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**- PRESS RELEASE -**

## **Road Traffic in European Cities Exposes 60 Million People to Noise Levels Harmful to Health**

*A study based on data from 749 cities estimates that compliance with WHO recommendations could prevent more than 3,600 deaths annually from ischaemic heart disease alone*

**Barcelona, 24 March 2022.** A study by the Barcelona Institute for Global Health (ISGlobal), a centre supported by the "la Caixa" Foundation, assessed the levels of noise generated by road traffic and examined its impact on health in **749 European cities**. The findings, published in *Environment International*, show that nearly **60 million adults** are subjected to unhealthy levels of vehicle-generated noise. Compliance with the World Health Organisation (WHO) noise-level guidelines could **prevent 3,600 deaths annually** from ischaemic heart disease alone.

Road traffic is the main source of environmental noise. Previous research has linked environmental noise to a range of adverse health effects: **sleep disturbance, annoyance, cardiovascular and metabolic disease, adverse birth outcomes, cognitive impairment, poor mental health and well-being, and premature mortality**. Long-term exposure to road traffic noise can cause a sustained stress reaction, which results in the release of stress hormones and increases in heart rate, blood pressure and vasoconstriction, eventually leading to chronic diseases such as cardiovascular disease, depression and anxiety disorders.

For this study, data on European cities were retrieved from the **Urban Audit 2018** dataset. Road traffic noise exposure was estimated using **noise maps** produced by countries and cities under the current European legislative framework (Environmental Noise Directive) or available from local sources (e.g. city governments and research institutions). For cases in which city-level data were not available, country-specific **predictive models** were developed and applied to estimate exposure to road traffic noise. Data on different causes of mortality for the year 2015 were retrieved from the **Eurostat database**.

The results showed that more than **48% of the 123 million adults** (aged 20 years or older) included in the study were exposed to noise levels exceeding the WHO-recommended threshold. Specifically, the WHO recommendation states that the average noise level recorded over a 24-hour period **should not exceed 53 decibels** (53 dB Lden). The percentage of the population exposed to higher-than-recommended noise levels in Europe's capital cities ranges from 29.8% in Berlin to 86.5% in Vienna, including 43.8% in Madrid and 60.5% in Rome.

### **Preventable Deaths and Annoyance**

Building on previous research that established associations between noise and mortality caused by ischaemic heart disease, the researchers estimated that compliance with WHO guidelines would prevent more than 3,600 deaths each year from ischaemic heart disease alone.

The study also found that **more than 11 million adults were highly annoyed** by road traffic noise. Annoyance was defined as the repeated disturbance of everyday activities, such as communicating, reading, working and sleeping. In this sense, annoyance goes beyond mere inconvenience, as it can increase stress and eventually give rise to various health problems.

"Our results provide, for the first time, a comprehensive picture of European cities and a clearer understanding of why transport-generated noise is the second major environmental cause of

adverse health outcomes in western Europe, after airborne particulate matter,” explained ISGlobal researcher **Sasha Khomenko**, lead author of the study. “Even so, we are convinced that the true health impact of traffic noise is much greater, as the lack of city-level data limits the health effects we can assess, thus leading to an underestimation of the impact. Moreover, the available data have only allowed us to analyse the population exposed to more than 55 dB Lden, whereas the WHO-recommended threshold is 53 dB Lden, and we suspect that adverse effects could occur even with exposure to lower noise levels.”

The team encountered methodological difficulties due to the heterogeneity and quality of the available data. The quality of each noise map was assessed, with most maps falling into the low or moderate quality categories; **less than 17% of the maps were considered to be of good quality.**

“The European directive on environmental noise made strategic noise mapping mandatory, but it did not set out a specific methodology or guidelines, so the results have been mixed,” commented **Mark Nieuwenhuijsen**, head of the Air Pollution and Urban Environment programme at ISGlobal and senior author of the study. “The EU member states have had a common methodology since January 2019, so we can expect to see much more comprehensive and accurate health impact assessments of traffic noise in the coming years.”

### Consult Data for All 749 Cities

This study forms part of the European Urban Burden of Disease Project, which so far has produced rankings of mortality associated with air pollution and green space, respectively, in European cities. However, due to differences in methodologies and sources of traffic noise data, the results obtained for the various cities analysed are not considered to be comparable. As a result, a road-noise ranking was not produced, although **all data have been posted on the project website**, where values for all 749 cities can be consulted.

For more information, visit: [www.isglobalranking.org](http://www.isglobalranking.org)

### Access for journalists

The data for the 749 cities analysed will not be made public until 10 March.

In the meantime, an alternative access for journalists has been made available at:

<https://isglobalranking.gestortectic.com/ranking/#noise>

### Data from some European capitals\*

City	% of population exposed to traffic noise levels above WHO-recommended threshold
Amsterdam	47.3%
Berlin	29.8%
Brussels	30.3%
Copenhagen	46.5%
Lisbon	40.6%
Madrid	43.8%
Oslo	62.5%
Paris	66.9%

\* Due to the heterogeneity of the available data on noise from road traffic and the lack of quality of the noise maps for many European cities, the authors consider that the results from different cities are not comparable with each other.

Rome	60.5%
Vienna	86.5%

**Reference**

Sasha Khomenko, Marta Cirach, Jose Barrera-Gómez, Evelise Pereira-Barboza, Tamara Iungman, Natalie Mueller, Maria Foraster, Cathryn Tonne, Meelan Thondoo, Calvin Jephcote, John Gulliver, James Woodcock, Mark Nieuwenhuijsen. Impact of road traffic noise on annoyance and preventable mortality in European cities: a health impact assessment. *Environment International*, Volume 162, 2022, 107160, ISSN 0160-4120, <https://doi.org/10.1016/j.envint.2022.107160>

**About ISGlobal**

The Barcelona Institute of Global Health (ISGlobal) is the result of an innovative alliance between the "la Caixa" Foundation and academic and government institutions. The Institute was set up to contribute to the work undertaken by the international community to address global health challenges. ISGlobal has consolidated a hub of excellence in research and medical care that has its roots in work first started in the world of health care by the Hospital Clínic and the Mar Health Park and in the academic sphere by the University of Barcelona and Pompeu Fabra University. ISGlobal's work model is based on generating knowledge through its scientific programmes and research groups and translating this knowledge into practice and policy through its Education, Policy and Global Development departments. ISGlobal is accredited as a Severo Ochoa Centre of Excellence and is a member of CERCA, the Catalan Government's network of research centres.

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