

ENVIRONMENTAL NOISE GUIDELINES

for the European Region

Dr Dorota Jarosinska, WHO European Centre for Environment and Health



Fachtagung zur EU-Umgebungslärmkartierung Nationale Berechnungsmethoden



Overview

Why the noise guidelines

Aim and scope

Guideline development process

Recommendations

After the launch of the guidelines



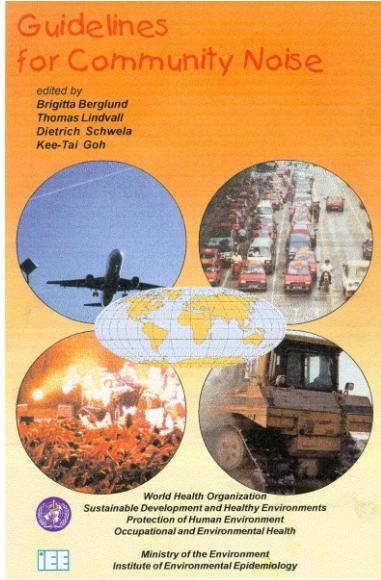
Burden of disease

- At least **100 million people** in the EU are affected by road traffic noise above the assessment threshold specified in the END (55dB L_{den})
- Over **83 million** Europeans are exposed to harmful levels of noise from night-time road traffic (above 50 dB L_{night})
- At least **1.6 million** healthy years of life are lost due to road traffic noise in Western Europe

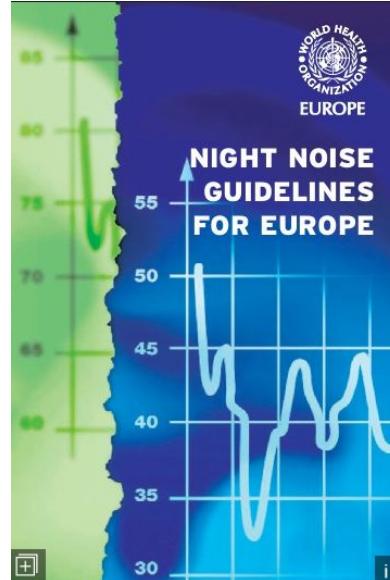
Source: WHO/JRC, 2011; EEA, 2017



WHO noise guidelines



1999



2009



ENVIRONMENTAL
NOISE
GUIDELINES
for the European Region



2018



Aim of the guidelines

Provide **evidence-based recommendations**

- Exposure - response relationships
- Effectiveness of interventions

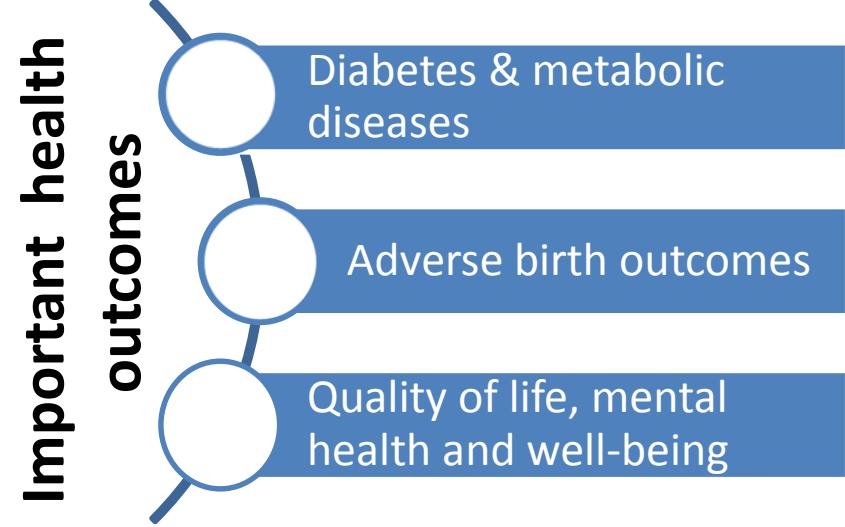
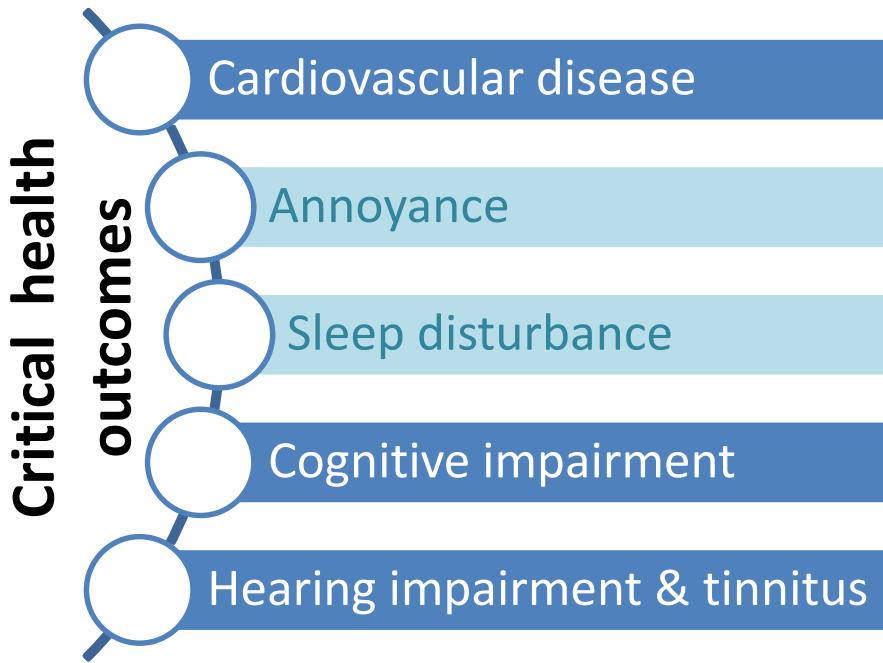
Based on:

Systematically **reviewed scientific evidence**

- Health effects of environmental noise
- Effectiveness of interventions to reduce exposure and improve health



Health outcomes considered



Noise sources considered

Road traffic



Railway



Aircraft



Wind turbines



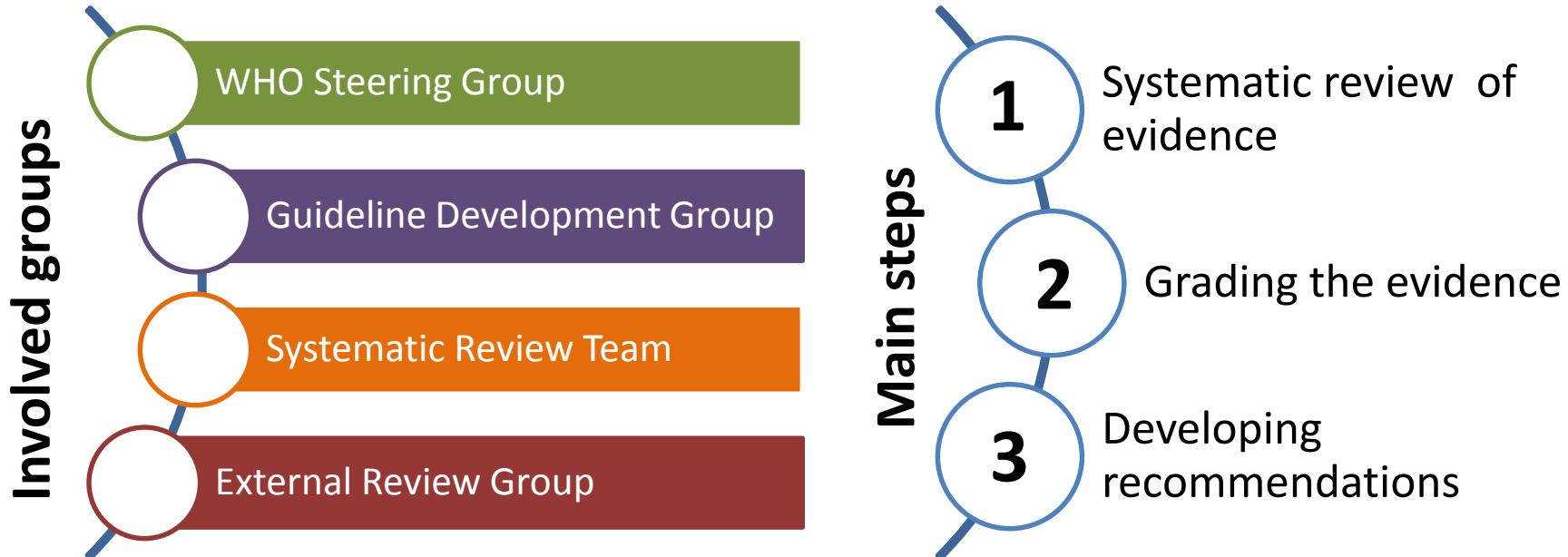
Leisure



Development of the guidelines



Guideline development process



Systematic reviews of evidence

- Cardiovascular disease and metabolic effects
- Annoyance
- Sleep disturbance
- Cognitive impairment
- Hearing impairment and tinnitus
- Adverse birth outcomes
- Quality of life, mental health and wellbeing
- Interventions to reduce noise and improve health



Systematic reviews of evidence



International Journal of
Environmental Research
and Public Health

Review

WHO Environmental Noise Guidelines for the European Region: A Systematic Review on Environmental Noise and Permanent Hearing Loss and Tinnitus

Mariola Śliwińska-Kowalska ^{1,} and Kamil Zaborowski ²



International Journal of
Environmental Research
and Public Health

Review

WHO Environmental Noise Guidelines for the European Region: A Systematic Review of Transport Noise Interventions and Their Impacts on Health

Ian Lex Brown ^{1,*}  and Irene van Kamp ²



Review

WHO Environmental Noise Guidelines for the European Region: A Systematic Review on Environmental Noise and Adverse Birth Outcomes

Mark J. Nieuwenhuijsen ^{1,2,3,}, Gordana Ristovska ^{4,5} and Payam Dadvand ^{1,2,3}



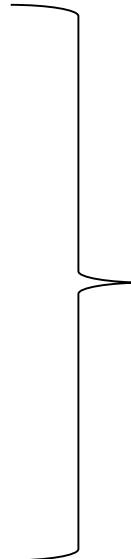
https://www.mdpi.com/journal/ijerph/special_issues/WHO_reviews



Grading the evidence

Assessment of the overall quality of evidence by Systematic Review Team:

- Study limitations
- Inconsistency of results
- Indirectness of evidence
- Imprecision
- Publication bias
- Magnitude of effect
- Plausible confounding
- Dose-response gradient

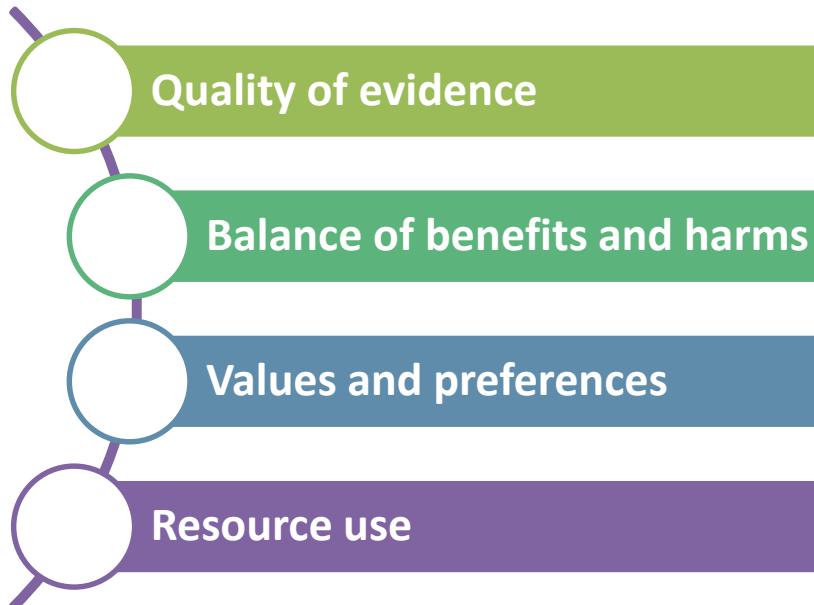


OVERALL QUALITY OF EVIDENCE

- High quality
- Moderate quality
- Low quality
- Very low quality

Developing recommendations

Factors to be considered



Types of recommendations



Developing recommendations

Definition: Noise exposure levels above which the GDG is confident there is an increased risk of adverse health effects

Priority health outcome measure (associated DW)	Relevant risk increase considered for setting of guideline level
Incidence of IHD (DW: 0.405)	5% RR increase
Incidence of hypertension (DW: 0.117)	10% RR increase
%HA (DW: 0.02)	10% absolute risk
%HSD (DW: 0.07)	3% absolute risk
Permanent hearing impairment (DW: 0.0150)	No risk increase due to environmental noise
Reading and oral comprehension (DW: 0.006)	One-month delay in terms of reading age

Developing recommendations

Definition: Noise exposure levels above which the GDG is confident there is an increased risk of adverse health effects

Priority health outcome measure (associated DW)	Relevant risk increase considered for setting of guideline level
Incidence of IHD (DW: 0.405)	5% RR increase
Incidence of hypertension (DW: 0.117)	10% RR increase 10% absolute risk
%HA (DW: 0.02)	
%HSD (DW: 0.07)	3% absolute risk
Permanent hearing impairment (DW: 0.0150)	No risk increase due to environmental noise
Reading and oral comprehension (DW: 0.006)	One-month delay in terms of reading age

Recommendations





Road traffic noise

For average noise exposure, the GDG **strongly** recommends reducing noise levels produced by road traffic below $53 \text{ dB } L_{\text{den}}$, as road traffic noise above this level is associated with adverse health effects.

For night noise exposure, the GDG **strongly** recommends reducing noise levels produced by road traffic during night time below $45 \text{ dB } L_{\text{night}}$, as road traffic noise above this level is associated with adverse effects on sleep.

To reduce health effects, the GDG **strongly** recommends that policy-makers implement suitable measures to reduce noise exposure from road traffic in the population exposed to levels above the guideline values for average and night noise exposure. For specific interventions, the GDG recommends reducing noise both at the source and on the route between the source and the affected population by changes in infrastructure.



Railway noise

For average noise exposure, the GDG **strongly** recommends reducing noise levels produced by railway traffic below $54 \text{ dB } L_{\text{den}}$, as railway noise above this level is associated with adverse health effects.

For night noise exposure, the GDG **strongly** recommends reducing noise levels produced by railway traffic during night time below $44 \text{ dB } L_{\text{night}}$, as railway noise above this level is associated with adverse effects on sleep.

To reduce health effects, the GDG **strongly** recommends that policy-makers implement suitable measures to reduce noise exposure from railways in the population exposed to levels above the guideline values for average and night noise exposure. There is, however, insufficient evidence to recommend one type of intervention over another.



Aircraft noise

For average noise exposure, the GDG **strongly** recommends reducing noise levels produced by aircraft below $45 \text{ dB } L_{\text{den}}$, as aircraft noise above this level is associated with adverse health effects.

For night noise exposure, the GDG **strongly** recommends reducing noise levels produced by aircraft during night time below $40 \text{ dB } L_{\text{night}}$, as aircraft noise above this level is associated with adverse effects on sleep.

To reduce health effects, the GDG strongly recommends that policy-makers implement suitable measures to reduce noise exposure from aircraft in the population exposed to levels above the guideline values for average and night noise exposure. For specific interventions the GDG recommends implementing suitable changes in infrastructure.



Wind turbine noise

For average noise exposure, the GDG **conditionally** recommends reducing noise levels produced by wind turbines below **45 dB L_{den}** , as wind turbine noise above this level is associated with adverse health effects.

To reduce health effects, the GDG **conditionally** recommends that policy-makers implement suitable measures to reduce noise exposure from wind turbines in the population exposed to levels above the guideline values for average noise exposure. No evidence is available, however, to facilitate the recommendation of one particular type of intervention over another.



Leisure noise

Rationale

- Low quality evidence for leisure noise and hearing loss
- No exposure response functions could be established
- Approach based on CNG and workplace prevention
- A detailed table for converting hourly and weekly exposure into yearly averages is provided
- Continue with CNG recommendations for single events for both children and adults



Leisure noise

For average noise exposure, the GDG **conditionally** recommends reducing the yearly average from all leisure noise sources combined to $70 \text{ dB } L_{\text{Aeq,24h}}$, as leisure noise above this level is associated with adverse health effects. The equal energy principle¹⁹ can be used to derive exposure limits for other time averages, which might be more practical in regulatory processes.

For single-event and impulse noise exposures, the GDG **conditionally** recommends following existing guidelines and legal regulations to limit the risk of increases in hearing impairment from leisure noise in both children and adults.

Following a precautionary approach, to reduce possible health effects, the GDG **strongly** recommends that policy-makers take action to prevent exposure above the guideline values for average noise and single-event and impulse noise exposures. This is particularly relevant as a large number of people may be exposed to and at risk of hearing impairment through the use of personal listening devices (PLDs). There is insufficient evidence, however, to recommend one type of intervention over another.

Launching the guidelines



The launch

- **Virtual press conference** held on 9 October 2018
- Technical **talking points** developed together with the GDG members to ensure consistent messaging
- **Executive summaries** available in four official languages of WHO Regional Office for Europe
- Official launch event held in Basel, Switzerland on 10 October, 2018



Media coverage - international

The West Australian: Wind turbines a potential Health Organisation

INDEPENDENT: Noise pollution from loud headphones is damaging health across Europe, WHO warns

THE WALL STREET JOURNAL: Støjkortlægger: WHO sætter Danmarks grænse for farlig støj

KOMSOMOLSKAYA PRAVDA: ВОЗ: Шум мотоциклов и моточампов провоцируют сердечные заболевания

Le bruit est mauvais pour la santé, à court et long terme: voici les décibels à ne pas dépasser

at least 56 news stories in 8 languages

La OMS recomienda límites a exposición al ruido por su impacto en la salud

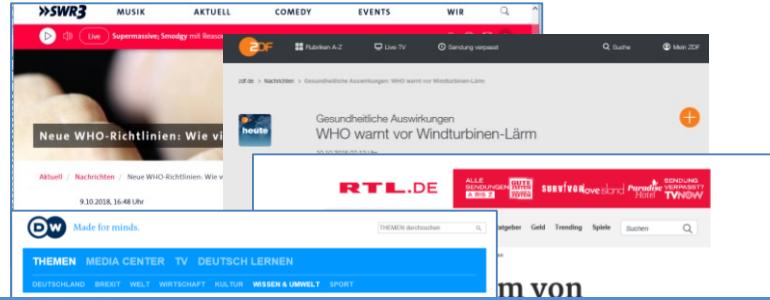
Noise: The other pollution hurting our health

OMS recomienda exposición al ruido

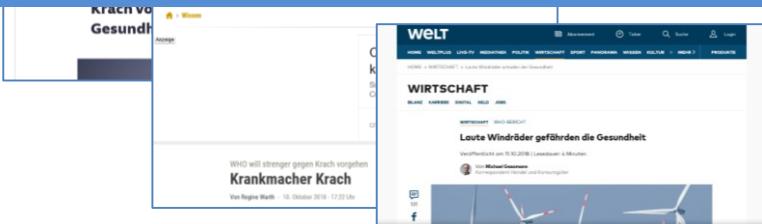
DutchNews.nl: Too much outside noise an issue for over one third of Dutch homes



Media coverage - Germany



at least 23 news stories



After the launch





COMITOLOGY REGISTER

European Commission > Comitology Register > Document search

[Home page](#)

[Commission
implementing powers](#)

[Document search](#)

[Old comitology register](#)

[Search for Committee](#)

[How to search for
dossiers and documents](#)

[FAQ](#)

[Annual Reports](#)

[Datasets](#)



Details

[Back to List](#)

D063276/01 (Draft implementing measure/act) in dossier [CMTD\(2019\)0906](#)

DG Internal Market, Industry, Entrepreneurship and SMEs

Title: COMMISSION DIRECTIVE (EU) .../... of XXX amending Annex III to Directive 2002/49/EC as regards the establishment of assessment methods for harmful effects of environmental noise

Date: 19 Jul 2019

Committee: Committee for the approximation of the laws of the Member States relating to noise emission in the environment by equipment for use outdoors

Basic legal act: Directive 2002/49/EC of the European Parliament and of the Council of 25 June 2002 relating to the assessment and management of environmental noise - Declaration by the Commission in the Conciliation Committee on the Directive relating to the assessment and management of environmental noise <#>

Codecision: Yes

Procedure: Regulatory with Scrutiny (art. 5a par. 1-5)

Opinion: Favourable

Voting sheet: [V063341/01](#)

Deadline: 06-Nov-2019

Status: Sent to Committee

05 Jul 2019

Language: [BG](#) [ES](#) [CS](#) [DA](#) [DE](#) [ET](#) [EL](#) [EN](#) [FR](#) [IT](#) [LV](#) [LT](#) [HU](#) [MT](#)
[NL](#) [PL](#) [PT](#) [RO](#) [SK](#) [SL](#) [FI](#) [SV](#) [HR](#)

[COMMISSION DIRECTIVE \(EU\) .../... of XXX amending Annex III to Directive 2002/49/EC as regards the establishment of assessment methods for harmful effects of environmental noise \(67 Kilobytes\)](#)

[ANNEX TO THE COMMISSION DIRECTIVE \(EU\) .../... of amending Annex III to Directive 2002/49/EC as regards the establishment of assessment methods for harmful effects of environmental noise \(114 Kilobytes\)](#)

The EC context

- Uptake of the guidelines in the work on amending Annex III to END

The next steps

- Support Member States in the implementation process
- Facilitate coordination between state and non-state actors to support application of the guidelines and relevant public health action
- Frame noise and health in a broader Environment and Health agenda
 - the Ostrava Declaration
 - Sustainable Development Goals



Acknowledgements

Members of:
the Guideline development Group
the Systematic Review Team
the External Review Group
the WHO Steering Group



Financial and in kind support from Switzerland and Germany

Thank you for your attention

<http://www.euro.who.int/en/health-topics/environment-and-health/noise>

