THE URBAN BURDEN OF DISEASE ESTIMATION FOR POLICY MAKING

POLICY

THE UNHEARD CRISIS: ENVIRONMENTAL NOISE AND HEALTH IN CITIES

Millions of Europeans are exposed to noise pollution levels that are damaging their health, particularly in cities. Several local authorities are already implementing policies to improve noise levels, but more needs to be done.

This policy brief highlights the health impacts of noise pollution and showcases successful urban policy measures to protect public health.

NOISE IN CITIES

Noise pollution is the second largest environmental health risk in Europe after air pollution, yet it is not high on the policy agenda.

The European Environment Agency (EEA) estimates that at least 20% of the EU population is exposed to unhealthy noise levels over the longterm.[1]

People living in cities are exposed to noise from a variety of sources, with road traffic noise being the most widespread and impactful.

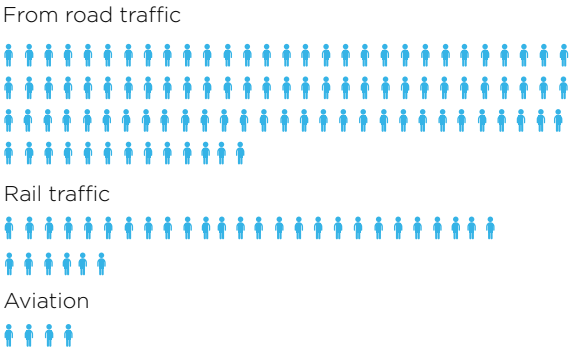
The EU Environmental Noise Directive (END) has been in place since 2002, establishing a framework for member states to assess and manage environmental noise. This law is also the basis for action in cities across Europe.

Noise pollution in European cities comes from several sources, but road traffic is the most significant.[2]

Noise from cars, vans, and lorries can disrupt people during the day, but its effects are greatest at night. Around 100 million people in Europe are exposed to long-term road traffic noise levels exceeding 55 decibels (dB(A)*), the threshold above which noise is considered harmful to health.[3]

Europeans exposed to harmful noise levels

Above 55 dB(A) — the threshold considered harmful to health. Each figure = 1 million people.



* dB(A) is a unit used to measure sound levels as perceived by the human ear. It reflects how loud something actually sounds to a person, not just its unfiltered sound intensity. Decibels in this briefing refer to db(A).

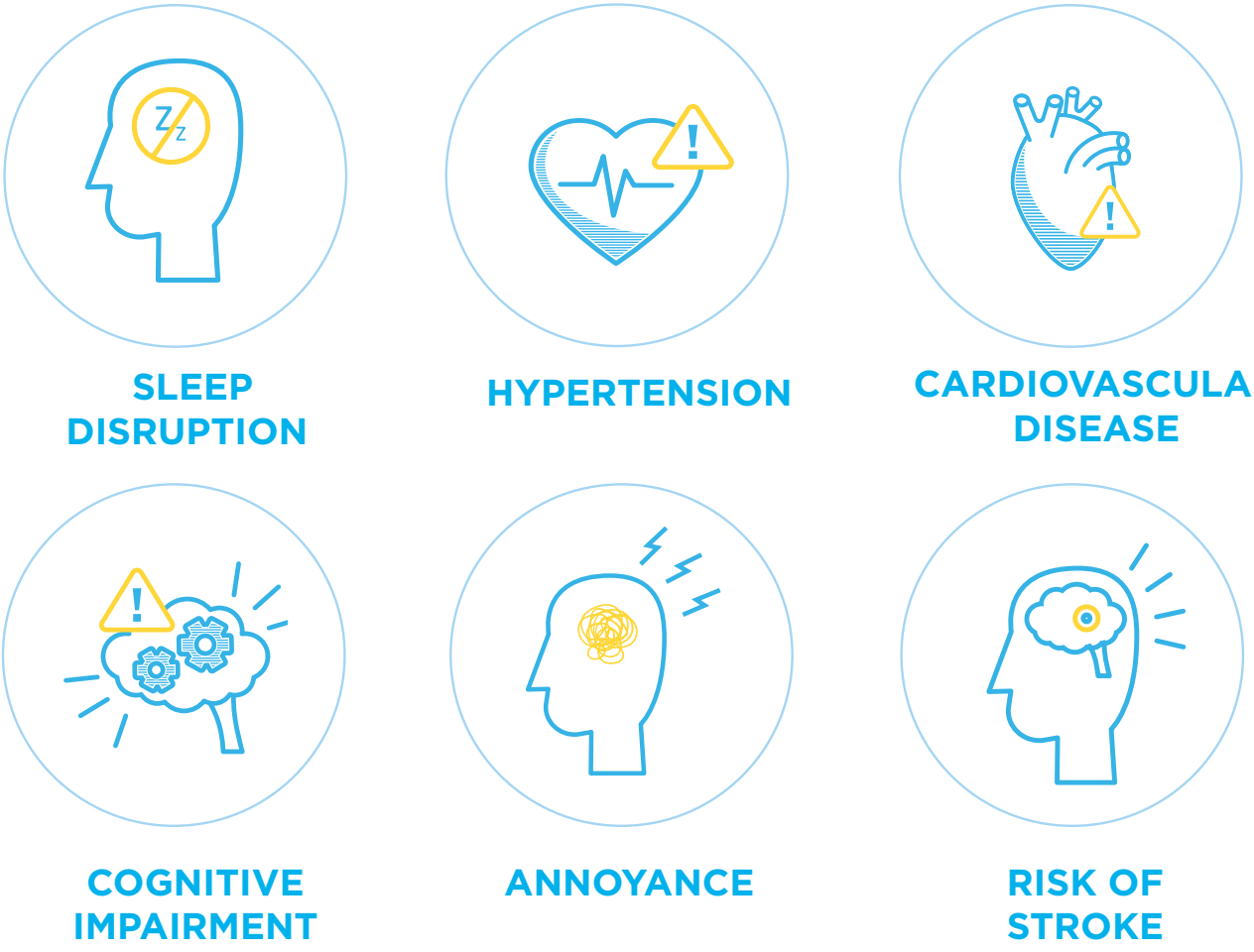
Rail traffic ranks second, affecting approximately 32 million people, particularly along densely connected urban corridors.[4]

Around major hubs, aviation noise is a significant concern, with roughly four million Europeans exposed to harmful levels near airports such as those in London, Paris, and Frankfurt.[5]

Industrial and construction activity also contributes substantially, though it tends to be more localised.

People living in France, Germany, Italy and Spain are the most exposed.[6] In France, 36% of citizens are disturbed by noise above the safe threshold, 26% in Germany, and 25% in Italy and Spain.

HEALTH EFFECTS OF NOISE POLLUTION



The World Health Organization (WHO) identified noise as a leading environmental cause of ill health in Europe, second only to air pollution.

For this reason, they issued guidelines in 2018, setting recommendations for evidence-based limits for environmental noise to protect public health.[7]

Exposure to noise levels above the recommended levels can harm health in several ways. It can cause sleep disruption, hypertension, cardiovascular disease, and cognitive impairment, particularly in children.[8]

With long exposure, the risk of heart attack and stroke increases.[9] Noise's impact on cardiovascular health is due to stress, as persistent noise triggers stress responses even during sleep.

According to the WHO, noise pollution is responsible for the loss of at least 1 million healthy life years annually in Europe.[10]

Research shows that noise and air pollution can amplify each other's harmful effects. Individuals exposed to both pollutants face greater health risks than those exposed to just one.[11]

This shows the importance of adopting integrated approaches to urban environmental health that address multiple pollution sources simultaneously to protect people's health.

Noise does not affect everyone equally. The elderly, children and those in poor health tend to be more adversely affected by environmental pollution, including noise.

While individuals from lower socioeconomic groups are exposed to more noise pollution, because they often live closer to high-traffic areas, and therefore their health is more impacted.[12]

EU FRAMEWORK TO REDUCE ENVIRONMENTAL NOISE

The Environmental Noise Directive (END), adopted by the European Union in 2002, established a common framework for assessing and managing environmental noise across member states.[13] It requires authorities in cities with 100,000 inhabitants or more, as well as those based near major roads, railways, and airports, to produce noise maps and action plans aimed at reducing exposure.

While the directive represented an important step forward in recognising noise pollution as a public health issue, the fact that no binding noise limit levels were included has limited its impact.[14]

The EEA notes that noise levels across Europe have not significantly improved since the directive came into force.[15]

Stronger enforcement mechanisms, clearer targets, and greater integration with urban planning and transport policy are necessary for the directive to make a real difference to health.

The Zero Pollution Action Plan was adopted by the European Commission in May 2021 as part of the broader European Green Deal. It sets ambitious targets for 2030 across air, water, soil, and noise. Recognising that noise is a major health risk, it aims to reduce by 30% the share of people chronically disturbed by transport noise by 2030 (compared to 2017 baseline).[16]

THE EUROPEAN ENVIRONMENT AGENCY NOISE MAP

The EEA maintains a comprehensive noise mapping and reporting framework, built primarily on data collected under the END. It is an interactive online tool that visualises noise exposure across Europe.[17] It aggregates noise data reported by EU member states and presents it geographically, allowing users to see noise levels from different sources across the continent.

BEST PRACTICE FROM EUROPEAN CITIES

Cities have a range of tools at their disposal to tackle noise pollution, spanning urban planning, regulation, and green infrastructure. To reduce noise, cities could designate quiet zones, set lower noise limits for vehicles, increase the use of low-noise asphalt, create buffer zones between major roads or railways and residential areas and lower speed limits.[18]

COPENHAGEN (DENMARK)

NOISE EXPOSURE

In Copenhagen, 621,500 people are exposed to day-evening-night average sound levels of 55 decibels or higher. Road traffic is by far the dominant source, followed by rail and aircraft noise.

POLICIES TO ADDRESS NOISE

City authorities have invested heavily in low-noise road surfaces, as well as traffic calming measures, reduced speed limits (down to 40 km/h or lower in residential areas), and extensive pedestrianisation, which have contributed to noise reduction.[19]

UTRECHT (THE NETHERLANDS)

NOISE EXPOSURE

Utrecht sits at a major motorway junction, creating significant noise corridors. In addition, Utrecht station is the busiest station in the country. A total of 238,300 people are exposed to day-evening-night average sound levels of 55 decibels or higher from road traffic.

POLICIES TO ADDRESS NOISE

The city prioritised cycling and public transport as core noise reduction strategies, and significantly reduced through-traffic in its historic centre. Utrecht invested in quiet road surfaces and designated noise-sensitive zones around schools, hospitals, and residential areas, and added a 63 decibel limit for new construction.[20]

PARIS (FRANCE)

NOISE EXPOSURE

Roughly 10.5% of residents are exposed to noise levels above 68 decibels, which is way above the recommended levels.[21] Noise pollution mostly comes from road traffic, as well as construction and public transport.

POLICIES TO ADDRESS NOISE

Paris has reduced speed limits to 30 km/h across most of the city, and expanded cycling infrastructure. The city also pedestrianised areas to progressively remove traffic from central areas.[22]

BEST PRACTICE FROM EUROPEAN CITIES

BARCELONA (SPAIN)

NOISE EXPOSURE

The main source of noise in Barcelona is road traffic, which is responsible for more than 85% of citizens' noise exposure. Rail and industrial noise each account for less than two percent of exposure.[23]

POLICIES TO ADDRESS NOISE

Barcelona designated quiet zones — known as *àrees de protecció acústica especial* — in particularly noise-sensitive areasand implemented traffic restrictions in parts of the city centre.[24] The superblocks also restrict traffic in certain residential blocks.[25]

BRUSSELS (BELGIUM)

NOISE EXPOSURE

As in many European cities, the main source of noise pollution in Brussels comes from road traffic. Thirty percent of residents are exposed to noise levels above 55 decibels.[26]

POLICIES TO ADDRESS NOISE

The *Good Move* mobility plan aims to significantly reduce car traffic in the city. The city introduced a low-emission zone (LEZ) and has been gradually expanding its cycling infrastructure and pedestrianised areas, which have had positive co-benefits for noise reduction.[27]

WARSAW (POLAND)

NOISE EXPOSURE

More than half (55%) of Warsaw residents are exposed to noise levels above 55 decibels.[28] Noise mostly comes from road traffic, with several national roads of international importance, public transport, and air traffic.

POLICIES TO ADDRESS NOISE

Warsaw has an Environmental Protection Plan against noise, which includes speed limits, the construction of acoustic barriers, as well as the planting of greenery.[29] It also started implementing a clean transport zone as of 2024, which contributes to decreasing noise levels.[30]

POLICY RECOMMENDATIONS

CITY-LEVEL DECISION-MAKERS

- Prioritise active mobility and public transportation to reduce car traffic and thus noise
- Set or update noise limit regulations based on the WHO 2018 guidelines and involve neighbouring authorities to develop these regulations and strategies
- Create dedicated funding streams for noise insulation in social and lower-income housing and for city investments towards green buffers,e.g. tree lines, green schoolyards, parks, and other acoustic barriers
- Modernize tracks as well as traffic surfaces to use low-noise road surfaces

EU-LEVEL DECISION-MAKERS

- Update and strengthen the Environmental Noise Directive (END) to introduce binding, health-based exposure limits. The standards should follow the 2018 WHO guidelines
- Strengthen the enforcement and implementation of the Directive with clearer timelines, targets for noise action plans and greater reporting requirements, with clear methodology
- Increase funding of noise reduction measures, especially in the next EU Multiannual Financial Framework, as many cities lack the financial resources to implement effective noise reduction measures
- Facilitate knowledge sharing and best practice among cities on noise reduction measures and health, for example, on the EU Cities Portal

REFERENCES

1 European Environment Agency (2026) Noise. https://www.eea.europa.eu/en/topics/in-depth/noise

2 European Environment Agency, The Noise Observation & Information Service for Europe, https://noise.eea.europa.eu/

3 European Environment Agency (2025), Exposure of Europe's population to environmental noise, https://www.eea.europa.eu/en/analysis/indicators/exposure-of-europe-population-to-noise

4 European Environment Agency (2025) Managing exposure to noise in Europe, https://www.eea.europa.eu/en/analysis/publications/managing-exposure-to-noise-in-europe

5 European Commission (2022) Study on airport noise reduction, https://op.europa.eu/en/publication-detail/-/publication/67225cf1-2d8c-11ed-975d-01aa75ed71a1/language-en

6 European Environment Agency (2025) Environmental noise in Europe, https://www.eea.europa.eu/en/analysis/publications/environmental-noise-in-europe-2025

7 WHO Regional Office for Europe (2018) Environmental noise guidelines for the European Region, https://www.who.int/europe/publications/i/item/9789289053563

8 European Environment Agency (2022) Environmental noise in Europe, https://www.eea.europa.eu/publications/environmental-noise-in-europe

9 Münzel et al. (2018) Cardiovascular effects of environmental noise exposure, European Heart Journal, 35(13), 829–836. https://doi.org/10.1093/eurheartj/ehu030

10 WHO Regional Office for Europe (2011) Burden of disease from environmental noise - Quantification of healthy life years lost in Europe https://www.who.int/publications/i/item/burden-of-disease-from-environmental-noise-quantification-of-healthy-life-years-lost-in-europe

11 Pyko et al. (2017) Long-term exposure to transportation noise in relation to development of obesity — a cohort study, Environmental Health Perspectives, 2017, 125(11). https://doi.org/10.1289/EHP1910

12 European Environment Agency (2018) Unequal exposure and unequal impacts, https://www.eea.europa.eu/en/analysis/publications/unequal-exposure-and-unequal-impacts

13 European Commission, Environmental Noise Directive, https://environment.ec.europa.eu/topics/noise/environmental-noise-directive_en

14 European Commission (2023) Report on the implementation of the Environmental Noise Directive, https://environment.ec.europa.eu/publications/noise-directive-implementation-report_en

15 European Environment Agency (2022) Environmental noise in Europe — 2022. EEA Report. https://www.eea.europa.eu/publications/environmental-noise-in-europe

16 EEA-JRC (2025) Zero pollution monitoring and outlook, https://www.eea.europa.eu/en/analysis/publications/zero-pollution-monitoring-and-outlook-report

17 European Environment Agency, The Noise Observation & Information Service for Europe, https://noise.eea.europa.eu/

18 European Environment Agency (2023) Are you noticing the harmful noise around you? https://www.eea.europa.eu/en/newsroom/editorial/are-you-noticing-the-harmful-noise

19 Copenhagen Noise Action Plan (submitted to the EEA under the END) https://noise.eea.europa.eu/action-plans

20 Province of Utrecht (2026) Sound, https://www.provincie-utrecht.nl/onderwerpen/gezonde-en-veilige-leefomgeving/geluid

21 City of Paris (2025) Amélioration de l'environnement sonore https://www.paris.fr/pages/bruit-et-nuisances-sonores-162

22 Ibid

23 Ajuntament de Barcelona, Noise pollution, https://coneixement-eu.bcn.cat/widget/atles-resiliencia/en_index_contaminacio_acustica.html

24 Ajuntament de Barcelona, Noise control service, https://ajuntament.barcelona.cat/ecologiaurbana/en/services/the-city-works/maintenance-of-public-areas/energy-management/noise-control-service

25 Ajuntament de Barcelona, Superilles, https://ajuntament.barcelona.cat/superilles/en

26 Bruxelles Environnement, cartographie du bruit routier, https://environnement.brussels/citoyen/documentation-et-outils/cartes/cartographie-du-bruit-routier

27 Observatoire Good Move, Où en est-on dans la mise en oeuvre du plan Good Move?, https://data-mobility.irisnet.be/home/fr/mise-en-oeuvre/

28 Warsaw infrastructure, Quality of the acoustic environment, https://infrastruktura.um.warszawa.pl/archiwum/sites/infrastruktura.um.warszawa.pl/files/indicator_6_warsaw.pdf

29 ibid.

30 City of Warsaw (2024) The clean transport zone in Warsaw from July, https://en.um.warszawa.pl/-/the-clean-transport-zone-in-warsaw-from-july

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