

From: [Yeow, Aaron](#)
To: [Julie Goodman](#)
Subject: RE: Question for Sabine Lange
Date: Wednesday, March 20, 2019 9:27:00 AM

Dr. Goodman,

Here is Dr. Lange's response to your question.

"In my comments on the Draft PM ISA, I provide three figures that are examples of how the EPA could use hypothesis testing in their data analysis. Because these figures were just intended as example analyses, I completed only a rough, simple estimation of the greater or lesser precision of exposure estimates. I used the data from the tables in the ISA that accompanied each figure (Table 5-5 for Figure 5-5, Table 5-11 for Figure 5-8, and Table 11-1 for Figure 11-1), and selected those studies that had used a seemingly more or less accurate method for estimating exposure. For example, in Table 5-5 Sarnat et al (2012) and Greenwald et al (2013) used concentrations measured outside the children's school, which would likely be a better exposure estimate for those children than Delfino et al. (2013), who estimated exposure based on one stationary monitor in the entire city (details for all determinations provided below). I did not use any additional information, such as model fit, monitor error, or comparisons to personal exposure, but merely tried to choose those methods that appeared to be clearly superior or inferior in terms of estimating exposure for the population of interest. However, I think that to do a thorough analysis of exposure estimates would require that additional information. While my estimates of less or more precise exposure are a simplification, I think that they demonstrate a principle that the EPA might follow in their ISAs.

Figure 5-5:

Better/more precise exposure methods: Monitoring outside the school (Sarnat et al. 2012, Greenwald et al. 2013), personal exposure (Delfino et al. 2006, Maikawa et al. 2016, McCreanor et al. 2007, Mirabelli et al. 2015).

Worse/less precise exposure methods: One ambient monitor per city/community (Delfino et al. 2013, Barraza-Villarreal et al. 2008, Berhane et al. 2011).

Figure 5-8:

Better/more precise exposure methods: Average of multiple monitors in a city (Staffoglia et al. 2013), modeled based on monitoring and AOD (Kloog et al. 2012 & 2014), modeled based on CMAQ/average of multiple monitors (Bravo et al. 2017).

Worse/less precise exposure methods: One monitor per city (Basagna et al. 2015, Burnett et al. 1997, Slaughter et al. 2005, Winquist et al. 2012, Peel et al. 2005, Tolbert et al. 2007, Darrow et al. 2011).

Figure 11-1:

Better/more precise exposure methods: Daily predictions based on satellite, monitoring data, and LUR (Kloog et al. 2013, Lee et al. 2015, Di et al. 2017, Shi et al. 2015).

Worse/less precise exposure methods: one monitor per city/air basin/area (Burnett & Goldberg 2003, Klemm & Mason 2003, , Young et al. 2017, Ueda et al. 2009), 10 monitors averaged across an entire country (Janssen et al. 2013).

Thank you for the question, I hope that this response helps to clarify my comments."

-Aaron

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-----Original Message-----

From: Julie Goodman

Sent: Saturday, March 16, 2019 2:26 PM

To: Yeow, Aaron <Yeow.Aaron@epa.gov>

Subject: Question for Sabine Lange

Aaron,

I was wondering if it would be possible to ask Sabine Lange a question. On page A-102, she talks about more and less precise exposure estimates. I was wondering if she could clarify how she determined which types of estimates were more or less precise.

Thank you.

Julie

Julie E. Goodman, Ph.D., DABT, FACE, ATS | Principal

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