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Robert Moss

Appointments

University of Melbourne, Australia

2014– **Research Fellow**, Melbourne School of Population and Global Health.

University of Melbourne, Australia

2016–17 **Academic Convener** (0.2 FTE), Data, Systems and Society Research Network.

Duke University, USA

2012–2014 **Visiting Assistant Professor**, Department of Mathematics.

CNRS, France

2010–2012 **Postdoc**, IR4M CNRS UMR8081, Université Paris-Sud.

University of Melbourne, Australia

2009–2010 **Research Officer**, Melbourne School of Population and Global Health.

Publications

Peer-reviewed journal articles

Accepted Moss et al. "Epidemic forecasts as a tool for public health: interpretation and (re)calibration", *Australian and New Zealand Journal of Public Health*, accepted on 2 Oct 2017.

Feb 2017 Zarebski et al. "Model selection for seasonal influenza forecasting", *Infect Dis Mod* 2(1): 56–70.

Jan 2017 Moss et al. "Retrospective forecasting of the 2010–14 Melbourne influenza seasons using multiple surveillance systems", *Epidemiol Infect* 145(1): 156–169.

Oct 2016 Moss et al. "Reducing disease burden in an influenza pandemic by targeted delivery of neuraminidase inhibitors: mathematical models in the Australian context", *BMC Infect Dis* 16(1): 552.

Sep 2016 Moss et al. "Model-informed risk assessment and decision making for an emerging infectious disease in the Asia-Pacific region", *PLoS Negl Trop Dis* 10(9): e0005018.

Jul 2016 Moss et al. "Forecasting influenza outbreak dynamics in Melbourne from Internet search query surveillance data", *Influenza Other Respir Viruses* 10(4): 314–323.

Aug 2015 Cao et al. "Innate immunity and the inter-exposure interval determine the dynamics of secondary influenza virus infection and explain observed viral hierarchies", *PLoS Comp Biol* 11(8): e1004334.

May 2014 Moss & Layton. "Dominant factors that govern pressure natriuresis in diuresis and antidiuresis: a mathematical model", *AJP Renal* 306(9): F952–F969.

Jan 2014 Moss & Thomas. "Hormonal regulation of salt and water excretion: a mathematical model of whole-kidney function and pressure-natriuresis", *AJP Renal* 306(2): F224–248. **Selected for an Editorial Focus article** (link)

Dec 2012 Dafilis et al. "Drivers and consequences of influenza antiviral resistant-strain emergence in a capacity-constrained pandemic response", *Epidemics* 4(4): 219–226.

Jun 2012 Moss et al. "Virtual Patients and Sensitivity Analysis of the Guyton Model of Blood Pressure Regulation: Towards Individualized Models of Whole-Body Physiology", *PLoS Comp Biol* 8(6): e1002571.

Apr 2012 Bolton et al. "An analysis of the likely effectiveness of pharmaceutical and non-pharmaceutical interventions for mitigating influenza transmission in Mongolia", *Bull WHO* 90(4): 264–271.

Oct 2011 Hernández et al. "Integration of detailed modules in a core model of body fluid homeostasis and blood pressure regulation", *Prog Biophys Mol Biol* 107(1): 169–182.

May 2011 McCaw et al. "A decision support tool for evaluating the impact of a diagnostic-capacity and antiviral-delivery constrained intervention strategy on an influenza pandemic", *Influenza Other Respi Viruses 5(Suppl. 1): 212–215.*

Feb 2011 Moss et al. "Diagnosis and Antiviral Intervention Strategies for Mitigating an Influenza Epidemic", *PLoS ONE* 6(2): e14505.

Nov 2009 Moss et al. "Discrete network models of interacting nephrons, *Physica D* 238(22): 2166–2176.

May 2009 Moss et al. "A computational model for emergent dynamics in the kidney, *Phil. Trans. R. Soc. A* 367(1896): 2125–2140.

May 2009 Harris et al. "The Virtual Kidney: an e-Science interface and Grid Portal", *Phil. Trans. R. Soc. A* 367(1896): 2141–2159.

Government reports

May 2016 Hunter A, Fielding JE, Moss R, McVernon J, McCaw JM, Glass K. "Review models of health care delivery in an influenza pandemic." Reporting Deliverable 2 (Stakeholder Consultations) to the Office of Health Protection, Australian Government Department of Health.

May 2016 Hunter A, Fielding JE, Moss R, McVernon J, McCaw JM, Glass K. "Model infection control with personal protective equipment during an influenza pandemic." Reporting Deliverable 2 (Stakeholder Consultations) to the Office of Health Protection, Australian Government Department of Health.

Apr 2016 Hunter A, McVernon J, Moss R, McCaw JM, Fielding JE, Glass K. "Review models of health care delivery in an influenza pandemic." Reporting Deliverable 1 (Literature Review & Simulation Modelling) to the Office of Health Protection, Australian Government Department of Health.

Apr 2016 Hunter A, McVernon J, Moss R, McCaw JM, Fielding JE, Glass K. "Model infection control with personal protective equipment during an influenza pandemic." Reporting Deliverable 1 (Literature Review & Simulation Modelling) to the Office of Health Protection, Australian Government Department of Health.

Aug 2015 McCaw JM, Moss R, McVernon J, Cheng A. "Review current evidence on the use of neuraminidase inhibitors held in the National Medical Stockpile, in a pandemic." Reporting Deliverable 2 (Model Analysis) to the Office of Health Protection, Australian Government Department of Health.

Jun 2015 McVernon J, Cheng A, McCaw JM, Moss R. "Review current evidence on the use of neuraminidase inhibitors held in the National Medical Stockpile, in a pandemic." Reporting Deliverable 1 (Evidence Review) to the Office of Health Protection, Australian Government Department of Health.

Apr 2015 McBryde E, Marshall C, Doan T, Hickson R, Davis M, McCaw JM, McVernon J, Moss R, Geard N, Hort K, Black J, Madden J, Tran N, Giesecke J, Ragonnet R, Peach E, Harris T. "Risk of importation and economic consequences of Ebola in the Asia Pacific Region." Final report to the Department of Foreign Affairs and Trade.

Dec 2014 McBryde E, Marshall C, Doan T, Ragonnet R, Peach E, McCaw JM, McVernon J, Moss R, Geard N, Hort K, Black J, Madden J, Tran N, Giesecke J, Harris T. "Modelling of Ebola risk in the Asia-Pacific region to inform policy strategy." Interim report to the Department of Foreign Affairs and Trade.

Other publications

Aug 2016 McVernon J, Wood J (eds). "A User's Guide to Infectious Disease Modelling", PRISM^2 CRE. ISBN: 978-0-7340-5303-9.

Jun 2016 McVernon J, Ross J, Glass K, Mitchell L, Geard N, Moss R. "Computing helps the study of infections on a global and local scale", *The Conversation*.

Aug 2015 Moss R, McCaw JM, McVernon J. "Why predicting a flu outbreak is like betting on football or flipping a coin", *The Conversation*.

Grants & Awards

Aug 2017 Policy relevant infectious disease simulation and mathematical modelling (PRISM^2) NHMRC Centre of Research Excellence; *Winner: Best Postdoctoral Presentation*. Funding $2,000.

Jan 2017 Policy relevant infectious disease simulation and mathematical modelling (PRISM^2) NHMRC Centre of Research Excellence; *Postdoctoral Researcher and PhD Student Funding Scheme*. Funding $1,847.

Oct 2016 Policy relevant infectious disease simulation and mathematical modelling (PRISM^2) NHMRC Centre of Research Excellence; *Seed Funding Grant*. Funding $3,300.

Aug 2016 Research agreement: McCaw JM, Moss R. Epidemic modelling for infectious diseases forecast. *Defence Science and Technology Group.* Funding $384,550.

Jun 2016 Melbourne Networked Society Institute; Seed Funding Scheme. *Evaluation of large-scale tracking data for epidemiological forecasting of influenza epidemics was successful.* Tomko M, Moss R, Geard N. Funding $45,000.

Feb 2016 Solicited tender: McVernon J, McCaw JM, Moss R, Hunter A, Fielding JE, Glass K. Model infection control with personal protective equipment during an influenza pandemic. *Office of Health Protection, Australian Government Department of Health*. Funding $39,969.

Feb 2016 Solicited tender: McVernon J, McCaw JM, Moss R, Hunter A, Fielding JE, Glass K. Review models of health care delivery in an influenza pandemic. *Office of Health Protection, Australian Government Department of Health*. Funding $126,558.

Nov 2015 Policy relevant infectious disease simulation and mathematical modelling (PRISM^2) NHMRC Centre of Research Excellence; *Postdoctoral Researcher and PhD Student Funding Scheme*. Funding $3,675.

Jun 2015 Solicited tender: McVernon J, McCaw JM, Moss R, Cheng A, Hurt A. Review current evidence on the use of neuraminidase inhibitors held in the National Medical Stockpile, in a pandemic. *Office of Health Protection, Australian Government Department of Health*. Funding $90,770.

Dec 2014 Solicited tender: McBryde E, et al. Risk and economic implications of importation, transmission and established epidemic of Ebola in the Asia-Pacific Region. *Department of Foreign Affairs and Trade*. Funding $76,000.

Sep 2010 The Origins of Renal Physiology, MDIBL.

Aug 2008 Stawell Scholarship recipient. Funding $10,000.

Teaching

Lecturer

2016,2017 Infectious Disease Modelling, University of Melbourne

2015,2016 Guest Lecturer, Mathematics for Biomedicine, University of Melbourne

2015 Advanced Modelling: Case Studies, University of Melbourne
2013 Multivariable Calculus, Duke University

Team Supervisor
2007–2008 Software Engineering Project, University of Melbourne

Tutor
2005–2008 Software Engineering Methods & Testing, University of Melbourne
2001–2004 Software Engineering Principles & Tools, University of Melbourne

Supervision

2015– Alexander Zarebski, PhD
Statistical forecasting methods
2015 William Cuningham, MSc (Epidemiology)
Defining optimal implementation strategies for antenatal influenza vaccination in temperate climates

Presentations

Invited Talks
Nov 2017 NHMRC Influenza Program (2014-19) annual retreat
University of Melbourne, Melbourne.
Nov 2017 12th Australian Influenza Symposium
Peter Doherty Institute for Infection and Immunity, Melbourne.
Aug 2016 MSoG Policy Labs: *Interdisciplinary Ways of Working*
Melbourne School of Government, The University of Melbourne.
Jun 2016 Communicable Diseases Network Australia face-to-face meeting
Australian Department of Health, Adelaide.
Nov 2015 National Influenza Surveillance Committee face-to-face meeting
Australian Department of Health, Canberra.
Jul 2015 Review of Neuraminidase Inhibitors (presentation of draft report)
Australian Department of Health, Canberra.
Jun 2015 Communicable Diseases Network Australia Jurisdictional Executive Group
Australian Department of Health, Melbourne.
Jun 2015 Quantitative & Applied Ecology Group, University of Melbourne.
May 2015 Infectious Diseases Epidemiology & Surveillance (IDEAS) meeting.
Victorian Department of Health & Human Services.
Apr 2015 PRISM^2 NHMRC Centre of Research Excellence inaugural meeting.
The University of Melbourne.
Dec 2014 Australia & New Zealand Mathematics Convention.
The University of Melbourne.
May 2014 Molecular to Systems Physiology.
Mathematical Biosciences Institute, Ohio State University.
Aug 2013 Department of Biomedical Physiology and Kinesiology,
Simon Frasier University.
Sep 2009 Department of Nephrology, Austin Hospital.
Dec 2008 Laboratory IBISC, Université d'Evry Val d'Essonne.

Conferences
Aug 2017 PRISM^2 Annual Conference.
University of Melbourne.
- Winner: Best Postdoc Talk.

Feb 2017 Australia & New Zealand Industrial & Applied Mathematics Conference.
Hahndorf, South Australia.

Jan 2016 Incidence, Severity, and Impact of Influenza 2016.
Institut Pasteur, Paris, France.

Feb 2015 Australia & New Zealand Industrial & Applied Mathematics Conference.
Gold Coast, Queensland.

May 2011 French Society of Theoretical Biology (*presented in French*).
Autrans, France.

Apr 2010 NSW Epidemiology Special Interest Group.
NSW Department of Health.

Mar 2010 MISMS Oceania Regional Influenza Meeting.
Melbourne Business School.

Dec 2009 NHMRC H1N1 workshop.
Canberra, ACT.

Sep 2008 UK e-Science 2008 All Hands Meeting.
University of Edinburgh, Scotland.

Jul 2007 Complex 07: 8th Asia-Pacific Complex Systems Conference.
Gold Coast, Queensland.
- Winner: Best Talk in Track.

Feb 2007 The Kidney: Cellular, Tubular, and Vascular Physiology.
Mathematical Biosciences Institute, Ohio State University.

Seminars

May 2015 Mathematical & Computational Biology Group, University of Melbourne.

Sep 2014 MathBio Interest Group, University of Melbourne.

May 2009 School of Mathematics and Statistics, University of Melbourne.

Aug 2008 PhD Completion Seminar.
Department of Computer Science and Software Engineering.
University of Melbourne.

Posters

Dec 2015 Epidemics 5.

Apr 2014 Experimental Biology 2014.

Apr 2013 Experimental Biology 2013.

Apr 2012 Experimental Biology 2012.

Apr 2011 Experimental Biology 2011.

Sep 2010 VPH 2010 Annual Conference.

Professional Service

Manuscript Reviewer

Acta Biotheoretica
American Journal of Physiology – Renal Physiology
BMC Infectious Diseases
BMC Public Health
Communicable Diseases Intelligence
Epidemiology and Infection
Interface Focus
Involve, a Journal of Mathematics
Journal of Pharmacokinetics and Pharmacodynamics
Mathematical Medicine & Biology
Open Forum Infectious Diseases
PLoS Computational Biology
PLoS ONE

Grant Reviewer

2017 NHMRC Project Grants

2017 External scientific advisor, Project Grant: "In silico preclinical models for the preservation of renal organ in vivo & ex vivo" (3 labs, 9 investigators). French National Research Agency

Event Organisation

Aug 2017 PRISM^2 Professional Development Workshop
Treacy Centre, Melbourne

Jun 2017 PRISM^2 Infectious Disease Forecasting Workshop
University of Melbourne

Jun 2017 PRISM^2 Modelling Literacy Workshop
Communicable Diseases Control Conference (CDCC)

Nov 2016 DSSRN Garage Sale
University of Melbourne

Sep 2016 Data, Systems and Society Research Network (DSSRN) launch event
University of Melbourne

Professional Courses

Oct 2016 Social Media: Theory (Melbourne Centre for the Study of Higher Education)

Oct 2016 Social Media: Practice (Melbourne Centre for the Study of Higher Education)

Apr 2016 Writing Opinion Pieces (Melbourne Centre for the Study of Higher Education)

Affiliations

2016 Melbourne School of Government Policy Labs

2014– Australian Mathematical Society (AMS)

2014– Australia & New Zealand Industrial and Applied Mathematics (ANZIAM)

Software Tools/Packages

pypfilt: bootstrap particle filter package for Python.
epifx: epidemic forecasting package for Python.
lhs_framework: Latin hypercube sampling (LHS) framework for MATLAB.

Education

University of Melbourne, Australia

2005–2008 PhD, Renal modelling.

- Stawell Scholarship recipient, 2008
- Australian Postgraduate Award

2000–2004 BSc(Pure Maths), BE(Software, First Class Honours)

References

Available upon request