

WHO Global Air Quality Guidelines 2021

Setting ambitious goals for air quality to protect public health

23 September 2021

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Setting ambitious goals to reduce air pollution

What is new in the AQGs?

Why are the AQGs so important for health?

How were these guidelines developed?

How can these guidelines be used?

What can countries do with them?

How will WHO support countries?

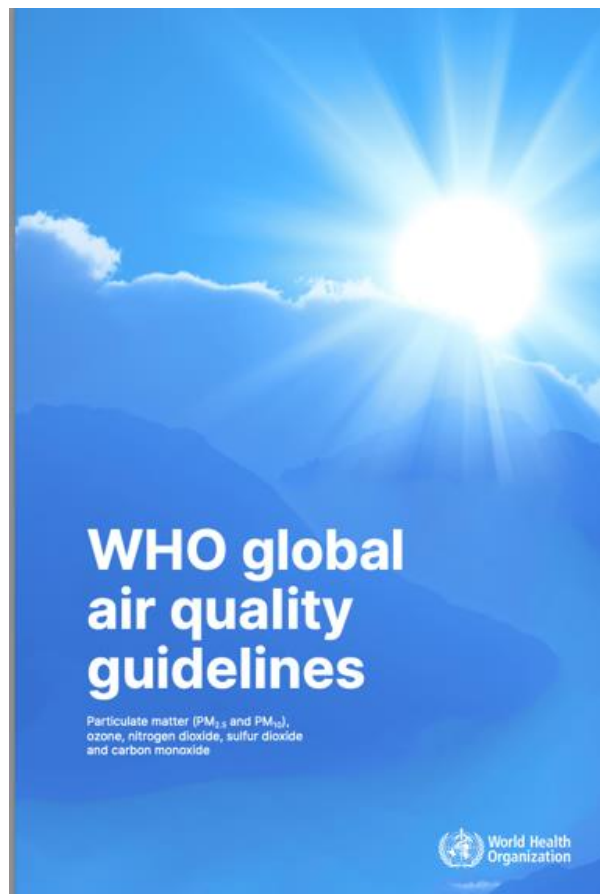
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What are the AQGs and what is new in them?

What are the WHO Air Quality Guidelines?

- Based on extensive scientific evidence, the AQGs identify the levels of air quality necessary to **protect public health worldwide**.
- They provide recommendations on **air quality guidelines levels** (and interim targets) for **PM_{2.5}** and **PM₁₀**, **O₃**, **NO₂**, **SO₂** and **CO**, and qualitative good practice statements for certain types of particulate matter.
- Guideline levels can be used as an **evidence-informed reference** to help decision-makers in setting legally binding standards and goals for air quality management.
- They are an **instrument to design effective measures** to achieve reduction of air pollution, and therefore, to protect human health.

What is new in these AQGs 2021?



- Since the last 2005 global update, there has been a marked increase in the quality and quantity of evidence that shows how air pollution affects different aspects of health.
- There are also now clearer insights about sources of emissions and the contribution of air pollutants to the global burden of disease.
- For that reason, and after a systematic review of the accumulated evidence, **several of the updated AQG levels are now lower than 15 years ago.**
- New features include new AQG levels for peak-season O₃ and 24-h NO₂ and CO, as well as new interim targets.

What the AQGs provide...

Summary of recommended AQG levels and interim targets

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

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 in 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.

Good practice statements

For the management of certain type of particle

SAND AND DUST STORM



- Maintain suitable air quality management and dust forecasting programmes.
- Maintain air quality monitoring programmes and reporting procedures.
- Conduct epidemiological studies and research activities aimed at better understanding toxicity.
- Implement wind erosion control through the carefully planned expansion of green spaces.

BLACK/ELEMENTAL CARBON



- Make systematic measurements.
- Undertake production of emission inventories, exposure assessments and source apportionment.
- Take measures to reduce emissions and develop standards (or targets).

ULTRAFINE PARTICLES



- Quantify ambient UFP in terms of PNC for a size range with a lower limit of ≤ 10 nm and no restriction on the upper limit.
- Expand the common air quality monitoring strategy by integration of UFP monitoring.
- Distinguish between low and high PNC to guide decisions on the priorities of UFP source emission control.
- Utilize emerging science and technology for the assessment of exposure.

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Why are the AQGs
so important for
health?



Air pollution and health

The importance of the AQGs for health



- Around **7 million premature deaths** are attributable to the joint effects of ambient and household air pollution and of these, more than **500 000 happen in the WHO European Region**.
- Air pollution is now recognized as the single biggest environmental threat to human health, along with climate change.
- Air pollution affects:
 - NCDs,
 - cardiovascular and respiratory diseases,
 - lower respiratory tract infections,
 - preterm birth,
 - and other causes of death in children and infants.

Air pollution in the world

- More than 90% of the global population in 2019 lived in areas where $PM_{2.5}$ concentrations exceeded the 2005 annual WHO AQG of $10 \mu g/m^3$.
 - *Many of the countries with the lowest national $PM_{2.5}$ exposure levels were in WHO European Region.*
- The patterns of ambient NO_2 concentrations had the highest population-weighted concentrations in eastern Asia, the Middle East, North America and much of Europe, reflecting emissions from mobile sources propelled by combustion engines.
- Air pollution leads to health-related economic impacts through human health costs and lost labour productivity.

Air pollution and the Air Quality Guidelines

- 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 increasing.**
- This burden of disease often disproportionately affects **the most vulnerable** and susceptible populations.
- The impact of air quality can be seen on **people with greater exposure and individuals with chronic conditions** (such as asthma, COPD, heart failure, diabetes), as well as children and pregnant women.

Studies in relatively high-income countries have reported adverse effects on health at much lower levels of air pollution than before.



The AQGs provide evidence-informed recommendations in the form of air quality guideline levels, including an indication of the shape of the concentration-response function in relation to critical health outcomes for PM_{2.5}, PM₁₀, O₃, NO₂, SO₂ and CO for relevant averaging times.

- **World Health Assembly resolution and the road map** (2015): recognized the WHO Air Quality Guidelines in providing guidance and recommendations for clean air that protects health.
- **UN Sustainable Development Agenda:** the WHO AQGs support the strategic priorities for NCDs (UN 2018), and those established in the 2030 Agenda for Sustainable Development.
- **UN Environment Assembly:**
 - A resolution on Strengthening the role of the UNEP in promoting air quality, highlights the effects of air pollution, especially from the perspective of sustainable development. (2014).
 - All UN entities to promote a coordinated approach to combating the challenges of SDS globally by supporting Member States in identification of data, policies and actions (2016).
 - A resolution on preventing and reducing air pollution to improve air quality calls countries to take actions across sectors to reduce air pollution. (2018)
- **UN Special Rapporteur on the Issue of Human Rights Obligations Relating to the Enjoyment of a Safe, Clean, Healthy and Sustainable Environment** highlighted the different state obligations in relation to the right to breathe clean air, as well as the specific obligation to protect people and groups in vulnerable situations (UN, 2019a).
- **UNECE Convention on Long-range Transboundary Air Pollution**, including Joint Task Force on the Health Aspects of Air Pollution, chaired by WHO ECEH

Air pollution and health: policy drivers

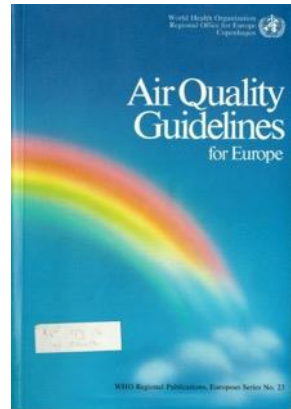
How were these guidelines developed?

3rd Meeting of the Guideline Development Group for the
update of the WHO Global Air Quality Guidelines

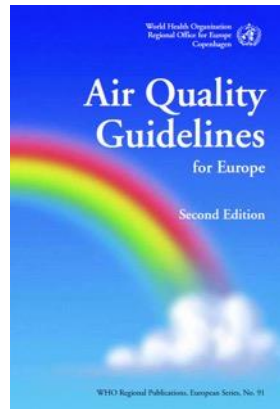
Bonn, Germany / 4-6 June, 2019



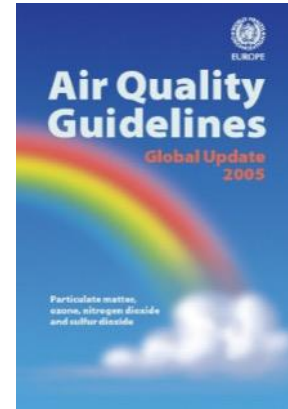
WHO Air Quality Guidelines



1987



2000



2006



since 2016



Robust public health recommendations



Support informed decision-making



Intended for worldwide use



Comprehensive assessment of the evidence

Guideline development

Main steps

1

Systematic review
process

2

Grading the evidence

3

Developing recommendations

Involved Groups

**Systematic
Review Team**

External
Review Group

**Guideline Development
Group**

External
Review Group



**WHO
Steering
Group**

The scope of the AQGs

Selection of pollutants

Scoping the guidelines involved the selection of air pollutants, and the critical health outcomes for each air pollutant in relation to durations of exposure.



The guideline development group (GDG) considered different criteria



The GDG decided to develop AQGs levels (with interim targets) for particulate matter PM₁₀ and PM_{2.5}, O₃, NO₂, SO₂ and CO, and good practice statements for black/elemental carbon, ultrafine particles and sand & duststorms

What the AQGs are not/do not include

- The WHO AQGs are not legally binding. They are a set of recommendations, which may serve a reference for setting standards or policies
- They do not apply to occupational settings, but all others (including outdoor and indoor)
- They do not include recommendations about joint effects of multiple exposures.
- They do not address specific recommendations on policies and interventions because these are largely context specific
- They do not cover all air pollutants, but all previous WHO guidelines not updated remain valid

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How can the AQGs
be used?



How can the AQGs be used?

AS AN EVIDENCE-INFORMED TOOL



The AQGs are an evidence-informed tool for decision-makers to guide legislation and policies, to reduce levels of air pollutants and decrease the health burden that results from air pollution exposure worldwide.

Everybody has a role to play

TO STIMULATE RESEARCH



Air pollution researchers and academics can use it to help identify critical data gaps that future research agendas could address to better protect the population from the harmful effects of air pollution.

FOR CLIMATE ACTION



Efforts to improve air quality can enhance climate change mitigation, and climate change mitigation efforts can, in turn, improve air quality. All this enhance people's health.

AQGs are a power tool for climate action

What can countries do with the AQGs?

Key points

- 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.***
 - ***Strengthening multisectoral cooperation*** at national, regional, and international levels, and advocating for air quality.
 - Taking effective steps to ***reduce health inequities*** related to air pollution.
- Actions to reduce air pollution require **cooperation** of various sectors and stakeholders.
- **Health sector is crucial** in raising awareness, gathering evidence, advising people on how to mitigate impacts, and joining advocacy efforts.

How will WHO support this process?

- In the European Region 94% of countries have standards for at least one pollutant. AQGs can help to update standards and add more pollutants to the list.
- **WHO is ready to support Member States and the EU in implementing the guidelines**
- **Science-policy dialogues** within and among Member States and with sectors and stakeholders
- **Advocacy** to support the uptake of AQGs and how to apply them
- **Capacity building** in the health and other sectors

Thank you

Funding and in-kind support provided by:

- European Commission
- Swiss Federal Office for the Environment
- German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety
- United States Environmental Protection Agency
- Government of the Republic of Korea

WHO Regional Office for Europe
European Centre for Environment and Health

Platz der Vereinten Nationen 1
53113 Bonn
Germany



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