

Joachim Worthington

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Research History

Research Fellow, **The Daffodil Centre (a partnership between the University of Sydney and Cancer Council NSW)**. 2017 - Present.

- Modelling and health economics in the Daffodil Centre Gastrointestinal Cancer Group.
- *Policy1-Liver*
 - Lead developer on *Policy1-Liver*, a model of hepatocellular carcinoma development, surveillance and costs in the Australian context.
 - Generated estimates of health impact and cost-effectiveness of regular ultrasound for patients with liver disease, to inform the *Roadmap to Liver Cancer Control* project.
 - Designed and implemented novel model framework to capture short timescale events in liver cancer development at greater precision than traditional modelling methods without sacrificing performance.
- *Policy1-Bowel*
 - Worked on development of the *Policy1-Bowel*, a world-class microsimulation model of colorectal cancer in Australia.
 - Used *Policy1-Bowel* for forecasting future colorectal cancer trends to advise policy makers and collaborators, including Cancer Institute NSW, Cancer Council Victoria, and the South Australian Health and Medical Research Institute.
 - Developed innovative metamodel calibration methods to update *Policy1-Bowel* to capture complex trends in colorectal cancer incidence.

Selected grants and awards

- The Australian Prevention Partnership Centre 2022 Seeding Grants, *Assessing the benefits of risk assessment for patients with metabolic-associated fatty liver disease* 2022
- University of Sydney Faculty of Medicine and Health EMCR Boost Award, 2022
- AI on MRFF Project Cancer Patient Population Projections in Australia– 2020–2024, \$3.6 million.
- AustMS Lift-Off Fellowship, 2017.
- K.E. Bullen International Conference Scholarship, 2015.
- Marcelle La Balette Scholarship in Theoretical Astrophysics, 2013.
- University of Sydney Medal and First Class Honours, 2012.

Policy Impact

- Modelled evaluations of COVID-19 related disruptions to screening for the Commonwealth Department of Health, including results for at-risk population subgroups such as Aboriginal and Torres Strait Islander Australians and CALD communities, *Estimated impact of a COVID-19 related disruption to the National Bowel Cancer Screening Program*, 2020. Available [here](#).
- Health and economic modelling evaluation of a pilot mass-media intervention to improve participation in the Australian National Bowel Cancer Screening Program (NBCSP), resulting in the allocation of a \$10 million Federal Government grant allocated to fund a national mass-media intervention for the NBCSP in 2019. See press release [here](#).
- Modelled evaluations informing the *Clinical practice guidelines for surveillance colonoscopy*, 2019. Available [here](#).

Selected grants and awards

- Lead CI on The Australian Prevention Partnership Centre grant *Assessing the benefits of risk assessment for patients at with metabolic-associated fatty liver disease*, 2023.
- AI on MRFF Project *Cancer Patient Population Projections in Australia – 2020–2024*, \$3.6 million.
- AustMS Lift-Off Fellowship, 2017.
- Marcelle La Balette Scholarship in Theoretical Astrophysics, 2013.

Education

PhD (Applied Mathematics), *University of Sydney*, 2013 - 2017.

Thesis: *Stability Theory and Hamiltonian Dynamics in the Euler Ideal Fluid Equations*.

Supervisor: Prof. Holger Dullin. Associate Supervisor: Dr. Robert Marangell.

Bachelor of Science (Advanced Mathematics)

Honours, first class with University Medal, *University of Sydney*, 2009 - 2012

Honours thesis: *A Study of the Planar Circular Restricted Three Body Problem*.

Supervisor: Prof. Holger Dullin.

Research Interests

Areas of interest include systems modelling, dynamical systems and stability theory, health economics and policy, fluid dynamics, and Poisson and Hamiltonian systems.

Selected Publications: ¹

- de Jonge, L., **Worthington, J.**, van Wifferen, F., Iragorri, N., Peterse, E.F., Lew, J.B., Greuter, M.J., Smith, H.A., Feletto, E., Yong, J.H. Canfell, K. Lansdorp-Vogelaar, I, 2021. Impact of the COVID-19 pandemic on faecal immunochemical test-based colorectal cancer screening programmes in Australia, Canada, and the Netherlands: a comparative modelling study. *The Lancet Gastroenterology and Hepatology*, 6(4), pp.304-314. Co-lead author.
- **Worthington, J.**, Feletto, E., Lew, J.B., Broun, K., Durkin, S., Wakefield, M., Grogan, P., Harper, T. and Canfell, K., 2020. Evaluating health benefits and cost-effectiveness of a mass-media campaign for improving participation in the National Bowel Cancer Screening Program in Australia. *Public health*, 179, pp.90-99. Lead author.
- **Worthington, J.**, Lew, J.B., Feletto, E., Holden, C.A., Worthley, D.L., Miller, C. and Canfell, K., 2020. Improving Australian National Bowel Cancer Screening Program outcomes through increased participation and cost-effective investment. *PLOS ONE*, 15(2), p.e0227899. Lead author.
- van Wifferen, F., de Jonge, L., **Worthington, J.**, Greuter, M.J., Lew, J.B., Nadeau, C., van den Puttelaar, R., Feletto, E., Yong, J.H., Lansdorp-Vogelaar, I. and Canfell, K, 2021. Prioritisation of colonoscopy services in colorectal cancer screening programmes to minimise impact of COVID-19 pandemic on predicted cancer burden: A comparative modelling study. *Journal of Medical Screening*, 096914132111056777.
- Dullin, H.R., Meiss, J.D. and **Worthington, J.**, 2019. Poisson structure of the three-dimensional Euler equations in Fourier space. *Journal of Physics A: Mathematical and Theoretical*, 52(36), p.365501. Lead author.

Selected Reports

- **Worthington, J.**, Lew, J.B., Canfell, K. and Feletto, E.. Modelled analysis of hypothetical impacts of COVID-19 related disruptions to the National Bowel Cancer Screening Program for Aboriginal and Torres Strait Islanders, 2020. Report prepared for the Commonwealth Department of Health.

¹Note that papers in public health are listed with the lead author first; papers in applied mathematics and physics have authors listed alphabetically. Lead authorship is noted.