



Air pollution in post-COVID-19 world: the final countdown of modern civilization?

Comment on: “COVID-19 and air pollution: the worst is yet to come”

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To the Editor:

One year ago, we described the unprecedented decrease of air pollution during the first global lockdown (Dutheil et al. 2020a). Due to the COVID-19 crisis, most governments closed their borders and airports, limited the external market, and reduced their industrial production to avoid SARS-CoV-2 spreading (Dutheil et al. 2020b). The first global lockdown of Spring 2020 induced the first decrease period of air pollution until industrial revolution. Humanity lived in healthy atmosphere during 8 months, approximately from February to September 2020 (European Space Agency (ESA) n.d.-a). At this time, we considered several published models to predict mortality due to air pollution (i.e., increase of all-cause mortality ranging from 0.13% per 10 $\mu\text{g}/\text{m}^3$ of nitrogen dioxide (NO₂) per day to 2% per 10 $\mu\text{g}/\text{m}^3$ of NO₂ on a 5-day period) (Chiusolo et al. 2011; Hoek et al. 2013; He et al. 2020). However, at the end of the first waves of SARS-CoV-2, most countries quickly increased their greenhouse gas emissions to revitalize the global market and avoid market collapse. At the time of writing, the world is living with COVID-19 pandemic

until 1 year, cumulating more than 125 million of cases and 2.8 million of deaths. Despite of several worldwide plan to reduce the spreading of SARS-CoV-2 (i.e., global quarantine, social restrictions, vaccination plan), numerous worldwide countries currently undergo a third wave of contagion. This alarming situation is increased by the high rate of SARS-CoV-2 mutations, and rare but severe iatrogenic reactions with several vaccines, limiting their acceptance in general population (Turner et al. 2021; Carli et al. 2021). From October 2020, the levels of NO₂ and monoxide carbon (CO) increased worldwide, with alarming concentration compared with levels before the COVID-19 pandemic (Fig. 1) (European Space Agency (ESA) n.d.-a); European Space Agency (ESA) n.d.-b). The impact of air pollution is not only a problem of western countries, but particularly affects developing countries: 193,000 European people died in 2012 from airborne particulate matter and 4000 preventable deaths each day in China with 1.6 million fatalities in 2016 (Wang et al. 2012; Rohde and Muller 2015; Ortiz et al. 2017). It is well-known that airborne particulate matter and radical species due to fossil fuel exhausts induce asthma, bronchitis, emphysema, lung and heart diseases, and respiratory allergies (Brauer 2010). To quickly restart the economic machine, most countries burn fossil fuel and continue to exploit coal mines, engulfing the world in ecological disaster. To memory, the Paris Agreement was adopted by 196 countries at COP 21 in Paris, on 12 December 2015, to limit global warming to below 2°C. While COVID-19 crisis will probably finish in 2022–2023 with an unprecedented mortality rate, we could ask to future young generations: “Post-COVID-19 world is it made for you?” In massively decreasing the greenhouse gas emissions during few months, the COVID-19 crisis could be described as “COVID-19 paradox” in the history of Anthropocene: a global survive of modern civilization against viral pandemic, in accelerating their future extinction due to climate change. Even if the needs of robust global economy are vital for the

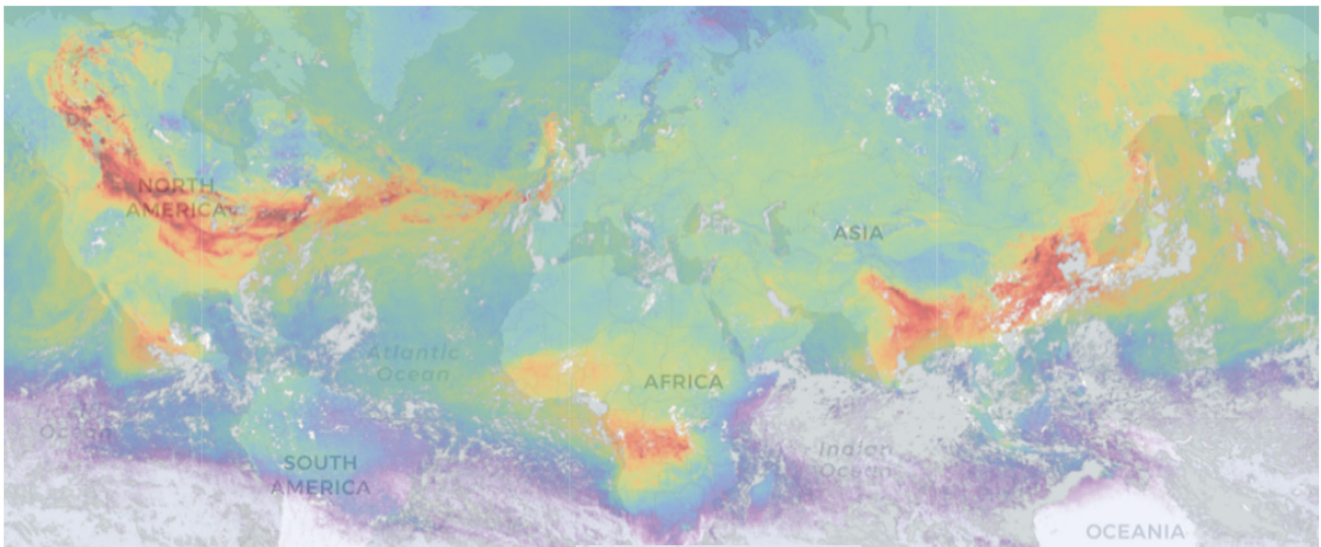
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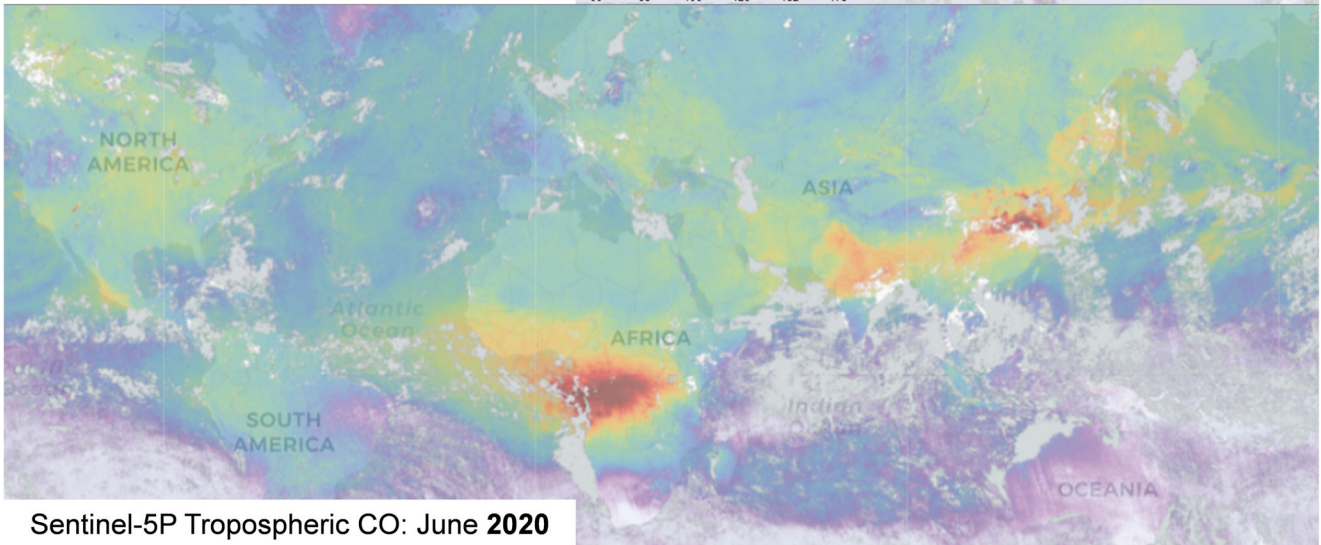
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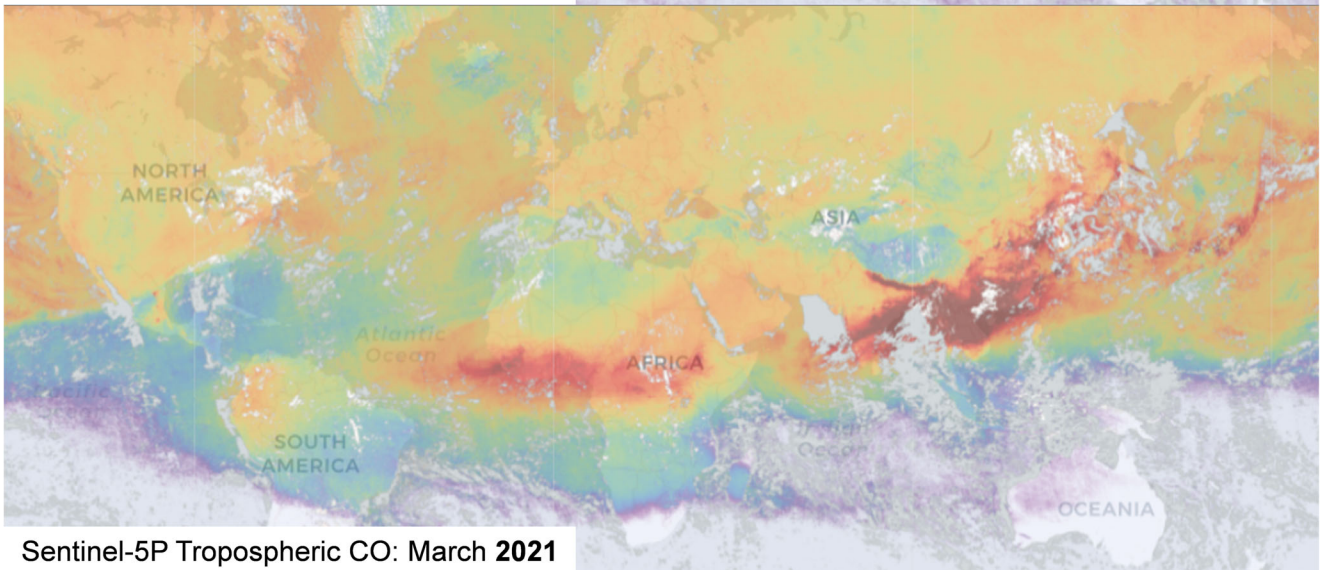
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Sentinel-5P Tropospheric CO: June 2019



Sentinel-5P Tropospheric CO: June 2020



Sentinel-5P Tropospheric CO: March 2021

◀ **Fig. 1** Maps of tropospheric CO concentrations from Copernicus Sentinel-5P satellite (European Space Agency (ESA) n.d.-b). The averaged carbon monoxide concentrations across the globe were described as 3-day moving average

needs of humanity (science, health, food resources), it seems to be valuable to consider our planet as the first precious resource rather than short-term concerns.

Declarations

Conflict of interest The authors declare no competing interests.

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