# Air Pollution in Europe: focus on cities

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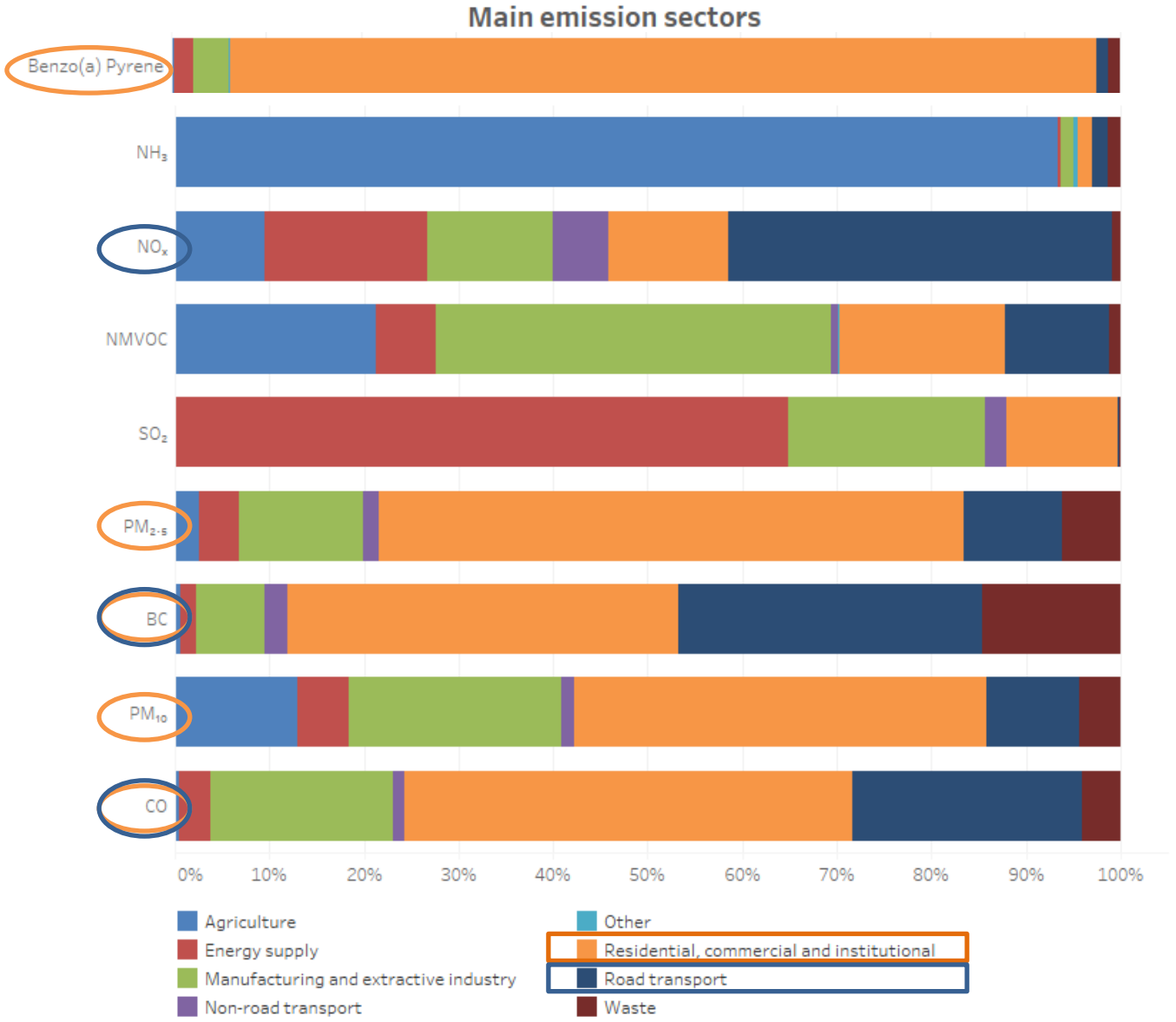
Alberto González Ortiz (EEA) / Healthy cities, healthy people:
Pathways for clean air in the EU's urban environments/ Brussels, 23 April 2024

European Environment Agency

# Air pollution: main urban emissions

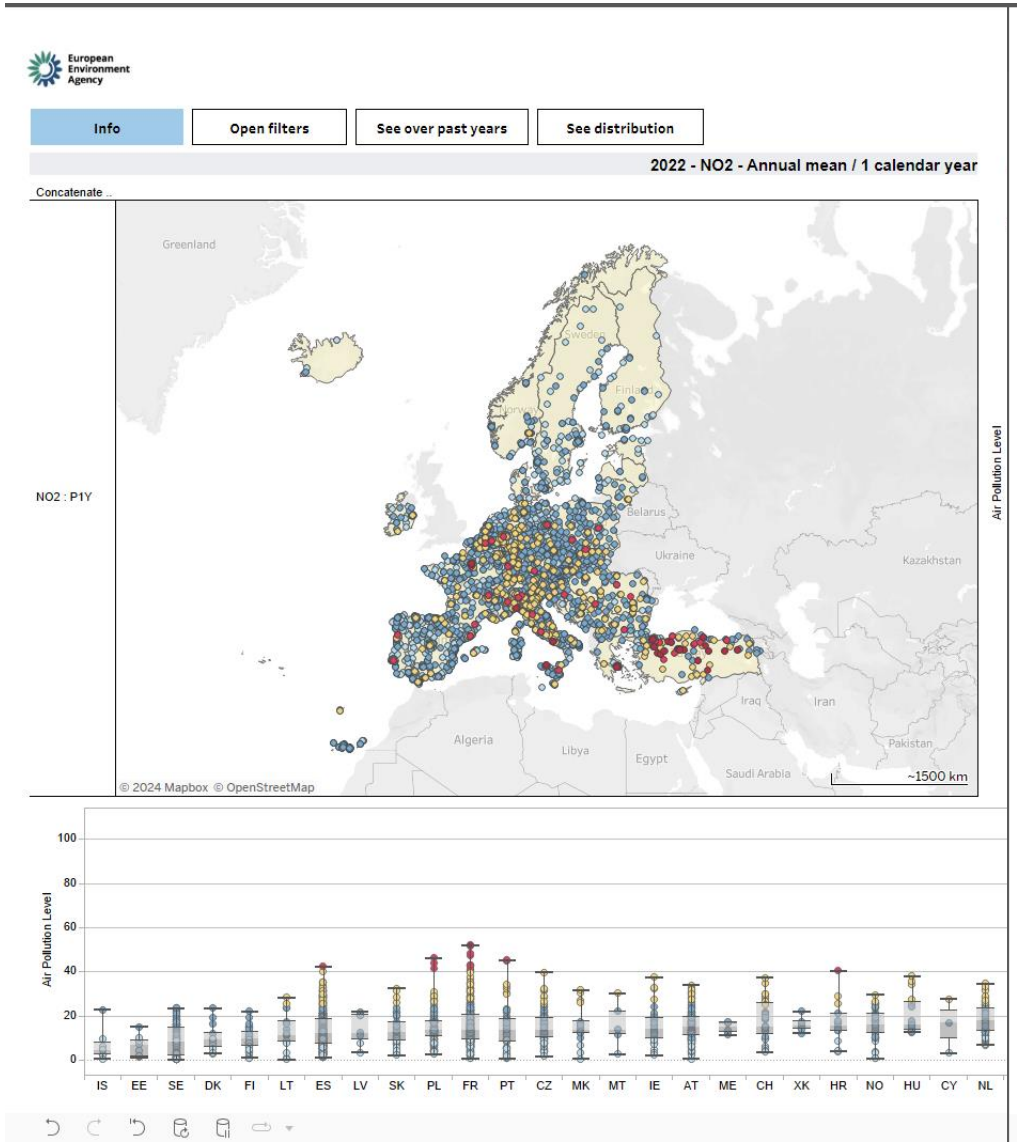


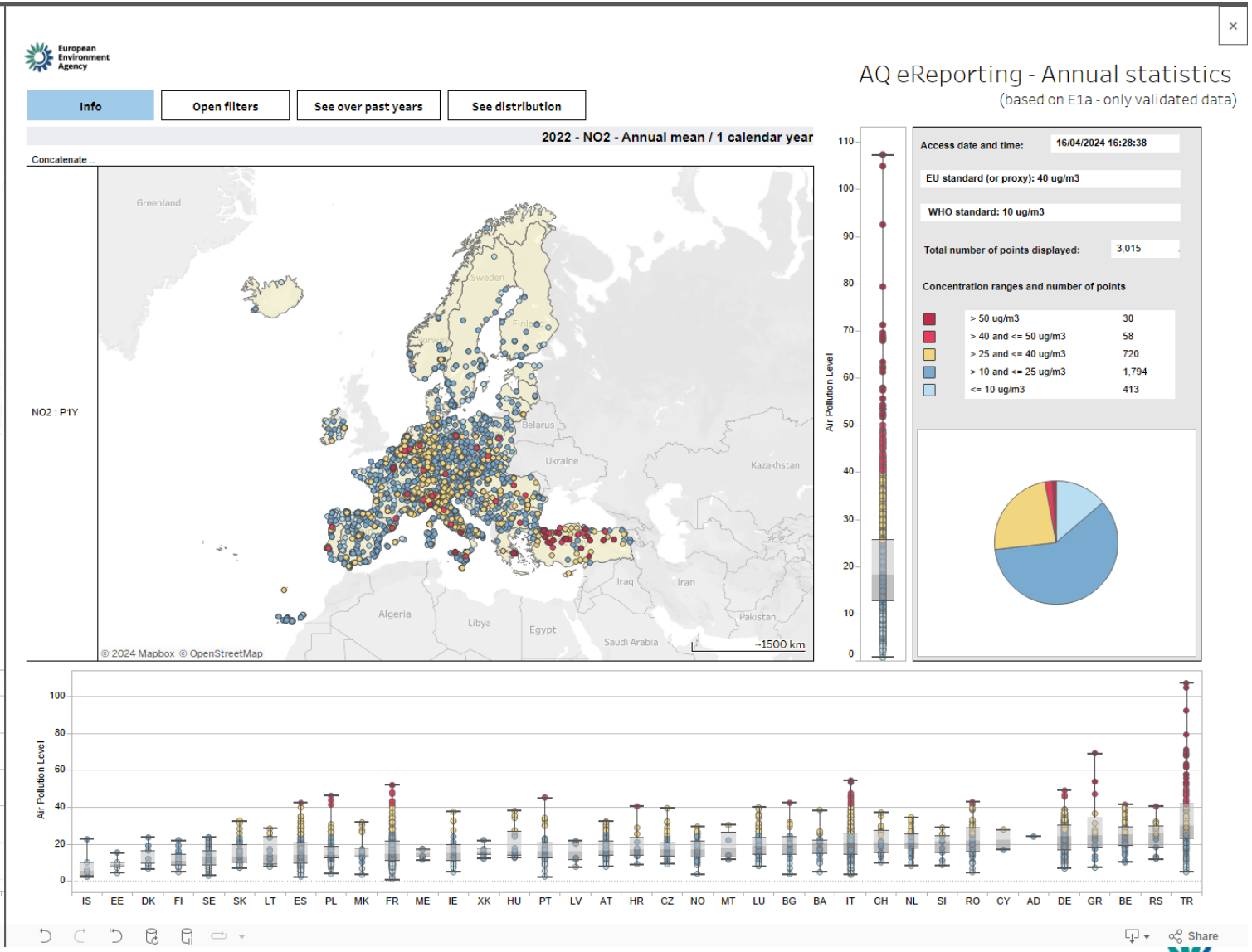

## Year 2021

Source: EEA's Air pollution in Europe: 2023 reporting status under the National Emission reduction Commitments Directive

European Environment Agency

# Air quality in Europe 2022: $NO_2$

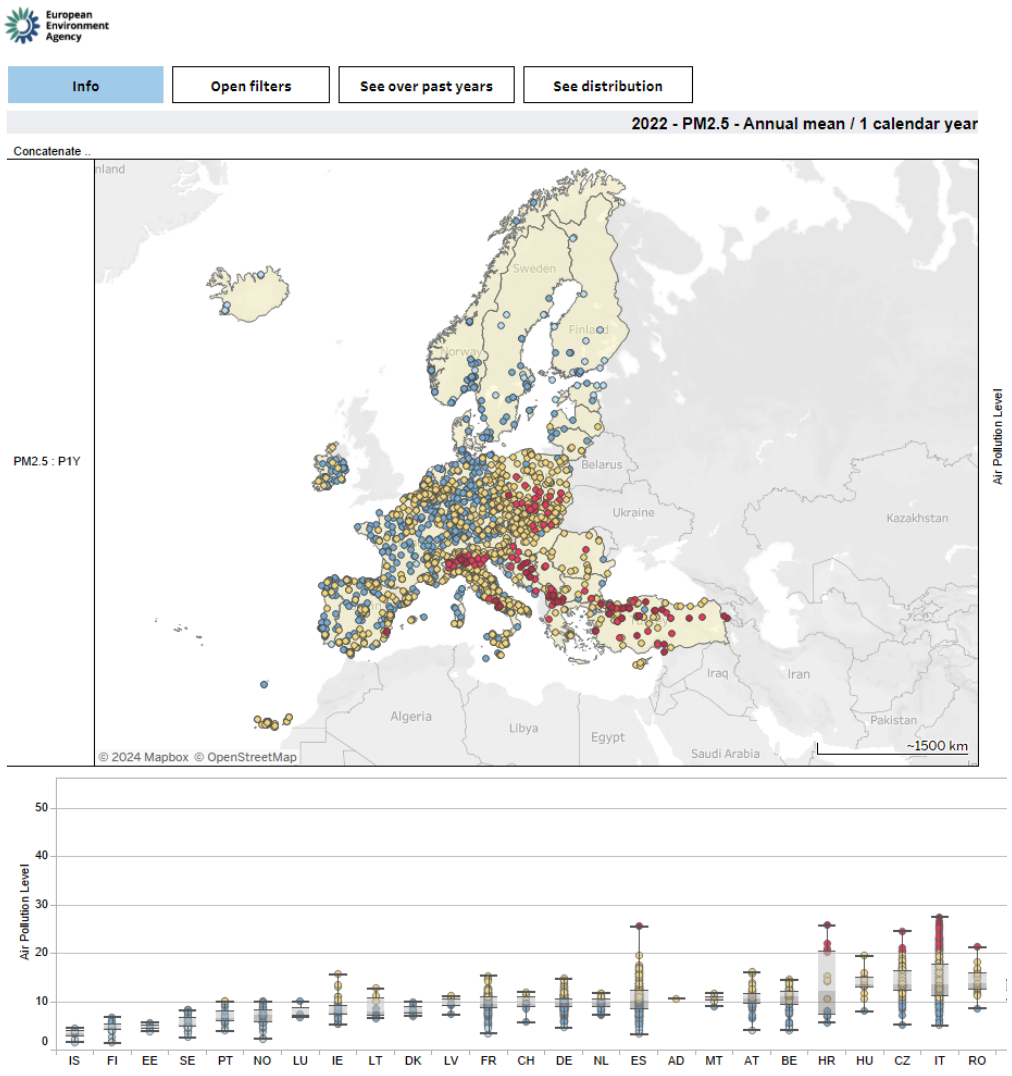


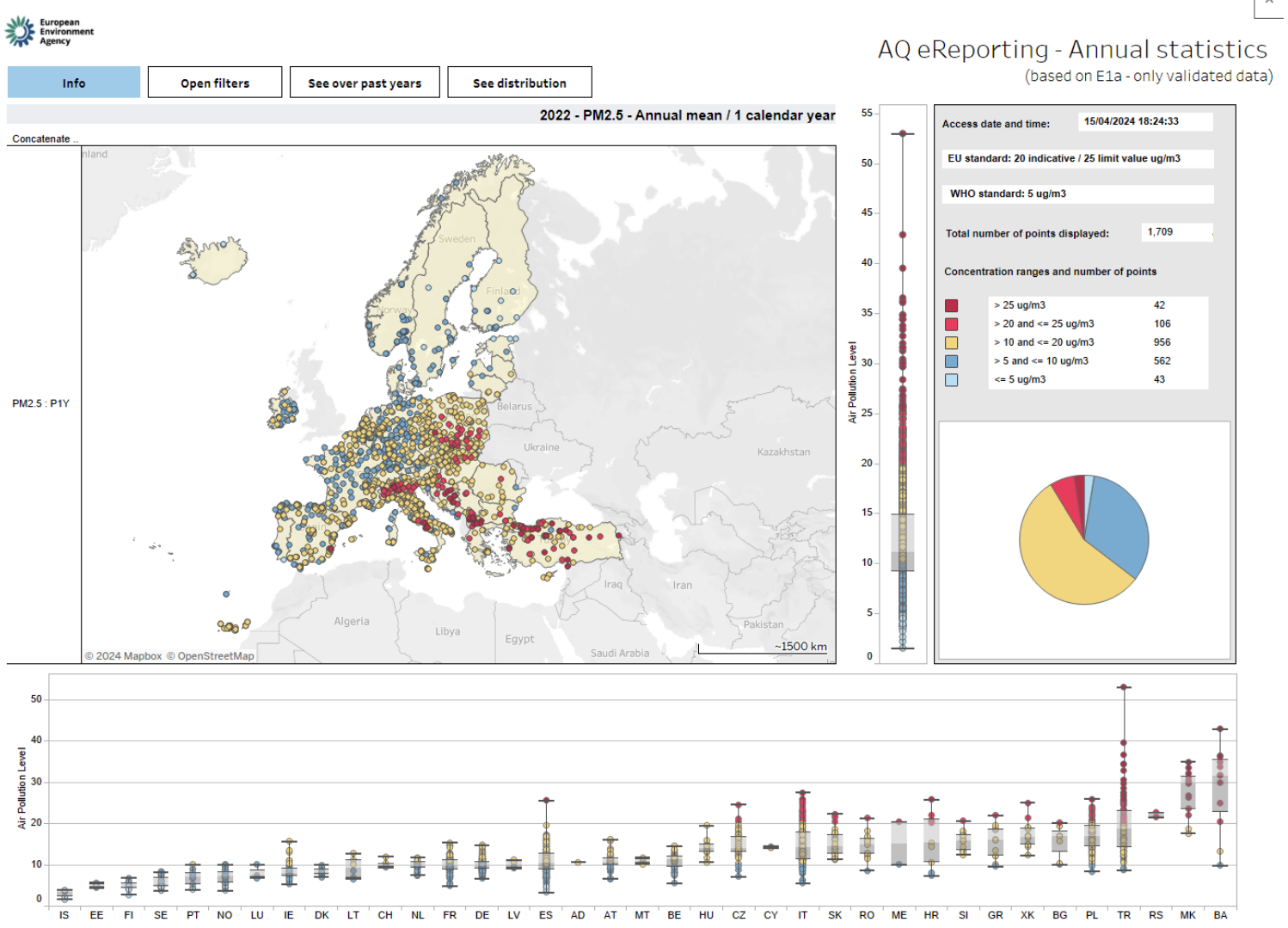




Source: [Air quality statistics]

European Environment Agency

# Air quality in Europe 2022: $PM_{2.5}$



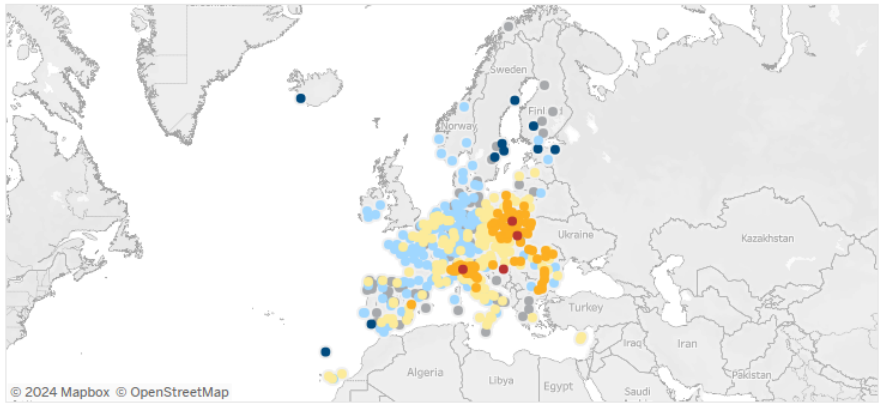

European Environment Agency

Source: [Air quality statistics]

# 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 2021 and 2022




PM2.
µg/m
0 - 5
5 - 1(
10 - :
15 - 2
> 25
no da
Coun
(All)
City
(All)

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

| City name | Country | Rank | Fine particulate matter in ug/m3 | Population in the c |
|---|---|---|---|---|
| Mainz | Germany | 166 | 10.3 | 218578 |
| Le Havre | France | 167 | 10.3 | 195042 |
| Bordeaux | France | 168 | 10.3 | 650138 |
| Mülheim a.d.Ruhr | Germany | 169 | 10.3 | 170632 |
| Annecy | France | 170 | 10.4 | 126924 |
| Arrecife | Spain | 171 | 10.4 | 64645 |
| Bamberg | Germany | 172 | 10.4 | 77373 |
| Bruxelles / Brussel | Belgium | 173 | 10.5 | 1223364 |
| Bilbao | Spain | 174 | 10.5 | 797590 |
| Greater Rotterdam | Netherlands | 175 | 10.5 | 1232747 |
| Klagenfurt | Austria | 176 | 10.6 | 96640 |
| Rennes | France | 177 | 10.6 | 216815 |
| Friedrichshafen | Germany | 178 | 10.6 | 61283 |
| La Spezia | Italy | 179 | 10.6 | 92550 |


| | |
|---|---|
| 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 | Country | Rank | Fine particulate matter in ug/m3 | Population in the city |
|---|---|---|---|---|
| Faro | Portugal | 1 | 3.7 | 61015 |
| Umeå | Sweden | 2 | 3.9 | 125080 |
| Uppsala | Sweden | 3 | 4.0 | 219914 |
| Funchal | Portugal | 4 | 4.2 | 104024 |
| Tallinn | Estonia | 5 | 4.3 | 438341 |
| Tampere / Tammerfors | Finland | 6 | 4.3 | 238140 |
| Reykjavik | Iceland | 7 | 4.3 | 132252 |
| Norrköping | Sweden | 8 | 4.7 | 140927 |
| Stockholm (greater city) | Sweden | 9 | 4.8 | 1745766 |
| Narva | Estonia | 10 | 4.9 | 53424 |

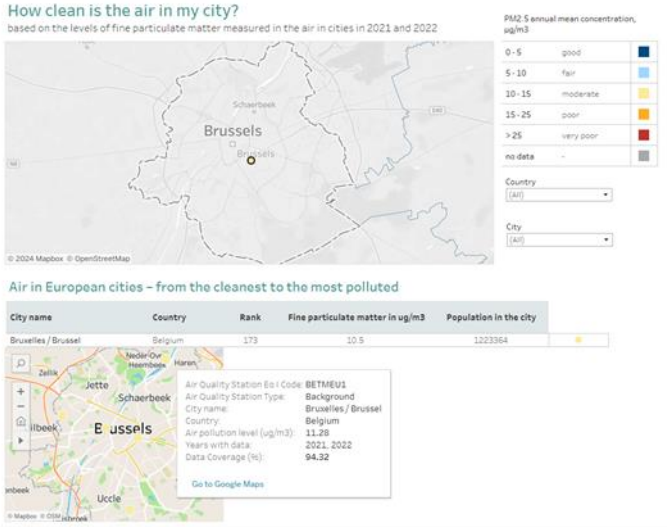

| | |
|---|---|
| 0 - 5 | good |
| 5 - 10 | fair |
| 10 - 15 | moderate |
| 15 - 25 | poor |
| > 25 | very poor |
| no data | - |

Country (All)

City (All)

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

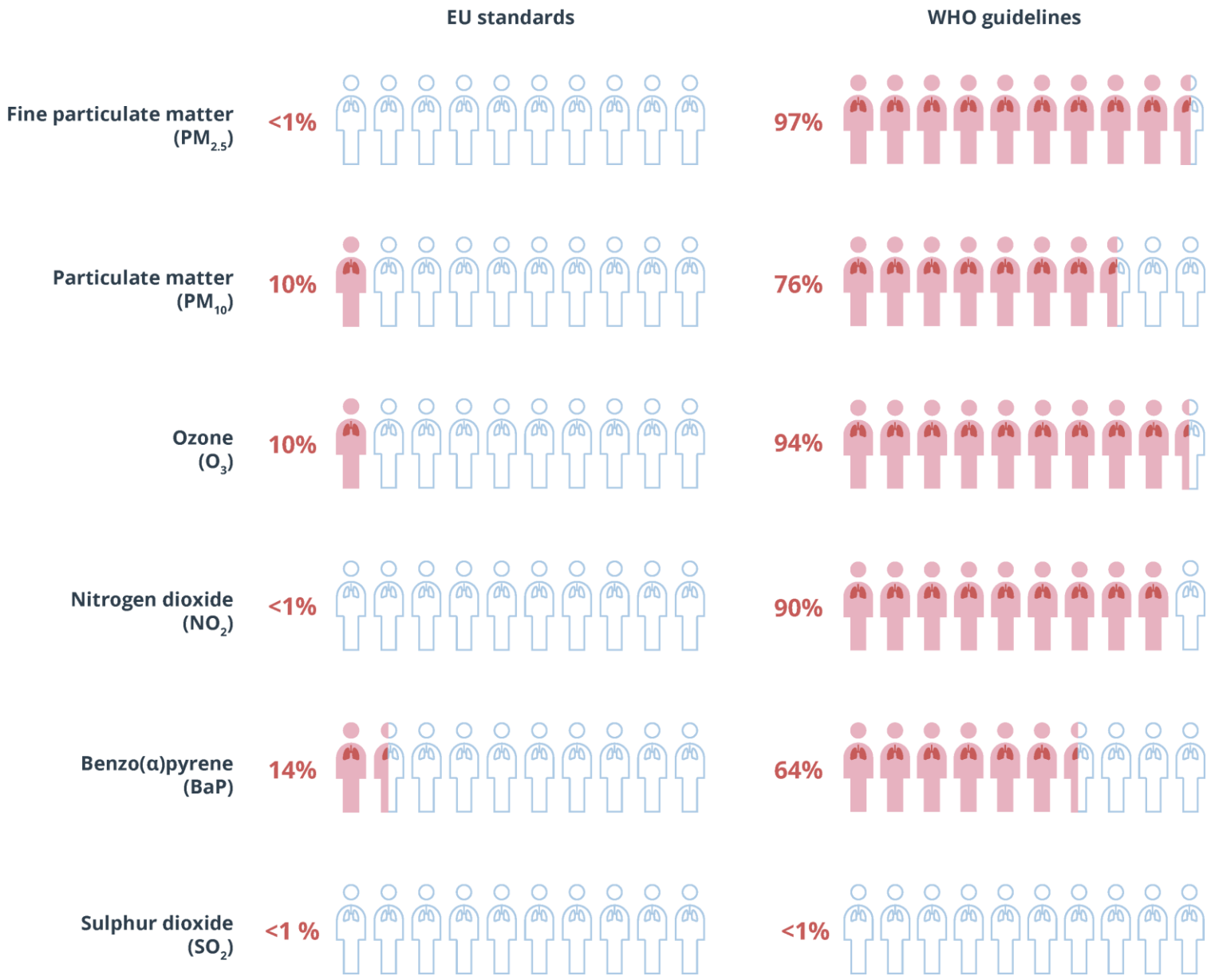
| City name | Country | Rank | Fine particulate matter in ug/m3 | Population in the city |
|---|---|---|---|---|
| Cremona | Italy | 372 | 25.1 | 72399 |
| Piotrków Trybunalski | Poland | 373 | 25.2 | 73670 |
| Nowy Sacz | Poland | 374 | 27.9 | 83896 |
| Slavonski Brod | Croatia | 375 | 28.0 | 52836 |




Source: [European city air quality viewer]

European Environment Agency

# Exposure of EU urban population in 2021




Source: AIR003

European Environment Agency

# Important burden of disease as mortality

In 2021, in Europe, mortality attributable to

https://discomap.eea.europa.eu/App/AQViewer/index.html?fqn=Airquality_Dissem.hra.cities_sel

## Air Quality Health Risk Assessments for cities and urban centres

(*Total City Population: Eurostat GEOSTAT 2011 1km2 population grid scaled to the year of analysis with national totals)

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| City Boundary Specification (LAU/grid) | Year | Health Risk Scenario | Country Or Territory | City | City Code | Air Pollutant | Total City Population * | Populated Area [km2] | Air Pollution Average [ug/m3] | Air Pollution Population Weighted Average [ug/m3] | Premature Deaths | Premature Deaths - lower CI | Premature Deaths - upper CI | Years Of Life Lost | Years Of Life Lost - lower CI | Years Of Life Lost - upper CI |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ESTAT Urban Audit Cities (LAU) | 2021 | WHO_2021_AQG_Scen_Base | Austria | Wien | AT001C1 | PM2.5 | 1841639 | 405 | 10.6 | 11 | 804 | 611 | 897 | 8105 | 6171 | 9051 |
| ESTAT Urban Audit Cities (LAU) | 2021 | WHO_2021_AQG_Scen_Base | Austria | Graz | AT002C1 | PM2.5 | 285573 | 160 | 11.9 | 14 | 185 | 141 | 207 | 1869 | 1427 | 2084 |
| ESTAT Urban Audit Cities (LAU) | 2021 | WHO_2021_AQG_Scen_Base | Austria | Linz | AT003C1 | PM2.5 | 218938 | 123 | 11.4 | 12.1 | 112 | 86 | 125 | 1134 | 865 | 1266 |
| ESTAT Urban Audit Cities (LAU) | 2021 | WHO_2021_AQG_Scen_Base | Austria | Salzburg | AT004C1 | PM2.5 | 165848 | 90 | 10.2 | 10.8 | 70 | 54 | 79 | 709 | 540 | 792 |
| ESTAT Urban Audit Cities (LAU) | 2021 | WHO_2021_AQG_Scen_Base | Austria | Innsbruck | AT005C1 | PM2.5 | 136236 | 61 | 7.8 | 9.4 | 44 | 34 | 49 | 445 | 339 | 498 |
| ESTAT Urban Audit Cities (LAU) | 2021 | WHO_2021_AQG_Scen_Base | Austria | Klagenfurt | AT006C1 | PM2.5 | 105597 | 152 | 11.2 | 12.3 | 56 | 42 | 62 | 562 | 429 | 629 |
| ESTAT Urban Audit Cities (LAU) | 2021 | WHO_2021_AQG_Scen_Base | Belgium | Bruxelles / Brussel | BE001C1 | PM2.5 | 1282848 | 195 | 11.2 | 11.4 | 637 | 485 | 711 | 5876 | 4475 | 6561 |
| ESTAT Urban Audit Cities (LAU) | 2021 | WHO_2021_AQG_Scen_Base | Belgium | Antwerpen | BE002C1 | PM2.5 | 573244 | 155 | 12.1 | 12.2 | 318 | 243 | 355 | 2939 | 2240 | 3280 |
| ESTAT Urban Audit Cities (LAU) | 2021 | WHO_2021_AQG_Scen_Base | Belgium | Gent | BE003C1 | PM2.5 | 297584 | 199 | 12.3 | 12.4 | 169 | 129 | 189 | 1561 | 1190 | 1743 |
| ESTAT Urban Audit Cities (LAU) | 2021 | WHO_2021_AQG_Scen_Base | Belgium | Charleroi | BE004C1 | PM2.5 | 279634 | 161 | 9.6 | 9.8 | 104 | 79 | 116 | 959 | 729 | 1071 |
| ESTAT Urban Audit Cities (LAU) | 2021 | WHO_2021_AQG_Scen_Base | Belgium | Liège | BE005C1 | PM2.5 | 459768 | 253 | 9.1 | 9.2 | 151 | 115 | 169 | 1394 | 1059 | 1558 |
| ESTAT Urban Audit Cities (LAU) | 2021 | WHO_2021_AQG_Scen_Base | Belgium | Brugge | BE006C1 | PM2.5 | 133302 | 152 | 10.7 | 11.2 | 65 | 49 | 72 | 596 | 454 | 665 |
| ESTAT Urban Audit Cities (LAU) | 2021 | WHO_2021_AQG_Scen_Base | Belgium | Namur | BE007C1 | PM2.5 | 125103 | 206 | 8.8 | 9 | 40 | 30 | 44 | 366 | 278 | 409 |
| ESTAT Urban Audit Cities (LAU) | 2021 | WHO_2021_AQG_Scen_Base | Belgium | Leuven | BE008C1 | PM2.5 | 128133 | 91 | 10.8 | 10.9 | 59 | 45 | 66 | 542 | 413 | 605 |
| ESTAT Urban Audit Cities (LAU) | 2021 | WHO_2021_AQG_Scen_Base | Belgium | Mons | BE009C1 | PM2.5 | 178568 | 224 | 10.4 | 10.9 | 82 | 62 | 92 | 759 | 578 | 848 |
| ESTAT Urban Audit Cities (LAU) | 2021 | WHO_2021_AQG_Scen_Base | Belgium | Kortrijk | BE010C1 | PM2.5 | 104588 | 101 | 11.8 | 12.3 | 59 | 45 | 66 | 543 | 414 | 608 |
| ESTAT Urban Audit Cities (LAU) | 2021 | WHO_2021_AQG_Scen_Base | Belgium | Oostende | BE011C1 | PM2.5 | 82940 | 45 | 10.2 | 10.6 | 36 | 27 | 40 | 331 | 252 | 370 |
| ESTAT Urban Audit Cities (LAU) | 2021 | WHO_2021_AQG_Scen_Base | Belgium | Mechelen | BE012C1 | PM2.5 | 110369 | 95 | 11.5 | 11.5 | 55 | 43 | 63 | 515 | 392 | 576 |
| ESTAT Urban Audit Cities (LAU) | 2021 | WHO_2021_AQG_Scen_Base | Belgium | Mouscron | BE013C1 | PM2.5 | 37443 | 48 | 11.6 | 12.2 | 21 | 16 | 23 | 191 | 145 | 213 |
| ESTAT Urban Audit Cities (LAU) | 2021 | WHO_2021_AQG_Scen_Base | Belgium | La Louvière (greater city) | BE014C1 | PM2.5 | 114455 | 113 | 10 | 10.3 | 47 | 35 | 52 | 432 | 328 | 483 |
| ESTAT Urban Audit Cities (LAU) | 2021 | WHO_2021_AQG_Scen_Base | Belgium | Verviers (greater city) | BE015C1 | PM2.5 | 81315 | 69 | 8.1 | 8.2 | 20 | 15 | 23 | 188 | 143 | 210 |
| ESTAT Urban Audit Cities (LAU) | 2021 | WHO_2021_AQG_Scen_Base | Bulgaria | Sofia | BG001C1 | PM2.5 | 1220559 | 592 | 13.2 | 16 | 2078 | 1589 | 2316 | 19133 | 14635 | 21316 |
| ESTAT Urban Audit Cities (LAU) | 2021 | WHO_2021_AQG_Scen_Base | Bulgaria | Plovdiv | BG002C1 | PM2.5 | 318525 | 74 | 19 | 20.3 | 743 | 570 | 826 | 6838 | 5251 | 7605 |
| ESTAT Urban Audit Cities (LAU) | 2021 | WHO_2021_AQG_Scen_Base | Bulgaria | Varna | BG003C1 | PM2.5 | 322774 | 150 | 13.8 | 16.2 | 559 | 428 | 623 | 5150 | 3940 | 5738 |
| ESTAT Urban Audit Cities (LAU) | 2021 | WHO_2021_AQG_Scen_Base | Bulgaria | Burgas | BG004C1 | PM2.5 | 198994 | 162 | 12.6 | 15.5 | 325 | 249 | 363 | 2996 | 2291 | 3339 |
| ESTAT Urban Audit Cities (LAU) | 2021 | WHO_2021_AQG_Scen_Base | Bulgaria | Pleven | BG005C1 | PM2.5 | 125645 | 162 | 13.7 | 17.4 | 240 | 184 | 267 | 2211 | 1694 | 2462 |
| ESTAT Urban Audit Cities (LAU) | 2021 | WHO_2021_AQG_Scen_Base | Bulgaria | Ruse | BG006C1 | PM2.5 | 157247 | 121 | 14.7 | 16.7 | 285 | 218 | 317 | 2621 | 2006 | 2919 |
| ESTAT Urban Audit Cities (LAU) | 2021 | WHO_2021_AQG_Scen_Base | Bulgaria | Vidin | BG007C1 | PM2.5 | 59725 | 155 | 15.6 | 23.1 | 162 | 125 | 180 | 1496 | 1152 | 1661 |
| ESTAT Urban Audit Cities (LAU) | 2021 | WHO_2021_AQG_Scen_Base | Bulgaria | Stara Zagora | BG008C1 | PM2.5 | 151947 | 276 | 13.4 | 15 | 237 | 181 | 265 | 2185 | 1670 | 2436 |
| ESTAT Urban Audit Cities (LAU) | 2021 | WHO_2021_AQG_Scen_Base | Bulgaria | Sliven | BG009C1 | PM2.5 | 118816 | 251 | 11.7 | 12.8 | 146 | 110 | 162 | 1336 | 1019 | 1491 |

Showing 1-30 of 787

<< < 1 2 3 4 .. > >>

### Filters

Clear

City Boundary Specification (LAU/grid)

- [x] ESTAT Urban Audit Cities (LAU) (787)
- [ ] Urban Centres (grid) (730)

Year

- [ ] 2005 (787)
- [ ] 2007 (787)
- [ ] 2008 (787)
- [ ] 2009 (787)
- [ ] 2010 (787)
- [ ] 2011 (787)
- [ ] 2012 (787)
- [ ] 2013 (787)
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- [ ] 2016 (787)
- [ ] 2017 (787)
- [ ] 2018 (787)
- [ ] 2019 (787)
- [ ] 2020 (787)
- [x] 2021 (787)

Health Risk Scenario

- [ ] WHO_2005_HRAPIE_Scen_Base (787)
- [x] WHO_2021_AQG_Scen_Base (787)
- [ ] WHO_2021_AQG_Scen_Sensitivity_2 (787)

Level Of Aggregation

- [x] City specific (787)

EU Countries

- [ ] No (29)
- [ ] Yes (758)

Country Or Territory

[ all ]

City

[ all ]

Air Pollutant

PM2.5 (787)

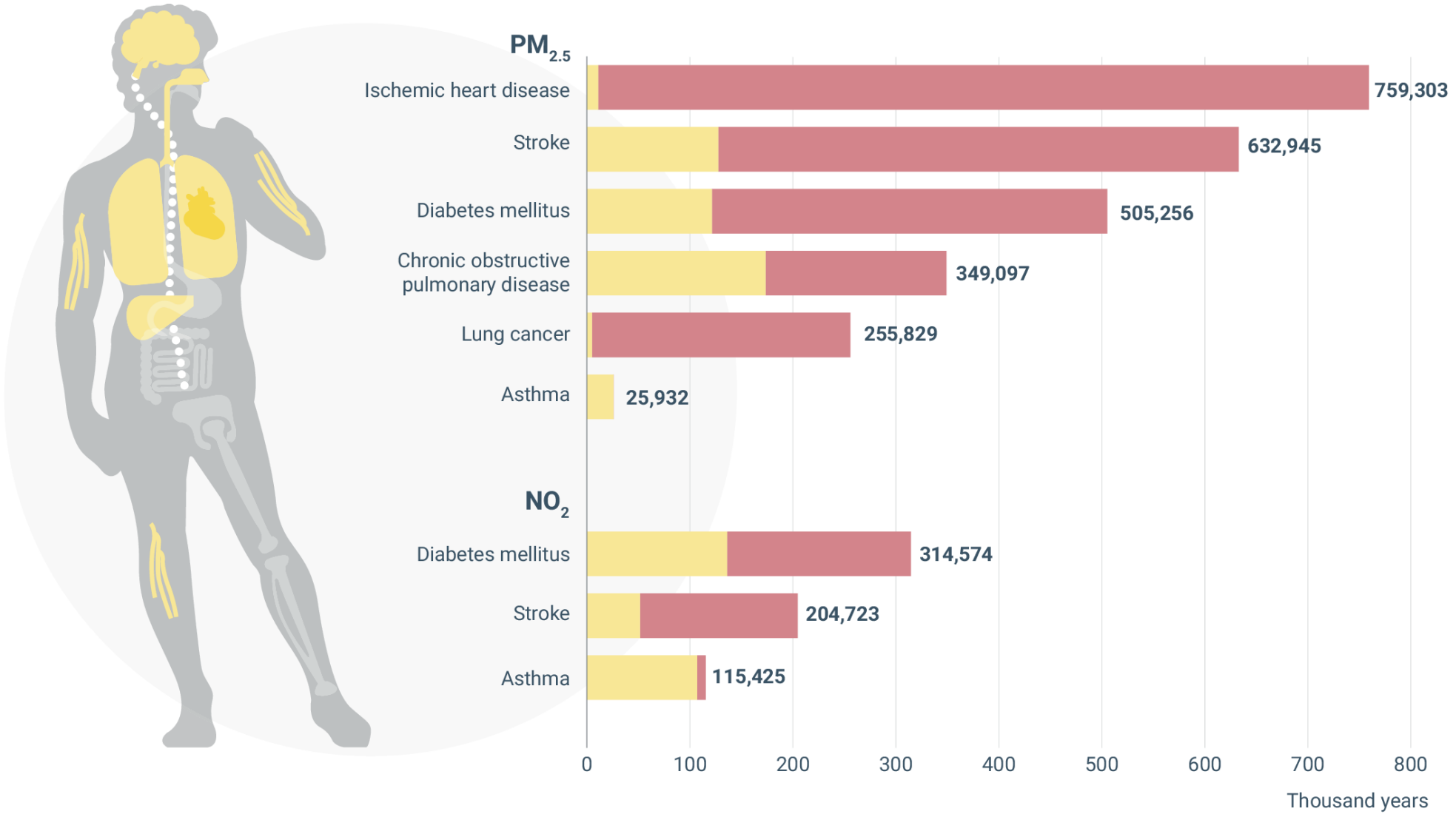
YLL per 100,000 inhabitants

0 — 2,115

Source: [Air Quality Health Risk Assessments]

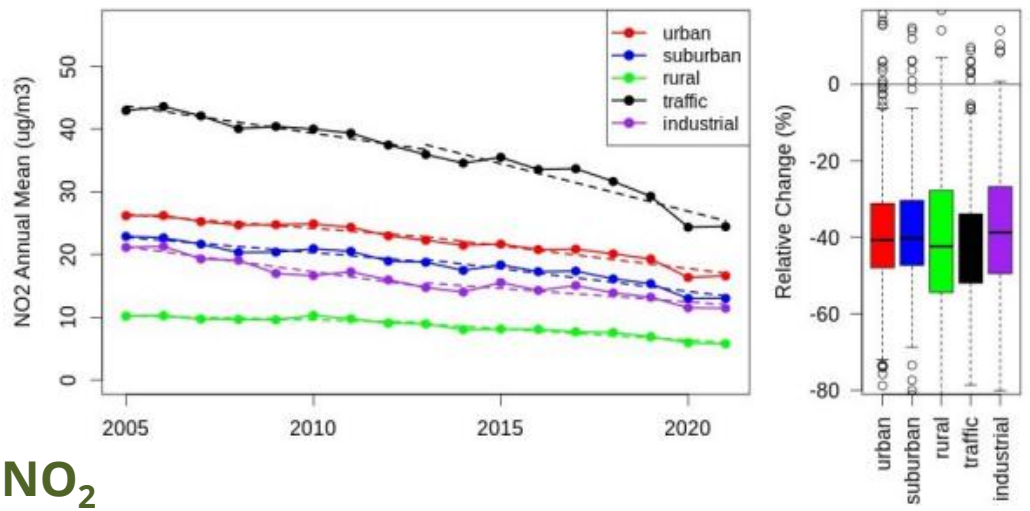
European Environment Agency

# Mortality is not the only impact of air pollution

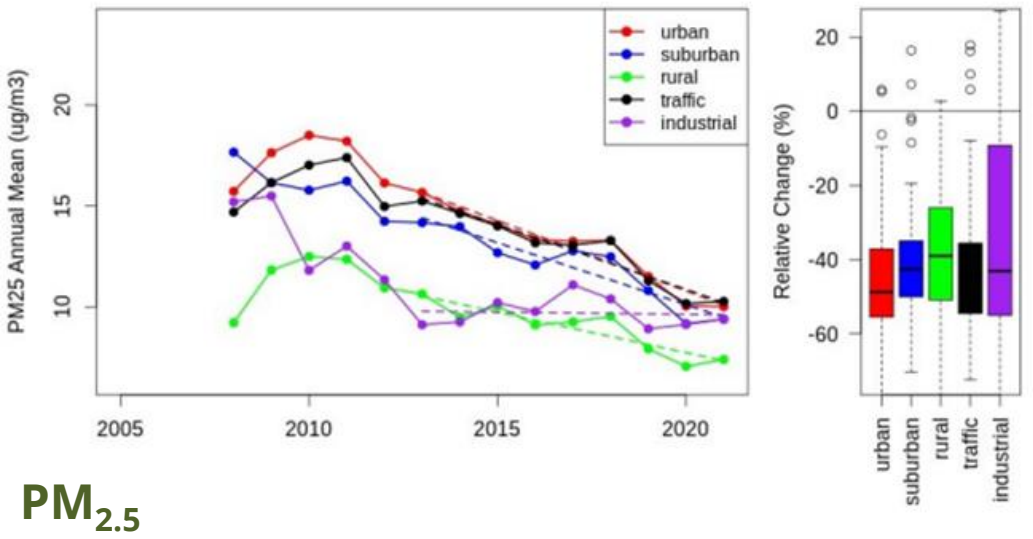



Source: EEA, 2023

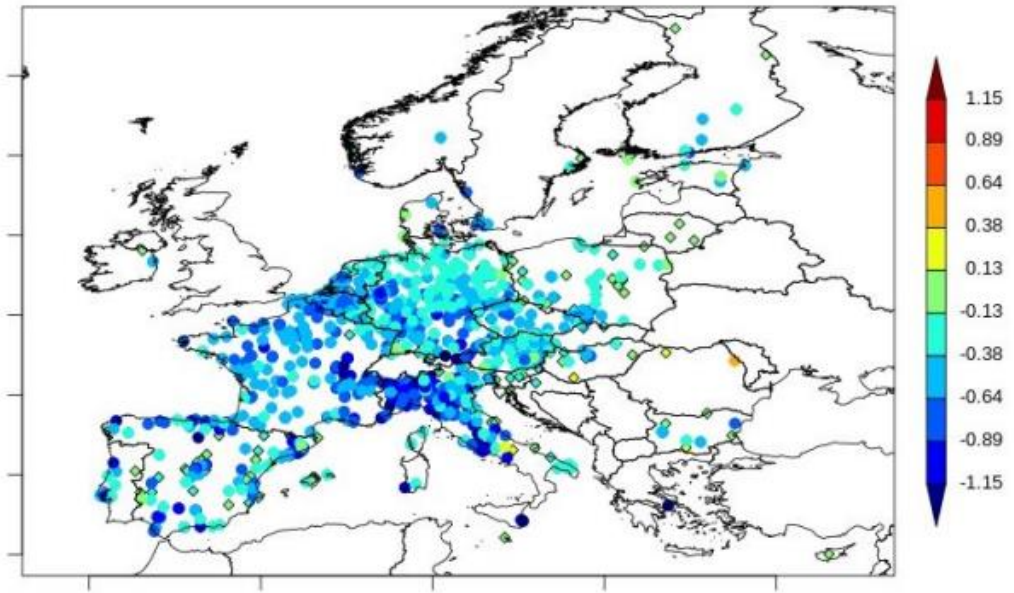
# Trend analysis 2005 – 2021

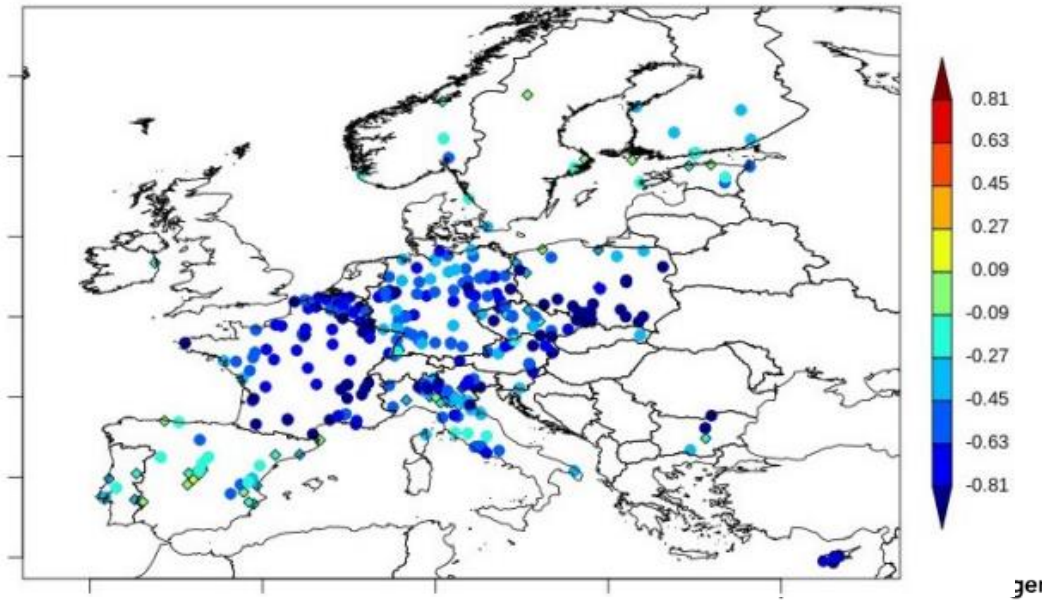



$NO_2$



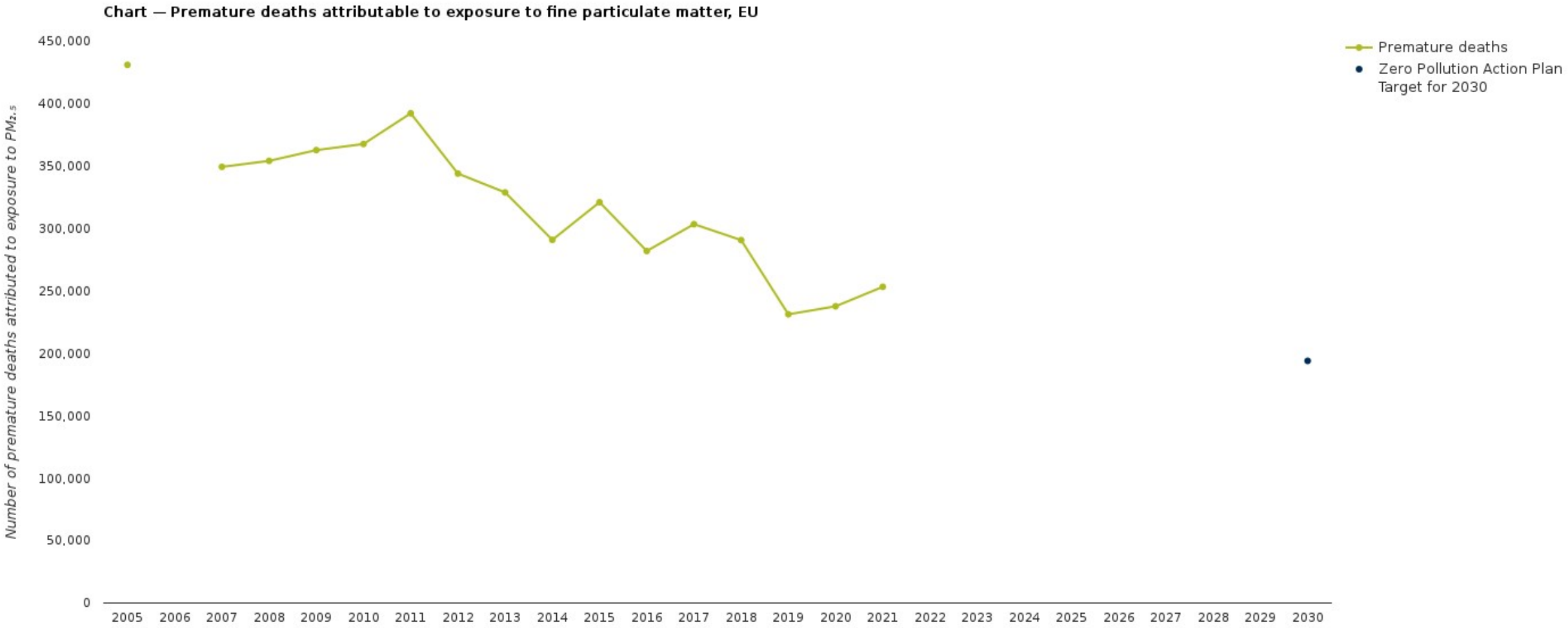

$PM_{2.5}$




Source: ETC HE Report 2023/8

# Improvement also in the health impacts




European Environment Agency

Source: EEA's indicator AIR007

# Examples of implemented measures

## Managing air quality in Europe

Air quality remains a persistent problem in Europe, continuing to harm health and ecosystems. This briefing reviews the status of air quality plans put in place by countries in situations where air pollution limits are exceeded. It also identifies th...

16 Feb 2022 **Topics:** Air pollution

**Source: European Environment Agency** / publications / managing-air-quality-i ...

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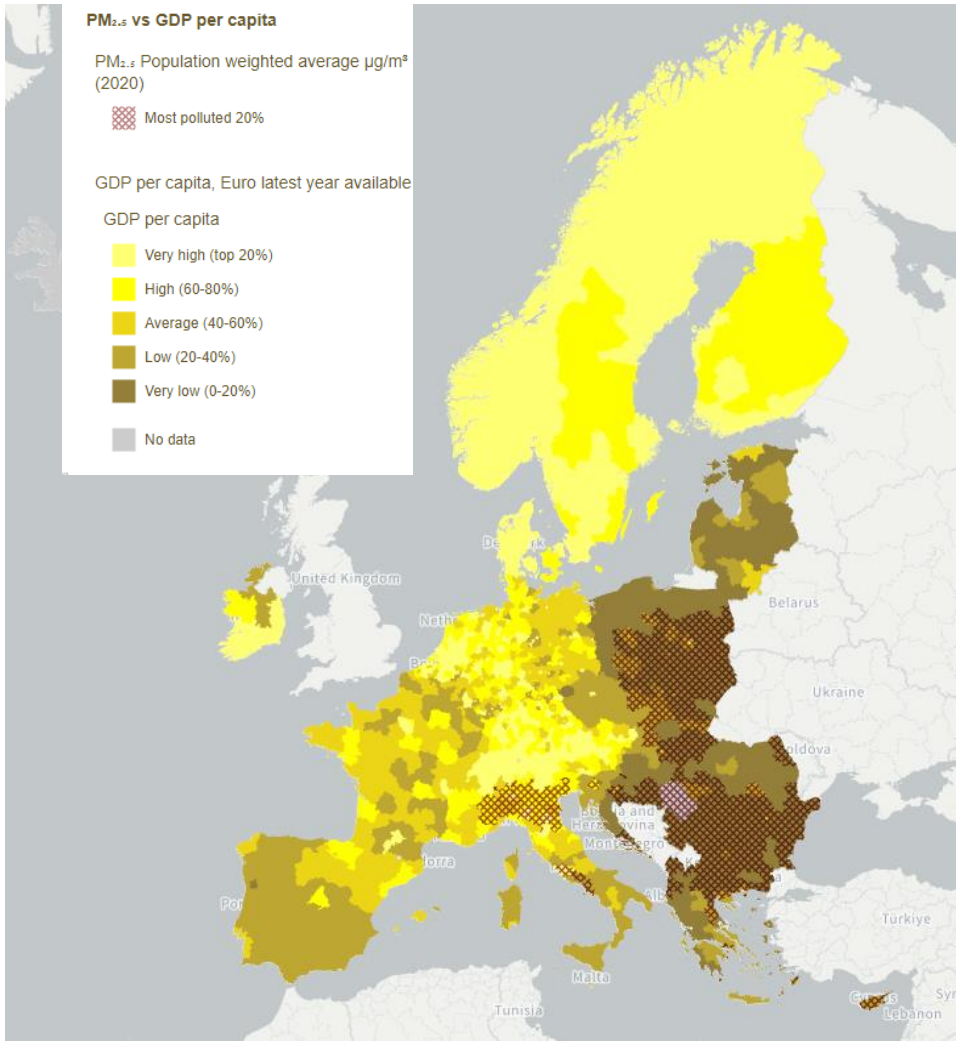
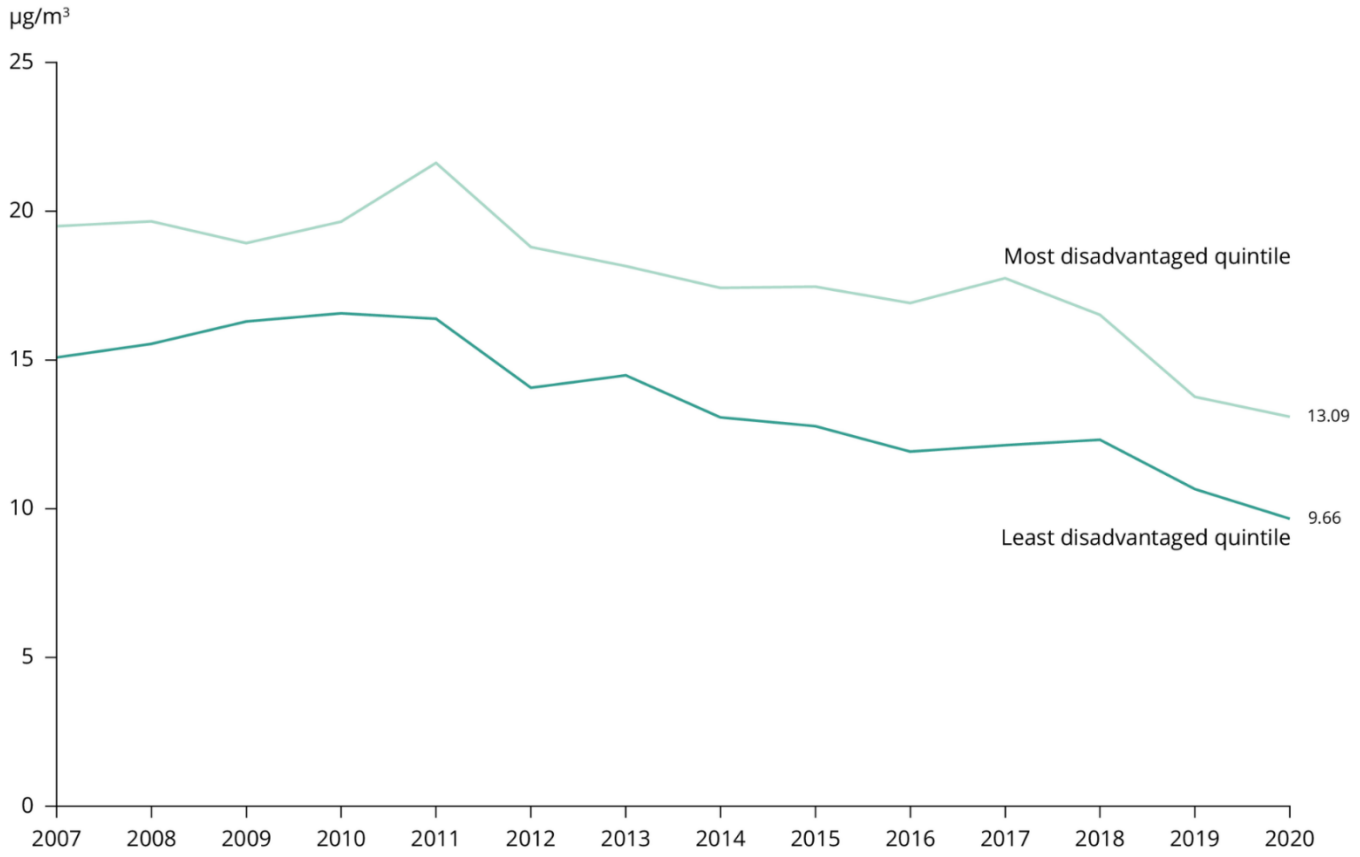
# Inequalities in the exposure to air pollution



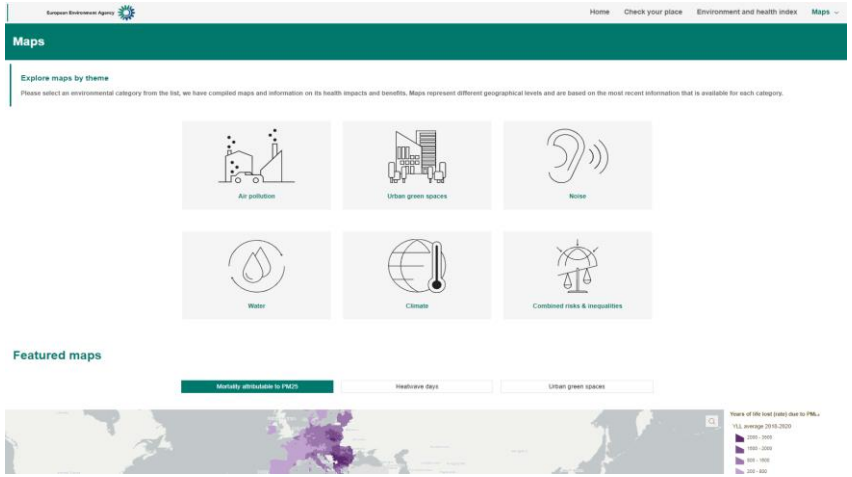

Source: EEA's indicator AIR009

Source: European environment and health atlas

European Environment Agency

# Environment and Health Atlas

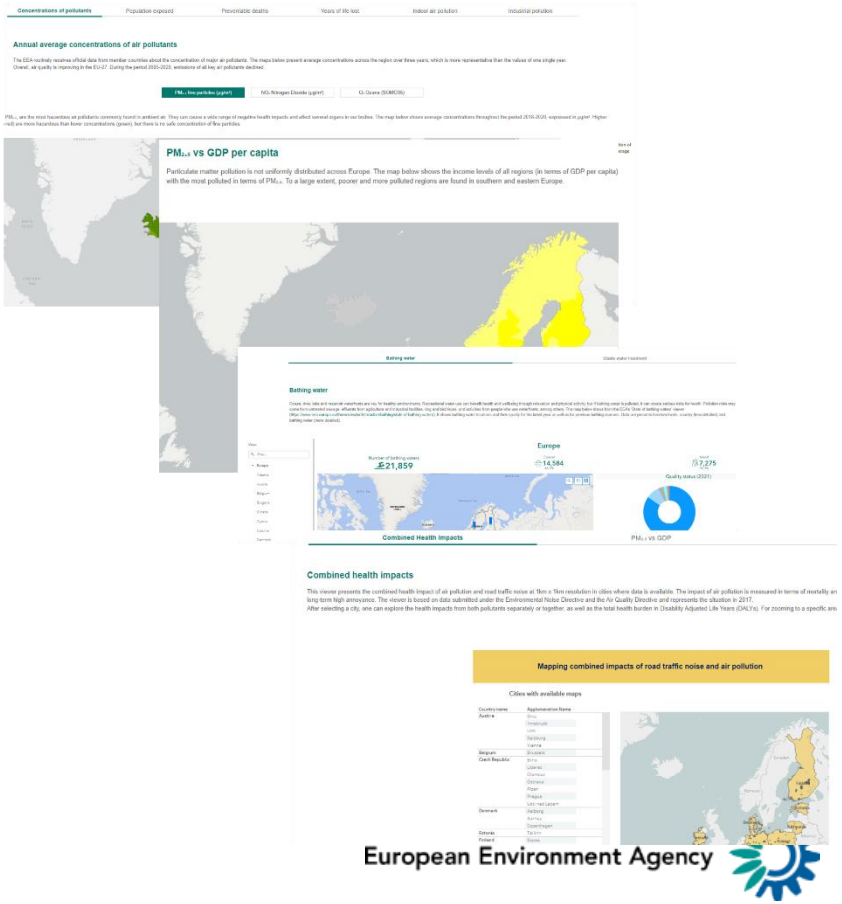
Clear narrative for people: the environment affects your health




[European environment and health atlas]

## Content organized around major topics

- Air pollutants: PM2.5, NOx, O3, industrial (air/water)
- Environmental noise
- Water (waste, bathing)
- Climate
- Green spaces
- Inequalities in exposure, combined impacts

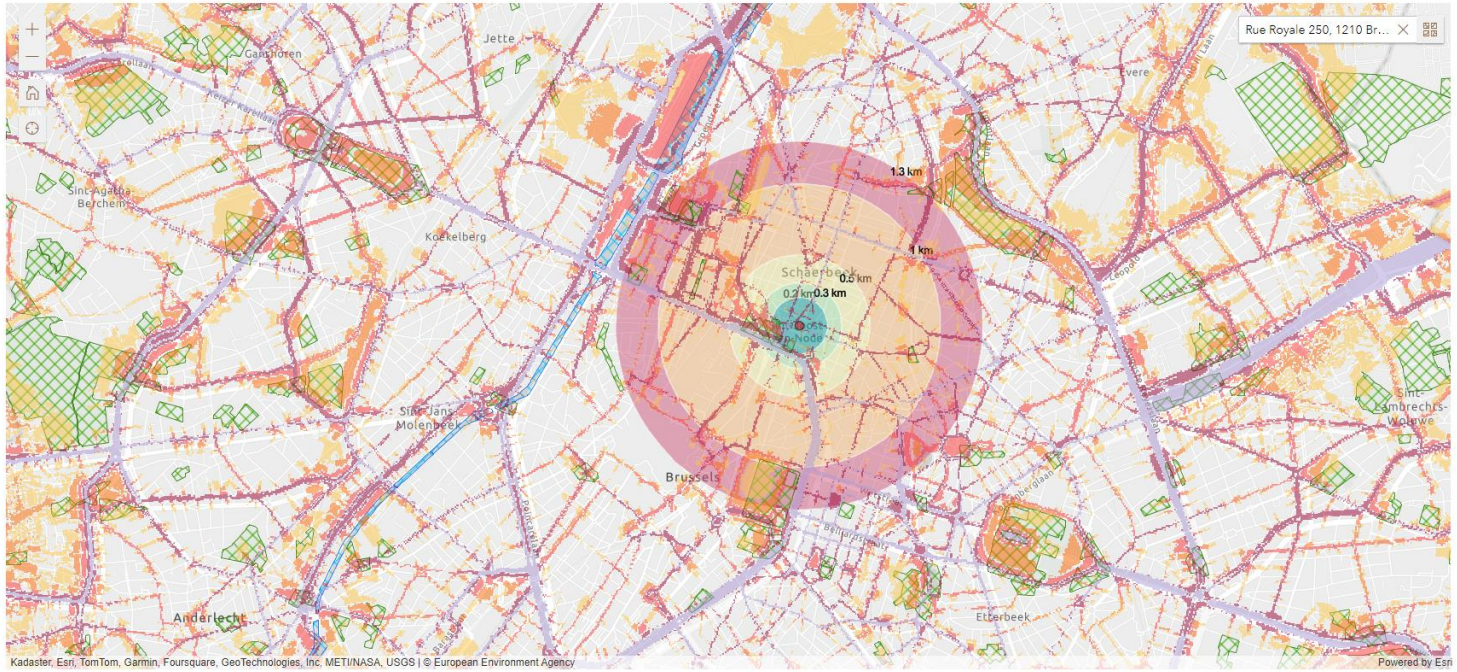


# Environment and Health Atlas

## Making it personal: the “Check your place” widget

### Check your place

Get an overview of the quality of the environment where you live, work, study, commute or play. Click on the map or enter an address and the results will be shown in the right-hand panel. You can show/hide layers by clicking on the eye icons and use the slider to manage the layer transparency. For additional details about the variables and thresholds used, check out the section Additional information below the map.




**Location Information**

| | |
|---|---|
| Address | **Rue Royale 250, 1210, Saint-Josse-ten-Noode** |
| City | **Saint-Josse-ten-Noode** |
| Country | **Belgique ()** |

**Environmental Quality**

| | | |
|---|---|---|
| Average concentration of $PM_{2.5}$ in air | 10.9 | **µg/m³** |
| Average concentration of $NO_2$ in air | 26.6 | **µg/m³** |
| O3 concentrations in air (SOMO35) | 2677.7 | **µg/m³·days** |
| Road traffic noise: night | No Data | |
| Road traffic noise: day-evening-night | No Data | |
| Bathing water quality within 10 km | None | |
| Nearest green space or water body is within | 0.2 | **km** |

**Neighbourhood information**

| | | |
|---|---|---|
| Nearest public transport stop within | 0.2 | **km** |
| Hospitals within 3 km | 11 | **Hospitals** |
| Sports and leisure facilities within 3 km | 8 | **Facilities** |

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