

Comment Letter #83



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Submitted via email

Dr. Sang-Mi Lee
Planning and Rules Manager
South Coast Air Quality Management District
slee@aqmd.gov

RE: Comments on the draft 2022 AQMP Appendix I: health effects

Dear Dr. Lee:

Thank you for the opportunity to submit comments on the draft 2022 AQMP Appendix I and for the Advisory Council discussion on August 10.

Overall, the 2022 AQMP draft Appendix I (Health Effects) appropriately summarizes the state of the science on the health effects of criteria air pollutants, and highlights the results of numerous studies that have been reviewed in the ISAs and some other key review papers. The summary is well-organized and provides an appropriate level of detail for the reader to understand the studies being described. The comments provided here are intended to help improve the overall clarity of the document. Based on the discussion at the August 10 Advisory Council meeting, I look forward to seeing the results of the health benefits analysis from the Socioeconomic Report, which help to illustrate the potential health impacts of reducing these pollutants in the South Coast region.

As a general comment, although the introduction describes an effort to highlight studies conducted in southern California (or California in general), it was not clear that this was the approach taken for the appendix. Although studies from other places may be generalizable to the population in the South Coast AQMD, it is helpful and compelling to see studies conducted within the local region. These data help to reinforce that criteria air pollutants are impacting the health of residents in the South Coast. Certainly, there have been many epidemiological studies conducted in the greater Los Angeles region or in California, or even toxicology studies utilizing air samples from southern California. It would be helpful to clarify whether study location was indeed one of the factors considered when selecting which epidemiological studies to highlight in this appendix.

Below are some detailed comments on specific sections of the draft appendix –

Ozone

- Given the length of the appendix, it would be helpful to add text to the beginning of each pollutant section to reiterate the attainment status for that pollutant.
- Page I-6 - Regarding EPA's downgrade of short-term ozone and cardiovascular effects from "likely" in the 2013 ISA to "suggestive" in the 2020 ISA warrants some explanation, especially since the recent studies provided on pages I-26-27 all provide additional evidence supporting such a relationship. Although the Appendix includes some text about the new evidence

indicating inconsistent results (page I-42), the studies that you summarized in that previous section does not reflect such “inconsistency”.

- Page I-8 – In this paragraph, you cite studies that use 3-hour exposures to 70ppb or 100ppb, among other concentrations. These types of exposures do, in fact, occur routinely in the summer season in the South Coast Air Basin. Although it is true that lower ambient concentrations are more common, this paragraph should acknowledge the context of South Coast’s ozone levels. Additionally, please check the FEV1 decrement cited for the Arjomandi 2018 study.
- Page I-9 to I-10 - In this section’s description of the results of experimental studies, the Appendix describes that the data do not show asthmatics to be a sensitive group. However, it should be noted that there are limitations to these types of human exposure studies. For example, even though some studies enroll patients with previously diagnosed asthma, people with poorly controlled asthma would unlikely be eligible for such studies. Additionally, these human exposure studies typically only enroll adults rather than children.
- Table I-3 – The table identifies pre-existing asthma as a factor that increases susceptibility to ozone-related health effects. If this wasn’t found in experimental studies, was this identified in observational studies (e.g. of asthma exacerbation)? If this is the case, then the evidence supporting the identification of this susceptible population is worth discussing.
- In general, it would be easier to interpret the OR/CI’s cited in the document if you provided the exposure unit that was used (e.g. for each 10ppb increase in ozone exposure averaged over 8 hours...)

Particulate Matter

- Page I-44 – two of the bullets are indented and it does not seem like they should be (they are not sub-bullets of the previous bullet point). Also, the Supplement to the 2019 ISA was published in May 2022, so you should update the citation.
- Table I-4 – where are the causality determinations for cancer and mortality? These need to be added to the table.
- Table I-5 – the units in this table are incorrect (they should be ug/m3). Also, please use the appropriate number of significant digits based on the NAAQS (e.g. 12.0 vs 12).
- Exposure units – similar to the ozone section, it would be easier to interpret the associations cited if you provided the exposure unit that was used in the study.
- Page I-62 – there are some extra numbers in some of the sentences here.
- Cardiovascular Mortality with short-term PM exposure – I find it a little awkward that the cardiovascular mortality section is presented separately from the “Mortality” section. Could these sections be combined, or perhaps the earlier section can refer to the latter section for related information?
- UFP – it might be worth mentioning that there is no nation-wide network of monitors for UFPs, so studies rely on short-term or other special monitoring campaigns.

Sulfur Dioxide

- In the last paragraph, it would be helpful to describe the relationship between SO2 and sulfates.

TACs

- I think the first sentence providing the definition of a TAC may be confusing. I recommend revising to state: "Toxic air contaminants are a group of pollutants defined in the California Health and Safety Code (section 39655) as 'air pollutant[s] which may cause or contribute to an increase in mortality or an increase in serious illness, or which may pose a present or potential hazard to human health.'"

VOCs

- Page I-137, 1st paragraph –it would be helpful to add that specific VOCs that are air toxics are also subject to air toxics regulations.
- Page I-137, 3rd paragraph – For the MATES V data, please specify whether the percentages cited in this paragraph are derived from the measurement or the modeling results.
- Page I-138, 2nd paragraph – while the statement that the MATES V data showed that the levels for individual pollutants were below the chronic RELs is correct, there was an exploratory analysis conducted as part of MATES V that calculated the chronic HI based on measurement data. That analysis showed that when the health effects of multiple pollutants acting on the same target organ systems are accounted for simultaneously, the hazard index is above one, indicating that the levels of air toxics in those locations could cause health effects. The results of that analysis should be cited here.
- Page I-138, 2nd paragraph – The data comparing the reductions in air toxics cancer risk in EJ communities and non-EJ communities are based on the SB535 definition of a "disadvantaged community". This definition should be specified, as there is no standard definition of what constitutes an environmental justice community. The 52% reduction in air toxics cancer risk in non-EJ communities – is this figure based on revised MATES V modeling results? The MATES V final report cites this number as 53%.
- Page I-138, 2nd paragraph – the discussion about AB 617 communities should be in a separate paragraph. The work conducted through AB 617, including the local monitoring programs implemented in the designated communities, are generally not part of the MATES program. Therefore, I recommend deleting the sentence that begins "MATES V study included local-scale studies...". Instead, the discussion about AB 617 in this section should simply mention that the District has been implementing this law through community planning efforts as well as through BARCT and incentive program implementation.

Conclusions

- Figure I-12 – fix the formatting issue for the 2015 box.

Recent Research and Upcoming Topics

While I agree that wildfire health impacts and potential impacts of air pollution exposures on COVID-19 outcomes are important and topical issues to address through research, the purpose of this section of the Appendix is not clear. Specifically, it is not clear why these particular studies were chosen to be highlighted when there are far more studies on these topics than the ones cited here. In particular, the Meo 2021 study has some serious methodological shortcomings and lack of clarity on their pollution exposure estimation methods. As a general comment, in the rush to publish studies related to COVID-19 outcomes, many studies utilized ecologic study designs or exposure models that do not reflect spatial

variations in PM_{2.5} air pollution across regions. If you are to highlight studies of air pollution effects on COVID-19 outcomes, I would strongly recommend describing some limitations of those studies.

Here is one possible study to consider citing regarding air pollution and COVID-19 outcomes:

- English et al. 2022 Environ Adv. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9316717/>

Here are some suggested studies to consider citing regarding wildfire air pollution health effects:

- Jones et al 2020 J Am Heart Assoc. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7428528/>
- Stowell et al 2019 Environ Int <https://pubmed.ncbi.nlm.nih.gov/31520956/>
- Heaney et al 2022 Geohealth <https://pubmed.ncbi.nlm.nih.gov/35795228/>
- This review paper from 2018 can provide some additional (albeit somewhat older) references: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6697173/>

I thank the AQMD staff for considering my comments and recommendations to improve the Appendix I, and I look forward to reviewing a future draft of this report.

Sincerely,

Jo Kay Ghosh
Director of Research and Evaluation
Heluna Health
jghosh@helunahealth.org