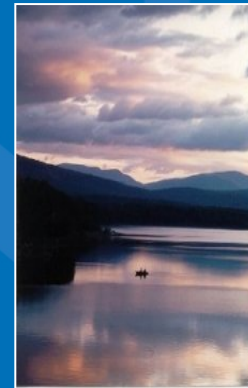


ELAPSE Results in the Context of EPA's NAAQS Program



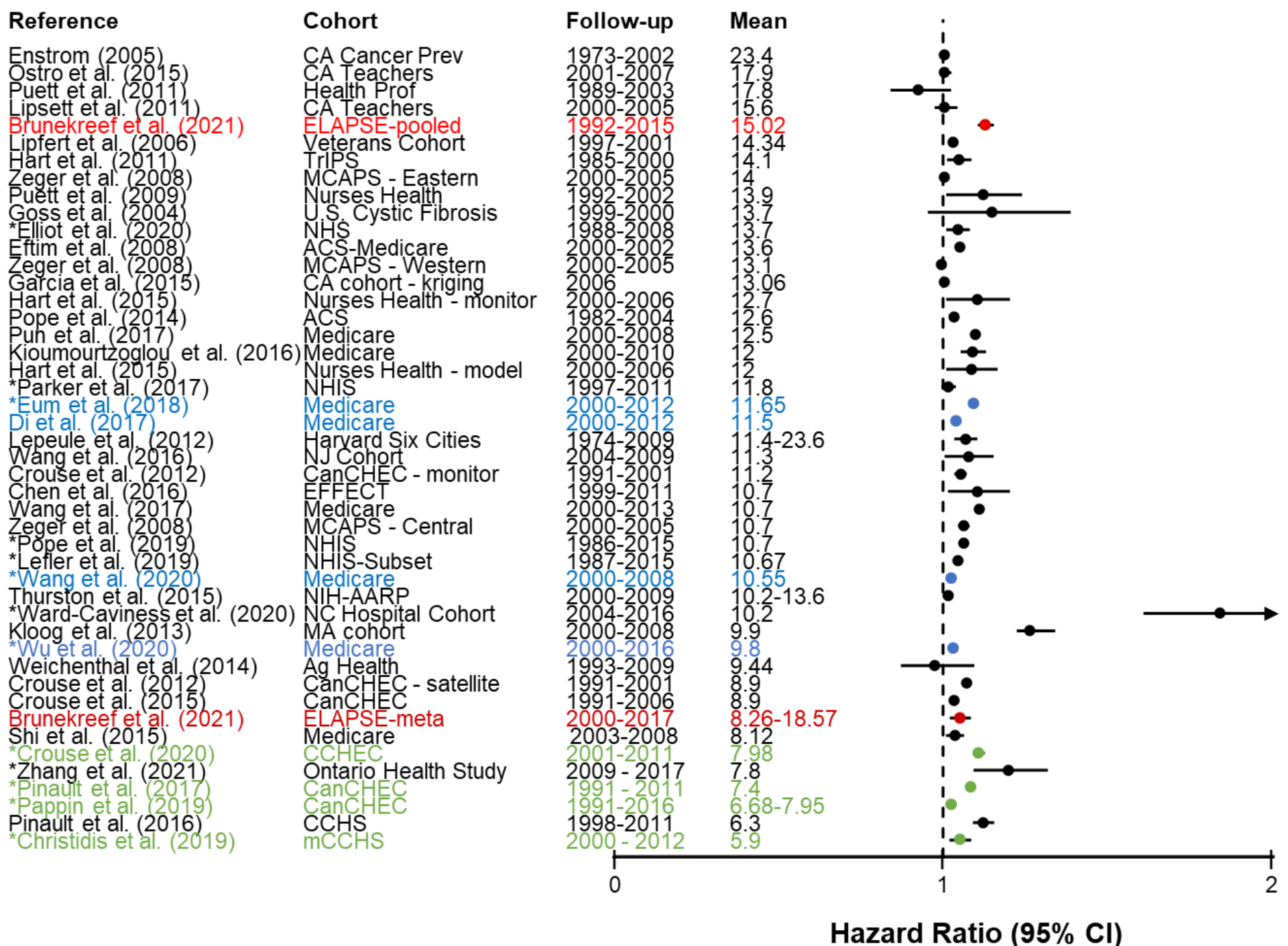
TOM LUBEN, PHD MSPH

Disclaimer: The views expressed in this presentation are those of the author and do not necessarily represent the views or policies of the U.S. Environmental Protection Agency.

Associations between long-term PM2.5 exposure and total (all cause or nonaccidental) mortality in recent North American cohorts and the ELAPSE pooled cohort.

ELAPSE Results are in Red
 MEDICARE (U.S) Results are in Blue
 MAPLE (Canadian) Results are in Green

*included in the 2021 Supplement (External Review Draft) to the 2019 PM ISA
 Associations are presented per 5 µg/m3 increase in pollutant concentration.
 Circles represent point estimates; horizontal lines represent 95% confidence intervals

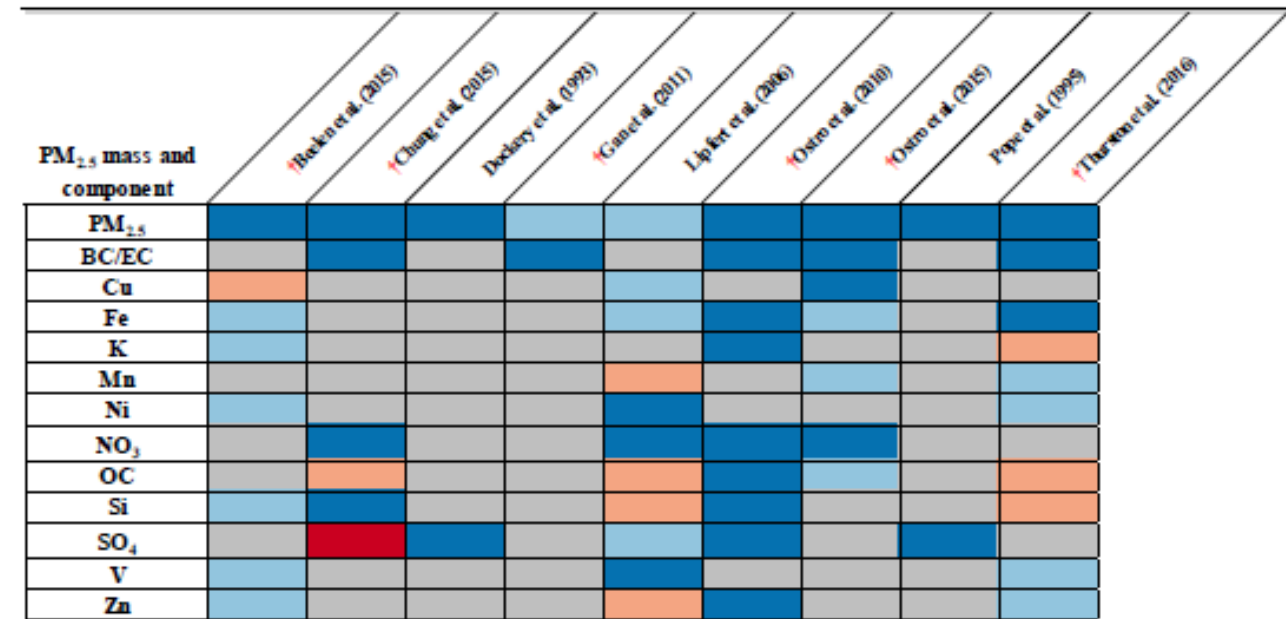


ELAPSE BC and PM2.5 Results

	Increment used in report	25 th -ile	75 th -ile	IQR	HR with increment used in report	HR with IQR increment
PM2.5	5	12.84	17.32	4.48	1.13 (1.11, 1.16)	1.12 (1.09,1.14)
BC	0.5	1.29	1.79	0.5	1.08 (1.07, 1.10)	1.08 (1.07, 1.10)

Comparison of PM2.5 and BC results in 2019 PM ISA

- “not sufficient evidence to differentiate components or sources more closely related to health outcomes when compared to PM2.5”
- “no individual PM2.5 component or source is a better predictor of mortality than PM2.5 mass”



BC = black carbon; Cu = copper; EC = elemental carbon; Fe = iron; K = potassium; Mn = manganese; Ni = nickel; NO₃ = nitrate; OC = organic carbon; PM_{2.5} = particulate matter with a nominal mean aerodynamic diameter less than or equal to 2.5 μm; Si = silicon; SO₄ = sulfate; V = vanadium; Zn = zinc.

Note: †PM_{2.5} component studies published since the 2009 PM ISA. Results are for total (nonaccidental) mortality except for [Gan et al. \(2011\)](#), who examine cardiovascular disease mortality. Dark blue = study reported statistically significant positive association; light blue = study reported a positive association regardless of width of confidence intervals; light orange = study reported null or negative association; red = study reported statistically significant negative association; gray = study did not examine individual component. Only those PM_{2.5} components that were examined in at least three studies are included in this figure.

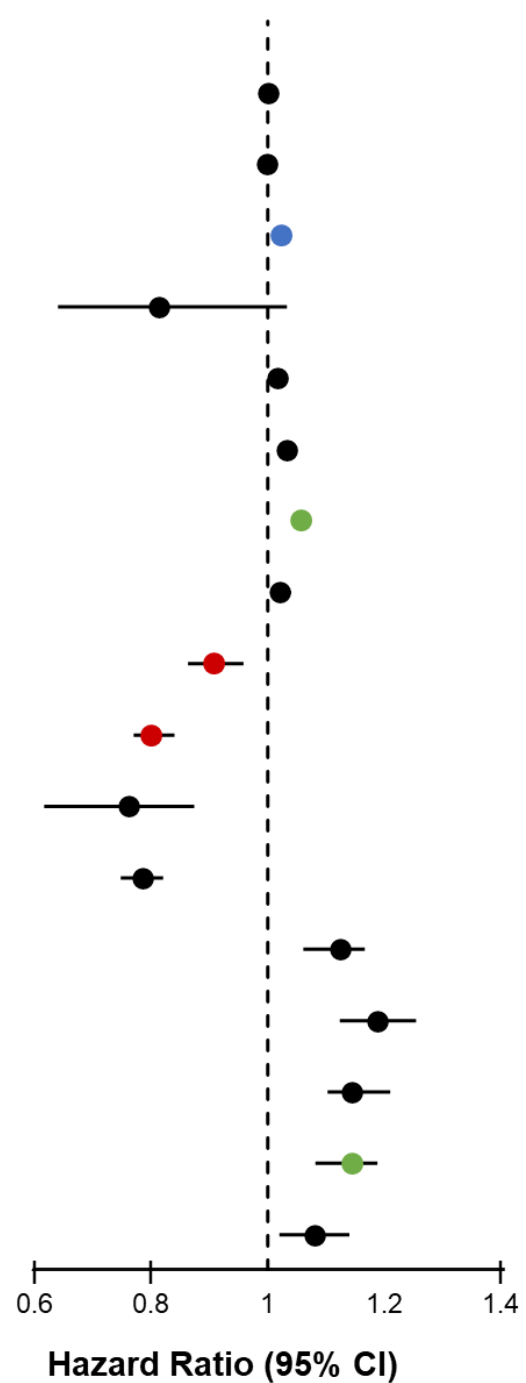
Figure 11-24 Heat map of associations observed between PM_{2.5} and PM_{2.5} components and mortality.

Associations between long-term ozone exposure and total (all cause or nonaccidental) mortality in recent cohorts and the ELAPSE pooled cohort.

ELAPSE Results are in Red
 MEDICARE (U.S) Results are in Blue
 MAPLE (Canadian) Results are in Green

Associations are presented per 10 ppb increase in pollutant concentration.
 Circles represent point estimates; horizontal lines represent 95% confidence intervals

Reference	Cohort	Years	Mean (ppb)
Jerrett et al. 2009	ACS	1982-2000	57.5
Jerrett et al. 2013	ACS	1982-2000	50.35
Di et al. 2017	Medicare	2000-2012	46.3
Bentayeb et al. 2015	Gazel	1989-2013	40.5
Eckel et al. 2016	CA Cancer Cohort	1988-2011	40.2
Crouse et al. 2015	CanCHEC	1991-2006	39.6
Weichenthal et al. 2017	CanCHEC	1991-2011	38.29
Turner et al. 2016	ACS	1982-2004	38.2
Bruneekreef et al. 2021	ELAPSE-Meta	2000-2017	34.38-47.39
Bruneekreef et al. 2021	ELAPSE-Pooled	1992-2015	33.7
Carey et al. 2013	English Medical Practice	2003-2007	25.85
Kim et al. 2017	NHIS-NSC	2007-2013	19.93
Zanobetti & Schwartz, 2011	Medicare - Heart Failure	1985-2006	15.6-71.4
	Medicare - MI		
	Medicare - Diabetes		
	Medicare - COPD		
Cakmak et al. 2018	CanCHEC	1991-2011	15.0-43.0



Associations between long-term NO₂/NO_x exposure and total (all cause or nonaccidental) mortality in recent cohorts and the ELAPSE pooled cohort.

ELAPSE Results are in Red

Associations are presented per 10 ppb (NO₂) and 20 ppb (NO_x) increase in pollutant concentration. Circles (NO₂) and triangles (NO_x) represent point estimates; horizontal lines represent 95% confidence intervals

*NO_x in ug/m³, HR not standardized

