

# Sam Abbott

Bristol Medical School: Population Health Sciences, University of Bristol

✉ [contact@samabbott.co.uk](mailto:contact@samabbott.co.uk) | 🏠 [samabbott.co.uk](http://samabbott.co.uk) | 📷 [seabbs](#) | 🐦 [seabbs](#)

*Dynamic modeller and data scientist focussing on infectious disease dynamics, epidemiology, and control. I have a strong interest in reproducibility and tool development, having developed multiple widely used packages and dashboards. My work lies at the interface between dynamic modelling, statistical modelling and data science - incorporating elements from software development to enhance robustness and longevity.*

## Education

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### University of Bristol

PHD IN EPIDEMIOLOGY

Bristol

October 2015–September 2019

- Modelling BCG vaccination policy in the UK: What is the effect of changing policy?
- Read here: [samabbott.co.uk/thesis/](http://samabbott.co.uk/thesis/)

### University of Glasgow

RESEARCH PLACEMENT

Glasgow

June 2015–September 2015

- Distinction
- The multi-species ecology of antimicrobial resistance in tanzanian human and livestock populations: Using Bayesian methods to infer genetic resistance patterns from phenotypic data.

### University of York

MSC ADVANCED MATHEMATICAL BIOLOGY

York

2014–2015

- Distinction
- Group project: Modelling superspreading and seasonality in Influenza, Distinction. An analysis of the resonant effects produced by the introduction of population heterogeneity and seasonal variation to an SIRS model.

### University of Durham

MMATH MATHEMATICS

Durham

2010–2014

- 2:1

## Experience

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### Funding Circle

DATA SCIENTIST

London

November 2017–January 2019

- Predictive modelling, inference, data visualisation, dashboarding and tool development

## Skills

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### Analytical

DYNAMIC MODELLING, STATISTICAL MODELLING, DATA SCIENCE, REPRODUCIBLE RESEARCH

### Programming

R (ADVANCED), C/C++, BASH, SQL, STAN, JAGS, LIBBI, PYTHON, MATLAB

### Packages

SHINY, TIDYVERSE, DATA.TABLE, RCPP, POMP, H2O, BRMS

### Tools

GIT, DOCKER, TRAVIS, AWS

# Training

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## University of Bristol

SHORT COURSES

- Basic Epidemiology, Multilevel Modelling, Data Linkage, Analysis of repeated measures, Bayesian statistics with WINBUGS, Multiple Imputation Methods to deal with Missing Data, Methods for Mediation and Interaction Analysis, and Advanced Survival Analysis and Prognostic Modelling

## DataCamp

DATA SCIENCE CAREER TRACK

- Covering the full range of data science skills from data cleaning through to predictive modelling and inference.

## Wellcome Trust

MATHEMATICAL MODELLING FOR INFECTIOUS DISEASE DYNAMICS

- Two week residential course starting with the basics and covering implementation details

Bristol

2016–2019

Online

2017

Hinxton

2016

# Teaching

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## Bristol Infectious Disease Dynamics: University of Bristol

*bristolmathmodellers.github.io/  
biddmodellingcourse*

INTRODUCTION TO INFECTIOUS DISEASE MODELLING

- Responsible for developing and teaching two 1 hour practicals on model development and dynamics.

2018, 2019

# Publications

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## First author

### S Abbott, J Hellewell, J Munday, S Funk, CMMID nCoV working group

THE TRANSMISSIBILITY OF NOVEL CORONAVIRUS IN THE EARLY STAGES OF THE 2019-20 OUTBREAK IN WUHAN: EXPLORING INITIAL POINT-SOURCE EXPOSURE SIZES AND DURATIONS USING SCENARIO ANALYSIS

*Wellcome Open Research*

2020

### S Abbott, H Christensen, MK Lalor, D Zenner, C Campbell, ME Ramsay, ...

EXPLORING THE EFFECTS OF BCG VACCINATION IN PATIENTS DIAGNOSED WITH TUBERCULOSIS: OBSERVATIONAL STUDY USING THE ENHANCED TUBERCULOSIS SURVEILLANCE SYSTEM

*Vaccine*

2019

### S Abbott, H Christensen, NJ Welton, E Brooks-Pollock

ESTIMATING THE EFFECT OF THE 2005 CHANGE IN BCG POLICY IN ENGLAND: A RETROSPECTIVE COHORT STUDY, 2000 TO 2015

*Eurosurveillance*

2019

### S Abbott

MODELLING BCG VACCINATION IN THE UK: WHAT IS THE IMPACT OF CHANGING POLICY?

*University of Bristol*

2019

### S Abbott

GETTBINR: AN R PACKAGE FOR ACCESSING AND SUMMARISING THE WORLD HEALTH ORGANISATION TUBERCULOSIS DATA

*Journal of Open Source Software*

2019

## Non-first author

### J Hellewell, S Abbott, A Gimma, NI Bosse, CI Jarvis, TW Russell, ...

FEASIBILITY OF CONTROLLING 2019-NCOV OUTBREAKS BY ISOLATION OF CASES AND CONTACTS

*medRxiv*

2020

### J Stone, H Fraser, AG Lim, JG Walker, Z Ward, L MacGregor, A Trickey, ...

INCARCERATION HISTORY AND RISK OF HIV AND HEPATITIS C VIRUS ACQUISITION AMONG PEOPLE WHO INJECT DRUGS: A SYSTEMATIC REVIEW AND META-ANALYSIS

*The Lancet Infectious Diseases*

2018

### M Jit, JD Munday, N Davies, A Gimma, K van Zandvoort, H Gibbs, ...

EARLY DYNAMICS OF TRANSMISSION AND CONTROL OF COVID-19: A MATHEMATICAL MODELLING STUDY

## Preprints

### S Abbott, H Christensen, E Brooks-Pollock

REASSESSING THE EVIDENCE FOR UNIVERSAL SCHOOL-AGE BACILLUS CALMETTE GUERIN (BCG) VACCINATION IN ENGLAND AND WALES

*BioRxiv*

2019

*Updated programmatically each week. See here for DOIs and citation details.*

# Selected Software

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## R Packages

### idmodelr

INFECTIOUS DISEASE MODEL LIBRARY AND UTILITIES

- Author and maintainer
- Released to CRAN with 1k+ downloads

[samabbott.co.uk/idmodelr](https://samabbott.co.uk/idmodelr)

2019

### EstZoonoticTB

AN R PACKAGE FOR EXPLORING, VISUALISING AND ESTIMATING THE GLOBAL ZONOTIC TUBERCULOSIS BURDEN

- Author and maintainer

[samabbott.co.uk/EstZoonoticTB](https://samabbott.co.uk/EstZoonoticTB)

2019

### getTBinR

ACCESS AND SUMMARISE WORLD HEALTH ORGANISATION TUBERCULOSIS DATA

- Author and maintainer
- Released to CRAN with 11k+ downloads

[samabbott.co.uk/getTBinR](https://samabbott.co.uk/getTBinR)

2018

### prettypublisher

AN R PACKAGE THAT AIMS TO IMPROVE YOUR WORKFLOW BY ALLOWING AN EASIER TRANSITION FROM LITERATE CODE TO A PAPER DRAFT READY FOR JOURNAL SUBMISSION

- Author and maintainer

[samabbott.co.uk/prettypublisher](https://samabbott.co.uk/prettypublisher)

2017

## Interactive tools

### Explore infectious disease models

DEVELOPED TO BE USED WITHIN A MODELLING SHORT COURSE AT THE UNIVERSITY OF BRISTOL. THIS DASHBOARD ALLOWS THE USER TO SIMULATE AND COMPARE A VARIETY OF COMPARTMENTAL INFECTIOUS DISEASE MODELS.

[github.com/seabbs/exploreidmodels](https://github.com/seabbs/exploreidmodels)

2019

### Explore global tuberculosis

BUILT INTO GETTBINR THIS DASHBOARD ALLOWS NON-R USERS TO EXPLORE WHO TB DATA USING ALL OF THE PACKAGE FUNCTIONALITY.

[getTBinR::run\\_tb\\_dashboard\(\)](#)

2018

### Introduction to Tuberculosis models

DEVELOPED TO ALLOW SIMPLE TB MODELS TO BE EXPLORED IN AN INTERACTIVE SESSION. INSPIRED BY PRACTICALS FROM THE INTRODUCTION TO TB COURSE, RUN BY TB MAC AT THE 2017 UNION CONFERENCE.

[github.com/seabbs/intro\\_to\\_tb\\_models](https://github.com/seabbs/intro_to_tb_models)

2017

### The pebble game

DEVELOPED AS A LEARNING AID TO HELP A GENERAL AUDIENCE UNDERSTAND THE IMPACT OF VACCINATION ON INFECTIOUS DISEASE DYNAMICS. USED AT GREEN MAN 2016 AS PART OF A WEEK OF OUTREACH WORK AND SUBSEQUENTLY DEVELOPED FURTHER.

[github.com/seabbs/thepebblegame](https://github.com/seabbs/thepebblegame)

2016

*See my GitHub for a complete overview of my software both released and in development.*

# Presentations

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### BristolR

(My) ESSENTIAL R RESOURCES

- Slides: [samabbott.co.uk/talk/myessentialr-bristolr\\_19\\_04\\_20/](https://samabbott.co.uk/talk/myessentialr-bristolr_19_04_20/)

Bristol

2019

### UK Clinical Vaccine Network Conference

WHAT DO WE REALLY KNOW ABOUT BCG?

- Slides: [samabbott.co.uk/talk/uk-vac-network-2019/](https://samabbott.co.uk/talk/uk-vac-network-2019/)

Oxford

2019

### R/Medicine

GETTBINR: AN R PACKAGE FOR ACCESSING AND SUMMARISING WORLD HEALTH ORGANIZATION TUBERCULOSIS DATA

- Slides: [samabbott.co.uk/talk/gettbinr-14-09-19/](https://samabbott.co.uk/talk/gettbinr-14-09-19/)

Boston

2019

### Research and Applied Epidemiology Scientific Conference

ESTIMATING THE EFFECT OF THE 2005 UK BCG VACCINATION POLICY CHANGE: A RETROSPECTIVE COHORT STUDY USING THE ENHANCED TUBERCULOSIS SURVEILLANCE SYSTEM, 2000-2015

- Slides: [samabbott.co.uk/talk/phe-applied-epi-2018/](https://samabbott.co.uk/talk/phe-applied-epi-2018/)

Warwick

2018

## Research and Applied Epidemiology Scientific Conference

Warwick

BENEFICIAL EFFECTS OF BCG VACCINATION IN OUTCOMES FOR PATIENTS WITH ACTIVE TB: OBSERVATIONAL STUDY USING THE ENHANCED TUBERCULOSIS SURVEILLANCE SYSTEM 2000-2014

2017

- Received best PhD student abstract.
- Slides: [samabbott.co.uk/talk/phe-applied-epi-2017/](http://samabbott.co.uk/talk/phe-applied-epi-2017/)

## 48th Union World Conference on Lung Health

Mexico

BENEFICIAL EFFECTS OF BCG VACCINATION IN OUTCOMES FOR PATIENTS DIAGNOSED WITH TB: OBSERVATIONAL STUDY USING THE ENHANCED TUBERCULOSIS SURVEILLANCE SYSTEM 2009-2015

2017

- Slides: [samabbott.co.uk/talk/union-2017/](http://samabbott.co.uk/talk/union-2017/)

## Research and Applied Epidemiology Scientific Conference

Warwick

ASSESSING THE EVIDENCE FOR UNIVERSAL BACILLUS CALMETTE-GUÉRIN (BCG) VACCINATION IN ENGLAND

2016

- Received best abstract from an early career researcher.
- Slides: [samabbott.co.uk/talk/phe-applied\\_epi-2016/](http://samabbott.co.uk/talk/phe-applied_epi-2016/)

## Service

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### Outreach

- Blog - with over 2.5k unique hits each year - looking at infectious disease epidemiology and dynamics, developments in 'R', tool development and reproducible research. Link: [samabbott.co.uk/post](http://samabbott.co.uk/post)

### Organisations

- Co-organiser of BristolR

### Manuscript Reviews

- Journal of Open Source Software (2)
- Eurosurveillance (1)