

Use of Air Quality Data for policy-relevant Health Assessments: new WHO Global Air Quality Guidelines and related data requirements.

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Regional Training on air quality and emissions to air statistics and indicators, 4 May 2023



World Health
Organization

European Region

www.who.int/europe

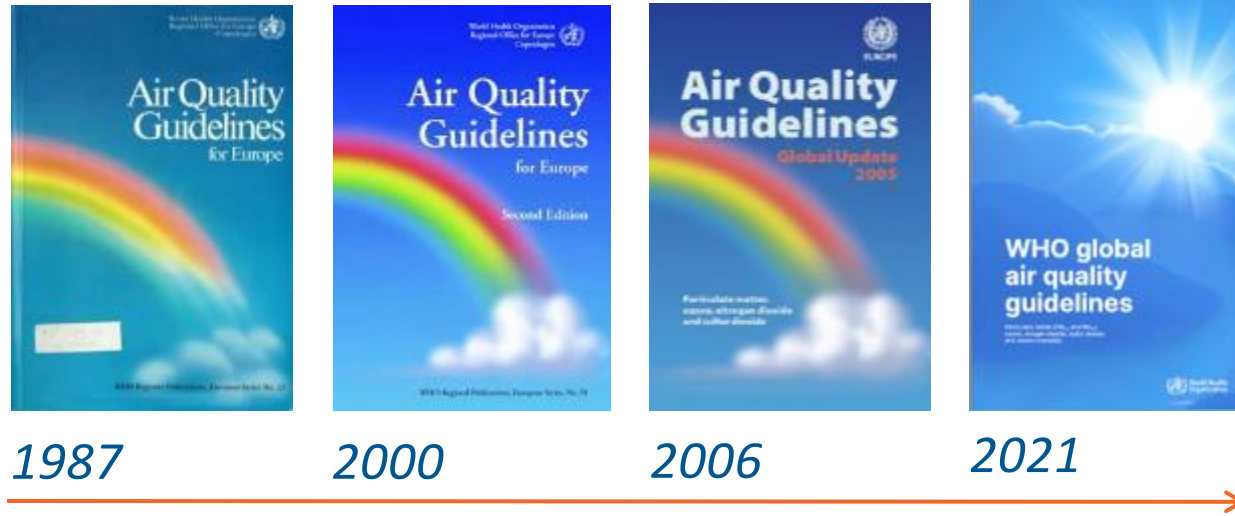


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- What are WHO Air Quality Guidelines (WHO AQG)?
 - How were WHO AQG developed?
 - How can WHO AQG be used?



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- What are WHO Air Quality Guidelines (WHO AQG)?

WHO Air Quality Guidelines (WHO AQG)



Robust public health recommendations



Support informed decision-making



Intended for worldwide use



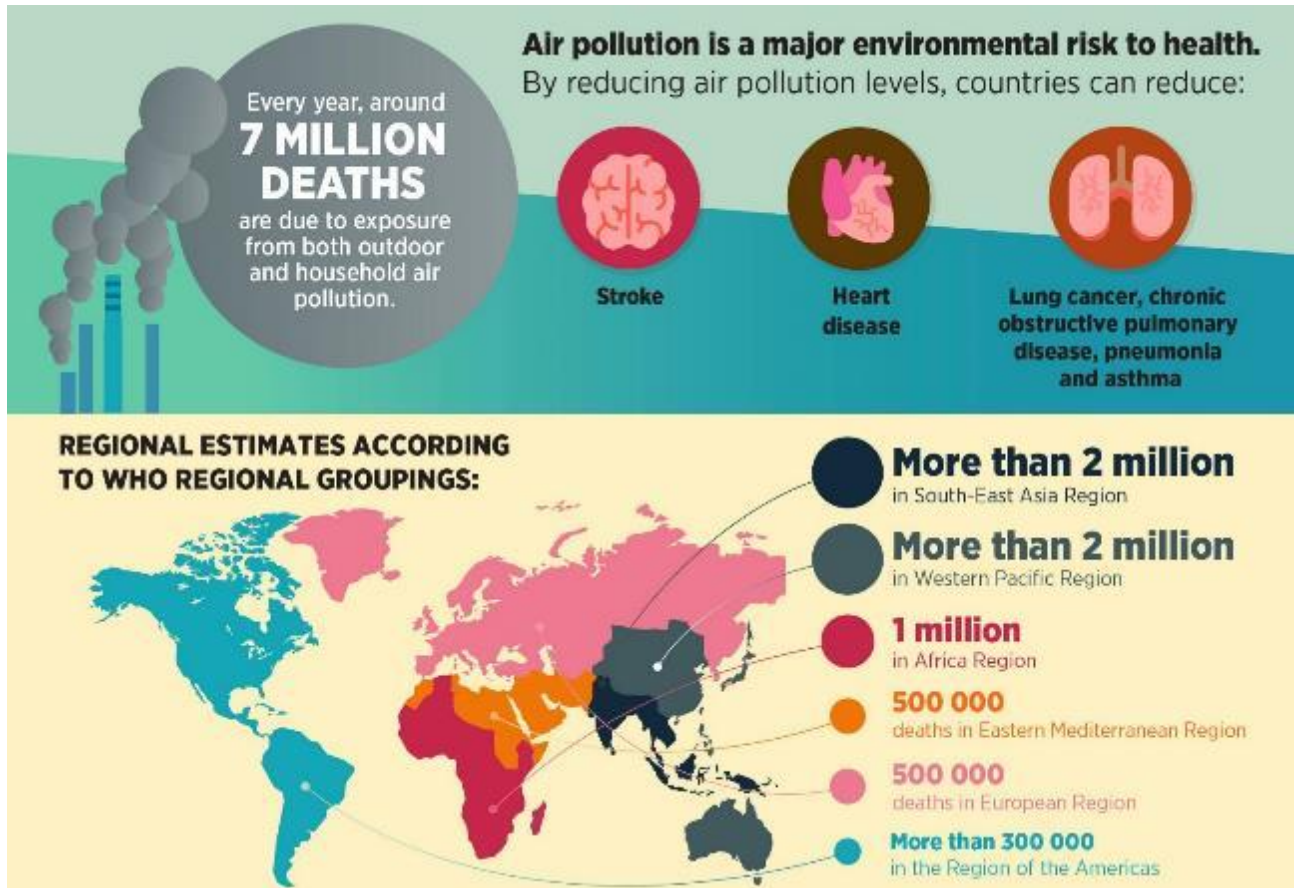
Comprehensive assessment of the evidence

Why the new WHO global AQG?



- Marked increase in the quality and quantity of **evidence** on the health effects of air pollution
- Better insight into global **concentrations** of some pollutants
- Insights into sources of emissions and the contribution of air pollution to the **global burden of disease**
- Importance of addressing health **inequities** related to air pollution
- Advances in the worldwide **adoption** of the 2005 air quality guidelines
- Mitigating air pollution has become more central in **WHO and UN activities**

Growing and inequitable burden of disease



- Despite certain improvements in air quality in some regions over the past 30 years, **the global toll in deaths and healthy years of life lost is very high.**
- This burden of disease often disproportionately affects **the most vulnerable** and susceptible populations.

Policy drivers

- World Health Assembly resolution (2015)
- UN Environment Assembly resolutions:
 - Promoting air quality (2014)
 - Coordinated approach to challenges of sand and dust storms (2016)
 - Actions across sectors (2018)
- UNECE Convention on Long-range Transboundary Air Pollution, including Joint Task Force on the Health Aspects of Air Pollution, chaired by WHO ECEH
- UN Special Rapporteur on the Issue of Human Rights Obligations Relating to the Enjoyment of a Safe, Clean, Healthy and Sustainable Environment – right to breathe clean air (2019)
- UN Sustainable Development Agenda:
 - 2030 Agenda for Sustainable Development (2015)
 - Strategic priorities for non-communicable diseases (2018)



What are the WHO global AQG?



- Based on the extensive evidence, they identify the levels of air quality necessary to protect public health worldwide
- Provide recommendations on air quality guideline levels for PM_{2.5}, PM₁₀, O₃, NO₂, SO₂ and CO
- Not legally binding, but serve as an evidence-informed reference for setting standards or policies
- An instrument to design effective measures to achieve reduction of air pollution and, therefore, protect human health
- Do not apply to occupational settings
- Do not address specific recommendations on policies and interventions

What do the WHO global AQG provide?

Air quality guideline levels for both long- and short-term exposure in relation to critical health outcomes

Interim targets to guide reduction efforts for the achievement of the air quality guideline levels

Good practice statements on the management of certain types of particulate matter for which evidence is insufficient to derive quantitative air quality guideline levels, but points to their health relevance

Pollutant	Averaging time	IT1	IT2	IT3	IT4	AQG level
PM _{2.5} , µg/m ³	Annual	35	25	15	10	5
PM _{2.5} , µg/m ³	24-hour ^a	75	50	37.5	25	15
PM ₁₀ , µg/m ³	Annual	70	50	30	20	15
PM ₁₀ , µg/m ³	24-hour ^a	150	100	75	50	45
O ₃ , µg/m ³	Peak season ^b	100	70	–	–	60
O ₃ , µg/m ³	8-hour ^a	160	120	–	–	100
NO ₂ , µg/m ³	Annual	40	30	20	–	10
NO ₂ , µg/m ³	24-hour ^a	120	50	–	–	25
SO ₂ , µg/m ³	24-hour ^a	125	50	–	–	40
CO, mg/m ³	24-hour ^a	7	–	–	–	4

Interim targets to guide continuous improvement of air quality

They set out to achieve this by:



Good practice
statements
on certain
types of PM



**Sand and
dust storms**



**Black/
elemental
carbon**

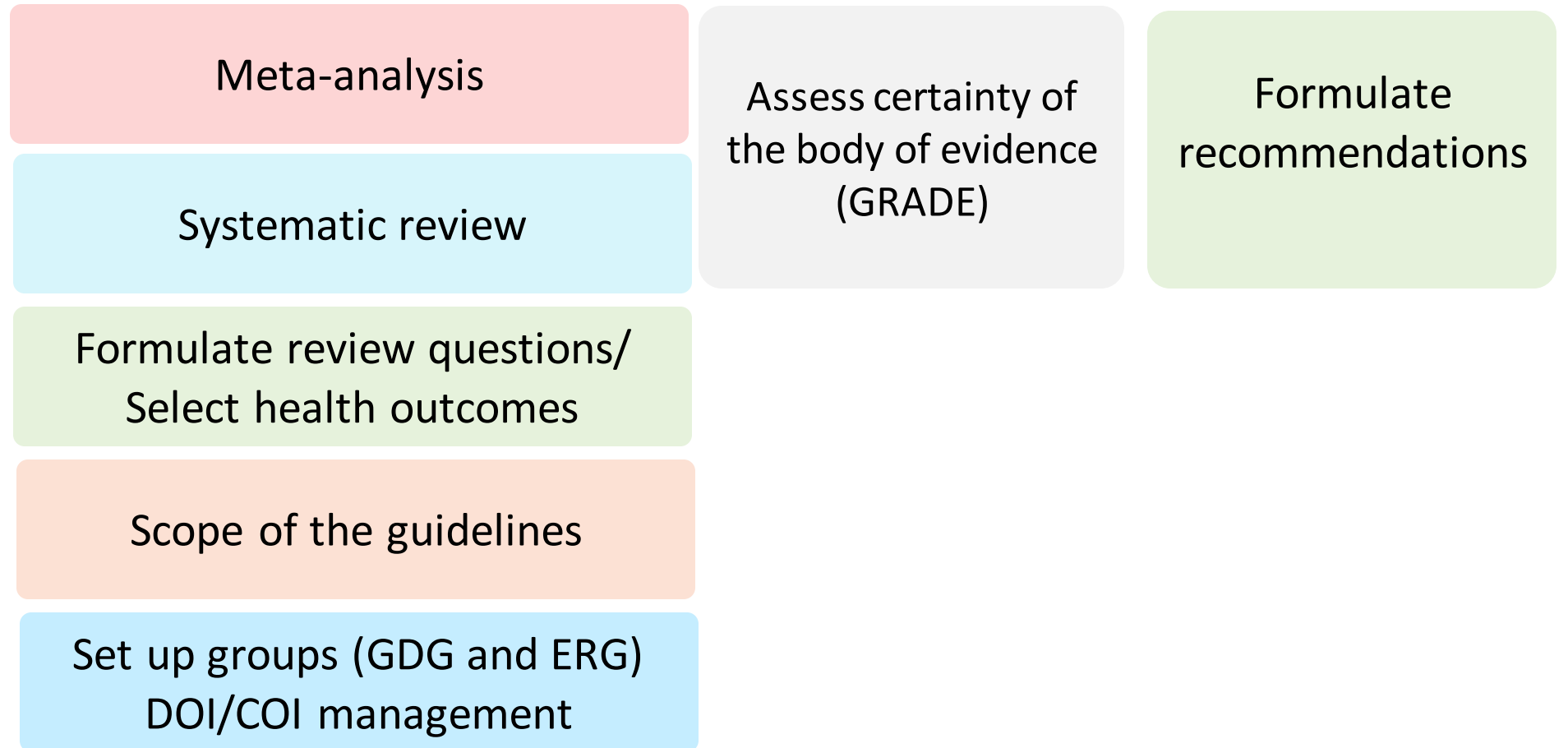


**Ultrafine
particles**

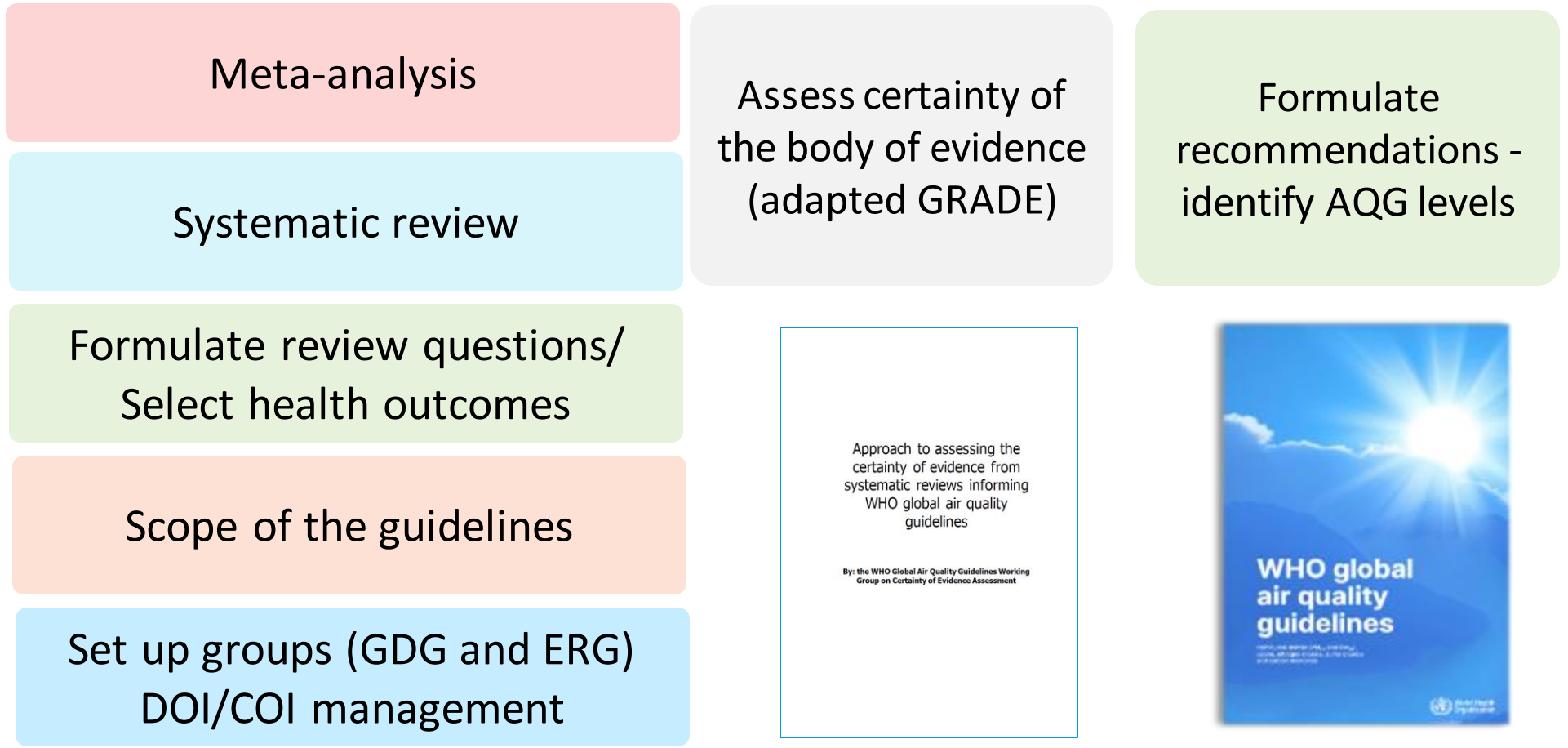


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- How were WHO AQG developed?

Main steps in the development of WHO guidelines



Main steps in the development of WHO AQG



Systematic review process

Scoping:	6 pollutants, 11 major outcomes, 6 questions (PECOS)
Planning:	6 protocols, 2 new tools, 3 physical meetings
Identification/screening:	12 databases searched; 20 000 papers screened
Eligibility:	500 eligible papers
Data extraction:	up to 60 data items extracted
Risk of bias :	6 domains assessed
Synthesis:	500 papers synthesized
Interpretation:	8 GRADE domains evaluated



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- How can WHO AQG be used?

A year after the launch ...

Global Regions

World Health Organization

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WHO global air quality guidelines: particulate matter (PM2.5 and PM10), ozone, nitrogen dioxide, sulfur dioxide and carbon monoxide

22 September 2021 | Guideline

Overview

Clean air is fundamental to health. Compared to 15 years ago, when the previous edition of these guidelines was published, there is now a much stronger body of evidence to show how air pollution affects different aspects of health at even lower concentrations than previously understood. But here's what hasn't changed: every year, exposure to air pollution is still estimated to cause millions of deaths and the loss of healthy years of life.

The burden of disease attributable to air pollution is now estimated to be on a par with other major global health risks such as unhealthy diets and tobacco smoking. In 2015, the World Health Assembly adopted a landmark resolution on air quality and health, recognizing air pollution as a risk factor for noncommunicable diseases such as ischaemic heart disease, stroke, chronic obstructive pulmonary disease, asthma and cancer, and the economic toll they take. The global nature of the challenge calls for an enhanced global response.

Download the report

Download the Executive summary

Learn more about air quality and health

WHO TEAM
Air quality and Health, Environment, Climate Change and Health

EDITORS
WHO

NUMBER OF PAGES
250

REFERENCE NUMBERS
ISBN: 9789240034203

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Directrices mundiales de la OMS sobre la calidad del aire

Глобальные рекомендации ВОЗ по качеству воздуха

Lignes directrices OMS relatives à la qualité de l'air

WHO Global Air Quality Guidelines:
14 October 2021

WHO is dedicated to supporting countries

Media:

BBC, EL PAÍS, Frankfurter Allgemeine, CNN, South China Morning Post, Brisbane Times,...

Science:

- BMJ, Lancet, Int J Public Health, Eur J Public Health, Allergy...
- Guideline >700 citations
- Systematic reviews >600 citations
- 2021 WHO list of 10 key global health moments
- Web downloads: >100 000

Main uses of WHO AQG

TO INFORM AIR QUALITY POLICIES

To guide the development of legislation and policies to reduce levels of air pollutants, strengthen intersectoral cooperation, decrease the disease burden and reduce inequities



TO STIMULATE RESEARCH

To identify critical data gaps that could be addressed in the future research agendas




TO ENHANCE CLIMATE ACTION

AQGs are a powerful tool for climate action.



An example from the European Union

An official website of the European Union How do you know? ▾

 European Commission

EN English Search

Environment

Home > Topics > Air > Air Quality > Revision of the Ambient Air Quality Directives

Revision of the Ambient Air Quality Directives

As part of the European Green Deal, the EU is revising the [air quality standards](#) ^(***) to align them more closely with the recommendations of the World Health Organization. See the latest WHO Air Quality Guidelines [\[1\]](#), published on 22 September 2021. This revision also aims to improve overall EU legislation for clean air, building on the lessons learnt from the 2019 evaluation ('fitness check') of the Ambient Air Quality Directives.

PAGE CONTENTS

- [Revision of the Directives](#)
- [Stakeholder consultation](#)
- ['Fitness check' of the Directives](#)

Revision of the Directives

The Commission plans to revise the Ambient Air Quality Directives in 2022. To this end, the Commission has published an [Inception Impact Assessment](#) ^(***), to guide the work and to assess the impacts of a possible revision.



Implementing the guidelines

Key enabling factors

Core institutional / technical tools and human capacity

Legally binding air quality standards

Existence and operation of air quality monitoring system

Air quality management systems

Public access to air quality data

Capacities for health risk assessment to set priorities for action

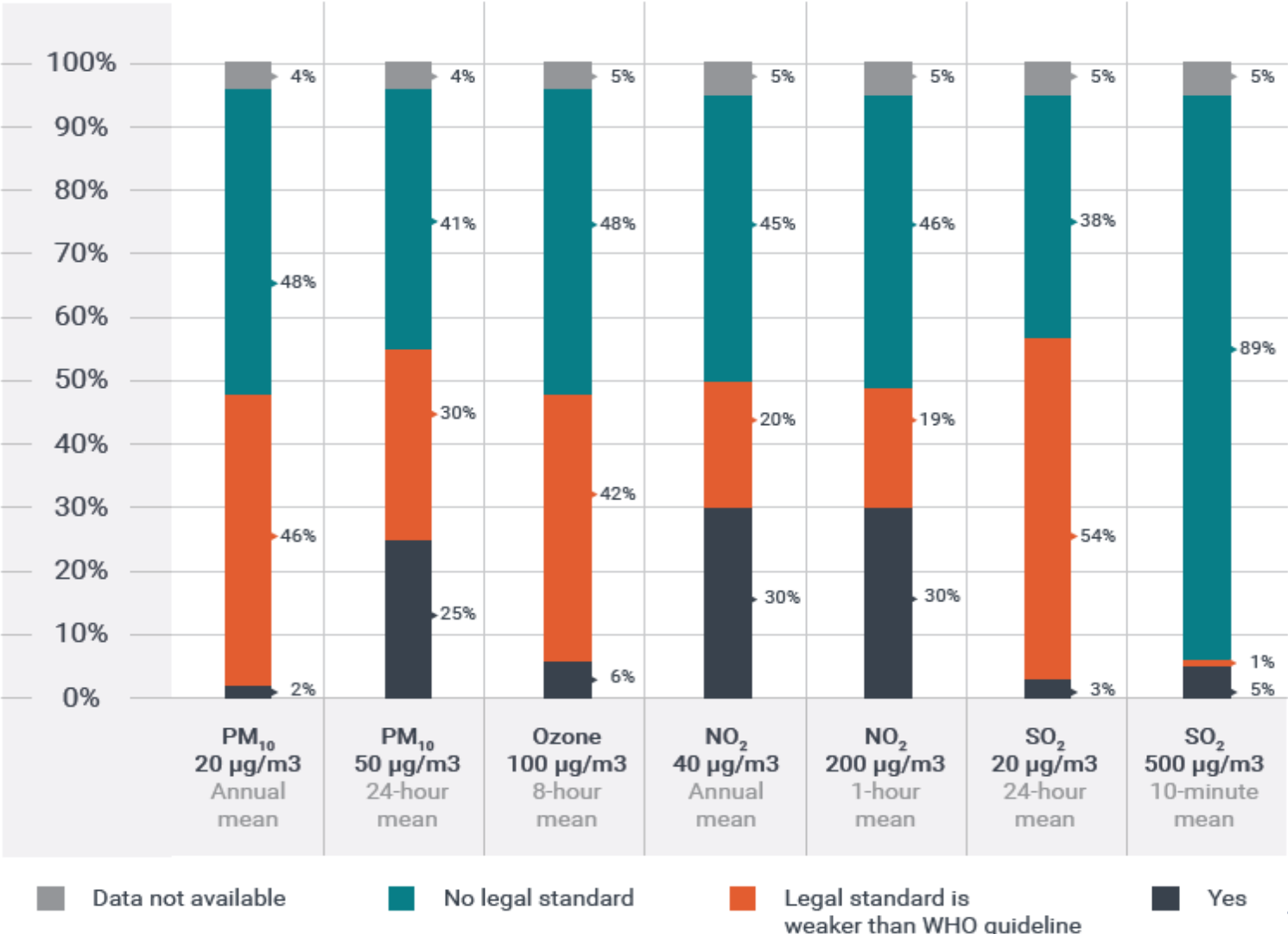
Cooperation among sectors and stakeholders, including the health sector

Uptake of AQG in AAQS across the world

WHO REGION	COUNTRIES IN THE REGION (N)	COUNTRIES WITH STANDARDS FOR AT LEAST ONE POLLUTANT AND AVERAGING TIME		COUNTRIES WITHOUT STANDARDS		COUNTRIES WITH NO INFORMATION	
		n	%	n	%	n	%
African Region	47	17	36	21	45	9	19
Region of the Americas	35	20	57	13	37	2	6
South-East Asian Region	11	7	64	3	27	1	9
European Region	53	50	94	2	4	1	2
Eastern Mediterranean Region	21	11	52	1	5	9	43
Western Pacific Region	27	12	44	13	48	2	7
Total	194	117	60	53	27	24	12

Kutlar Joss et al., 2017

Legal incorporation of 2005 WHO air quality guidelines in national ambient air quality standards



What can countries do with the AQGs?

Key actions

Countries can **use the AQGs as a tool** to guide, drive and support the selection and adoption of measures to reduce exposure to air pollution:

- Establish or update their **legally binding air quality standards** and **develop policies**
- Strengthen **multisectoral cooperation** at national, regional, and international levels, and **advocate** for air quality
- Take effective steps to **reduce** health **inequities** related to air pollution

Actions to reduce air pollution require **cooperation** of various sectors and stakeholders.

Implementing the guidelines

**Air quality
standards are the
cornerstone of air
quality management**

Moving from guidelines to legally-binding standards

Solutions require intersectoral cooperation



The health sector has a key role

- raising awareness of the impact of air quality on health
- advising the public and patients about how the impact of air pollutants can be mitigated at an individual level
- gathering evidence on health effects
- joining advocacy efforts at the national and international levels to ensure that the health arguments are heard



WHO support to Member States

- Dissemination: Executive summaries in 14 languages
- Communication to promote the uptake of AQGs
- Communication about actions people can take to reduce exposure to air pollution
- Compendium of existing tools and materials to support implementation
- Science-policy dialogues in Member States
- Capacity building training in health and other sectors
- Methodological developments and assessments



**Protecting health through
ambient air quality management**
A resource package for the WHO European Region



The impacts of air pollution: data requirements

- Air pollution
- Population
- Health data
- Risk selection

From input data to estimates

Air quality: tools available or under development

WHO is producing and testing various tools:

- **AirQ+**: impacts on health of air pollution



- **CaRBonH** (Carbon Reduction Benefits on Health)



CLIMAQ-H

Climate Mitigation, Air Quality and Health



- **GreenUr**



- **HEAT** (Health Economic Assessment Tool):
online tool that conducts an economic assessment of the health benefits of walking or cycling



AirQ+: welcome screen

The screenshot shows the AirQ+ interface with several key elements highlighted:

- Menu:** A yellow circle highlights the 'Projects Overview' sidebar on the left, which lists 'Impact Assessment', 'Burden of Disease', and 'Risk Analysis'.
- Documentation:** A red circle highlights the 'Documentation' section in the main content area, which includes a 'Welcome to AirQ+' message and a list of links: 'What is AirQ+', 'Getting started', and 'Acknowledgments'.
- Start analysis:** A green circle highlights the 'Create new' buttons for 'Impact Assessment', 'Burden of Disease', and 'Risk Analysis'.
- Language and Info:** A red circle highlights the top right corner, showing the 'English' language dropdown and a menu with 'Glossary', 'Disclaimer', 'Manuals', and 'Citation'.

The interface also features the World Health Organization logo and the 'AirQ+' title in the top left. The bottom status bar shows 'AirQ+' and 'v. 2.0'.

Current version: AirQ+ 2.2 (March 2023) link:

<http://www.euro.who.int/en/health-topics/environment-and-health/air-quality/activities/airq-software-tool-for-health-risk-assessment-of-air-pollution>

AQG: Take home messages



- An increase in the quality and quantity of evidence on air pollution and health
- Clearer insights about global concentrations, sources of emissions, inequities and global burden of disease
- Based on a systematic review of the evidence and a robust guideline development process, several new AQG levels are lower than 15 years ago
- AQGs are not legally binding, but provide recommendations to protect public health through the continuous improvement of air quality
- Implementation of the guidelines requires intersectoral cooperation at different levels
- The health sector has a crucial role to play

Conclusions

- AQGs provide recommendations to protect public health through the improvement of air quality and offering information for health risk assessment to set priorities for action
- Implementation of policies that take into account the guidelines requires tools for health risk assessment
- Estimating health impacts of policies are important to orient decision-making
- The health sector is empowered with tools that allow collaboration with other sectors
- WHO provides data and tools simple to use to estimates adverse health risks and impacts of air pollution

Thank you

Funding and in-kind support provided by:

European Commission

German Federal Ministry for the
Environment, Nature Conservation and
Nuclear Safety

German Federal Ministry of Health

Government of the Republic of Korea

Swiss Federal Office for the Environment

United States Environmental Protection
Agency