mgodhi NM, Edugupanti S, and Gilbert PB. Prediction of VRC01 neutralization sensitivity by HIV-1 gp160 sequence features. 2018 (under second round of review)
6. **Williamson BD**, Gilbert PB, Simon N, and Carone M. Nonparametric variable importance assessment using machine learning techniques. *University of Washington Department of Biostatistics Working Paper Series*, (422), 2017 (under second round of review)
5. Hanscom B, Hughes JP, **Williamson BD**, and Donnell D. Adaptive non-inferiority margins under observable non-constancy. *Statistical Methods in Medical Research*, 2018. doi: 10.1177/0962280218801134
4. \*Feng J, \***Williamson BD**, Carone M, and Simon N. Nonparametric variable importance using an augmented neural network with multi-task learning. In *International Conference on Machine Learning*, volume 80, pages 1495–1504, 2018
3. Anchang B, Davis KL, Fienberg H, **Williamson B**, Bendall SC, Karacosta L, Tibshirani R, Nolan GP, and Plevritis SK. DRUG-NEM: optimizing drug combinations using single-cell perturbation response to account for intratumoral heterogeneity. *Proceedings of the National Academy of Sciences*, 115(18):E4294–E4303, 2018
2. Safren SA, Hughes JP, Mimiaga MJ, Moore AT, Friedman RK, Srithanaviboonchai K, Limbada M, **Williamson BD**, Elharrar V, Cummings V, Magidson JF, Gaydos CA, Celentano D, and Mayer KH for the HPTN063 Study Team. Frequency and predictors of estimated HIV transmissions and bacterial STI acquisition among HIV-positive patients in HIV care across three continents. *Journal of the International AIDS Society*, 19, 2016
1. Ritchwood TD, Hughes JP, Jennings L, MacPhail C, **Williamson B**, Selin A, Kahn K, Gómez-Olivé XF, and Pettifor A. Characteristics of age-discordant partnerships associated with HIV risk among young South African women (HPTN 068). *Journal of Acquired Immune Deficiency Syndromes*, 72:423–429, 2016

## SOFTWARE

**vimp**: R software for nonparametric variable importance (available on [CRAN](#))  
**vimpy**: python package for nonparametric variable importance (available on [PyPI](#))  
**uwIntroStats**: R software for introductory biostatistics students, developed with Scott Emerson M.D. Ph.D., Andrew Spieker Ph.D., Travis Hee Wai, and Solomon Lim (available on [CRAN](#))

## PRESENTATIONS

### **“Assessing Variable Importance Nonparametrically using Machine Learning Techniques”**

2018 *Joint Statistical Meetings*, Vancouver, BC, Canada (selected for an *ASA Biometrics Section Travel Award*)

2017 *Western North American Region (WNAR) of the International Biometric Society*, Santa Fe, NM (selected as the *Most Outstanding Oral Paper*)

*University of Washington Statistical Learning Applied to Biostatistics (SLAB) Lab*, Seattle, WA

2016 *University of Washington Department of Biostatistics Student Seminar*, Seattle, WA

### **“An Introduction to Targeted Learning”**

2017 *University of Washington Department of Biostatistics Student Seminar*, Seattle, WA

### **“Shrinkage Estimators for High-Dimensional Covariance Matrices”**

2014 *Pomona College Mathematics Seminar*, Claremont, CA

### **“Automating Cell Gating and Creating a Nested Effects Model to Compare Drug Effects”**

2013 *Stanford University Center for Cancer Systems Biology Meeting*, Stanford, CA

## POSTER PRESENTATIONS

4. **Williamson BD**, Magaret CA, Borate B, Carpp LN, Georgiev I, Setliff I, Dingens A, Benkeser DC, Simon N, Carone M, Montefiori D, Alter G, Yu WH, DeCamp AC, Juraska M, Edlefsen PT, Karuna S, Edugupanti S, and Gilbert PB. HIV-1 Sequence Predictors of VRC01 Neutralization Sensitivity. 25th HIV Dynamics and Evolution Meeting. April 2018, Leavenworth, WA.
3. **Williamson B**, Gilbert P, Simon N, and Carone M. Assessing Variable Importance Non-parametrically using Machine Learning Techniques. University of Washington Biostatistics Department Retreat. November 2017, Seattle, WA.
2. **Williamson B**, Gilbert P, Simon N, and Carone M. Assessing Variable Importance Non-parametrically using Machine Learning Techniques. Joint Statistical Meetings. July 2017, Baltimore, MD.
1. **Williamson B**, Carone M, and Simon N. Assessing Variable Importance Nonparametrically. University of Washington Biostatistics Department Retreat. September 2015, Blaine, WA.

## PROFESSIONAL SOCIETIES

### **Western North American Region of the International Biometric Society (WNAR)**

*Student Member* 08/2014–Present

### **American Statistical Association**

*Student Member* 03/2013–Present

### **Bernoulli Society**

*Student Member* 03/2016–Present

#### UNIVERSITY SERVICE

##### University of Washington Department of Biostatistics

###### *Student Member*

Diversity Committee	09/2016–Present
Educational Policy and Teaching Evaluation Committee (EPTEC)	09/2015–09/2018
Website Committee	03/2015–06/2015

###### *Peer Mentor*

Peer mentoring program	09/2016–Present
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###### *Co-organizer*

Statistical Learning Applied to Biostatistics (SLAB) Lab	09/2016–09/2017
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#### PROFESSIONALLY-RELATED SERVICE

<i>Session Chair</i> , “Quantification, Association Testing, and Integration of the Microbiome”, WNAR/ENAR Invited Session, JSM 2017	08/2017
<i>Alumni Mentor</i> , SagePost 47	06/2015–Present
<i>Statistical Consultant</i> , Sierra Streams Institute, Nevada City, California	03/2016–06/2016

#### TECHNICAL SKILLS

Statistical packages: Advanced knowledge of R, basic knowledge of SAS and Stata

Languages: Proficient in Python, basic knowledge of Java, C++, SML

Applications: Advanced knowledge of L<sup>A</sup>T<sub>E</sub>X, common Windows software, Proficient in git + GitHub

Operating Systems: Advanced knowledge of Unix/Linux, Windows