The UK COVID-19 modelling response

July 2023 team meeting @CFA-CDC

Sam Abbott
@seabbs
samabbott.co.uk

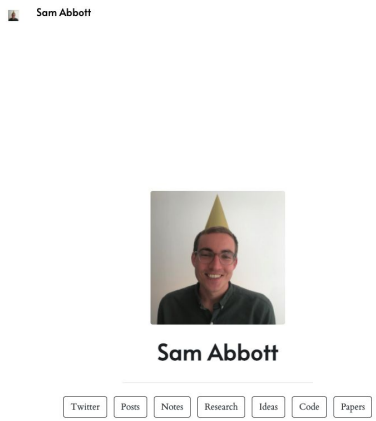
Overview

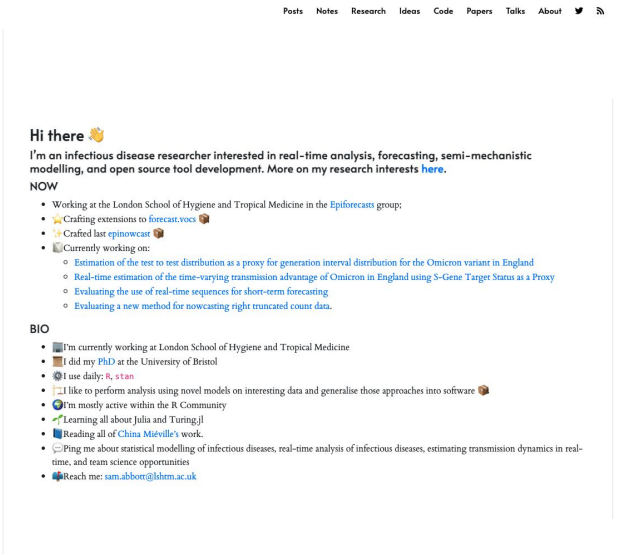
- Who am I - a primer
- Structure of the UK COVID-19 response
- SPI-M-O
- Real-time analysis case studies from the COVID-19 pandemic
- My pandemic (a very abridged tail)
- Reflections on the COVID-19 response

Who am I - primer

I'm an infectious disease researcher interested in real-time analysis, forecasting, semi-mechanistic modelling, and open source tool development.

- Contractor with the Centre for forecasting and outbreak analysis at the US CDC
- Research Fellow w/ epiforecasts.io at the London School of Hygiene and Tropical Medicine
- PhD in modelling Tuberculosis and the optimal use of the BCG vaccine
- Background in mathematical biology, mathematics, and theoretical physics





samabbott.co.uk

samabbott.co.uk/posts/2022-04-11-a-very-biased-view-of-my-recent-research

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"We basically have a strategy which depends upon four tactical aims:

- *Contain: the first one is to contain;*
- *Delay: the second of these is to delay;*
- *Research: the third of these is to do the science and the research;*
- *Mitigation: and the fourth is to mitigate so we can brace the NHS"*

Chris Whitty (former UK Chief Medical Officer), February 2020

The top of the pyramid

The UK government and civil service has a formal structure for receiving scientific advice.

- The two key scientific advisors are the Government Chief Scientific Advisor (GCSA) and Chief Medical Officer (CMO)

- Most government departments have a Chief Scientific Advisor

- Scientific Advisors are typically established academics

Scientific Advisory Group for Emergencies (SAGE)

- The GCSA and CMO chair SAGE
    - SAGE draws expertise from multiple fields for emergencies
    - SAGE has been activated 9 times since 2009, e.g. for the Toddbrook reservoir breach
    - SAGE was activated in January 2020 in response to early reports of SARS-CoV-2
    - Since being activated SAGE met 100+ times (generally weekly)

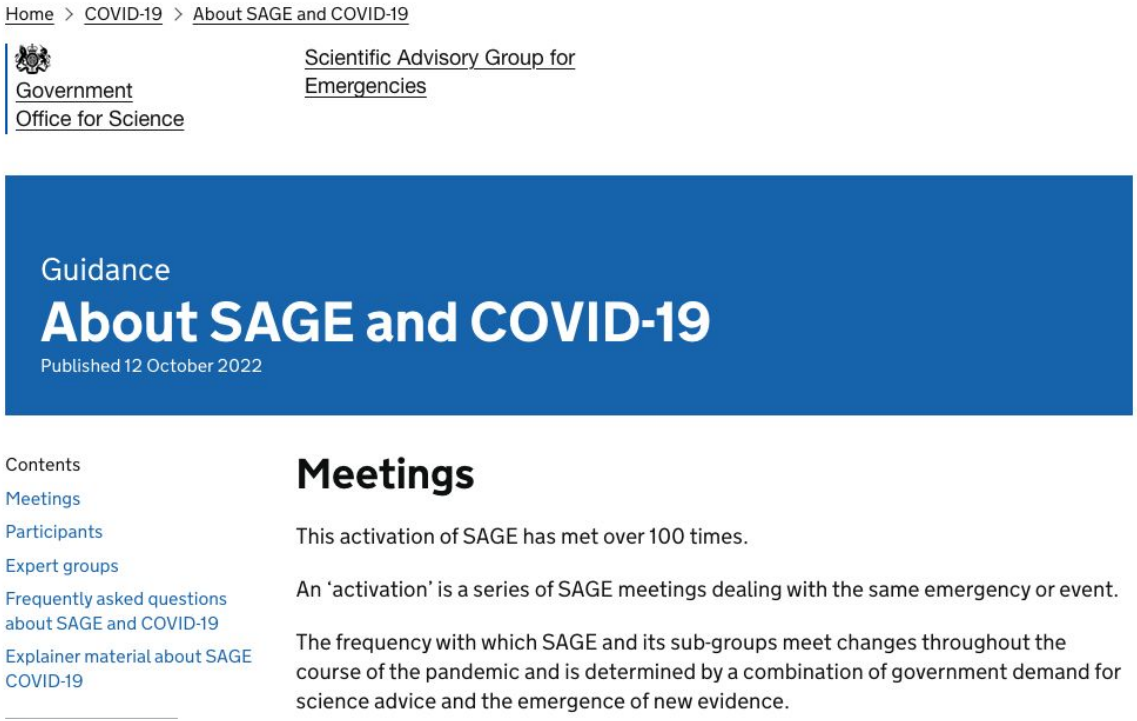
Scientific Advisory Group for Emergencies (SAGE)

- Membership includes senior epidemiologists, clinicians, public health experts, immunologists, virologists, engineers, environmental scientists, data scientists, mathematical modellers and statisticians, geneticists, and behavioural and social scientists

- Produces consensus statements for government

- Supported by several sub-committees such as SPI-M-0 and SPI-M-B and draws on the wider scientific community for advice.

Scientific Advisory Group for Emergencies (SAGE)



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Government
Office for Science

Scientific Advisory Group for Emergencies

Guidance

About SAGE and COVID-19

Published 12 October 2022

Contents

- Meetings
- Participants
- Expert groups
- Frequently asked questions about SAGE and COVID-19
- Explainer material about SAGE COVID-19

Meetings

This activation of SAGE has met over 100 times.

An 'activation' is a series of SAGE meetings dealing with the same emergency or event.

The frequency with which SAGE and its sub-groups meet changes throughout the course of the pandemic and is determined by a combination of government demand for science advice and the emergence of new evidence.

https://www.gov.uk/government/publications/about-sage-and-covid-19/about-sage-and-covid-19

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Scientific Pandemic Influenza Group on Modelling (SPI-M-O)

Chaired by Graham Medley and Angela McLean (now GCSA)

SPI-M-O is primarily composed of infectious disease modellers

- First met on COVID-19 on 27 Jan 2020
- Met at least weekly throughout 2020-2022
- Membership expanded to around 50 modellers
- Members are independent of UK government and are not paid.

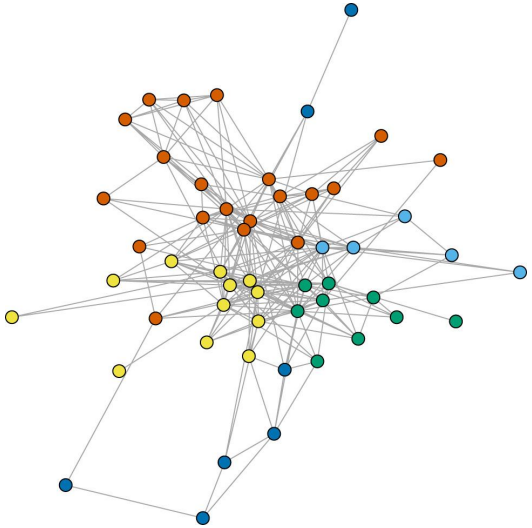
Received commissions from SAGE and then produced consensus reports (for example) that were presented to SAGE.

Scientific Pandemic Influenza Group on Modelling (SPI-M-O)

Unofficial motto: “Tell me why I am wrong”

- Early SPI-M-O work estimated key parameters like growth rates and reproduction numbers

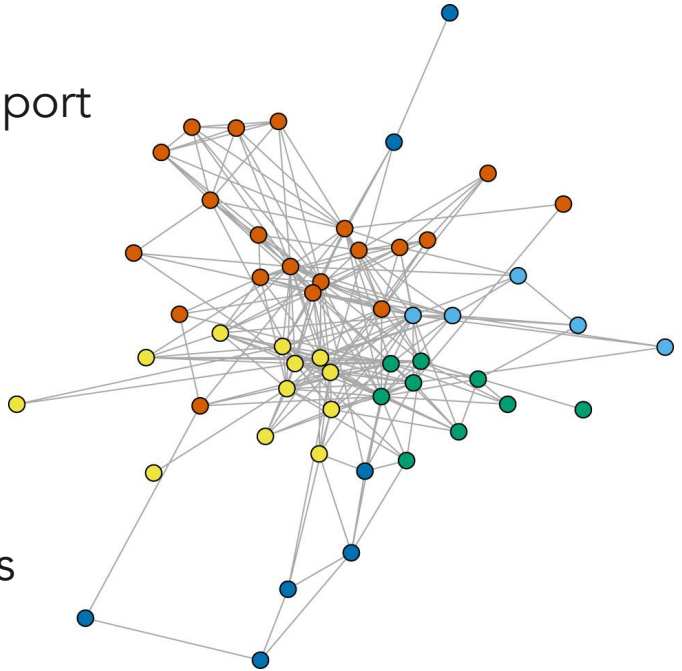
- Routinely produced:
  - weekly estimates of growth rate and Reproduction numbers
  - short- and medium-term forecasts/projections
  - scenario analysis for proposed interventions and relaxations.



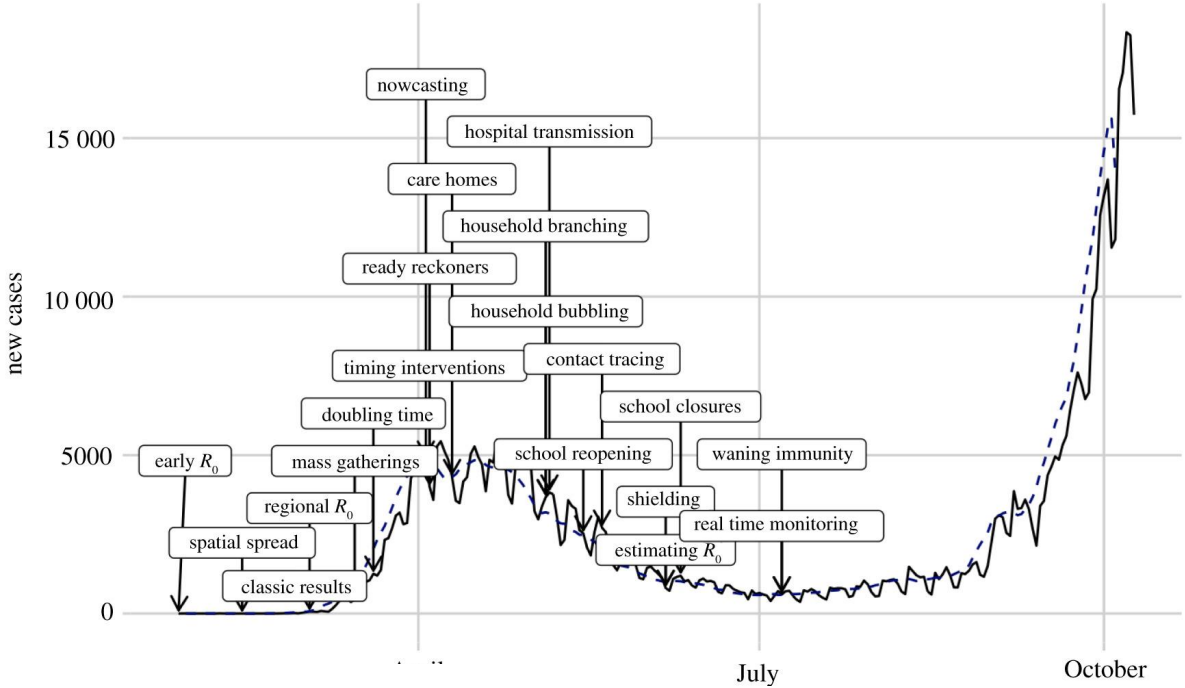
Scientific Pandemic Influenza Group on Modelling (SPI-M-O)

Unofficial motto: “Tell me why I am wrong”

- Responded to policy questions, e.g. impact of support bubbles or lockdowns
- Synthesis and discuss emerging evidence.
- Functionality depends on pre-existing relationships and collaborations between modellers



Scientific Pandemic Influenza Group on Modelling (SPI-M-O)



Introduction

Modelling that shaped the early COVID-19 pandemic response in the UK

Ellen Brooks-Pollock†, Leon Danon†, Thibaut Jombart and Lorenzo Pellis†

Published: 31 May 2021 https://doi.org/10.1098/rstb.2021.0001

A consensus of evidence: The role of SPI-M-O in the UK COVID-19 response

Graham F. Medley

doi.org/10.1098/rstb.2021.0001

doi.org/10.1016/j.jbior.2022.100918

14 October 2022

Re: SPI-M-O Award for Modelling and Data Support

Dear Sam Abbott,

Epidemiological and modelling advice has been vital in the government's response to the COVID-19 pandemic. The Scientific Pandemic Influenza Group on Modelling (SPI-M-O) and Scientific Advisory Group for Emergencies (SAGE) recognise that this has involved teams of people, who have often worked long and unsociable hours to ensure the government has access to world leading scientific evidence.

The SPI-M-O Award for Modelling and Data Support (SAMDS) has been introduced to recognise those people who have made an exceptional contribution to the work of SPI-M-O outside of their usual work activity.

We are pleased to inform you that you have been selected to receive a SAMDS. The award does not carry a financial value, but demonstrates our gratitude for your support during the pandemic, and should be added to your CV.

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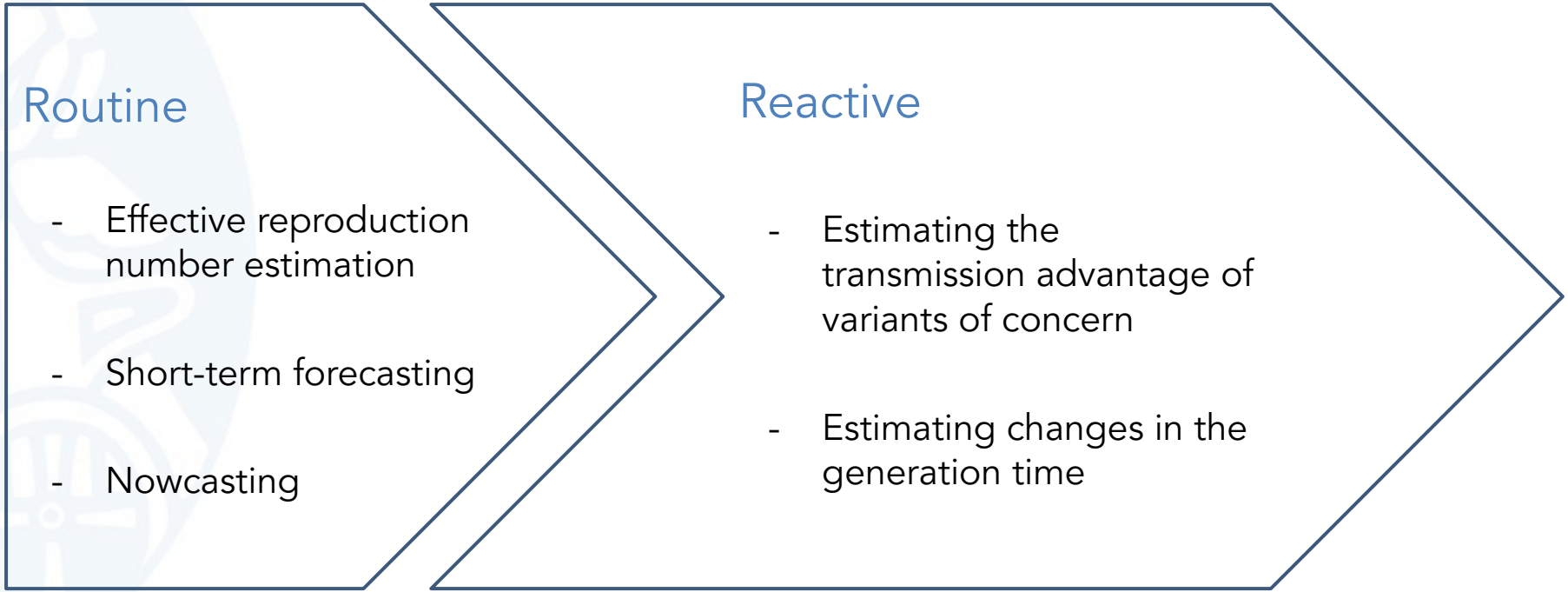
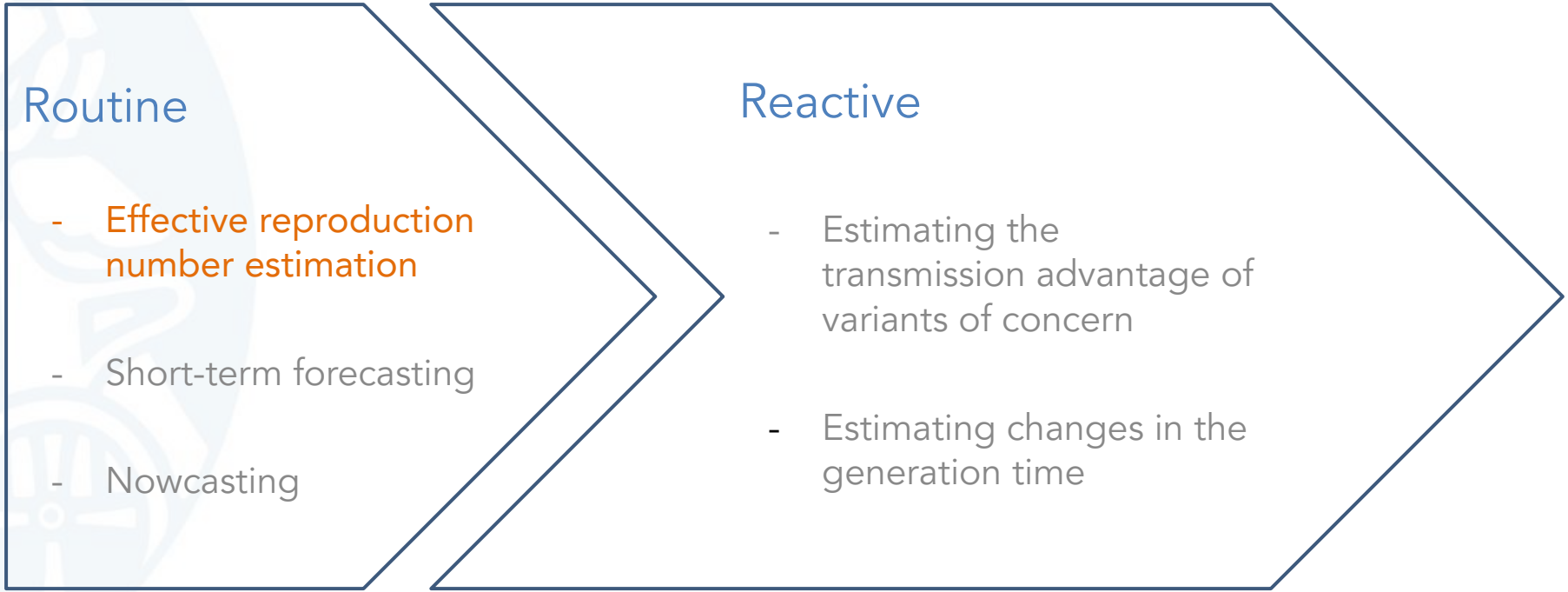
An 80% right paper before a policy decision is made is worth ten 95% right papers afterwards, provided the methodological limitations imposed by doing it fast are made clear.

Whitty et al. BMC Medicine, 2015, DOI: 10.1186/s12916-015-0544-8

Case studies



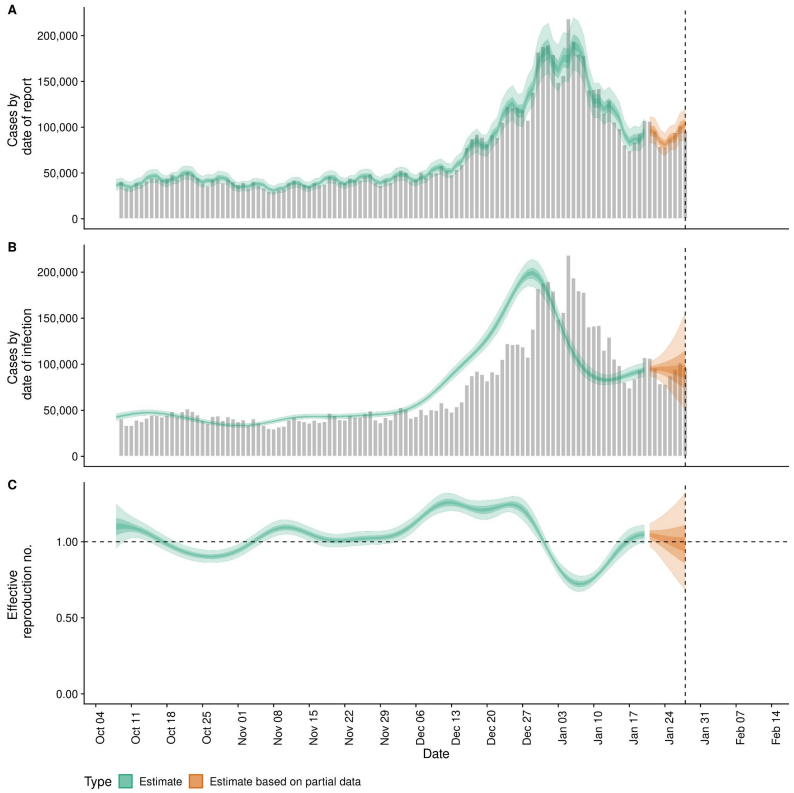
Case studies



Effective reproduction number estimation

The average number of secondary infections produced by a single infected person.

- A helpful metric to track transmission (?)
- Tricky to estimate as depends on infections and on the interval between primary and secondary infections.
- Estimating using various methodologies from February 2020.
- Estimates submitted as part of the SPI-M-O consensus estimate each week for two years.
- Estimates also published each day for over 1000 locations from April 2020 to March 2022 on epiforecasts.io/covid w/ 1 million+ views.
- Used by various governments/WHO/CDC etc.



Abbott et al. Wellcome Open Res, 2020, DOI: 10.12688/wellcomeopenres.16006.2

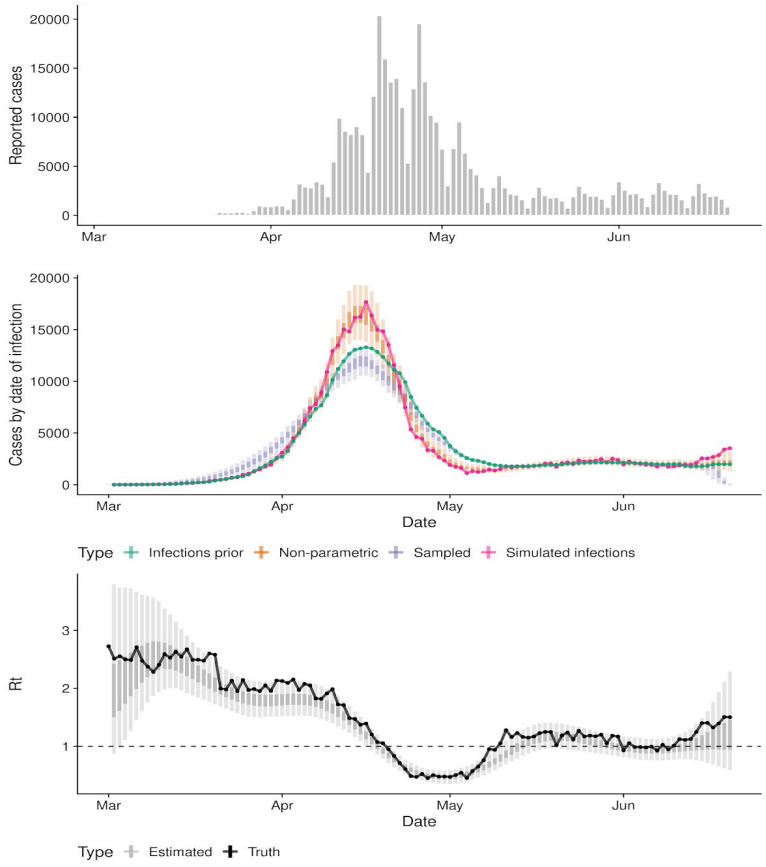
Effective reproduction number estimation

Key Challenges

- We care about linking policy changes with changes in transmission but only observe delayed proxies like reported cases and deaths.
- Surveillance data subject to a range of difficult to account for biases.
- Estimation at scale in real-time is currently computationally challenging.

Mitigations

- Generative model of expected infections.
- Worked with the Met Office to develop production ready code using resources donated by Microsoft Azure.
- Estimate independently on a range of data sources.



Sherratt et al. Phil Trans B, 2021, DOI: 10.1098/rstb.2020.0283

Effective reproduction number estimation

Reflections on two years estimating effective reproduction numbers

Over the last two years we have estimated reproduction numbers daily for several thousand locations, presented these estimates as a curated data set and visualised them at epiforecasts.io/covid. In this post we reflect on this project, summarising its utility, its integration with other projects, unanticipated challenges, and finally whether we would do it again.

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London School of Hygiene and Tropical Medicine

PUBLISHED

March 25, 2022

On this page

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Blog post: epiforecasts.io/posts/2022-03-25-rt-reflections/

Lessons learnt

- Routine work can be a useful way to gain situational awareness.
- Real-time analysis often builds on analyses, tools, and data pipelines previously developed.
- Outputs are easiest to use when they are robust, modular, evaluated, and available.
- Combining estimates from a range of sources and methodologies are likely to improve decision making versus using a single analysis.
- Work that is good enough tends to be work that is available.

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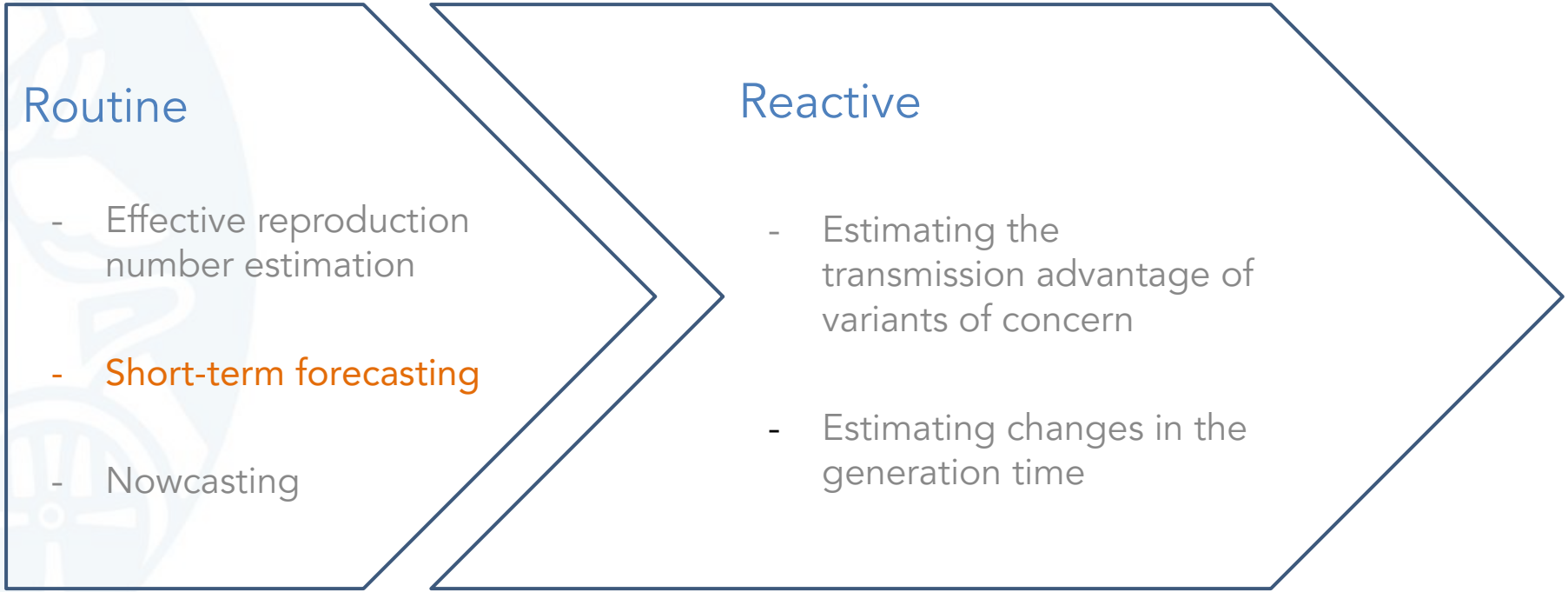
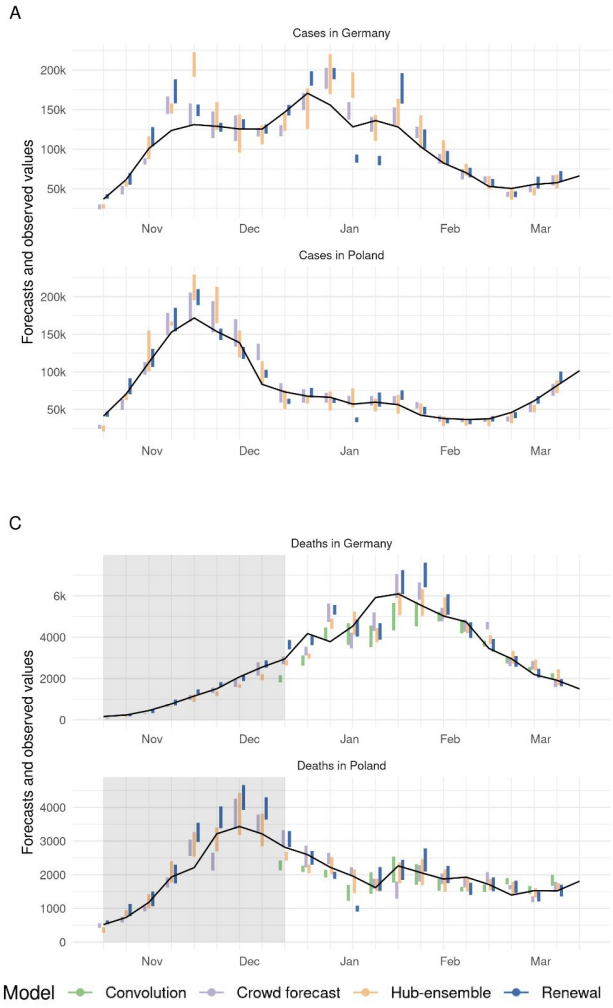


Short–term forecasts

What do we think will happen to reported metrics over the next 1-4 weeks

- Using the reproduction number renewal model and similar discrete convolution models.
- Submitting to the ECDC and CDC forecasting hubs weekly as well as to SPI-M-O 3 times a week until mid 2020.
- Performed ~well compared to other models but out performed by an all-model ensemble.
- Also outperformed by a human judgement model.
- All forecasts struggle to account for policy changes and behavioural changes.



Bosse et al. medRxiv, 2020, DOI: 10.1101/2021.12.01.21266598

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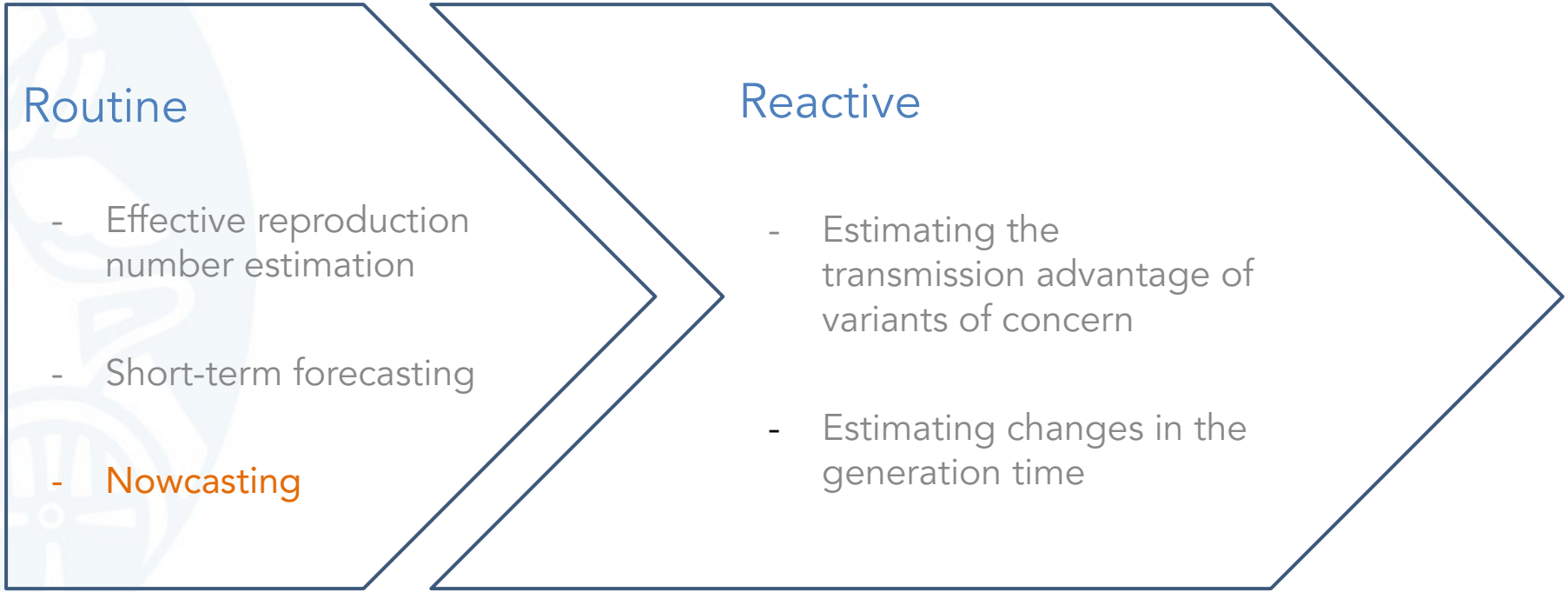
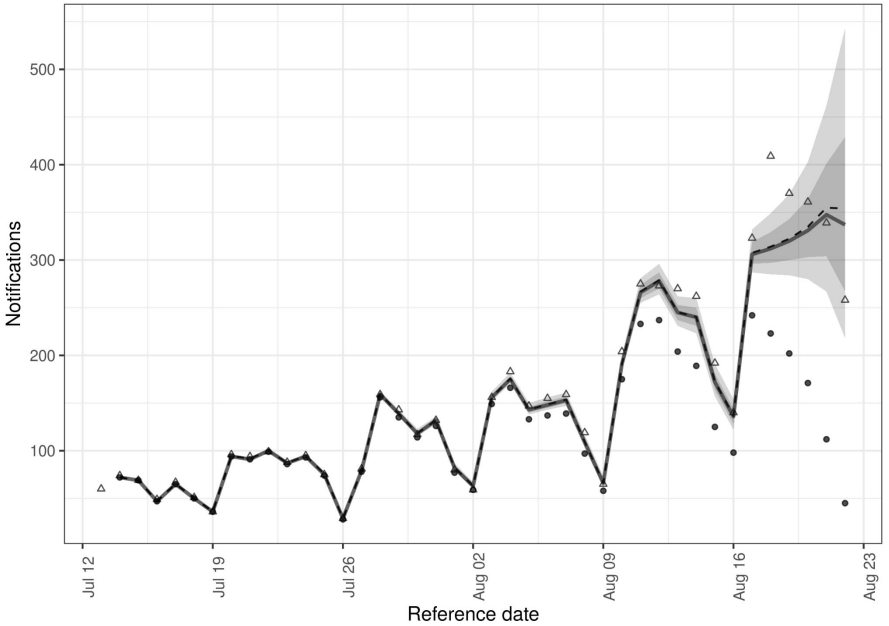


Nowcasts

What is happening now to metrics we partially observe

- International collaboration estimating 7-day hospital admissions by date of positive test in Germany (the key metric used by decision makers).
- Statistical approach is to decompose the model into forecast and reporting delay components.
- Multi-method ensemble outperforms any single model.
- Nowcasting is conceptually difficult to understand and so potentially under used.
- Open access tools, such as epinowcast, make access easier.



Bracher et al. covid19nowcasthub.de

Wolffram et al: epinowcast.org/posts/2023-05-08-collab-nowcasting-covid19-germany

Abbott et al. github.com/epiforecasts/epinowcas

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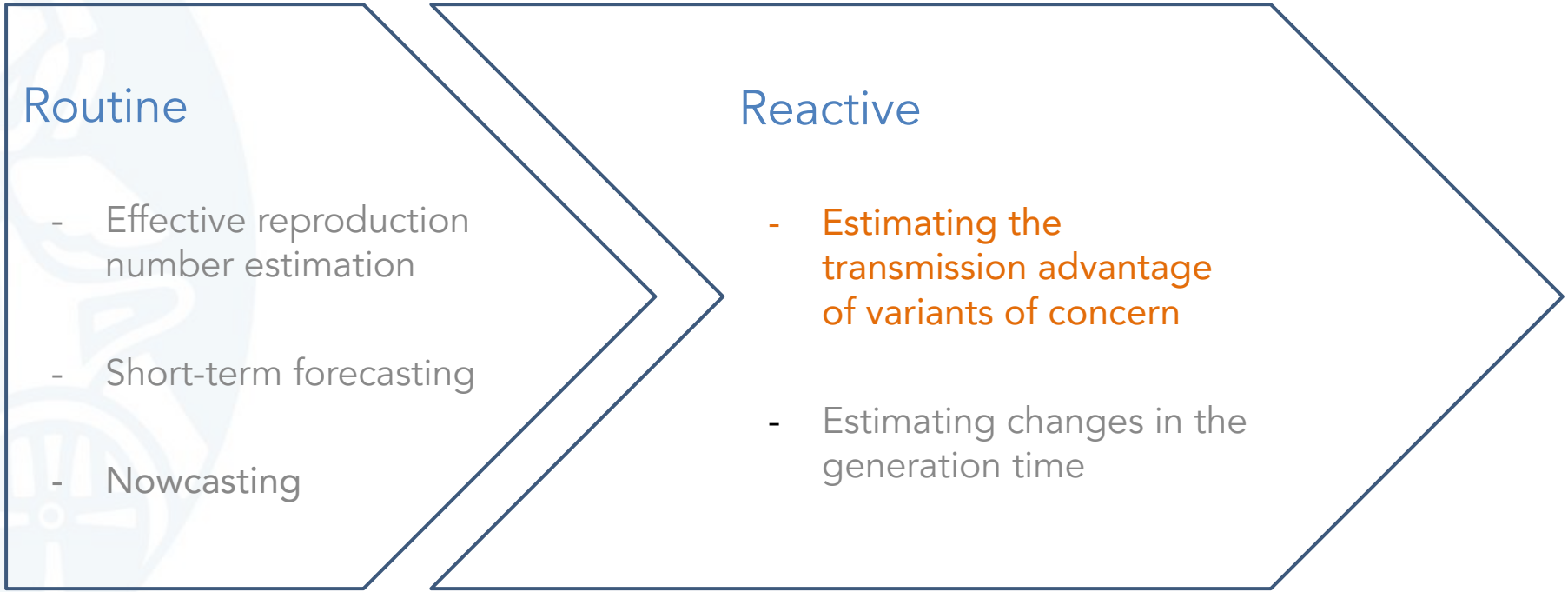
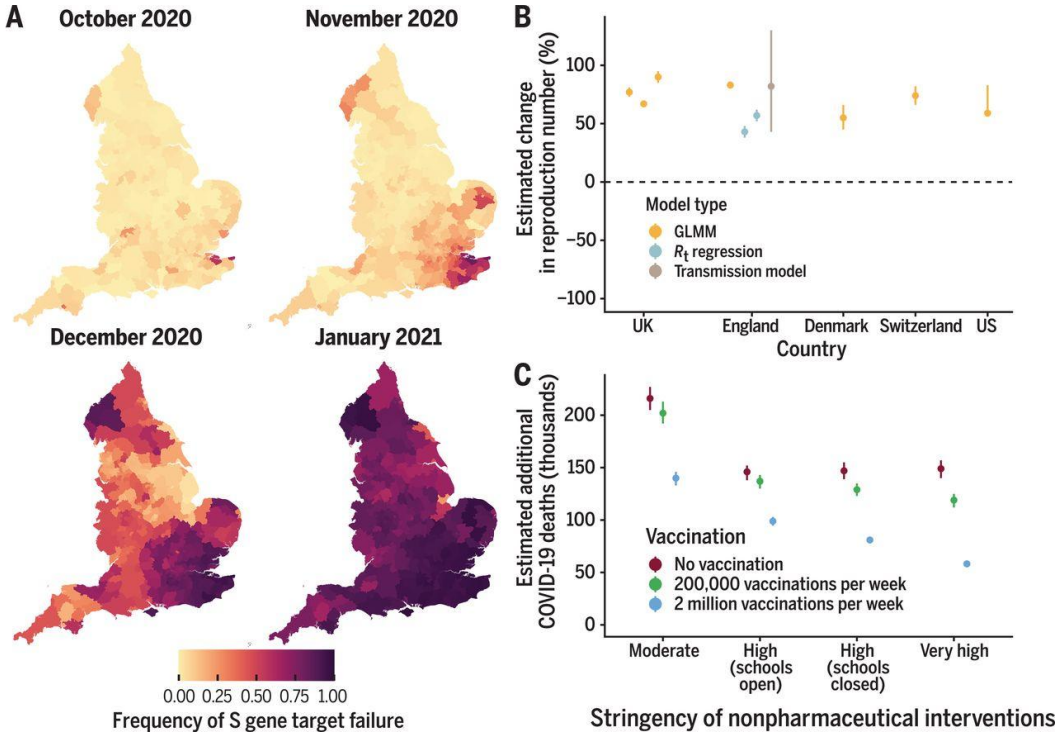


Estimating the transmission advantage of Alpha

How much more transmissible is Alpha than wild-type?

- Part of a multi-method approach by Davies et al.
- Used reproduction number estimates by Lower-Tier local authority as "data" + S-gene target failure status (SGTF) as a proxy for variant status.
- Estimated the transmission advantage using an extended regression model adjusted for confounders
- Work done between December 20th 2020 and January 1st 2021.

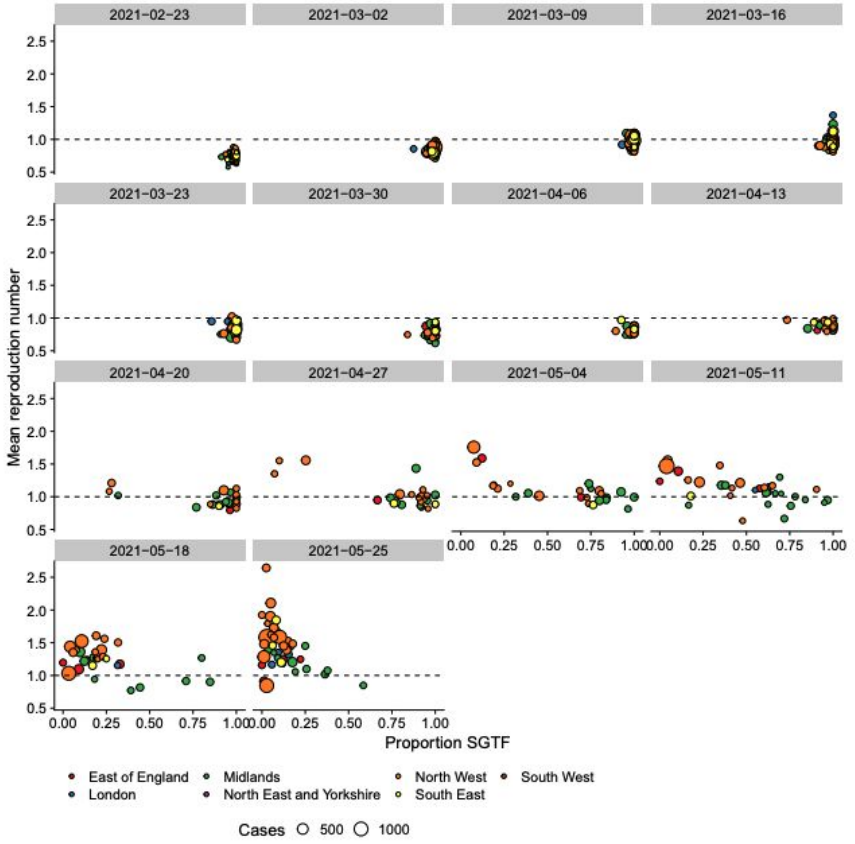


Davies et al. Science, 2021, DOI: 10.1126/science.abg3055

Estimating the transmission advantage of Delta

How much more transmissible is Delta than Alpha?

- Repurposed the approach used for Alpha using reproduction number estimates as data.
- Extended the methodology to include uncertainty for the reproduction number estimates and SGTF status.
- Estimates combined with others as apart of the SPI-M consensus statement.

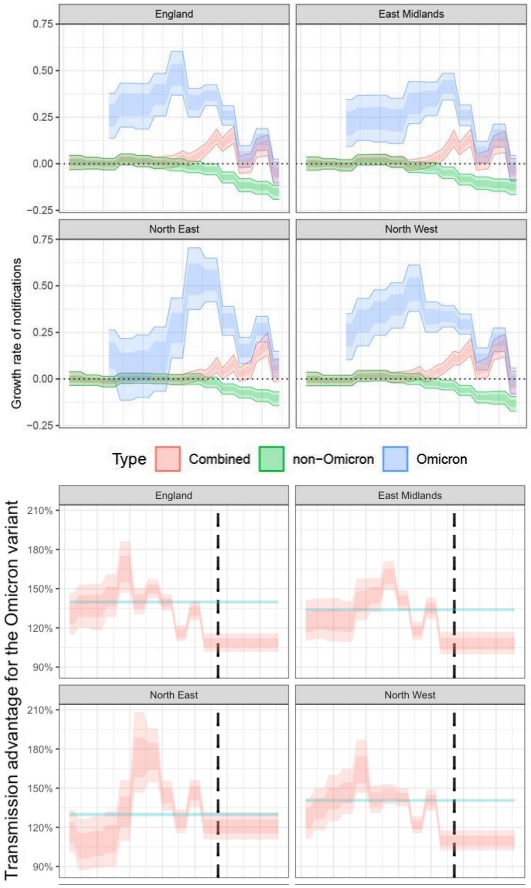


Abbott et al. medRxiv, 2021, DOI: 10.1101/2021.11.30.21267056v1

Estimating the transmission advantage of Omicron

How much more transmissible is Omicron than Delta and does it vary over time?

- Early evidence from South Africa suggested that Omicron may be more successful than Delta at escaping prior immunity.
- This would be identifiable as variation over time in the transmission advantage (in the model we were using). Our previous analysis didn't support this.
- Repurposed methodology developed to evaluate the role of sequences for forecasting (forecast.vocs 📦).
- Identified a reduction in transmission advantage prior to Christmas (rather than the increase expected due to immune escape).
- A real-time report developed, submitted to SPI-M, and updated daily from the 18th of December 2021 to the 1st of January 2022.



Pearson et al. medRxiv, 2021, DOI: 10.1101/2021.12.19.21268038
Abbott et al. github.com/epiforecasts/omicron-sgtf-forecast/releases/tag/reportv1.3.0

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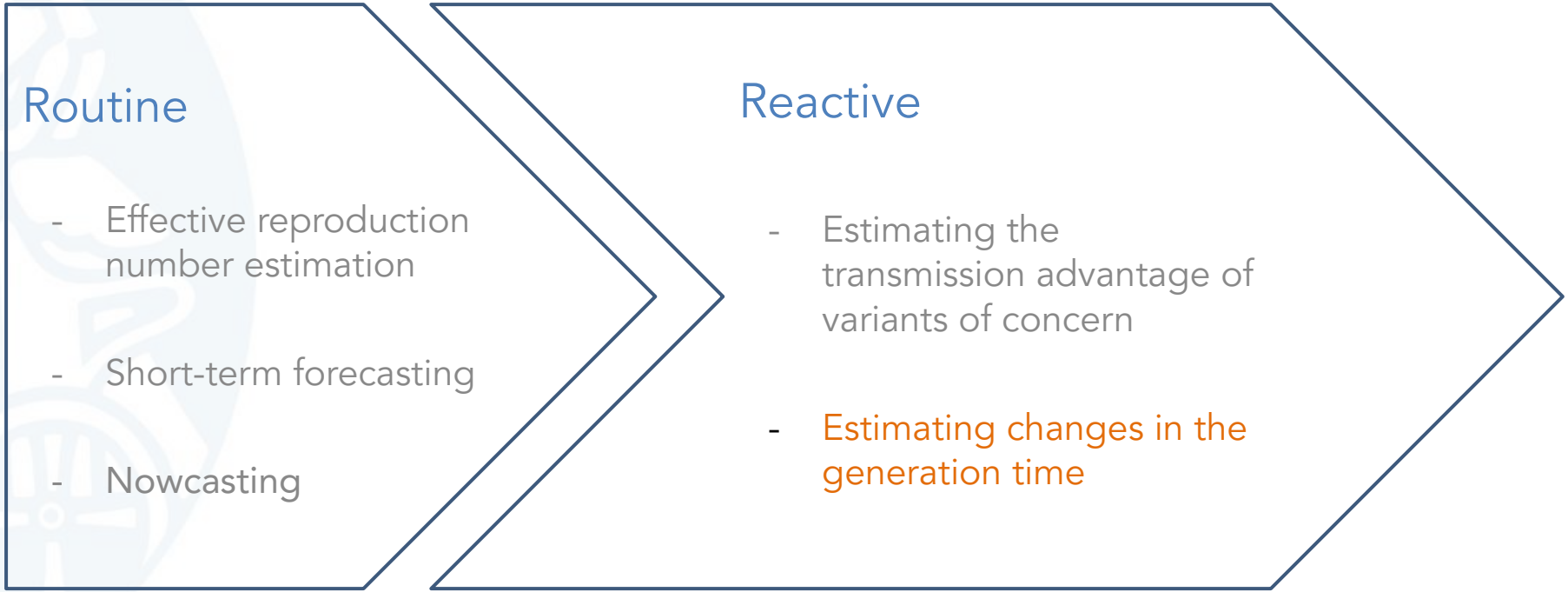
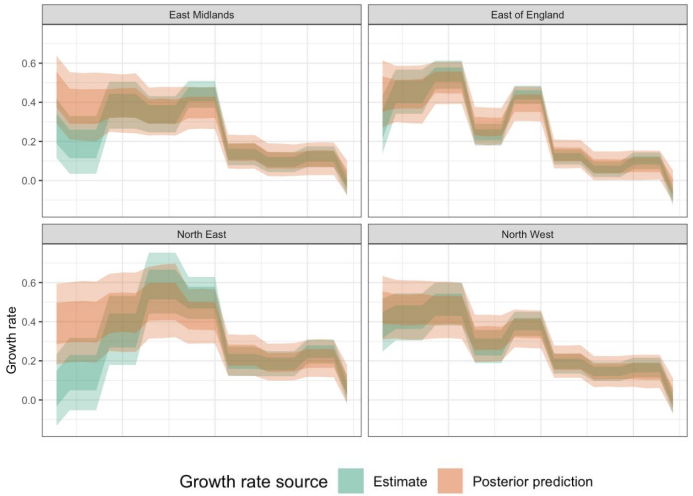


Estimating the generation time of Omicron

Is Omicron's generation time shorter than Delta's?

$$R = \left(1 + \bar{G}kr\right)^{\frac{1}{k}}$$

- Observed reduction (from daily routine reporting) in transmission advantage could indicate a shorter generation time.
- This is due to the relationship between the daily growth rate and the reproduction number.
- Used growth rates for Omicron and Delta to explore this and found that a shorter generation time was plausible.
- Findings supported by a study from UKHSA using household contact data.
- Results available in early January and formed part of the SPI-M consensus statement.



Park et al. medRxiv, 2021, DOI: 10.1101/2021.05.03.21256545
Abbott et al. medRxiv, 2021, DOI: 10.1101/2022.01.08.22268920
Park et al. medRxiv, 2022, DOI: 10.1073/pnas.222188712

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Lessons learnt

- Higher standards can be achieved via teamwork, more pre-emptive work, and evaluation. These are currently all poorly incentivised.

- Real-time analysis is hard and those doing it need to be well trained in statistical methodology, software engineering, and public communication of limitations.

- This skillset is poorly rewarded by traditional academic incentives and difficult to acquire through currently available training.

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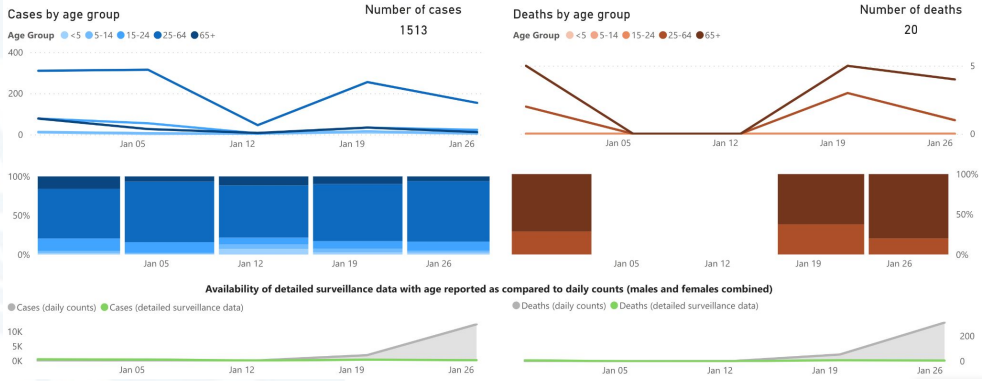
2020: January



- Jan 6th: Joined the school to work on real-time forecasting of infectious disease
- Jan 18th: First COVID-19 working group meeting -> Full-time on COVID-19.
- Jan 30th: Report: Reporting delays and Rt in China (led by Sebastian Funk)
- Jan 30th: Paper: Size of spillover and reproduction number estimates

RESEARCH ARTICLE

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 [version 1; peer review: 2 approved]

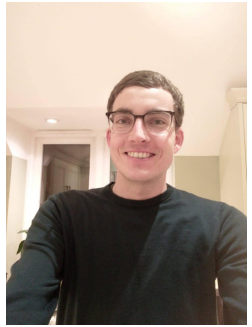
Sam Abbott, Joel Hellewell, James Munday, CMMID nCoV working group, Sebastian Funk

Reporting delays and temporal variation in transmission in China during the 2019-nCoV outbreak

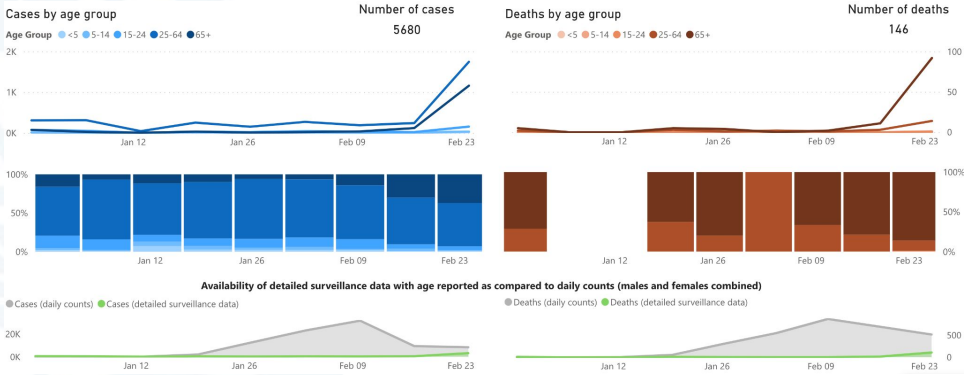
Status: In Progress | First online: 30-01-2020 | Last update: 30-01-2019

Authors: *Sebastian Funk*, Sam Abbott, Stefan Flasche & CMMID COVID-19 working group.*

* corresponding author



2020: February



- Feb 5th: Presented PhD work to the JVCI BCG meeting
- Feb 7th: Feasibility of contact tracing (led by Joel Hellewell)
- Feb 19th: In person PhD graduation @Bristol
- Feb: 1st/20+ reports to SPI-M-O

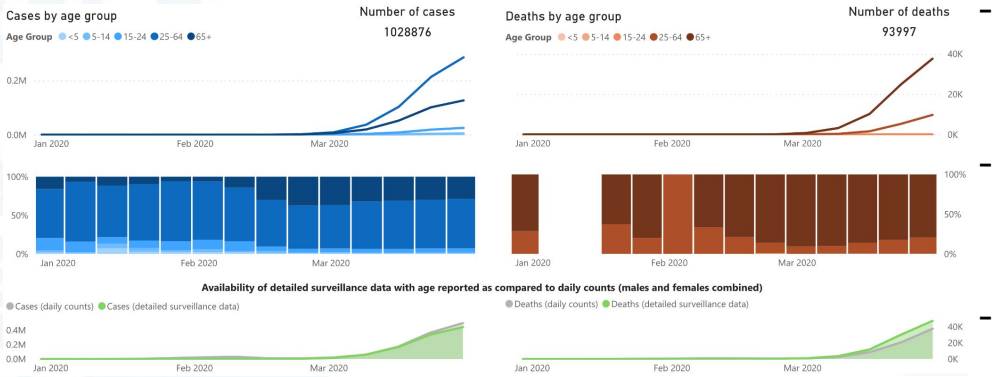
Feasibility of controlling COVID-19 outbreaks by isolation of cases and contacts

Joel Hellewell, PhD • Sam Abbott, PhD * • Amy Gimma, MSc * • Nikos I Bosse, BSc • Christopher I Jarvis, PhD • Timothy W Russell, PhD • et al. Show all authors • Show footnotes

Open Access • Published: February 28, 2020 •

DOI: https://doi.org/10.1016/S2214-109X(20)30074-7

2020: March



- March 2nd: Temporal variation in transmission (Rt) + release of EpiNow
- March 10th: In person teaching (first and last @LSHTM)
- March 10th: Pointing at graphs on newsnight

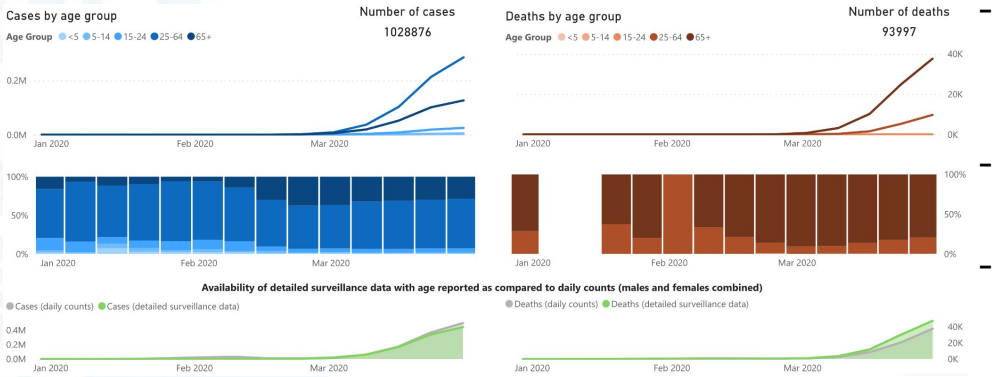
Temporal variation in transmission during the COVID-19 outbreak

Status: In Progress | First online: 02-03-2020 | Last update: 04-04-2020

Authors: *Sam Abbott*, Joel Hellewell, James D Munday, June Young Chun, Robin N. Thompson, Nikos I Bosse, Yung-Wai Desmond Chan, Timothy W Russell, Christopher I Jarvis, CMMID COVID-19 working group, Stefan Flasche, Adam J Kucharski, Rosalind M Eggo & Sebastian Funk.*

* corresponding author

2020: March



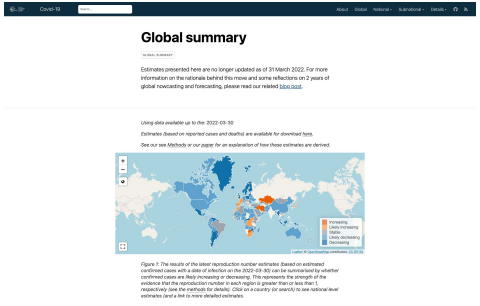
- March 20th: Partner flew back from Postdoc in the US

- March 23rd: London -> Bristol
- March 31st: epiforecasts.io/covid
  - Rt + short-term forecasts
  - Daily for 2+ years
  - Initially manually
  - 2000+ locations

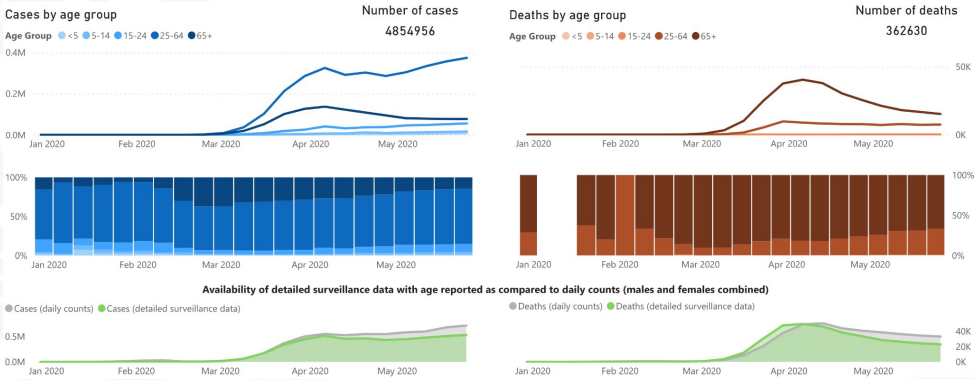
RESEARCH ARTICLE

UPDATE **Estimating the time-varying reproduction number of SARS-CoV-2 using national and subnational case counts [version 2; peer review: 1 approved, 1 approved with reservations]**

Sam Abbott *, Joel Hellewell *, Robin N. Thompson, Katharine Sherratt, Hamish P. Gibbs, Nikos I. Bosse, James D. Munday, Sophie Meakin, Emma L. Doughty, June Young Chun, Yung-Wai Desmond Chan, Flavio Finger, Paul Campbell, Akira Endo, Carl A. B. Pearson, Amy Gimma, Tim Russell, CMMID COVID modelling group, Stefan Flasche, Adam J. Kucharski, Rosalind M. Eggo, Sebastian Funk



2020: April - May



- April 1st: Start of 3 times a week short-term forecasts and Rt estimates for SPI-M-O
- April: More reports (5+) for SPI-M-0
- April: Became non-verbal outside of work.
- May: Forecasts -> Weekly

Estimates of nosocomial and community transmission of COVID-19 in the England

Authors: *Sam Abbott, Joel Hellewell, Jonathan Read, Nikos I Bosse, Kath Sherratt, James D Munday, and Sebastian Funk on behalf of the LSHTM COVID-19 Modelling Team*

Date: 2020-04-12

Aim

To identify changes in the reproduction number, rate of spread, and doubling time during the course of the COVID-19 outbreak in nosocomial and community populations whilst accounting for potential biases due to delays in case reporting.

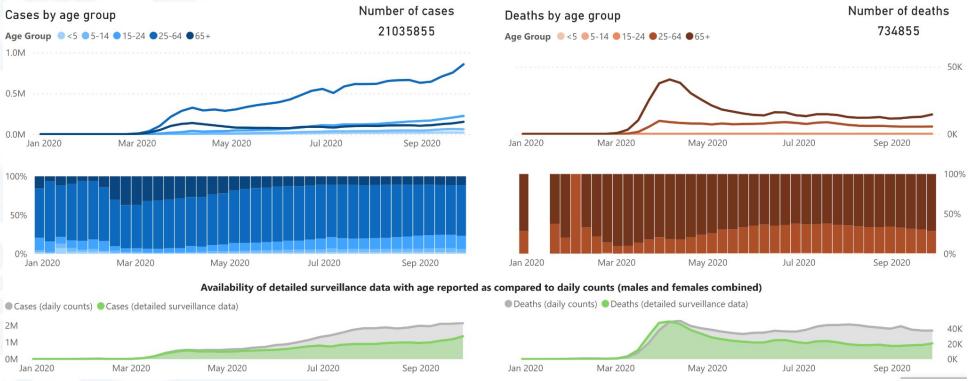
Short-term forecasts to inform the response to the Covid-19 epidemic in the UK

S Funk, S Abbott, BD Atkins, M Baguelin, JK Baillie, P Birrell, J Blake, NI Bosse, J Burton, J Carruthers, NG Davies, D De Angelis, L Dyson, WJ Edmunds, RM Eggo, NM Ferguson, K Gaythorpe, E Gorsich, G Guyver-Fletcher, J Hellewell, EM Hill, A Holmes, TA House, C Jewell, M Jit, T Jombart, I Joshi, MJ Keeling, E Kendall, ES Knock, AJ Kucharski, KA Lythgoe, SR Meakin, JD Munday, PJM Openshaw, CE Overton, F Pagani, J Pearson, PN Perez-Guzman, L Pellis, F Scarabel, MG Semple, K Sherratt, M Tang, MJ Tildesley, E Van Leeuwen, LK Whittles, CMMID COVID-19 Working Group, Imperial College COVID-19 Response Team, ISARIC4C Investigators

doi: https://doi.org/10.1101/2020.11.11.20220962

This article is a preprint and has not been peer-reviewed [what does this mean?]. It reports new medical research that has yet to be evaluated and so should *not* be used to guide clinical practice.

2020: June - September



Practical considerations for measuring the effective reproductive number, R_t

Katelyn M. Gostic, Lauren McGough, Edward B. Baskerville, Sam Abbott, Keya Joshi, Christine Tedijanto, Rebecca Kahn, Rene Niehus, James A. Hay, Pablo M. De Salazar, Joel Hellewell, Sophie Meakin, James D. Munday, [···], Sarah Cobey
[view all]

Published: December 10, 2020 • https://doi.org/10.1371/journal.pcbi.1008409

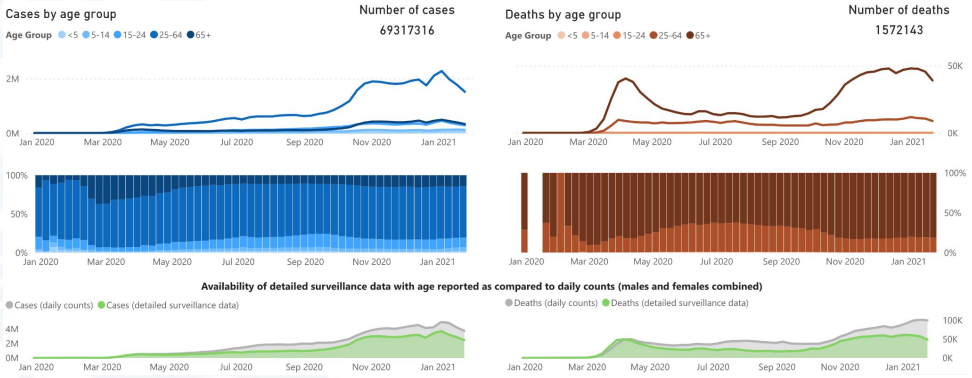
EpiNow2: Estimate real-time case counts and time-varying epidemiological parameters

lifecycle maturing | R-CMD-check passing | codecov 75% | downloads 21K

License MIT | contributors 13 | r-universe 1.3.4 | commits since v1.3.4 16 | DOI 10.5281/zenodo.7611804

- June: Stopped forecasts and started projections for SPI-M-O
- June: Started speaking outside of work again.
- June: Email from Katie Gostic + James Hay -> Rt method is flawed
- June: Start forecasting weekly for the CDC forecast hub
- July 23rd: First stable EpiNow2 release
- Sept 31st: Moved in with parents in Cornwall due to panic attacks

2020-2021: October - January



- Oct 22nd: Grandma's funeral (10 people)
- Oct 22nd: Worked overnight implementing susceptibility for SPI-M-O projections.
- Oct: Sisters wedding (14 people)

- Nov-Jan: Worked with Met office to productionize our Rt estimates
- Jan 1st: Moved to partner's parent's house to start our own house hunt
- Jan 8th: Local area Rt and S-gene target failure

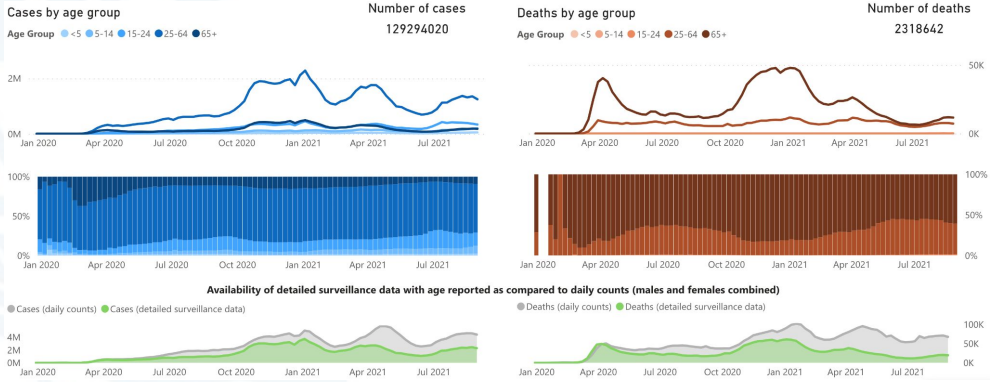
Local area reproduction numbers and S-gene target failure

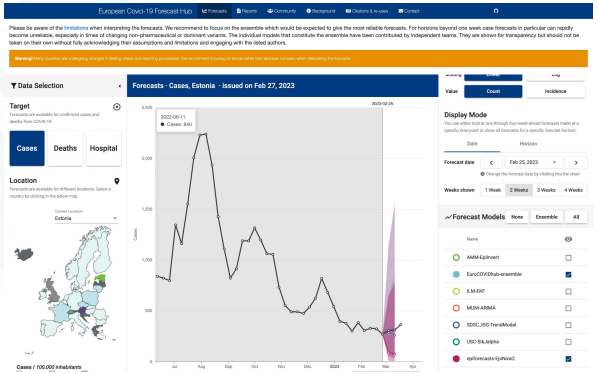
Status: Real time report | First online: 08-01-2021 | Last update: 08-01-2021

Authors: *Sam Abbott, Sebastian Funk* & CMMID COVID-19 working group.*

* corresponding author

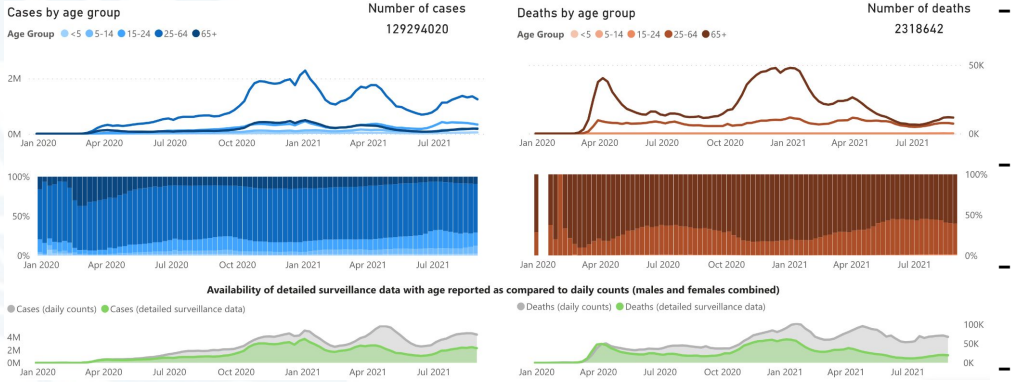
2021: February - August



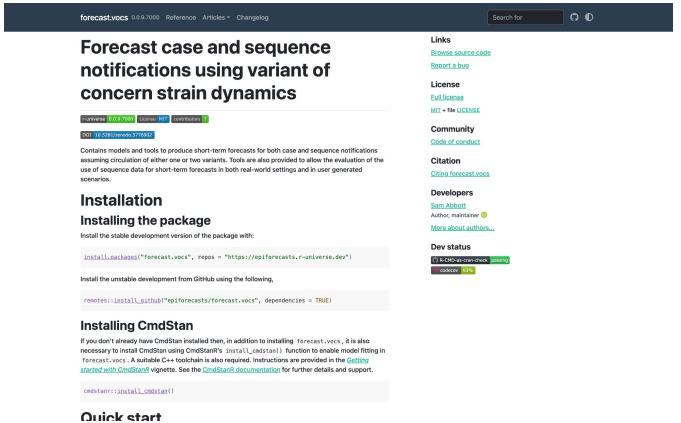


- Feb: Started forecasting weekly for the European forecasting Hub
- March 1st: Start on EpiNow2 v2 dev
- March 18th: Moved out of and sold Bristol flat
- 20th April: Gave up on house buying -> Cornwall

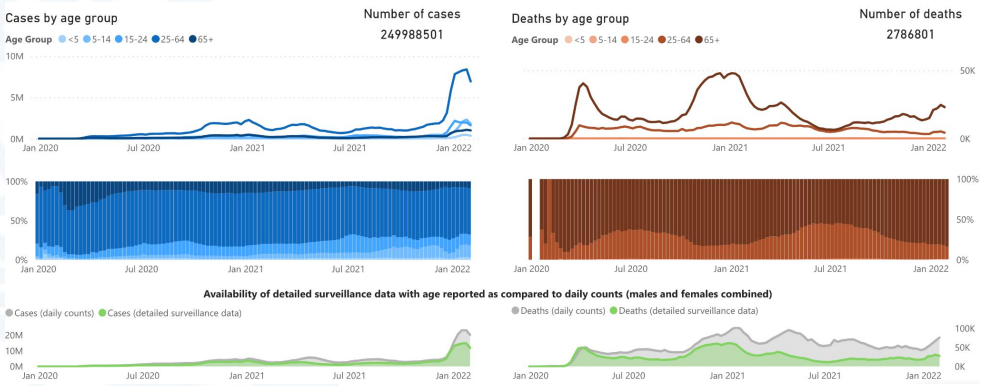
2021: February - August



- April: Started being able to talk to people outside the house/work etc. again
- April 21st: Grandad's funeral (30 people)
- May: Burned out on EpiNow2 dev
- May - August: Short-term forecasts of variant dynamics + cases



2021-2022: September - January



Estimation of the test to test distribution as a proxy for generation interval distribution for the Omicron variant in England

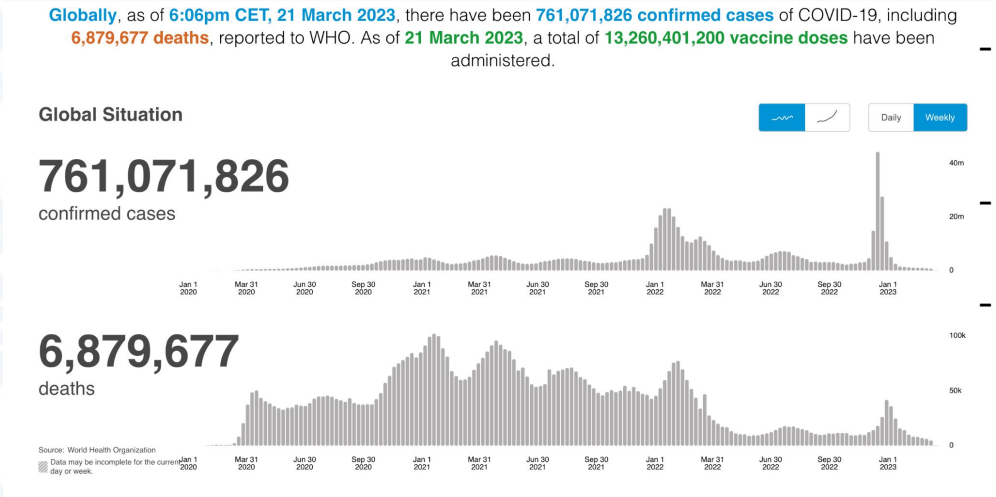
Sam Abbott, Katharine Sherratt, Moritz Gerstung, Sebastian Funk

doi: https://doi.org/10.1101/2022.01.08.22268920

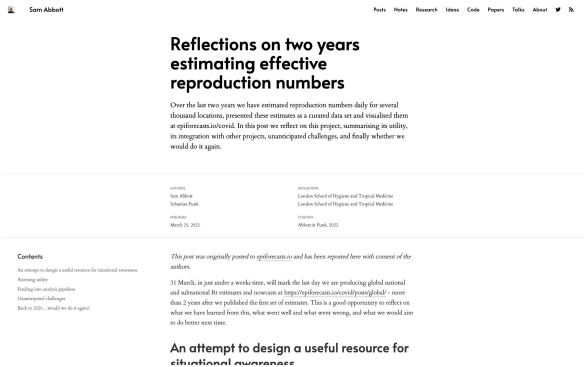
- Sept 1st: Cornwall -> Bristol (staff flat). House buying round 2
- Oct 1st: Dev on epinowcast.org begins
- Nov: Niece born + 1st day @office since 2020

- Nov 21st: Daily nowcasting of hospitalisations in Germany
- Dec 22nd: Daily Omicron short-term forecasts
- Jan 1st: Had 1st round of COVID-19
- Jan 3rd: Estimate of Omicron's generation time (last SPI-M-O report)

2022-2023: Feb - March



- March 10th: First successful house offer (note 1st…)
- March 17th: Had COVID round 2
- March 25th: Turned off Rt pipeline after 2 years
  - 500k unique users
  - 1.2 million page views
  - Was it worth it?


Sam Abbott

Posts Notes Research Ideas Code Papers Talks About

Reflections on two years estimating effective reproduction numbers

Over the last two years we have estimated reproduction numbers daily for several thousand locations, presented these estimates as a curated data set and visualised them at epiforecasts.io/covid. In this post we reflect on this project, summarising its utility, its integration with other projects, unanticipated challenges, and finally whether we would do it again.

Sam Abbott
Sebastian Funk

London School of Hygiene and Tropical Medicine
London School of Hygiene and Tropical Medicine

March 21, 2022

Abbott & Funk, 2022

Contents

An attempt to design a useful resource for situational awareness
Assessing utility
Feeding into analysis pipelines
Unanticipated challenges
Back to 2020… would we do it again?

This post was originally posted to epiforecasts.io and has been reposted here with consent of the authors.

31 March, in just under a weeks time, will mark the last day we are producing global national and subnational Rt estimates and nowcasts at https://epiforecasts.io/covid/posts/global/ - more than 2 years after we published the first set of estimates. This is a good opportunity to reflect on what we have learned from this, what went well and what went wrong, and what we would aim to do better next time.

An attempt to design a useful resource for situational awareness

Overview

- Who am I - a primer
- Structure of the UK COVID-19 response
- SPI-M-O
- Real-time analysis case studies from the COVID-19 pandemic
- My pandemic (a very abridged tail)
- Reflections on the COVID-19 response

CONFERENCE

CENTRE FOR STATISTICAL METHODOLOGY, CENTRE FOR MATHEMATICAL MODELLING OF INFECTIOUS DISEASES, CENTRE FOR EPIDEMIC PREPAREDNESS AND RESPONSE

series event

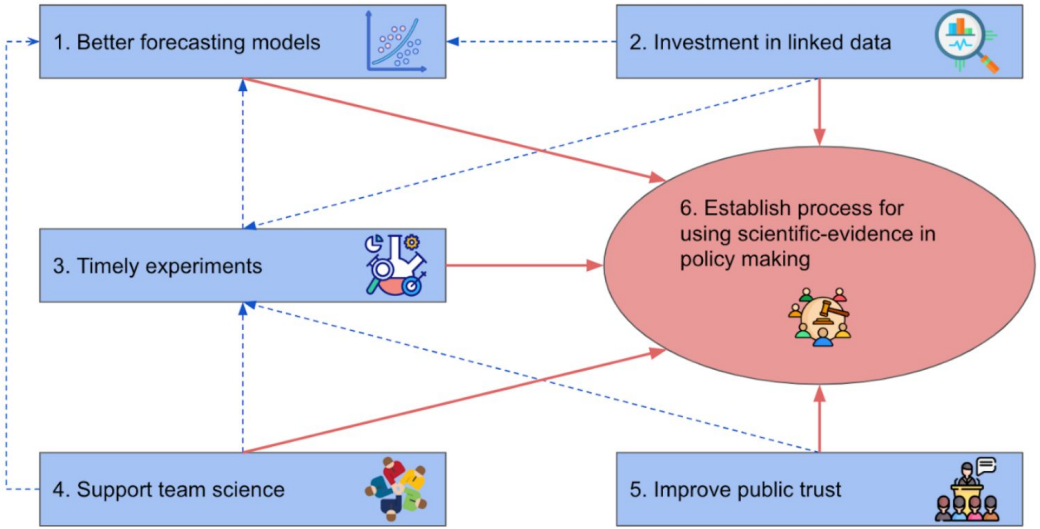
How can mathematical and statistical models combine with big data to improve our response to pandemics?

Share

Pictured left to right: Professor Sir Chris Whitty, Professor Bhramar Mukherjee and Professor Dame Angela McLean

https://www.lshtm.ac.uk/newsevents/events/how-can-mathematical-and-statistical-models-combine-big-data-improve-our-response

Figure 1: Interlinked themes that can help prepare for a future pandemic



The importance of investing in data, models, experiments, team science, and public trust to help policymakers prepare for the next pandemic

Short title: International insights about data and models for pandemic preparedness

Richard Grieve[1,2*], Youqi Yang[3], Sam Abbott[4,5], Giridhara R Babu[6], Malay Bhattacharyya[7], Natalie Dean[8], Stephen Evans[1,9], Nicholas Jewell[1,9], Sinéad M Langan[10], Woojoo Lee[11], Geert Molenberghs[12], Liam Smeeth[10], Elizabeth Williamson[1,9], and Bhramar Mukherjee[1]

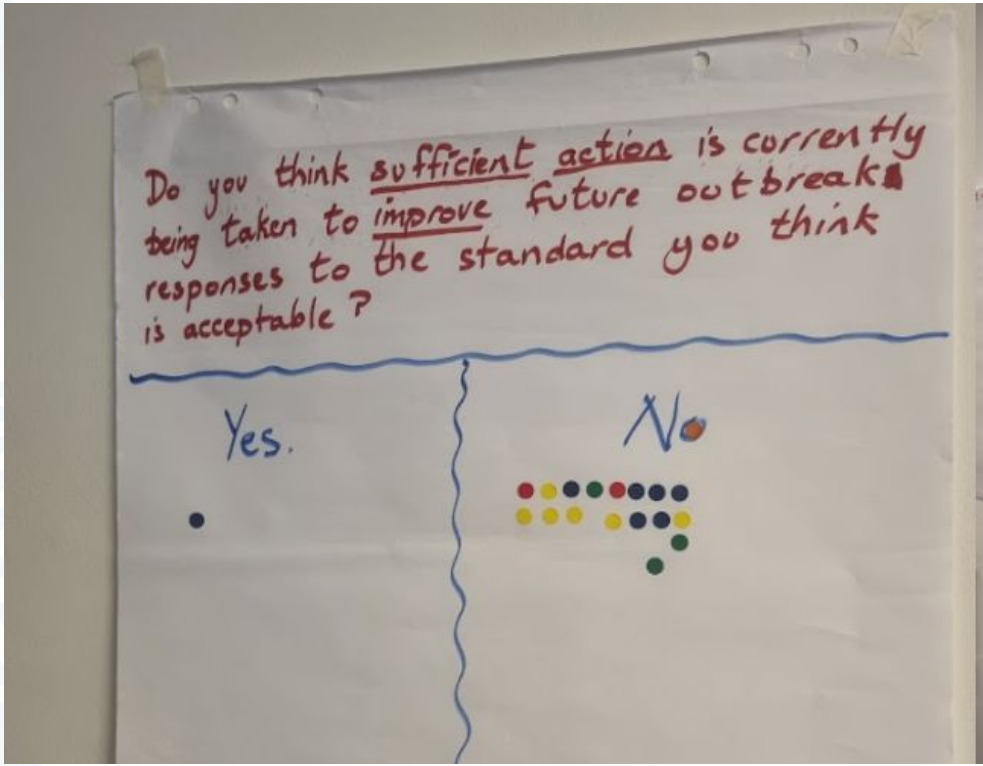
COVID-19 reflections workshop

- Workshop with 27 attendees from all levels of the UK COVID-19 response (from SAGE members to research assistants).

- Run by an external facilitator.

- Used paired discussions and then small groups to summarise experiences.

- The aim was to summarise our collective experiences and then use these to motivate a set of recommendations for improving future responses.


Do you think sufficient action is currently being taken to improve future outbreak responses to the standard you think is acceptable?
Yes.
No


Summarise your pandemic (post-IP) experience in one word.....
hard
intense
Repetitive
Valuable
stressful
Focused
Hectic
PRESSURE

"institutions got awards, not individuals (not all key players)"

"not being able to say no"

"trading off career versus health and everything".

"Pride in overwork"

"Stressful (x2) (+1) (+1)"

"surreal level of public and media interest (good or bad)"

"Shift from egalitarian structure to pre-existing hierarchies".

"Shame associated with 'doing well'"

"work and the world were one and the same. Neither was an escape from the other."

"pressure [that] came in waves. 'Not again…'"

Themes

- Funding and institutional support: Participants reported insufficient institutional support and contract insecurity due to reliance on external grant funding, impacting both academic and professional services roles. Recognitions, rewards, and access: Current reward metrics were deemed inadequate, with unequal credit attribution and limited access to policy-making spaces.

- Team and work dynamics: Issues included insufficient capacity, competing demands, barriers to progression, and both positive and negative aspects of collaborative working.

- Non-academic contributions: The importance of professional services staff and collaboration with public health agency workers were highlighted.

- Personal impacts: Public recognition led to both increased visibility and challenges; mental ill health and burnout were prevalent; balancing work with personal commitments was difficult for many.

Recommendations

- Acknowledge and reward impactful response work at institution, funder, and research community levels. For example, refining impact measures to credit all forms of output produced during, and required for, response work; institutions could incorporate response-driven work into criteria for doctoral theses and promotion.

- Encourage routine interaction between academia and public health agencies, including consistently reviewing the appropriate allocation of epidemic response tasks. One potential solution is creating sustainable dual positions recruiting from both sectors.

- Ensure response teams are well-staffed, well-resourced, stable, and provided psychological support. This approach reduces dependence on key individuals. One approach is to establish sustainable team-building and training programmes during non-response periods.

Recommendations

- Increase the transparency of the evidence pathway from scientists to decision-makers. This makes it easier for those across the scientific community to contribute as well as making the evidence base for decisions clearer to the general public. This could be achieved by standardising rapid open access to the minutes of scientific advisory meetings.

- Implement best practices for a sustainable work environment. Employers and team leads can promote leave-taking and respecting work hours, clarify communication about processes and rewards across career stages, prepare for, and standardise, the onboarding of new team members, and integrate support roles.

COVID-19 reflections workshop

Improving modelling for epidemic responses: reflections from members of the UK infectious disease modelling community on their experiences during the COVID-19 pandemic

Katharine Sherratt, Anna C. Carnegie, Adam Kucharski, Anne Cori, Carl A. B. Pearson, Christopher I. Jarvis, Christopher Overton, Dale Weston, Edward M. Hill, Edward Knock, Elizabeth Fearon, Emily Nightingale, Joel Hellewell, W. John Edmunds, Julián Villabona Arenas, Kiesha Prem, Li Pi, Marc Baguelin, Michelle Kendall, Neil Ferguson, Nicholas Davies, Rosalind M. Eggo, Sabine van Elsland, Timothy Russell, Sebastian Funk, Yang Liu, Sam Abbott

doi: https://doi.org/10.1101/2023.06.12.544667

Summary: epinowcast.org/posts/2023-06-18-improving-modelling-for-epidemic-responses/

Preprint: biorxiv.org/content/10.1101/2023.06.12.544667v1

Recap

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