

Air Quality in Cities: EEA's data viewers and products

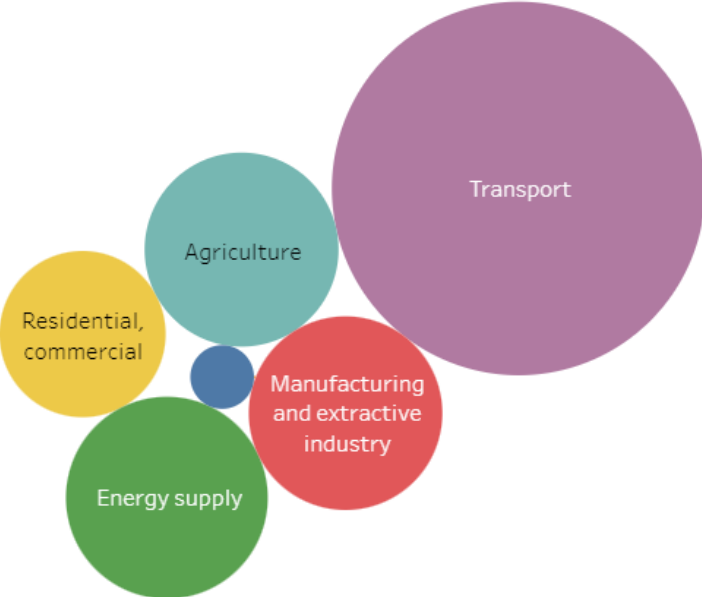


Overview

- Main sources of air pollution in cities
- Air quality data reported to the EEA
 - What is reported and why
- EEA viewers related to cities
- Other related EEA's products

Main urban emissions in 2022

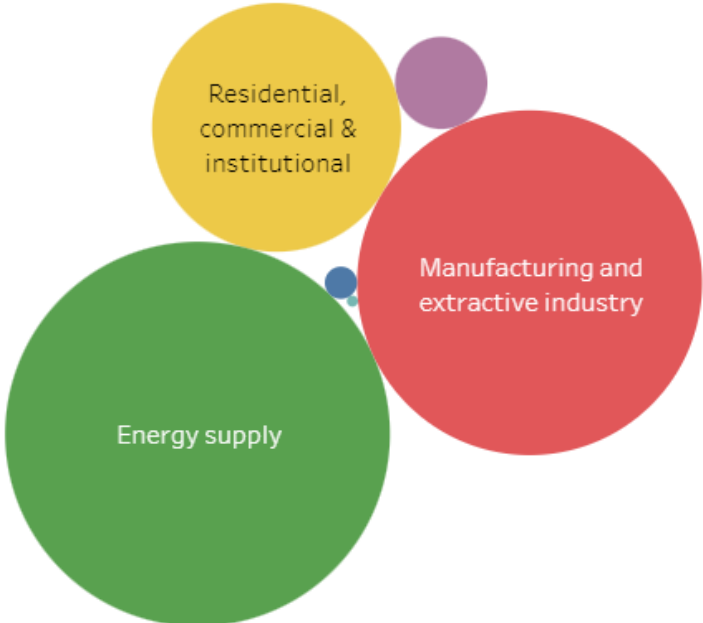
Nitrogen Oxides (NO_x)



Fine Particulate Matter (PM_{2.5})



Sulphur Dioxide (SO₂)



- Transport
- Residential, commercial & institutional
- Energy supply
- Agriculture

- Manufacturing and extractive industry
- Other
- Waste

Source: EEA's [Air pollution in Europe: 2024 reporting status under the National Emission reduction Commitments Directive](#)

Main urban emissions in 2022

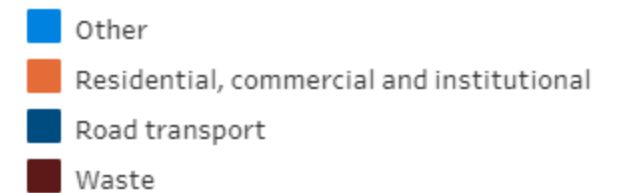
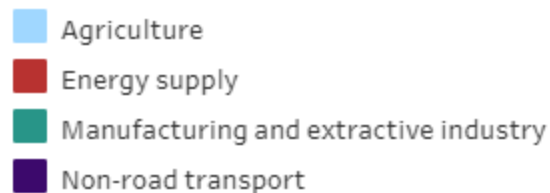
Particulate Matter (PM₁₀)



Black Carbon (BC)



Carbon Monoxide (CO)



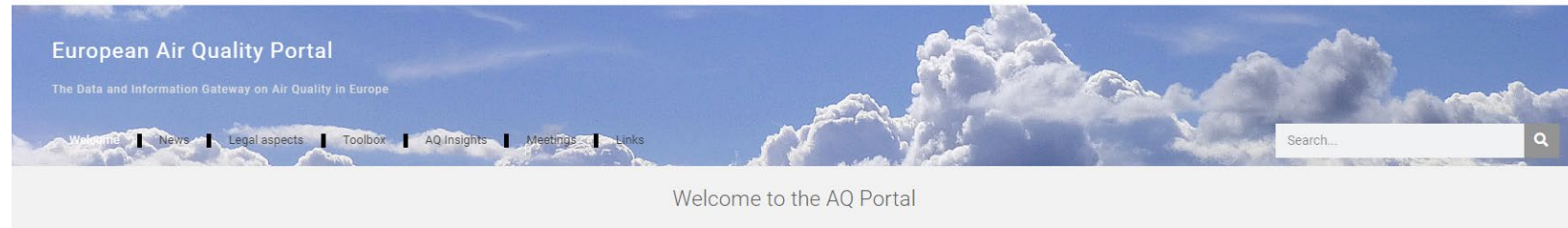
What is reported and why?

- Air quality is monitored all over Europe
 - In accordance as per Directive 2008/50/EC and Directive 2004/107/EC (under revision)
- Ambient air quality measurements are annually reported by member states to the EEA
 - Range of pollutants: PM_{2.5}, PM₁₀, NO₂, NO_x, SO₂, O₃, CO, benzene, lead, arsenic, cadmium, nickel, B(a)P and others
 - Up-To-Date hourly data also reported

Air Quality data tables and viewers

EEA viewers related to cities

Air Quality Portal



The European Air Quality (AQ) Portal is a digital platform centered around the Air Quality eReporting system, a key initiative established by the [European Commission](#) (EC). This system is managed and overseen by the [European Environment Agency](#) (EEA) supported by the [European Topic Centre on Human Health and the Environment](#) (ETC HE).

The portal provides users with detailed technical specifications and a range of services designed to facilitate the efficient reporting of air quality data. This data is sourced from EU Member States and other participating EEA member and cooperating countries.

The platform contains a set of interactive tools that allow users to visualize the compiled data and statistics, as well as providing an option to download them for further use or distribution. These tools are accessible via the boxes below.

For more detailed documentation, users can navigate the top menu bar. This section houses a broad spectrum of materials, from technical documents and legal frameworks to reports and briefing notes based on AQ e-Reporting data, among other relevant resources.

SUBMISSION IS NOW OPEN !

Next submission deadline: 30/09/2024

Data flows B to G – reporting on 2023

10 Days	13 Hours	35 Minutes	14 Seconds
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Attainment viewer upgraded

An upgraded version of the attainment viewer is now online...

[Read More](#)

Michel Houssiau
September 11, 2024

AQ eReporting	Data flows monitors	Data tables
Data download	Air quality now	Data analysis and stats
Focus on cities	Compliance status	Impact on health

EEA viewers related to cities

Focus on cities

- Statistics in cities (monthly air quality levels and annual means tables)
 - Monthly and annual values calculated from AQ e-Reporting for European cities
- City population exposed to air pollution (table)
 - Urban population exposed to air pollutant (NO₂, O₃, PM_{2.5}, PM₁₀) concentrations above selected EU air quality standards in the EEA member countries
- European City Air Quality ranking (viewer)
 - Presents levels of fine particulate matter in over 350 cities from across EEA member countries. Data comes from on the ground measurements of fine particulate matter, taken by over 500 monitoring stations.

Focus on cities

Focus on cities

Statistics in cities

Monthly air quality values originating from AQ e-Reporting as averages (2018 until present) calculated for European cities – direct link: https://discomap.eea.europa.eu/Aq/AQViewer/index.html?fgn=Airquality_Dissemination.MonthlyAirQualityStatisticsInCities

Annual average air quality (PM10 and PM2.5) values in urban areas calculated from AQ e-Reporting data for countries in Europe – direct link: https://discomap.eea.europa.eu/Aq/AQViewer/index.html?fgn=Airquality_Dissemination.csi4.AirQualityInCountryUrbanAreas

City population exposed to air pollution

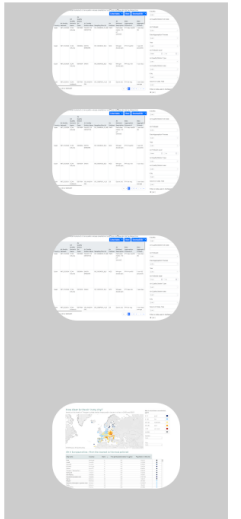
Urban population exposed to air pollutant (NO₂, O₃, PM_{2.5}, PM₁₀) concentrations above selected EU air quality standards in the EEA member countries.

Direct link: https://discomap.eea.europa.eu/Aq/AQViewer/index.html?fgn=Airquality_Dissemination.csi4.ExposureSummary

City ranking

Levels of fine particulate matter (PM_{2.5}) in over 340 cities from across EEA member countries. Data comes from on the ground measurements of fine particulate matter, taken by over 400 monitoring stations.

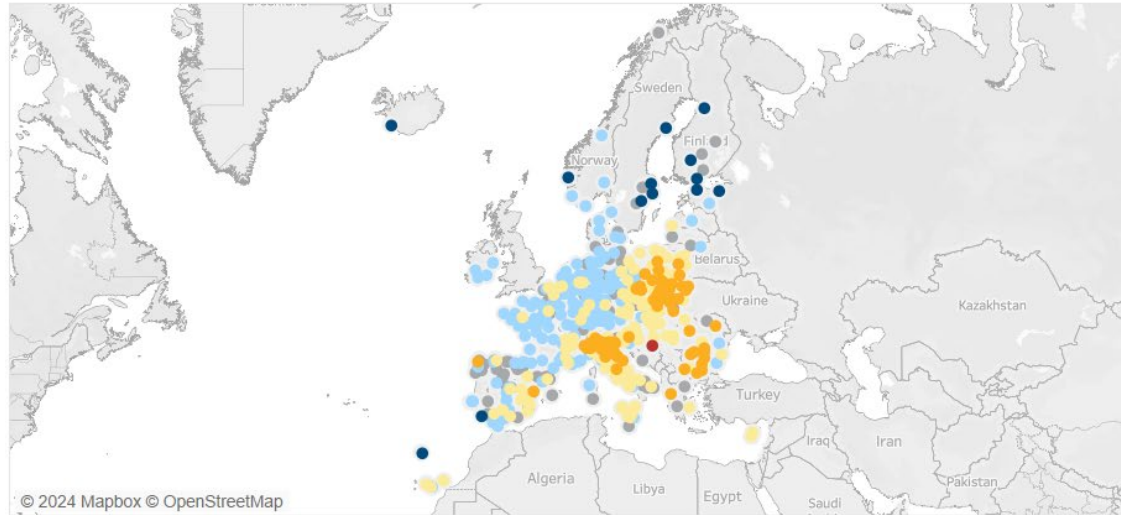
Direct link: https://tableau-public.discomap.eea.europa.eu/views/City_AQ_Viewer_2023/EuropeanCityRanking



The European City Air Quality viewer

How clean is the air in my city?

based on the levels of fine particulate matter measured in the air in cities in 2022 and 2023



PM2.5 annual mean concentration, $\mu\text{g}/\text{m}^3$

0 - 5	good	■
5 - 10	fair	■
10 - 15	moderate	■
15 - 25	poor	■
> 25	very poor	■
no data	-	■

Country
All

City
All

Air in European cities – from the cleanest to the most polluted

City name	Country1	Rank	Fine particulate matter in $\mu\text{g}/\text{m}^3$	Population in the city	
Stockholm (greater city)	Sweden	11	4.6	1745766	●
Helsinki / Helsingfors (greater city)	Finland	12	4.9	1154967	●
Bergen	Norway	13	5.0	267950	●
Saint Denis	France	14	5.1	147931	●
Cork	Ireland	15	5.2	118713	●
Trondheim	Norway	16	5.2	179692	●
Tartu	Estonia	17	5.7	95430	●
Greater Heerlen	Netherlands	18	6.1	198168	●
Göteborg	Sweden	19	6.1	564039	●
Bayonne	France	20	6.1	115561	●
Sassari	Italy	21	6.2	125273	●
Kiel	Germany	22	6.2	246794	●
Greater 's-Gravenhage	Netherlands	23	6.4	769888	●
Vilnius	Lithuania	24	6.5	561836	●

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City

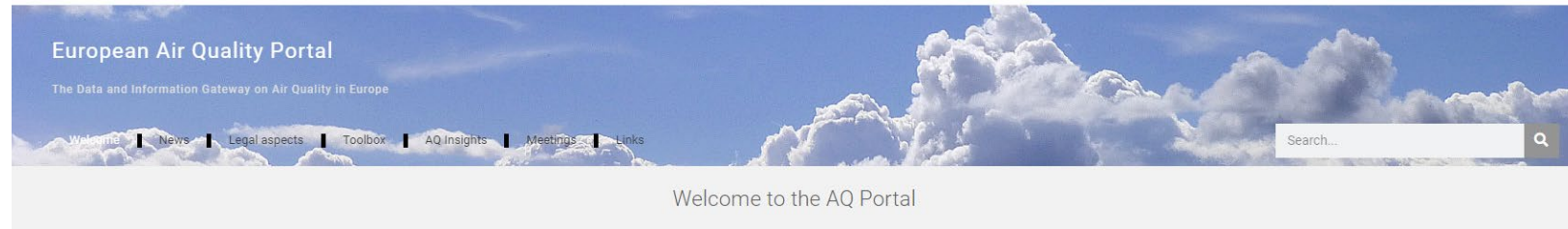
All

Air in European cities – from the cleanest to the most polluted

City name	Country1	Rank	Fine particulate matter in $\mu\text{g}/\text{m}^3$	Population in the city	
Uppsala	Sweden	1	3.5	219914	
Umeå	Sweden	2	3.6	125080	
Faro	Portugal	3	3.6	61015	
Reykjavik	Iceland	4	3.9	132252	
Oulu	Finland	5	4.0	205489	
Tampere / Tammerfors	Finland	6	4.0	238140	
Norrköping	Sweden	7	4.1	140927	
Funchal	Portugal	8	4.4	104024	
Tallinn	Estonia	9	4.4	438341	
Narva	Estonia	10	4.6	53424	
Stockholm (greater city)	Sweden	11	4.6	1745766	
Helsinki / Helsingfors (greater city)	Finland	12	4.9	1154967	
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AQ eReporting



Data flows monitors



Data tables



Data download



Air quality now



Data analysis and stats



Focus on cities



Compliance status



Impact on health

EEA viewers related to cities

Data &
statistics

Data and statistics

- Various tables with different types of statistics
 - Most tables can be filtered on city

Statistics – country / city / station levels

These viewers give a **quick overview of the air pollution levels** for Particulate Matter (PM10 and PM2.5), Nitrogen Dioxide (NO2) and Ozone (O3) as transmitted by the participating countries to the EEA in the frame of AQ eRep..

The results are presented:

- at the **country level**: the values are averaged on all measuring stations – direct link: https://tableau-public.discomap.eea.europa.eu/views/AQeRep_for_public_for_portal/Countrydashboard
- at the **city level**: the values are averaged over all the measuring stations located within in the city – direct link: https://tableau-public.discomap.eea.europa.eu/views/AQeRep_for_public_for_portal/Citydashboard
- at the **station level** – direct link: https://tableau-public.discomap.eea.europa.eu/views/AQeRep_for_public_for_portal/Stationdashboard

Daily – weekly – monthly viewer

The evolution throughout the year(s) of the daily, weekly or monthly air pollution concentrations can be followed with this viewer at station level. Stations are also ranked according to their level of pollution.

Direct link: https://tableau-public.discomap.eea.europa.eu/views/data_viewer_ng/Home

General statistical viewer

This is the general statistical viewer. It covers all pollutants and all aggregations. Results are presented by year on maps and box plots. Specific screens also show the evolution throughout the years as well as the distribution of the values.

Direct link: https://tableau-public.discomap.eea.europa.eu/views/statistical_ng/General

Correlation tool

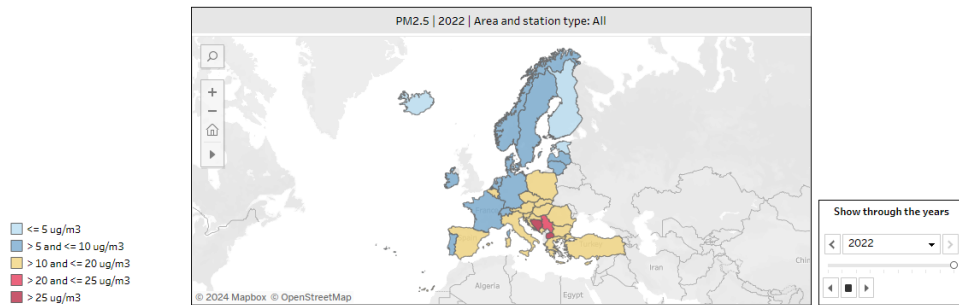
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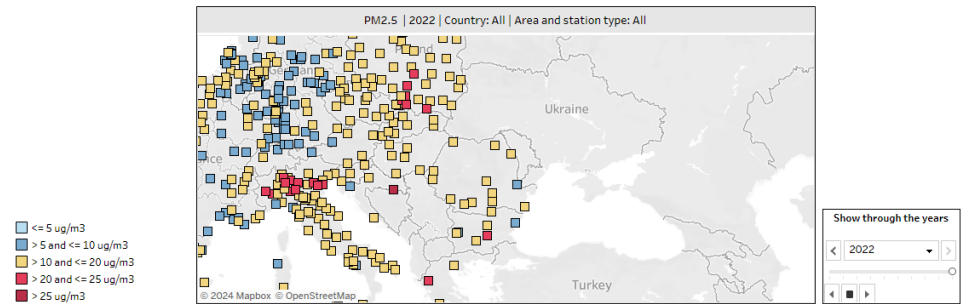
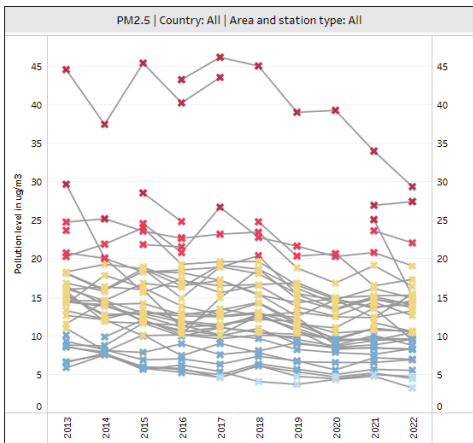
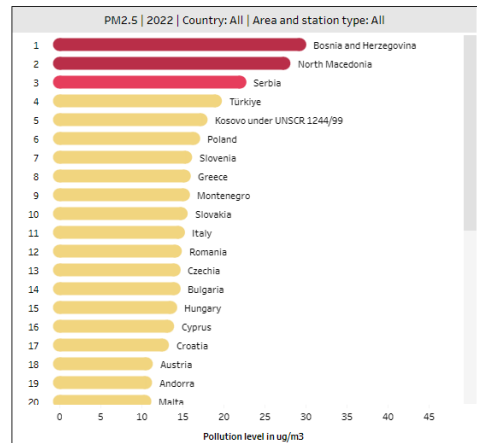
Statistics at the city level

- Annual mean values at country/city/station level.



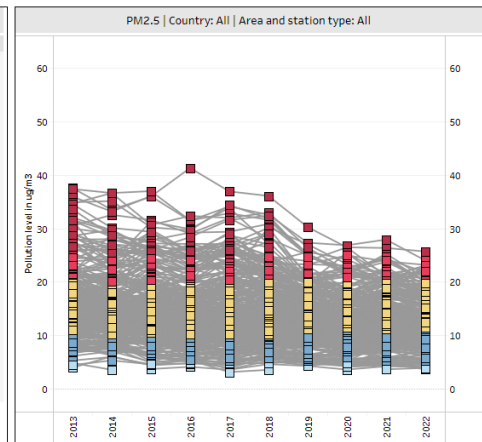
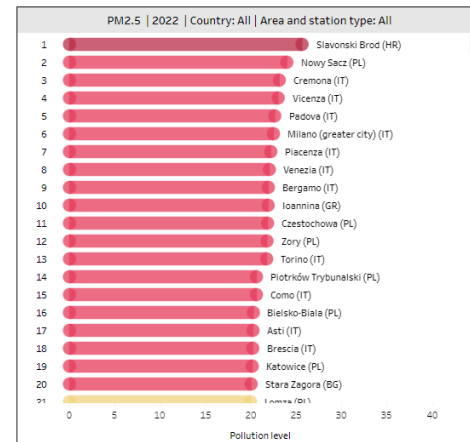
Bars showing the pollution level in each country.

Graph showing the evolution the pollution level throughout the years for each country.



Bars showing the pollution level in each city.

Graph showing the evolution the pollution level throughout the years for each city.



EEA viewers related to cities

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statistics

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Daily – Weekly – Monthly viewer



AQ eReporting - data viewers

NO2 | year(s): 2020, 2021, 2022 | month(s): All | country(ies): All
Average concentration over selected period

Filters

Pollutant
NO2

Year(s)
Multiple values

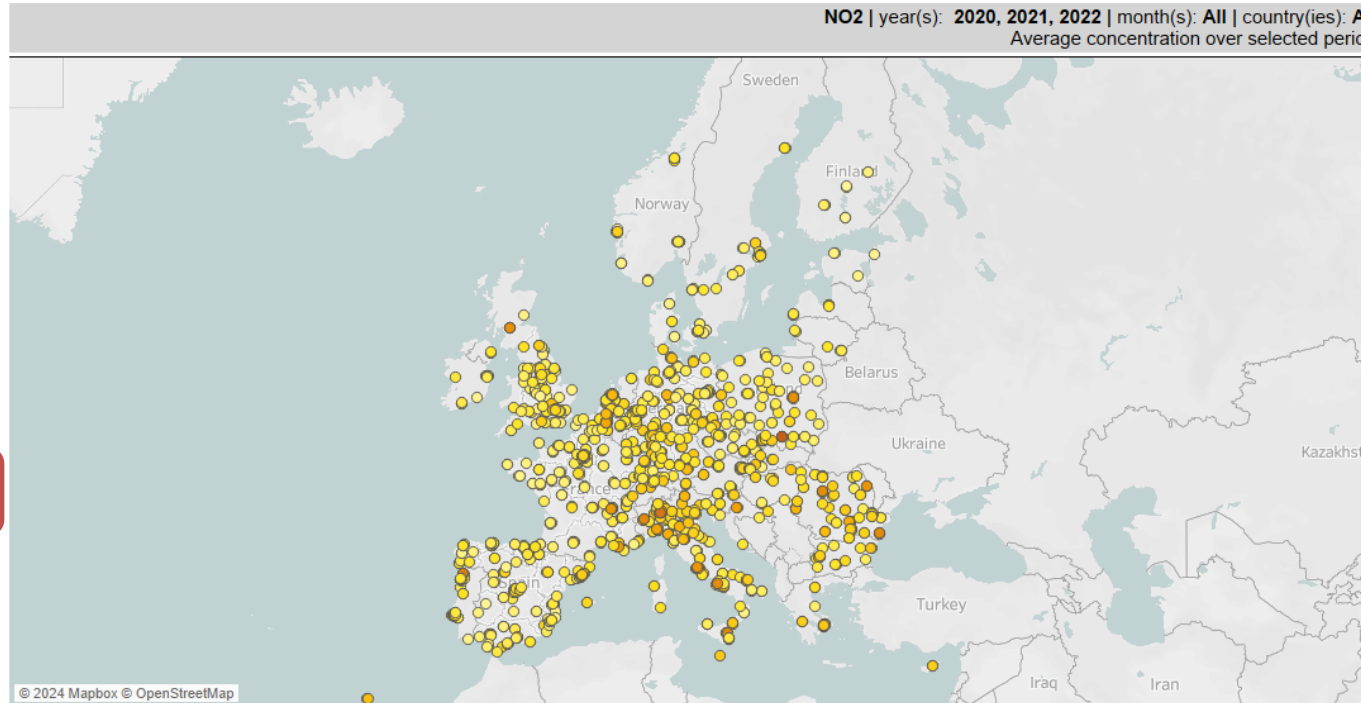
Month(s)
All

Country
All

City (country)
All

Station type
All

Station area
All



Station ranking based on average concentration over considered period (column and color coding = concentration)

Rank	Station Name	Area	Type	City	Country	Concentration (ug/m3)
1	PATISION	Urban	Traffic	Athina (GR)	Greece	69.1
2	Auto A1 - Saint-Denis	Urban	Traffic	Paris (FR)	France	56.5
3	PIREAUS-1	Urban	Traffic	Athina (GR)	Greece	55.5
4	München/Landshuter Allee	Urban	Traffic	München (DE)	Germany	51.6
5	Bld peripherie Est	Urban	Traffic	Paris (FR)	France	51.4
6	CORSO EUROPA - VIA S. MARTINO - GEN..	Urban	Traffic	Genova (IT)	Italy	50.9
7	PA - Di Blasi	Urban	Traffic	Palemo (IT)	Italy	50.5
8	Kraków, Aleja Krasińskiego	Urban	Traffic	Kraków (PL)	Poland	49.5
9	RN20 - MONTLHERY	Suburban	Traffic	Paris (FR)	France	48.9
10	NA07 ENTE FERROVIE	Urban	Traffic	Napoli (IT)	Italy	48.5
11	Lyon Périphérique	Urban	Traffic	Lyon (FR)	France	48.4
12	Montpellier Liberté	Urban	Traffic	Montpellier (FR)	France	48.3
13	Perpignan bd Pyrénées	Urban	Traffic	Perpignan (FR)	France	48.2
14	Torino - Rebaudengo	Urban	Traffic	Torino (IT)	Italy	47.5
15	FERMI	Urban	Traffic	Roma (IT)	Italy	46.4

[Info](#)

[Viewers](#)

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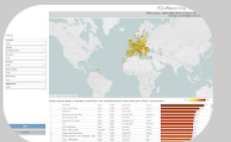
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General statistics viewer



2023 - PM2.5 - Annual mean / 1 calendar year

Year
2023

Pollutant
PM2.5

Statistics
Annual mean / 1 calendar year

EU 27
 Non EU 27
 All

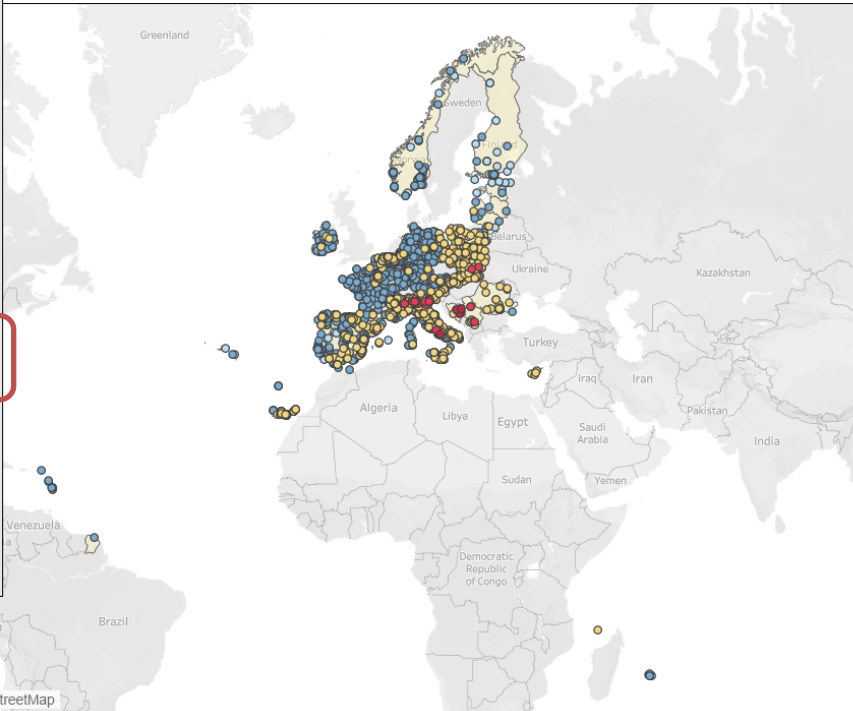
Country
All

City
All

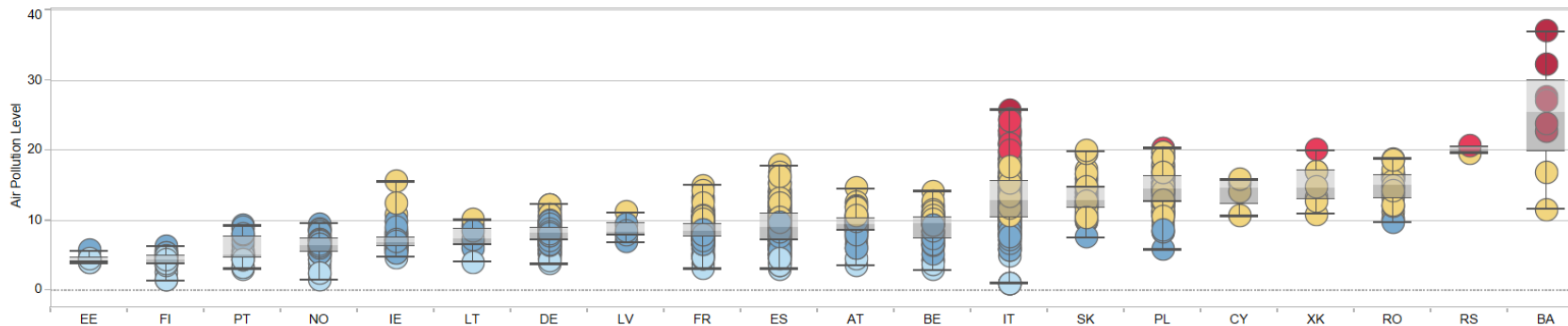
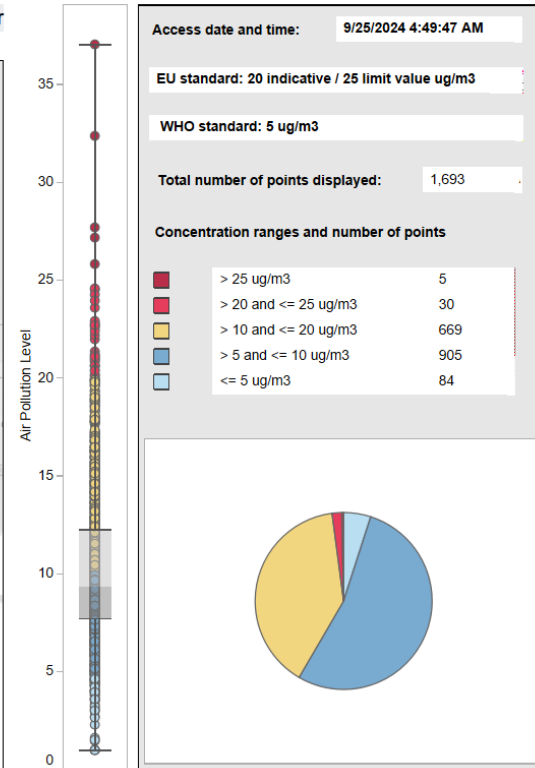
Station area
All

Station type
All

Show all values
 Exclude potential outliers

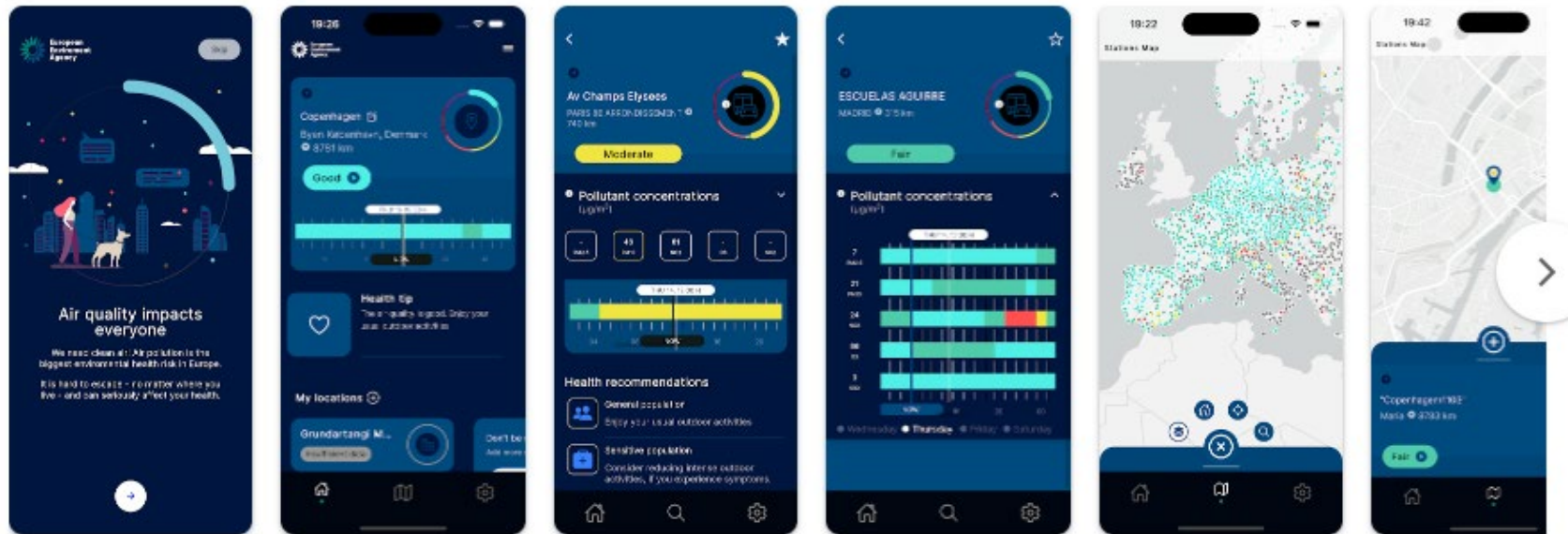


AQ eReporting - Annual statistics
(based on E1a - only validated data)



External use of the EEA's air quality data: data products

- European Air Quality Index APP



More information

Download the **Air quality index mobile app**

- For Android
- For iPhone/iPad



[European Air Quality Index - Apps on Google Play](#)

[European Air Quality Index on the App Store \(apple.com\)](#)

Download Service



Air Quality Download Service

Filters

Filter to download specific data

Countries

Pollutants

Dataset

Type

Temporal coverage

Start

End

List of URLs

Download

Summary

[Metadata](#)

[Vocabulary](#)

[Documentation](#)

Download Service provides access to air quality measurements time series. Three sets of time series are available for download:

- Historical Airbase data delivered between 2002 and 2012 before Air Quality Directive 2008/50/EC entered into force.
- Verified data (E1a) from 2013 to 2022 reported by countries by 30 September each year for the previous year.
- Unverified data transmitted continuously (Up To Date/UTD/E2a) data from the beginning of 2023.

The selected time series will be downloaded as zipped Parquet files. Each file contains a complete time series at a monitor location (Sampling Point), the filename corresponds to the identifier (localId) of the Sampling Point. Verified and UTD time series for the same Sampling Point are provided in separate files.

The measurement start and end time indicated the Parquet files for hourly data and variable (var) measurements are converted to UTC+1 time zone, daily values are instead delivered in the time zone reported by countries. Monitoring site metadata can be downloaded using the metadata link at the bottom of the page. Additional information on data elements presented as controlled codes can be accessed using the vocabulary link at the bottom of this page.

Data extracts are limited to 300MB. If more is needed, please use the "List of URLs" checkbox to download the data afterwards.

Country selection

- Select one or more

City selection

- Select one or more

Pollutant selection

- Select one or more

Dataset selection

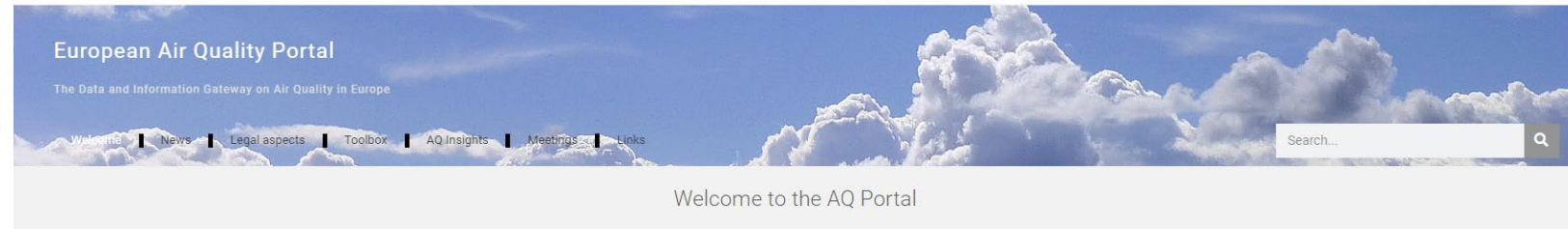
- E1a Primary validated data
- E2b Up-to-date (unvalidated) data
- Historical Airbase data (from 2002 and 2012)



Air Quality assessments and indicators

EEA viewers related to cities

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Data analysis and stats



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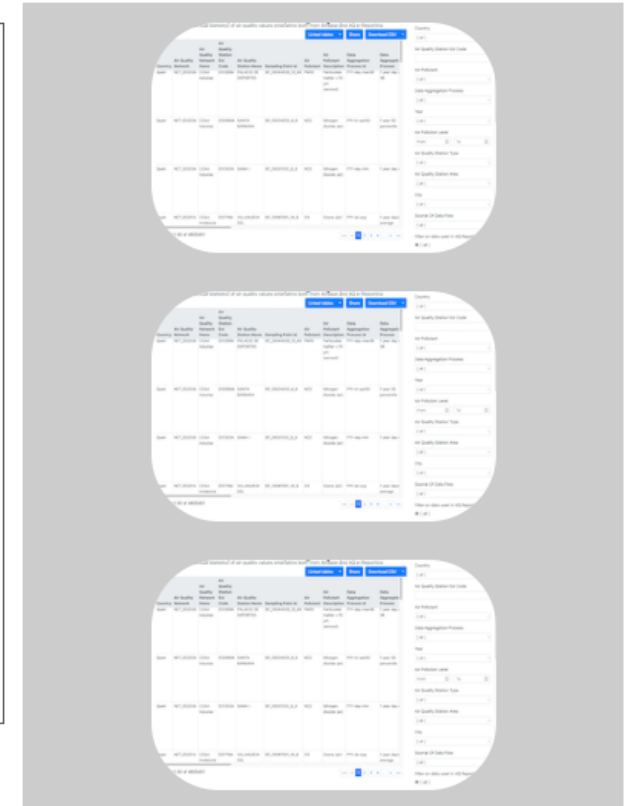
EEA viewers related to cities

Health Risk assessment

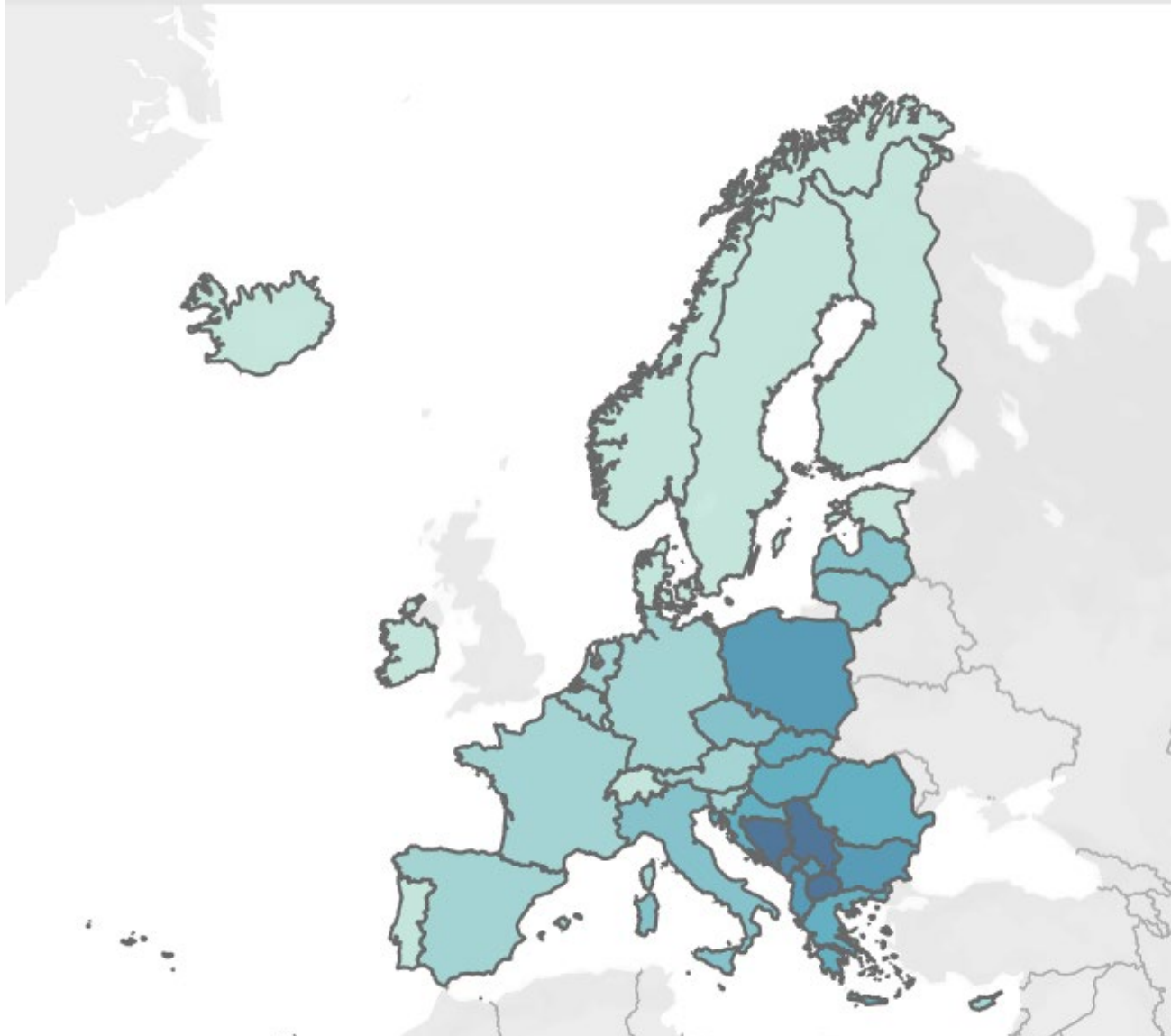
Health Risk Assessment

Information on air quality Health Risk Assessments (HRA) in terms of premature deaths and years of life lost calculated for different scenarios at:

- **Country level** – direct link: https://discomap.eea.europa.eu/App/AQViewer/index.html?fqn=Airquality_Dissemination.hra.countries_sel
- **NUTS 3 level** – direct link: https://discomap.eea.europa.eu/App/AQViewer/index.html?fqn=Airquality_Dissemination.hra.nuts3_sel
- **City level** – direct link: https://discomap.eea.europa.eu/App/AQViewer/index.html?fqn=Airquality_Dissemination.hra.cities_sel



Burden of disease as mortality



In 2021, in Europe, mortality attributable to concentrations of **PM_{2.5}** above the 2021 WHO air quality guideline level of **5 µg/m³** was as follows:

253,000 attributable deaths in EU-27 (293,000 in 40 countries)

2,584,000 years of life lost (2,936,000)

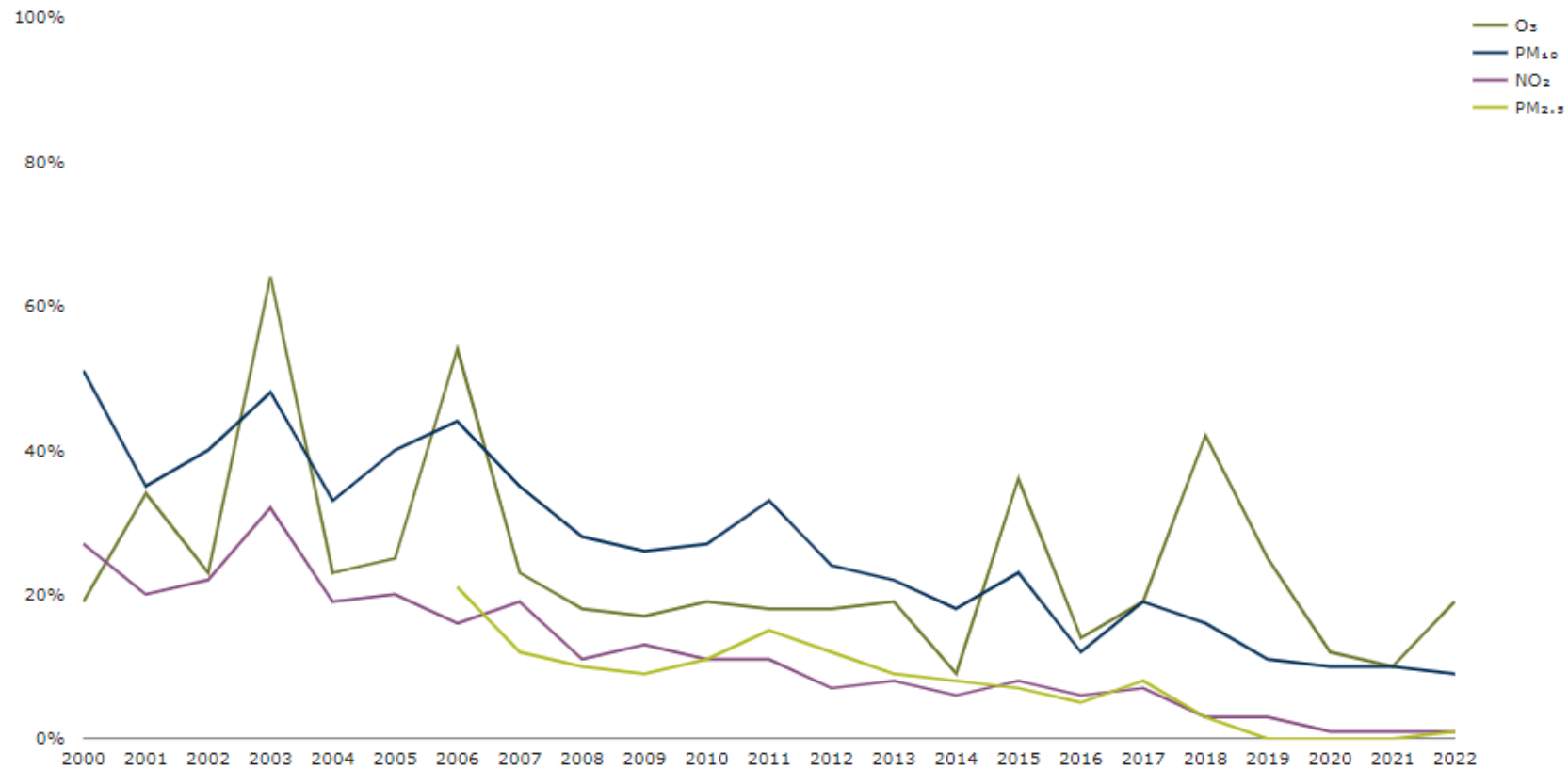
584 years of life lost per 100,000 inhabitants (618)


NO₂ (>10 µg/m³): **52,000 attributable deaths in EU-27** (69,000 in 41 countries)

O₃ (short-term >70 µg/m³): **22,000 attributable deaths in EU-27** (27,000 in 41 countries)

Exposure of EU urban population in 2022

Figure 1. Urban population exposed to air pollutant concentrations above selected EU air quality standards, EU-27



An aerial view of a road with a group of cyclists riding in a line. A silver car is driving in the same direction as the cyclists. The scene is set on a paved road with a green-painted lane for cyclists. There are trees and a signpost in the background.

Thank you for your attention!