

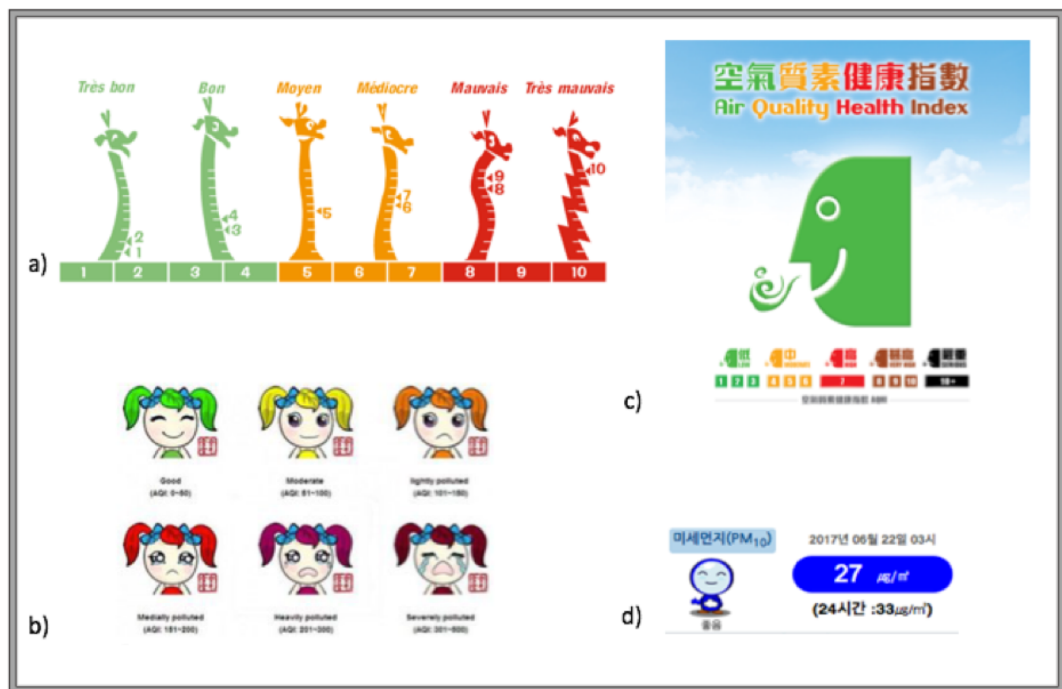


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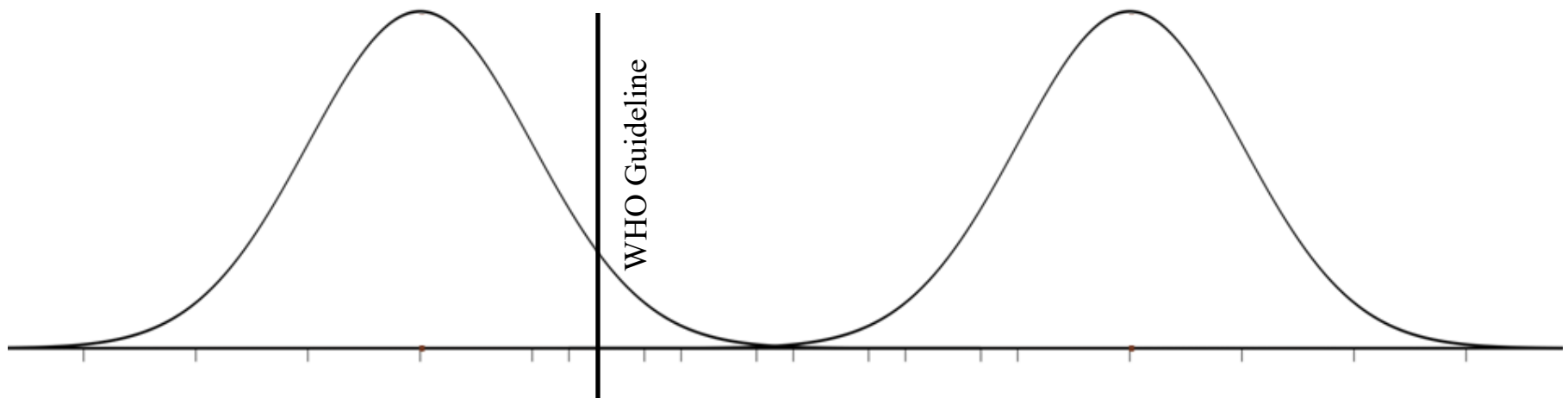
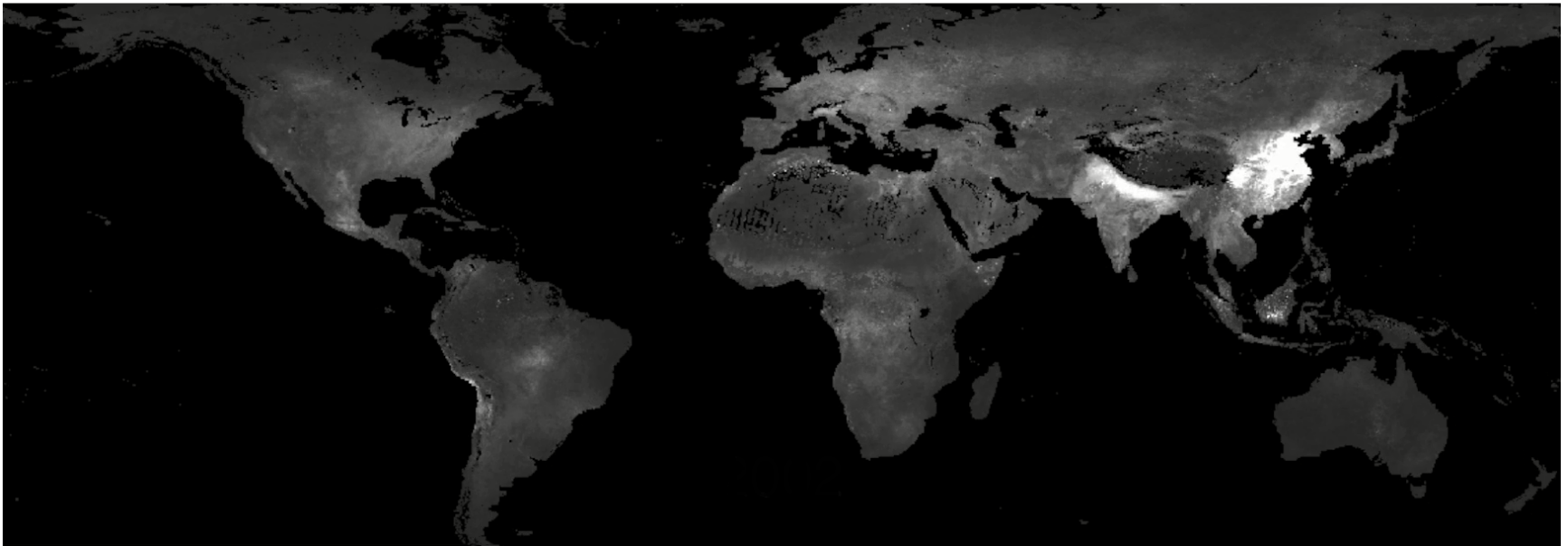
Kevin Cromar, PhD
Director, Air Quality Program

Spain	Italy	Germany	Switzerland	France	United Kingdom	Netherland
Good	No restriction	Very Good (1)	Very weak (1)	Very good (1)	Low (1)	Low (1)
				Very good (2)	Low (1)	Low (2)
		Good (2)	Weak (2)	Good (3)	Low (3)	Low (3)
Admissible	Active limitation from tomorrow			Good (4)	Moderate (4)	Moderate (4)
		Satisfactory (3)	Moderate (3)	Medium (5)	Moderate (5)	Moderate (5)
		Sufficient (4)	Important (4)	Poor (6)	Moderate (6)	Moderate (6)
Unhealthy	Active limitation – Level 1			Poor (7)	High (7)	Insufficient (7)
				Bad (8)	High (8)	Insufficient (8)
		Bad (5)	High (5)	Bad (9)	High (9)	Insufficient (9)
Very Unhealthy	Active limitation – Level 2					High (10)
		Very Bad (6)	Very high (6)	Very Bad (10)	Very High (10)	Very High (11)



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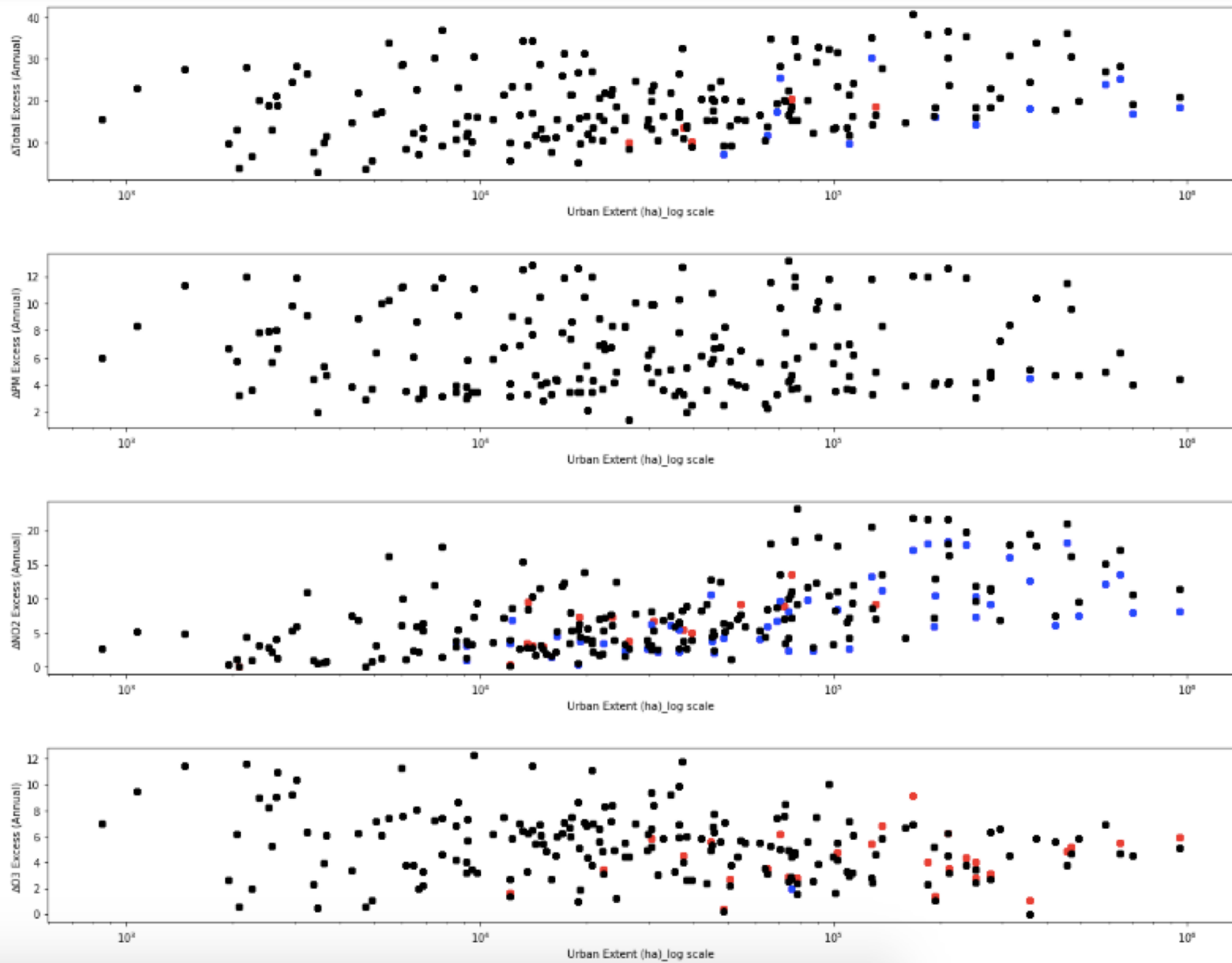


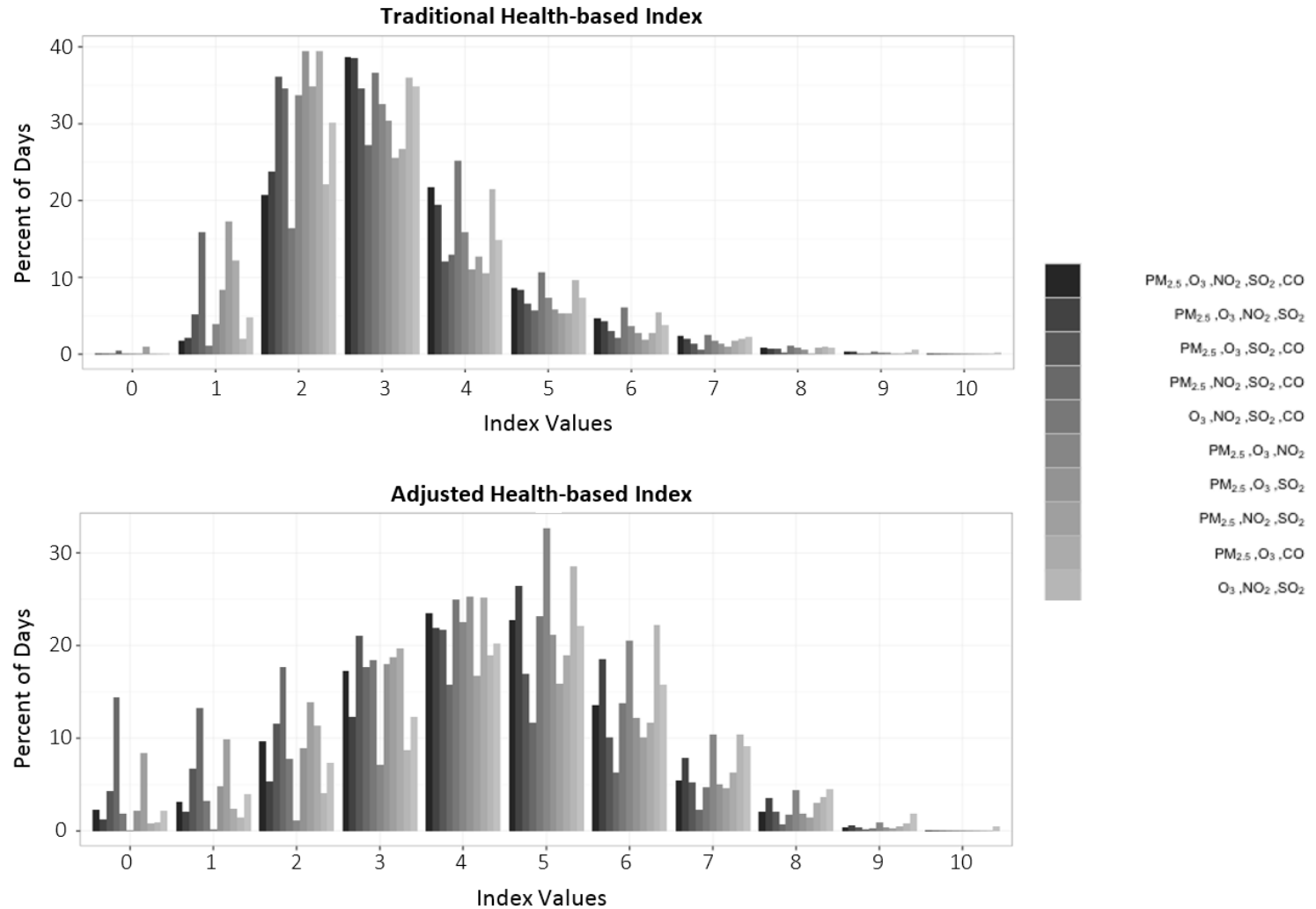
Good	Satisfactory	Moderate	Poor	Very Poor	Severe
0-50	51-100	101-200	201-300	301-400	>401



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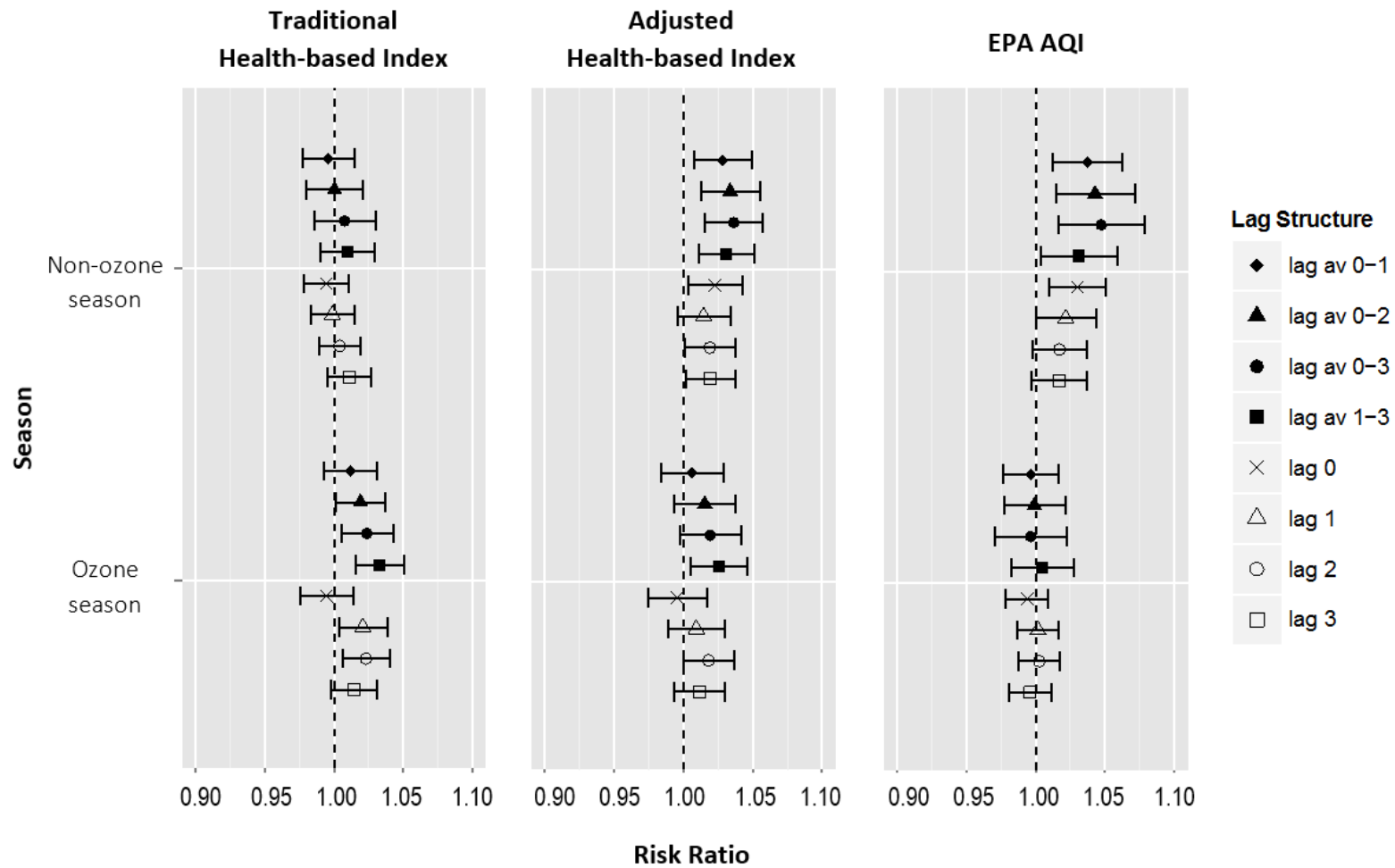
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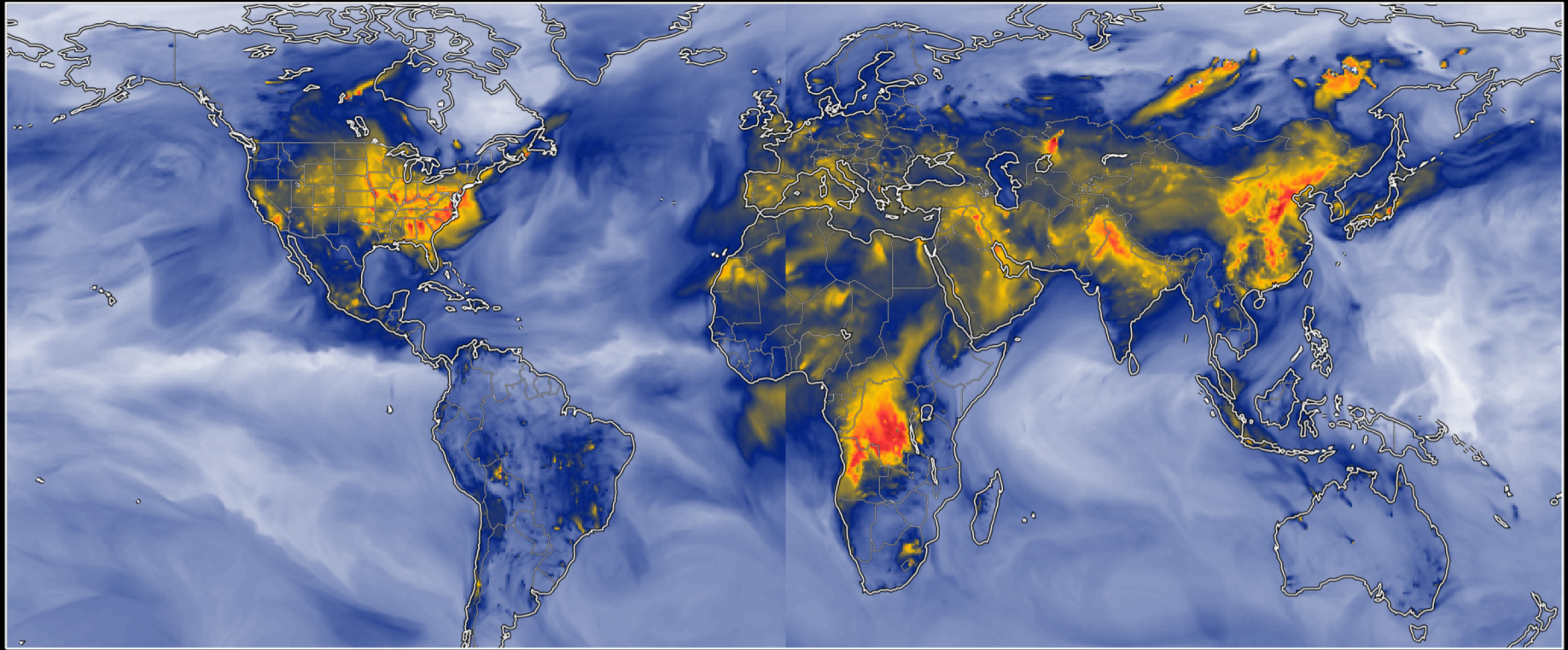




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GEOS-CF 1/4°

GEOS-Chem v11-02



GMAO

Global Modeling and Assimilation Office
NASA Goddard Space Flight Center



Greater health risks



Atmospheric Chemistry Modeling Group
Harvard University



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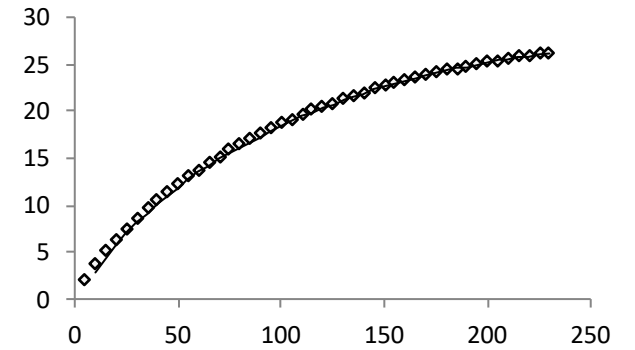
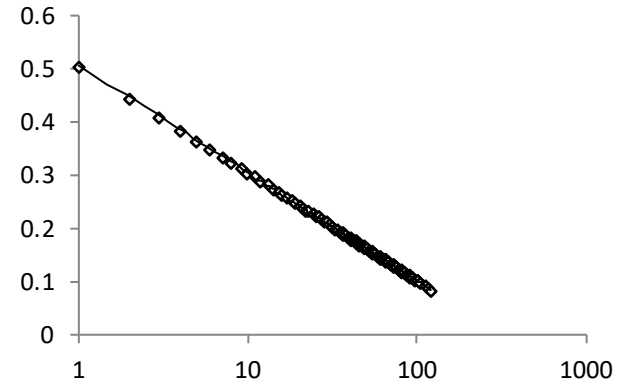
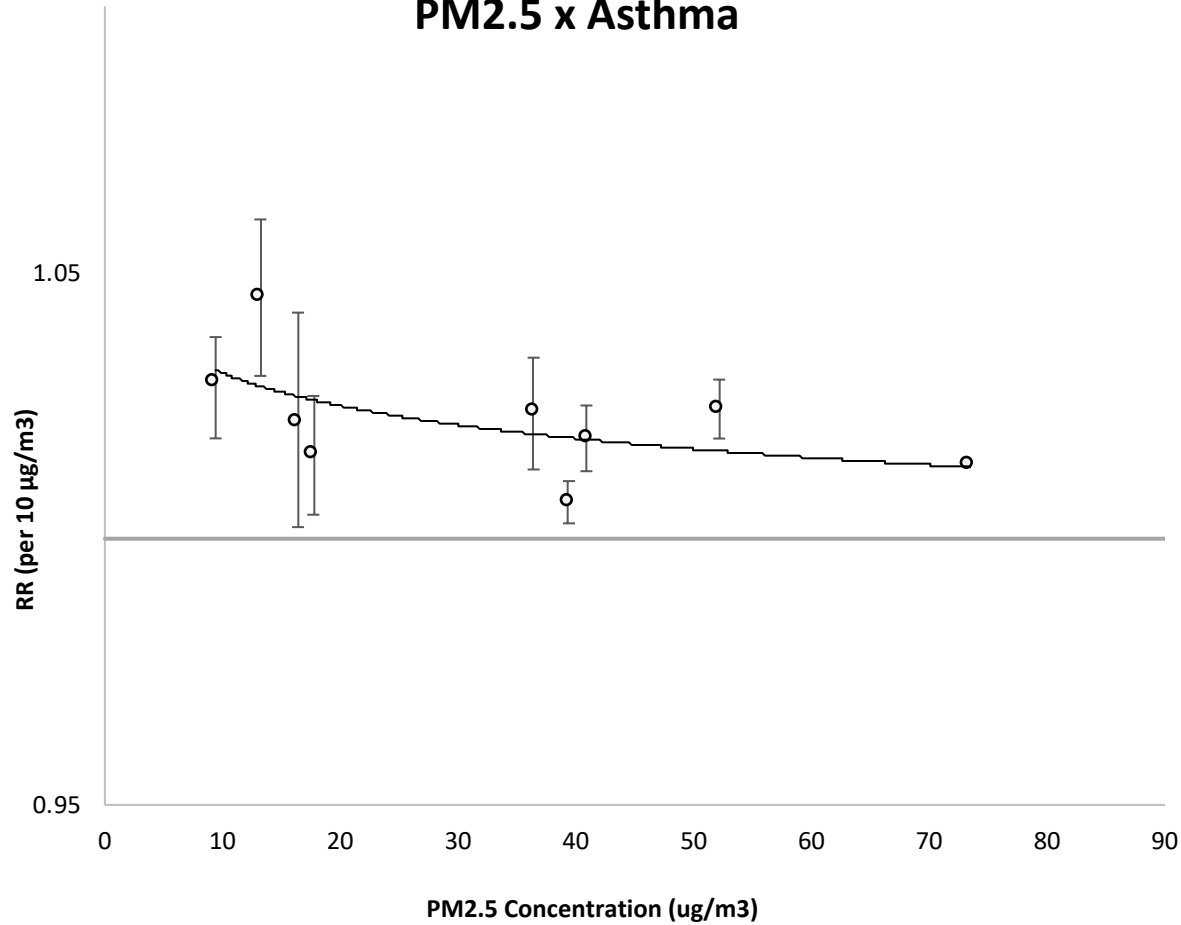
Initial search terms were run through the Ovid Medline, Embase, CINAHL, Wiley Cochrane, CENTRAL, and Web of Science. Terms included air pollution terminology, specific respiratory outcomes and a list of countries in order to capture any studies with data from developing nations.

The resulting 5,868 results were screened using Covidence online software, restricting results to systematic reviews and meta-analyses. Title and abstract screening. Remaining articles were downloaded and a full text screening was performed to remove remaining mortality-only studies, as well as articles not reporting on one of the four focus pollutants ($\text{PM}_{2.5}$, O_3 , NO_2 , SO_2) or not providing relative risks by continuous pollutant concentration change.

32 systematic reviews and meta-analyses were extracted and from these, a total of 75 relevant studies were pulled and summarized in a preliminary database.



PM2.5 x Asthma



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$$\text{PM}_{2.5}: -0.088(x) * (\ln(x) - 1) + 0.506(x),$$

where x is the 24-hour average in $\mu\text{g}/\text{m}^3$

$$\text{O}_3: 0.299(x) - 8.97,$$

where x is the 8-hour maximum concentration in ppb

$$\text{NO}_2: -0.181(x) * (\ln(x) - 1) + 1.057(x),$$

where x is the 24-hour concentration in ppb

$$\text{SO}_2: [-0.336(x) * (\ln(x) - 1) + 1.761(x)] / 3,$$

where x is the 24-hour concentration in ppb



