

**Preliminary Comments from Dr. Lianne Sheppard on
EPA's Integrated Review Plan for the National Ambient Air Quality Standards
for Particulate Matter (External Review Draft – April 2016)
05-22-16**

Comments on Chapter 4:

To what extent does Chapter 4 clearly and adequately describe the scope and specific issues, including the identification of the most important uncertainties, to be considered in developing the HREA Planning Document for this review?

I believe Chapter 4 does a good job clearly describing the scope and specific issues relevant to a HREA. One important point was not addressed: What are the criteria the HREA Planning Document will use to determine whether or not a HREA is justified? Resource considerations are important and should be weighed against the anticipated benefit from any potential risk and exposure assessments.

With respect to considerations of potential quantitative assessments in the HREA, I suggest that the framing of the questions and approach should be updated to reflect the more sophisticated exposure assessment approaches that are now commonplace in cohort studies. Characterization of risk on a national scale (1 25-6) is very appropriate for annual average exposures given the availability of national ambient PM prediction models. Predicted exposure (at e.g., subjects' residences) is now preferred over metrics such as nearest monitor where a single measurement represents exposure for a large population. Thus "putting results into a national public health perspective" (p 4-11 1 1-2) should be the target of any HREA analyses for long-term exposures. I don't think planning for these should be viewed following a previous approach that focused on selected urban areas. If the HREA will continue to focus on selected urban areas for the annual standard, then it should also explicitly address EPA's rationale for not focusing on characterizing risk on a national scale.

Is there additional information that should be considered or are there additional issues that should be addressed in considering the potential for risk and/or exposure analyses in the current review?

Since the last review there has been considerable advancement in PM exposure modeling, meaning that we have good modeled estimates of PM_{2.5} at all census tract centroids. The HREA should consider using modeled PM rather than relying only on monitored PM.

Monitor siting is a new and potentially important issue for consideration. If a set of monitors doesn't fully represent the population being considered, then recent theoretical research into exposure measurement error has shown this lack of spatial compatibility can affect inference in epidemiologic studies. This may affect the set of estimates and their uncertainties reported in the literature. I believe it is less likely to affect risk assessment as we found in one investigation that predictions of pollutants from spatially compatible and incompatible networks were highly correlated.

P 4-15 1 34: The discussion of exposure metrics should be expanded to address considerations of whether to use individual monitors or modeled surfaces for long-term exposure.

Comments on Table 4-1: Areas of Uncertainty...: Broadening the assessment to the entire nation changes the transferability considerations. In addition to using composite monitors, there should be a discussion about uncertainty due to exposure modeling (as well as to which monitors are included in an exposure model). For long-term studies, multi-city studies are presumably going to be used. Potential measurement error is not only due to population mobility.

Other comments on Chapter 4

1. The document is clearly written and organized. It makes good use of explanatory footnotes.
2. As part of the HREA Planning Document and eventual HREA (if any), EPA should consider making its computer code available to the public.
3. P 4-17 l 12: Reword “cascade the impact” to improve clarity.
4. Table 4-2 comments. If APEX is to be used, consider:
 - a. MESA Air can provide predictions of PM_{2.5} for census tracts; thus tract-to-tract spatial variation of annual average PM_{2.5} is available for use in APEX.
 - b. Near roadside and in-vehicle exposures are important sources so they should be considered even if they are very uncertain.
 - c. It makes sense to prioritize geographic areas well represented in CHAD and for which AER distributions have been developed.
 - d. It would be useful to better account for habitual repeated behaviors of individuals in the application of CHAD, thus overcoming an important limitation of this database. Consider whether some small studies should be conducted to directly address this issue so that appropriate use of the 2-day activity data can be made to better address habitual activity patterns of individuals. This is clearly important for application to long-term exposures.

Comments on other chapters

1. Figure 2-1: The consideration of indicators should also reflect that indicators that aren't focused on size may be entertained.
2. P 2-34 l 9: Clarify wording.
3. P 3-6 organization of the PM ISA: Consider adding a high-level outline of the ISA to this section.