

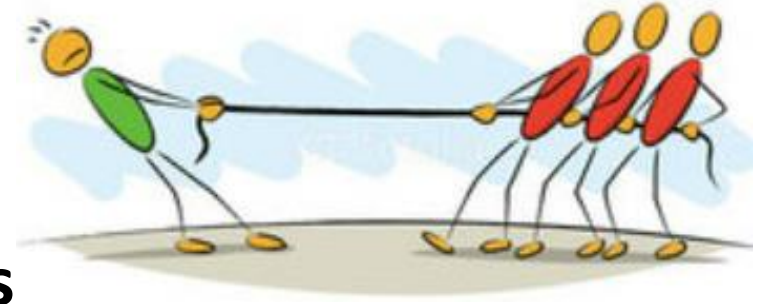
# Inquinamento e salute: WHO AQGs e la discussione sulla proposta di EU AAQD.

Francesco Forastiere

# A busy period of science-policy interaction

- **September 2021:** Publication of WHO Air Quality Guidelines, with support of the Medical Societies
- **January 2022:** Publication of ELAPSE results, administrative cohorts (Stafoggia et al, 2022)
- **June 2022:** Publication of the HEI Traffic review
- **August 2022:** Proposed analyses of the mortality impacts of PM2.5 and NO2 (Hoffmann et al, 2022)
- **October 2022.** Proposal of the new EU Ambient Air Quality Directive
- **January 2023:** Clean Air in Europe for All: A Call for More Ambitious Action (Boogaard et al, 2023)
- **February March 2023:** Discussions and Amendments

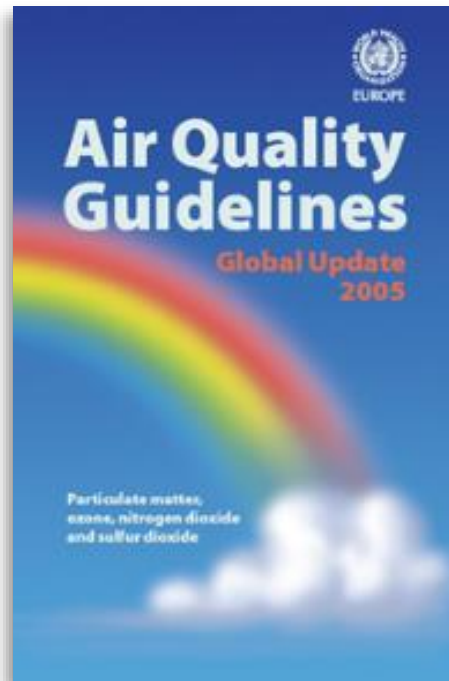




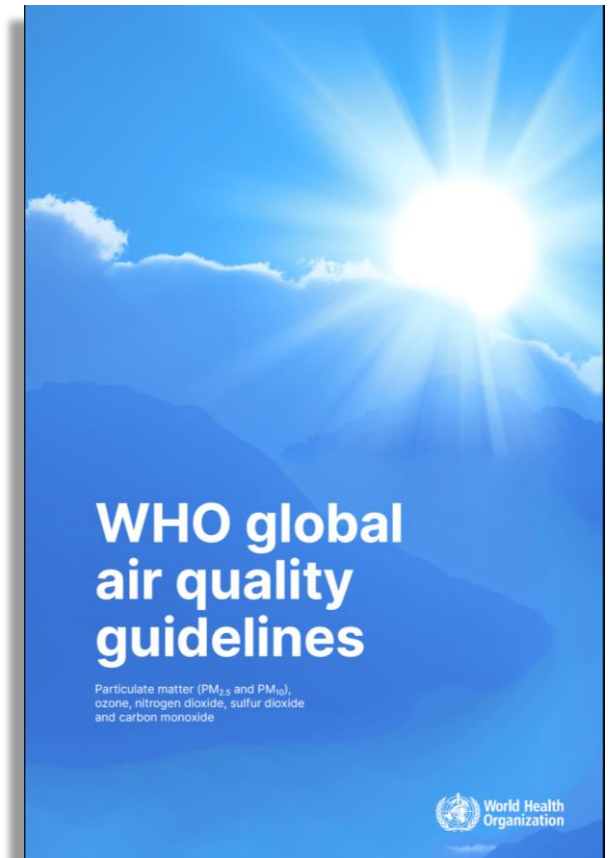
- **The update of the WHO Global Air Quality Guidelines**

- Approach to assessing the certainty of evidence from systematic reviews informing WHO global air quality guidelines
- **Systematic reviews published on Env Int in 2020**
- **Report published in September 2021**

AQG – Global update 2005



WHO global AQGs 2021



LIVE acensione Servizio streaming dal vivo personalizzato



International Journal of Public Health  
doi: 10.3389/ijph.2021.1604465



International Journal of Public Health  
COMMENTARY  
published: 23 September 2021  
doi: 10.3389/ijph.2021.1604465



WHO Air Quality Guidelines 2021 – Aiming for healthier air for all

A joint statement by medical, public health, scientific societies and patient representative organisations > 100 endorsements!

## WHO Air Quality Guidelines 2021–Aiming for Healthier Air for all: A Joint Statement by Medical, Public Health, Scientific Societies and Patient Representative Organisations

Barbara Hoffmann<sup>1\*</sup>, Hanna Boogaard<sup>2</sup>, Audrey de Nazelle<sup>3</sup>, Zorana J. Andersen<sup>4</sup>, Michael Abramson<sup>5</sup>, Michael Brauer<sup>6</sup>, Bert Brunekreef<sup>7</sup>, Francesco Forastiere<sup>8</sup>, Wei Huang<sup>9</sup>, Haidong Kan<sup>9</sup>, Joel D. Kaufman<sup>10</sup>, Klea Katsouyanni<sup>3,11</sup>, Michal Krzyzanowski<sup>3</sup>, Nino Kuenzli<sup>12</sup>, Francine Laden<sup>13</sup>, Mark Nieuwenhuijsen<sup>14</sup>, Adetoun Mustapha<sup>3,15</sup>, Pippa Powell<sup>16</sup>, Mary Rice<sup>13</sup>, Aina Roca-Barceló<sup>3</sup>, Charlotte J. Roscoe<sup>13</sup>, Agnes Soares<sup>17</sup>, Kurt Straif<sup>18</sup> and George Thurston<sup>19</sup>

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**Keywords:** air pollution, WHO Air Quality Guidelines, health effects, policy implications, average population exposure

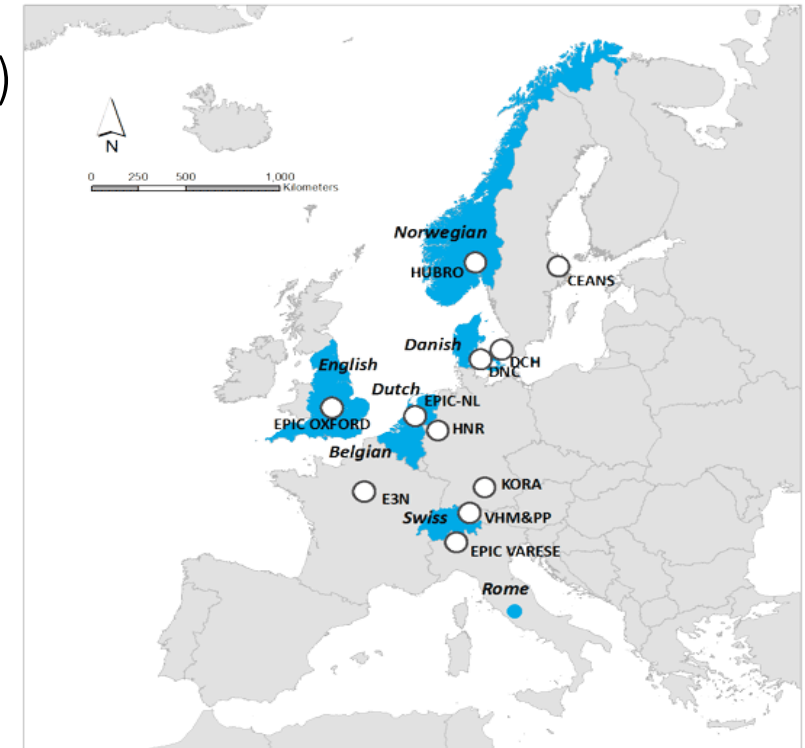


ERS Website: <https://www.ersnet.org/news-and-features/news/urge-implement-air-pollution-policies-who-aggs/>



# ELAPSE: Effects of Low-Level Air Pollution: a Study in Europe

- Mortality, lung cancer incidence, CVD events, respiratory disease
- Advanced exposure modeling combining LUR, CTM, AIRBASE, satellite observations
- Modeling for PM<sub>2.5</sub>, NO<sub>2</sub>, BC, and O<sub>3</sub> with high resolution
- Two arms of the study:
  - Pooling of several well-examined European cohorts (ESCAPE)
  - ~ 380,000 subjects
  - Seven large administrative/national cohorts in UK, NO, DK, IT, NL, CH, B
  - ~ 28,000,000 subjects, no pooling



# ELAPSE Administrative cohorts (Stafoggia et al, 2022)

	Increment	Hazard ratio (95% CI)			
		Non-accidental mortality	Cardiovascular mortality	Non-malignant respiratory mortality	Lung cancer mortality
PM <sub>2.5</sub>	5 µg/m <sup>3</sup>	1.053 (1.021-1.085)	1.041 (1.010-1.072)	1.064 (1.013-1.118)	1.102 (1.036-1.172)
NO <sub>2</sub>	10 µg/m <sup>3</sup>	1.044 (1.019-1.069)	1.025 (1.006-1.044)	1.058 (1.024-1.093)	1.093 (1.053-1.134)
Black carbon	0.5 × 10 <sup>-5</sup> /m <sup>3</sup>	1.039 (1.018-1.059)	1.022 (1.004-1.040)	1.053 (1.021-1.085)	1.078 (1.038-1.118)
O <sub>3</sub>	10 µg/m <sup>3</sup>	0.953 (0.929-0.979)	0.976 (0.954-0.998)	0.948 (0.910-0.988)	0.924 (0.887-0.963)

After indirect adjustment for smoking and BMI

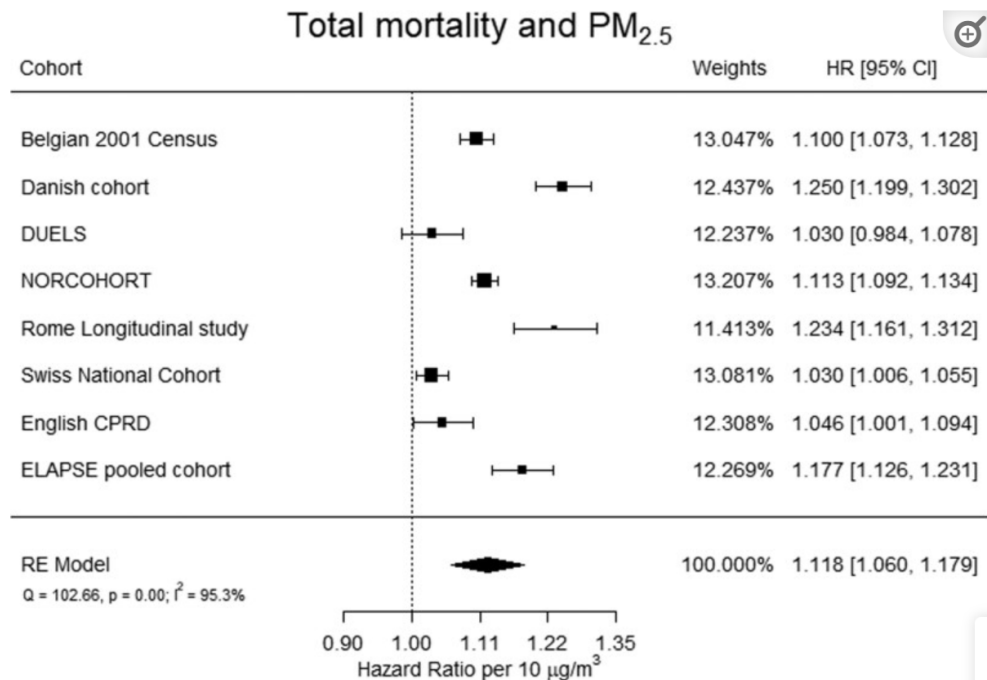
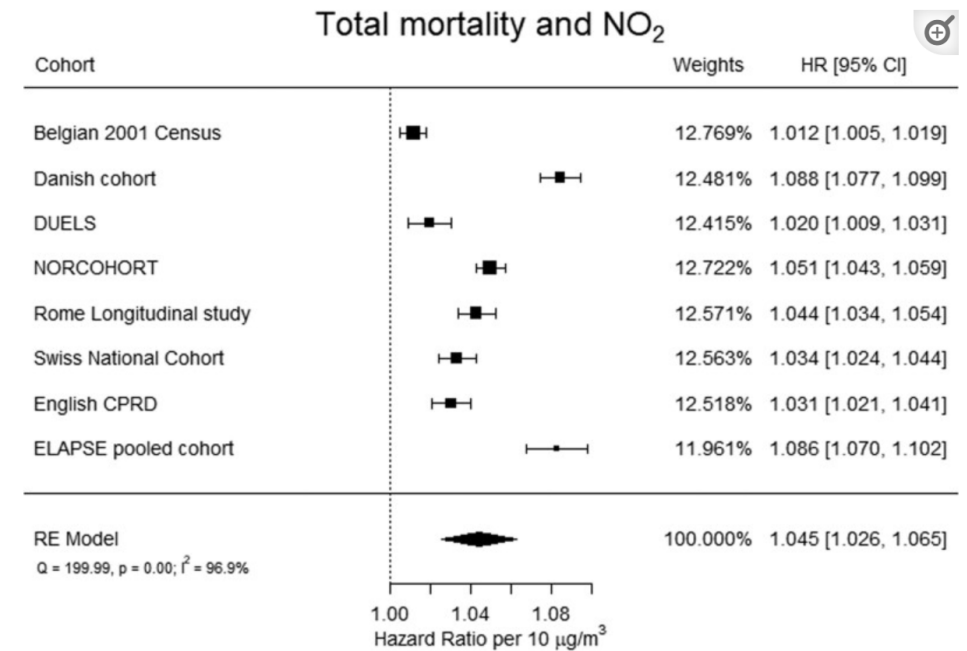


Figure 2.



# The New HEI Traffic Review, June 2022

- <https://www.healtheffects.org/meeting/new-hei-review-webinar-health-effects-traffic-related-air-pollution>



HEALTH  
EFFECTS  
INSTITUTE

Number 23  
June 2022

SPECIAL REPORT

## Systematic Review and Meta-analysis of Selected Health Effects of Long-Term Exposure to Traffic-Related Air Pollution

HEI Panel on the Health Effects of Long-Term Exposure to  
Traffic-Related Air Pollution

# HEI Traffic Review

**Executive Summary Table.** Overall Confidence Assessment and Meta-analytical Summary Estimates of Associations Between Long-Term Exposure to the Most Common Traffic-Related Air Pollutants (NO<sub>2</sub>, EC, PM<sub>2.5</sub>) and Health Outcomes (NOTE: the individual pollutants are considered indicators of TRAP)

Health Outcome	Overall Confidence Assessment	NO <sub>2</sub> per 10-μg/m <sup>3</sup>		EC per 1-μg/m <sup>3</sup>		PM <sub>2.5</sub> per 5-μg/m <sup>3</sup>	
		<i>N</i>	Relative Risk (95% CI)	<i>N</i>	Relative Risk (95% CI)	<i>N</i>	Relative Risk (95% CI)
<b>Mortality</b>							
All-cause	High	11	1.04 (1.01–1.06)	11	1.02 (1.00–1.04)	12	1.03 (1.01–1.05)
Circulatory	High	10	1.04 (1.00–1.09)	9	1.02 (1.00–1.04)	11	1.04 (1.01–1.08)
Respiratory	Moderate	8	1.05 (1.00–1.09)	8	1.01 (0.98–1.05)	7	1.03 (0.97–1.10)
Lung cancer	Moderate to high	5	1.04 (1.01–1.07)	3	1.02 (0.88–1.19)	6	1.06 (0.99–1.13)
IHD	High	6	1.05 (1.03–1.08)	6	1.05 (0.99–1.11)	7	1.07 (1.04–1.10)
Stroke	Low to moderate	6	1.01 (0.98–1.04)	<3	NA	3	1.04 (1.01–1.07)
COPD	Low	3	1.03 (1.00–1.05)	<3	NA	<3	NA

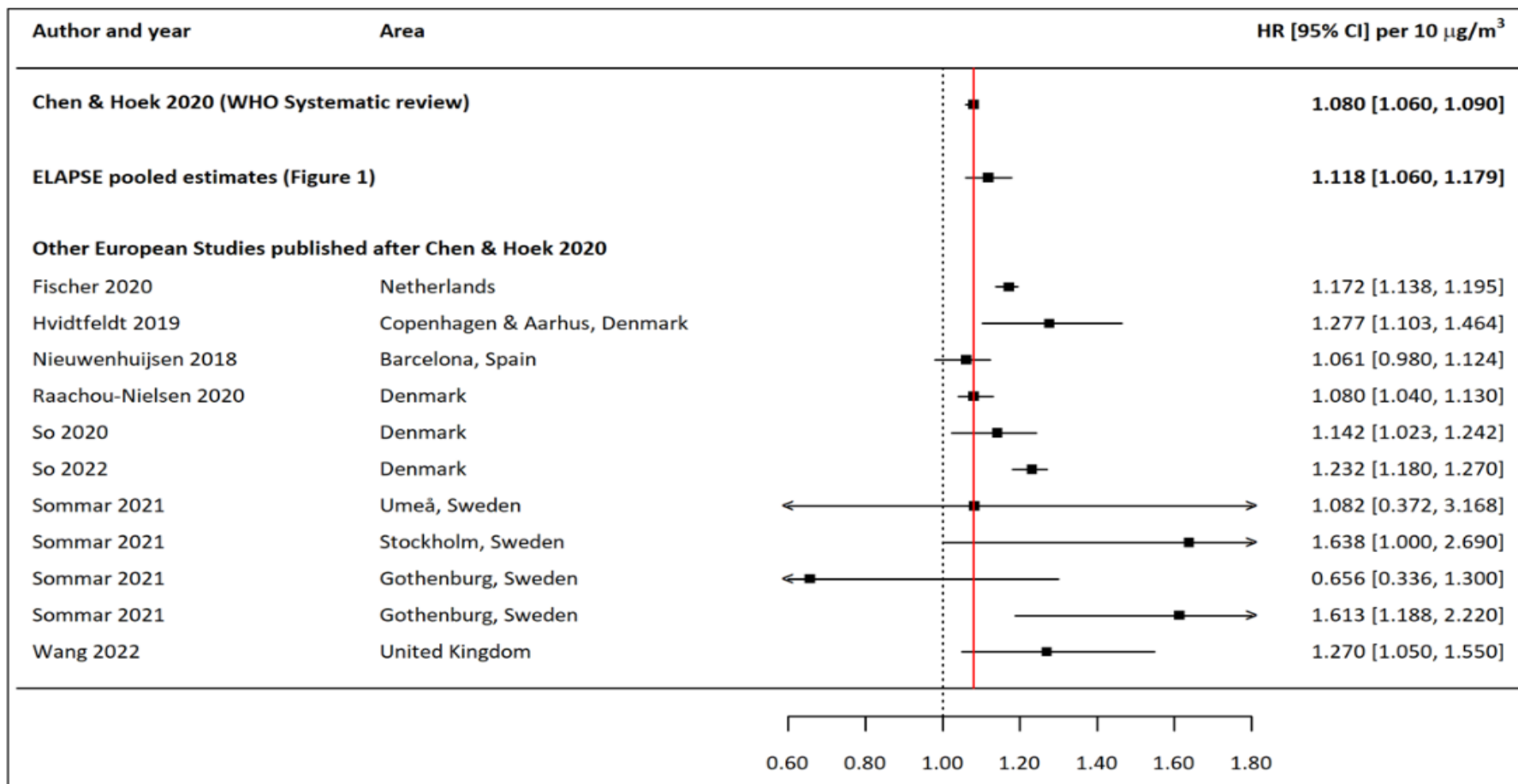


# Benefits of future clean air policies in Europe

## Proposed analyses of the mortality impacts of PM<sub>2.5</sub> and NO<sub>2</sub>

Barbara Hoffmann<sup>a</sup>, Bert Brunekreef<sup>b</sup>, Zorana J. Andersen<sup>c</sup>, Francesco Forastiere<sup>d</sup>, Hanna Boogaard<sup>e\*</sup>

# PM<sub>2.5</sub> and total mortality



**Figure 3. Total mortality and long-term PM<sub>2.5</sub> from other European studies published since the WHO systematic review by Chen & Hoek (2020).\***

\*Red line indicates the summary estimate from the systematic review by Chen & Hoek (2020). Range of mean PM<sub>2.5</sub> exposure in European studies from 5.8 to 20.5 µg/m<sup>3</sup>.

## GENERAL PUBLICATIONS

# Proposal for a revision of the Ambient Air Quality Directives

## Details

**Publication date**

26 October 2022

**Author**

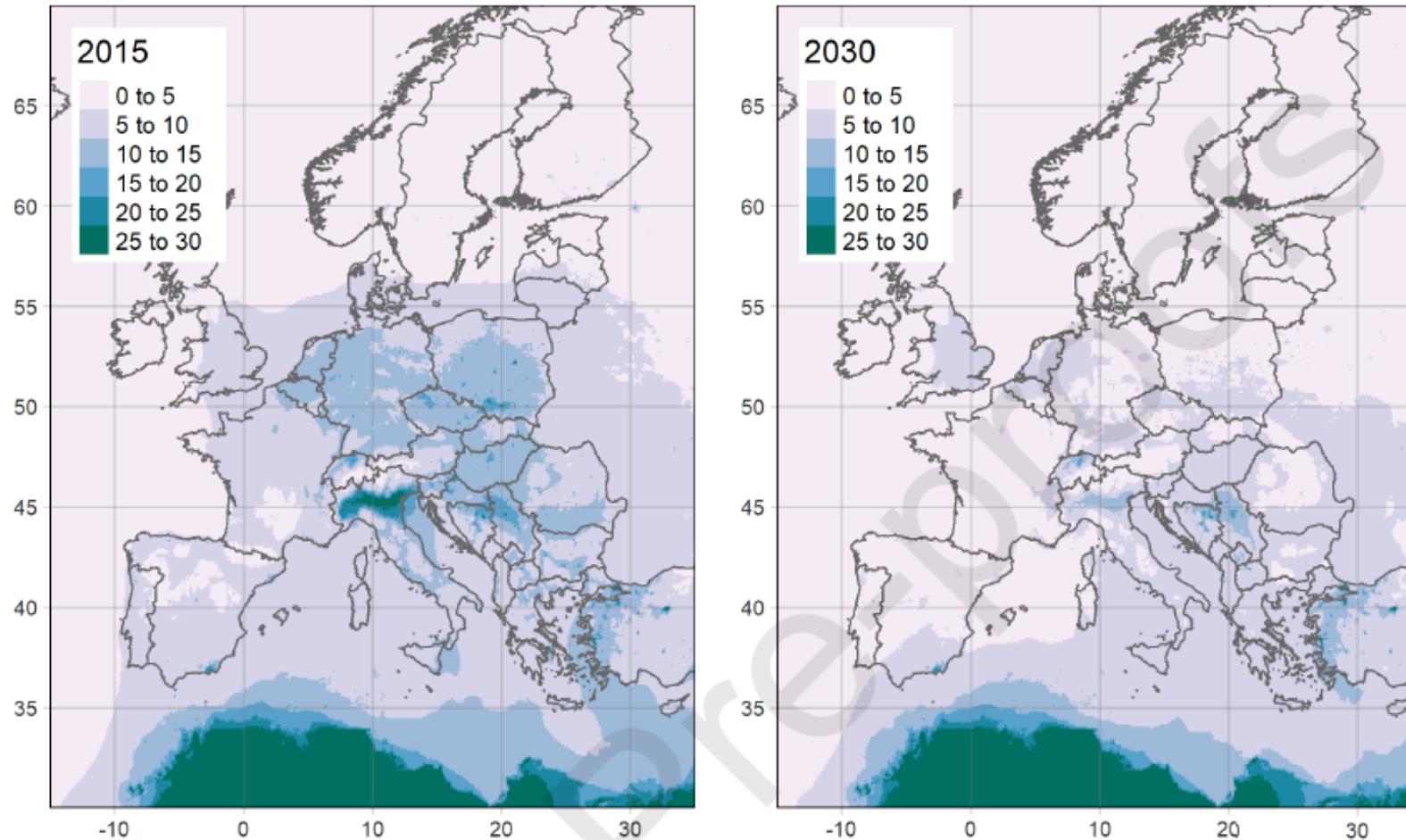
[Directorate-General for Environment](#)



# **Study to support the impact assessment for a revision of the EU Ambient Air Quality Directives**

**Specific Contract under Framework Contract ENV/F1/**

# PM2.5 concentrations in 2015 and 2030 projections



**Pisoni et al,  
2023**

*figure 1: PM2.5 yearly average concentrations ( $\mu\text{g}/\text{m}^3$ ), for 2015 (left) and 2030 scenario (right).*





# Immediate (same day) reaction!



“The newly proposed annual limit values will ensure important health benefits, and are much stricter than the 2008 limit values in particular for PM2.5 and NO2. However, greater collective efforts are ultimately needed for a continued improvement in air quality down to, or below, the latest WHO health-based Air Quality Guidelines.”

- **Dr. Hanna Boogaard**

Co-Chair  
International Society for Environmental  
Epidemiology (ISEE) Europe Chapter



“We are faced with a public health emergency from air pollution - tackling it requires political will, for immediate and long-lasting health benefits.

Where the Commission shied away from proposing what’s needed, the European Parliament and Member States now have to step up, to save lives and prevent disease. This is done by fully aligning with the updated WHO guidelines by 2030 at the latest and with a strong enabling framework, including limit values and enforcement mechanisms.”

- **Anne Stauffer**

Deputy Director  
at the Health and Environment Alliance (HEAL)



“The burden of disease from air pollution remains unacceptably high in Europe. We need greater efforts to reduce air pollution exposure with a more ambitious path to achieving full alignment with WHO Air Quality Guidelines everywhere in Europe.”

- **Prof. Zorana Jovanovic Andersen**

Chair of the Environment and Health Committee  
European Respiratory Society (ERS)

# ANNEX

*Table 1 – Limit values for the protection of human health to be attained by 1 January 2030*

Averaging period	Limit value
<b>PM<sub>2.5</sub></b>	
1 day	25 $\mu\text{g}/\text{m}^3$ not to be exceeded more than 18 times per calendar year
Calendar year	10 $\mu\text{g}/\text{m}^3$
<b>PM<sub>10</sub></b>	
1 day	45 $\mu\text{g}/\text{m}^3$ not to be exceeded more than 18 times per calendar year
Calendar year	20 $\mu\text{g}/\text{m}^3$

The diagram illustrates the transition of limit values for PM<sub>2.5</sub> and PM<sub>10</sub> by 1 January 2030. For PM<sub>2.5</sub>, the 1-day limit is currently 25  $\mu\text{g}/\text{m}^3$  (circled in red) and is to be reduced to 15  $\mu\text{g}/\text{m}^3$ . The calendar year limit is currently 10  $\mu\text{g}/\text{m}^3$  (circled in red) and is to be reduced to 5  $\mu\text{g}/\text{m}^3$ . For PM<sub>10</sub>, the 1-day limit is currently 45  $\mu\text{g}/\text{m}^3$  (circled in red) and is to be reduced to 15  $\mu\text{g}/\text{m}^3$ . The calendar year limit is currently 20  $\mu\text{g}/\text{m}^3$  (circled in red) and is to be reduced to 15  $\mu\text{g}/\text{m}^3$ . Additionally, the frequency limit 'not to be exceeded more than 18 times per calendar year' (circled in red) is highlighted for both pollutants.

### Nitrogen dioxide (NO<sub>2</sub>)

1 hour	200 µg/m <sup>3</sup>	not to be exceeded more than once per calendar year
1 day	50 µg/m <sup>3</sup>	not to be exceeded more than 18 times per calendar year
Calendar year	20 µg/m <sup>3</sup>	10

3

20 µg/m<sup>3</sup>

10

18

1 **Clean Air in Europe for All: A Call for More Ambitious Action**

2 Hanna Boogaard<sup>a</sup>, Zorana Jovanovic Andersen<sup>b</sup>, Bert Brunekreef<sup>c</sup>, Francesco Forastiere<sup>d</sup>, Bertil  
3 Forsberg<sup>e</sup>, Gerard Hoek<sup>c</sup>, Michal Krzyzanowski<sup>d</sup>, Ebba Malmqvist<sup>f</sup>, Mark Nieuwenhuijsen<sup>g</sup>, Barbara  
4 Hoffmann<sup>h</sup> on behalf of ERS and ISEE  
5  
6  
-

- **A clear path towards complete alignment with the 2021 WHO AQG is missing**
- **Limit values are needed for ozone**
- **Adverse health effects of air pollution are underestimated**
- **Many potential policy options and actions are missing from the feasibility scenario**
  - the main message of the impact assessment is clear: the health benefits outweigh by far (a factor 6-18) the implementation costs of air quality actions with the largest net benefit (EUR 38 billion) for the policy option of complete alignment with the 2021 WHO AQG by 2030.
- **More effort needed to decrease air pollution health inequalities**
- **Be wary of the deduction of “natural” source contributions**



**European Parliament**

2019-2024



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*Committee on the Environment, Public Health and Food Safety*

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**2022/0347(COD)**

23.2.2023

**\*\*\*I**

## **DRAFT REPORT**

on the proposal for a directive of the European Parliament and of the Council  
Ambient Air quality and cleaner air for Europe (recast)  
(COM(2022)0542 – C9-0364/2022 – 2022/0347(COD))

Committee on the Environment, Public Health and Food Safety

Rapporteur: **Javi López**

(Recast – Rule 110 of the Rules of Procedure)

# Meeting on Air Quality proposal

*Regione Lombardia*

*10<sup>th</sup> February 2023*



[www.regione.lombardia.it](http://www.regione.lombardia.it)



*We are available to support the definition of amendments on the proposal*

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**Improving air quality and achieving WHO suggested concentrations of pollutants is an important ambition for the protection of citizens' health** by European, national, and local institutions. Anyway, **reaching near-zero limits in a limited time is extremely complex.**

For these reasons, the AIR group Regions have sent a position paper to the European Commission. The document aims to promote a careful and in-depth discussion between the Community institutions and national and regional governments. The AIR group Regions are Lombardia, Piemonte, Veneto, Emilia-Romagna, Catalunya, Comunidad de Madrid, Dutch Provinces, Steiermark. Among the Air group Regions, there are the regions of the Po Valley in Northern Italy.

# FEASIBILITY

The Impact assessment provided by the European Commission shows on page 137 the map of PM2.5 concentrations evaluated by model for the baseline 2020 (Figure A5.8), but these concentrations are underestimated of about 5  $\mu\text{g}/\text{m}^3$  all over the Europe compared to the PM2.5 annual mean concentrations (Figure A11.2) as measured by fixed stations.

Under these assumptions, also **the 2030 scenarios provided by the European Commission could be significantly underestimated: this leads to misleading conclusions on the feasibility to achieve before 2030 not only the WHO recommendations but also the proposed limits.**



## FEASIBILITY

### **What does it mean** a reduction of 80% of SOX, NOX, PM, NH3 and NMVOC emissions?

According to a study of the Environmental Protection Agency of Lombardia, in Po Valley that reduction **is not possible with only technical measures, but it is also necessary a drastic reduction of activities**, such as:

- Removing 75% of vehicles and replacing the remaining 25% vehicles with zero emissions vehicles
- PLUS Removing 75% of methane domestic heating systems and 100% of biomass domestic heating systems
- PLUS Removing 60% of pigs and cattle and applying BAT on the remaining 40% (livestock stabling, coverage of manure storages and management of manure spreading)
- PLUS Removing 75% of industrial activities

# TIMING

**In general, the timing provided by the Directive proposal can be effective?**

- Considering that EU Impact assessment scenario is affected by a significant underestimation of the concentrations also as starting point, **is it possible to comply with the proposed limits in 2030** also in the other regions of Europe?
- The new directive could be adopted in 2024. The transposition into national law by Member States would be effective in 2026. Considering the time necessary to adopt and enforce air quality plans, **is it possible to see the results of the measures of the plans in only one or two years?**
- Furthermore, the 2028 for the first review seems not adequate

# Inquinamento, le nuove regole dell'Europa e le conseguenze: «In Veneto 3 fabbriche su 4 dovrebbero chiudere»

*Luca Zaia: «Le Alpi fanno da barriera, bisogna considerare la morfologia del territorio»*

Tra sette anni, per essere in **regola** con le **nuove norme europee** sull'**inquinamento atmosferico**, il **Veneto** dovrebbe bloccare il 75 per cento di tutti gli autoveicoli, sia privati che commerciali. **Dovrebbe obbligare alla chiusura il 75 per cento delle attività industriali. Il 60 per cento degli allevamenti** - mucche, galline, maiali - dovrebbe cessare. E anche il **75 per cento degli impianti di riscaldamento** dovrebbe essere spento. Chi se lo immagina un Veneto così?

# Will Coyote and Climate Change

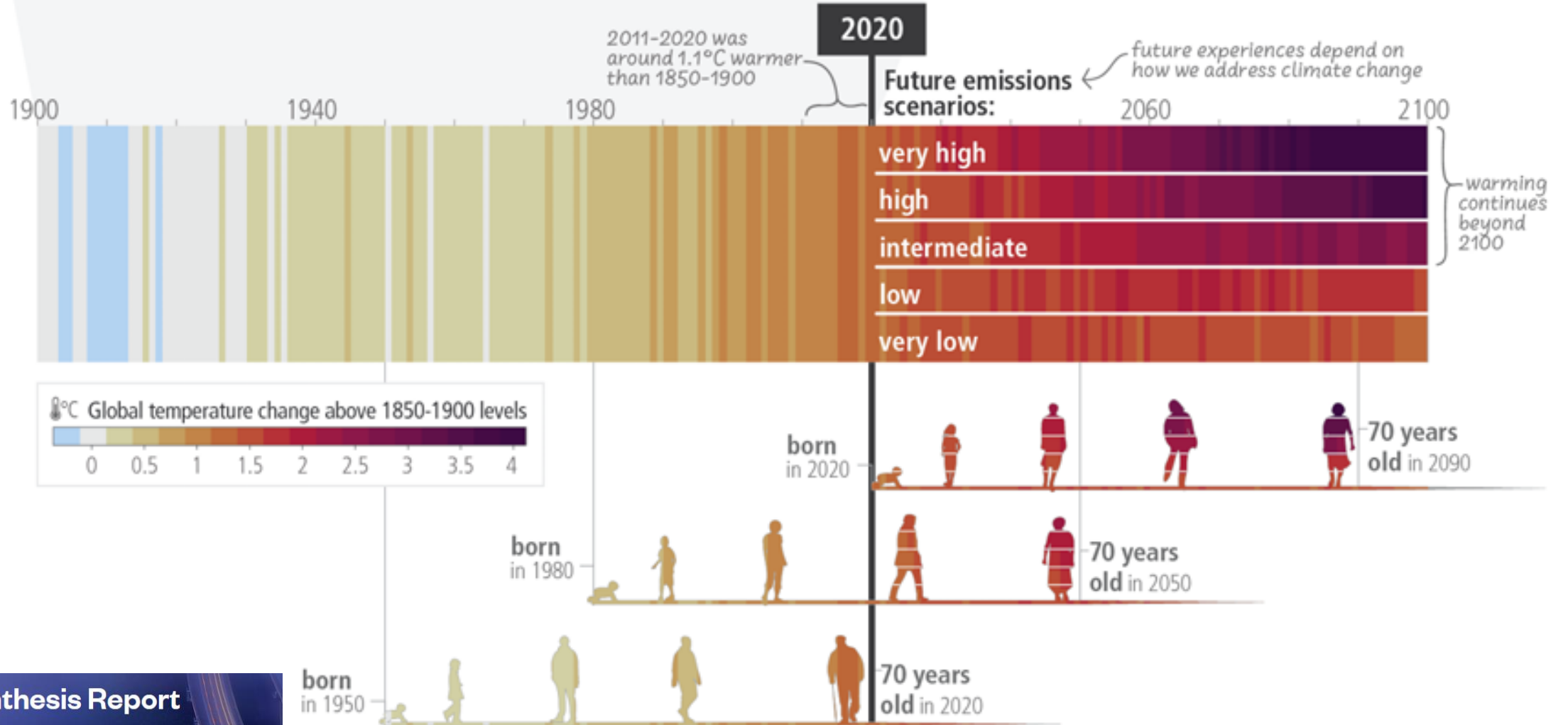


Global heating:  
an urgent call  
for action to  
protect health  
The Lancet  
November 4,  
2022

- **Accelerating collapse of some of the most important planetary systems underpinning human survival.**
  - The Antarctic ice-shelf has contracted by almost 2% since 1997; further loss and thinning could lead to substantial sea-level rises.
  - Climate change is causing rapid acidification of the Arctic Ocean, risking long-lasting damage to the region's ecology.
  - Climate effects are endangering the ability of forests to mitigate adverse atmospheric changes, especially in the Amazon and North America. Forest resilience is declining, with a halving of tree life expectancies in some regions.
  - The world is edging closer to multiple tipping points that, once crossed, will drive temperature change well above 2°C.
- **The key conclusion from these findings is that our current actions are insufficient to limit heating to the Paris target of 1.5°C**



c) The extent to which current and future generations will experience a hotter and different world depends on choices now and in the near-term



# Thanks

