World Health Organization
Western Pacific Region

National Air Quality Standards: A Western Pacific Regional Overview

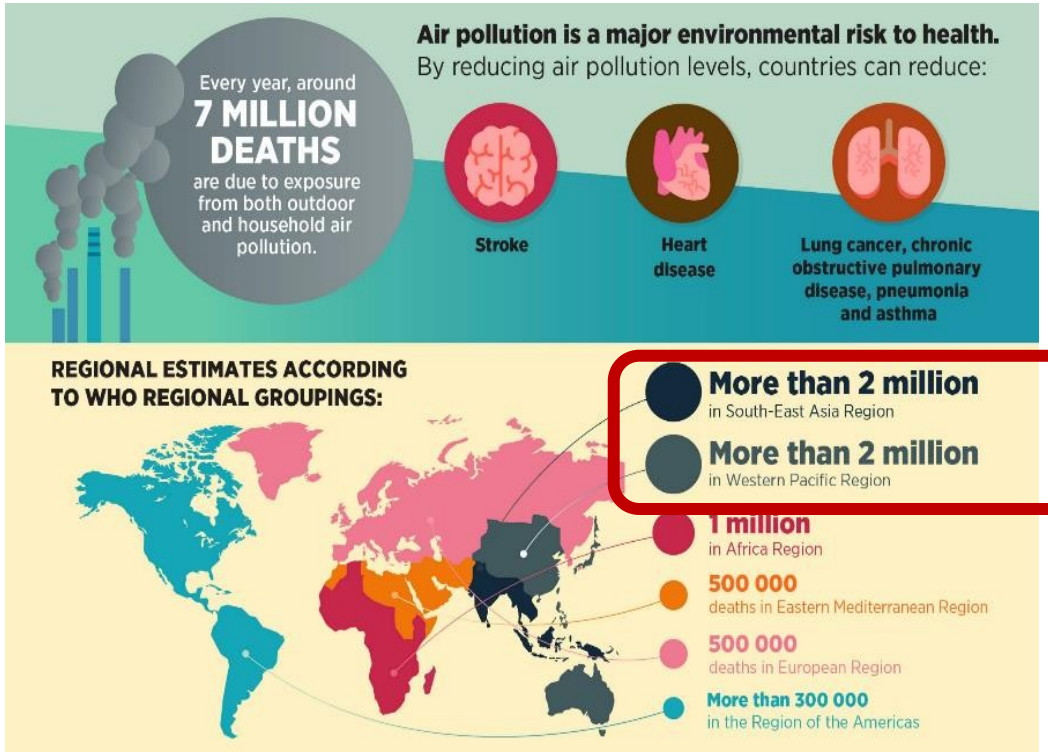
BAQ 2023

Ambition to Action: Clean air for health and the climate

Health

15 November 2023, Manila

Air quality and health in the Western Pacific Region

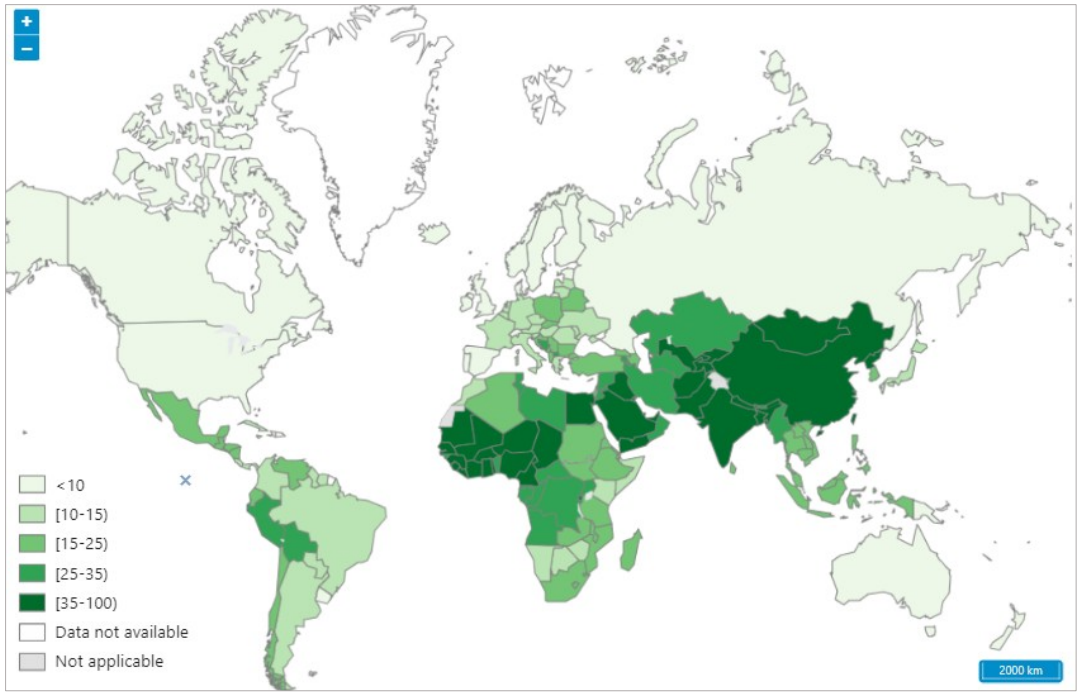


- Clean air is a basic human right and fundamental for human health, well-being and sustainable development
- Unequal burden and biggest impacts in lower- and middle-income countries
- The Western Pacific Region shares great mortality and morbidity burden
- Non-communicable diseases attributable to ambient PM pollution per 100 000 population :
  - **78.65** in the Region
  - 47.5 global

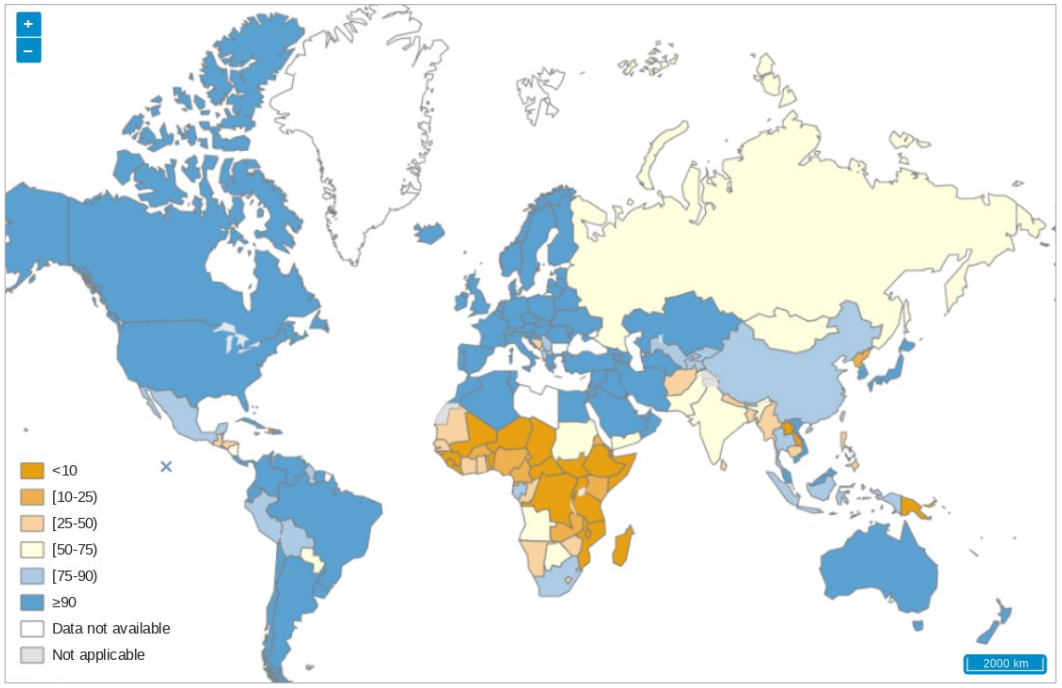
Ambient air pollution attributable deaths (who.int).

Air quality in the Western Pacific: key indicators

Concentrations of fine particulate matter ($PM_{2.5}$)



Population with primary reliance on clean fuels and technologies for cooking (%)



Source: WHO Air Quality Database

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Air quality and health in the Western Pacific: key indicators

SDG indicator 3.9.1: Mortality rate attributed to household and ambient air pollution (per 100 000 population)

- Global: 87
- Western Pacific Region**: 110** (total cause)

SDG indicator 7.1.2: Population with primary reliance on clean fuels and technologies (%)

- Global: 72%
- WPR: 83%; rural (68%) & urban (91) disparity

SDG indicator 11.6.2: Annual mean levels of fine Particulate Matter ($PM_{2.5}$) in cities

- Global: 31.7 µg/m3
- WPR: 33 µg/m3

Annual average masks large disparity

Implementing WHO Air Quality Guidelines greatly contribute to achieving SDGs

Source: The global health observatory, https://www.who.int/data/gho/data/themes/air-pollution?lang=en

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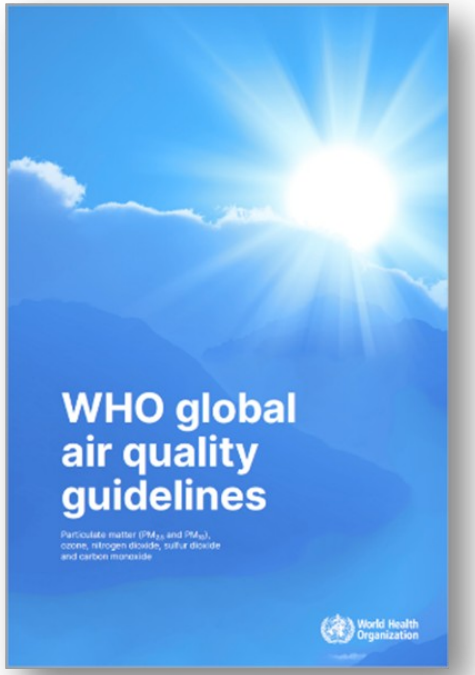
Health-based Air Quality Guidelines

Driving incremental improvement of air quality implementing WHO Air Quality Guidelines



Pollutant	Averaging time	Interim target				AQG level
		1	2	3	4	
$PM_{2.5}$, μg/m³	Annual	35	25	15	10	5
	24-hour[a]	75	50	37.5	25	15
PM_{10}, μg/m³	Annual	70	50	30	20	15
	24-hour[a]	150	100	75	50	45
O_3, μg/m³	Peak season[b]	100	70	–	–	60
	8-hour[a]	160	120	–	–	100
NO_2, μg/m³	Annual	40	30	20	–	10
	24-hour[a]	120	50	–	–	25
SO_2, μg/m³	24-hour[a]	125	50	–	–	40
CO, mg/m³	24-hour[a]	7	–	–	–	4

[a] 99th percentile (i.e. 3–4 exceedance days per year).
[b] Average of daily maximum 8-hour mean O_3 concentration in the six consecutive months with the highest six-month running-average O_3 concentration.

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Tremendous health and cost benefits from reducing pollutant concentrations to AQG levels

How many premature deaths could be avoided?

If achieved 2021 WHO AQG level for $PM_{2.5,}$:

- **3.1 million deaths** avoided in the Region ➞ annual economic benefit of **US$ 4.6 trillion**
- Gradual achievement of the interim targets bring substantial health benefits, in particular in areas with high $PM_{2.5,}$ concentrations

Reducing premature death by achieving AQG level in the Western Pacific Region
(scenario analysis for 2016 air pollution levels)

IT 1	IT 2	IT 3	IT 4	AQG level
9%	20%	36%	50%	80%

Sources:
Health and economic benefits of meeting WHO air quality guidelines, Western Pacific Region - PMC (nih.gov)
World Bank, 2021
WHO global air quality guidelines, 2021

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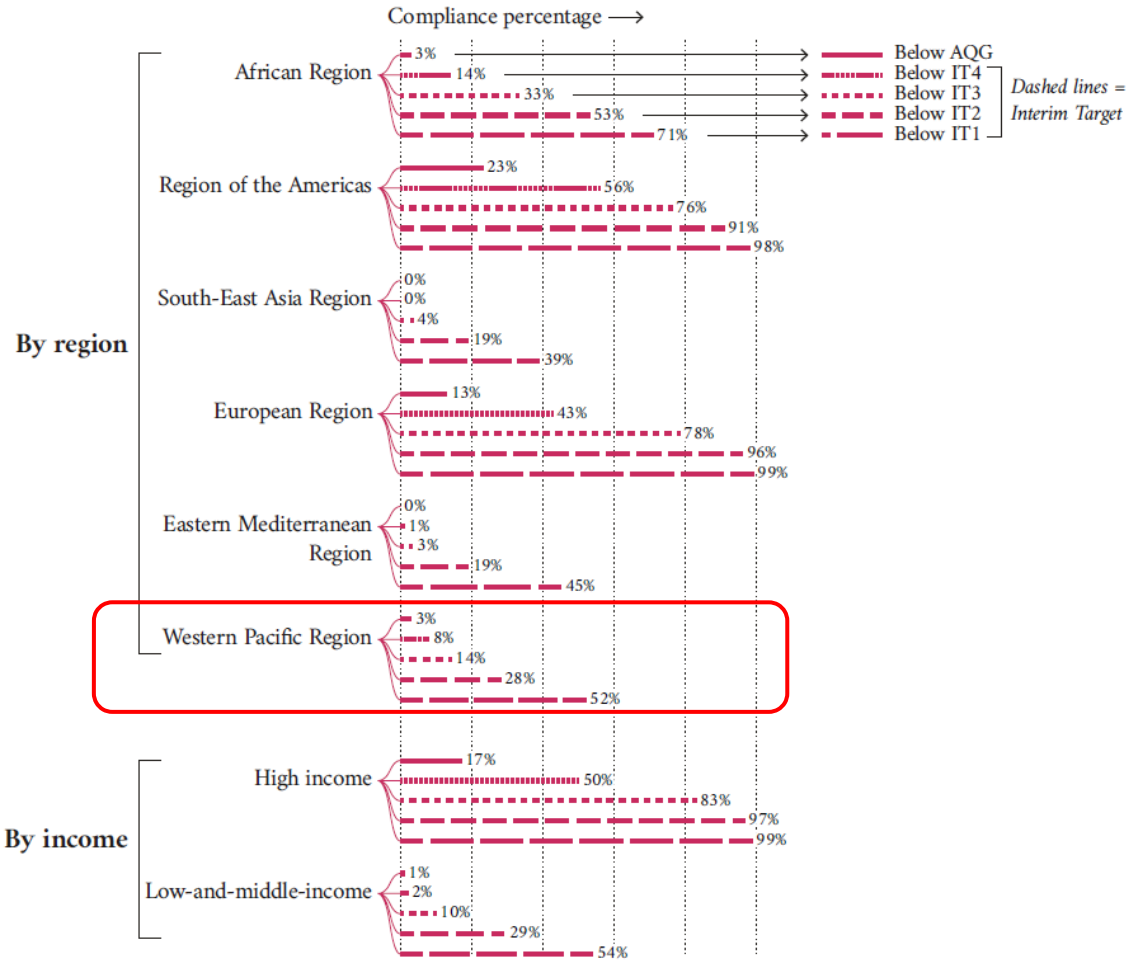
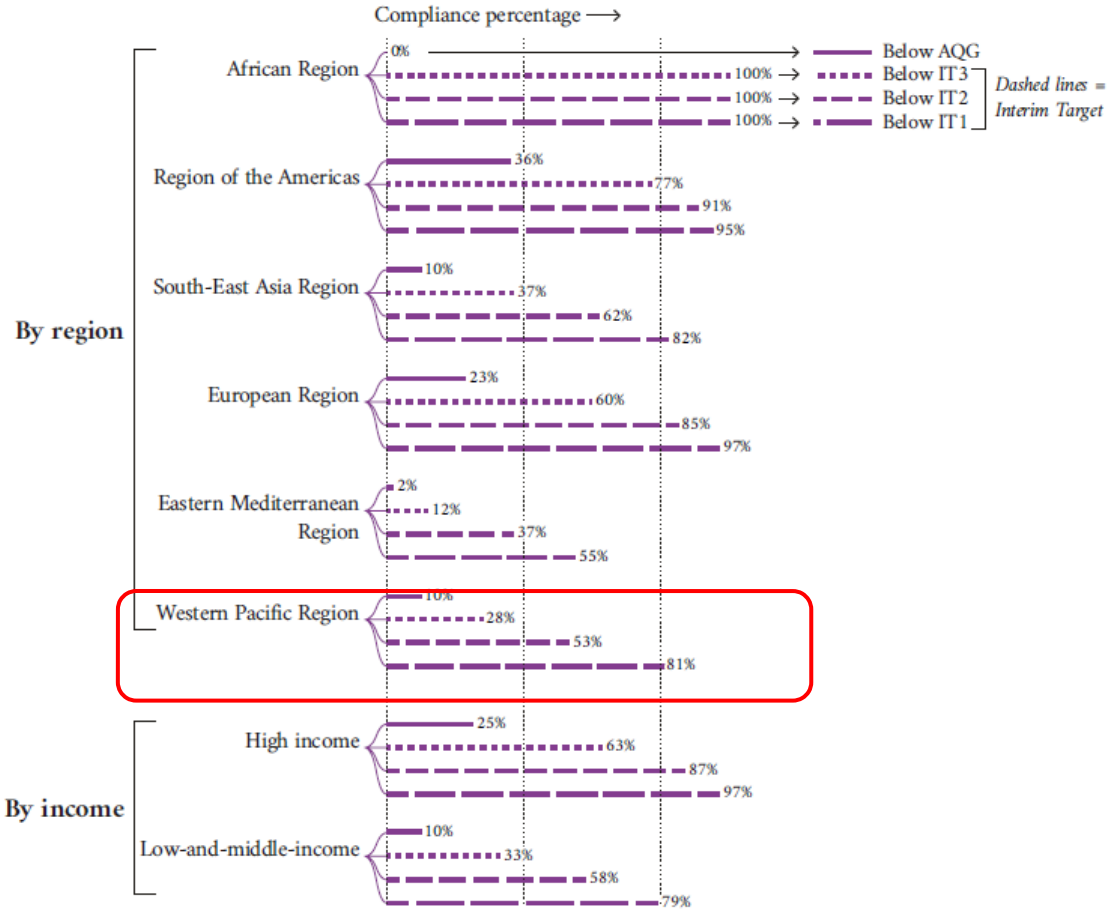
Compliance with WHO Air Quality Guidelines

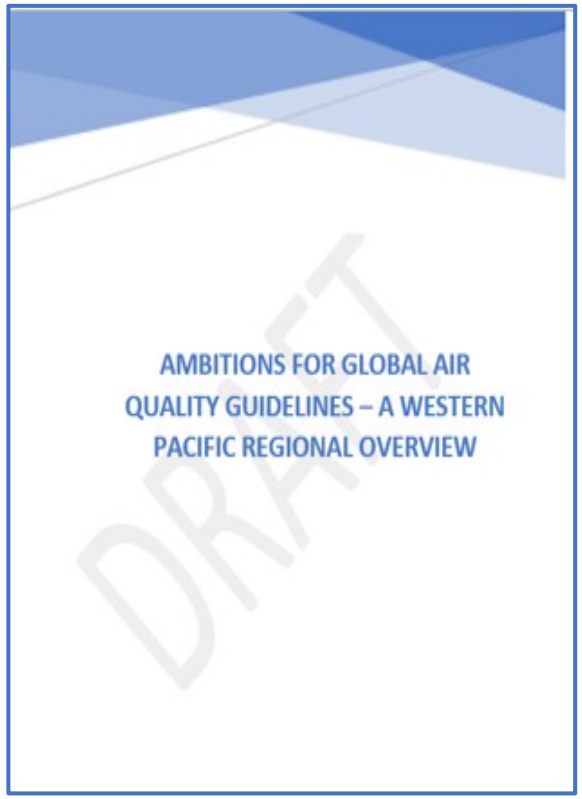
Particulate matter (annual average)



Nitrogen dioxide (annual average)



Translating global air quality guidelines in national standards



- A snapshot of the current air quality standards set by Member States of WPR for tracking progress progress towards achieving 2021 WHO AQG recommendations
- Focus on classical air pollutants: $PM_{2.5,}$ PM_{10}, ozone, nitrogen dioxide, sulfur dioxide, carbon monoxide
- Prompting national and regional actions to strengthen regulatory framework and enforcement capacities

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Overview of national air quality standards

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Western Pacific Region

Annual PM2.5 Average Target (µg/m³)	Annual PM10 Average Target (µg/m³)	Annual NO2 Average Target (µg/m³)	24-hour SO2 Average Target (µg/m³)	8-hour CO Average Target (mg/m³)	8-hour Ozone Average Target (µg/m³)
12					
8					
15					
12					
25	50	40	125	10	240
15		40	50		60
	50	40		9	
15	50	40	75	9	
10	50	40			120
15	50	40	125		
10		40		10	100
12	50				
25		40	20	10	100
25	60	60	125	10.31	100
15	50		50	10.31	60
10					
25	50	40	125	10.31	
5	15	10	40	10	100

24-hour PM2.5 Average Target (µg/m³)	24-hour PM10 Average Target (µg/m³)	1-hour NO2 Average Target (µg/m³)	10-minute SO2 Average Target (µg/m³)	1-hour CO Average Target (mg/m³)
35				
25				
25				
35				
35				
35	50	200	500	30
35		200	500	
	150	200		
35	150	200		
35	150	100		
50	150	200		
25	50	200		
35	150			
	50			
50	150	200		40.1
35	100			28.64
25				
50	150	200		
15	45	200	500	35

| Note: Work in progress

Country experiences: Australian Ambient Air Quality Standards

World Health Organization
Western Pacific Region

Pollutant	Averaging period	Maximum (ambient) concentration	Goal within 10 years (maximum allowable exceedences)
CO	8 hours	9.0 ppm	1 day a year
NO_2	1 hour	0.12 ppm	1 day a year
	1 year	0.03 ppm	none
Photochemical oxidants (as ozone)	1hour	0.10 ppm	1 day a year
	4 hours	0.08 ppm	
SO_2	1 hour	0.20 ppm	1 day a year
	1 day	0.08 ppm	
	1 year	0.02 ppm	none
Lead	1 year	0.50 µg/m^3	none
PM_{10}	1 day	50 µg/m^3	5 days a year
$PM_{2.5}$[a]	1 day	**25 µg/m^3**	–
	1 year	**8 µg/m^3**	–
Notes: a. Advisory reporting standards			

- Based on international scientific evidence and WHO AQG World
- Climate, geography, and demographics considered in estimating the likely exposure

https://www.transportpolicy.net/standard/australia-air-quality-standards/

Country experiences: Pollution reduction targets and measures

World Health Organization
Western Pacific Region

Striving progress in the Republic of Korea

Target: to lower the national average concentration of ultrafine dust particles from 18 **µg/m³** in 2021 to 13 **µg/m³** by reducing ultrafine dust by 30% by 2027

Measures:

- **seasonal fine dust management** program
- **ban grade 5 vehicles** in the cities (Seoul, Busan, and Daegu) and increase use of **zero-emission** vehicles
- Monitor **indoor air quality** in public places
- Monitor fine dust around **port areas** and the use of fuel oils with reduced sulfur content for ships
- Tackling illegal disposal of **waste** from major industrial complexes and collecting **agricultural waste**.

Korea-China Joint Research program

- Ground-based $PM_{2.5}$.monitoring: analyze mass and chemical composition and identify sources, including during high concentration events in major cities
- Assess effectiveness of air quality seasonal management policies

Outcomes:

- Significant decrease from oil combustion, industry and coal burning after implementation of these policies
- Provide scientific evidence for policy makers for developing source-specific management policies

Source: Ministry of Environment, Republic of Korea

Main take aways

- Setting and enforcing **health-based air quality standards** and **policies** aligned with WHO AQG are key drivers for reducing pollution and its adverse effects
- Need for **regulatory push,** especially in countries with increased level of exposure to air pollution
- Strengthen air quality **management** and **accountability** mechanisms at all levels
- Develop/maintain vigilant **monitoring, surveillance and reporting** systems
- Promote proactive **multisectoral actions**

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WHO activities on air quality and health in the Region

Improving evidence

- Regional overview on air quality and health
- Indoor air quality and health
- Air quality in megacities
- Collating best practices in regulations and mitigation solutions

Policy support

- Review national adoption of WHO Air Quality Guidelines
- Support countries in setting and enforcing air quality standards, targets and policies

Capacity building

- Trainings on air quality and health
- Application of WHO tools to assess health impacts and benefits
- Technical consultation and meetings

Strengthening health systems

- Embed air pollution mitigation in public health programmes (e.g. non-communicble and respiratory diseases)
- Scale up action towards climate resilient and low carbon health systems

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THANK YOU

For more information, please contact:
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