

Sam Abbott

Bristol Medical School: Population Health Sciences, University of Bristol

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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

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/

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

Funding Circle

DATA SCIENTIST

London

November 2017–January 2019

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

Skills

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

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

Bristol Infectious Disease Dynamics: University of Bristol

[bristolmathmodellers.github.io/](https://bristolmathmodellers.github.io/biddmodellingcourse)

[biddmodellingcourse](https://bristolmathmodellers.github.io/biddmodellingcourse)

INTRODUCTION TO INFECTIOUS DISEASE MODELLING

2018, 2019

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

Publications

First author

S Abbott, J Hellewell, RN Thompson, K Sherratt, HP Gibbs, NI Bosse, ...

ESTIMATING THE TIME-VARYING REPRODUCTION NUMBER OF SARS-CoV-2 USING NATIONAL AND SUBNATIONAL CASE COUNTS

Wellcome Open Research

2020

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

S Abbott, J Hellewell, J Hickson, J Munday, K Gostic, P Ellis

EpiNow2: ESTIMATE REAL-TIME CASE COUNTS AND TIME-VARYING EPIDEMIOLOGICAL PARAMETERS. 2020

R package version

Non-first author

NG Davies, S Abbott, RC Barnard, CI Jarvis, AJ Kucharski, JD Munday, ...

ESTIMATED TRANSMISSIBILITY AND IMPACT OF SARS-CoV-2 LINEAGE B. 1.1. 7 IN ENGLAND

Science

2021

K Sherratt, S Abbott, SR Meakin, J Hellewell, JD Munday, N Bosse, ...

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

2021

QJ Leclerc, ES Nightingale, S Abbott, T Jombart

ANALYSIS OF TEMPORAL TRENDS IN POTENTIAL COVID-19 CASES REPORTED THROUGH NHS PATHWAYS ENGLAND

Scientific reports

2021

P Mee, N Alexander, P Mayaud, FJ Colon-Gonzalez, S Abbott, ...	<i>medRxiv</i>
TRACKING THE EMERGENCE OF DISPARITIES IN THE SUBNATIONAL SPREAD OF COVID-19 IN BRAZIL USING AN ONLINE APPLICATION FOR REAL-TIME DATA VISUALISATION.	2021
J Hellewell, S Abbott, A Gimma, NI Bosse, CI Jarvis, TW Russell, ...	<i>The Lancet Global Health</i>
FEASIBILITY OF CONTROLLING COVID-19 OUTBREAKS BY ISOLATION OF CASES AND CONTACTS	2020
TW Russell, J Hellewell, CI Jarvis, K Van Zandvoort, S Abbott, ...	<i>Eurosurveillance</i>
ESTIMATING THE INFECTION AND CASE FATALITY RATIO FOR CORONAVIRUS DISEASE (COVID-19) USING AGE-ADJUSTED DATA FROM THE OUTBREAK ON THE DIAMOND PRINCESS CRUISE SHIP, FEBRUARY 2020	2020
A Endo	<i>Wellcome open research</i>
ESTIMATING THE OVERDISPERSION IN COVID-19 TRANSMISSION USING OUTBREAK SIZES OUTSIDE CHINA	2020
KM Gostic, L McGough, EB Baskerville, S Abbott, K Joshi, C Tedijanto, ...	<i>PLoS computational biology</i>
PRACTICAL CONSIDERATIONS FOR MEASURING THE EFFECTIVE REPRODUCTIVE NUMBER, RT	2020
TW Russell, N Golding, J Hellewell, S Abbott, L Wright, CAB Pearson, ...	<i>BMC medicine</i>
RECONSTRUCTING THE EARLY GLOBAL DYNAMICS OF UNDER-ASCERTAINED COVID-19 CASES AND INFECTIONS	2020
N Imai, KAM Gaythorpe, S Abbott, S Bhatia, S van Elsland, K Prem, Y Liu, ...	<i>Wellcome Open Research</i>
ADOPTION AND IMPACT OF NON-PHARMACEUTICAL INTERVENTIONS FOR COVID-19	2020
M Pavelka, K Van-Zandvoort, S Abbott, K Sherratt, M Majdan, P Jarčuška, ...	<i>MedRxiv</i>
THE EFFECTIVENESS OF POPULATION-WIDE, RAPID ANTIGEN TEST BASED SCREENING IN REDUCING SARS-CoV-2 INFECTION PREVALENCE IN SLOVAKIA	2020
T Jombart, K Van Zandvoort, TW Russell, CI Jarvis, A Gimma, S Abbott, ...	<i>Wellcome Open Research</i>
INFERRING THE NUMBER OF COVID-19 CASES FROM RECENTLY REPORTED DEATHS	2020
DJ Price, FM Shearer, MT Meehan, E McBryde, R Moss, N Golding, ...	<i>Elife</i>
EARLY ANALYSIS OF THE AUSTRALIAN COVID-19 EPIDEMIC	2020
A Kaura, JAC Sterne, A Trickey, S Abbott, A Mulla, B Glampson, ...	<i>The Lancet</i>
INVASIVE VERSUS NON-INVASIVE MANAGEMENT OF OLDER PATIENTS WITH NON-ST ELEVATION MYOCARDIAL INFARCTION (SENIOR-NSTEMI): A COHORT STUDY BASED ON ROUTINE CLINICAL DATA	2020
M Jit, T Jombart, ES Nightingale, A Endo, S Abbott, WJ Edmunds	<i>Eurosurveillance</i>
ESTIMATING NUMBER OF CASES AND SPREAD OF CORONAVIRUS DISEASE (COVID-19) USING CRITICAL CARE ADMISSIONS, UNITED KINGDOM, FEBRUARY TO MARCH 2020	2020
EL Davis, TCD Lucas, A Borlase, TM Pollington, S Abbott, D Ayabina, ...	<i>medRxiv</i>
AN IMPERFECT TOOL: COVID-19 'TEST & TRACE' SUCCESS RELIES ON MINIMISING THE IMPACT OF FALSE NEGATIVES AND CONTINUATION OF PHYSICAL DISTANCING.	2020
JD Munday, K Sherratt, S Meakin, A Endo, CAB Pearson, J Hellewell, ...	<i>medRxiv</i>
IMPLICATIONS OF THE SCHOOL-HOUSEHOLD NETWORK STRUCTURE ON SARS-CoV-2 TRANSMISSION UNDER DIFFERENT SCHOOL REOPENING STRATEGIES IN ENGLAND	2020
SF Sam Abbott, Katharine Sherratt, Joe Palmer, Richard Martin-Nielsen ...	<i>Zenodo</i>
COVIDREGIONALDATA: SUBNATIONAL DATA FOR THE COVID-19 OUTBREAK	2020
J Bracher, D Wolfram, J Deuschel, K Goergen, JL Ketterer, A Ullrich, ...	<i>medRxiv</i>
SHORT-TERM FORECASTING OF COVID-19 IN GERMANY AND POLAND DURING THE SECOND WAVE—A PREREGISTERED STUDY	2020
J Stone, H Fraser, AG Lim, JG Walker, Z Ward, L MacGregor, A Trickey, ...	<i>The Lancet infectious diseases</i>
INCARCERATION HISTORY AND RISK OF HIV AND HEPATITIS C VIRUS ACQUISITION AMONG PEOPLE WHO INJECT DRUGS: A SYSTEMATIC REVIEW AND META-ANALYSIS	2018

Preprints

S Abbott, H Christensen, E Brooks-Pollock	<i>BioRxiv</i>
REASSESSING THE EVIDENCE FOR UNIVERSAL SCHOOL-AGE BACILLUS CALMETTE GUERIN (BCG) VACCINATION IN ENGLAND AND WALES	2019

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

Selected Software

R Packages

idmodelr

samabbott.co.uk/idmodelr

INFECTIOUS DISEASE MODEL LIBRARY AND UTILITIES

2019

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

EstZoonoticTB

samabbott.co.uk/EstZoonoticTB

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

2019

- Author and maintainer

getTBinR

samabbott.co.uk/getTBinR

ACCESS AND SUMMARISE WORLD HEALTH ORGANISATION TUBERCULOSIS DATA

2018

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

prettypublisher

samabbott.co.uk/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

2017

- Author and maintainer

Interactive tools

Explore infectious disease models

github.com/seabbs/exploreidmodels

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.

2019

Explore global tuberculosis

`getTBinR::run_tb_dashboard()`

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

2018

Introduction to Tuberculosis models

github.com/seabbs/intro_to_tb_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.

2017

The pebble game

github.com/seabbs/thepebblegame

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.

2016

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

Presentations

BristolR

Bristol

(My) ESSENTIAL R RESOURCES

2019

- Slides: samabbott.co.uk/talk/myessentialr-bristolr_19_04_20/

UK Clinical Vaccine Network Conference

Oxford

WHAT DO WE REALLY KNOW ABOUT BCG?

2019

- Slides: samabbott.co.uk/talk/uk-vac-network-2019/

R/Medicine

Boston

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

2019

- Slides: samabbott.co.uk/talk/gettbinr-14-09-19/

Research and Applied Epidemiology Scientific Conference

Warwick

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

2018

- Slides: samabbott.co.uk/talk/phe-applied-epi-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/

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/

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/

Service

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

Organisations

- Co-organiser of BristolR

Manuscript Reviews

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