

European perspective: How has scientific evidence helped inform air quality policy?

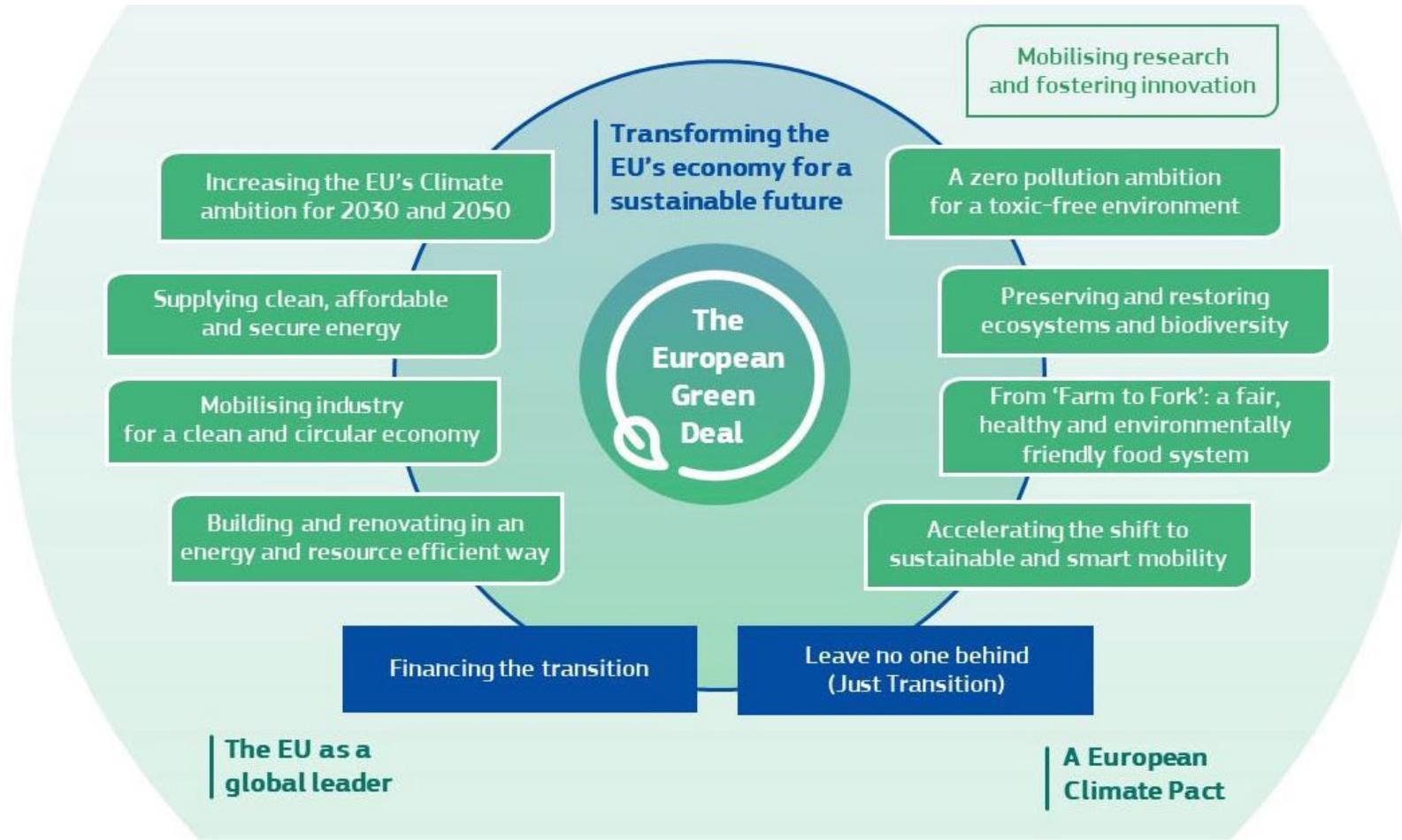
HEI/HEAL/CSD Southeast Europe webinar, February 2, 2022

Hanna Boogaard, Health Effects Institute



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There is a lot going on in Europe...



The **European Green Deal** was published in 2019.

This is the European Commission's response to the climate and environmental challenges Europe (and the world) is facing.

The European Green Deal has the overarching aim of reducing sources of carbon dioxide sufficiently to make Europe **climate neutral by 2050**.

This requires bold actions at all levels and across **all** sectors, e.g., energy, buildings, industry, transport.

There is a lot going on in Europe...

Key actions in the Zero Pollution Action Plan

➤ Improve human health:

- ✓ Reduce air and noise pollution
- ✓ Reduce health inequalities
- ✓ Support urban zero pollution action

➤ Boost change across society:

- ✓ Showcase zero pollution solutions for buildings
- ✓ Create living labs for green digital solutions

The **Zero Pollution Action Plan** was published in 2021.

It puts **pollution prevention** first.

ENVIRONMENT

Adopted Green Agenda Action Plan for Western Balkans brings EUR 9 billion in grants, 2024

➤ Reduce pollution from production and consumption:

- ✓ Reduce pollution from industrial installations
- ✓ Reduce pollution from agriculture
- ✓ Encourage the least polluting options for consumers

➤ promote change globally

➤ Promote digital solutions for zero pollution

➤ Stimulate knowledge and innovation

Ambitious targets by **2030** includes reduction of premature deaths caused by air pollution with 55%.

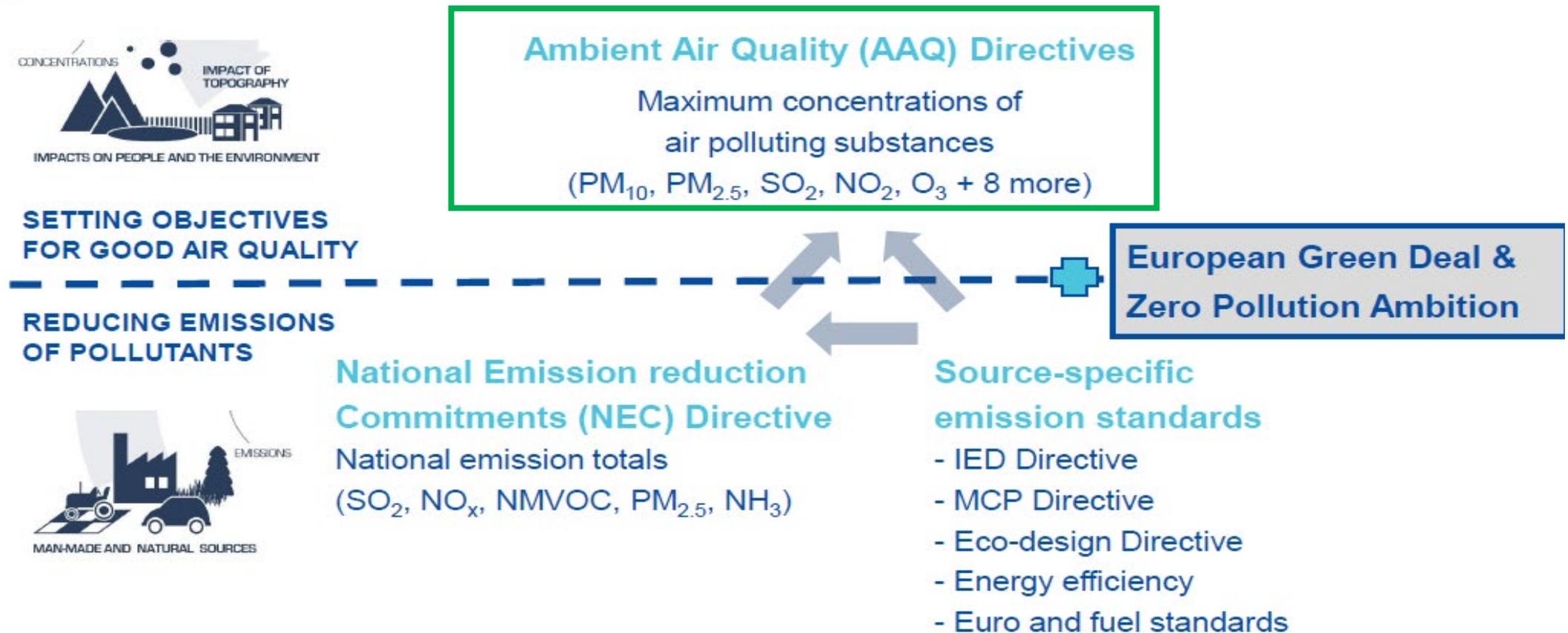
2050:

A HEALTHY PLANET FOR ALL



Revisions of the Ambient Air Quality Directives

EU Air Policy Framework



Clean Air Milestones 2020 to 2023 (indicative)

Fitness Check
(published in Nov 2019)

Expert consultation
(on monitoring, modelling, plans)

Council discussions of
legislative proposal
(air quality - revision of EU rules)

Council Conclusions

WHO Guidelines publication
(postponed to II/2021)

Submission of Second
National Air Pollution Control
Programmes begins

NEC Implementation Report
(Commission Communication)

Zero Pollution Action Plan

Finalisation of
Impact Assessment (air quality)



EEA Air Quality Report 2020

EEA Air Quality Briefings 2021

EEA Air Quality Briefings 2022

EEA Air Quality Briefings 2023

Inception Impact Assessment
(revising the Air Quality Directive)

WHO Guidelines publication
(22 September 2021)

Adoption: legislative proposal
(air quality - revision of EU rules)

4th EU Clean Air Forum
(location to be determined)

Second Clean Air Outlook
(Commission Report)

Public consultation: air quality
(air quality - revision of EU rules)

Review Gothenburg Protocol
(Air Convention)

3rd EU Clean Air Forum
(18 & 19 November in Madrid)

Third Clean Air Outlook
(Commission Report)

What is new in the WHO Air Quality Guidelines 2021?



- Marked increase in the quality and quantity of evidence
- Systematic review of the accumulated evidence; all reviews published in a Special issue of *Environment International*
- Consistent methodology
- **Most of the updated health-based AQG's are considerably lower than 15 years ago.**
- **Interim targets** to guide reduction efforts for the achievement of the air quality guideline levels
- New features: AQG for long-term O₃, good practise statements for ultrafine particles, black/elemental carbon and sand/dust storms

WHO Air Quality Guidelines and EU standards

Pollutants	2005 WHO Guidelines	2021 WHO Guidelines	EU Current Standards	EU New Standards?
PM ₁₀ (year)	20 µg/m ³	15 µg/m ³	40 µg/m ³	?
PM ₁₀ (day)	50 µg/m ³	45 µg/m ³	50 µg/m ³	?
PM_{2.5} (year)	10 µg/m³	5 µg/m³	25 µg/m³	?
PM _{2.5} (day)	25 µg/m ³	15 µg/m ³	-	?
NO₂ (year)	40 µg/m³	10 µg/m³	40 µg/m³	?
NO ₂ (day)	-	25 µg/m ³	50 µg/m ³	?
O ₃ (8-hour mean)	100 µg/m ³	100 µg/m ³	120 µg/m ³	?
O ₃ (peak season mean)	-	60 µg/m ³	-	?

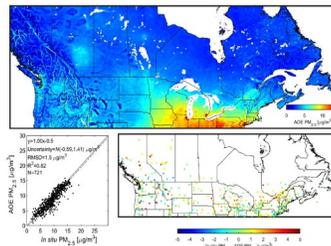
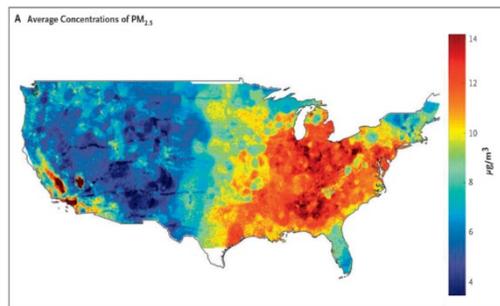
HEI Research Program to examine the Health Effects of Low Levels of Air Pollution

- At what ambient levels can we observe these effects?
- What does the exposure-response function look like at the low end of exposure?

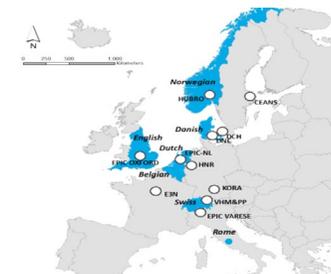
Three HEI studies, with **key** features:

- Very large populations, with millions in the US, Canada, and Europe; administrative and traditional cohorts
- High quality exposure assessment models at high spatial resolutions, using data from satellites, ground level monitors, other sources, and modeling
- Development and application of novel statistical methods

Medicare Cohort



ELAPSE



The European study ELAPSE

The European study was published in **September 2021**.

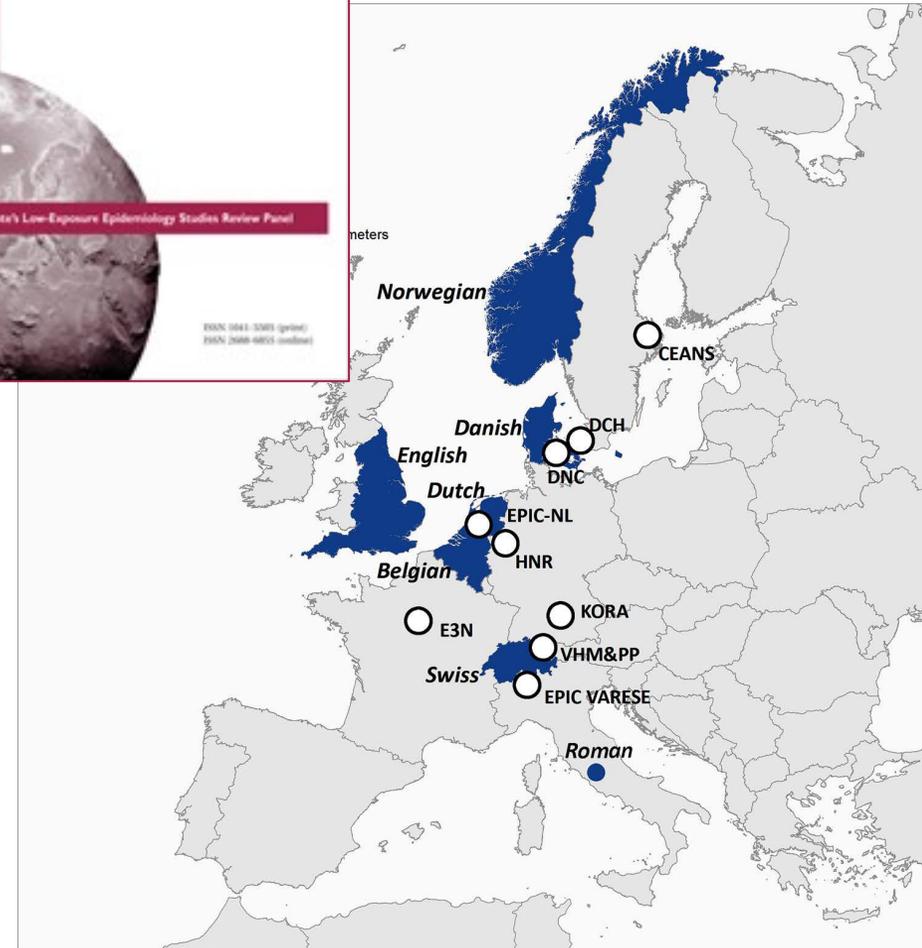
Analyzed a pooled cohort of 9 well-characterized cohorts and 7 large administrative cohorts individually, followed by a meta-analysis.

In 11 European countries

- Mortality and morbidity
- Long term exposure to $PM_{2,5}$, but also NO_2 , Black carbon and ozone, modeled at residential address level

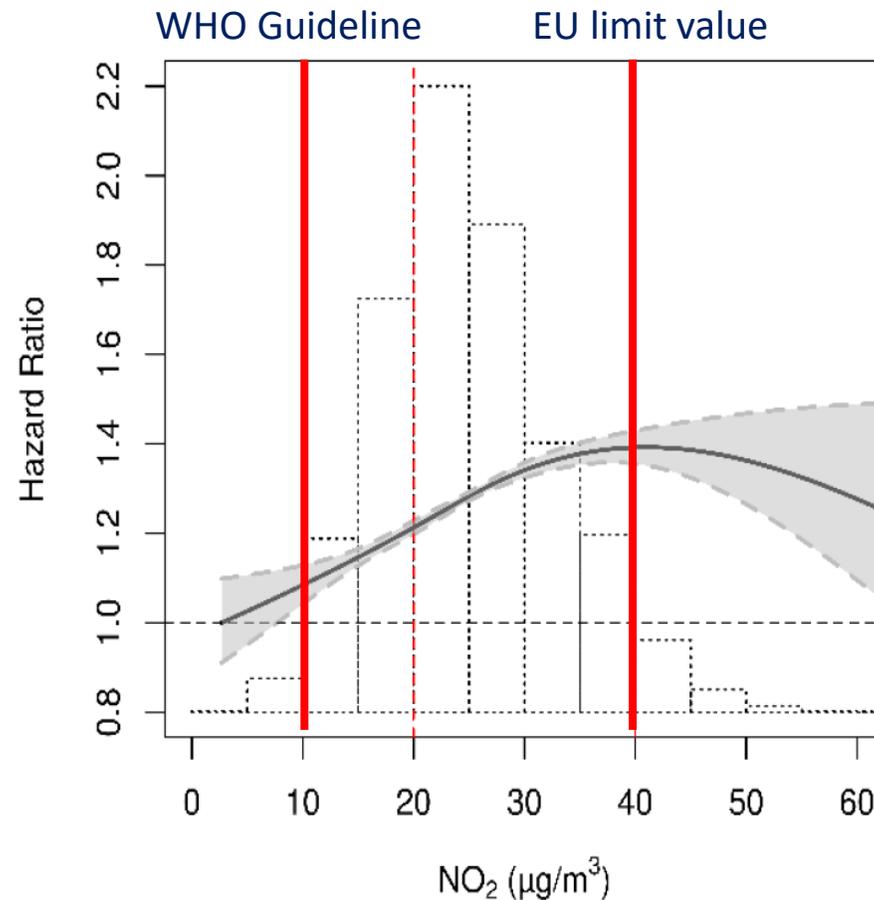
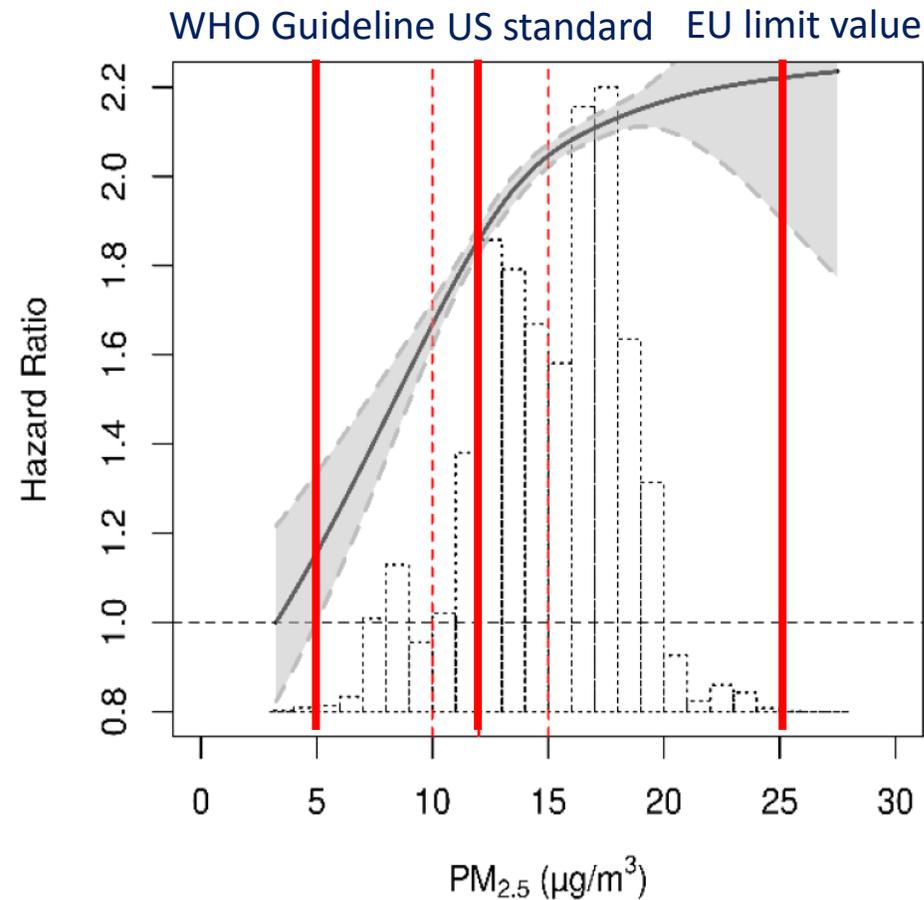


Figure 1. Study cohorts. Shaded regions indicate the areas included in the administrative cohorts; open circles indicate the cohorts included in the pooled cohort.



The European ELAPSE Study

All-cause mortality in the pooled cohort (N~330,000)



- Evidence for an association between mortality and air pollution exposure at levels below the current EU standards
- No observable thresholds
- Steeper slopes at lower exposures
- Findings robust in multipollutant models

Conclusions US and Canadian reports

	<p>RESEARCH REPORT</p>
<p>HEALTH EFFECTS INSTITUTE Number 200 November 2019</p>	<p>Assessing Adverse Health Effects of Long-Term Exposure to Low Levels of Ambient Air Pollution: Phase 1</p> <p>Francesca Dominici, Joel Schwartz, Qian Di, Danielle Braun, Christine Choirat, and Antonella Zanobetti</p>

	<p>RESEARCH REPORT</p>
<p>HEALTH EFFECTS INSTITUTE Number 211 January 2022</p>	<p>Assessing Adverse Health Effects of Long-Term Exposure to Low Levels of Ambient Air Pollution: Implementation of Causal Inference Methods</p> <p>Francesca Dominici, Antonella Zanobetti, Joel Schwartz, Danielle Braun, Ben Sabath, and Xiao Wu</p>

	<p>RESEARCH REPORT</p>
<p>HEALTH EFFECTS INSTITUTE Number 203 November 2019</p>	<p>Mortality–Air Pollution Associations in Low-Exposure Environments (MAPLE): Phase 1</p> <p>Michael Brauer, Jeffrey R. Brook, Tanya Christidis, Yen Chu, Dan L. Crouse, Anders Erickson, Perry Hystad, Chi Li, Randall V. Martin, Jun Meng, Amanda J. Pappin, Lauren L. Pinault, Michael Tjepkema, Aaron van Donkelaar, Scott Weichenthal, and Richard T. Burnett</p>

Evidence for an association between mortality and PM_{2.5} exposure at levels below the current US National Air Quality Standards (<12 µg/m³) with no observable thresholds



January 21-22, 2020

Square Brussels Convention Centre,
Coudenberg 3, 1000 Brussels, Belgium

Early plans for another joint meeting and European Parliament Briefing in Brussels in late Spring 2022! Please stay tuned....



EUROPEAN RESPIRATORY *journal*

FLAGSHIP SCIENTIFIC JOURNAL OF ERS

Air pollution and health: recent advances in air pollution epidemiology to inform the European Green Deal: a joint workshop report of ERS, WHO, ISEE and HEI

Eur Respir J 2020; 56: 2002575

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Clean Air Milestones 2020 to 2023 (indicative)



THANK YOU!

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Check out our website www.healtheffects.org



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