WHO Environmental noise guidelines for the European Region

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ABSTRACT

WHO published the *Guidelines for Community Noise* in 1999 and the *Night Noise Guidelines for Europe* in 2009. Significant new research in the area of environmental noise and health has taken place since then. As well, new noise sources of concern for public health, such as personal electronic devices and wind turbines, were not addressed in previous guidelines. For these reasons, WHO is currently engaged in the revision of all pertinent literature and will provide recommendations for the protection of public health as part of new *WHO Environmental Noise Guidelines for the European Region*. The guidelines will focus on the WHO European Region and provide guidance to its Member States that is compatible with the noise indicators used in the European Union (EU) Directive on Environmental Noise.

The process for updating the guidelines is complex, involving the work of top scientists from across the world under the coordination of WHO. The following health outcomes are deemed critical or very important and will be included: effects on sleep,

annoyance, cognitive impairment, cardiovascular diseases, hearing impairment, tinnitus, adverse birth outcomes, and mental health and wellbeing.

The guidelines will consider the evidence on health effects of environmental noise related to the various sources, for each outcome of relevance:, aircraft, rail, road and wind turbines. As well, specific settings such as residences, hospitals, learning establishments and public venues will be taken into account.

Additionally, the guidelines will review the potential health benefits from noise mitigation and interventions to decrease noise levels.

The Guidelines will provide up-to-date information on the health risks from environmental noise and evidence-based recommendations in order to support WHO Member States in their efforts to prevent and control exposure to excessive community noise.

INTRODUCTION

World Health Organization (WHO) defines health as a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity. Environmental noise has negative impacts on human health and well-being and is a growing concern among both the general public and policy-makers in Europe.

In 2011, the WHO Regional Office for Europe and the Joint Research Centre (JRC) of the European Commission published the report “Burden of Disease from Environmental Noise”, which quantified the healthy years of life lost in Europe due to environmental noise (WHO Regional Office for Europe, 2011). The burden of disease combines in one measure the time lived with disability and the time lost due to premature mortality in the general population. Sufficient information is available to quantify the burden of disease from environmental noise for effects such as cardiovascular diseases, cognitive impairment of children, sleep disturbance, tinnitus, and annoyance. These results indicate that at least one million healthy years of life are lost every year from road traffic-related noise in the western part of Europe. Sleep disturbance and annoyance, mostly related to road traffic noise, comprise the main burden of environmental health. This places the burden of disease from environmental noise as the second major environmental risk after air pollution (WHO Regional Office for Europe, 2011).

According to the European Environmental Agency, 40 % of the urban European Union population is impacted by road traffic noise levels above 55 dB(A) Lden while more than 30 % of the population is exposed to noise levels above 55 dB(A) Lnight during the night (European Environment Agency, 2013). Both values exceed recommendations set by the “WHO Night Noise Guidelines for Europe” (WHO Regional Office for Europe, 2009). However, there is a lack of noise exposure data in the central and eastern parts of the WHO European region, making a complete assessment of the burden of disease challenging.

CONTEXT

The “WHO Guidelines for Community Noise” in 1999 (WHO, 1999) included scientific evidence on noise related health outcomes and recommendations for protecting human health from environmental noise exposure originating from various sources and community settings. The “WHO Night Noise Guidelines for Europe” in 2009 (WHO Regional Office for Europe, 2009) are considered as an extension of the former guidelines.

New evidence on the health effects of environmental noise has accumulated in recent years, requiring an update of existing WHO noise guidelines. The need for health-based guidelines also originates in part from the European Union (EU) Directive 2002/49/EC relating to the assessment and management of environmental noise (commonly known as the Environmental Noise Directive), which requires EU Member States to establish action plans to control and reduce the harmful effects of noise exposure (European Commission, 2002).

In the Parma Declaration Commitment to Act, developed at the Ministerial Conference on Environment and Health in Parma, Italy 2010, the Member States called upon all stakeholders to reduce children's exposure to noise, including that from personal electronic devices, recreation and traffic, especially in residential areas, at child care centres, kindergartens, schools and public recreational settings. As a consequence the Member States urged WHO to produce appropriate noise guidelines (WHO Regional Office for Europe, 2010). Therefore, WHO Regional Office for Europe is developing a new set of guidelines, the "WHO Environmental Noise Guidelines for the European Region" (the Guidelines) to provide suitable scientific evidence and recommendations for policy-makers of the Member States in the European Region.

GUIDELINE DEVELOPMENT PROCESS

WHO guidelines represent the most widely accepted set of public health recommendations and are intended to assist policy-makers, health-care providers, and other relevant stakeholders to make informed decisions for the protection of public health. WHO has adopted internationally recognized standards and methods for guideline development to ensure that guidelines are free from biases, meet public health needs and are consistent with the following principles: (1) recommendations are based on a comprehensive and objective assessment of the available evidence, and (2) the process used to develop the recommendations is clear. Therefore, the reader will be able to see how a recommendation has been developed, by whom, and on what basis. The entire process is conducted according to the "WHO Handbook for Guidelines" (WHO, 2012).

WHO initiated the process of developing the Guidelines in early 2013. The main objectives of the updated Guidelines are to systematically review the scientific literature on the health effects of environmental noise and to provide evidence-based recommendations for protecting public health from the health risks of environmental noise.

In order for experts to be involved in the Guideline process, they are required to declare all potential personal, financial, and academic interests by completing the WHO Declaration of interests form.

According to established procedures, WHO set up a Guideline Development Group (GDG) composed of leading experts and end-users responsible for the process of developing the evidence-based recommendations. A first meeting of the GDG experts took place on 14-15 November 2013, in Bonn, Germany. The GDG experts defined the scope of the Guidelines and decided on the key questions to be addressed by the Guidelines; proposed a Table of Contents; authors for background papers, systematic reviews of the evidence and Guideline chapters; and agreed on a plan and timeline for completing the work.

Health outcomes deemed as critical or important by the GDG experts will be included in the systematic literature review using a protocol developed for this purpose. In order to assess the quality of the evidence for each health outcome required for appropriate recommendations, the authors of the systematic review will use the GRADE methodology which will rank the quality of evidence as high, moderate, low, or very low (GRADE working group, 2013).

SCOPE OF THE GUIDELINES

Environmental noise will be defined in the Guidelines as “noise emitted from all sources except sources of occupational noise exposure in workplaces”.

Significant research has been undertaken in the area of environmental noise and health since the previous WHO environmental noise guidelines were published in 1999 and 2009. Therefore, in order to include these new findings, the Guidelines will review all pertinent literature on health evidence, revisit the previous guidelines and issue revised recommendations, as relevant. The health outcomes for which the health evidence will be systematically reviewed are the following: effects on sleep, annoyance, cognitive impairment, cardiovascular diseases, hearing impairment, tinnitus, adverse birth outcomes, and mental health and wellbeing.

As well, the Guidelines will review the evidence on health benefits from noise mitigation and interventions to decrease noise levels.

Combined exposure to various noise sources as well as non-acoustical factors will be included where relevant. In particular, the Guidelines will address combined exposure to environmental noise and: occupational noise; vibration from railway traffic (relevant especially for annoyance and sleep disturbance); air pollution (relevant especially for cardiovascular diseases); and visual aspects of wind turbines (relevant especially for annoyance).

The Guidelines will separately assess the environmental noise coming from various sources, for each relevant health outcome: aircraft, rail, road, and wind turbines. The document will also consider specific settings such as residences, hospitals, educational settings and public venues.

CONCLUSION

Environmental noise is increasingly recognized as a significant public health issue. New scientific evidence in the field of environmental noise and public health has prompted WHO to revisit the recommendations issued in the previous guidelines and develop the “WHO Environmental Noise Guidelines for the European Region”. The Guidelines will provide up-to-date information on the health risks from environmental noise and evidence-based recommendations in order to support WHO Member States in their efforts to prevent and control exposure to excessive noise. The Guidelines are expected to be finalized mid-2015.

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DISCLAIMER

Marie-Eve Héroux is a staff member of the WHO Regional Office for Europe. The authors alone are responsible for the views expressed in this publication and they do not necessarily represent the decisions or the stated policy of the World Health

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