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Robert Moss

2019–09–03

Current position

Senior Research Fellow
Melbourne School of Population and Global Health, University of Melbourne.

Statement

Rob Moss is a mathematical biologist and epidemiologist, who uses mathematical models to inform national pandemic preparedness and response policy, and develops near-real-time epidemic forecasting methods in collaboration with public health staff across Australia. He is also a member of the WHO Influenza Incidence Analytics Group (IIAG), where he leads the Australian and regional discussions. Despite holding research-only appointments since obtaining his PhD in 2009, Rob is actively involved in curriculum development and delivery activities, develops interactive teaching tools, and regularly engages with audiences outside of the academic classroom.

Specialisation

Mathematical biology; Mathematical epidemiology; Infectious disease dynamics; Epidemic forecasting; Pandemic preparedness and response.

Education

University of Melbourne, Australia

2005–2008 PhD, Department of Computer Science and Software Engineering.

- Stawell Scholarship recipient, 2008
- Australian Postgraduate Award

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

Appointments

University of Melbourne, Australia

Sep 2019– **Senior Research Fellow**, Melbourne School of Population and Global Health.

Aug 2014–Aug 2019 **Research Fellow**, Melbourne School of Population and Global Health.

Feb 2016–Dec 2017 **Academic Convener** (0.2 FTE), Data, Systems and Society Research Network.

Duke University, USA

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

CNRS, France

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

University of Melbourne, Australia

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

Publications

Peer-reviewed journal articles *metrics: Google Scholar & SCImago*

23. u/review Shearer F, **Moss R**, McVernon J, Ross JV, McCaw JM. "Incorporating decision analysis in pandemic planning and response", *PLoS Med*.

22. Jun 2019 Cuningham W, Geard N, Fielding JE, Braat S, Madhi SA, Nunes MC, Christian LM, Lin S-Y, Lee C-N, Yamaguchi K, Bisgaard H, Chawes B, Chao A-S, Blanchard-Rohner G, Schlaudecker EP, Fisher BM, McVernon J, **Moss R**. "Optimal Timing of Influenza Vaccine during Pregnancy: a Systematic Review and Meta-Analysis", *Influenza Other Respir Viruses* 13(5): 438–452.
Citations: 0. **Journal:** #50 in Infectious Diseases (Q1)

21. May 2019 **Moss R**, Naghizade E, Tomko M, Geard N. "What can urban mobility data reveal about the spatial distribution of infection in a single city?", *BMC Public Health* 19: 656.
Citations: 0. **Journal:** #63 in Public, Environ, and Occup Health (Q1)

20. Mar 2019 **Moss R**, Zarebski AE, Dawson P, Franklin LJ, Birrell FA, McCaw JM. "Anatomy of a seasonal influenza epidemic forecast", *Commun Dis Intell* 43: 1–14.
Citations: 2. **Journal:** #1082 in Medicine (miscellaneous) (Q2)

19. Jan 2019 **Moss R**, Zarebski AE, Carlson SJ, McCaw JM. "Accounting for healthcare-seeking behaviours and testing practices in real-time influenza forecasts", *Trop Med Infect Dis* 4(1): 12. **Invited manuscript**
Citations: 2. **Journal:** NA; first issue in Dec 2016

18. Feb 2018 **Moss R**, Fielding JE, Stephens N, McVernon J, Dawson P, McCaw JM. "Epidemic forecasts as a tool for public health: interpretation and (re)calibration", *Aust N Z J Public Health* 42(1): 69–76.
Citations: 9. **Journal:** #145 in Public, Environ, and Occup Health (Q2)

17. Feb 2017 Zarebski AE, Dawson P, McCaw JM, **Moss R.** "Model selection for seasonal influenza forecasting", *Infect Dis Mod* 2(1): 56–70.
Citations: 8. **Journal:** NA; first issue in Oct 2016

16. Jan 2017 **Moss R**, Zarebski AE, Dawson P, McCaw JM. "Retrospective forecasting of the 2010–14 Melbourne influenza seasons using multiple surveillance systems", *Epidemiol Infect* 145(1): 156–169.
Citations: 17. **Journal:** #95 in Infectious Diseases (Q2)

15. Oct 2016 **Moss R**, McCaw JM, Cheng AC, Hurt AC, McVernon J. "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.
Citations: 3. **Journal:** #58 in Infectious Diseases (Q1)

14. Sep 2016 **Moss R**, Hickson RI, McVernon J, McCaw JM, Hort K, Black J, Madden JR, Tran NH, McBryde ES, Geard N. "Model-informed risk assessment and decision making for an emerging infectious disease in the Asia-Pacific region", *PLoS Negl Trop Dis* 10(9): e0005018.
Citations: 5. **Journal:** #18 in Infectious Diseases (Q1)

13. Jul 2016 **Moss R**, Zarebski AE, Dawson P, McCaw JM. "Forecasting influenza outbreak dynamics in Melbourne from Internet search query surveillance data", *Influenza Other Respir Viruses* 10(4): 314–323.
Citations: 24. **Journal:** #50 in Infectious Diseases (Q1)

12. Aug 2015 Cao P, Yan AWC, Heffernan JM, Petrie S, **Moss R**, Carolan LA, Guarnaccia TA, Kelso A, Barr IG, McVernon J, Laurie KL, McCaw JM. "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.
Citations: 31. **Journal:** #5 in Modelling and Simulation (Q1)

11. May 2014 **Moss R**, Layton AT. "Dominant factors that govern pressure natriuresis in diuresis and antidiuresis: a mathematical model", *AJP Renal* 306(9): F952–F969.
Citations: 19. **Journal:** #42 in Physiology (Q1)

10. Jan 2014 **Moss R**, Thomas SR. "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)
Citations: 21. **Journal:** #42 in Physiology (Q1)

9. Dec 2012 Dafilis MP, **Moss R**, McVernon J, McCaw J. "Drivers and consequences of influenza antiviral resistant-strain emergence in a capacity-constrained pandemic response", *Epidemics* 4(4): 219–226.
Citations: 4. **Journal:** #31 in Infectious Diseases (Q1)

8. Jun 2012 **Moss R**, Grosse T, Marchant I, Lassau N, Gueyffier F, Thomas SR. "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.
Citations: 17. **Journal:** #5 in Modelling and Simulation (Q1)

7. Apr 2012 Bolton KJ, McCaw JM, **Moss R**, Morris RS, Wang S, Burma A, Darma B, Narangerel D, Nymadawa P, McVernon J. "Likely effectiveness of pharmaceutical and non-pharmaceutical interventions for mitigating influenza transmission in Mongolia", *Bull WHO* 90(4): 264–271.
Citations: 14. **Journal:** #16 in Public, Environ, and Occup Health (Q1)

6. Oct 2011 Hernández AI, Le Rolle V, Ojeda D, Baconnier P, Fontecave-Jallon J, Guillaud F, Grosse T, **Moss R**, Hannaert P, Thomas SR. "Integration of detailed modules in a core model of body fluid homeostasis and blood pressure regulation", *Prog Biophys Mol Biol* 107(1): 169–182.
Citations: 24. **Journal:** #21 in Biophysics (Q1)

5. May 2011 McCaw JM, **Moss R**, McVernon J. "A decision support tool for evaluating the impact of a diagnostic-capacity and antiviral-delivery constrained intervention strategy on an influenza pandemic", *Influenza Other Respir Viruses 5(Suppl. 1): 212–215*.
Citations: 2. **Journal:** #50 in Infectious Diseases (Q1)

4. Feb 2011 **Moss R**, McCaw JM, McVernon J. "Diagnosis and Antiviral Intervention Strategies for Mitigating an Influenza Epidemic", *PLoS ONE* 6(2): e14505.
Citations: 25. **Journal:** #474 in Medicine (miscellaneous) (Q1)

3. Nov 2009 **Moss R**, Kazmierczak E, Kirley M, Harris PJ. "Discrete network models of interacting nephrons", *Physica D* 238(22): 2166–2176.
Citations: 3. **Journal:** #100 in Condensed Matter Physics (Q1)

2. May 2009 Harris PJ, Buyya R, Chu X, Kobialka T, Kazmierczak E, **Moss R**, Appelbe W, Hunter PJ, Thomas SR. "The Virtual Kidney: an e-Science interface and Grid Portal", *Phil. Trans. R. Soc. A* 367(1896): 2141–2159.
Citations: 6. **Journal:** #75 in Mathematics (miscellaneous) (Q1)

1. May 2009 **Moss R**, Kazmierczak E, Kirley M, Harris PJ. "A computational model for emergent dynamics in the kidney", *Phil. Trans. R. Soc. A* 367(1896): 2125–2140.
Citations: 8. **Journal:** #75 in Mathematics (miscellaneous) (Q1)

Government reports

12. Jun 2019 Degeling C, Williams J, Massey P, Gilbert L, **Moss R**, Carter S, Braunack-Mayer A, Shih P, Crookes K, McVernon J. "Investigate and model initial pandemic influenza vaccination target groups". Reporting Deliverable 3 (Community Juries) to the Office of Health Protection, Australian Government Department of Health.

11. Sep 2018 Herry G, Herz J, **Moss R**, Carvalho N, Sullivan S, McVernon J. "Evidence base to inform policy development regarding future long-term supply arrangements for pandemic influenza vaccine." Reporting Deliverable (Phases 2 & 3, Modelling and cost-effectiveness of alternative vaccine supply models) to the Office of Health Protection, Australian Government Department of Health.

10. Jun 2018 McVernon J, Fielding JE, Macartney K, Beard F, Subbarao K, Sullivan S, Williams J, Dawson A, Gilbert L, Massey P, Miller A, Durrheim D, Crooks K, McCaw JM, **Moss R.** "Investigate and model initial pandemic influenza vaccine target groups." Reporting Deliverable 2 (Ethical Framework) to the Office of Health Protection, Australian Government Department of Health.
9. Apr 2018 McVernon J, Fielding JE, Macartney K, Beard F, Subbarao K, Sullivan S, Dawson A, Gilbert L, Massey P, Miller A, Durrheim D, Crooks K, McCaw JM, **Moss R.** "Investigate and model initial pandemic influenza vaccine target groups." Reporting Deliverable 1 (Evidence Review) to the Office of Health Protection, Australian Government Department of Health.
8. 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.
7. 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.
6. 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.
5. 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.
4. 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.
3. 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.
2. 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.
1. 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.

Book chapters

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

Other publications

Apr 2019 Sullivan SG, **Moss R.** "We can't predict how bad this year's flu season will be but here's what we know so far", *The Conversation*.

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*.

Awards

Net amount: $84,009

Aug 2019 Options for the Control of Influenza X, Singapore. **Moss R. Funding:** $1,410 (1400 SGD).

Aug 2019 Policy relevant infectious disease simulation and mathematical modelling ($PRISM^2$) NHMRC Centre of Research Excellence; *Postdoctoral Researcher and PhD Student Funding Scheme*. **Moss R. Funding:** $1,733.

Nov 2018 WHO Influenza Incidence Analytics Group, Geneva. **Moss R. Funding:** $3,344 (2537 USD).

May 2018 CIVSEC 2018 National Innovation Award for Civil Security. Lau T, Skvortsov A, Ristic B, Gailis R, Dawson P, McCaw J, **Moss R.** *Civil Security Congress and Exposition, Industry Defence and Security Australia Ltd*.

May 2018 CIVSEC 2018 Innovation Award for Disaster Relief, Emergency Management and Humanitarian Services. Lau T, Skvortsov A, Ristic B, Gailis R, Dawson P, McCaw J, **Moss R.** *Civil Security Congress and Exposition, Industry Defence and Security Australia Ltd*.

Aug 2017 Policy relevant infectious disease simulation and mathematical modelling ($PRISM^2$) NHMRC Centre of Research Excellence; *Winner: Best Postdoctoral Presentation*. **Moss R. 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*. **Moss R. Funding:** $1,847.

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

Sep 2010 **Moss R**, selected to attend The Origins of Renal Physiology (an intensive one-week laboratory course), *Mount Desert Island Biological Laboratory*, USA.

Aug 2008 Stawell Scholarship recipient. **Moss R. Funding:** $10,000.

2005–2008 Australian Postgraduate Award. **Moss R. Funding:** $60,000 (3 years).

Grants

Net amount: $1,153,979

Jun 2018 Solicited tender: McVernon J, **Moss R**, Carvalho N, Herz J, Herry G, Sullivan S. Supply arrangements for pandemic influenza vaccine. *Office of Health Protection, Australian Government Department of Health*. **Funding:** $212,030.

Feb 2018 Solicited tender: McVernon J, Fielding J, Macartney K, Beard F, Subbarao K, Sullivan S, Dawson A, Gilbert L, Massey P, Miller A, Durrheim D, Crooks K, McCaw J, **Moss R.** Investigate and model initial pandemic influenza vaccine target groups. *Office of Health Protection, Australian Government Department of Health*. **Funding:** $175,802.

Oct 2016 Seed funding: Mitchell L*, **Moss R***. *Infectious Disease Forecasting Workshop*. Policy relevant infectious disease simulation and mathematical modelling ($PRISM^2$) NHMRC Centre of Research Excellence. **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 Seed funding: Tomko M, **Moss R**, Geard N. *Evaluation of large-scale tracking data for epidemiological forecasting of influenza epidemics*. Melbourne Networked Society Institute. **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.

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, 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. 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.

Teaching

Lecturer

2018 Declarative Programming (Masters), University of Melbourne
2016,2017 Infectious Disease Modelling, University of Melbourne
2015,2016 Guest Lecturer, Mathematics for Biomedicine, University of Melbourne
2015 Advanced Modelling: Case Studies (Masters), 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
2007 Computing Fundamentals A, University of Melbourne
2001–2004 Software Engineering Principles & Tools, University of Melbourne

Supervision

Research staff

2018– Dr Freya Shearer, Research Fellow

Students

2019– Parinaz Mehdipour, PhD; *Chair, advisory committee*
2019 Bradley Crammond, MBioStat
2019 Zhang Cheng, MIT
2018 Monica Nation, MPH
Influenza vaccination and mortality in elderly patients
2018 Anabel Gil, MPH
Seasonal influenza epidemics variation in the state of Victoria
2015–2019 Alexander Zarebski, PhD
Quantitative Epidemiology: A Bayesian Perspective
2015 William Cuningham, MSc (Epidemiology)
Defining optimal implementation strategies for antenatal influenza vaccination in temperate climates

Presentations

Invited Talks

Oct 2019 **Moss R.** "Influenza forecasting after 2019: what are we aiming for?". *13th Australian Influenza Symposium*. Queensland University of Technology, Brisbane.

Aug 2019 **Moss R.** "Building a forecasting capability for Australian public health". *Options for the Control of Influenza X*. Singapore.

May 2019 **Moss R.** "Seasonal influenza forecasting: models, data, and so many unknowns". *Respiratory Seminar*. The Peter Doherty Institute, Melbourne.

Feb 2019 **Moss R** et al. "Best use of a limited vaccine supply in a pandemic: what does 'best' actually mean?". *Vaccines in the 21st Century*. The Peter Doherty Institute, Melbourne.

Feb 2019 **Moss R** et al. "The mathematics of infectious disease epidemics". *The Melbourne Maths and Science Meetup*. Melbourne.

Nov 2018 **Moss R.** "Seasonal influenza forecasting for Australian cities". *WHO Meeting on Using Influenza Data for Severity Assessment*. Global Influenza Programme, World Health Organization, Geneva.

Oct 2018 **Moss R.** "Early epidemic situational awareness and epidemic forecasting". *Modelling Workshop, Indo-Pacific Centre for Health Security, Department of Foreign Affairs and Trade*. The Peter Doherty Institute, Melbourne.

Apr 2018 **Moss R**, Zarebski AE, McCaw JM. "Who watches the watchmen?". *Mathematics of Biological Systems Management Symposium*. University of Melbourne, Melbourne.

Nov 2017 **Moss R**, Zarebski AE, McCaw JM. "Epidemic forecasting: circulating strains, population immunity, and other headaches". *NHMRC Influenza Program (2014-19) annual retreat*. University of Melbourne, Melbourne.

Nov 2017 **Moss R**, Zarebski AE, McCaw JM. "Epidemic forecasts as a (potential) tool for public health". *12th Australian Influenza Symposium*. Peter Doherty Institute for Infection and Immunity, Melbourne.

Oct 2017 Tomko M, **Moss R**, Naghi Zadeh Kakhki E, Geard N. "Mapping Urban Mobility for Flu Forecasting". *Networked Society Symposium 2017*. University of Melbourne, Melbourne.

Aug 2016 **Moss R.** "Where did I come from? The facts of life without any nonsense and with illustrations". *MSoG Policy Labs: Interdisciplinary Ways of Working*. Melbourne School of Government, The University of Melbourne.

Jun 2016 McVernon J, Fielding J, **Moss R.** "Models of Health Care Delivery & Infection Control with PPE during an Influenza Pandemic – project outcomes". *Communicable Diseases Network Australia face-to-face meeting*. Australian Department of Health, Adelaide.

Nov 2015 **Moss R**, Zarebski AE, Dawson P, Lau T, McCaw JM. "Forecasting seasonal influenza epidemics in Australia (using mathematical models)". *National Influenza Surveillance Committee face-to-face meeting*. Australian Department of Health, Canberra.

Jul 2015 McVernon J, Cheng AC, McCaw JM, **Moss R**, Hurt AC. "Strategic distribution of NAIs in a pandemic – simulation modelling & international context". *Presentation of draft report*. Australian Department of Health, Canberra.

- Presentation to Australia's Chief Medical Officer, Prof Chris Baggoley.

Jun 2015 **Moss R**, Zarebski AE, Dawson P, McCaw JM. "Epidemic forecasting from surveillance data via Bayesian estimation". *Communicable Diseases Network Australia Jurisdictional Executive Group*. Australian Department of Health, Melbourne.

Jun 2015 **Moss R**, Zarebski AE, Dawson P, McCaw JM. "Epidemic forecasting from surveillance data via Bayesian estimation". Quantitative & Applied Ecology Group, University of Melbourne.

May 2015 **Moss R**, Dawson P, McCaw JM. "Epidemic forecasting from surveillance data (using recursive Bayesian estimation)". *Infectious Diseases Epidemiology & Surveillance (IDEAS) meeting.* Victorian Department of Health & Human Services.

Apr 2015 **Moss R**. "Epidemic detection and forecasting from surveillance data via Bayesian estimation". *PRISM^2 NHMRC Centre of Research Excellence inaugural meeting*. The University of Melbourne.

Dec 2014 **Moss R**, Thomas SR, Layton AT. "Predicting hormonal regulation of renal function: a 5,000 piece jigsaw puzzle". Australia & New Zealand Mathematics Convention. The University of Melbourne.

May 2014 **Moss R**. "Regulation of renal function: building a detailed and coherent mathematical model". *Molecular to Systems Physiology*. Mathematical Biosciences Institute, Ohio State University.

Aug 2013 **Moss R**. "Mathematical modelling: hormonal regulation of water and salt excretion". Department of Biomedical Physiology and Kinesiology. Simon Frasier University, Vancouver.

Sep 2009 **Moss R**. "The Clinical Applications of Renal Modelling". Department of Nephrology, Austin Hospital, Melbourne.

Dec 2008 **Moss R**. "A computational model for studying emergent dynamics in the kidney". Laboratory IBISC, Université d'Evry Val d'Essonne, France.

Conferences

Feb 2019 **Moss R**, Zarebski AE, Carlson SJ, McCaw JM. "Real-time assessment and prediction of influenza severity". *Australia & New Zealand Industrial & Applied Mathematics Conference*. Nelson, New Zealand.

Aug 2018 **Moss R**. "Who watches the watchmen? Vol 2". *PRISM^2 International Conference*. Cairns, Australia.

Aug 2017 **Moss R**, Zarebski AE, Cope RC, Mitchell L. "Using non-specific rate data to estimate denominators for notifications data". *PRISM^2 Annual Conference*. University of Melbourne.

- Winner: Best Postdoc Talk. **Funding:** $2,000.

Feb 2017 **Moss R**, Zarebski AE, McCaw JM. "Bayesian forecasting of seasonal influenza: putting prior knowledge into the prior". *Australia & New Zealand Industrial & Applied Mathematics Conference*. Hahndorf, South Australia.

Jan 2016 **Moss R**, McCaw JM, McVernon J, Cheng AC, Hurt AC. "Evaluating pandemic preparedness and intervention strategies subject to available healthcare capacity and clinical pathways: a modelling study". *Incidence, Severity, and Impact of Influenza 2016*. Institut Pasteur, Paris, France.

Feb 2015 **Moss R**, McCaw JM, Dawson P. "Epidemic detection and forecasting from surveillance data via Bayesian estimation". *Australia & New Zealand Industrial & Applied Mathematics Conference*. Gold Coast, Queensland.

May 2011 **Moss R**, Grosse T, Thomas SR. "La construction d'un modèle multi-agent du rein". *French Society of Theoretical Biology* (*presented in French*). Autrans, France.

Apr 2010 **Moss R**, McCaw JM, McVernon J, Wood J, McBryde E. *NSW Epidemiology Special Interest Group*. NSW Department of Health, Sydney.

Mar 2010 **Moss R**, McCaw JM, McVernon J, Wood J, McBryde E. *MISMS Oceania Regional Influenza Meeting*. Melbourne Business School, Melbourne.

Dec 2009 McCaw JM, McVernon J, Wood J, McBryde E, **Moss R**. "Strategies for Antiviral Usage: Modelling Diagnosis & Treatment". *NHMRC H1N1 workshop*. Canberra, ACT.

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

Jul 2007 **Moss R**. "A Preliminary Model for Studying the Interactions Between Nephrons". *Complex 07: 8th Asia-Pacific Complex Systems Conference.* Gold Coast, Queensland.
- Winner: Best Talk in Track.

Feb 2007 **Moss R**. "A Preliminary Model for Studying the Interactions Between Nephrons". *The Kidney: Cellular, Tubular, and Vascular Physiology*. Mathematical Biosciences Institute, Ohio State University.

Seminars

May 2015 **Moss R**, Dawson P, McCaw JM. "Epidemic forecasting from surveillance data via Bayesian estimation". *Mathematical & Computational Biology Group*. University of Melbourne.

Sep 2014 **Moss R**. "Regulation of renal function: building a detailed and coherent mathematical model". *MathBio Interest Group*. University of Melbourne.

May 2009 **Moss R**. "Decoupled equations for studying complex systems". School of Mathematics and Statistics, University of Melbourne.

Aug 2008 **Moss R**. *PhD Completion Seminar*. Department of Computer Science and Software Engineering, University of Melbourne.

Posters

Aug 2019 **Moss R**, Zarebski AE, Carlson SJ, McCaw JM. "Improving epidemic forecasts with behavioural insights gained from community-level surveillance". *Options for the Control of Influenza X*. Singapore.

Aug 2019 **Moss R**, Dawson A, Fielding JE, Massey P, Sullivan SG, Williams J, McCaw JM, McVernon J. "Best use of a limited vaccine supply in a pandemic: what does 'best' actually mean?". *Options for the Control of Influenza X*. Singapore.

Dec 2015 **Moss R**, Zarebski AE, Dawson P, McCaw JM. "Forecasting influenza outbreak dynamics from metropolitan Melbourne surveillance data". *Epidemics 5: Fifth International Conference on Infectious Disease Dynamics*. Florida, USA.

Apr 2014 **Moss R**, Layton AT. "A dynamic mathematical model of water & solute excretion". *Experimental Biology 2014*. San Diego, USA.

Apr 2013 **Moss R**, Layton AT. "Modeling the effects on medullary blood flow regulation on pressure natriuresis". *Experimental Biology 2013*. Boston, USA.

Apr 2012 **Moss R**, Grosse T, Thomas SR. "Exploration of pressure-natriuresis mechanisms using a lumped, six-nephron whole-kidney model". *Experimental Biology 2012*. San Diego, USA.

Apr 2011 **Moss R**, Grosse T, LeRolle V, Hernandez A, Thomas SR. "Extended sensitivity analysis of the Guyton model of blood pressure regulation". *Experimental Biology 2011*. Washington, D.C., USA.

Sep 2010 Grosse T, **Moss R**, Bazin J, LeRolle V, Fontecave-Jallon J, Guillaud F, Hannaert P, Baconnier P, Hernandez A, Thomas SR. "Sensitivity analysis of the Guyton model of blood pressure regulation I: Global analysis of the whole model". *VPH 2010 Annual Conference*. Brussels, Belgium.

Professional Service

Manuscript Reviewer

Acta Biotheoretica
American Journal of Physiology – Renal Physiology
ANZIAM Journal
BMC Infectious Diseases
BMC Public Health
Communicable Diseases Intelligence
Epidemiology and Infection
International Journal of Computers and Applications
Involve, a Journal of Mathematics
Journal of Pharmacokinetics and Pharmacodynamics
Journal of the Royal Society: Interface
Journal of the Royal Society: Interface Focus
Mathematical Medicine & Biology
Nature Communications
Open Forum Infectious Diseases
PLoS Computational Biology
PLoS ONE
Proceedings of the National Academy of Sciences
Scientific Reports

Grant Reviewer

2017, 2018 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

Sep 2019 Session chair: Imprinting, Sero-epidemiology, Age Profile Differences
Options for the Control of Influenza X, Singapore.

Jun 2019 Prepared materials for PRISM^2 CRE workshop
Global Health Security 2019, Sydney.

Mar 2019 Facilitator, Grand Challenges Workshop
Computational Biology Research Initiative, University of Melbourne

Aug 2018 Workshop: Reproducible Research
PRISM^2 International Conference, Cairns, Australia.

Nov 2017 Shaping the future workforce of digital research experts at Melbourne
(3 separate workshops)
University of Melbourne

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)
Melbourne

Nov 2016 DSSRN Garage Sale
University of Melbourne

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

Academic Service

May 2019 HPC/Cloud Compute Architectural Review
Enterprise Architects, University of Melbourne

Nov 2018 Planning Day
Melbourne School of Population and Global Health

Aug 2017 Discussion Paper: "Enhancing and retaining data science capability at the University of Melbourne". Data, Systems and Society Research Network.

External Engagement Events

Jul 2019 Two-week workshop: *Influencing Public Health Policy with Data-Informed Mathematical Models of Infectious Diseases*
MAThematical Research Institute (MATRIX), Creswick.

Jun 2019 Health Protection Blueprint Workshop
Victorian Department of Health and Human Services.

Apr-May 2019 Expert witness: *A framework for prioritising pandemic influenza vaccines in Australia: views of Community Juries* (3 separate juries).
Wollongong, NSW; Melbourne, Vic; Kalgoorlie-Boulder, WA.

Feb 2019 The Melbourne Maths and Science Meetup, Melbourne.

May 2018 Pandemic vaccination prioritisation and sequencing: Evidence and ethics workshop
University of Sydney.

Apr 2018 Models of Care for Pandemic Influenza: Presentation & Discussion
Victorian Department of Health and Human Services, Melbourne.

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

Oct 2015 PRISM^2 Policy Translation workshop
Improving the communication of scientific results to policy makers
Attendees included public servants from:
- Australian Department of Defence
- Australian Department of Foreign Affairs & Trade
- Australian Department of Health

Australian National University, Canberra

May 2015 Infectious Diseases Epidemiology & Surveillance (IDEAS) meeting.
Victorian Department of Health & Human Services.

Media Contributions

May 2019 Recorded interview, RRR 102.7FM radio news.

May 2018 Approached for comment, news story for *Communications of the ACM*.

Mar 2018 Quoted in "Disease maps to predict the arrival of flu just as weather maps predict rain", *Australian Financial Review*.

Feb 2018 Contributed to, and quoted in, "Forecasting flu outbreaks", *Pursuit*.
Also covered by Futurity and IT News.

Jan 2018 Approached for comment, news story for *Scientific American*.

Nov 2017 Quoted in "How Bad Will the Flu Season Get? Forecasters Are Competing to Figure it Out", *The Scientist*.

Nov 2016 Quoted in "Flu outbreaks are subject to humidity — not just heat", *Cosmos*.

Jul 2016 Quoted in "Defence scientists' bio attack detector could predict flu outbreaks", *The Herald Sun*.

Jun 2010 Mentioned in "Our medical future", *Voice*, University of Melbourne.

Committees

Jun 2019– National Immunisation Program (NIP) Vaccine Evaluations Panel
Commonwealth Department of Health

May 2019– Observer, National Influenza Surveillance Committee
Commonwealth Department of Health

Dec 2018– Large Scale Computing Expertise Group

Jan 2018– MSPGH Research Computing Working Group

Jan 2018– WHO Influenza Incidence Analytics Group

Feb 2016–Dec 2018 Data, Systems and Society Research Network

Professional Courses

Feb 2019 Advanced Social Media (Melbourne Centre for the Study of Higher Education)

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)

Research Software Tools/Packages

Whole-kidney model of salt and water excretion.
CeCILL v2.0 or CeCILL-C v1.0, also available as a virtual environment.

pypfilt: bootstrap particle filter package for Python.
BSD 3-Clause license, available in the Python Package Index (PyPI).

epifx: epidemic forecasting package for Python.
BSD 3-Clause license, available in the Python Package Index (PyPI).

lhs_framework: Latin hypercube sampling (LHS) framework for MATLAB.
GNU GPLv3 or later, available on figshare.
Used independently by other researchers in:

- 1 peer-reviewed publication: Campbell PT et al., *Vaccine* 33(43), 2015;
- 2 conference presentations;
- 1 conference poster;
- 2 technical reports to the World Health Organisation; and
- 1 technical report to the Australian Department of Health.

targeted-NAI: Epidemic & clinical pathways models for evaluating stockpile requirements and population impact of targeted antiviral interventions.
GNU GPLv3 or later, available on figshare.

References *Available upon request*