

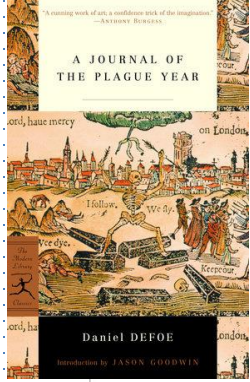


The University of Edinburgh

# The rhetoric of numbers and Covid-19 discourses on social media

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The like Encrease of the Bills was observ'd in the Parishes of St. Brides, adjoining on one Side of Holborn Parish, and in the Parish of St. James Clarkenwell, adjoining on the other Side of Holborn ; in both which Parishes the usual Numbers that died weekly were from 4 to 6 or 8, whereas at that time they were increas'd, as follows—

From Dec. 20. to Dec. 27.	St. Brides—	0
	St. James—	8
Dec. 27. to Jan. 3.	St. Brides—	6
	St. James—	9
Jan. 3. to — 10.	St. Brides—	11
	St. James—	7
Jan. 10. to — 17.	St. Brides—	12
	St. James—	9
Jan. 17. to — 24.	St. Brides—	9
	St. James—	15
Jan. 24. to — 31.	St. Brides—	8
	St. James—	12
Jan. 31. to Feb. 7.	St. Brides—	13
	St. James—	5
Feb. 7. to — 14.	St. Brides—	12
	St. James—	6

Besides this, it was observ'd, with great Uneasiness by the People, that the weekly Bills in general encreas'd very much during these Weeks, altho' it was at a Time of the Year when usually the Bills are very moderate.

The usual Number of Burials within the Bills of Mor-



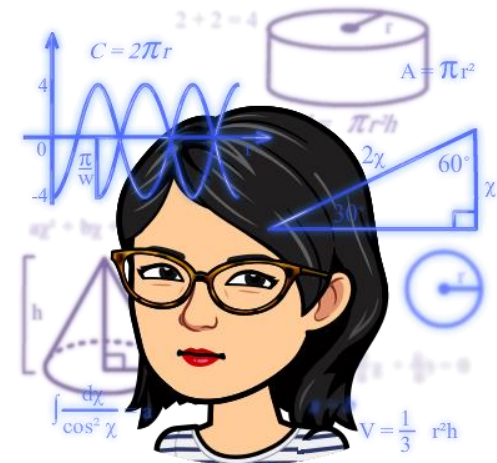


## Overview

- Linguistic approaches to numbers and numeric information
- The design of the study
  - Rational: Why Covid discourse?
  - Dataset & Data Analysis
- Arguing with graphs on social media
- The “so what” question



# LINGUISTIC APPROACHES TO NUMBERS AND NUMERIC INFORMATION





## Theoretical and experimental semantics and pragmatics

- Long-standing interest in the truth-conditional meaning contributions of numbers, and other quantity expressions
- Meaning contributions may be intrinsic to the expressions or arise because of contextual factors
  1. Some vaccine recipients have died from side-effects.
  2. 100 people died of Covid since this time yesterday.
  3. At most 2500 people are currently being treated.
  4. More than 2000 people are currently being treated.
- (Surprising) complexity in numeric meaning





## Numerical expressions, truth and argumentativity

- Complexity in numeric expression and its implications for communication
  - a speaker who wishes to make a statement about quantity chooses among many "truthful" alternatives
  - often unclear whether a speaker who chooses a misleading description can actually be called a liar
  - information exchange is not the whole story...
- Argumentativity (Anscombe and Ducrot, 1983)
  - a speaker is also concerned with persuading the hearer to a particular course of action, or causing them to have a certain belief



# Intimations of argumentativity

1. Some vaccine recipients have died from side-effects.
  2. Few vaccine recipients have died from side-effects.
- Idea: We can (to some extent) read off the speaker's likely argumentative agenda from their word choice (as well as the propositional meaning they convey)

# Functions of numeric expression in discourses

- Rhetoric effects of numbers in public communication and mass media (Roeh & Feldman 1984)
- Distribution of different types of numbers (Coupland, 2011)
  - Lexicalised (fifty) & numerals (50) in BNC & WWW
  - Specific groups of numbers have particular functional characteristics in discourse: e.g. round numbers & geminated numerals
- Uses of numbers in Covid briefing in the UK (Billig, 2021)
  - Round numbers: over a million tests vs. 1,308,071







## What we have learned from linguistic studies so far

- Numeric expressions have rhetorical effects (as well as reporting information)
- They can be manipulated in different argumentative contexts to achieve certain discourse purposes
- However, the manipulation is complicated to perform – even when just choosing a sentence – because of the rich array of choices available and the complex nature of meanings that arise



- What happens when numeric and quantitative information is presented multimodally in a potentially argumentative context?



# WHY COVID DISCOURSE?

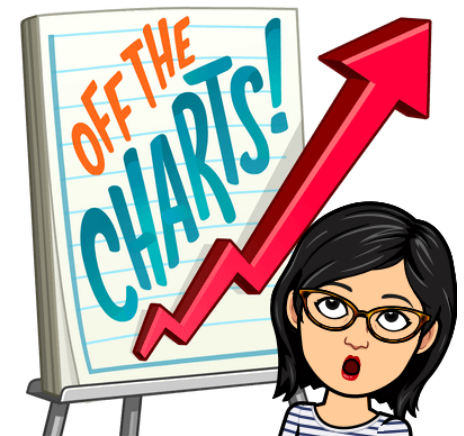




- The obvious...
- The less obvious...
  - The availability of new semiotic technologies (Zhao et al 2014): accessibility of big data and data visualisation apps e.g. <https://ourworldindata.org/>
  - Changing technologies of writing: multimodal genres are readily available to non-expert writers/speakers
  - the recontextualization of scientific multimodal genres (e.g. O’Halloran, 2005 & Kress & Bezemer, 2020) on social media
  - social media as the main theatre of global public debates (e.g. Zappavigna, 2012)
  - uses of numbers to justify public health and political policies across nations (e.g. Jablonka & Berg, 2021)



# DATASET & DATA ANALYSIS







## The broader context

- how numbers have been used to promote and justify particular policy decisions and personal choices on social media during the global pandemic
- Multiple social agents
- UK national media
  - prominent public health experts and statisticians on YouTube and Twitter
  - the comments below/response to the original videos/posts

## This presentation



- From March 15<sup>th</sup>, 2020 (when her first column on Covid appeared in the Guardian) to April 12, 2022
- All tweets with graphs and replies to the original tweet with graphs: 10+28

**Prof. Devi Sridhar** @devisridhar

A certain rewriting of the past 2 years going on- Zero COVID (ie. countries with max suppression) was best for saving lives & economy until vaccines. South Korea & NZ are taking a wave of cases but in a highly vaccinated population & with healthcare workers having adequate PPE.

Cumulative confirmed COVID-19 deaths per million people  
Due to varying protocols and challenges in the attribution of the cause of death, the number of confirmed deaths may not accurately represent the true number of deaths caused by COVID-19.

Source: Johns Hopkins University CSSE COVID-19 Data

10:16 AM · Apr 1, 2022 · Twitter for iPhone

418 Retweets 29 Quote Tweets 1,268 Likes

- Expertise in public health (verified)
- Secondary data source
- Text + Graph
- Clear argumentative agenda

**William Ku, Ph.D.** @DrWilliamKu

Replying to @devisridhar

#COVID19 cases in South Korea has peaked and deaths also appear to have topped out at very high levels. However, with a highly vaccinated population, it appears that the case fatality rate is just 0.1% far better than the US had been in 2020 or is in 2022.

COVID-19 Cases and Deaths in South Korea

11:56 AM · Apr 5, 2022 · Twitter Web App

3 Likes

- Expert in Data Science
- Primary data source
- Text + Graph
- Unclear argumentative agenda

**Venugopalan Govindan** @gvenugopalan · Apr 1

Replying to @devisridhar

The graphs that she doesn't want us to see.

How the deaths have PEAKED, AFTER vaccines have reached ALL eligible population.

Enough to give 2 doses to 120% of population - 10% threshold

During the last week reported, South Korea averaged about **40,234 doses administered** each day. At that rate, it will take a further **258 days** to administer enough doses for another 10% of the

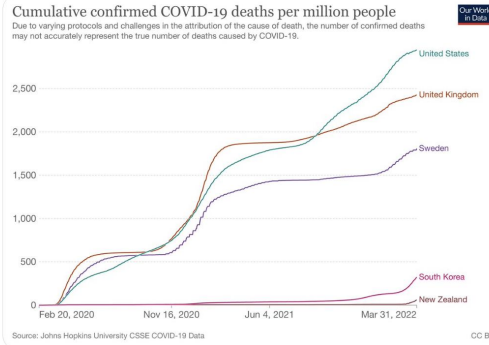
2 3 6

- self declared "victim"
- Secondary data source
- +Graph
- Clear argumentative agenda



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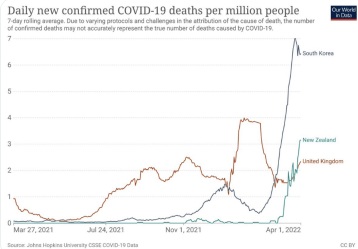
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John Kenney @John\_Kenney - Apr 2

Replying to @devisridhar and @ISAGCOVID19  
South Korea is really doing quite badly and you have to go back to before the mass availability of vaccination to find worse daily death numbers in the UK. What's going wrong there?



Catherine Hall @catecoburg - Apr 9

I read SK didn't vaccinate the very elderly

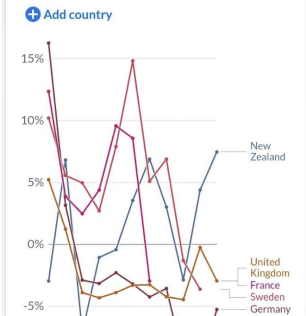
- No (relevant) Expertise declared
- Secondary data source
- +Graph
- Unclear argumentative agenda



Brian Morrison @bripmo - Apr 3

Replying to @devisridhar

based on previous years. The reported number might not count all deaths that occurred due to incomplete coverage and delays in reporting.



- No (relevant) expertise declared
- Secondary data source
- +Graph
- Unclear argumentative agenda



Prof. Devi Sridhar ✓  
@devisridhar

...

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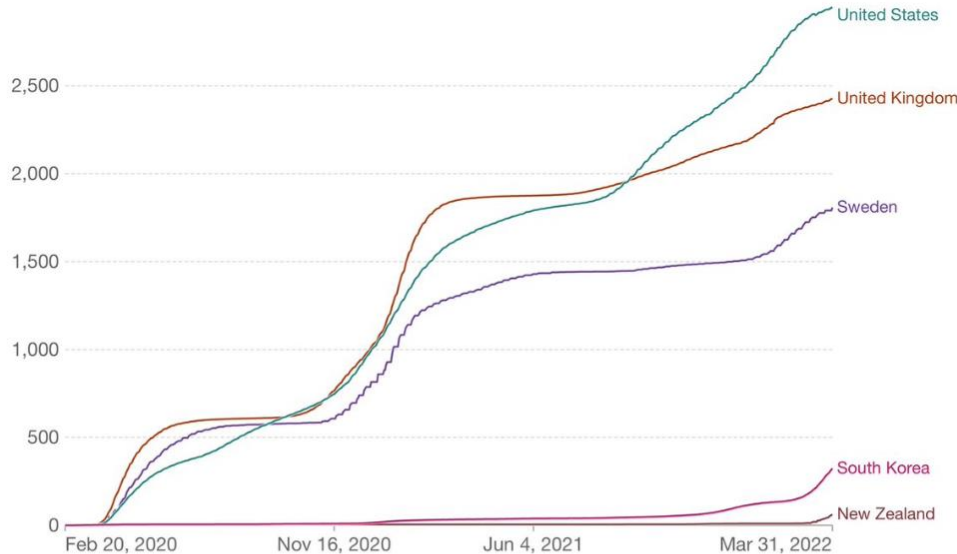
## Minimum Mapping (Zhao. 2012)

- 2 years
- South Korean & New Zealand
- Saving lives [bridging] deaths per million

### Cumulative confirmed COVID-19 deaths per million people

Due to varying protocols and challenges in the attribution of the cause of death, the number of confirmed deaths may not accurately represent the true number of deaths caused by COVID-19.

Our World  
in Data



Source: Johns Hopkins University CSSE COVID-19 Data

CC BY

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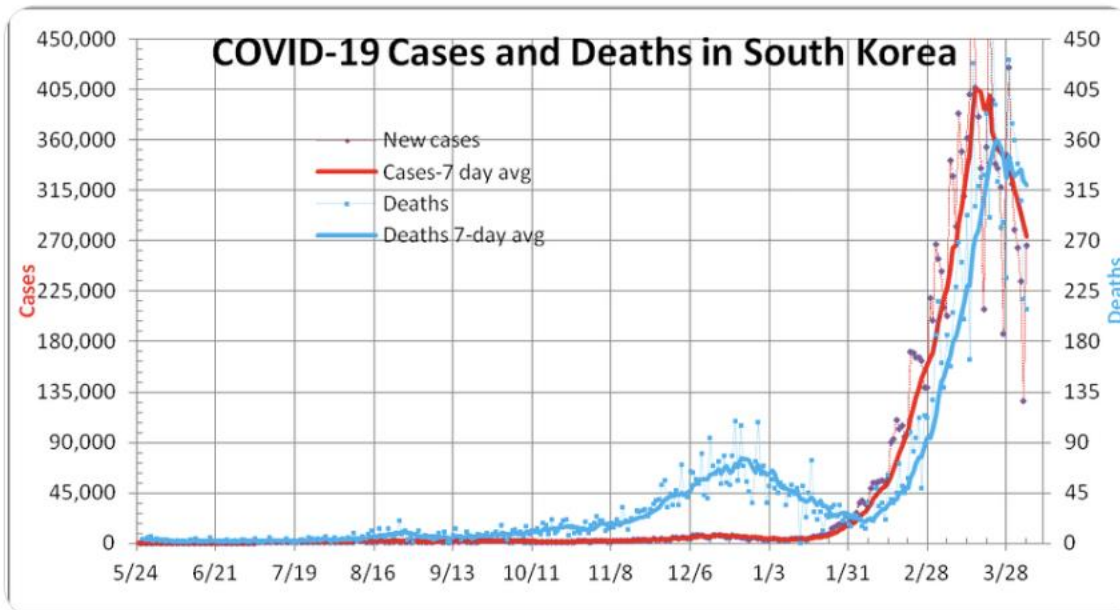
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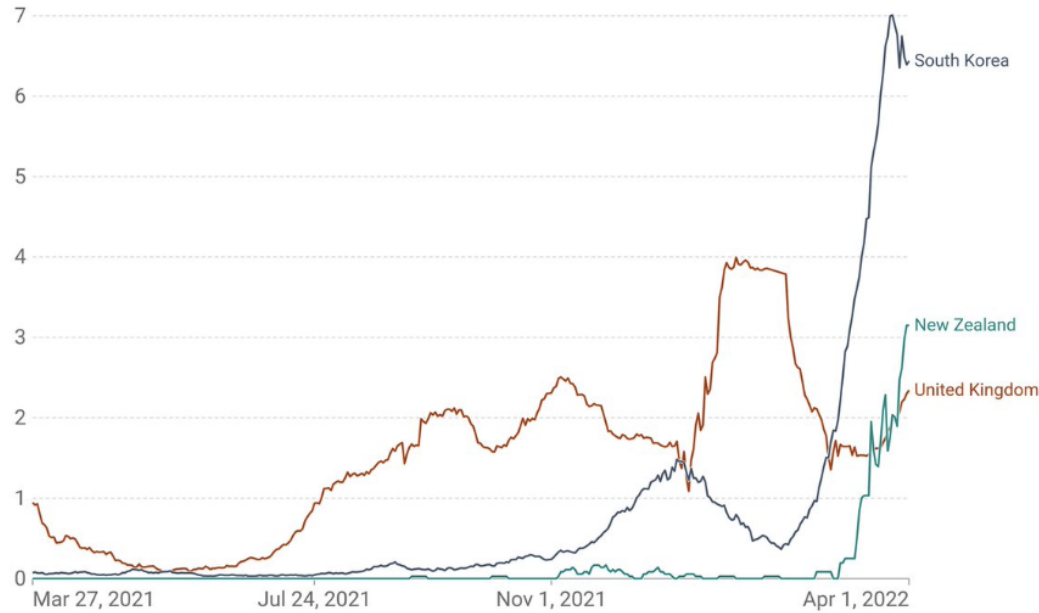
Replying to @devisridhar and @ISAGCOVID19

South Korea is really doing quite badly and you have to go back to before the mass availability of vaccination to find worse daily death numbers in the UK. What's going wrong there?

### Daily new confirmed COVID-19 deaths per million people



7-day rolling average. Due to varying protocols and challenges in the attribution of the cause of death, the number of confirmed deaths may not accurately represent the true number of deaths caused by COVID-19.



Source: Johns Hopkins University CSSE COVID-19 Data

CC BY



1



**Catherine Hall** @catecoburg · Apr 9



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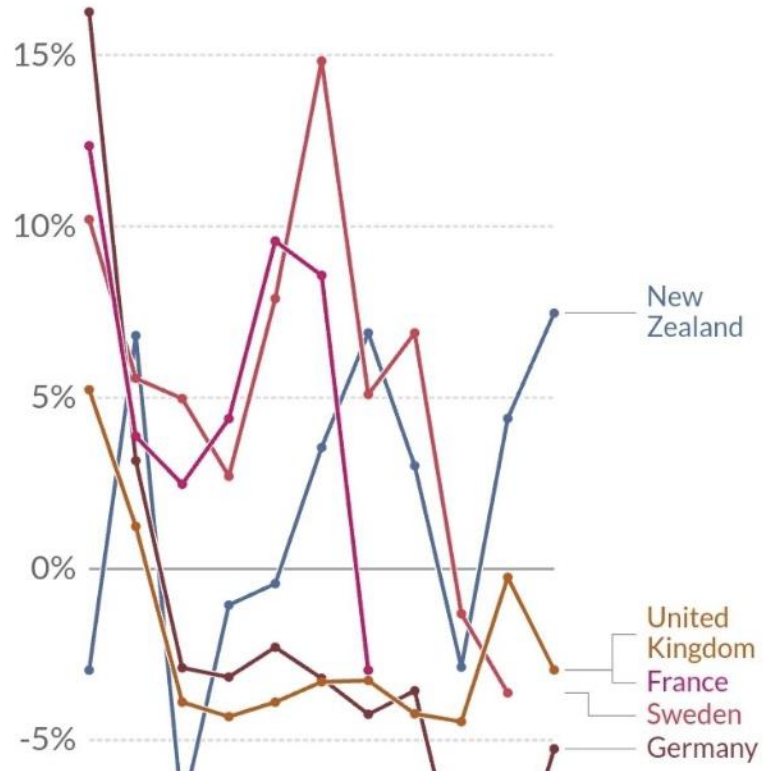
**Brian Morrison** @bripmo · Apr 3

Replying to @devisridhar



based on previous years. The reported number might not count all deaths that occurred due to incomplete coverage and delays in reporting.

[+ Add country](#)





# TAKE-AWAY MESSAGE FROM THE TALK





- Quantity information is selectively presented (even by objective and cooperative interlocutors)
- To protect ourselves from drawing erroneous conclusions, we need to understand the argumentative stance of the speaker
- This applies to graphs as well as utterances
- There are good reasons to think that we are very able at inferring speaker's argumentative stances based on very little information (e.g. how they package a graph in a tweet)



# THE “SO WHAT” QUESTION



**WHO CARES?!**





....it would be valuable to know how people cope or fail to cope with ultra-human numerical scaling, for example the bewildering observation that at the end of 2009 the UK government's general debt was £950.4 billion (when the mathematical definition of a billion is itself variably interpreted). It would be even more valuable to know how statements of this kind are put to work discursively in the service of particular political interests, for example in engendering 'statistical panic'. (Coupland, 2011)

**Communicating uncertainty with big data is not going away with Covid....**