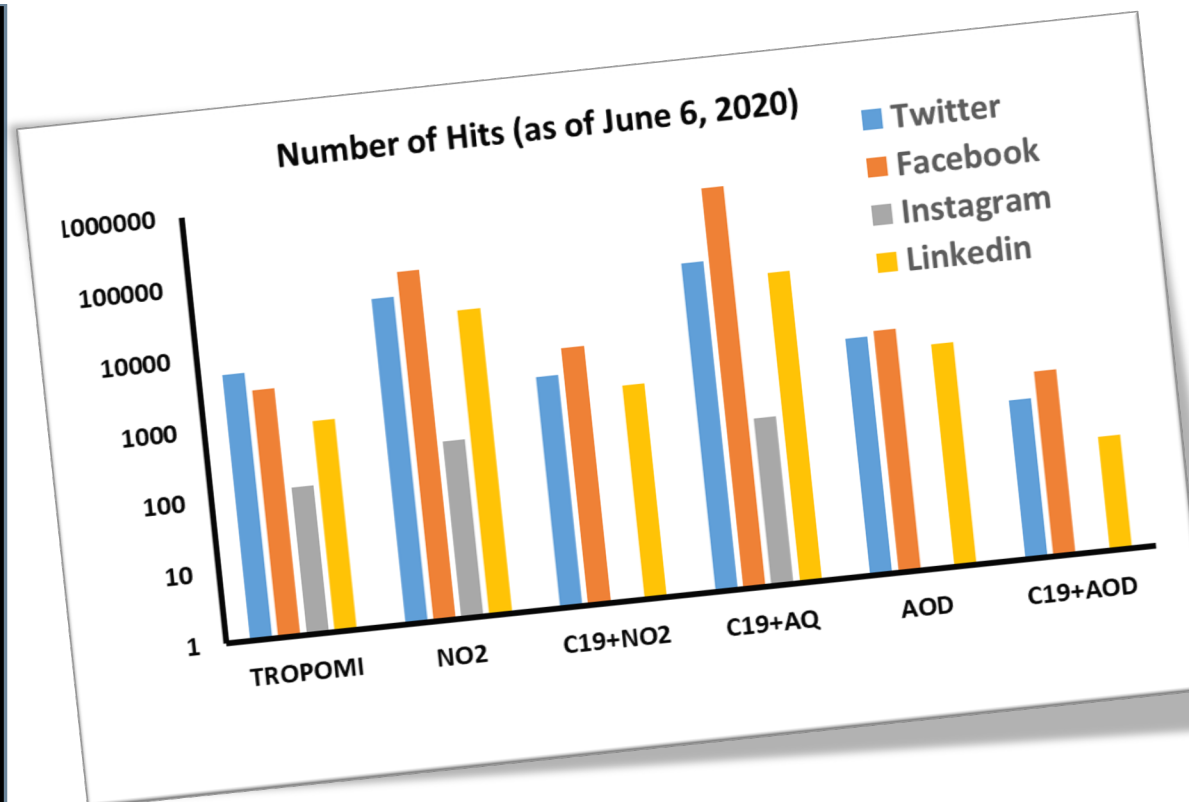


June 8-11, 2020



Disseminating Scientific Results in the Age of Social Media

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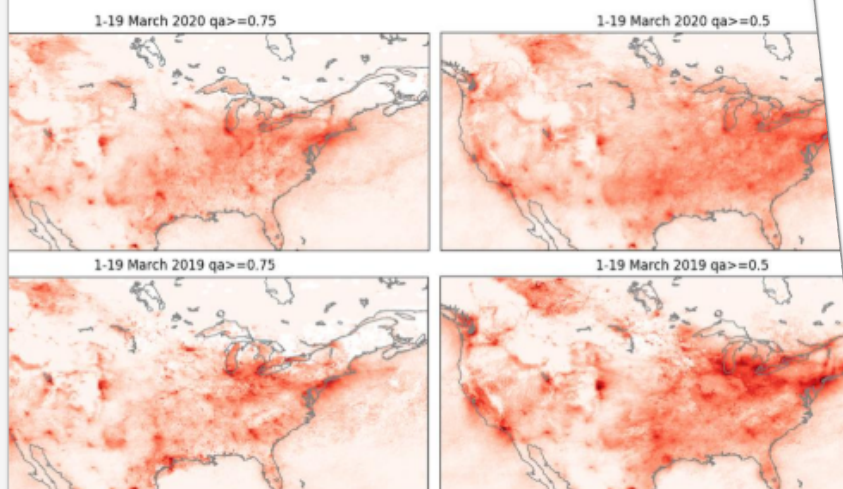
Who has been posting on social media?

- Agencies (press releases)
- Young scientists eager to showcase their findings
- News media

CEOS Atmospheric Composition – Virtual Constellation Meeting

COVID-19, TROPOMI, NO₂, Air Quality

2



Flawed estimates of the effects of lockdown measures on air quality derived from satellite observations

atmosphere.copernicus.eu

programme are processed to compare periods of time before and after the enforcement of restrictions in different parts of the world. For some regions in the world, the expected reduction trends have been observed from the S5P data after several weeks of lockdown. However, results are also published in the media that are based on flawed analysis, e.g. by comparing too short time periods and/or insufficient filtering of the data. It is critical for a sound analysis to consider the provided quality flag, which accounts, among other things, for the fraction of clouds in each pixel. When correctly using this quality flag (qa_value > 0.75 for NO₂), no marked trend is detected, for example, over the USA for the first three weeks of March.

Criticism: Rushing to the press

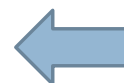
- Weather impacts not considered
- Highest quality data not used
- Shorter time periods are being studied

Rigor Missing?

Analysis with Rigor

3

| Percentage drop in column NO ₂ as observed by TROPOMI | | |
|--|---|---|
| | Account for sun-angle only | Account for sun-angle & meteorology |
| | Method 1 | Method 2 |
| City Name | Δ between years 2019 vs. 2020 (Mar 15 - Apr 30) | Using ERA5 analogs to account for meteorology 2019 vs. 2020 (Mar 15 - Apr 30) |
| San Jose | 43.4% | 40.7% |
| Los Angeles | 32.6% | 32.5% |
| Toronto | 31.0% | 17.0% |
| Philadelphia | 36.6% | 30.7% |
| Denver | 29.2% | 23.4% |
| Atlanta | 35.2% | 27.4% |
| Detroit | 29.9% | 22.8% |
| Boston | 22.8% | 23.5% |
| Washington DC | 31.4% | 21.2% |
| Montreal | 3.3% | 20.9% |
| New York City | 20.2% | 20.0% |
| New Orleans | 13.5% | 19.6% |
| Las Vegas | 9.5% | 18.4% |
| Houston | 26.3% | 15.6% |
| Chicago | 23.6% | 14.9% |
| Phoenix | 12.8% | 14.8% |
| Austin | 14.5% | 9.4% |
| Dallas | 11.9% | 3.6% |
| Miami | 16.1% | -1.6% |
| Minneapolis | 14.3% | 9.2% |
| Mean of each method | 22.9% | 19.2% |



Effects of weather in urban areas can matter ~10-15% over a 6-week time frame.
- Dan Goldberg (GWU)

Decreases in NO₂ due to COVID-19 related lockdown between 2019 and 2020 were smaller than when effects of meteorology not included. Impact still present.

The Controversy...

4

HOME |

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Comments (1)

medRxiv
THE PREPRINT SERVER FOR HEALTH SCIENCES

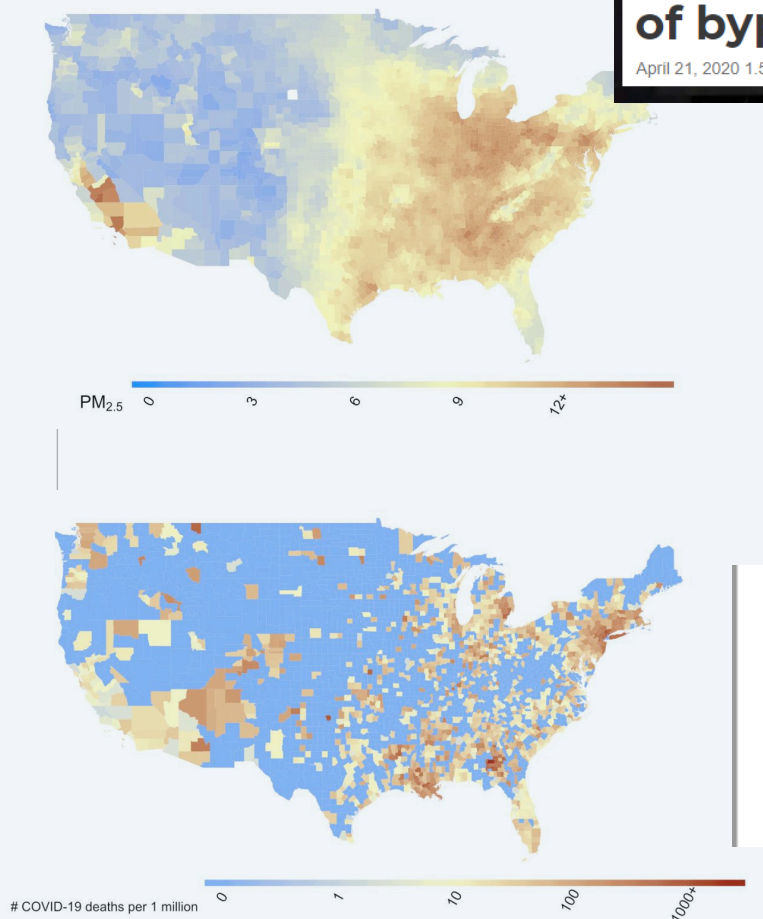
CSH
Cold Spring Harbor Laboratory

BMJ Yale

Exposure to air pollution and COVID-19 mortality in the United States: A nationwide cross-sectional study

Xiao Wu, Rachel C. Nethery, Benjamin M. Sabath, Danielle Braun, Francesca Dominici
doi: <https://doi.org/10.1101/2020.04.05.20054502>

This article is a preprint and has not been peer-reviewed [what does this mean?]. It reports new medical research that has yet to be evaluated and so should not be used to guide clinical practice.



Air pollution, COVID-19 and death: The perils of bypassing peer review

April 21, 2020 1:56pm EDT

Villeneuve and Goldberg, theconversation.com, April 21, 2020

Concerns:

- Not peer-reviewed
- PM_{2.5} data at county level
- Risks overestimated
- Etc.

CONGRESS. LEGISLATION. POLITICS.

AIR POLLUTION

Republican demands review of Harvard COVID-19 study

Sean Reilly, E&E News reporter

Published: Monday, May 4, 2020

What Should the Rules of Engagement Be?

5

- Reporters want layman language
 - ▣ How do scientists talk about analysis (e.g., quality flags)?
 - ▣ Should satellite product documents (ATBDs etc.) have disclaimers or language pertinent to applications such as COVID-19? DOs and DON'Ts... so the onus is on the scientist talking to the media to get it right
- Journals are encouraging for pre-prints with doi numbers prior to peer-review
 - ▣ For important topics such as COVID-19 impact, should scientists say no to pre-prints?
- What is wrong if agencies and their scientists seek publicity to demonstrate to the public the value of their satellite assets?