Kathryn Teresa Morrison

Abbreviated curriculum vitae

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Current position

PhD Candidate, Epidemiology, McGill University — Expected completion January 2017
Surveillance Lab, Clinical and Health Informatics Research Group

Education

Master of Science, University of Victoria — 2009 - 2011
Geographic Information Science

Bachelor of Science, University of Victoria — 2007 - 2009
Quantitative Geography (Major), Statistics (Minor)

Associate of Science Degree, Camosun College — 2004 - 2006
General Science

Technical Skills

Software & Programming

Proficient R, JAGS, OpenBUGS, INLA, ggplot2, LaTeX, QGIS
Competent R markdown, knitr/sweave, git/github, postgreSQL, postGIS
Familiar Python, Stan, MATLAB/Octave, Stata, SPSS, HTML/CSS

Analysis & Theory

- Exploratory analysis, data visualization and GIS mapping, sampling theory, database manipulation
- Linear and generalized linear models, hierarchical models, bootstrapping, Bayesian inference
- Time series, spatial, and spatio-temporal analysis; hierarchical and Bayesian approaches
- Epidemiological study design and theory, causal inference theory
- Prediction and forecasting, cross-validation, regularization; machine learning and non-parametric approaches

Research Work Experience

Surveillance Lab, Clinical & Health Informatics, McGill University — Sep 2011 - present

- Explored dispersion patterns of Zika spread during recent epidemic (in progress).
- Developed and published R package `outbreakvelocity` for estimating front-wave velocity of epidemics (published on github: https://github.com/kathryntmorrison/outbreakvelocity)
- Estimated rate of Ebola spread during 2015 epidemic (published in *Lancet ID*, 2^{nd} author).
- Investigated rurality and H1N1 in First Nations persons during 2009 pandemic (published in *Health and Place*, 1^{st} author).
- Explored a framework for classifying outbreaks of waterborne gastrointestinal disease (abstract in *Online Journal of Public Health Informatics*).
- Provide statistical consultation for research projects as needed.

BC Centre for Disease Control, Provincial Health Services Authority — Aug 2013 - Jul 2014

- Literature review of evidence for health surveillance of wildfire smoke events (published as a technical report by the *BCCDC, Environmental Health Services Division*).

Spatial Pattern Analysis & Research Lab, University of Victoria — Sep 2009 - Jun 2011

- Designed lecture slides for undergraduate GIS classes.
- Consulted on various projects involving spatial regression and spatial statistics.
- Analyzed cortisol (stress hormone) data on grizzly bears (*Ursus arctos*) in Alberta to describe the spatial distribution of the data and compare the stress levels of tagged and untagged bears in an Alberta region for the *Foothills Research Institute Grizzly Bear Program*.

Population Health Research Lab, University of Victoria — May 2007 - Aug 2012

- Data analysis, mapping, manuscript writing
- Constructed databases using publicly available agricultural and nutrition data.
- Analyzed databases to describe agricultural capacity in BC (published in *Environments*, 2^{nd} author).
- Supervised other research assistants on related projects.

Teaching Experience

Guest Instructor

EPIB 615 (McGill): Infectious Disease Epidemiology — Once per term 2013 - 2015
GEO 473 (UVic): Environment and Health — Once per term 2009 - 2011
GEO 101 (UVic): Introductory Demography (250 students) — February 22, 2010

Sessional Co-Instructor

PHSP 502 (UVic): Epidemiology and Biostatistics II — Winter 2012 term

Co-designed and co-delivered an online class to a distance-based Masters of Public Health program. Content included basic biostatistics, inference, and regression.

Temporary Lecturer

GEO 328 (UVic): Advanced Geographic Information Systems — Mar 2011

While the instructor was on leave, lectured in this class for one month on relational databases, spatial interpolation, multi-criteria modelling, and an introduction to spatial statistics.

Teaching Assistant / Lab Instructor

GEO 226 (UVic): Applied Introductory Statistics — Each term 2009 - 2011
GEO 524 (UVic): Advanced Quantitative Methods — Fall term 2010

Selected Publications

Doll MK, **Morrison KT**, Buckeridge DL, Quach C. 2016. Two birds with one stone: estimating population vaccination coverage from a test-negative vaccine effectiveness case-control study. *Clinical Infectious Diseases* (in press, DOI: 10.1093/cid/ciw397).

Morrison KT, Shaddick G, Henderson SB, Buckeridge DL. 2015. A latent process model for forecasting multiple time series in environmental public health surveillance. *Statistics in Medicine*, 35(18): 3085?3100.

Doll M, Buckeridge D, **Morrison KT**, Gagneur A, Tapiero B, Charest H, Quach C. 2015. Effectiveness of monovalent rotavirus vaccine in a high-income setting with its predominant use. *Vaccine*, 33(51): 7307-7314.

Zinszer K, **Morrison KT**, Anema A, Majumder M, Brownstein J. 2015. The velocity of Ebola spread in parts of west Africa. *The Lancet Infectious Diseases*, 15(9): 1005-1007.

Morrison KT, Buckeridge D, Xiao Y, Moghadas S. 2014. The impact of geographic location of residence on disease outcomes among Canadian First Nations populations during the 2009 influenza A (H1N1) pandemic. *Health and Place*. 26: 53-59.

Morrison KT, Nelson T, Nathoo F, Ostry A. 2012. Application of Bayesian spatial smoothing models to assess agricultural self-sufficiency. *International Journal of Geographical Information Science* 26(7): 1213-1229.

Frisch, LE, **Morrison KT**. 2012. Commentary on: Propagation of uncertainty in Bayesian diagnostic test interpretation. *Southern Medical Journal* 105(9): 460-461.

Selected Conference Presentations

Morrison KT, Shaddick G, Henderson SB, Buckeridge DL. *Department of Mathematical Sciences, Environmental Statistics Workshop*. June 3, 2016. Bath, UK. 'A latent process model for forecasting multiple time series in environmental public health surveillance.'

Morrison KT, Buckeridge D, Xiao Y, Moghadas S. *International Society for Disease Surveillance Annual Meeting*. December 3-5, 2012. San Diego, California. 'Rurality and the 2009 influenza H1N1 pandemic: a case study of Canadian First Nations.'

Morrison KT, Nelson T, Nathoo F, Ostry A. *Canadian Public Health Association Conference.* June 19-22, 2011. Montreal, Quebec. 'Estimating theoretical agricultural self-sufficiency in British Columbia.'

Research Fellowships

Frederick Banting & Charles Best CGS CIHR Doctoral Research Award $105,000	2012
McGill University Doctoral Entrance Fellowship $18,000	2011
University of British Columbia BRIDGE Program Doctoral Fellowship $63,000 (Declined)	2011
Joseph-Armand Bombardier CGS Master's Scholarships $17,500	2010

Professional Development

Technical Workshops

- **Spatio-temporal Analysis**. Gavin Shaddick, Jim Zidek. May 23, 2014. Statistical Society of Canada.
- **Mathematical Modelling of Infectious Disease.** July 8-19, 2013. Utrecht University, Netherlands.
- **Public Health and Modelling.** April 29-30, 2013. The Fields Institute, Toronto.
- **Data Mining**. April 5-6, 2013. Statistical Horizons, Philadelphia.
- **Software Carpentry Bootcamp.** January 12-13, 2013. McGill University.
- **Bayesian Disease Mapping**, Andrew Lawson. July 29-30, 2010. University of British Columbia.
- **Summer Program in Data Analysis: Multilevel Modelling**. June 2-10, 2010. York University.

Peer Reviewer

Preventative Medicine Reports
International Journal of Geographical Information Science
Drug and Alcohol Review
Applied Geography
PLOS ONE

Administration

Vice President (Finance), Epidemiology & Biostatistics Student Society — Jan 2013 - Oct 2015

- Sat on the executive board and maintained the financial records.
- Fundraised for the society each year.
- Assisted in organizing the annual Research Day student conference.

Session Organizer & Chair, American Association of Geographers Annual Meetings — 2009 - 2011

- Organized multiple sessions on analysis of food systems and agricultural capacity.

References

Dr. David L. Buckeridge, MD, PhD
Associate Professor, McGill University
CIHR Chair of Applied Public Health
Clinical and Health Informatics Research Group
Surveillance Laboratory

Dr. Sarah B. Henderson, PhD
Associate Professor, University of British Columbia
School of Population and Public Health
Senior Scientist, Environmental Health Services Division
British Columbia Centre for Disease Control

Dr. Trisalyn Nelson, PhD
Lansdowne Research Chair of Spatial Sciences
Professor, University of Victoria
Spatial Pattern Analysis & Research Laboratory

Dr. Gavin Shaddick, PhD
Reader, University of Bath, United Kingdom
Department of Mathematical Sciences

Contact information available upon request.