Air quality and health - what is new from WHO

World Health Organization
REGIONAL OFFICE FOR Europe

UNECE Air Convention (LRTAP)

2nd Expert Panel on Clean Air in Cities (EPCAC)

29 September 2020

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Outline of the presentation

- New evidence on air pollution and health
- Air pollution and COVID-19
- Update of WHO global air quality guidelines (WHO AQG)

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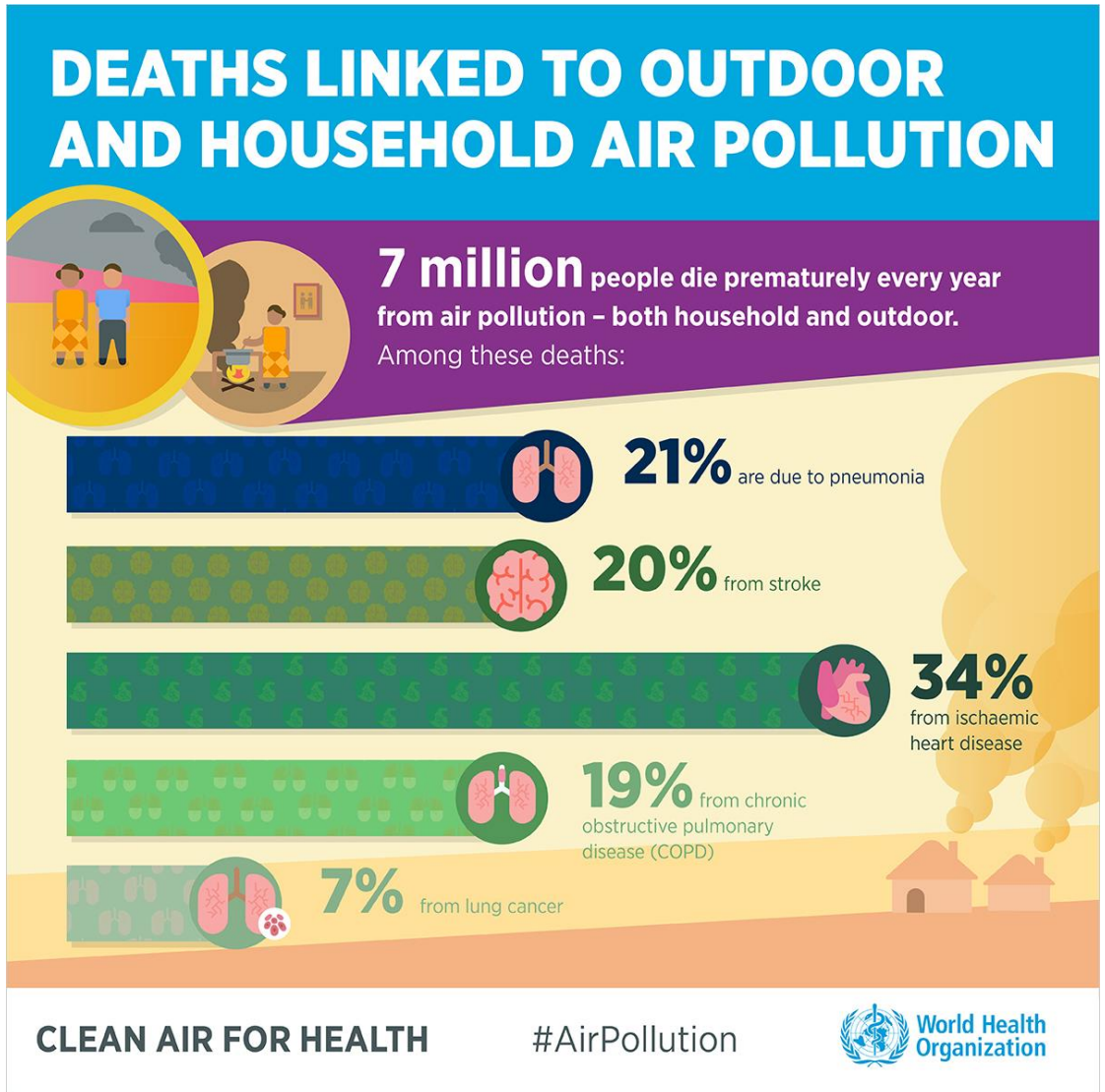

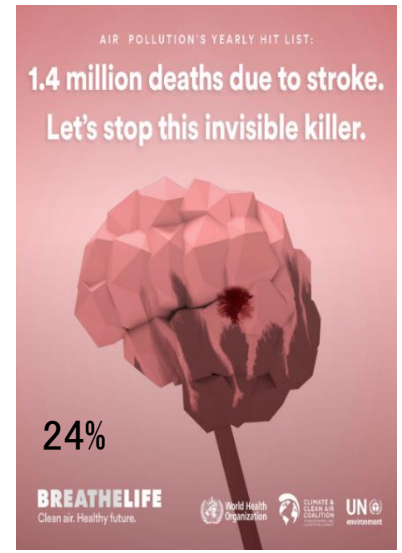

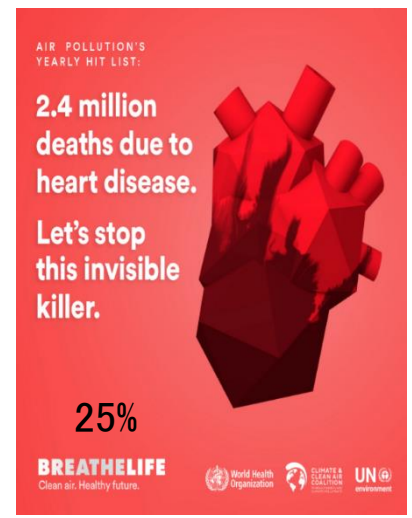

Pollutant	Effects on health	Assessment
Particulate Matter (<2.5µm)	Death	causal
	Cardiovascular diseases	causal
	Lung cancer	causal
	Respiratory diseases	probably causal
Ozone	Short-term effects on respiratory diseases	causal
	Short-term effects on cardiovascular diseases	probably causal
	Respiratory diseases	probably causal
Nitrogen dioxide	Short-term effects on respiratory diseases	causal
	Respiratory diseases	probably causal

ERS/ISEE 2019

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Effects of air pollution on health

Report of the Joint Task Force on the Health Aspects of Air Pollution on its twenty-third meeting

V. Progress in research on health impacts of air pollution

10. An expert from Utrecht University (Netherlands) presented the results of a recent study on the effects of low-level air pollution in Europe. The study had been sponsored by the Health Effects Institute, and covered Canada, Europe and the United States of America. For Europe, both pooled cohorts and administrative cohorts had been used covering a population size of over 28 million subjects, and a common codebook had been used to harmonize the variables between cohorts. The objective of the study had been to investigate associations between long-term exposure to $PM_{2.5}$, NO_2, O_3 and BC in relation to natural and cause-specific mortality and the incidence of lung cancer and cardiovascular events.

http://www.elapseproject.eu/

https://www.unece.org/fileadmin/DAM/env/documents/2020/AIR/EMEP_WGE_Joint_Session/ECE_EB.AIR_GE.1_2020_17-2009360E.pdf

Air pollution and COVID-19

Evidence on the link between air pollution and COVID-19

- Effect on incidence and severity
- Role in transmission

Potential effect of air pollution on vulnerability and susceptibility to COVID-19 are plausible

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What do we know about aerosol transmission?

Access the publication

Some medical procedures can produce very small droplets (called aerosolized droplet nuclei or aerosols) that are able to stay suspended in the air for longer periods of time. When such medical procedures are conducted on people infected with COVID-19 in health facilities, these aerosols can contain the COVID-19 virus. These aerosols may potentially be inhaled by others if they are not wearing appropriate personal protective equipment. Therefore, it is essential that all health workers performing these medical procedures take specific airborne protection measures, including using appropriate personal protective equipment. Visitors should not be permitted in areas where such medical procedures are being performed.

There have been reported outbreaks of COVID-19 in some closed settings, such as restaurants, nightclubs, places of worship or places of work where people may be shouting, talking, or singing. In these outbreaks, aerosol transmission, particularly in these indoor locations where there are crowded and inadequately ventilated spaces where infected persons spend long periods of time with others, cannot be ruled out. More studies are urgently needed to investigate such instances and assess their significance for transmission of COVID-19.

https://www.who.int/news-room/q-a-detail/q-a-how-is-covid-19-transmitted

Methodological challenges

EDITORIAL
INFECTIOUS DISEASE

Go slow to go fast: a plea for sustained scientific rigour in air pollution research during the COVID-19 pandemic

Dick J.J. Heederik, Lidwien A.M. Smit and Roel C.H. Vermeulen

Commentary

A Section 508–conformant HTML version of this article is available at https://doi.org/10.1289/EHP7411.

Methodological Considerations for Epidemiological Studies of Air Pollution and the SARS and COVID-19 Coronavirus Outbreaks

Paul J. Villeneuve[1,2] and Mark S. Goldberg[2,3,4,5]

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[2]Department of Epidemiology, Biostatistics, and Occupational Health, McGill University, Montreal, Canada
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[5]Centre for Outcomes Research and Evaluation, Research Institute of the McGill University Hospital Centre, Montreal, Canada

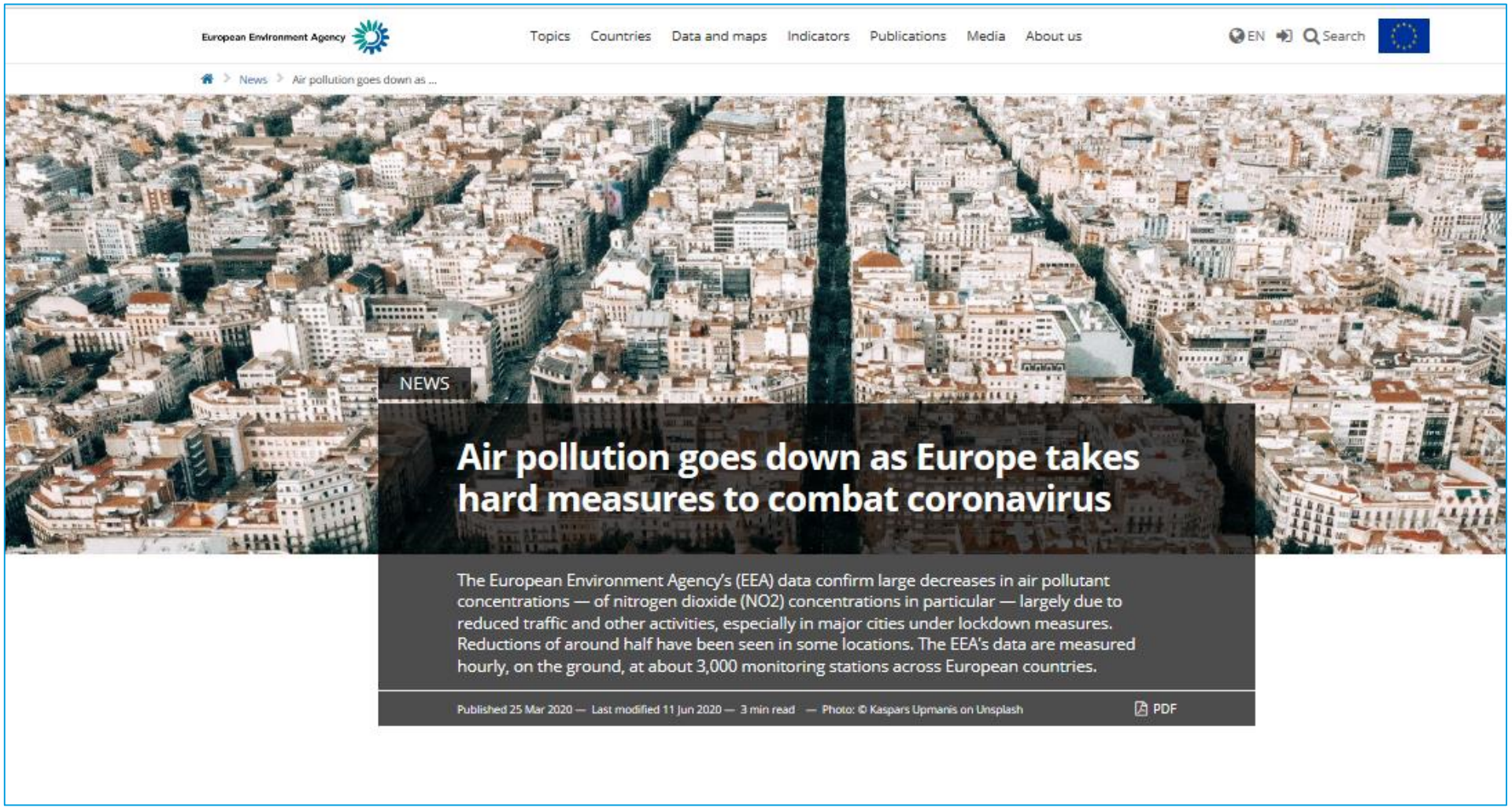
Open research questions

Does exposure to air pollutants (short term or/and long-term)

- Increase **susceptibility** to illness
- Change the **prognosis** of the illness
  - severity
  - mortality
  - long-term consequences

HERA-COVID-19
Research needs on Covid-19/Environment & Health nexus
Contribution of HERA

Does the improvement of environmental conditions during the epidemic lead to **improvement** in human health



Source: https://www.eea.europa.eu/highlights/air-pollution-goes-down-as

Impact of COVID-19 lock-down on air quality

- Lockdown measures led to sharp reduction in **road traffic** and industries, leading to reductions in NO_2 concentrations
- Some major European cities, such as Milan, Rome, Paris and Madrid experienced NO_2 emission **reductions of approximately 50%** compared to pre-lockdown conditions
- **Weather conditions** may possibly significantly affect the changes seen in pollutant concentrations (EEA, 2020)
- Pollution levels have **rebound** in some cities, and in some cases, exceeded pre-lockdown pollutant concentrations, hence the need for rapid action to recover better

Green and healthy recovery from COVID-19
WHO Manifesto

Six pillars:

1. Protect and preserve the source of human health: nature
2. Invest in essential services, from water and sanitation to clean energy in healthcare facilities
3. Ensure a quick transition to clean renewable sources of energy
4. Switch to healthy and sustainable food systems
5. Build healthy, livable cities
6. Stop using taxpayers money to fund pollution

Update of the WHO Global Air Quality Guidelines

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Table 1.1. The guideline development process at WHO

Stage/primary contributor	Step	Chapter
Planning		
WHO Member State, WHO country office or public/private entity	Request guidance on a topic	1
WHO technical unit	Determine if a guideline is needed; review existing WHO and external guidelines	2
	Obtain approval for guideline development from the director of the relevant technical unit at WHO	2
	Discuss the process with the GRC Secretariat and with other WHO staff with experience in developing guidelines	2
	Form the WHO guideline steering group	3
	Identify sufficient resources; determine the timeline	2
WHO guideline steering group	Draft the scope of the guideline; begin preparing the planning proposal	2,4
	Identify potential members of the GDG and its chair	3
	Obtain declaration of interests and manage any conflicts of interest among potential GDG members	6
WHO guideline steering group and GDG	Formulate key questions in PICO format; prioritize outcomes	5, 7
WHO guideline steering group	Finalize the planning proposal and submit it to the GRC for review	4
GRC	Review and approve the planning proposal	4
Development		
Systematic review team	Perform systematic reviews of the evidence for each key question	8
	Evaluate the quality of the evidence for each important outcome, using GRADE as appropriate	9
WHO guideline steering group	Convene a meeting of the GDG	10,11
GDG	Formulate recommendations using the GRADE framework	10,11
WHO steering group	Draft the guideline document	10,11
External review group	Conduct external peer review	12
Publishing and updating		
WHO guideline steering group and editors	Finalize the guideline document; perform copy-editing and technical editing; submit the final guideline to the GRC for review and approval	12
GRC	Review and approve the final guideline	12
WHO guideline steering group and editors	Finalize the layout; proofread	12
	Publish (online and in print as appropriate)	12
WHO technical unit and programme manager	Disseminate, adapt, implement, evaluate	13
WHO technical unit	Update	12

- *September 2016*: 1st meeting of the Guideline Development Group (GDG)
- *January 2017*: guideline proposal approved
- *Since 2017*: systematic reviews of evidence
- *March 2018*: 2nd meeting of the GDG
- *June 2019*: 3rd meeting of the GDG

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- *February 2020*: 4th meeting of the GDG
  - adaptation of GRADE framework
  - approach to setting interim targets
  - approach to deriving AQG levels
- *June 2020*: 5th meeting of the GDG
  - deriving long and short-term AQG levels
  - updating associated interim targets
  - agreed good practice statements on
    - black carbon
    - ultrafine particles
    - sand storm

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Next steps:

- Publication of systematic reviews (on-going)
- Completion of the draft guideline document (on-going)
- Consultation of the draft guideline document
- Finalisation of the guideline documents
- Submission to the WHO Guideline Review Committee

Systematic reviews of evidence

Short-term exposure to O_3, NO_2 and SO_2 and asthma

Long-term exposure to O_3 and NO_2 and all-cause and cause-specific mortality

Long-term exposure to PM and all-cause and cause-specific mortality

Short-term exposure to SO_2 and all-cause and cause-specific mortality

Short-term exposure to CO and ischaemic heart disease

Short-term exposure to PM, NO_2 and O_3 and all-cause and cause-specific mortality

Special issue:
https://www.sciencedirect.com/journal/environment-international/special-issue/10MTC4W8FXJ

Thank you

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