

WHO's Ambient Air Pollution database - Update 2014

Data summary of the AAP database

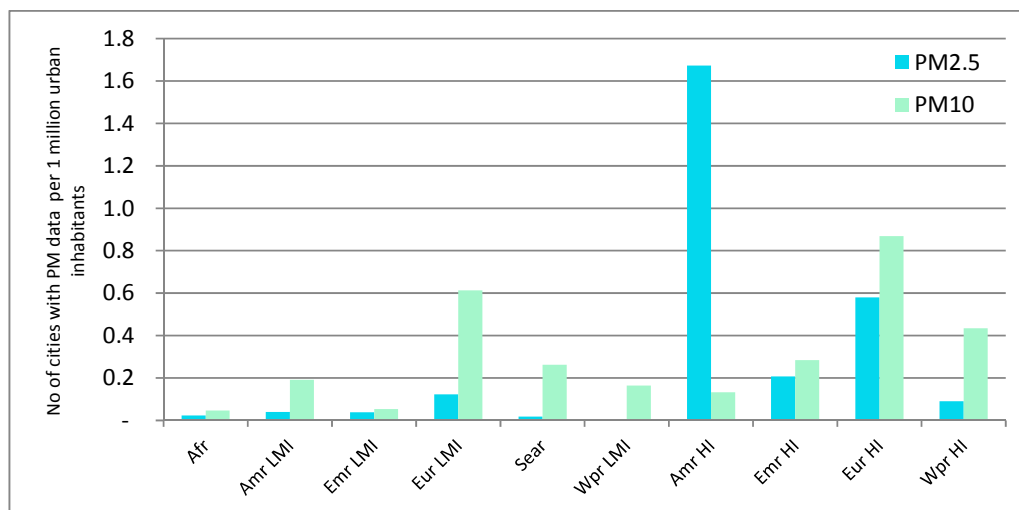
The 2014 version of the Ambient Air Pollution (AAP) database consists mainly of urban air quality data – annual means for PM₁₀ and/or PM_{2.5} – for about 1 600 cities from 91 countries for the years 2008-2013. The regional distribution of cities documented in the database, and the number of cities with accessible data by urban inhabitants are described in Table 1 and Figure 1, respectively.

Table 1: Total number of cities in AAP database, 2014 version, by region

Region	Number of cities	Number of countries	Total number of countries in region
Africa (Sub-Saharan)	16	6	47
America, LMI	88	13	26
America, HI	535	4	9
Eastern Mediterranean, LMI	14	6	15
Eastern Mediterranean, HI	12	5	6
Europe, LMI	109	8	20
Europe, HI	461	29	33
South-East Asia	167	9	11
Western Pacific, LMI	133	5	21
Western Pacific, HI	93	6	6
World	1 628	91	194

LMI: Low-and middle-income; HI: high-income.

Figure 1: Number of cities with accessible PM₁₀ and PM_{2.5} data in 2014 per urban population



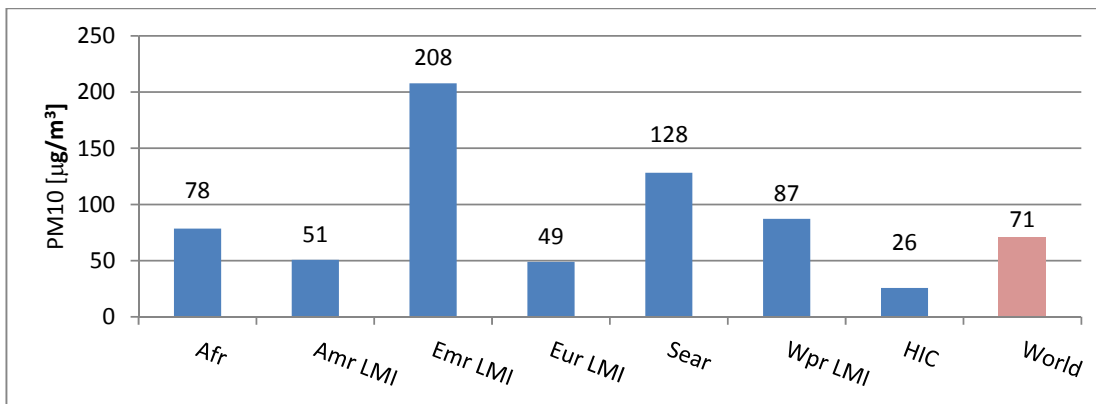
PM_{10/2.5}: Fine particulate matter of 10/2.5 microns or less; Afr: Africa; Amr: America; Emr: Eastern Mediterranean; Eur: Europe; Sear: South-East Asia; Wpr: Western Pacific; LMI: Low- and middle-income; HI: high-income.

PM_{2.5} measurements can directly be linked to estimates of health risks, and are therefore of particular interest. PM₁₀ measurements first need to be converted to PM_{2.5} in order to do so. In high-income countries, PM_{2.5} measurements are already being widely performed. In low- and middle-income countries, however, while PM_{2.5} measures are increasingly being developed, they are not yet available in

many countries. In low- and middle-income countries, annual mean $PM_{2.5}$ measurements could be accessed in only 69 cities, but PM_{10} in as many as 512 cities. In high-income countries, 816 cities with $PM_{2.5}$ measures could be accessed, against 544 cities with PM_{10} measurements.

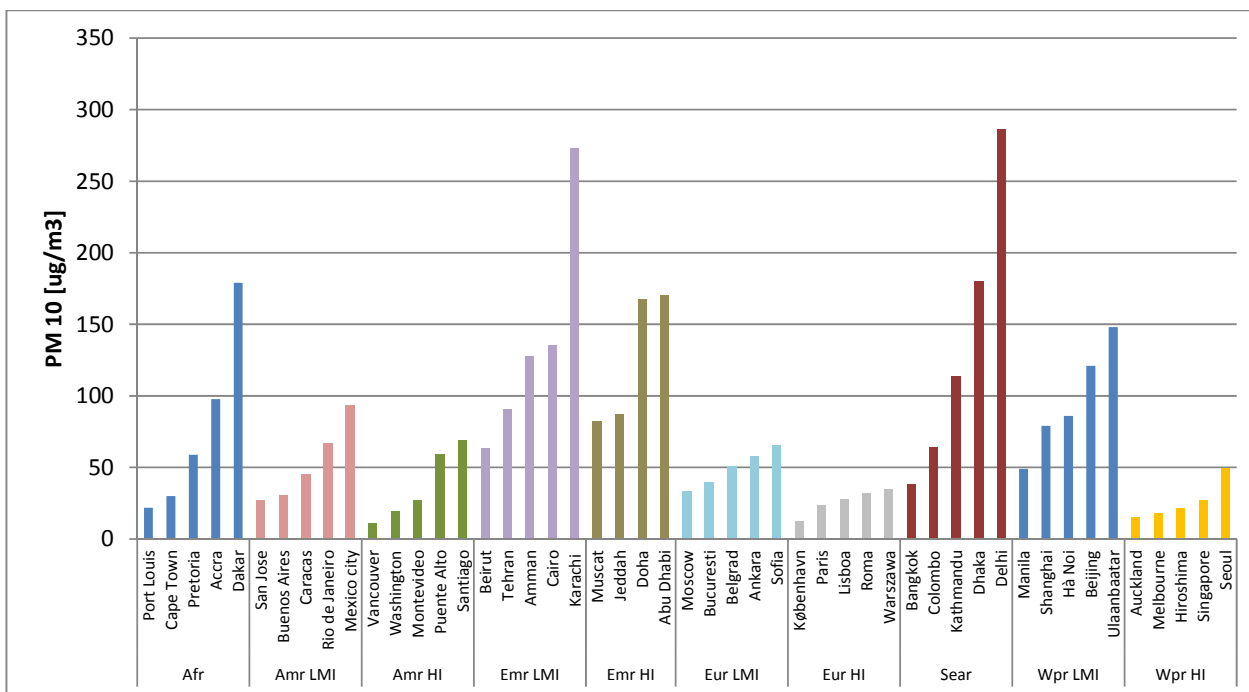
An overview of PM_{10} levels for the WHO regions and selected cities is presented in Figure 2 and 3.

Figure 2: PM_{10} levels by region, for the last available year in the period 2008-2012.



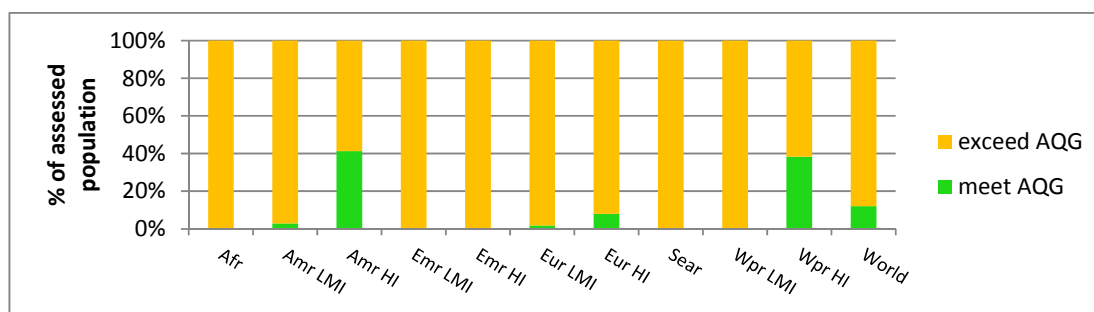
PM_{10} : Fine particulate matter of 10 microns or less; Afr: Africa; Amr: America; Emr: Eastern Mediterranean; Eur: Europe; Sear: South-East Asia; Wpr: Western Pacific; LMI: Low- and middle-income; HI: high-income. PM_{10} values are regional urban population-weighted.

Figure 3: PM_{10} levels for selected cities by region, for the last available year in the period 2008-2012.



PM_{10} : Fine particulate matter of 10 microns or less; Afr: Africa; Amr: America; Emr: Eastern Mediterranean; Eur: Europe; Sear: South-East Asia; Wpr: Western Pacific; LMI: Low- and middle-income; HI: high-income.

Figure 4: Annual mean PM of the assessed urban population compared to the WHO Air Quality Guidelines (AQG)^a



Afr: Africa; Amr: America; Emr: Eastern Mediterranean; Eur: Europe; Sear: South-East Asia; Wpr: Western Pacific; LMI: Low- and middle-income; HI: high-income; AQG: WHO Air Quality Guidelines.

^a Annual mean PM₁₀: 20 µg/m³; Annual mean PM_{2.5}: 10 µg/m³.

Figure 4 shows the regional and global percentages of the assessed urban population experiencing PM₁₀ or PM_{2.5} air pollution levels that meet or exceed the WHO Air Quality Guidelines annual mean values of 20 µg/m³ (for PM₁₀) and 10 µg/m³ (for PM_{2.5})¹. Globally, according to the currently available data, 12% of the assessed population are exposed to PM₁₀ or PM_{2.5} annual mean levels complying with AQG levels. This figures raises to 27% for the interim target 3 (IT-3, 30 µg/m³ for PM₁₀ and 15 µg/m³ for PM_{2.5}) of the AQG, 49% for IT-2 (50 µg/m³ for PM₁₀ and 25 µg/m³ for PM_{2.5}), and 62% for IT-1 (70 µg/m³ for PM₁₀ and 35 µg/m³ for PM_{2.5}).

Comparison of urban air pollution levels in recent years

A total of 851 cities in 72 countries are present in both the 2011 and 2014 versions of the database, with air quality data for different years (Table 2). The 2011 version of the database contains data for 2010 or earlier, and the 2014 version for 2012 or earlier. To compare levels of air pollution for an equivalent of a three-year average for cities present in both versions of the database, a linear interpolation or (rarely) an extrapolation was made. A regional summary is presented by WHO region and income groups (Figure 5).

Table 2: Number of cities present in both the 2011 and the 2014 versions of the AAP database, by region

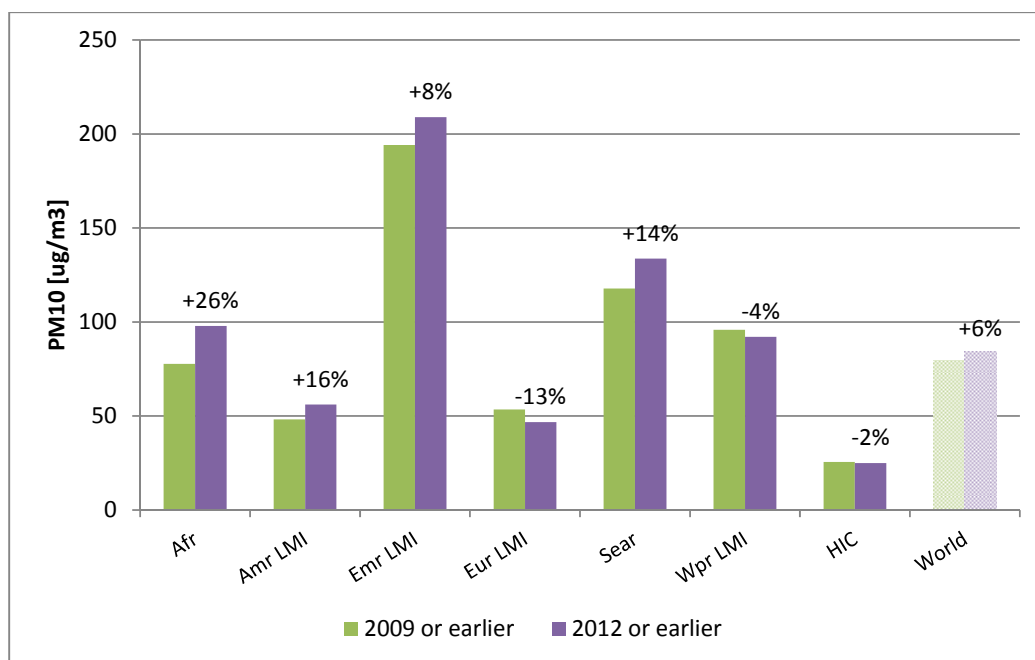
Region	Number of cities	Number of countries
Africa (Sub-Saharan)	4	3
America, LMI	25	10
America, HI	406	4
Eastern Mediterranean, LMI	9	4
Eastern Mediterranean, HI	3	2
Europe, LMI	56	10
Europe, HI	236	24
South-East Asia	52	8
Western Pacific, LMI	34	3
Western Pacific, HI	26	4
World	851	72

LMI: Low- and middle-income countries; HI: High-income.

¹ For cities with both PM₁₀ and PM_{2.5} values (337), PM_{2.5} were used.

Globally, annual PM_{10} levels are estimated to increase by 6% during the recent three-year periods (2009 to 2012 or earlier period) as assessed in cities present in both databases and weighted by regional urban population.

Figure 5: Regional city-population weighted comparisons¹ in annual mean PM_{10} for a three-year period, by region, for cities present in both versions of the database

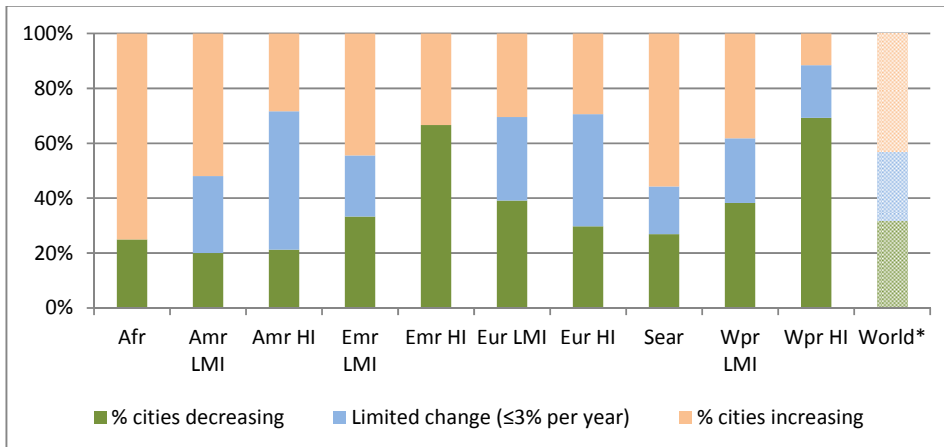


PM_{10} : Fine particulate matter of 10 microns or less; Afr: Africa; Amr: America; Emr: Eastern Mediterranean; Eur: Europe; Sear: South-East Asia, Wpr: Western Pacific; LMI: Low- and middle-income; HI: high-income. Results are based on 851 cities and are to be interpreted with caution, as yearly variations due for example to climatic changes can be important and 3-year comparisons do not necessarily represent trends, in particular when changes are limited.

¹ The mean for the World is based on weighting by regional urban population.

Figure 6 shows the percentage of cities with decreasing levels of annual mean PM_{10} (in green), increasing levels (in light orange), and levels with changes of $\leq 3\%$ per year (in blue), by region. The variation in population living in cities with increasing or decreasing population levels is represented in Figure 7.

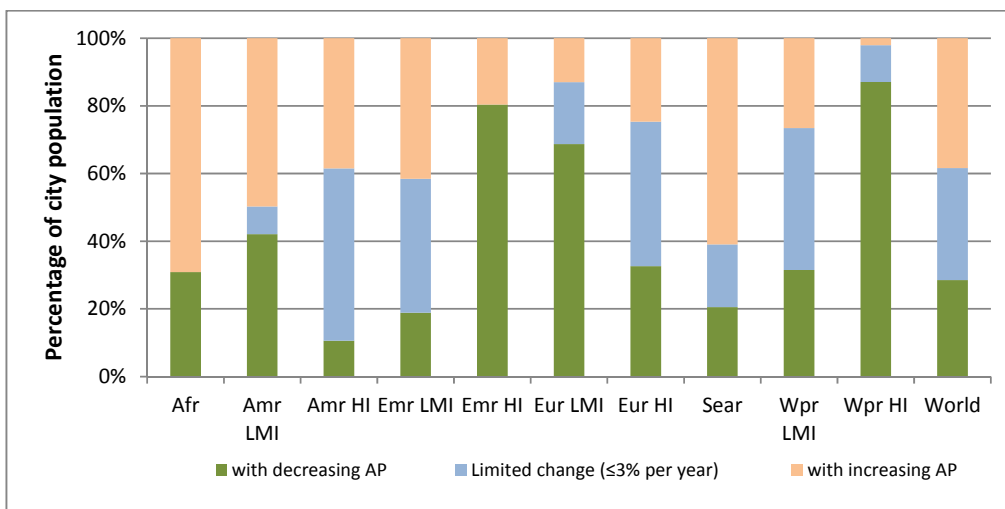
Figure 6: Percentage of cities with increasing and decreasing PM_{10} annual means, by region.



Afr: Africa; Amr: America; Emr: Eastern Mediterranean; Eur: Europe; Sear: South-East Asia, Wpr: Western Pacific; LMI: Low- and middle-income; HI: high-income.

*The world figure is regional population-weighted.

Figure 7: Percentage of city population experiencing increasing and decreasing PM_{10} annual means, by region.



Afr: Africa; Amr: America; Emr: Eastern Mediterranean; Eur: Europe; Sear: South-East Asia, Wpr: Western Pacific; LMI: Low- and middle-income; HI: high-income.

Limitations

The presented comparison of air pollution levels has a number of limitations:

- The period of comparison is relatively short. Yearly variations may for example be influenced by the weather and a comparison of three-year periods may not be sufficient to reflect a longer term trend. Therefore, three-year running means were used where available. A longer time period of comparison is however required to confirm any trends.
- The sampling locations may have changed within the period of comparison, and a variation in annual mean PM levels of a city may reflect different sampling locations rather than a trend. Measurement locations are however reasonably stable over time.

For further information, please contact:
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