Discussion about
COVID-19: data, modeling, and communication
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Statistical methods and models for complex data
800 years of research to understand a complex world

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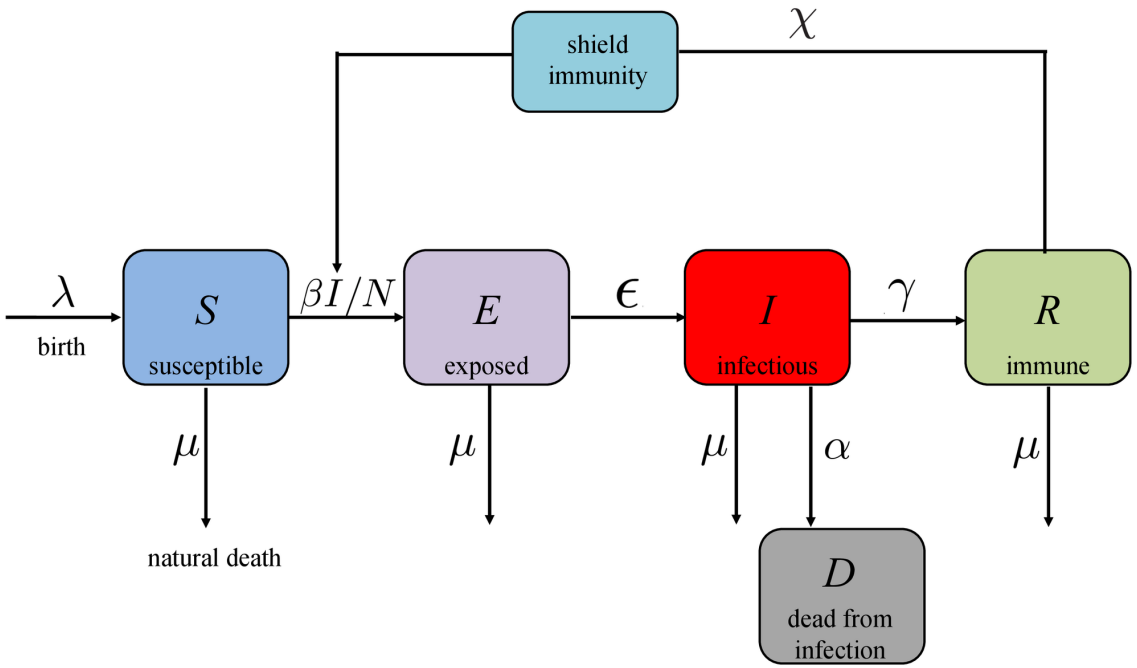
21 Settembre 2022 - Padova

Comment 1 - The theoretical model

1. Get the experts talking

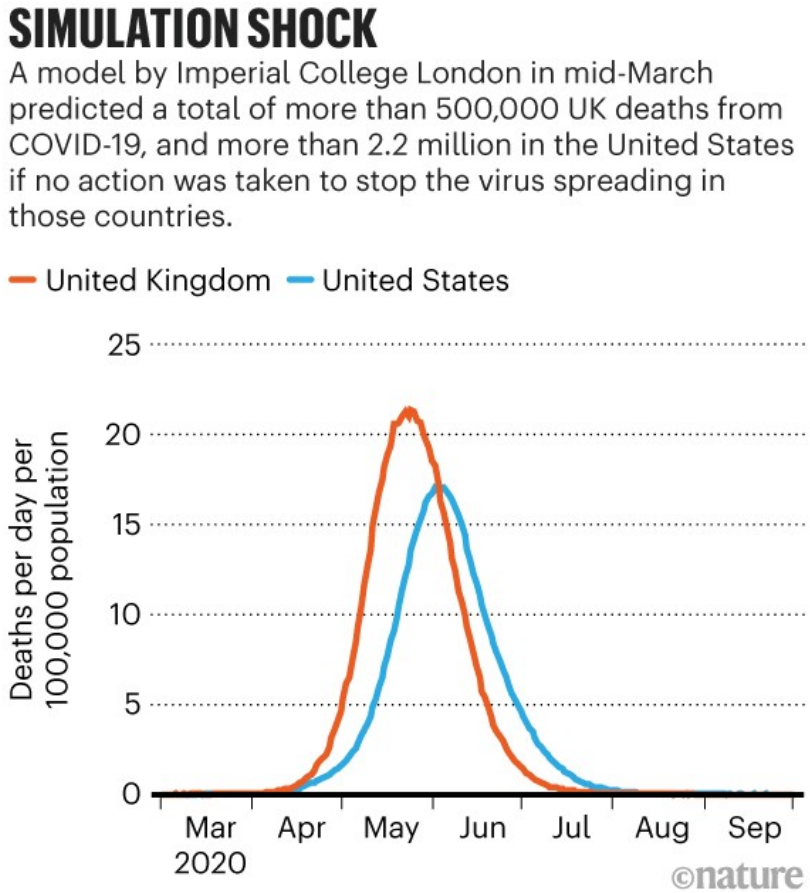
Fact: At the beginning of the pandemic phase, since the availability of public data, a large field of experts produced analysis and interpretation using their own skills.

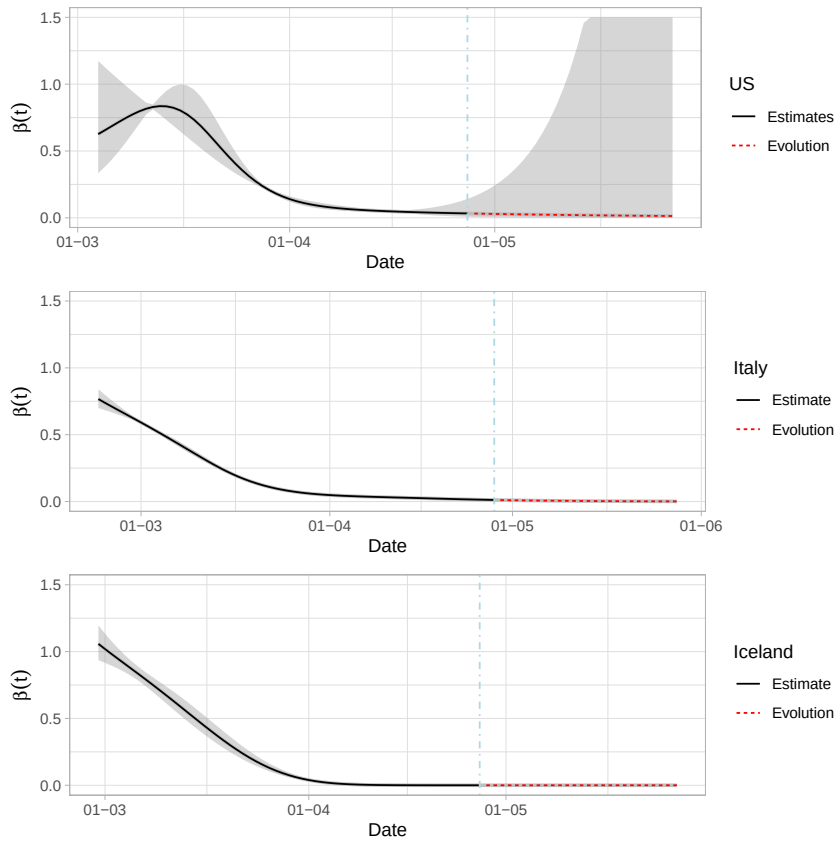
Comment: However only a limited set of experts used appropriate models for epidemiological diffusion, starting from compartmental models to more complex methods.



Comment 1 - The theoretical model

Simulations [1] often produce scenarios far from what happens in the real world (but this is however fine).
Most of the future contagion estimates was presented without any measure of uncertainity (i.e. interval confidence; and this is not fine).





Comment 2 - GIGO [Garbage in - Garbage out]

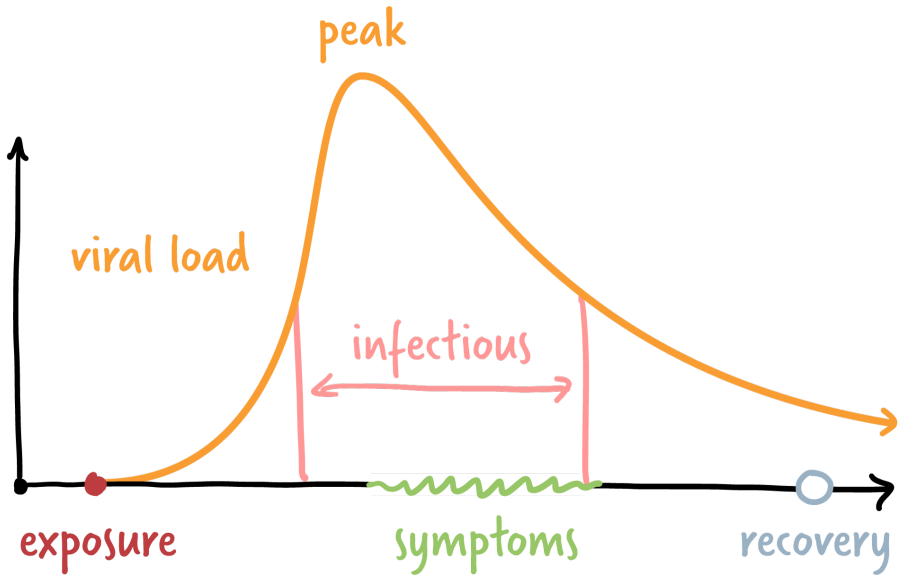
2. Your results is good as your data

Fact: The availability of public data (number of infected, deaths, etc... with temporal and spatial profile) allows easy use of them for data analysis.

Comment: All that glitters is not gold. Issues about the quality and reliability of public data affect the results by producing biased estimations and bad predictions.

Comment 2 - GIGO [Garbage in - Garbage out]

For example, the daily numbers of occurrences related to COVID-19 are time-lagged (with respect to the date of diagnosis). Without account for that, results are biased [2].



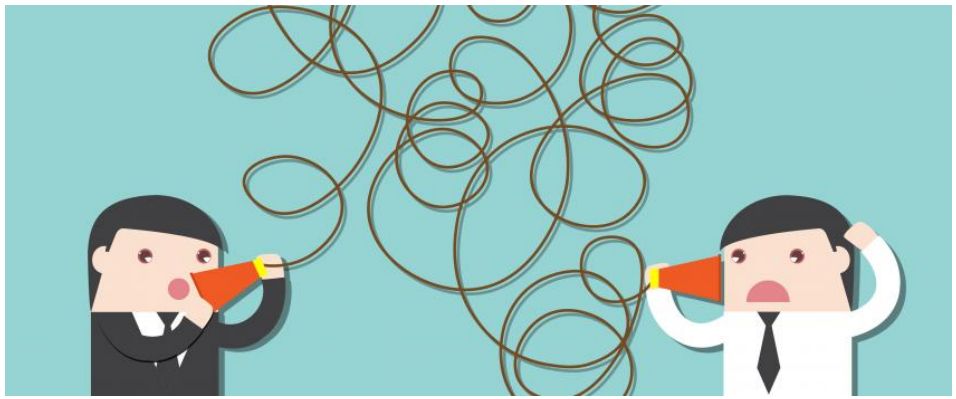
In fact, the main biases are due to problems in data collection and management [3, 5]. The reliability of future scenarios is also affected by prediction length [4].

Comment 3 - The communication

3. The problem of communication is the illusion that it takes place.

Fact: The communication about COVID-19 is often misunderstood.

Comment: Most part of people is confused by the COVID-19 numbers and statistics.



Comment 3 - The communication

There are some pieces of evidence:

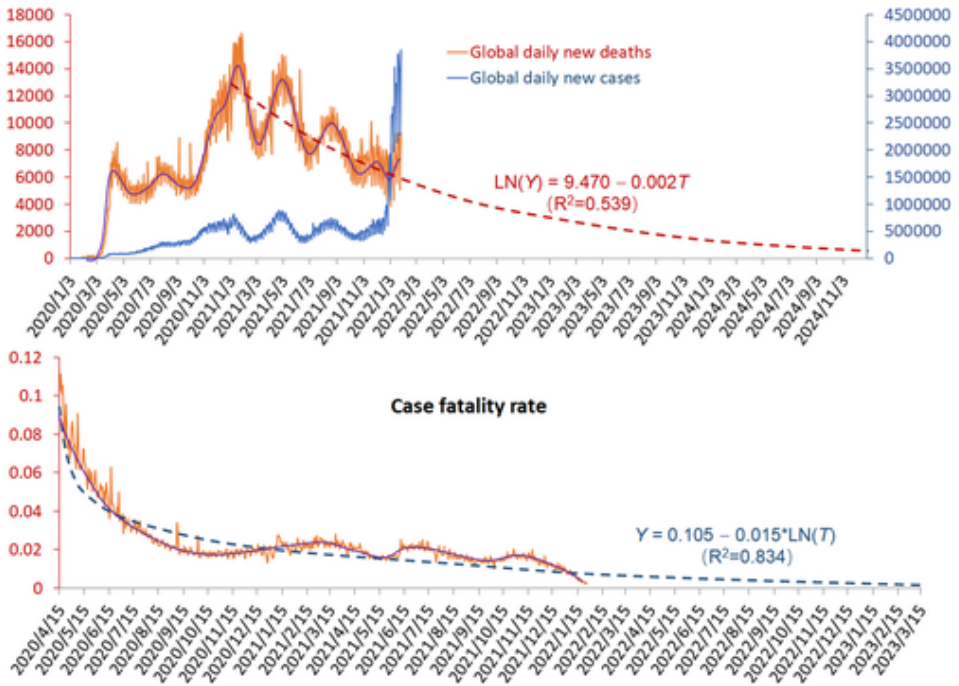
- COVID-19 news have always a negative tone [6] and it implies a certain difficult to be followed;
- Authorities and agencies sometimes failed to communicate COVID-19 risks and decisions [7];
- The mathematical COVID-19 language (rates, percentages, trends, . . .) is hard to be understood for someone [5].

Comment 4 - What's the next?

4. History teaches, but has no pupils.

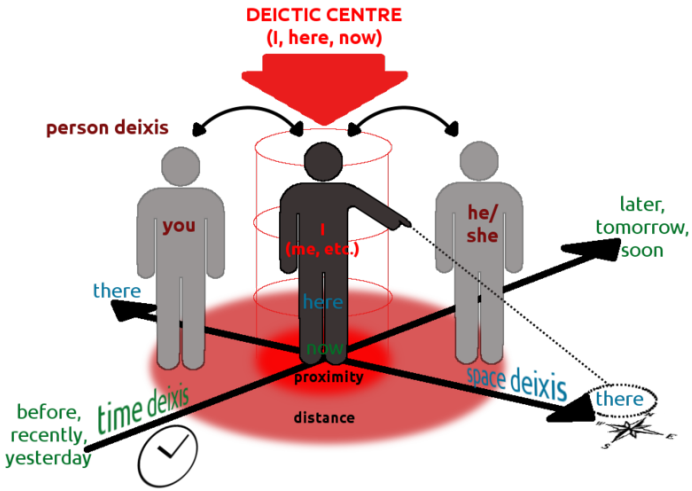
Fact: One week ago, the WHO declares that we are close to the end of the pandemic.

Comment: The lessons learned could help in designing effective public responses for constraining future waves of COVID-19 worldwide.



Comment 4 - What's the next?

- COVID-19 provides a modern example of why the classic mantra of "person, place, and time" in epidemiology is essential. [5]



- Both the global and national public health communities must remain in constant dialogue with governments.
- As for other sectors (i.e. nuclear energy) States and WHO should promote international networks and protocols for data sharing and analysis.

References

David Adam.

Special report: The simulations driving the world's response to covid-19.

Nature, 580(7802):316–319, 2020.

Ritwik Banerjee, Joydeep Bhattacharya, and Priyama Majumdar.

Exponential-growth prediction bias and compliance with safety measures related to covid-19.

Social Science & Medicine, 268:113473, 2021.

Janet Delgado, Alicia de Manuel, Iris Parra, Cristian Moyano, Jon Rueda, Ariel Guersenzvaig, Txetxu Ausin, Maite Cruz, David Casacuberta, and Angel Puyol.

Bias in algorithms of ai systems developed for covid-19: A scoping review.

Journal of Bioethical Inquiry, pages 1–13, 2022.

Janyce Eunice Gnanvi, Kolawolé Valère Salako, Gaëtan Brezesky Kotanmi, and Romain Glèlè Kakaï.

On the reliability of predictions on covid-19 dynamics: A systematic and critical review of modelling techniques.

Infectious Disease Modelling, 6:258–272, 2021.

Neil Pearce, Jan P Vandenbroucke, Tyler J VanderWeele, and Sander Greenland.

Accurate statistics on covid-19 are essential for policy guidance and decisions, 2020.

Bruce Sacerdote, Ranjan Sehgal, and Molly Cook.

Why is all covid-19 news bad news?

Technical report, National Bureau of Economic Research, 2020.

Molly A Sauer, Shaun Truelove, Amelia K Gerste, and Rupali J Limaye.

A failure to communicate? how public messaging has strained the covid-19 response in the united states.

Health security, 19(1):65–74, 2021.