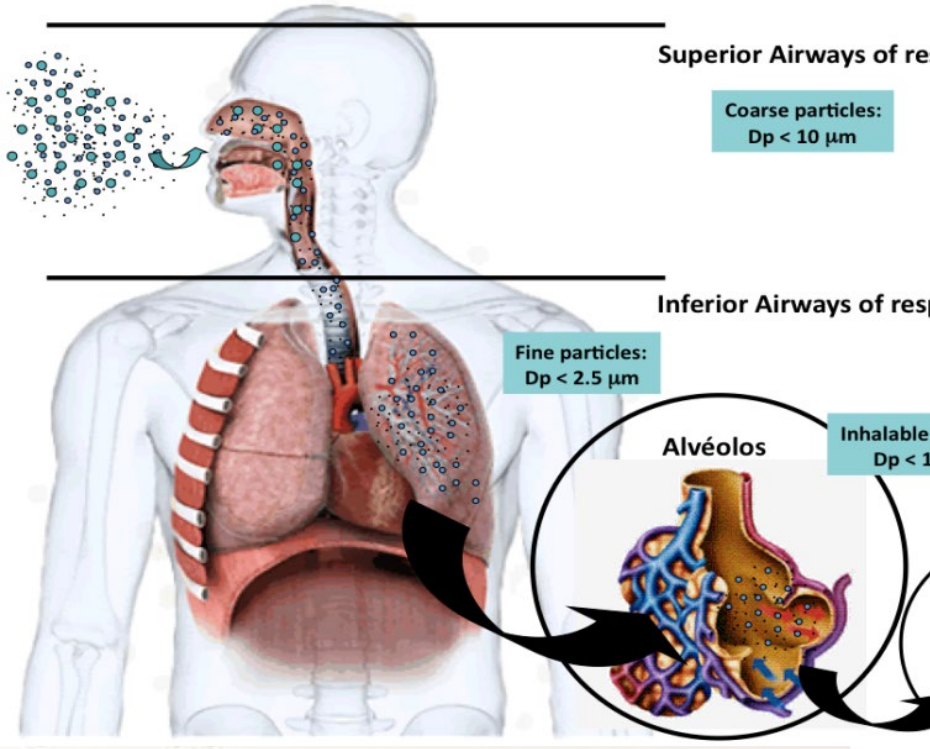


CLEAN AIR IN EUROPE





Life after WHO 2021 AQG – What does science tell us?

ERS

24th May, 2023

Zorana Jovanovic Andersen, Chair of the European Respiratory Society (ERS) Environment and Health Committee; Professor in Environmental Epidemiology, Department of Public Health, University of Copenhagen, Denmark

WHO 2021 AQG – main messages and beyond



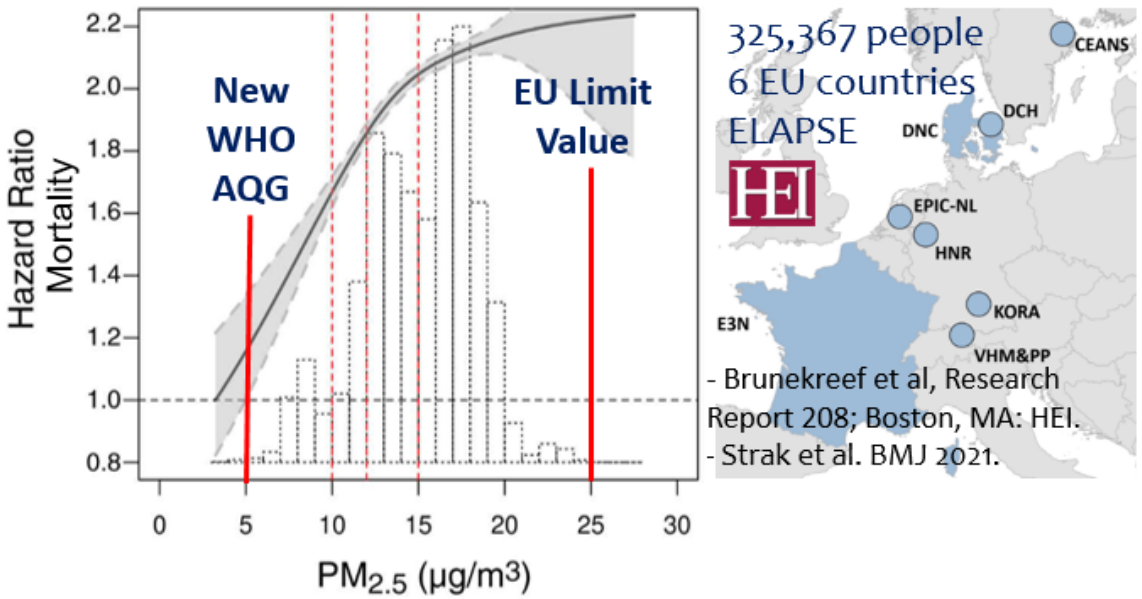
WHO AIR QUALITY GUIDELINES

NO2	2005: 40 µg/m³, annual	
	2021: 10 µg/m³, annual	
PM2.5	2005: 10 µg/m³, annual	
	2021: 5 µg/m³, annual	

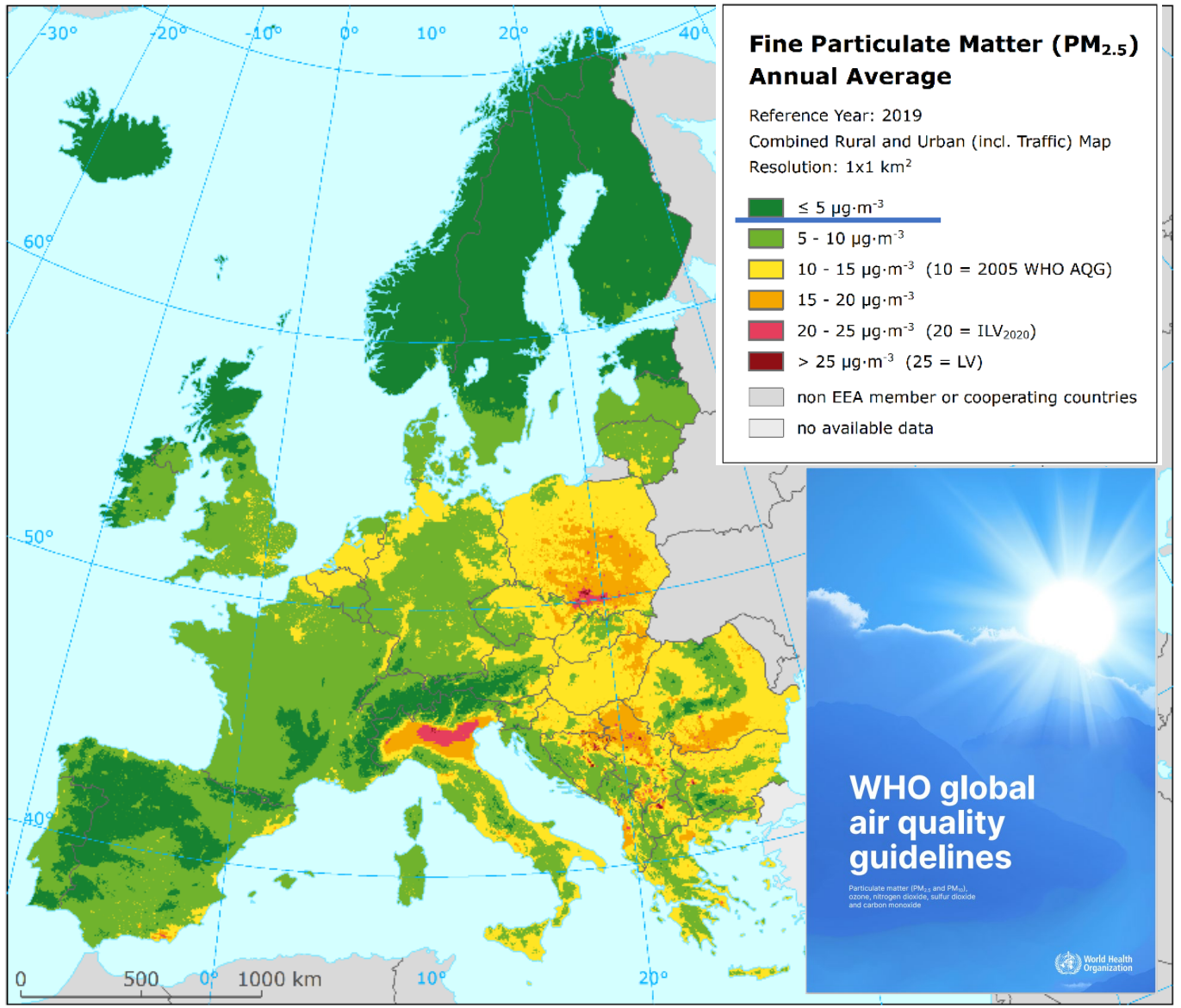
1. Everyone is exposed – no lower threshold

1. Everyone in Europe is exposed to harmful levels of air pollution (97.5% European population)

2. No lower threshold below which air pollution is safe



- Brunekreef et al, Research Report 208; Boston, MA: HEI.
- Strak et al. BMJ 2021.



Source: file:///C:/Users/vlq961/Downloads/ETC%20HE%20report%202022-3_status_eionet_mix_2021_2022-03-31_FINAL-2.pdf

2. Air pollution burden is huge, increasing & underestimated

- WHO 2005 AQG (Hoek et al. 2013): **6.2%***
- **WHO 2021 AQG (Chen & Hoek 2020): 8.0%**

Global

EEA

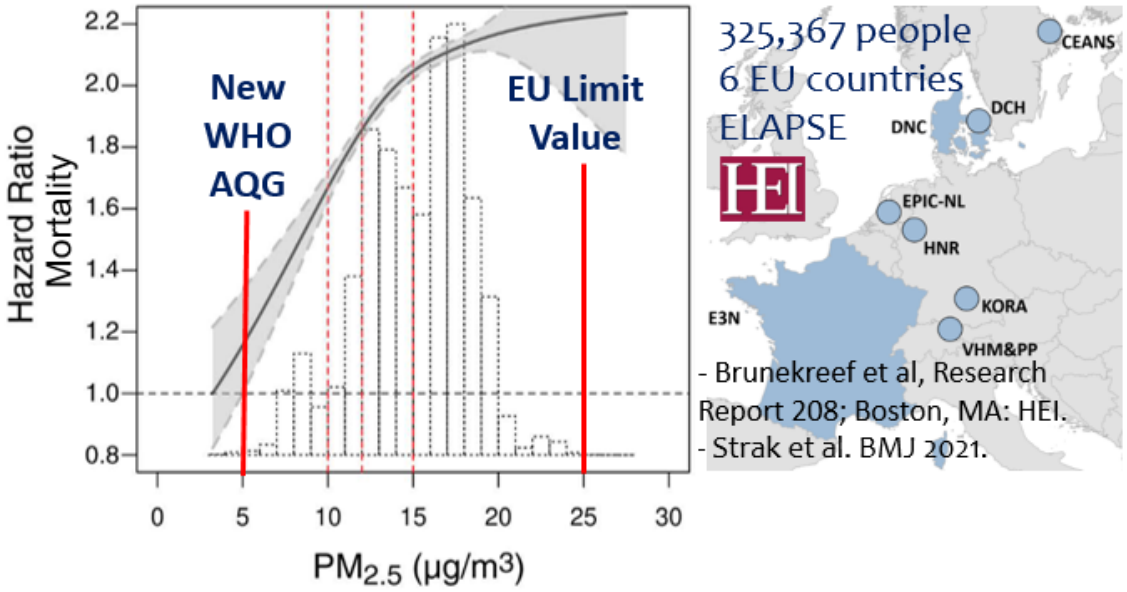
2019: 307,000 deaths attributed to $PM_{2.5}$

2020: 412,000 deaths attributed to $PM_{2.5}$

238,000 deaths > 5 µg/m³ $PM_{2.5}$

1. ELAPSE (after WHO 2021 AQG): 11.8%
2. Stronger effects at low levels?

EU



- Brunekreef et al, Research Report 208; Boston, MA: HEI.
- Strak et al. BMJ 2021.

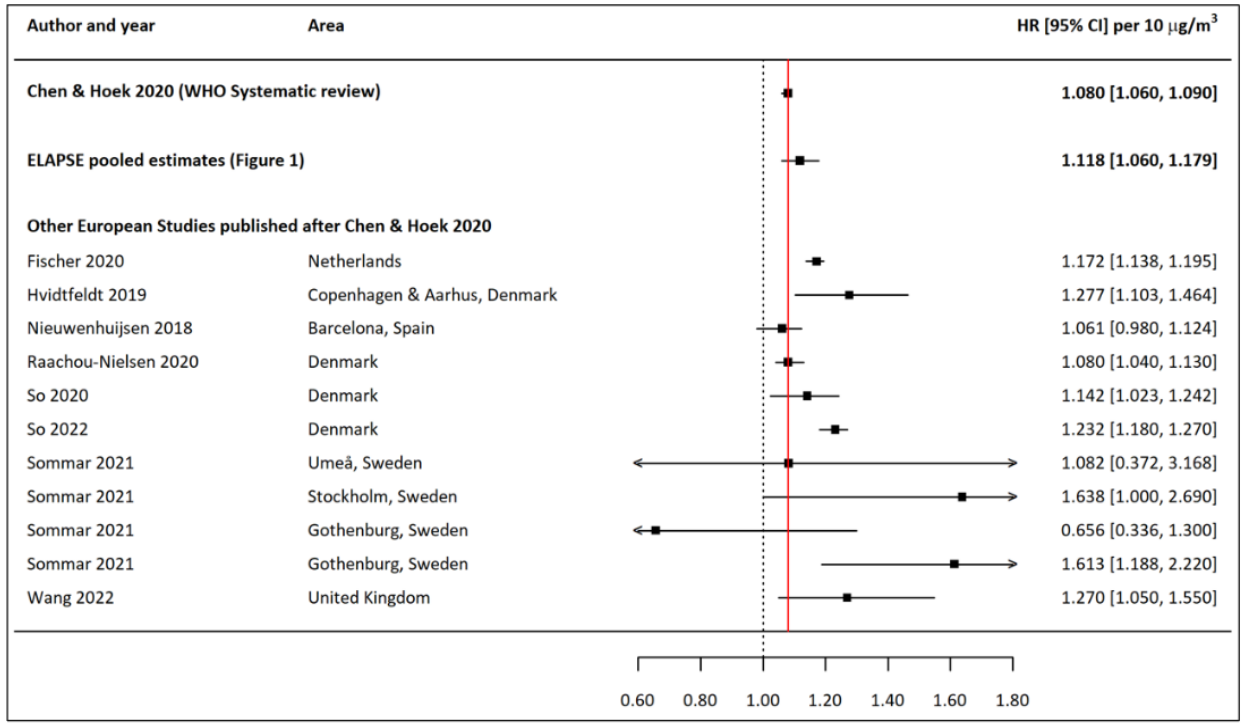


Figure 3. Total mortality and long-term $PM_{2.5}$ from other European studies published since the WHO systematic review by Chen & Hoek (2020).*

*Red line indicates the summary estimate from the systematic review by Chen & Hoek (2020). Range of mean $PM_{2.5}$ exposure in European studies from 5.8 to 20.5 µg/m³.

interpretation: 6.2 % increase in mortality risk for each 10 µg/m³ increase in $PM_{2.5}$

- https://www.ersnet.org/wp-content/uploads/2022/04/Statement-HIA-by-ERS_ISEE_final-002.pdf
- https://journals.lww.com/environepidem/Fulltext/2022/10000/Benefits_of_future_clean_air_policies_in_Europe_.5.aspx

3. Air pollution and climate change – inseparable issues

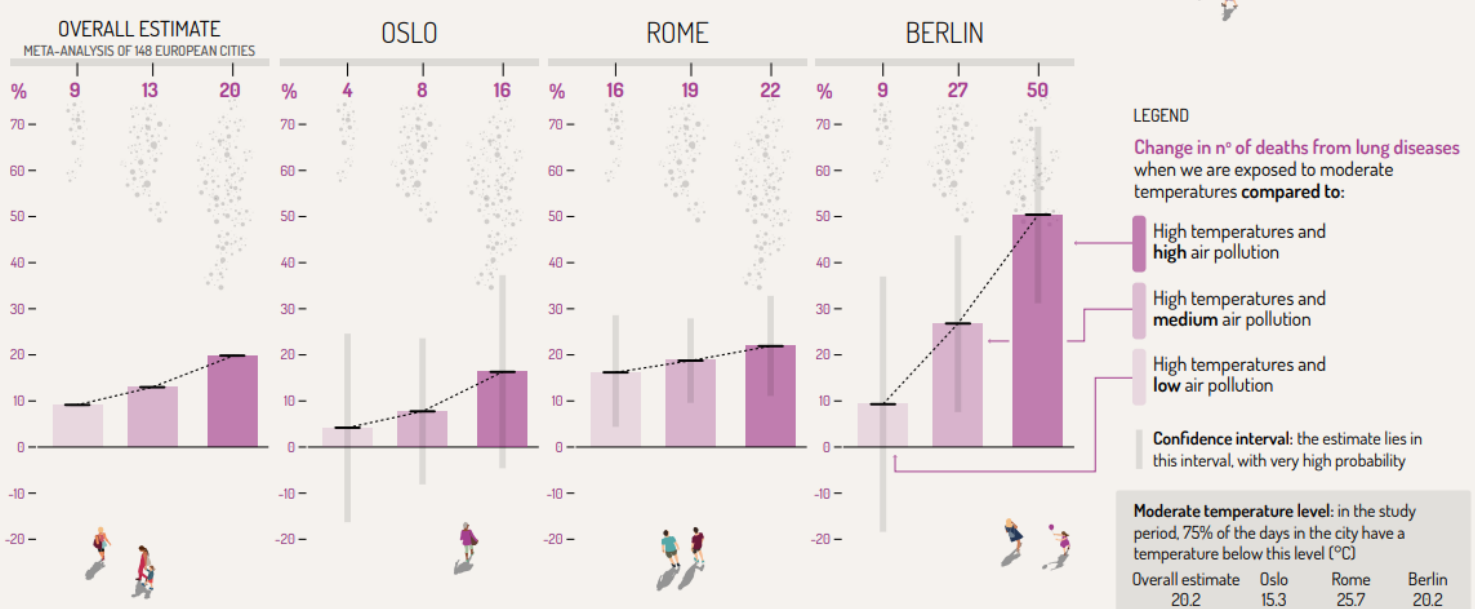
EXHAUSTION
www.exhaustion.eu

WE BREATHE CLIMATE CHANGE

More people will die of **lung** diseases in our cities when high temperatures are combined with high levels of air pollution. This is especially true for those of us who are 65 and older.

The good news
Policies that make us less exposed to heat and air pollution will be beneficial for our health and wellbeing.

Change in number of deaths from lung diseases in European cities (%) in association with high temperatures, by different levels of air pollution (PM2.5)



LEGEND

Change in n° of deaths from lung diseases when we are exposed to moderate temperatures **compared to:**

- High temperatures and **high** air pollution
- High temperatures and **medium** air pollution
- High temperatures and **low** air pollution

Confidence interval: the estimate lies in this interval, with very high probability

Low, medium and high levels of air pollution (fine particles PM2.5, µg/m³)

	Overall estimate			Oslo			Rome			Berlin		
	low	medium	high	low	medium	high	low	medium	high	low	medium	high
	4	10	21	2	6	15	9	15	23	7	12	21

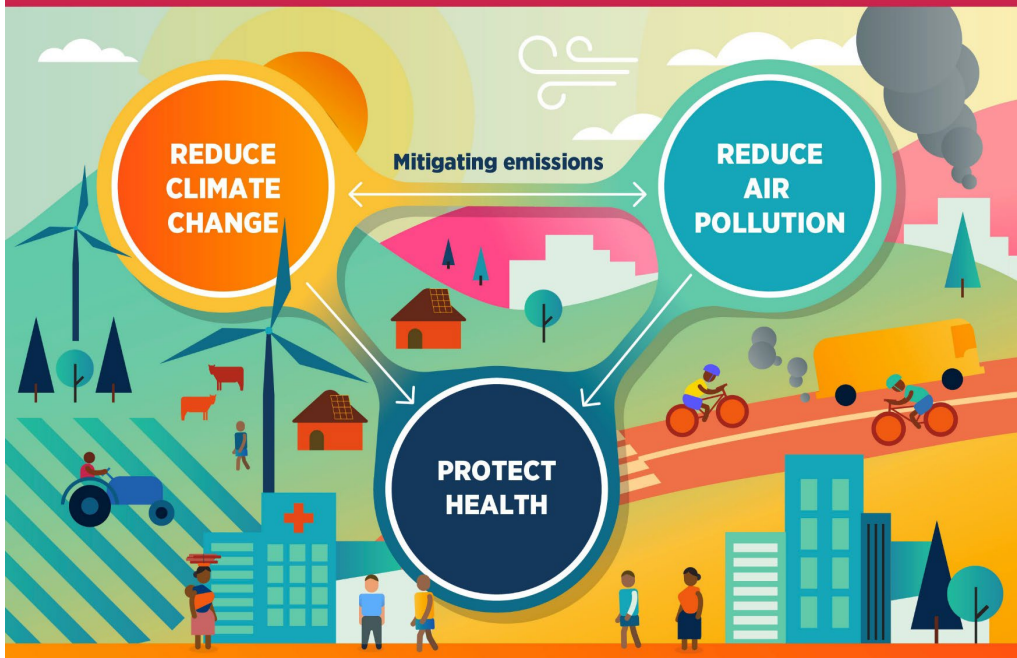
Moderate temperature level: in the study period, 75% of the days in the city have a temperature below this level (°C)

Overall estimate	Oslo	Rome	Berlin
20.2	15.3	25.7	20.2

High temperature level: in the study period, 1% of the days in the city have a temperature above this level (°C)

Overall estimate	Oslo	Rome	Berlin
26.4	21.7	29.6	27.1

REDUCING AIR POLLUTION AND MITIGATING CLIMATE CHANGE, TOGETHER HELP TO PROTECT OUR HEALTH



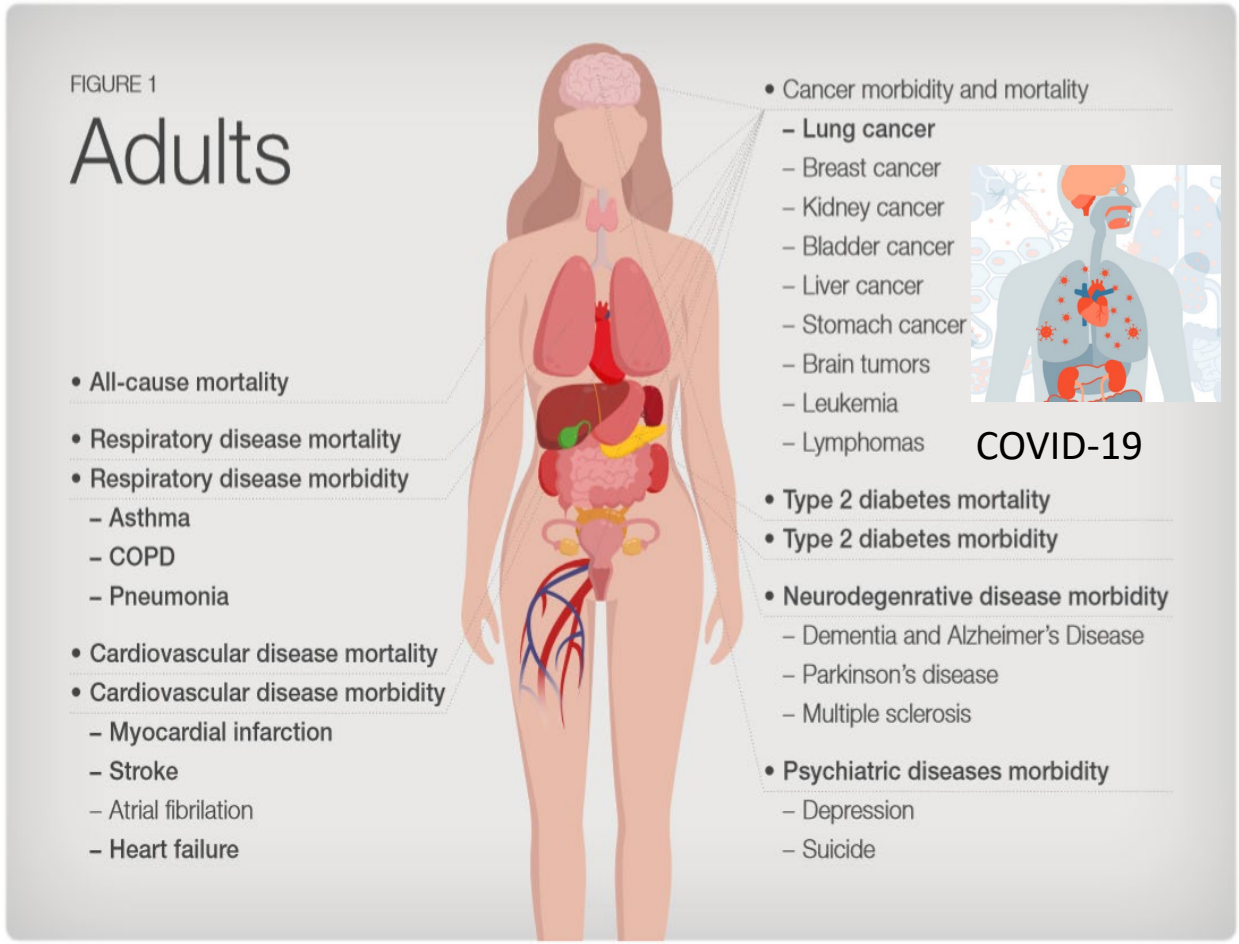
WHO Air Quality Guidelines set goals to protect millions of lives from air pollution.

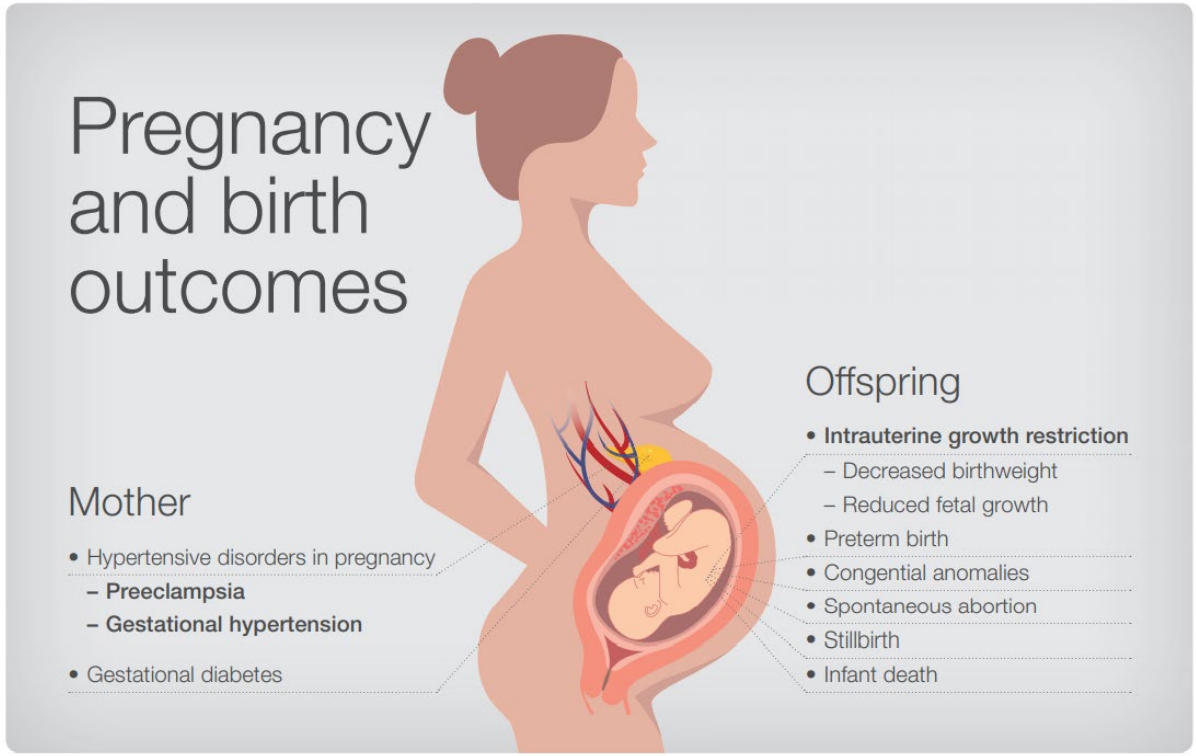
CLEAN AIR FOR HEALTH #AirPollution World Health Organization

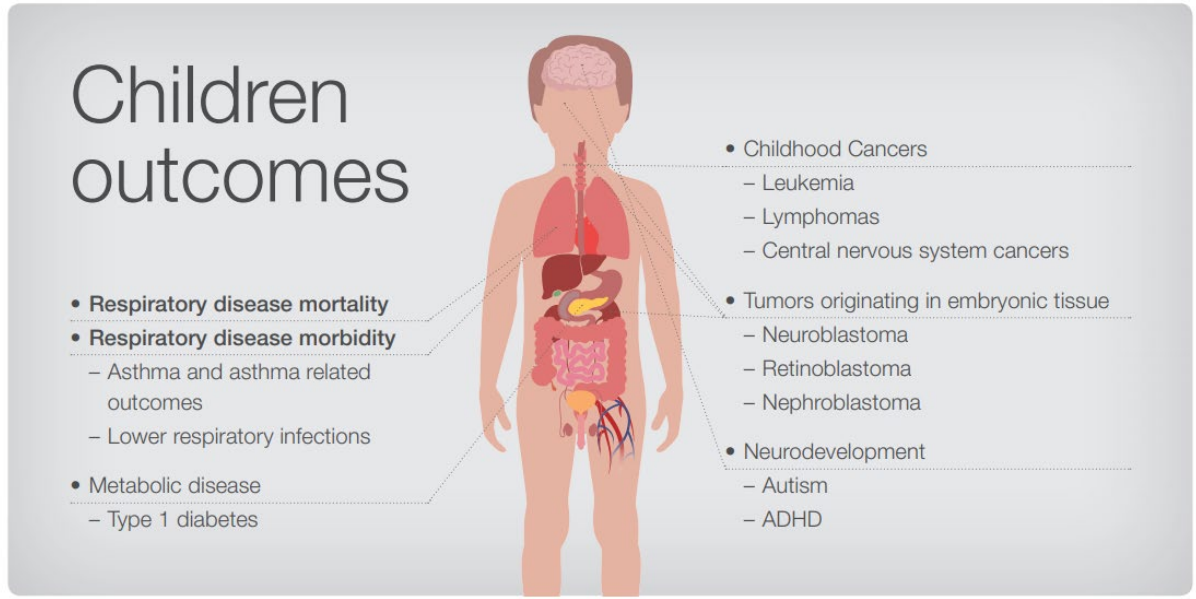


Health burden of air pollution

Premature deaths + millions of new cases of disease, symptoms, worsened quality of life, doctor visits, ER visits, hospital admissions, sick days (school & work), medication use….







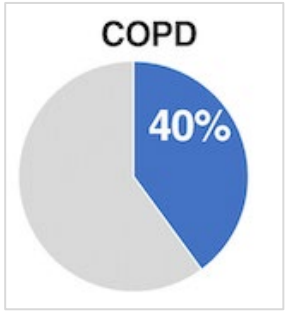
Air Pollution and Lung (Erik)

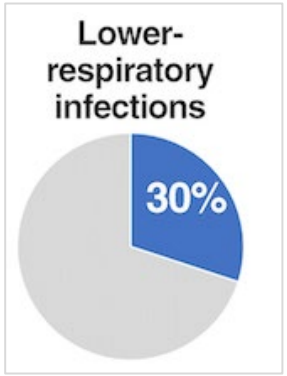
- **Long-term (years, lifetime) exposure to air pollution** can lead to impaired lung function and development of new lung disease in healthy individuals and increased risk of dying from those diseases:

asthma, COPD, pneumonia, COVID-19, lung cancer

- **Short-term (hours, days) exposure to air pollution** can exacerbate existing lung disease in lung patients and trigger:

wheezing, cough, shortness of breath, need for medication, ER visits, hospitalizations, and death





GBD - Mortality specific-causes, 'fraction attributable' to air pollution https://www.stateofglobalair.org/



16% asthma cases in children due to air pollution*

*Khreis H, et al.. Environ. Int. 2017



Ella Adoo-Kissi-Debrah: Air pollution a factor in girl's death, inquest finds

16 December 2020

Ella Adoo-Kissi-Debrah lived 25 metres from the South Circular Road in south-east London

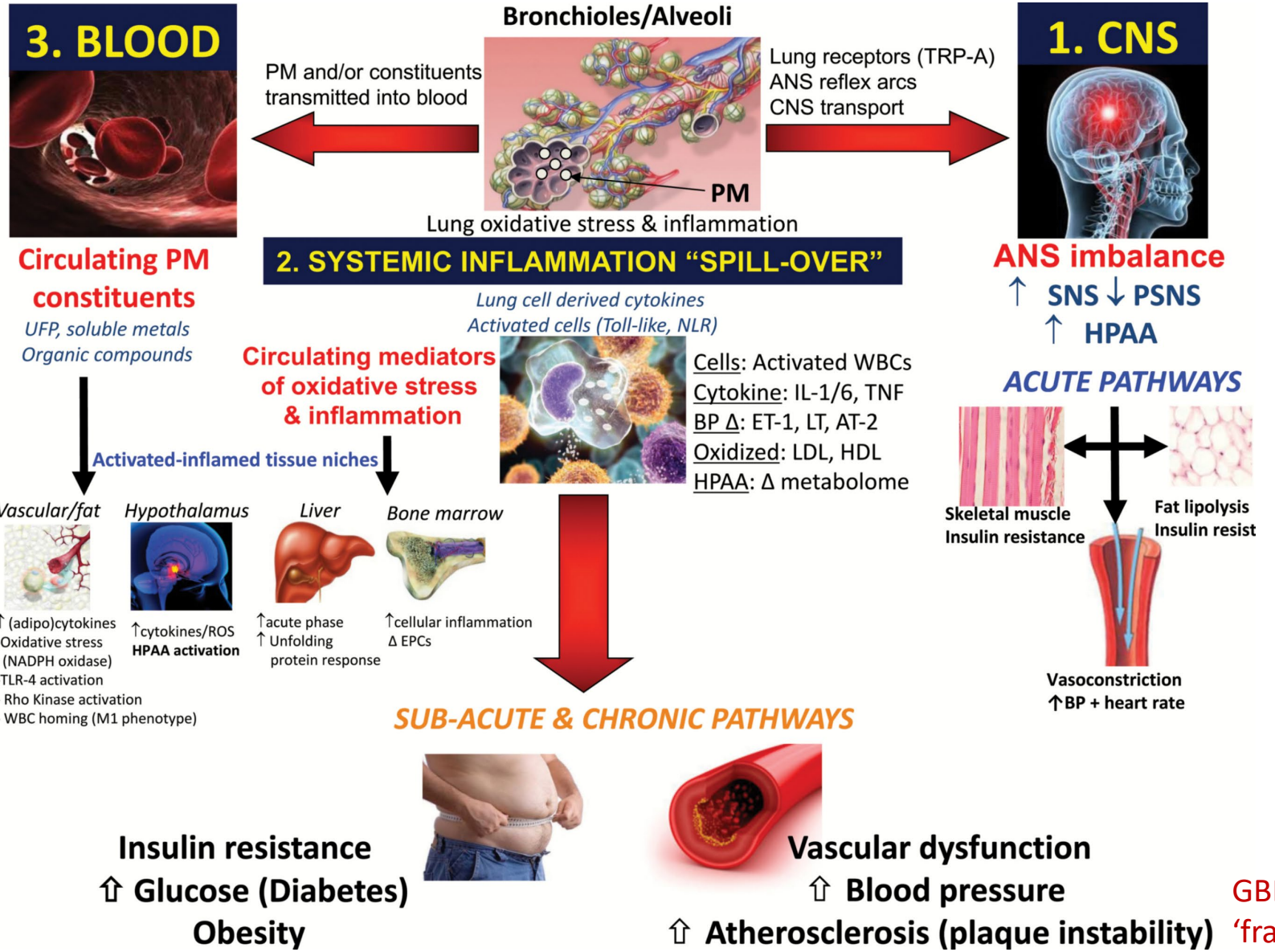
A nine-year-old girl who died following an asthma attack has become the first person in the UK to have air pollution listed as a cause of death.

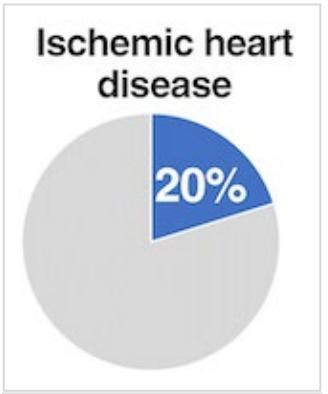
Ella Adoo-Kissi-Debrah, who lived near the South Circular Road in Lewisham, south-east London, died in 2013.

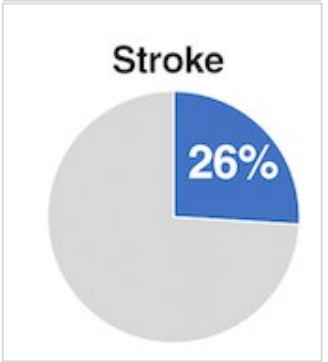
Ella Kissi-Debrah - 9 year old girl suffered fatal asthma attack triggered by air pollution, London, February 2013

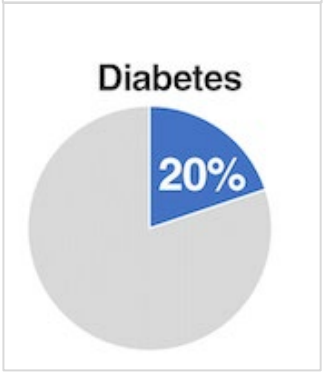
Air pollution and cardio-metabolic health (Petter)

ERS















GBD - Mortality specific-causes, 'fraction attributable' to air pollution
https://www.stateofglobalair.org/

Air pollution and cancer (Michelle)

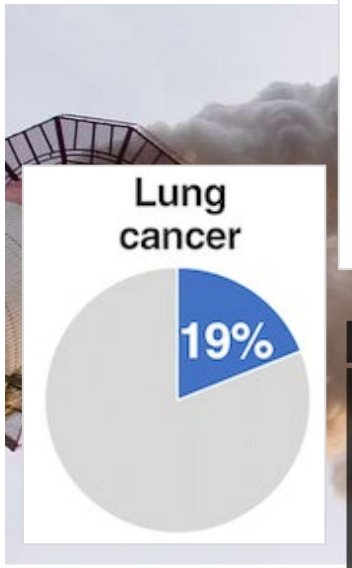






"In 2020, while we were all fighting against the COVID-19 pandemic, many of us were fighting a silent battle. The battle against cancer. In 2020, we lost 1.3 million Europeans to this disease. And sadly, the number of cases is on the rise. This is why we present Europe's Beating Cancer Plan today. The fight of t

- Cancer causes 1 in 4 deaths in the EU (1.3 million cancer deaths in 2020)
- Air pollution is carcinogenic,* causes lung cancer and possibly other (breast, liver, blood, stomach, colon) cancers
- BECA - the EU Green Deal is a key tool to limit people's exposure to (air) pollution and prevent cancer,



> Cutting pollution through the EU's Zero Pollution Action Plan and the Chemical Strategy for Sustainability as well as strong implementation of other existing EU policies would go a long way to reduce cancer cases and deaths. This would be an effective investment in our citizen's well-being.
>
> Hans Bruyninckx, EEA Executive Director

European Environment Agency

NEWS

Exposure to pollution causes 10% of all cancer cases in Europe

Exposure to air pollution, second-hand smoke, radon, ultraviolet radiation, asbestos, certain chemicals and other pollutants causes over 10% of all cancer cases in Europe, according to a European Environment Agency (EEA) report published today. The good news is that these risks are preventable.

GBD - 'fraction attributable' to air pollution
https://www.stateofglobalair.org/

*International Agency for Research on Cancer (IARC) 'Air Pollution and Cancer' 2013

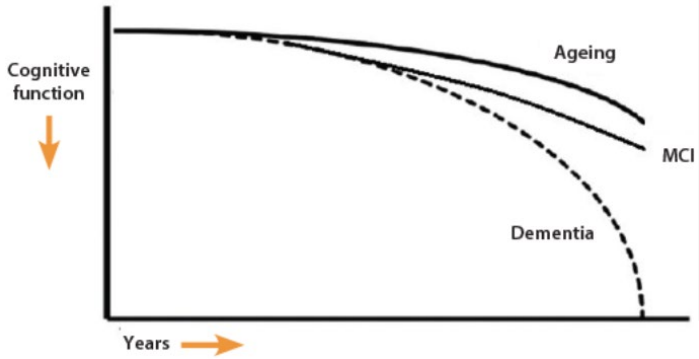
Emerging issues: air pollution and the brain (Barbara)

- Impaired neurocognitive development in children (learning difficulties, loss of IQ, ADHD, autism)
- Accelerated cognitive decline (dementia) elderly
- **Mental health (suicide, depression, anxiety)**

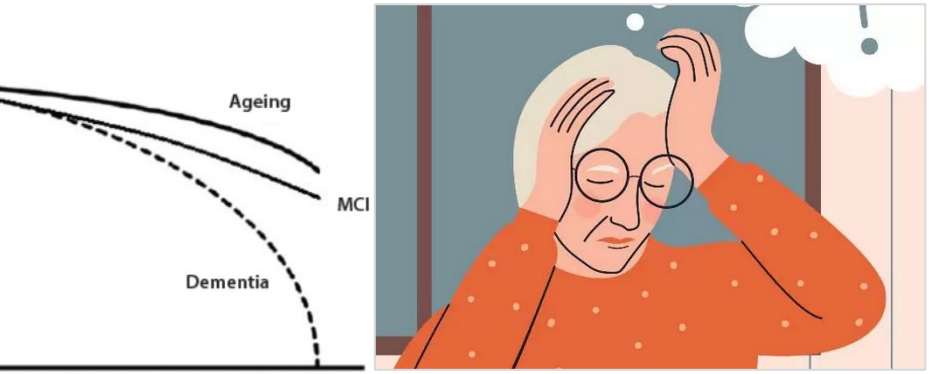


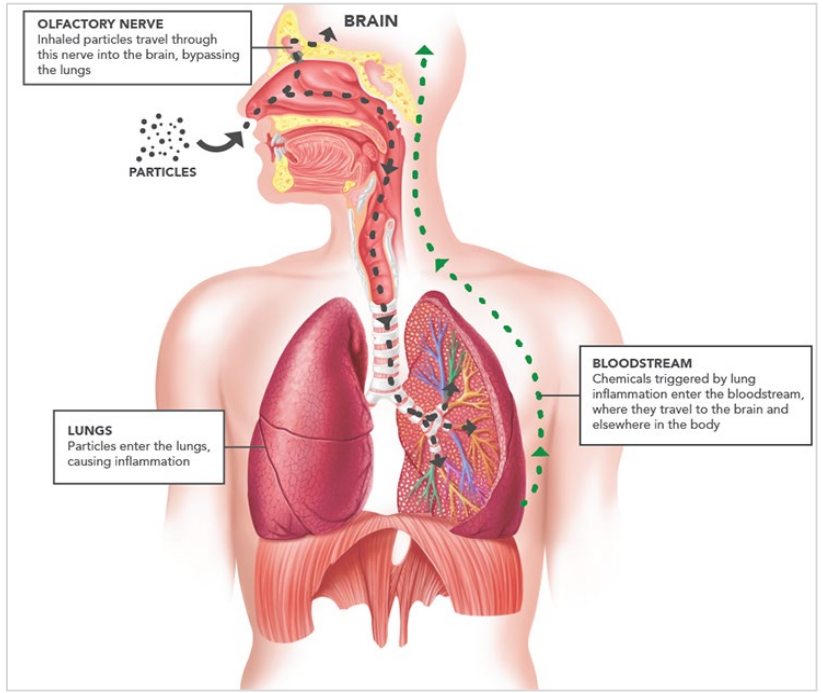


Adulthood



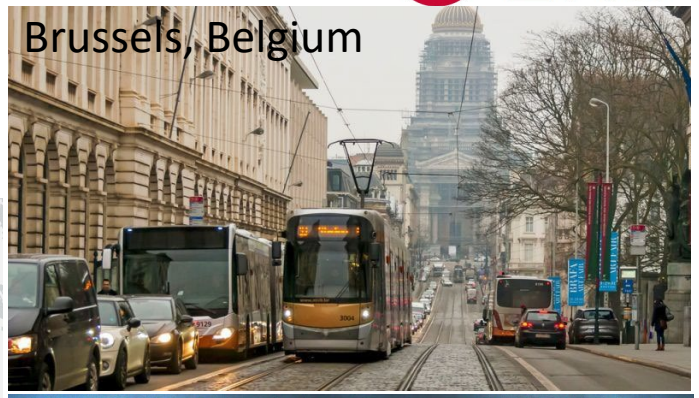
Old age

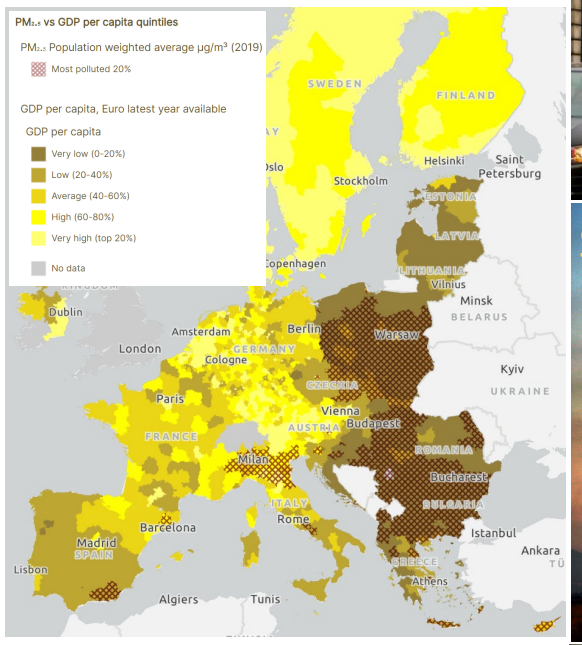




Everyone is exposed – some are more vulnerable

- Children
- Pregnant women
- Elderly
- Chronic diseases patients
- Poor (environmental inequality)















Conclusion

New AAQD, fully aligned with WHO 2021 AQG, is a major public and planetary health opportunity, that would:

1. prevent a substantial number of new cases of major NCDs
2. make EU citizens more resilient to seasonal influenza epidemics and COVID-19-like new pandemics
3. improve life of lung, heart, and other chronic disease patients
4. Indirect benefit for health - help mitigate unprecedented climate change impact on our health and our planet

Clean air as a basic civil right - no one should get sick or die from breathing









Thank You

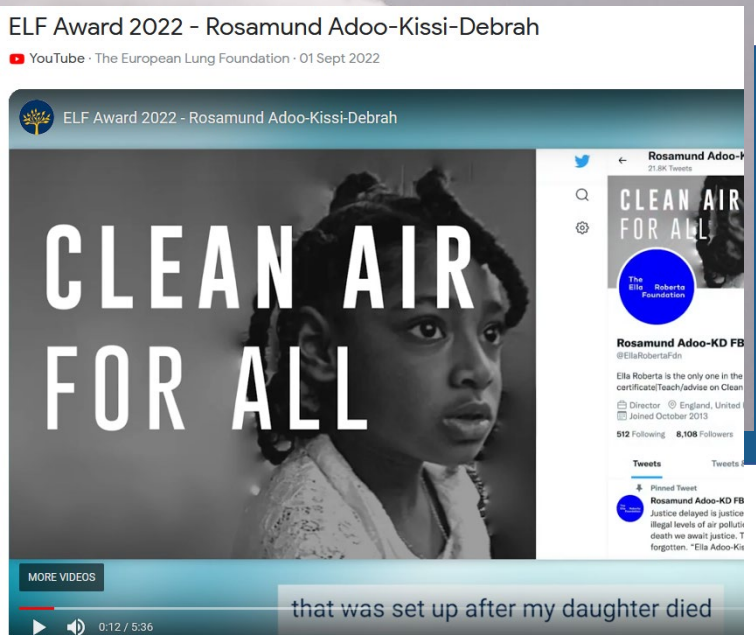
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@zoranajova

ERS

European Parliament

Rosamund Adoo Kissi Debrah:'*We need to ensure parents know the impact air pollution has on their children*'



https://www.youtube.com/watch?v=V673obDHCVc