Robin Blythe robin.blythe@qut.edu.au +64 22 398 7146

Education

January 2024 (projected)	Australian Centre for Health Services Innovation (**AusHSI**), Queensland University of Technology PhD Clinical Informatics/Biostatistics Dissertation: Real-time clinical decision support systems for the prevention of acute deterioration
July 2016	**University of California, Los Angeles** (UCLA) Master of Public Health, Health Policy & Management
September 2013	**University of Auckland**, New Zealand BA (Economics), BCom (International Business)

Research and professional experience

July 2020 – Present **PhD researcher** **AusHSI**

- Currently investigating how clinical decision support systems using prediction models can improve outcomes for patients, including model development, validation, and implementation
- Mixed-methods study design for better clinical prediction modelling:
    - Quantitatively assessed model development assumptions including imputation, longitudinal data, and differences between model testing and training sets, and their impact on performance measures
    - Qualitatively assessed clinician preferences, decision making processes, and perceptions of algorithm-assisted care provision for better model outcomes
- Currently developing methods for diagnosis recognition and triage based on conditional probability for more relevant prediction models,
- Industry scholar in digital health, supported by the Digital Health CRC (funder) and Metro South Hospital and Health Service (clinical partner)

March 2022 – Present **Research fellow** **Victoria University of Wellington**

- Project manage a $3.1m grant from the NZ Ministry of Business, Innovation and Employment (MBIE) Endeavour Fund: Te Rourou Tātaritanga
- Explore and benchmark novel frequentist, Bayesian and machine learning/AI data analytics methods for use in secure, large tabular data sets, including privacy preserving techniques and synthetic data methods

2016 – 2023 **Health economist** **AusHSI**

- Collaborate with clinical and government partners to guide, deliver, and evaluate value-based care using mixed quantitative and qualitative methods
- Develop statistical and/or simulation models to prospectively and retrospectively examine economic impact of clinical or policy interventions on patients and health systems
- Project manage and support the delivery of initiatives on integrated care, evidence-based practice, and clinical prediction models

Skills and awards

- Proficient: R, RShiny, TreeAge, simulation (Markov, discrete-time, decision trees, Monte Carlo), regression (linear models, survival analysis, mixed effects)
- Competent: Stata, SAS, machine learning, causal inference methods
- Novice: Python
- Inductee through academic excellence into the Delta Omega honorary society of public health
- Centre for Healthcare Transformation higher degree research award for best paper (2022)
- Guest editor of the Journal of Health Organization and Management

Selected journal publications (5 of 21)

Blythe R, Parsons R, Barnett A, McPhail SM, White, N. Vital signs-based deterioration prediction model assumptions can lead to losses in prediction performance. *Journal of Clinical Epidemiology*. Published 2023 May 26. doi:10.1016/j.jclinepi.2023.05.020

Blythe R, Parsons R, White NM, Cook D, McPhail S. A scoping review of real-time automated clinical deterioration alerts and evidence of impacts on hospitalised patient outcomes. *BMJ Quality & Safety*. Published 2022 June 22. doi:10.1136/bmjqs-2021-014527

Blythe R, O'Gorman P, Crawford R, Feenan R, Hatton A, Whitehouse S, Graves N. Fixation method for hip arthroplasty stem following hip fracture: A population-level cost-effectiveness analysis. *Journal of Arthroplasty*. Published 2020 Feb 7. doi:10.1016/j.arth.2020.02.001

Blythe R, Naidoo S, Abbott C, Bryant G, Dines A, Graves N. Development and pilot of a multicriteria decision analysis (MCDA) tool for health services administrators. *BMJ Open*. 2019;9(4):e025752. Published 2019 Apr 24. doi:10.1136/bmjopen-2018-025752

Blythe R, White N, Kularatna S, McPhail S, Barnett A. A Bayesian approach for incorporating the EQ-5D Visual Analogue Scale when estimating the health-related quality of life. *Value in Health*. Published 2022 March 16. doi: 10.1016/j.jval.2022.01.017

Selected conference presentation (1 of 13)

Blythe R. Clinical Utility in Decision Support Systems. Oral presentation and invited panellist at the Australian Digital Health Summit 2022, Sydney.

R Shiny apps and packages (2 of 3)

White N, **Blythe R**. ShinyPrior: A tool for estimating probability distributions using published evidence. doi:10.31219/osf.io/zf62e. Available at https://aushsi.shinyapps.io/ShinyPrior/

Parsons, R**, Blythe R**, et al. `predictNMB`, an R package for using simulation to determine the required performance for clinical prediction models to be worth implementing in clinical practice