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EPA should incorporate cumulative impact assessments into its decision making and on research to strengthen the methodologies used for cumulative impact assessments.

The Science Advisory Board to provide the agency with advice on how it can incorporate data, particularly quantitative data, for combinations of chemicals and non-chemical stressors into its near-term decision-making.

People living in communities are often exposed to multiple chemical and non-chemical stressors. EPA assessments and decision making should take into consideration that reality and take steps to move away as much as possible from the status quo of one source, once chemical, one environmental medium and average person to better reflect real conditions.

In providing advice to EPA on the applications of cumulative impact assessment that are supported by currently available data and methods, it will be helpful for the SAB to consider the full range of potential applications from supporting regulatory decisions to prioritization and screening activities.

Some examples we note are:

- **Enhancing how population vulnerability is quantified in risk assessments** through incorporating evidence of effect modification of dose-response relationships between pollutant/chemical and adverse health outcome by non-chemical stressors such as low socio-economic status or membership in a population group that has been historically economically/socially marginalized (e.g., race/ethnicity are proxies). We suggest that you consider analyses supporting the lead NAAQS for good examples of incorporating non-chemical stressors as effect modifiers of the dose-response relationship. Specifically, see Appendix C. Supplemental Information Related to the Human Health Risk Assessment in the External Review Draft of the 2021 EPA's Policy Assessment for the Reconsideration of the National Ambient Air Quality Standards for Particulate Matter and Chari et al. (2012).
- Another area of opportunity is in **assessing health risks for classes and groups of chemicals** that impact the same biological targets to inform health-based decisions. This can be done as part of Toxic Substance Control Act risk evaluations, for example in the assessment of phthalates. This could build on the earlier work of the U. S. Consumer Product Safety Commission in 2014.
- Another application of would be in the 6-year review of drinking water standards (e.g., carcinogenic or neurotoxic drinking water contaminants) (see Evans et al. 2019).
- Finally, the Clean Air Act hazardous air pollutant residual risk rules are actions where cumulative risk and impacts should be considered.

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In terms of recommendations for incorporating particular stressors that are frequently present in communities, we recognize that this is an area that is more challenging, given the lack of consensus on how to incorporate non-chemical stressors. Nonetheless, we recommend that the identification and inclusion of stressors that are important to communities be driven by a shared health endpoint. Chemical and non-chemicals stressors should be included based on the availability of evidence linking each stressor to a common health endpoint. Data sources such as the U.S. National Health and Nutrition Examination Survey (NHANES), U.S. Census, Chemical and Product Database, EJScreen, and the Toxics Release Inventory can be used to identify both chemical and non-chemical stressors. See Pullen-Fedinick et al. (2021) for an example on how to incorporate stressors for shared endpoint using available data.

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