

WHO Air Quality Guidelines Global update 2005

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<http://www.euro.who.int/air>

This presentation:

- Why WHO is preparing the Air Quality Guidelines?
- Process of 2005 WHO AQG Update;
- Main conclusions of the 2005 Update: the Guidelines;
- Discussion: implications for SE Asia / India.

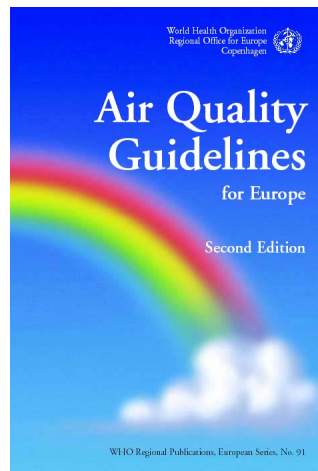
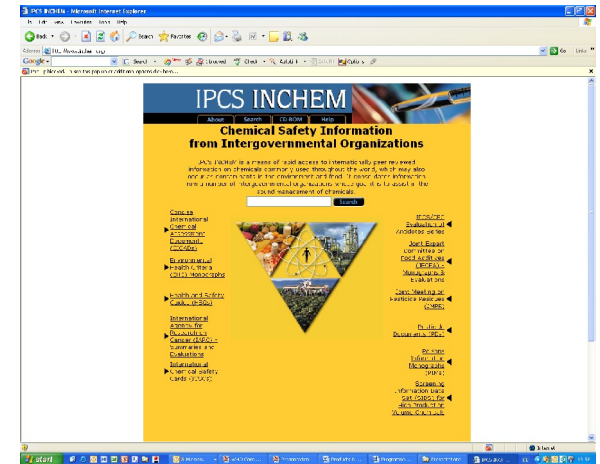
WHO Core Functions

- Providing leadership on matters critical to health and engaging in partnerships where joint actions are needed
- Articulating ethical and evidence-based policy positions
- **Setting norms and standards**
- Shaping the research agenda, and stimulating the generation, translation and dissemination of valuable knowledge
- Providing technical support, catalyzing change and developing sustainable institutional capacity
- Monitoring the health situation and assessing the trends

Setting norms and standards

WHO Norms and standards related to environment and health:

- IPCS EH Criteria monographs
- IARC Summaries and Evaluations
- Drinking water quality guidelines
- Recreational water quality guidelines
- Codex Alimentarius standards and guidelines
- Noise Guidelines
- **Air Quality Guidelines**



http://www.euro.who.int/air/activities/20050223_3

Setting norms and standards

Why WHO?

- In many countries – the only available assessment
- Access to the best available international expertise
- Independence

AQG Global Update

WG Meeting, Bonn, Oct 2005



Setting norms and standards

Guidelines:

Recommendation on protection of health or environment from adverse effects of pollutants

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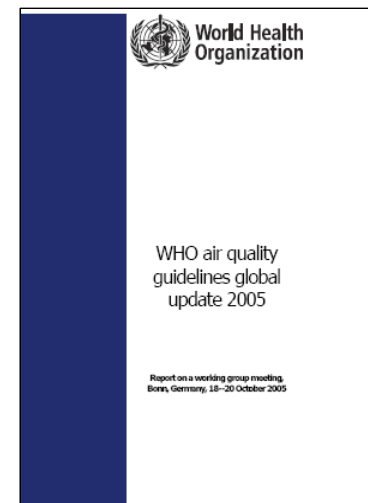
Standard:

- Concentration (exposure level) of the pollutant adopted by regulatory authority as enforceable

- Instruments for implementation (monitoring and reporting requirements, consequences of non-compliance, ...)

WHO AQG: Global update 2005: the process

- Oct – Nov 2004: Steering Group established;
- January 2005: Steering Group agrees on the update scope & structure; recommendation of authors of background material;
- July 2005: 1st draft distributed for external review;
- Sept 2005: comments on 1st draft sent to WG members;
- **18-20 October 2005: WG meeting, Bonn** (report published Feb 2006);
- Dec 2006: 2nd draft distributed for 2nd review;
- Apr 2006: 3rd draft ready for SG approval;
- WHO editing / printing ⇒ publication: Autumn 2006



WHO AQG: Global update 2005: Steering Group

- RH Anderson (UK)
- B. Brunekreef (The Netherlands)
- B. Chen (China)
- A. Cohen (USA)
- R. Maynard (UK)
- I. Romieu (Mexico)
- KR. Smith (USA)
- S. Wangwongwatana (Thailand)

WHO AQG: Global update 2005: Table of contents & authors of 1st drafts

Chapter	Title	Authors
Part 1. Application of AQG for policy development and risk reduction		
1	Sources of air pollution	R. Harrison (UK)
2	Air pollution levels	B. Sivertsen (Norway)
3	Human exposure to air pollution	N. Janssen (The Netherlands), S. Mehta (US)
4	Health effects of air pollution	N. Gouveia (Brazil), M. Maisonet (PAHO/Chile)
5	Determinants of susceptibility	M. Utell (US), M. Frampton (US)
6	Environmental equity	P. Kinney (US), MS O'Neill (US)
7	Health impact assessment	B. Ostro (US)
8	Applications of guidelines in policy formulation	A. Fernandez (Mexico), M. Zuk (Mexico)
9	Indoor air quality: special issues in risk assessment and management	K. Balakrishnan (India), NG Bruce (UK)
Part 2. Risk assessment of selected pollutants		
10	Particulate matter	J. Samet (US), M. Brauer (Canada) R. Schlesinger (US)
11	Ozone	P. Saldiva (Brazil), N. Künzli (US / Switzerland)
12	Nitrogen dioxide	F. Forastiere (Italy), A. Peters (Germany) F. Kelly (UK), ST Holgate (UK)
13	Sulfur dioxide	M. Lippmann (US), K. Ito (US)

Full list of reviewers: WG Meeting Report

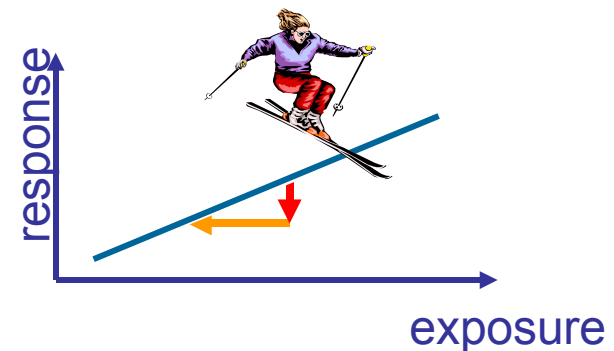
WHO AQG: Global update 2005: Main results

Guideline values for PM, ozone, NO₂ and SO₂:

- the epidemiological evidence indicates that the possibility of adverse effects remains, even if the guideline value is achieved;
- some countries might select even lower concentrations for their standards.

Interim targets for each pollutant:

- define steps in a progressive reduction of air pollution in more polluted areas;
- promote a shift from concentrations with acute, serious health consequences to concentrations that, if achieved, would result in significant reductions in risks for acute and chronic effects.



WHO AQG: Global update 2005: Particulate matter: annual mean

Annual mean level	PM ₁₀ (µg/m ³)	PM _{2.5} (µg/m ³)	Basis for the selected level
WHO interim target-1 (IT-1)	70	35	Levels associated with about 15% higher long-term mortality than at AQG
WHO interim target-2 (IT-2)	50	25	Risk of premature mortality decreased by approximately 6% (2-11%) compared to WHO-IT1
WHO interim target-3 (IT-3)	30	15	Mortality risk reduced by approximately 6% [2-11%] compared to WHO-IT2 levels.
WHO Air quality guidelines (AQG)	20	10	Lowest levels at which total, CP and LCA mortality have been shown to increase (Pope et al., 2002). The use of PM _{2.5} guideline is preferred.

WHO AQG: Global update 2005: Particulate matter: 24-h mean

24-hour mean level *)	PM ₁₀ (µg/m ³)	PM _{2.5} (µg/m ³)	Basis for the selected level
WHO interim target-1 (IT-1)	150	75	About 5% increase of short-term mortality over AQG
WHO interim target-2 (IT-2)*	100	50	About 2.5% increase of short-term mortality over AQG
WHO interim target-3 (IT-3)**	75	37.5	(about 1.2% increase in short-term mortality over AQG)
WHO Air quality guidelines (AQG)	50	25	Based on relation between 24-hour and annual PM levels

*) 99th percentile (3 days / year)

Comments:

- 24-h levels are less restrictive than for annual mean;
- Immediate action to improve AQ recommended if AQG not met

WHO AQG: Global update 2005: Ozone: daily maximum 8-h mean

	Daily maximum 8-hour mean	Effects at the selected ozone level
High level	240 $\mu\text{g}/\text{m}^3$	Significant health effects, substantial proportion of vulnerable population affected.
WHO interim target-1 (IT-1)	160 $\mu\text{g}/\text{m}^3$	Important health effects, an intermediate target for populations with ozone concentrations above this level. Does not provide adequate protection of public health.
WHO Air quality guideline (AQG)	100 $\mu\text{g}/\text{m}^3$	This concentration will provide adequate protection of public health, though some health effects may occur below this level.

WHO AQG: Global update 2005: Nitrogen dioxide

The guideline values remain unchanged at the following levels:

40 $\mu\text{g}/\text{m}^3$ for annual mean;

200 $\mu\text{g}/\text{m}^3$ for 1-hour mean.

Rationale:

- Experimental data: NO₂ toxic above 200 $\mu\text{g}/\text{m}^3$
- Epi studies: NO₂ – marker of mixture of combustion related pollution
- Precursor of ozone and PM_{2.5}

WHO AQG: Global update 2005: Sulfur dioxide

	24-hour average SO₂	10-minute average SO₂
WHO interim target-1 (IT-1) (2000 AQG level)	125 µg/m ³	-
WHO interim target-2 (IT-2)	50 µg/m ³ Intermediate goal based on controlling either (1) motor vehicle (2) industrial emissions and/or (3) power production; feasible goal to be achieved leading to significant health improvements that would justify further improvements	-
WHO Air quality guidelines (AQG)	20 µg/m³	500 µg/m³

WHO AQG: Global update 2005: Summary of updated AQG values

AQG levels recommended to be achieved everywhere in order to significantly reduce the adverse health effects of pollution

Pollutant	Averaging time	AQG value
Particulate matter PM_{2.5}	1 year 24 hour (99 th percentile)	10 µg/m ³ 25 µg/m ³
PM₁₀	1 year 24 hour (99 th percentile)	20 µg/m ³ 50 µg/m ³
Ozone, O₃	8 hour, daily maximum	100 µg/m ³
Nitrogen dioxide, NO₂	1 year 1 hour	40 µg/m ³ 200 µg/m ³
Sulfur dioxide, SO₂	24 hour 10 minute	20 µg/m ³ 500 µg/m ³

Thank you



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