Katharine Sherratt
London, UK | kathsherratt@gmail.com | +447923663916
OrcID: 0000-0003-2049-3423 | linkedin.com/in/kathsherratt | kathsherratt.github.io/kathsherratt/

My research has specialised in policy-focused infectious disease modelling during outbreak response. I have extensive experience building and evaluating open-source tools for managing real-time data, model comparison and multi-model combination. I am interested in working with interdisciplinary approaches to inform policy for global health and disaster risk reduction.

Research experience

2023-present **The London School of Hygiene and Tropical Medicine**
Centre for Mathematical Modelling of Infectious Disease *Research fellow*

- Research evaluates the use of multiple models for decision support during infectious disease outbreak response. Recent topics have included analysis of policy-relevant information gains and losses in collating multiple scenario projections; using inferential methods to assess the influence of model methodology on forecast accuracy; and evaluating the infrastructure required for effective policy-oriented modelling during real-time outbreak response.
- PhD by prior publication: *"Real-time modelling for outbreak response: a decision-oriented analysis of model comparison and combination"*. A thematic analysis of prior work, focused on the optimal use of multi-model combination as a decision support tool over the lifecycle of an infectious disease outbreak. Expected viva in July 2024.

2021-2023 **The London School of Hygiene and Tropical Medicine**
European COVID-19 Forecast and Scenario Modelling Hubs *Research assistant*

- Led research describing, evaluating, and combining multiple models' forecasts and scenario projections of COVID-19, including: implementing and evaluating ensemble methods, such as averaging, linear opinion pool, or performance weighting; implementing and analysing forecast evaluation metrics, using proper scoring rules for forecasts while accounting for differences in model contributions.
- From February 2022, as co-PI initiated and led development of the European Scenario Hub, with an emphasis on coordinating with policy advisors at the European Centre for Disease Prevention and Control to address specific recommendations for public health management up to 12 months ahead. Coordinated up to 20 research teams, facilitating regular technical meetings and interpreting across modelling approaches; quantitatively compared results across multiple models and translated into policy insights.
- From February 2021, adapted existing infrastructure to create an interactive platform for collating, combining, and evaluating weekly real-time forecasts of COVID-19 outcomes across 32 European countries. Coordinated and analysed forecasts from up to 40 research teams across Europe.

2020-2021 **The London School of Hygiene and Tropical Medicine**
Centre for Mathematical Modelling of Infectious Disease *Research assistant*

- Contributed to modelling work informing UK COVID-19 policy, including rapid responses to weekly policymaker commissions (lead author on 4 and co-author on 18 SPI-M evidence submissions). Work focused on estimating the reproduction number, maintaining an open source production pipeline for twice-weekly forecasts, and the impact of biases in outbreak surveillance data.
- Implemented forecasting methods for COVID-19 outcomes, maintaining a range of simple and complex models and ensemble forecasts for weekly COVID-19 deaths across 52 US states, contributing to the US Forecast Hub.
- Lead development of the R package covidregionaldata, auditing, extracting, cleaning, and standardising subnational COVID-19 data from 17 countries.
- Supported researchers and public health agency users of specialist software for estimating and forecasting from the effective reproduction number.

Research funding

2023	**The London School of Hygiene and Tropical Medicine**, £15,000 grant from the COVID-19 Response Fund for independent research: *"Supporting policy relevant multi-model efforts for outbreak response"*
2022	**European Centre for Disease Prevention and Control** co-Principal Investigator: *"The COVID-19 Scenario Modelling Hub"*
2017	**UK Medical Research Council** PhD Studentship: "*A multidimensional analysis of risk of dengue in the Philippines"*

Teaching

2024 (summer)	**Stockholm University** European Summer Program in Infectious Disease Analysis and Modelling *"Nowcasting and forecasting infectious disease dynamics".* Collaboratively developing and delivering material for a 2-week module.
2024	**The London School of Hygiene and Tropical Medicine** *"R for Research: an introduction to best practices"*. I developed and delivered original material for internal training for students and staff. *"Introduction to R"*, teaching assistant.

Conferences

2023	**Forecasting natural and social systems**, The Royal Society, London
2022	**European Scientific Conference on Applied Infectious Disease Epidemiology (ESCAIDE)**, Stockholm Presenter, *"Collaborative modelling of the future dynamics of COVID-19: the European Forecasting and Scenario Hubs."*

Academic citizenship

2023-present	**The UK Pandemic Sciences Network** Early career research representative for the Centre for Epidemic Preparedness and the London School of Hygiene and Tropical Medicine.
2022-*present*	**The Consortium of Infectious Disease Modeling Hubs** Collaboration developing a central open-source suite of software for creating, hosting, maintaining, and running a modelling hub.

Awards and prizes

2023	**Centre for Epidemic Preparedness** *Resource Prize* Team award for developing the European COVID-19 Forecast and Scenario Hubs
2012	**UCL** Faculty of Social and Historical Sciences, Dean's List (top 5% graduating)
2012	**UCL** Geography Department, Human Geography Dissertation Prize
2012	**UCL** Faculty of Social and Historical Sciences, College Prize

Relevant non-academic experience

2018	**United Nations Environment Programme** International Resource Panel *Intern*
2015 – 2017	**Wellcome Trust** *Graduate Programme* Worked across global health research and funding, including the "Climate and Health" research theme; Strategy, Insight and Analysis; and Investments teams.

Education

2017 – present **The London School of Hygiene and Tropical Medicine**

PhD *"Real-time modelling for outbreak response: a decision-oriented analysis of model comparison and combination"*. Expected viva in July 2024.

MPhil *"A multidimensional analysis of risk of dengue in the Philippines"*. Funded by the UK MRC. Investigated the burden and prevention of dengue in the Philippines, focussing on transmission intensity and healthcare access. Methods included statistical modelling using a national surveillance dataset of 1.2 million patient records over 2011-2017.

MSc Epidemiology, *Distinction*

Trained in quantitative health research, particularly regression-family models for observational data, and: clinical trial design and evaluation; infectious disease dynamics and control; mathematical disease modelling; issues in global health.

2012 – 2015 **University College London**

BA Geography, *First Class Hons*. Study focused on environmental risk, international development, and statistical methods, with original dissertation using mixed methods to study microeconomics of sanitation access among rural south Indian households.

Erasmus placement MSc Environmental Risk & Human Security programme, United Nations University, Germany (3 months)

2010 – 2012 **Hills Road College** *A levels*: Geography (A*); Psychology (A); Spanish (A)

Technical skills

Data management and statistical analyses

- Advanced skills in exploratory data analysis and inferential statistics across multiple spatio-temporal scales, with strong experience using epidemiological and socio-economic data and general experience with environmental data
- Strong experience with statistical time-series analysis and forecasting, general knowledge of Bayesian approaches and using INLA for spatial modelling
- Advanced use of R for data manipulation and analysis using the tidyverse, data.table; visualisation and reporting using ggplot2, shiny, Rmarkdown; extensive experience with GIS, in R with sf, plotly, and leaflet, as well as ArcGIS, QGIS

Scientific programming and software development

- Developer of R packages including *covidregionaldata*, *covidhubutils*: tools for programmatically extracting, transforming, and loading data streams, validating and testing
- Advanced use of git throughout project workflow, including for version control, interoperability, testing and automation using Github Actions
- Use of bash and Linux platforms (locally and remotely); working knowledge of Python, Docker, Azure, Tableau

Collaboration and communication

- Strong experience project managing large international collaborations, with excellent skills in transdisciplinary facilitation in both technical and non-technical contexts, and using project management techniques from project scoping, managing deliverables, to evaluation
- Excellent written skills, with experience for academic journals, policy briefs, strategy recommendations; experience presenting across academic, policy, and private sectors.
- Languages: English (fluent), Spanish (CEFR B1); French (B1); Hindi (A1)

Publications

---

* indicates joint first authorship

Sherratt, Katharine, Rok Grah, Bastian Prasse, Sam Abbott, and Sebastian Funk. 2024. 'The Influence of Methodology and Location Specificity on Epidemic Forecast Accuracy among European COVID-19 Forecasts'. Manuscript.

Sherratt, Katharine, Ajitesh Srivastava, Kylie Ainslie, David E. Singh, Aymar Cublier, Maria Cristina Marinescu, Jesus Carretero, et al. 2024. 'Characterising Information Gains and Losses When Collecting Multiple Epidemic Model Outputs'. *Epidemics*, March, 100765. https://doi.org/10.1016/j.epidem.2024.100765.

Sherratt, Katharine*, Anna C Carnegie*, Adam Kucharski, Anne Cori, Carl AB Pearson, Christopher I Jarvis, Christopher Overton, et al. 2024. 'Improving Modelling for Epidemic Responses: Reflections from Members of the UK Infectious Disease Modelling Community on Their Experiences during the COVID-19 Pandemic [Version 1; Peer Review: Awaiting Peer Review]'. *Wellcome Open Research* 9 (12). https://doi.org/10.12688/wellcomeopenres.19601.1.

Sherratt, Katharine, Hugo Gruson, Rok Grah, Helen Johnson, Rene Niehus, Bastian Prasse, Frank Sandmann, et al. 2023. 'Predictive Performance of Multi-Model Ensemble Forecasts of COVID-19 across European Nations'. Edited by Amy Wesolowski, Neil M Ferguson, Jeffrey L Shaman, and Sen Pei. *eLife* 12 (April): e81916. https://doi.org/10.7554/eLife.81916.

Abbott, Sam, **Katharine Sherratt**, Nikos Bosse, Hugo Gruson, Johannes Bracher, and Sebastian Funk. 2022. 'Evaluating an Epidemiologically Motivated Surrogate Model of a Multi-Model Ensemble'. medRxiv. https://doi.org/10.1101/2022.10.12.22280917.

Abbott, Sam, **Katharine Sherratt,** Moritz Gerstung, and Sebastian Funk. 2022. 'Estimation of the Test to Test Distribution as a Proxy for Generation Interval Distribution for the Omicron Variant in England'. medRxiv. https://doi.org/10.1101/2022.01.08.22268920.

Cramer, Estee Y., Evan L. Ray, Velma K. Lopez, Johannes Bracher, Andrea Brennen, Alvaro J. Castro Rivadeneira, Aaron Gerding,... **Katharine Sherratt,** et al. 2022. 'Evaluation of Individual and Ensemble Probabilistic Forecasts of COVID-19 Mortality in the United States'. *Proceedings of the National Academy of Sciences* 119 (15): e2113561119. https://doi.org/10.1073/pnas.2113561119.

Meakin, Sophie, Sam Abbott, Nikos Bosse, James Munday, Hugo Gruson, Joel Hellewell, **Katharine Sherratt**, et al. 2022. 'Comparative Assessment of Methods for Short-Term Forecasts of COVID-19 Hospital Admissions in England at the Local Level'. *BMC Medicine* 20 (1): 86. https://doi.org/10.1186/s12916-022-02271-x.

Sherratt, Katharine*, Sam Abbott*, Sophie R. Meakin, Joel Hellewell, James D. Munday, Nikos Bosse, Mark Jit, and Sebastian Funk. 2021. 'Exploring Surveillance Data Biases When Estimating the Reproduction Number: With Insights into Subpopulation Transmission of COVID-19 in England'. *Philosophical Transactions of the Royal Society B: Biological Sciences* 376 (1829): 20200283. https://doi.org/10.1098/rstb.2020.0283.

Biggs, Joseph R., Ava Kristy Sy, **Katharine Sherratt,** Oliver J. Brady, Adam J. Kucharski, Sebastian Funk, Mary Anne Joy Reyes, et al. 2021. 'Estimating the Annual Dengue Force of Infection from the Age of Reporting Primary Infections across Urban Centres in Endemic Countries'. *BMC Medicine* 19 (1): 217. https://doi.org/10.1186/s12916-021-02101-6.

Munday, James D., **Katharine Sherratt**, Sophie Meakin, Akira Endo, Carl A. B. Pearson, Joel Hellewell, Sam Abbott, et al. 2021. 'Implications of the School-Household Network Structure on SARS-CoV-2 Transmission under School Reopening Strategies in England'. *Nature Communications* 12 (1): 1942. https://doi.org/10.1038/s41467-021-22213-0.

Palmer*, Joseph, **Katharine Sherratt***, Richard Martin-Nielsen, Jonnie Bevan, Hamish Gibbs, Cmmid COVID-19 Working Group, Sebastian Funk, and Sam Abbott. 2021. 'Covidregionaldata: Subnational Data for COVID-19 Epidemiology'. *Journal of Open Source Software* 6 (63): 3290. https://doi.org/10.21105/joss.03290.

Pavelka, Martin, Kevin Van-Zandvoort, Sam Abbott, **Katharine Sherratt**, Marek Majdan, Cmmid Covid, Stefan Flasche, and Sebastian Funk. 2021. 'The Impact of Population-Wide Rapid

Antigen Testing on SARS-CoV-2 Prevalence in Slovakia'. *Science* 372 (6542): 635–41. https://doi.org/10.1126/science.abf9648.

Funk, S., S. Abbott, B. D. Atkins, M. Baguelin, J. K. Baillie, P. Birrell, J. Blake, … **Katharine Sherratt**, et al. 2020. 'Short-Term Forecasts to Inform the Response to the Covid-19 Epidemic in the UK'. *medRxiv*, November, 2020.11.11.20220962. https://doi.org/10.1101/2020.11.11.20220962.

Ray, Evan L., Nutcha Wattanachit, Jarad Niemi, Abdul Hannan Kanji, Katie House, Estee Y. Cramer, Johannes Bracher, … **Katharine Sherratt**, et al. 2020. 'Ensemble Forecasts of Coronavirus Disease 2019 (COVID-19) in the U.S.' *medRxiv*, August, 2020.08.19.20177493. https://doi.org/10.1101/2020.08.19.20177493.

Gostic, Katelyn M., Lauren McGough, Edward B. Baskerville, Sam Abbott, Keya Joshi, Christine Tedijanto, Rebecca Kahn, … **Katharine Sherratt**, et al. 2020. 'Practical Considerations for Measuring the Effective Reproductive Number, Rt'. *PLOS Computational Biology* 16 (12): e1008409. https://doi.org/10.1371/journal.pcbi.1008409.

Abbott, Sam, Joel Hellewell, Robin N. Thompson, **Katharine Sherratt**, Hamish P. Gibbs, Nikos I. Bosse, James D. Munday, et al. 2020. 'Estimating the Time-Varying Reproduction Number of SARS-CoV-2 Using National and Subnational Case Counts'. *Wellcome Open Research* 5 (June): 112. https://doi.org/10.12688/wellcomeopenres.16006.1.