Kirsten E. Eilertson

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Research Interest

My work is focused on the application and development of statistical methods for active scientific research. Most recently, these applications have been in the domains of public health and medicine. My statistical areas of expertise include generalized linear mixed models, latent variable and state space models.

Education

Ph.D. **Statistics, Cornell University**. Ithaca NY. Summer 2011
Concentrations: Biometry and Mathematical Statistics
Advisor: Carlos D. Bustamante (Stanford University)
Dissertation Title: Estimation and Inference of Generalized Linear Mixed Models with applications to Population Genetics and Proteomics

M.S. **Statistics, Cornell University**. Ithaca NY. Fall 2009
Advisor: Carlos D. Bustamante

B.A. **Mathematics, St. Olaf College.** Northfield MN. Spring 2006
Concentration: Statistics

Positions

Associate Professor	**Colorado State University**	**August 2020 – Present**
Vaccine Impact Modelling Consortium Modeller		January 2017 – Present
Faculty in the Graybill Statistics and Data Science Laboratory		August 2019 – Present
Faculty in the Colorado School of Public Health Department of Biostatistics and Informatics		January 2020 – Present
Assistant Professor	**Colorado State University**	**August 2019 – August 2020**
Associate Research Professor	**Penn State University**	**July 2019 – August 2019**
Managing Director of the Statistical Consulting Center		August 2018 – August 2019
Faculty consultant in the Statistical Consulting Center		August 2013 – August 2019
CTSI Biostatics, Epidemiology and Research Design Biostatistician		January 2017 – August 2019
Vaccine Impact Modelling Consortium Modeller		January 2017 – August 2019
Assistant Research Professor	**Penn State University**	**August 2013 – June 2019**
Lead Biostatistician	**Gladstone Institutes, UCSF**	**May 2011 – July 2013**

Teaching

Colorado State University

STAA 554: Mixed Models
Topics in linear and generalized linear mixed models for students in the master's in applied statistics program.

STAA 512: Design and Data Analysis for Researchers II
Statistical methods for experimenters and researchers emphasizing design and analysis of experiments.

PBHL 560: Introduction to Biostatistics
An introductory statistics course for graduate students in the School of Public Health at CSU.
BIOS 6602: Biostatistics II
A second course in biostatistics for graduate students in the School of Public Health at CSU.

Penn State University

Stat 580: Statistical Consulting Practicum I
An introductory course to Statistical Consulting aimed at second year master's of applied statistics students and second or third year doctoral students.
Stat 581: Statistical Consulting Practicum II
A second course in Statistical Consulting aimed at second year master's of applied statistics students and third year PhD students.
Stat 470: Statistical Problem Solving and Communication in Applied Statistics
A capstone course for statistics majors.
Stat 500: Applied Statistics
An introductory statistics course for graduate students (primarily a service course).

Professional Memberships and Service

Reviewer: NASA Human Research Program proposals	2020 - Present
Program Chair of the Consulting Section at the Joint Statistical Meetings 2022	2020 – Present
Session Chair at Conference on Statistics In Practice, San Diego CA	2016
Council of Sections Representative for the Consulting Section of ASA	2016 – 2017
Member of American Statistical Association	2006 - Present
Member of American Society of Human Genetics	2007-2010

CSU Committee Service

MAS committee
Strategic Planning Committee
Applied Graduate Statistics Committee (Chair)
CCAF Promotion Committee (Math Department)

CSU Student Academic Committees

Outside Member: Cora Okkema	Active
Outside Member: Lawande, Rusha	Active
Outside Member: Jarosz, Jess	Graduated Fall 2020

Undergraduate Mentoring

Joshua Baumgardner 2020
Met with student on several occasions to discuss statistical conceptualizations, approaches, and methods needed to address research aims of project. Co-authored a resulting publication.

Baylee Schell 2019
Met with student on several occasions to discuss statistical conceptualizations, approaches, and methods needed to address research aims of project.

Funding

CURRENT

Title: Updating Measles Vaccine Impact Estimates – 2020-2021
PI: Matthew Ferrari, Penn State University
Sponsor: Vaccine Impact Modelling Consortium
Role: Co-PI
Period of Performance: 04/02/2020 – 03/31/2022

PENDING

Title: MnBuOE as a Novel Chemosensitizer for Breast Cancer and Neuroprotector
PI: Antino Allen
Sponsor: NIH
Role:Co-I (PI at CSU)

Title: Sulforaphane to Ameliorate Cognitive Decline after Acute Lymphoblastic Leukemia Treatment
PI: Antino Allen
Sponsor: NIH
Role:Co-I, (PI at CSU)

Title: Using Curriculum to Enhance Biomedical Research Workforce Diversity
PI: Tremain Williams
Sponsor: NIH
Role:Co-I (PI at CSU)

Title: Virtual Reality Symphone as a Non-pharmacological Intervention to Promote Cognition and Stress Management in Older Adults and Caregivers
PI: Meara Faw
Sponsor: NIH
Role:Co-I

Title: Minimizing Chemotherapy cognitive toxicities with the neuro- protector Sulforaphane
PI:Antino Allen
Sponsor: NIH
Role: Co-I (PI at CSU)

COMPLETED

Project Title: "Vitamin A mediated protection from gastrointestinal infection"
PI: Margherita Cantorna
Sponsor: National Institute of Allergy and Infectious Diseases
Candidate's Role: Co-PI

Project Title: "Performance of a new measles model"
PI: Matthew Ferrari
Sponsor: World Health Organization
Period of Performance: 9/19/2016-2/19/2017
Candidate's Role: Co-PI

Project Title: "Retrospective Impact Modeling for Measles Vaccination"
PI: Matthew Ferrari
Sponsor: Global Alliance for Vaccines and Immunizations

Period of Performance: 9/1/2014-4/15/2016
Candidate's Role: Co-PI

Peer Reviewed Publications

Li, Xiang, et al. "Estimating the health impact of vaccination against ten pathogens in 98 low-income and middle-income countries from 2000 to 2030: a modelling study." *The Lancet* 397.10272 (2021): 398-408.

Joshua L. Baumgardner, William L. Bauerle & Kirsten Eilertson (2020) Estimating optimal daily nitrate, potassium, and water requirements of *Cannabis sativa* 'cherry wine' during the vegetative phase, Journal of Plant Nutrition, DOI: 10.1080/01904167.2020.1867741

Eilertson, K., Fricks, J., Ferrari, M. (2019). Estimation and prediction for a mechanistic model of measles transmission using particle filtering and maximum likelihood estimation. *Statistics in Medicine.*

Sadeghi, S., Lin, C., Eilertson, K., Quinlan, K., Billy, G., Bible, J., Sions, J., Cortes, D. (2018). Shear wave elastography protocol to quantify active contraction of lumbar spine muscles. *Journal of Biomedical Engineering. 141(8), 081003.*

K. Eilertson, J.Fricks, and M.Ferrari. (2017) Modelling Vaccine Impact On Measles. Marco Grzegorczyk and Giacomo Ceoldo (Eds.) *Proceedings of the 32nd International Workshop on Statistical Modelling. July 3-7, 2017, Groningen, Netherlands*.

Cattadori, I. M., Sebastian, A., Hao, H., Katani, R., Albert, I., Eilertson, K. E., ... & Mitchell, S. (2016). Impact of helminth infections and nutritional constraints on the small intestine microbiota. *PloS One*, *11*(7), e0159770.

Ong, A. W., Eilertson, K. E., Reilly, E. F., Geng, T. A., Madbak, F., McNicholas, A., & Fernandez, F. B. (2016). Nonoperative management of splenic injuries: significance of age. *Journal of Surgical Research*, *201*(1), 134-140.

Dubal, D. B., Yokoyama, J. S., Zhu, L., Broestl, L., Worden, K., Wang, D., ... & Mucke, L. (2014). Life extension factor klotho enhances cognition. *Cell Reports*,7(4), 1065-1076.

Allen, A. R., Eilertson, K., Chakraborti, A., Sharma, S., Baure, J., Habdank-Kolaczkowski, J., ... & Fike, J. R. (2014). Radiation exposure prior to traumatic brain injury induces responses that differ as a function of animal age. International journal of radiation biology, 90(3), 214-223.

Allen, A. R., Eilertson, K., Sharma, S., Baure, J., Allen, B., Leu, D., ... & Fike, J. R. (2014). Delayed Administration of Alpha-Difluoromethylornithine Prevents Hippocampus-Dependent Cognitive Impairment after Single and Combined Injury in Mice. *Radiation Research*, 182(5), 489-498.

Suberbielle, E., Sanchez, P. E., Kravitz, A. V., Wang, X., Ho, K., Eilertson, K., ... & Mucke, L. (2013). Physiologic brain activity causes DNA double-strand breaks in neurons, with exacerbation by amyloid-[beta]. *Nature Neuroscience*,16(5), 613-621.

Ma, X., Kelley, J. L., Eilertson, K., Musharoff, S., Degenhardt, J. D., Martins, A. L., ... & Bustamante, C. D. (2013). Population Genomic Analysis Reveals a Rich Speciation and Demographic History of Orang-utans (Pongo pygmaeus and Pongo abelii). *PloS One*, 8(10), e77175.

Eilertson, K.E., Booth, J.G., Bustamante, C.D. (2012) "SnIPRE: Selection inference using a Poisson random effects model" *PLoS Computational Biology* 8(12): e1002806. doi:10.1371/journal.pcbi.1002806

Booth, J., Eilertson, K.E.*, Olinares, P.D., Yu,H. (2011). "A Bayesian Mixture Model for Comparative Spectral Count Data in Shotgun Proteomics Studies" *Molecular and Cellular Proteomics* 10(8).
*co-first author

Cornejo, O. Lefebure, T. , Bitar, P., Lang, P., Richards, V., Eilertson, K., Do, T., Beighton, D., Zeng, L., Ahn, S., Burne, R., Siepel, A., Bustamante, C., Stanhope, M. (2012)"Evolutionary and population genomics of the cavity causing bacteria Streptococcus mutants". Molecular Biology and Evolution doi: 10.1093/molbev/mss278

Tomoda, K., Takahashi, K., Leung, K., Okada, A., Narita, M., Yamada, N., Eilertson, K., Tsang, P., Baba, S., White, M., Sami, S., Srivastava, D., Conklin, B., Panning, B., and Yamanaka, S. (2012). "Derivation conditions impact x-inactivation status in female human induced pluripotent stem cells." Cell Stem Cell, 11(1), 91 – 99

Wamstad, J., Alexander, J., Truty, R., Shrikumar, A., Li, F., Eilertson, K., Ding, H., Wylie, J., Pico, A., Capra, J., Erwin, G., Kattman, S., Keller, G., Srivastava, D., Levine, S., Pollard, K., Holloway, A., Boyer, L., and Bruneau, B. (2012). "Dynamic and coordinated epigenetic regulation of developmental transitions in the cardiac lineage." *Cell, 151*(1), 206-220

Gilleland, E., L. Chen, M. DePersio, G. Do, K. Eilertson, Y. Jin, E.L. Kang, F. Lindgren, J. Lindström, R.L. Smith, and C. Xia. (2011). "Spatial Forecast Verification: Image Warping." *NCAR Technical Notes*, TN-482+STR, 30pp.

Eilertson, K. Booth, J., Bustamante, C., (2010) Identifying Genes Under Selection. Adrian W. Bowman (Ed.) *Proceedings of the 25th International Workshop on Statistical Modelling. Glasgow, Scotland, 5-9 July 2010*

Brideau, C., Eilertson, K., Hagarman, J., Bustamante, C., and Soloway, P. (2010). Successful computational prediction of novel imprinted genes from epigenomic features. *Molecular and cellular biology* 30(13), 3357-3370

Presentations

Talk: Using State Space Models to Track Measles Infections. K. Eilertson*, J.Fricks, and M.Ferrari
Women in Statistics and Data Science Conference (2017).

Poster: Modelling Vaccine Impact On Measles. K. Eilertson*, J.Fricks, and M.Ferrari. International Workshop On Statistical Modelling (2017)

Poster: Communicating Applied Statistics through Online Courses and Consulting. N. Altman, K. Eilertson, and J. Rosenberger. Conference on Statistics in Practice (2015).

Talk: Sorting out Superinfection with a Coalescent Model
Penn State Hershey Biostatistics and Bioinformatics seminar (2014)

Poster: Deep Sequencing to the Rescue: Sorting Out Sequentially Expressed Dual Infection from Superinfection Gordon Bentley, T Liegler, J McConnell, A Holloway, **K Eilertson***, F Hecht, and R Grant. Conference on Retroviral and Opportunistic Infections (2011).
**co-presenting author*

Talk: Identifying genes under selection using generalized linear mixed models
Joint Statistical Meetings, Vancouver CA (2010)

Talk: Identifying genes under selection using generalized linear mixed models
International Workshop on Statistical Modelling, Glasgow, UK (2010)

Poster: Selection inference using Bayesian Data Analysis
American Society for Human Genetics Conference, Honolulu, Hawaii (2009)

Poster: The MK statistic and log-linear models
Society for Molecular Biology and Evolution Conference, Barcelona Spain (2008)

Professional Development Workshops Attended

Speak & Connect: Public speaking workshop (2015) Conference on Statistics in Practice.

ECoS Faculty Ethics Workshop. (2014) Developing Ethics Curriculum for courses. Penn State University.

Professional Conferences Attended

Vaccine Impact Modelling Consortium Meeting	2020, 2018, 2017
Conference on Statistics In Practice	2019, 2016, 2015
Undergraduate Conference on Teaching Statistics (USCOTS)	2015, 2017
Joint Statistical Meetings	2017, 2010, 2005
International Workshop on Statistical Modelling	2017, 2010
Conference on Retroviral and Opportunistic Infections	2011
American Society for Human Genetics	2009
Society for Molecular Biology and Evolution Conference	2008