



Office for
Statistics Regulation

Communicating uncertainty in official statistics

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January 2023

The Office for Statistics Regulation (OSR)

- **The regulatory arm of the UK Statistics Authority**
- Promote and safeguard the production and publication of official statistics
- Do not produce statistics and are separate from the Office for National Statistics (ONS)

Our role

How statistics are produced

We uphold the trustworthiness, quality and value of statistics and data used as evidence

How statistics are used

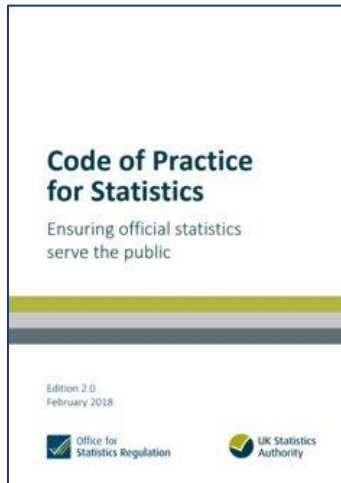
We protect the role of statistics in public debate

How statistics are valued

We develop a better understanding of the public good of statistics

Our vision : Statistics that serve the public good

The Code of Practice for Statistics



Trustworthiness – Providing usable evidence that allows others to check whether you are trustworthy, in the form of public commitments

Quality – Statistics should be the best available measure of what they aim to represent, and should not be materially misleading

Value – Statistics should help people answer their questions

Uncertainty

“Nothing can be said to be certain except death and taxes”

(Benjamin Franklin)



Uncertainty in official statistics

- Statistics aren't certain facts but are often presented as so – most contain some uncertainty
- Are the statistics a good measure of the intended subject? Given uncertainties in the statistics, can they bear the weight that might be put on them?
- Users need help to understand how statistics can inform their decisions

Sources of uncertainty

- Data:
 - Administrative data:
 - time lags
 - misclassifications
 - missing records and deadwood
 - Sample surveys:
 - sampling
 - non-sampling
- Methods and assumptions

Why communicating uncertainty matters



But communicating uncertainty is hard

- Need to understand uncertainty and use
- Balance:
 - want to be clear on caveats
 - while not undermining trust
- Don't want to overburden the text
- Different audiences
- Accessibility guidelines

Our project (part of our Insight Programme)

We:

- Reviewed the findings from our recent regulatory work including relevant casework
- Held a team day to dip sample official statistics publications
- Worked with ONS's Data Quality Hub and Winton Centre

Our findings

- A mixed bag – some great examples in bulletins and charts but sometimes not mentioned at all
- Especially a problem for detailed tables, bespoke table-builders
- Emerging approaches:
 - Use of language in statistical narrative
 - Graphical presentation in charts
 - Detailed information in methodology documentation
- Understanding of users and use is crucial

Example: ONS Covid Infection Survey

Estimated number of people with COVID-19 in the week ending 14 September 2022*

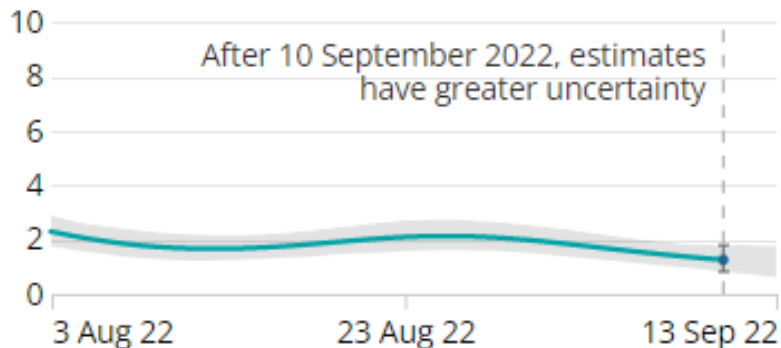
(not living in care homes, hospitals or other communal establishments)

* N. Ireland and Scotland in the week ending 13 September 2022

England	Wales	N. Ireland	Scotland
1 in 70	1 in 75	1 in 80	1 in 55

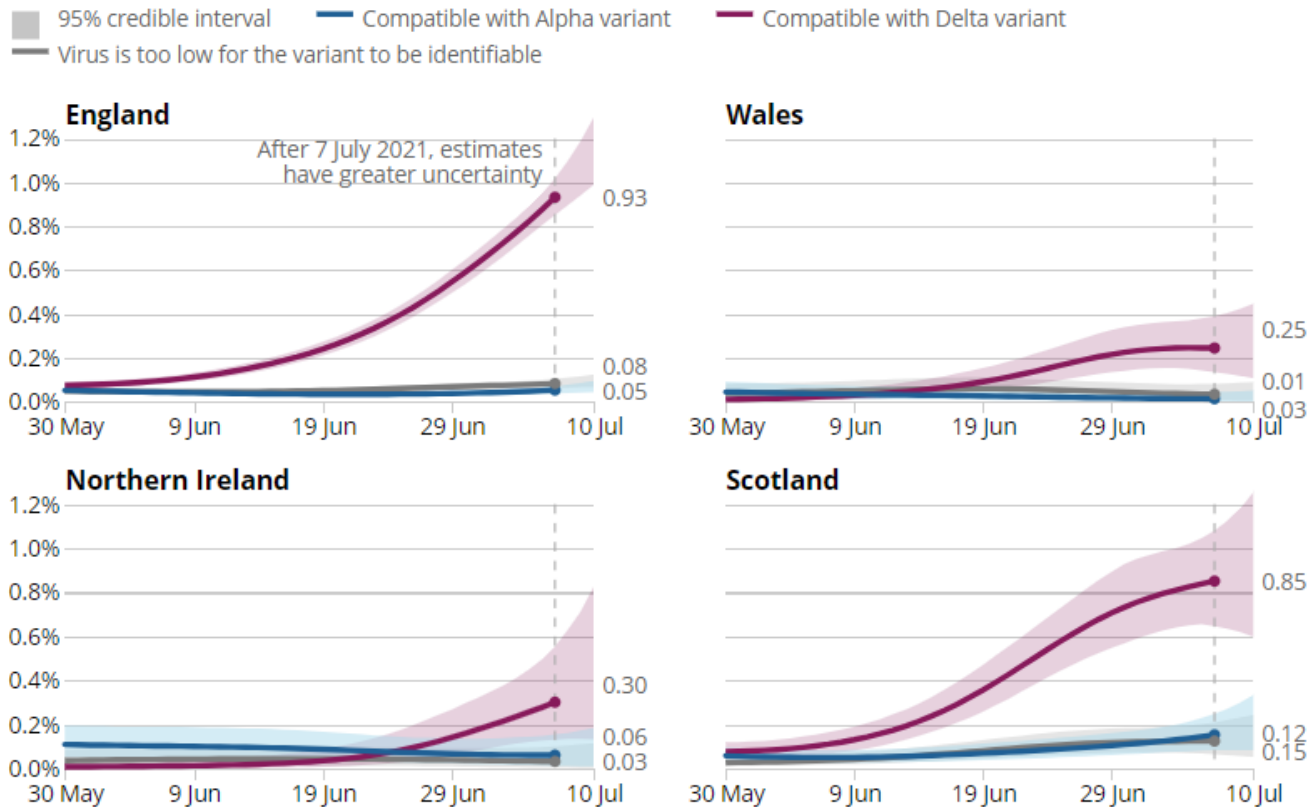
“In England, the estimated number of people testing positive for COVID-19 was 766,500 (95% credible interval: 714,800 to 822,400), equating to 1.41% of the population, or around 1 in 70 people.”

Percentage testing positive for COVID-19



“All daily modelled estimates are provisional and subject to revision. See [Section 10: Measuring the data](#) and [Section 11: Strengths and limitations](#) for more details. There is a higher degree of uncertainty for data broken down by smaller population groups compared with England as a whole.”

Example: ONS Covid Infection Survey



“... This increase, combined with evidence from other data suggests that variant B.1.617.2 is likely to have caused this increase, but this cannot be confirmed until sequenced data are available. The value of categorising positive results for the infection in this way provides an early indication of a variant in circulation.”

Examples: Language used

- *Wellbeing of Wales 2022, Welsh Government:*
 - Labour market data is volatile over the short term and it is important not to overinterpret recent changes, particularly in the context of the pandemic. With this caveat, labour market data suggests the pandemic has impacted Welsh economic performance in a way that is broadly similar to the UK (excluding London).

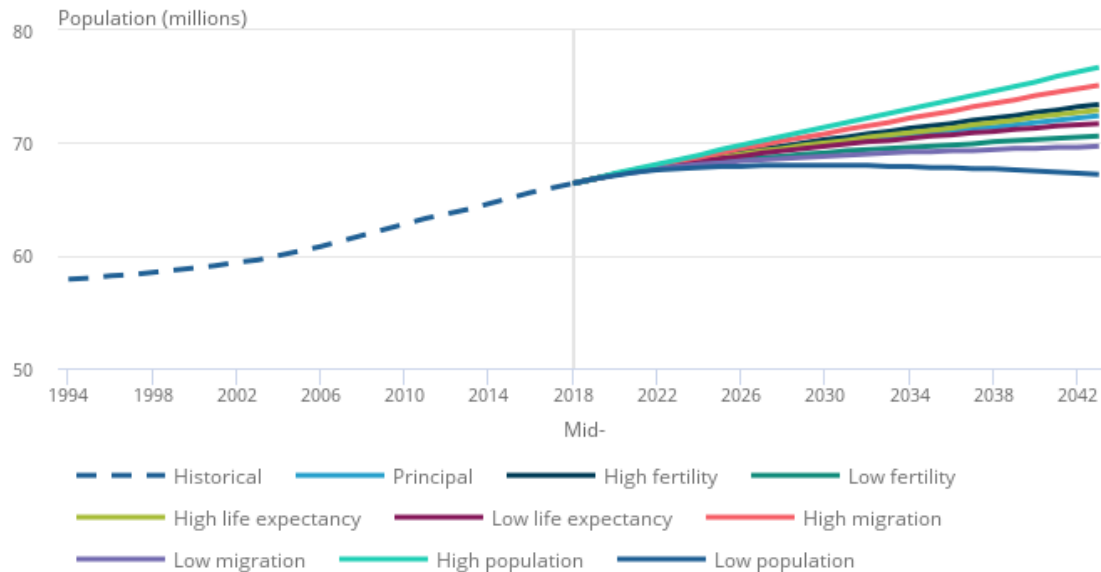
Examples: Language used

- *Crime in England and Wales, ONS:*
 - Since restrictions were lifted following the third national lockdown in early 2021, police recorded crime data show indications that certain offence types are returning to or exceeding the levels seen before the pandemic.
- *Country and Regional Analysis, HM Treasury:*
 - The share of identifiable spending taken by England, Scotland, Wales and Northern Ireland has remained broadly unchanged in recent years

Example: ONS Population Projections

Figure 1: The variant population projections offer a range of future demographic scenarios

Estimated and projected total population for selected variants, UK, mid-1994 to mid-2043



Source: Office for National Statistics – National population projections

Example: Welsh Index of Multiple Deprivation

Do's

WIMD can be used for:

- Identifying the most deprived small areas
- Comparing relative deprivation of small areas
- Exploring the 8 types of deprivation for small areas
- Comparing the proportion of small areas within a larger area that are very deprived
- Using indicator data (but not ranks) to compare absolute change over time

gov.wales/wimd

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Don'ts

WIMD can't be used for:

- Quantifying how deprived a small area is, or how much more than another
- Using ranks to infer absolute change over time (as they are relative measures)
- Identifying deprived people – not everyone who is deprived lives in a deprived area
- Comparing with other UK countries – each country measures deprivation slightly differently
- Measuring affluence – lack of deprivation is not the same as being affluent

What next

- We recognise that this is an area where practice is developing all the time
- We will do more to promote and support good practice around presenting uncertainty
- We will focus on helping to share that good practice, enabling producers to learn from each other and improve the presentation of uncertainty
- We will also consider how to adapt our regulatory work

Links: our report and blog

<https://osr.statisticsauthority.gov.uk/publication/approaches-to-presenting-uncertainty-in-the-statistical-system/>

<https://osr.statisticsauthority.gov.uk/communicating-uncertainty-in-statistics/>