Jessica Erin Stockdale: Curriculum Vitae

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Experience:

Postdoctoral Fellow, MAGPIE research group, Department of Mathematics, Simon Fraser University, 2018-2022

My research focuses on mathematical modelling of infectious disease outbreaks, particularly incorporating pathogen genomic data. Projects have included population genomic modelling of pathogenic bacteria, modelling the impact of social distancing during the COVID-19 pandemic in BC, and evaluating transmissibility of SARS-CoV-2 in long term care with a Bayesian hierarchical model. During Mar-Dec 2020 I was seconded part-time to the British Columbia Centre for Disease Control for rapid response modelling of COVID-19.

- Taught the undergraduate courses 'Foundations of Analytical and Quantitative Reasoning` and Calculus II
- Supervised graduate students
- Made reports to funding agencies
- Organized and co-hosted 'EpiCoronaHack' COVID-19 Hackathon

Instructor, Summer Institute in Statistics and Modeling in Infectious Diseases (SISMID), University of Washington, 2020-2022

I designed and taught the course 'Reconstructing Transmission with Genomic Data' along with Prof. Caroline Colijn at SISMID 2020 and 2021. Through a combination of lectures and interactive tutorials, we teach students, academics and professionals about mathematical and statistical approaches for reconstructing paths of transmission during infectious disease outbreaks from genomic data.

Research Assistant, Nottingham Business School, Nottingham Trent University, 2018

I provided support across projects within the People, Work and Organisational Practice research centre. This included working with charitable organisations to evaluate the UK government's 50+ volunteering programme.

Teaching Assistant, School of Mathematical Sciences, University of Nottingham, 2014-2018

Alongside my PhD studies I ran small group tutorials for undergraduate students in mathematics, supported larger mathematical and computing support sessions, and marked coursework/exams.

Research Internship, School of Mathematical Sciences, University of Nottingham, 2012-2013

During my undergraduate degree I undertook two summer research internships, performing statistical analysis of hospital superbugs using large-scale genomic data and investigating the transmission potential of smallpox with stochastic epidemic models and Markov Chain Monte Carlo methods.

Education:

2018   PhD in Statistics, School of Mathematical Sciences, University of Nottingham
Thesis: "Bayesian computational methods for stochastic epidemics"

With funding from the UK Engineering and Physical Sciences Research Council, my research concerned development of computational Bayesian methods for use in stochastic epidemic modelling, specifically the development of likelihood approximation methods for dealing with large and incomplete disease outbreak data.

2014   1st Class Hons. MMath Master of Mathematics, University of Nottingham

Masters dissertation on statistical analysis of mass spectrometry data for melanoma diagnoses using dimension-reduction techniques.

Key Skills: Infectious disease modelling, genomic epidemiology, Bayesian statistics & MCMC, data analysis.

Programming & software: R, C, MATLAB, Git, High performance computing (UNIX / LINUX), R package building, RStan, BEAST2, Tableau, BioRender.

Publications:

Quantifying transmissibility of SARS-CoV-2 and impact of intervention within long-term healthcare facilities. **Stockdale JE**, Anderson SC, Edwards AM, Iyaniwura SA, Mulberry N, Otterstatter MC, Janjua NZ, Coombs D, Colijn C, Irvine MA. *Royal Society Open Science 9.1 (2022)* 10.1098/rsos.211710

COVID-19 endgame: from pandemic to endemic? Vaccination, reopening and evolution in a well-vaccinated population. Are EB, Song Y, **Stockdale JE**, Tupper P, Colijn C. medrXiv (2021) 10.1101/2021.12.18.21268002

Long time frames to detect the impact of changing COVID-19 measures, Canada, March to July 2020. **Stockdale JE**, Doig R, Min J, Mulberry N, Wang L, Elliott LT, Colijn C. *Eurosurveillance 26.40 (2021)* 10.2807/1560-7917.ES.2021.26.40.2001204

Pair-based likelihood approximations for stochastic epidemic models. **Stockdale JE**, Kypraios T, O'Neill PD, *Biostatistics 22.3 (2021)* 10.1093/biostatistics/kxz053

How much leeway is there to relax COVID-19 control measures? Anderson SC, Mulberry N, Edwards AM, **Stockdale JE**, Iyaniwura SA, Falcao RC, Otterstatter MC, Janjua NZ, Coombs D, Colijn C. *Epidemics 35 (2021)* 10.1016/j.epidem.2021.100453

Quantifying the impact of COVID-19 control measures using a Bayesian model of physical distancing. Anderson SC, Edwards AM, Yerlanov M, Mulberry N, **Stockdale JE**, Iyaniwura SA, Falcao RC, Otterstatter MC, Irvine MA, Janjua NZ, Coombs D, Colijn C. *PLoS computational biology 16.12 (2020)* 10.1371/journal.pcbi.1008274

Transmission analysis of a large tuberculosis outbreak in London: a mathematical modelling study using genomic data. Xu Y, **Stockdale JE**, Naidu V, Hatherell H, Stimson J, Stagg HR, Abubakar I, Colijn C. *Microbial Genomics 6.11 (2020)* 10.1099/mgen.0.000450

Quantifying the annual incidence and underestimation of seasonal influenza: A modelling approach. McCarthy Z, Athar S, Alavinejad M, Chow C, Moyles I, Nah K, Kong JD, Agrawal N, Jaber A, Keane L, Liu S, Nahirniak M, St Jean D, Romanescu R, **Stockdale JE**, Seet BT, Coudeville L, Thommes E, Taurel AF, Lee J, Shin T, Arino J, Heffernan J, Chit A, Wu J. *Theoretical Biology and Medical Modelling 17.11 (2020)* 10.1186/s12976-020-00129-4

Evidence for transmission of COVID-19 prior to symptom onset. Tindale LC*, **Stockdale JE***, Coombe M, Garlock ES, Lau WYV, Saraswat M, Zhang L, Chen D, Wallinga J, Colijn C. *eLife 9 (2020)* 10.7554/eLife.57149 *joint first author

Modelling and Bayesian analysis of the Abakaliki Smallpox Data. **Stockdale JE**, Kypraios T, O'Neill PD, *Epidemics 19: 13-23. (2017)* 10.1016/j.epidem.2016.11.005

PhD thesis: Bayesian computational methods for stochastic epidemics. Stockdale JE (2019) http://eprints.nottingham.ac.uk/id/eprint/56483

Selected conferences and seminars:

"How long does it take to detect a change in COVID-19 control measures?"*, Lloyd Elliott journal club, 2020, Online*

"How long does it take to detect a change in COVID-19 control measures?", *Society for Mathematical Biology Annual Meeting, 2020, Online*

UBC Mathematical Biology seminar "Pair-based likelihood approximations for stochastic epidemic models", *2019, Vancouver, Canada*

"Modelling and genomics to identify dangerous Streptococcus pneumoniae strains", *Society for Mathematical Biology Annual Meeting, 2019, Montreal, Canada*

"Approximation Methods for Stochastic Epidemic Modelling", *SFU Postdoctoral Fellows Research Day, 2019, Vancouver, Canada*

"Bayesian estimation for transmission potential of smallpox" and poster "Likelihood approximation methods for stochastic epidemic models", *European Meeting of Statisticians, 2017, Helsinki, Finland*

"Modelling and Bayesian analysis for the Abakaliki smallpox data", *Meeting on Stochastic Epidemic Models with Structured Populations, 2017, Nottingham, UK*

Research Funding/Awards:

- Funding to attend Fields-CQAM Industrial Problem Solving Workshop, *Fields Institute, Toronto (2019)*
- 1st place lightning talk, SFU Postdoctoral Fellows Research Day (2019)

- UK Engineering and Physical Sciences Research Council funding for doctoral study through Doctoral Training Partnership EP/M506588/1 *(2014-2017)*
- Best poster award, *European Meeting of Statisticians (2017)*
- University of Nottingham work experience grant *(2013)*
- Nuffield Foundation undergraduate research bursary *(2012)*
- Eliahou Dangoor undergraduate STEM scholarship *(2011).*