Public services augmented by algorithm, what could go wrong?

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NHS Track and Trace app launched in May, wait no, that was September, oh and it was the version Google and Apple dictated on the UK because of their privacy concerns

How to raise awareness of algorithms in the public sector – Ofqual algorithm to estimate GCSE and A-level grades

https://www.theguardian.com/education/2020/aug/20/england-exams-row-timeline-was-ofqual-warned-of-algorithm-bias

How hard is it to use a spreadsheet?

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Health policy

Covid: how Excel may have caused loss of 16,000 test results in England

Public Health England data error blamed on limitations of Microsoft spreadsheet

Ignorance is bliss, when people jump on the wrong algorithm bandwagon.

CODECHECK certificate 2020-010

https://doi.org/10.5281/zenodo.3865491

CODE CHECK ✓
http://codecheck.org.uk/

Item	Value
Title	Report 9: Impact of non-pharmaceutical interventions (NPIs) to reduce COVID-19 mortality and healthcare demand. March 16, 2020.
Authors	Neil Ferguson, COVID-19 Response Team
Reference	Imperial College Preprint https://doi.org/10.25561/77482
Codechecker	Stephen J. Eglen
Date of check	2020-05-29 12:20:00
Summary	Replication of key findings from Report 9 using CovidSim reimplementation.
Repository	https://github.com/codecheckers/covid-report9

Mathematical epidemiologist Neil Ferguson led Imperial College London's influential simulation of the coronavirus pandemic, released in mid-March. Credit: Thomas Angus/Imperial College London

"Totally unreliable." "A buggy mess." Over the past month, software engineers have sharply criticized the code underpinning an influential coronavirus simulation by scientists at Imperial College London, one of several modelling exercises that helped sway UK politicians into declaring a lockdown. Some media articles even suggested that the simulation couldn't be repeated by others – casting further doubt on the study. Now, a computational neuroscientist has reported that he has independently rerun the simulation and reproduced its results. And other scientists have told *Nature* that they had already privately verified that the code is reproducible.

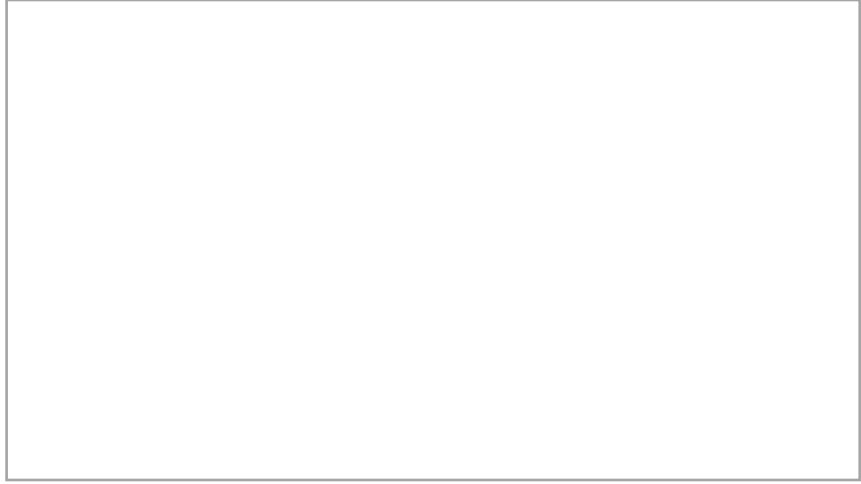
Coding that led to lockdown was 'totally unreliable' and a 'buggy mess', say experts

The code, written by Professor Neil Ferguson and his team at Imperial College London, was impossible to read, scientists claim

By Hannah Boland *and* Ellie Zolfagharifard
16 May 2020 • 1:32pm

Neil Ferguson was one of the key architects behind the Imperial model

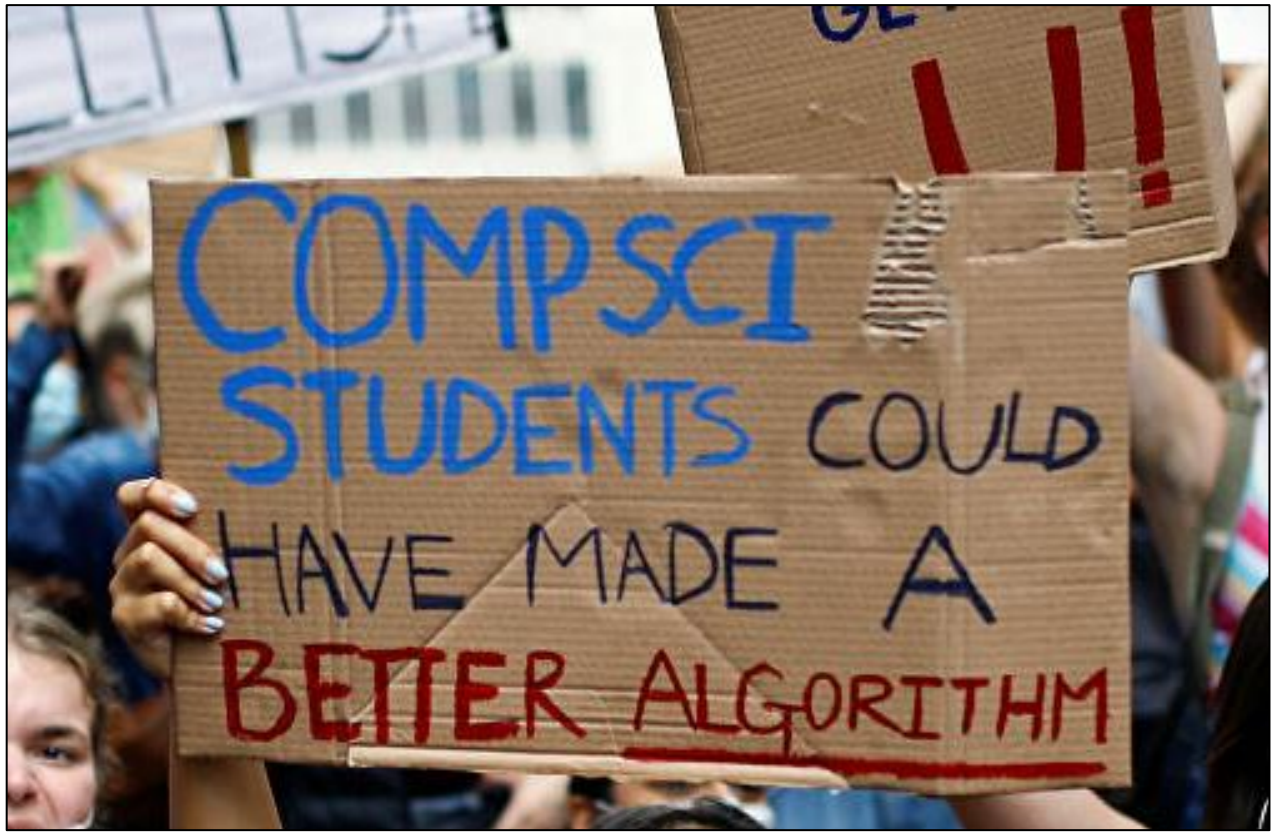
Algorithms rule, OK?



Over half (53%) of UK adults have no faith in any organisation to use algorithms when making judgements about them, in issues ranging from education to welfare decisions.

https://www.bcs.org/more/about-us/press-office/press-releases/the-public-dont-trust-computer-algorithms-to-make-decisions-about-them-survey-finds/

Do students know something the rest of us don't?



Front page cover photo from the Guardian online

Policy objectives

- Right at the start policy makers need to frame the **outcomes** they want in a way the public can **understand** and in a way they can be **effectively consulted** on.
- Choices at this point about what data will be needed and how it will be used to deliver policy objectives will have a huge influence on what information system is produced and any supporting algorithms.

Ownership

- Which organisations are responsible for delivering the information system, and who needs to have oversight of its development.
- Key to ensuring stakeholders are able to check the final information system is going to deliver the right outcomes.
- Choices about how to implement those principles will affect the design of the information system and the underpinning algorithms.

The model

- Deciding on a data model that will lead to the intended outcomes is the result of choices that to some degree are subjective.

Gathering and processing data

- Identifying and capturing the appropriate quality data based on the chosen data model and making sure it can be turned into a form that is fit for purpose is challenging and involves many choices.
- It is critical that an evaluation of the processed data is carried out prior to its use in informing judgements and it is equally important that those going to be affected by the data have sight of the evaluation.
- Choices about how to evaluate the data will affect how the data is used, which again means more choices about any final algorithms.

The algorithm

- Only after choices about policy objectives, ownership, data models and data gathering are made can a set of algorithms be developed that collectively automate those judgements the data is fit to be used for.
- Algorithms have consequences beyond the creation of a computer program, they constrain how objectively stakeholders can interrogate information that has been processed, which shapes the way people choose to present outputs to others when explaining things like fairness, and greatly affects any appeals process.
- Yet again there are more choices about the exact steps an algorithm follows and what counts as an exception the algorithm should escalate for someone or something else to handle through an appeals process.

Testing is vitally important

- Testing will determine if the system is good enough.
- This will include testing standalone parts of the system, how well those distinct elements work when integrated into a bigger component, and how well the final system achieves what it was intended for, including testing the system with those it affects as well as those who use it.
- Deciding what will need to be tested and how to test it will influence the design of a system.

What next then?

- Government supports professionalising data science.
- Establish communities of practise to facilitate policy makers appreciate capabilities and risks of algorithms in public policy.
- Government ensures good ethical and professional practice in algorithm design, development and testing become ubiquitous.
- Algorithms in public policy go through public impact assessment, undertaken by independent experts against an appropriate ethical framework

https://www.bcs.org/media/6135/algorithms-report-2020.pdf