General comments:

This paper describes a dataset of temporal daily adjustment factors for the year 2020 due to the Pandemic outbreak which can be applied to emission inventories of primary pollutants. This dataset covers the whole European country and is based on several proxy combined together to provide a new improvement of a previous set of data released in 2021. This kind of dataset is very useful to adapt the emissions to this peculiar period and provide a framework of continuous adaptation of emissions along this sanitary crisis.

I think the paper is suitable for publication after the consideration of the following comments.

Specific comments:

1) My major comment regards the proxy used for the adjustment of GNFR_C emissions. I think a proxy related to energy consumptions of households (electricity or fuels) could be more relevant than google mobility data. Could the authors discuss this point and did they try to find this proxy in European databases?

2) The paper lacks a comment on the emissions regarding the agricultural sector. In most studies related to the COVID outbreak the implicit assumption is that emissions from agriculture (mainly ammonia) was not affected. It could be interesting to prove this with satellite data or find a reference paper to add (see references here below for suggestions).

3) To help the reader, I would prefer to have first the section describing the BAU that is the reference and after the description of the COVID19 case. It should be more logical.

4) It is not clear how the authors handle the meteorological effect on emission to build the BAU reference so that the adjustment just reflect the restrictions and lockdowns due to the pandemic. This is an important point to clarify for modellers to help them to correctly use these daily factors.

5) In some countries there are some hourly variation of traffic counts that could be added as an update to get some flavours of the hourly variations we could extrapolate at the European level (See CEREMA web site in France).

6) In the discussion you could add something for FR with a rebound of NOx emissions in August with higher emissions compared to BAU in Adelaide et al. (2021)

7) In the limitations I suggest the authors to elaborate more on the spatial variation within the country with probably a decrease of emissions in very urbanized cities impacted by the COVID (Paris for instance) and in the countryside probably an increase of emissions (particularly for the PM from wood burning). This would be due to an *exodus* from city centres toward remote areas during the sanitary crisis.

I would suggest to add these missing references:

- *Adélaïde, L., Medina, S., Wagner, V., de Crouy-Chanel, P., Real, E., Colette, A., Couvidat, F., Bessagnet, B., Alter, M., Durou, A., Host, S., Hulin, M., Corso, M., Pascal, M., 2021. Covid-19 Lockdown in Spring 2020 in France Provided Unexpected Opportunity to Assess Health Impacts of Falls in Air Pollution. Front. Sustain. Cities 3, 643821. https://doi.org/10.3389/frsc.2021.643821.*

In this reference there is an annex with a methodology to calculate adjustment factors with a tentative retrieve of an indicator of house hold consumption to address GNFR_C residential emissions.

- This web site: https://www.citepa.org/fr/barometre/
  Citepa as an official organism providing emissions release a monthly evolution of emissions.

- *Zhang, Y., Liu, X., Fang, Y., Liu, D., Tang, A., Collett, J.L., 2021. Atmospheric Ammonia in Beijing during the COVID-19 Outbreak: Concentrations, Sources, and Implications. Environ. Sci. Technol. Lett. 8, 32–38. https://doi.org/10.1021/acs.estlett.0c00756.*

  Lovarelli, D., Conti, C., Finzi, A., Bacenetti, J., Guarino, M., 2020. Describing the trend of ammonia, particulate matter and nitrogen oxides: The role of livestock activities in northern Italy during Covid-19 quarantine. Environmental Research 191, 110048. https://doi.org/10.1016/j.envres.2020.110048

  These studies could be commented to discuss NH3 emissions.

- *Gkatzelis, G.I., Gilman, J.B., Brown, S.S., Eskes, H., Gomes, A.R., Lange, A.C., McDonald, B.C., Peischl, J., Petzold, A., Thompson, C.R., Kiendler-Scharr, A., 2021. The global impacts of COVID-19 lockdowns on urban air pollution. Elementa: Science of the Anthropocene 9, 00176. https://doi.org/10.1525/elementa.2021.00176*

  In the introduction, I would cite this study that is a good review on the impact of COVID restrictions on air quality.

Technical comments

Very few minor comments, the paper is very well written, just chose either American or UK English. To help the reader I would add a list of acronyms and abbreviations.

Through the publication, please correct **Le Quéré** with two accents (when necessary).

Line 156 : heterogen**e**ous impact (same L 839 and L 1005)

Line 239: This sentence could be improved "Italy is where the recovery is more pronounced, reaching emissions above the BAU during August"

Line 394: I would write "Until the end of August, most"