World Health Organization

Frequently Asked Questions

Fourth WHO Ambient Air Quality Database
Updated May 2018

1. What is the aim of the ambient air quality database ?

The fourth database on ambient (outdoor) air quality - the largest of its kind – compiles information on air pollution levels for over 4300 human settlements, mostly cities, in 108 countries. The aim of this updated database is not to rank cities or countries but to reflect the monitoring efforts undertaken in those countries. WHO has brought together this information on ambient air pollution from particulate matter collected by cities and towns worldwide in order to raise awareness of the extent of air pollution and facilitate adequate responses to protect public health from the adverse impacts of outdoor air pollution.

2. What information does the ambient (outdoor) air quality database include? How was this information collected and organized in this database?

The ambient air pollution database includes data on particulate matter (PM_{10} or $PM_{2.5}$) concentrations – either the annual mean concentrations based on daily measurements, or on data which could be aggregated into annual means. In a few cases where annual means could not be calculated, measurements covering a more limited part of the year were used. In order to present air quality that is largely representative of human exposure, only measurements characterized as urban background, residential areas, commercial and mixed areas were used. Stations characterized as particular "hot spots" or exclusively industrial areas were not included.

Particulate matter is not the only air pollutant with serious impacts on health, however it is an important indicator of long-term air quality and of health risks.

Primary sources of data include official reporting from countries to WHO, official national/subnational reports, national/subnational web sites containing measurements of PM10 or PM2.5 and ground measurements compiled in the framework of the Global Burden of Disease project. Furthermore, measurements reported by the following regional networks were used: Clean Air for Asia and the Air quality e-reporting database from the European Environment Agency for Europe. In the absence of the above-mentioned data, data from (a) UN agencies, (b) development agencies, and (c) articles from peer reviewed journals were used.

3. What are the most polluted cities in the world? Does WHO rank or compare cities on outdoor air quality?

Unfortunately, many cities in the world, including some expected to be among the most polluted, do not collect information or report on outdoor air quality. WHO therefore cannot compare cities based on their levels of outdoor air pollution.

Rather, WHO has brought together information on ambient air pollution collected by cities and towns worldwide in order to raise awareness and facilitate adequate responses to protect public health from the adverse impacts of outdoor air pollution.

Cities that collect and disseminate information on outdoor air quality need to be praised for their action. This is the first crucial step to identify if there is an outdoor air pollution problem and to begin to take corrective action. The cities which have invested in the capacity to regularly monitor and report local air quality measurements have already demonstrated a commitment to begin the process of addressing air quality issues and public health.

4. What are the key findings about the database?

The air in the great majority of low-and middle income cities and towns exceed WHO's Air Quality Guideline levels. The WHO Air Quality Guidelines recommend PM_{10} and $PM_{2.5}$ maximum annual mean levels of 20 µg/m^3 and 10 µg/m^3, respectively. Cities and towns meeting the WHO Guideline values tend to be clustered in high-income countries. Based on the monitored cities and towns, air quality is poorest in the Eastern Mediterranean and African regions, followed by the South-East Asian countries.

Based on extrapolations of these data, more than half of the global urban population lives in cities that exceed the recommended levels of fine particulate matter set out by the WHO Air Quality Guidelines by 2.5 times or more and only around 18% of the total urban population assessed lives in cities and towns where the air quality falls below Guideline levels.

5. What has changed since the last database?

Information on air quality levels in 4300 human settlements, mostly cities, from 108 countries have been compiled in this updated database. This is significantly more than were included in the 2016 database, which covered 3000 cities and towns, or the 2014 database, which covered only 1600 cities. This may indicate that more cities are concerned with their air quality, and are either aiming to take action to improve their air quality, or working to maintain the clean levels already achieved (e.g. most of the increase is in Europe).

As seen in the previous version of the database, data on air quality in Sub-Saharan Africa, and low and middle income countries of the Western Pacific and the Eastern Mediterranean regions remains scarce.

Based on the comparison of cities with data available in both the 2011, 2014 and the 2016 versions of the database and selected for the comparison purposes, the most cities have not seen a decrease in ambient air pollution in recent years. However, in several countries, mostly in high-income of Europe and the Americas, however, the air quality appears to have improved.

Some cities do not necessarily follow the regional trend in terms of air quality showing it is possible to take actions locally to improve the situation.

6. What are some of the major sources or causes of ambient air pollution?

Both 'mobile' sources (i.e. cars) and 'stationary' sources (i.e. smoke stacks) make significant contributions to ambient (outdoor) air pollution both in urban and in rural areas. Some of the major sources include exhaust fumes from vehicles, emissions from manufacturing facilities (e.g. factories), agriculture practices,

waste and crop burning and power generation (e.g. smoke stacks of coal fired power plants). Also, residential use of coal, wood and other polluting fuels for cooking and heating can make an important contribution to the levels of ambient air pollution.

7. WHO produces regular alerts on the number of deaths caused by air pollution, how are these numbers calculated?

The number of deaths caused by air pollution are estimated on the basis of the air quality levels people are exposed to, and the increased risks of cardiovascular and respiratory diseases that are incurred at those levels. The air quality levels are estimated using a combination of satellite information, chemical transport models and ground measurements of air quality, and the increased risks come from epidemiological studies. The methods are explained in detail on our web site (http://www.who.int/airpollution/data/).

To find out more about health impacts of ambient air pollution, WHO Air Quality Guidelines, ambient air pollution fact sheet and other resources please click here

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