

EMMA JEAN SMITH

Ph.D. Candidate, Biostatistics

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EDUCATION

- 2019 to Present** **Ph.D. Epidemiology and Biostatistics, Biostatistics**
Schulich School of Medicine & Dentistry, Western University
Dr. Guangyong Zou and Dr. Vipul Jairath
- 2016 to 2017** **M.Sc. Mathematics & Statistics, Applied Statistics**
University of Guelph
Quantifying Health with Missing Data: Measuring the Impact of Fecal Microbiota Transplantation on Health-Related Quality of Life
Dr. Peter T. Kim and Dr. Anthony F. Desmond
- 2011 to 2015** **B.Sc.H. Mathematics & Statistics, Statistics (Mathematics Minor)**
University of Guelph

HONOURS AND AWARDS

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|---------------------|---|--|
| 2021 to 2022 | Ontario Graduate Scholarship
Provincial / Research | University of Western Ontario
\$15,000 CAD |
| 2020 to 2021 | Dean's Research Scholarship
Institutional / Research | University of Western Ontario
\$14,000 CAD |
| 2016 to 2017 | Canada Graduate Scholarship
National / Research | University of Guelph
\$17,500 CAD |
| 2016 to 2017 | Graduate Tuition Scholarship
Institutional / Academic | University of Guelph
\$16,000 CAD |

Declined	Ontario Graduate Scholarship Provincial / Research	University of Guelph \$15,000 CAD
2015	Gordon Ashton Scholarship Institutional / Academic	University of Guelph \$500 CAD
2015	Statistics Graduation Prize Institutional / Academic	University of Guelph \$500 CAD
2014	Tucker Scholarship for Women Institutional / Leadership	University of Guelph \$500 CAD

RESEARCH INTERESTS

- Individually and cluster randomized controlled trials
- Nonparametric methods
- Data visualization
- Missing data and imputation

TEACHING INTERESTS

- Regression methods
- Statistical inference
- Statistical programming
- Machine learning

RESEARCH EXPERIENCE

- 2016 to 2017** **Graduate Student**
Department of Mathematics & Statistics, University of Guelph
- Thesis focused on quantifying improvements in multidimensional health profile (RAND-36) of patients enrolled in a multicenter clinical trial.
 - Longitudinal nature of data resulted in high degree of missing data which was imputed using state-of-the-art methods including MICE.
 - Imputation, clinical trial, and survey methodologies were used for the project and implemented using R.
 - Supervised by Dr. Peter T. Kim and Dr. Anthony F. Desmond.

Summer 2017

Graduate Research Assistant

Department of Mathematics & Statistics, University of Guelph

- Proposed and developed estimation methods for extreme value copulas using shape-restricted splines.
- Evaluated performance of method using simulation in R.
- Supervised by Dr. Anthony F. Desmond.

Fall 2016

Graduate Student Assistant

Data Resource Centre, McLaughlin Library, University of Guelph

- Provided one-on-one consultation to university researchers and proposed strategies to address various challenges arising from their experimental designs and data structures.
- Solutions were implemented using statistical software: STATA, SPSS, R, SAS, and Excel.
- Supervised by Lucia Constanzo.

Summer/Fall 2016 Associate Statistical Consultant

Community Engaged Scholarship Institute, University of Guelph

- Provided consultation to GIS expert, community facilitator, municipal government, and downtown business association.
- Drafted indicators of the viability and vitality of Guelph's downtown core.
- Methodologies encompassed fields of urban planning, economics, and behavioral modelling.
- Supervised by Sam Laban.

2016 to 2017

Research Assistant

Infectious Disease & Microbiology, St. Joseph's Healthcare Hamilton

- Formulated, edited, and performed statistical analysis for papers based on results of non-inferiority clinical trial.
- Provided consulting services to researchers and physicians within the fields of microbiology and virology.
- Completed good clinical practice (GCP) and Health Canada Division 5 (Drugs for Clinical Trials Involving Human Subjects) education modules.
- Compiled, processed, and entered data into RedCap databases for principal investigators and auditors.
- Supervised by Dr. Marek Smieja and Dr. Christine Lee.

Summer 2015

Undergraduate Research Assistant

Department of Mathematics & Statistics, University of Guelph

- Conducted thorough literature review of derivative pricing, stochastic volatility, and volatility updating models.
- Applied various numerical methods to daily option chain data scraped from Google Finance using R to estimate the implied volatility of equity derivatives.
- Supervised by Dr. Peter T. Kim.

TEACHING EXPERIENCE

Winter 2021

Graduate Teaching Assistant

Department of Epidemiology & Biostatistics, University of Western Ontario

- BIOSTATS*9521: Multivariable Methods in Biostatistics.
- Reviewed course material and answered student questions during weekly office hours.
- Responded to student questions via e-mail.
- Graded bi-weekly assignments.

2016 to 2017

Graduate Teaching Assistant

Department of Mathematics & Statistics, University of Guelph

- STAT*2060: Statistics for Business Decisions (2 semesters), STAT*2040: Statistics I (1 semester), Mathematics & Statistics Learning Centre (2 semesters).
- Assisted students with statistics material in both one-on-one (office hours) and group environments (Mathematics & Statistics Learning Centre).
- Assisted with development of textbook examples, practice questions, and online homework assignments (MapleTA) for STAT*2060.
- Monitored and responded to student discussions and questions on Desire2Learn course platforms.
- Graded assignments, midterms, and final exams.

PROFESSIONAL EXPERIENCE

2018 to 2019

Data Scientist

Machine Learning, Adknown Inc.

- Time series analysis of real-time, high frequency ad exchange data.
- Natural language processing of advertiser text and websites for classification and creation of big optimization engine.
- Built and maintained algorithms and their pipelines using AWS (Athena/PrestoDB, Elastic Cloud Compute), Python (scikit-learn, pandas, numpy, keras, spaCy, nltk), and Git.
- Developed APIs to allow internal and external stakeholders to incorporate model outputs into their own systems and workflows.
- Supervised by Tim Schmitt.

2017 to 2018

Statistical Analyst

Insight & Discovery, Canadian Operations, Sun Life Financial

- Developed dashboards and data visualization tools using Tableau and RShiny to communicate methodology and statistical results to non-technical audiences.
- Built and optimized SQL queries to import high-dimensional data into R for cleaning, processing, and analysis.
- Translated data and inference into actionable insights, recommendations, and opportunities for stakeholders.
- Worked with stakeholders to translate high-level business requirements into formal hypotheses for investigation.
- Projects included development of a vendor categorization algorithm, text sentiment analysis, A/B testing, and exploratory analyses of data sets pertaining to client behaviors.
- Supervised by Edward Hum and Daniel Graves.

ACADEMIC AND ADMINISTRATIVE EXPERIENCE

Present

Society of Graduate Students (SOGS) Representative

Western Epidemiology & Biostatistics Student Council

Present

Organizer / Facilitator

Western Epidemiology & Biostatistics Journal Club

Summer 2016

Coordinator

Southern Ontario Graduate Mathematics & Statistics Conference

2014 to 2015 **Student Representative**
Department of Mathematics & Statistics Curriculum Committee

2014 to 2015 **Secretary**
University of Guelph Mathematics and Statistics Club

ARTICLES PUBLISHED IN PEER-REVIEWED JOURNALS

Speicher, D.J., Luinstra, K., **Smith, E.J.**, Castriciano, S., Smieja, M. (2020) Non-invasive detection of IgG antibodies from common pathogenic viruses using oral flocced swabs. *Diagnostic Microbiology and Infectious Disease*. 97(3): 115038.

OTHER PEER-REVIEWED CONTRIBUTIONS

Lee, C., Kim, P., **Smith, E.** (2017, May 6-9) Outcome of Fecal Microbiota Transplantation for recurrent *Clostridium Difficile* infection on quality of life. [Poster]. Digestive Disease Week, Chicago, Illinois. DOI: doi.org/10.1016/S0016-5085(17)33230-4.

NON-PEER-REVIEWED CONTRIBUTIONS

Smith, E. (February 2020). Intro to Shiny for interactive graphics and data visualization. [Tutorial]. R-Ladies, London, Ontario.

Smith, E. (2016, July 13) Quantifying Health: Measuring the Impact of Fecal Microbiota Transplantation on Quality of Life. [Presentation]. The Canadian Statistical Sciences Institute Joint Analysis of Neuroimaging Data Meeting, Victoria, British Columbia.