

Challenges of communicating COVID-19 statistics

Irish Statistical Association & RSS

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Statistical Ambassador

24th April 2022



What is a Statistical Ambassador?

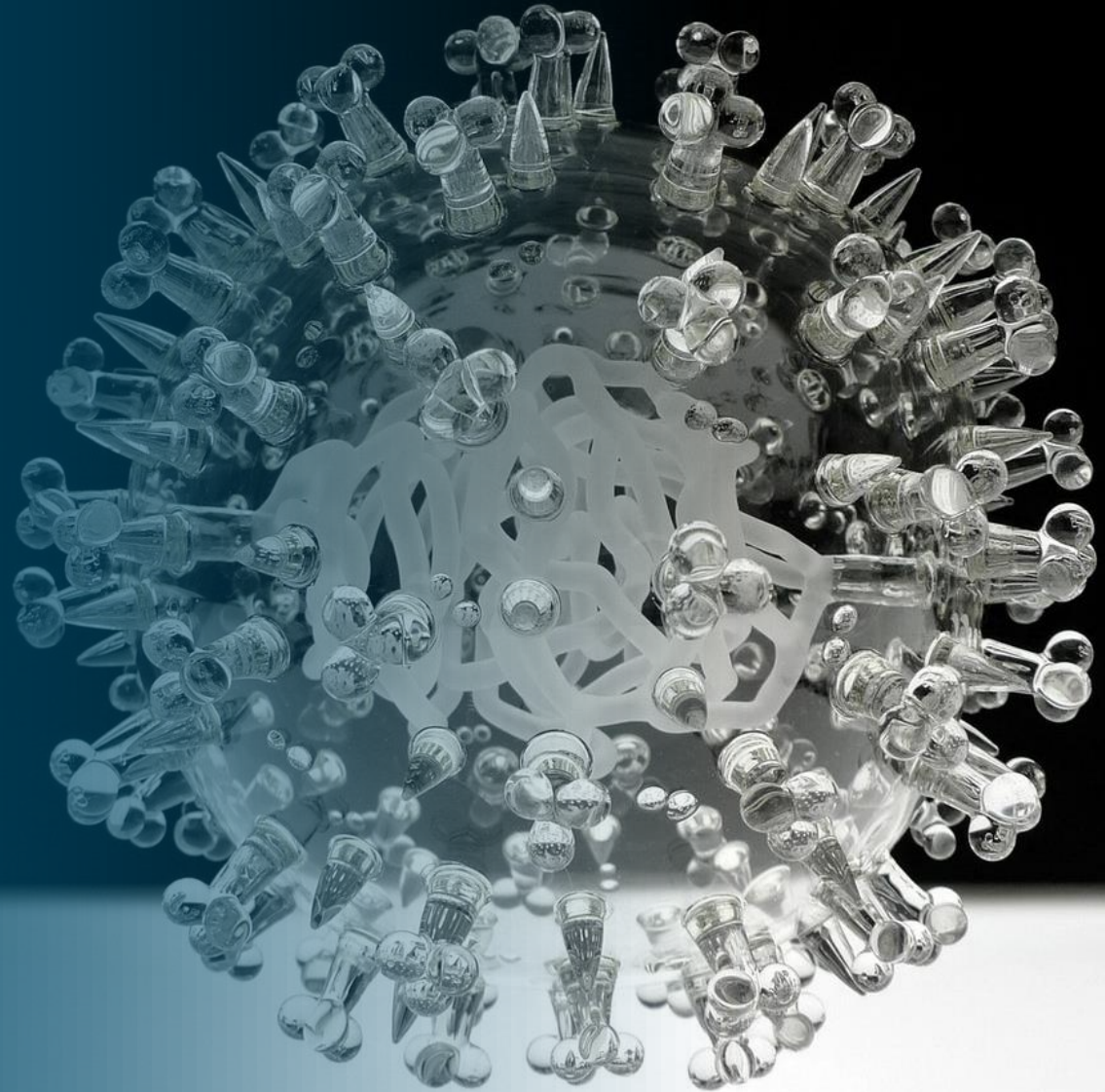
A Statistical Ambassador is a voluntary role for the Royal Statistical Society.

A misunderstood statistic can have dire consequences. We aim to improve public understanding of statistics. We work with policy-makers, researchers, journalists, and the public.



SARS-CoV-2: the sequel worse than Highlander II

One issue has triumphed over
others for statistical interest.



Five stages of statistics

Collection

Management

Analysis

Interpretation

Communication



Major challenges in communicating COVID-19 statistics

Challenge I: Novel virus, novel statistics

Challenge II: Setting numbers in context

Challenge III: Limited space for explanations



Challenge I: Novel virus, novel statistics

There are **common misunderstandings** of pandemic statistics.

Measures	Definition	Limitations
Daily confirmed COVID-19 cases	Infection episodes with a positive test, reported in the latest period	<ul style="list-style-type: none"> Confirmed cases are not all infections There are reporting delays
Daily confirmed COVID-19 deaths [in England, Scotland & Northern Ireland]	Deaths within 28 days of a positive test from any cause, reported in the latest period	<ul style="list-style-type: none"> The 28-day window is arbitrary Not death certificates There are reporting delays
Case fatality rate	Confirmed deaths divided by the number of confirmed cases	<ul style="list-style-type: none"> Not the infection fatality rate Missing cases and deaths

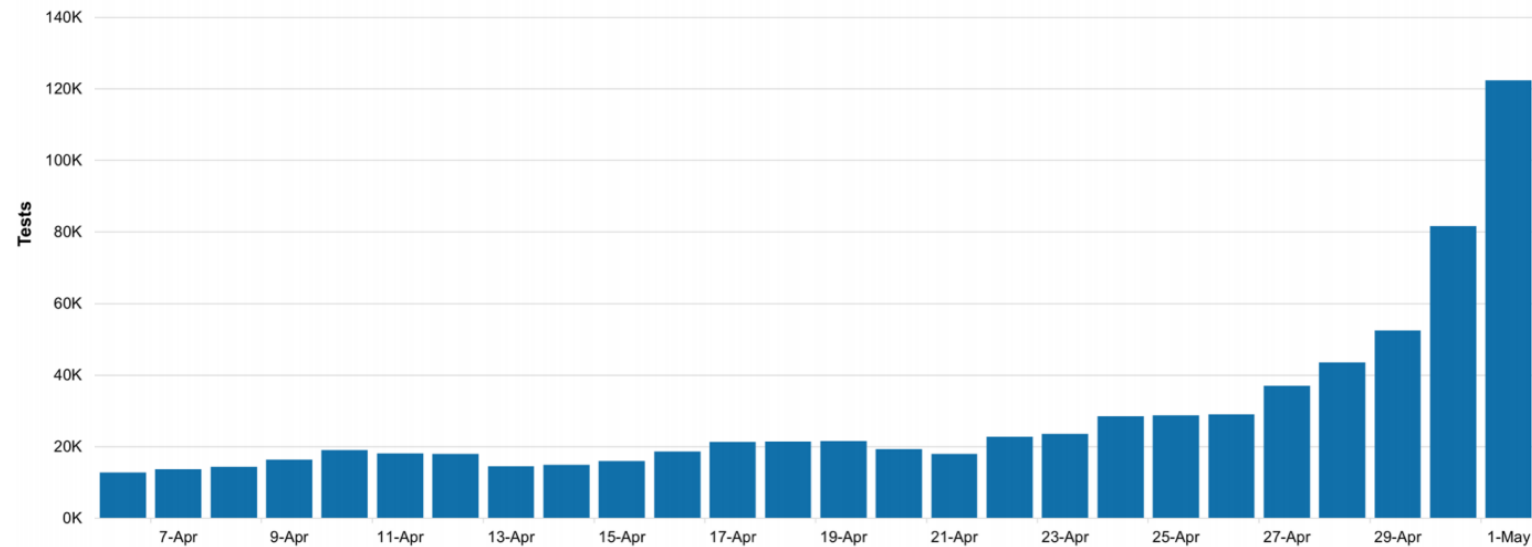


Challenge I: Novel virus, novel statistics

The Health Secretary for the UK government said on 1st May 2020:
“We have now met our goal. The **number of tests** yesterday on the last day of April was 122,347”.

Daily tests (UK)

In the 24 hours up to 9am on 1 May, there were 122,347 tests in the UK.



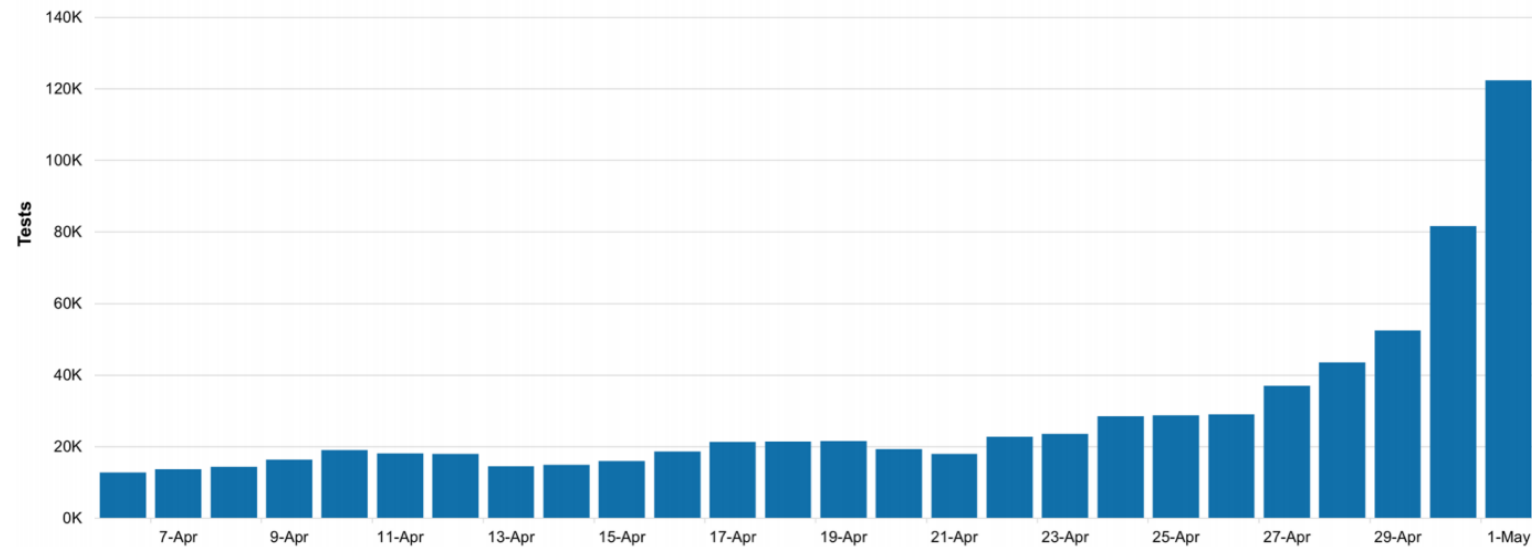
Source: DHSC/ NHSx, NHSE, Welsh Gov., Scottish Gov., Northern Ireland Executive. The number of tests includes; (i) tests processed through our labs, and (ii) tests sent to individuals at home or to satellite testing locations.

Challenge I: Novel virus, novel statistics

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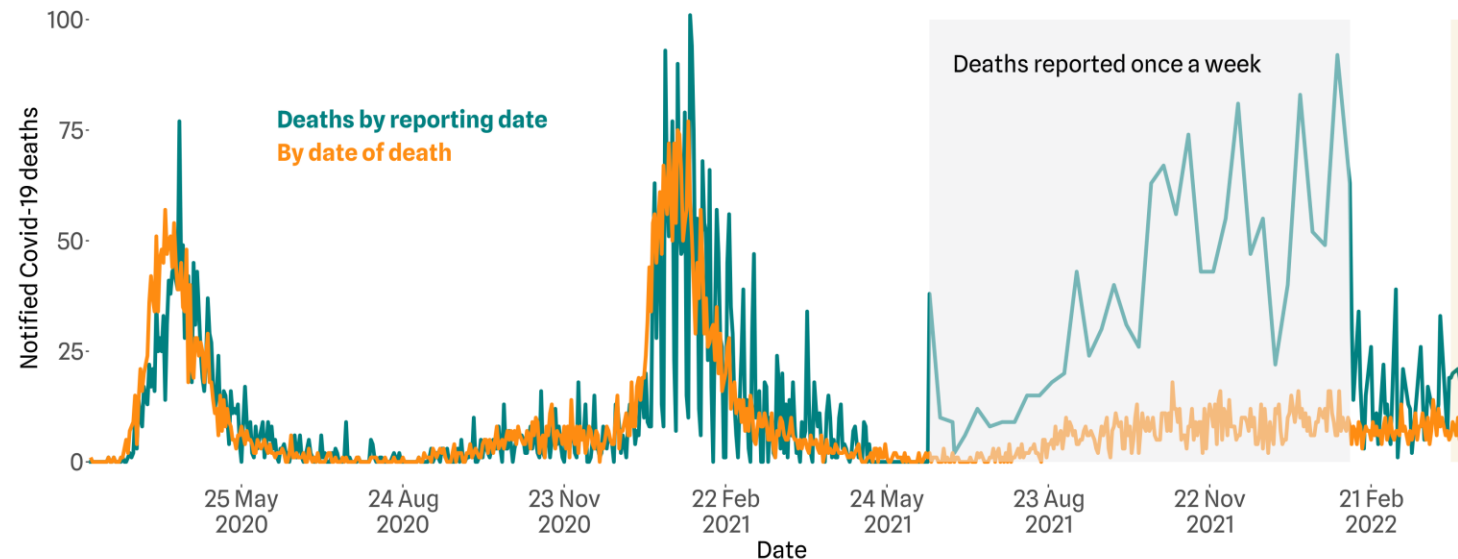
Source: DHSC/ NHSx, NHSE, Welsh Gov., Scottish Gov., Northern Ireland Executive. The number of tests includes; (i) tests processed through our labs, and (ii) tests sent to individuals at home or to satellite testing locations.

Challenge I: Novel virus, novel statistics

Notified deaths for each reporting date does not represent counts of such deaths on those days.

Notified Covid-19 deaths in Ireland have shown two large peaks.

Notified deaths involving Covid-19 in Ireland, by reporting date and date of death. These figures include deaths in confirmed, probable and possible Covid-19 cases. Deaths by date of occurrence in recent days may be incomplete, and are subject to revision.



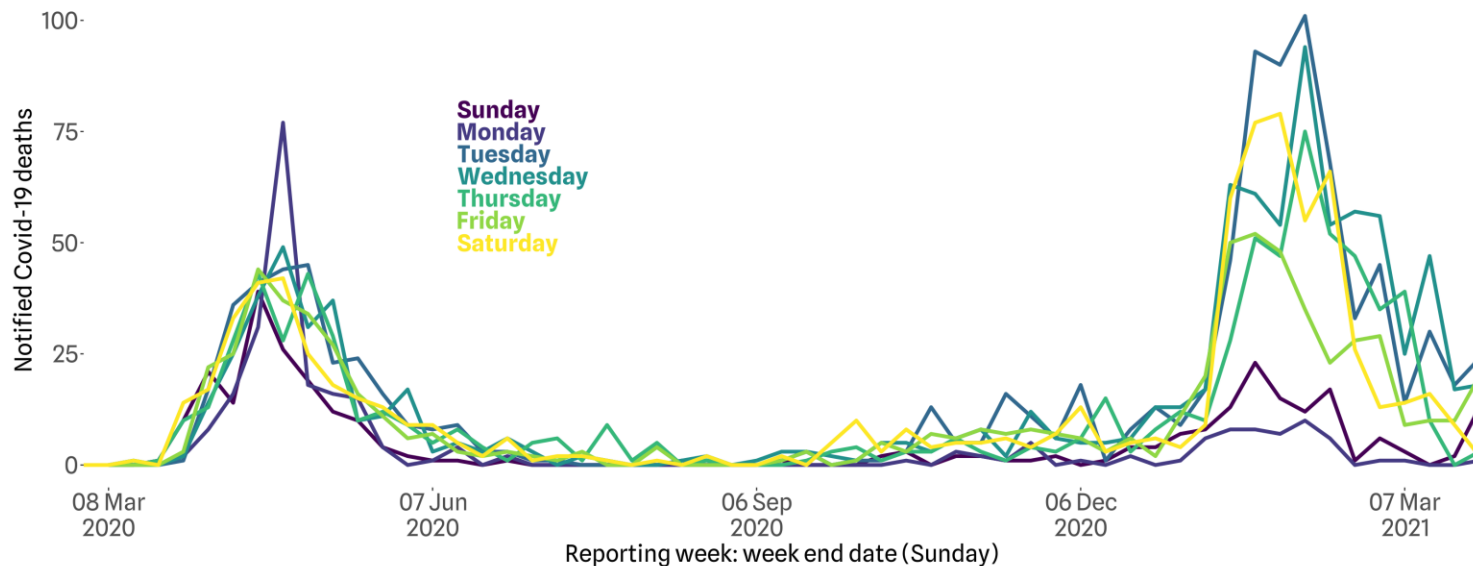
Source: Health Protection Surveillance Centre (Ireland): COVID-19 HPSC Detailed Statistics Profile.

Challenge I: Novel virus, novel statistics

As in other countries, a reporting cycle develops.

Before daily publication ended, Covid-19 surveillance deaths in Ireland had a reporting cycle.

Notified deaths involving Covid-19 in Ireland, by reporting date, allocated to each week. These figures include deaths in confirmed, probable and possible Covid-19 cases. There are delays between death and notification, and some notified deaths may be later removed.



Source: Health Protection Surveillance Centre (Ireland): COVID-19 HPSC Detailed Statistics Profile.

Challenge II: Setting numbers in context

What is the comparison against? What helps readers understand?

Confirmed cases or deaths



Other countries



The past or expectations

Infection fatality rates



Other diseases



Between age groups

Adverse events in vaccines



Acceptable thresholds



Absolute & relative risks



Challenge II: Setting numbers in context

- By August 2021, over nine in 10 Irish adults aged 40 or older had two Covid-19 vaccine doses.
- Analysis by the HPSC Epidemiology team suggested unvaccinated people had a lower hospitalisation rate, compared to those fully vaccinated.
- **The quality of these statistics hinge on the accuracy of population estimates.**

Covid: 54% of hospital patients with virus are fully vaccinated

Rising proportion of vaccinated people in hospital reflects greater numbers in population getting vaccines

© Fri, Sep 10, 2021, 07:02 | Updated: Fri, Sep 10, 2021, 07:29

Paul Cullen Health Editor

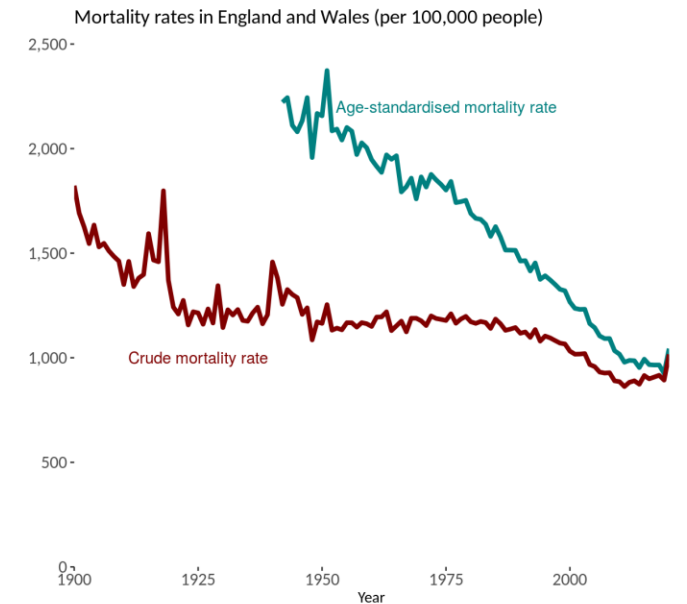
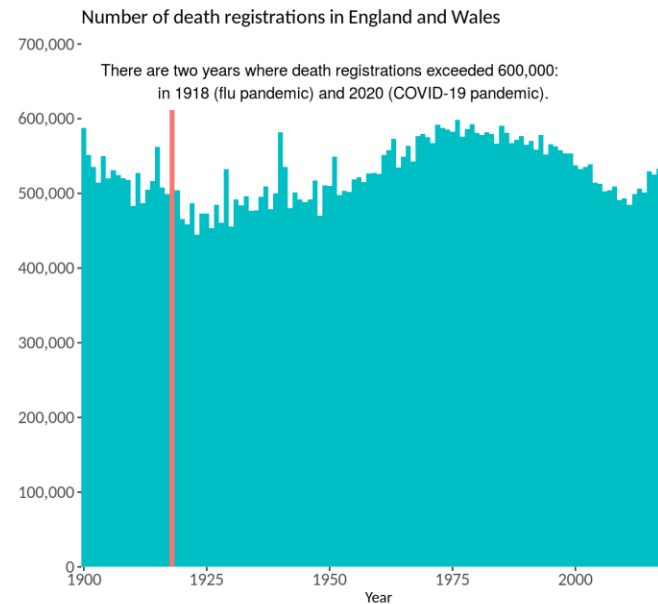


About half of all Covid-19 patients in hospital and in intensive care are fully vaccinated against the disease

Challenge II: Setting numbers in context

- For England and Wales, age-standardised mortality in 2020 reverted to its rate in 2008.
- Given age-standardised mortality usually reduces from one year to the next, the first year of the Covid-19 pandemic was an historic outlier.

In 2020, there were over 608,000 death registrations in England and Wales.



Source: Office for National Statistics, 1900 to 2020 (provisional).

Challenge III: Limited space for explanations

Administrative calculations

- What administrative system is the count from?
- Are there other systems to compare against?
- How is the calculation defined?
- What might be missing?

Survey estimates

- What does the survey measure?
- What was the sampling frame and mode?
- What uncertainties are there in the estimate?
- What non-sampling issue could affect the estimate?

Model outputs (or estimates)

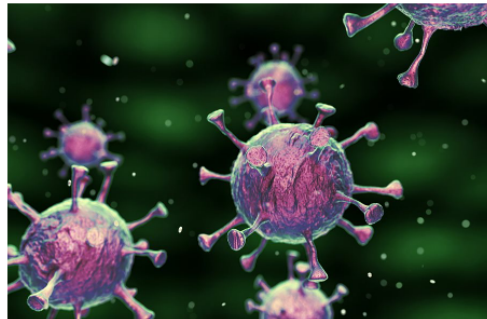
- What are the model inputs?
- What is the model seeking to estimate (such as a prediction or scenario)?
- What is the uncertainty in the model estimates?



Challenge III: Limited space for explanations

With my fellow Statistical Ambassadors, we wrote a guide to Covid-19 statistics, to aid interpretation and understanding.

[Home](#) > [News](#) > [2020](#) > [A statistician's guide to coronavirus numbers](#)



A statistician's guide to coronavirus numbers

06.04.20 | [Statistics news](#)

Our Statistical Ambassadors have collated an essential guide for understanding statistics about COVID-19. Here, they list definitions, things to look out for, and what you should do about the numbers you are seeing.

During this COVID-19 pandemic, you will hear or read about many different numbers. The Royal Statistical Society exists to help the public better understand statistics. We have prepared this short guide to help you at this difficult and uncertain time.

Key points

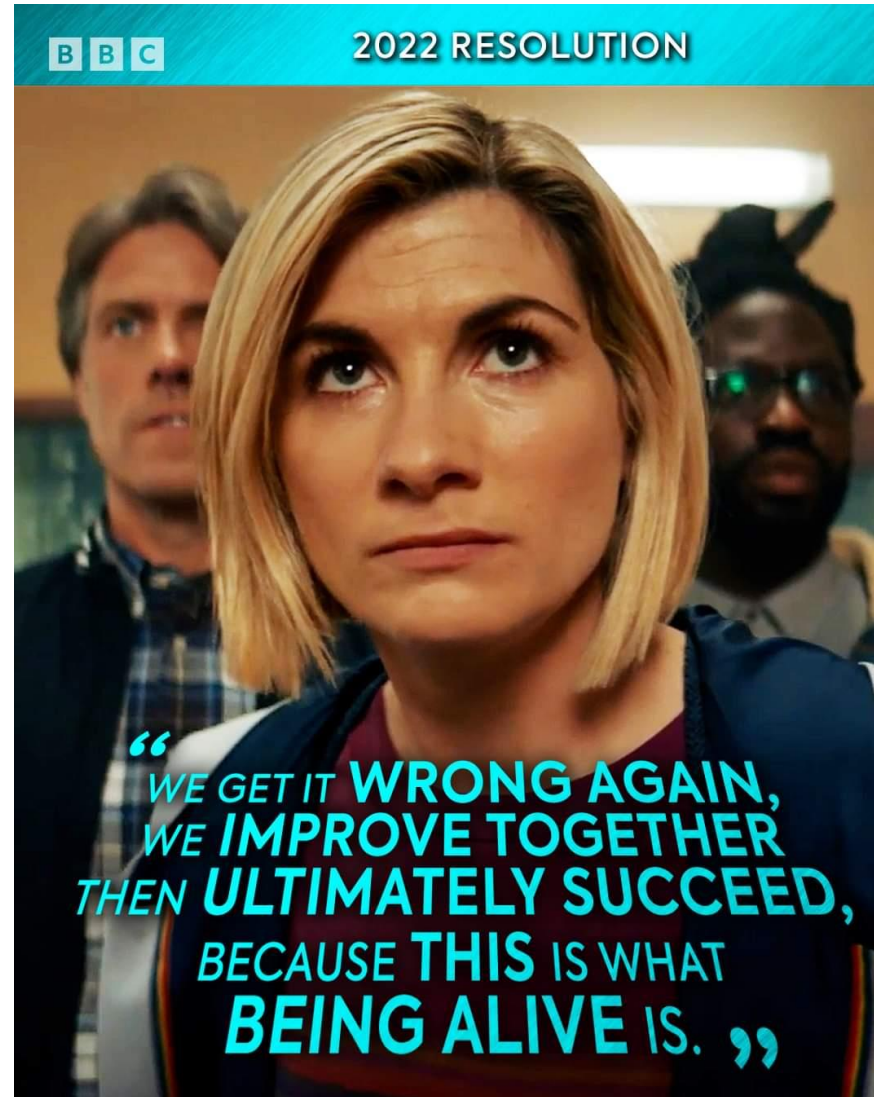
- The number of confirmed cases will be less than the number of actual cases.
- Comparisons of case and death numbers between countries may not be meaningful.
- Models produce estimates with plausible ranges. These models can help us understand the likely effects of policies.



A skill in its own right

Communication is a skill.

Learn, practice, improve.



Data does not speak for itself – it needs analysts to speak with honesty and care on its behalf.



A short guide to communicating statistics

1. **Meaning:** Say what the numbers mean, avoiding jargon
2. **Limitations:** Relay key limitations with the statistics
3. **Uncertainty:** Show plausible ranges of values
4. **Comparisons:** Different methods can come to different estimates
5. **Data visualisation:** Graphs are powerful for showing context

Share statistics, not misinformation.



References

- The presentation format comes from the Royal Statistical Society.
- The glass SARS-CoV-2 image is credited to [Luke Jerram](#).
- The daily test slide comes from [the UK government press conference on 1st May 2020](#). Full Fact wrote an article about whether the UK government met its [testing targets](#).
- The [Covid-19 FAQs](#) and [A Statistician's Guide to Coronavirus Numbers](#) are on the RSS site.
- My R code is on [R Pubs](#) and [GitHub](#). I regularly update [my Medium blog](#).
- HSE published [an analysis by vaccination status](#) of those aged 12 or over on 13th December 2021. The Irish Times [article](#) was published on 10th September 2021.
- Published by Penguin Random House, 'Covid by Numbers' was published in October 2021. [You can order this book online](#) or buy it in bookstores.

