RESULTS FROM THE SEARCH FOR AVAILABLE SYSTEMATIC REVIEWS AND META-ANALYSES ON ENVIRONMENTAL NOISE

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Abstract

In the context of the development of the WHO environmental noise guidelines for the European Region, this paper includes a description of the methodology used to search, select and assess the quality of available systematic reviews and meta-analyses on environmental noise. It presents the search strategies employed for the different databases and the list of included and excluded studies.

Keywords

INFORMATION STORAGE AND RETRIEVAL – METHODS
RESEARCH DESIGN
META-ANALYSIS AS TOPIC
REVIEW LITERATURE AS TOPIC
DATABASES, BIBLIOGRAPHIC
EVIDENCE-BASED MEDICINE - METHODS
NOISE

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1 The search for available systematic reviews

1.1 Introduction

Exposure to environmental noise has been demonstrated to have adverse effects on health. Systematic evidence reviews were commissioned as part of the development of new WHO environmental noise guidelines for the European Region to assess the exposure-response relationships between environmental noise and associated health outcomes and to analyse the effects on health outcomes of interventions to change exposure to environmental noise.

Seven systematic reviews were conducted on the following topics:

- effects on sleep;
- annoyance;
- cognitive impairment, mental health and well-being;
- cardiovascular disease, diabetes and metabolic diseases;
- hearing impairment and tinnitus;
- adverse birth outcomes;
- effectiveness of interventions to reduce exposure to or adverse outcomes from environmental noise.

As a first step, a single search was conducted to retrieve all relevant existing systematic reviews on environmental noise, health effects and interventions. The search methodology is detailed in the protocols for the systematic reviews (sections 2.1.5 and 2.2.5 of the document “Methodology for systematic evidence reviews for WHO environmental noise guidelines for the European Region” [hereafter “the methodology paper”]).

1.2 The search strategy

As a first step in the retrieval of evidence, in February 2014 a review of existing evidence on environmental noise published in or after 2000 in all languages was conducted in databases such as Medline/PubMed, Scopus (including Embase), PsycINFO, Web of Science, ScienceDirect and the database of the Organization for Applied Scientific Research of the Netherlands (TNO). The search for available systematic reviews is detailed in sections 2.1.5 and 2.2.5 of the methodology paper. See also chapter 2 lists the search strategies for the various databases.

1.3 Refining the search results

The database search yielded 507 studies. A further 55 articles were identified by the systematic review team through hand-searching and snowballing, yielding a total of 562 literature reviews and articles (see Table 1).

<table>
<thead>
<tr>
<th>Source</th>
<th>Number of search results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Databases</td>
<td>507</td>
</tr>
<tr>
<td>Medline/PubMed</td>
<td>275</td>
</tr>
<tr>
<td>Web of Science</td>
<td>114</td>
</tr>
<tr>
<td>Scopus (including Embase)</td>
<td>77</td>
</tr>
<tr>
<td>Science Direct</td>
<td>25</td>
</tr>
</tbody>
</table>
The experts reviewed all the results and finally narrowed the list down to 81 eligible studies, assessed to be relevant for the purposes of the guidelines (see chapter 3 for lists of the included and excluded studies). Fig. 1 provides a visual summary of the reviews retrieved during the search and the process used to assess the papers and identify the eligible studies.

### 1.4 Suitability of exposure and assessment of quality

The authors assessed and documented the suitability of exposure and quality of the systematic reviews retrieved to decide whether they were relevant for the purposes of the guidelines and how best to use them (section 2.1.6 of the methodology paper). For systematic studies to be included in the review, they were required to meet a high quality standard and to have been published recently (in the last two years, based on availability and rate of production of new information). Where the condition for quality was met but the review was older than two years, an updated search of systematic reviews was performed to include new papers. If more than one up-to-date high-quality systematic review was
available for a particular outcome but they provided inconsistent results, further exploration was done to develop a rationale justifying why a specific review was selected to inform the guidelines. Where appropriate, this is reported separately as part of the evidence reviews commissioned for the guidelines. Finally, where no high-quality systematic reviews were available for a particular health outcome and/or intervention, a new search was conducted.

In some cases, systematic reviews that were narrative in nature or did not entirely match the key questions addressed in the WHO guidelines were included in the final list of papers. They were retained if they addressed one facet of the guidelines, provided useful background information or informed the systematic reviews commissioned (even though they did not directly describe exposure-response relationships between environmental noise and health outcomes or interventions). This was particularly the case for the reviews of health effects, for which limited quantitative evidence was found.

In the second phase, a search for individual papers was conducted, and the search strategy was adapted according to the outcome of the first phase. As availability of systematic reviews and meta-analyses differed for the various health outcomes considered under the guidelines, as well as for the review of interventions, the search process varied for each evidence review. As noted in the methodology paper, expert judgement was used to decide how the results of this search affected the search strategy for individual studies, based on the quality of the systematic reviews, as well as the coherence with the main research question of the evidence reviews. Specific results from the evidence reviews are available as open access papers in the Special Issue “WHO Noise and Health Evidence Reviews” of the International Journal of Environmental Research and Public Health (IJEI) at http://www.mdpi.com/journal/ijerph/special_issues/WHO_reviews.
2 Search strategies for different databases

2.1 Medline/PubMed


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Results from the search for available systematic reviews and meta-analyses on environmental noise

2.2 Web of Science

114

#36 AND #35
Indexes=SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH, BKCI-S, BKCI-SSH Timespan=All years

133

#36 AND #35
Indexes=SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH, BKCI-S, BKCI-SSH Timespan=All years

103,746

#34 OR #33 OR #32 OR #31 OR #30
Indexes=SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH, BKCI-S, BKCI-SSH Timespan=All years

88,201

#29 OR #28 OR #27 OR #26 OR #25 OR #24 OR #23 OR #22 OR #21 OR #20 OR #19 OR #18 OR #17 OR #16 OR #15 OR #14 OR #13 OR #12 OR #11 OR #10 OR #9 OR #8 OR #7 OR #6 OR #5 OR #4 OR #3 OR #2 OR #1
Indexes=SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH, BKCI-S, BKCI-SSH Timespan=All years

31,376

(TS=(evidence* AND based*)) AND DOCUMENT TYPES: (Review)
Indexes=SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH, BKCI-S, BKCI-SSH Timespan=All years

6,252

((SO=cochrane*)) AND DOCUMENT TYPES: (Review)
Indexes=SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH, BKCI-S, BKCI-SSH Timespan=All years

1,512

(TS=(health* AND technol* assess*)) AND DOCUMENT TYPES: (Review)
Indexes=SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH, BKCI-S, BKCI-SSH Timespan=All years

40,997

(TS=(meta* AND analys*)) AND DOCUMENT TYPES: (Review)
Indexes=SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH, BKCI-S, BKCI-SSH Timespan=All years

47,764

(TS=(systemat*)) AND DOCUMENT TYPES: (Review)
Indexes=SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH, BKCI-S, BKCI-SSH Timespan=All years

10,909

TS=(social* AND noise*) OR TS=(noise* AND load*)
Indexes=SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH, BKCI-S, BKCI-SSH Timespan=All years

103

TS=(motorcycle* AND noise*)
Indexes=SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH, BKCI-S, BKCI-SSH Timespan=All years

449

TS=(motor* AND vehicle* AND noise*)
Indexes=SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH, BKCI-S, BKCI-SSH Timespan=All years

408

TS=(truck* AND noise*)
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Indexes=SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH, BKCI-S, BKCI-SSH Timespan=All years

12,362
TS=(noise* AND expos*)
Indexes=SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH, BKCI-S, BKCI-SSH Timespan=All years
472
TS=(noise* AND nuisance*)
Indexes=SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH, BKCI-S, BKCI-SSH Timespan=All years
509
TS=(combined* AND noise* AND exposure*)
Indexes=SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH, BKCI-S, BKCI-SSH Timespan=All years
1,027
TS=(hospital* AND noise*)
Indexes=SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH, BKCI-S, BKCI-SSH Timespan=All years
239
TS=(noise* AND toy*)
Indexes=SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH, BKCI-S, BKCI-SSH Timespan=All years
59
TS=(noise* AND mp3* AND player*)
Indexes=SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH, BKCI-S, BKCI-SSH Timespan=All years
32
TS=(noise* AND personal* AND electronic* AND device*)
Indexes=SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH, BKCI-S, BKCI-SSH Timespan=All years
5,231
TS=(high* AND volume* AND noise*)
Indexes=SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH, BKCI-S, BKCI-SSH Timespan=All years
178
TS=(high* AND volume* AND music*)
Indexes=SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH, BKCI-S, BKCI-SSH Timespan=All years
860
TS=(school* AND noise*)
Indexes=SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH, BKCI-S, BKCI-SSH Timespan=All years
348
TS=(classroom* AND noise*)
Indexes=SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH, BKCI-S, BKCI-SSH Timespan=All years
34,228
TS=(low* AND frequency* AND noise*)
Indexes=SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH, BKCI-S, BKCI-SSH Timespan=All years
306
TS=(household* AND noise*)
Indexes=SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH, BKCI-S, BKCI-SSH Timespan=All years
2,198
TS=(neighborhood* AND noise*) OR TS=(neighbourhood* AND noise*)
Results from the search for available systematic reviews and meta-analyses on environmental noise

2.3 PsycINFO

[((environmental* NEAR/1 noise*) OR (community* NEAR/1 noise*) OR (traffic* NEAR/1 noise*) OR (wind* NEAR/1 turbine* NEAR/1 sound*) OR (wind* NEAR/1 turbine* NEAR/1 noise*) OR (wind* NEAR/1 farm* NEAR/1 sound*) OR (wind* NEAR/1 farm* NEAR/1 noise*) OR (airport* NEAR/1 noise*) OR (aircraft* NEAR/1 noise*) OR (railway* NEAR/1 noise*) OR (road* NEAR/1 traffic* NEAR/1 noise*) OR (transportation* NEAR/1 noise*) OR (train* NEAR/1 noise*) OR (leisure* NEAR/1 noise*) OR (neighborhood* NEAR/1 noise*) OR (neighbourhood* NEAR/1 noise*) OR (household* NEAR/1 noise*))
OR (low* NEAR/1 frequency* NEAR/1 noise*) OR (classroom* NEAR/1 noise*) OR (school* NEAR/1 noise*) OR (high* NEAR/1 volume* NEAR/1 music*) OR (high* NEAR/1 volume* NEAR/1 noise*) OR (noise* NEAR/1 personal* NEAR/1 electronic* NEAR/1 device*) OR (noise* NEAR/1 mp3* NEAR/1 player*) OR (noise* NEAR/2 toy*) OR (hospital* NEAR/1 noise*) OR (combined* NEAR/1 noise* NEAR/1 exposure*) OR (noise* NEAR/1 nuisance*) OR (noise* NEAR/1 expos*) OR (truck* NEAR/1 noise*) OR (motor* NEAR/1 vehicle* NEAR/1 noise*) OR (motorcycle* NEAR/1 noise*) OR (social* NEAR/1 noise*) OR (noise* NEAR/1 load*)) OR (SU.EXACT.EXPLODE("Noise Effects") AND (SU.EXACT.EXPLODE("Environment"))) AND (((systemat* NEAR/1 review*) OR (meta* NEAR/1 analy*) OR (health* NEAR/1 technol* NEAR/1 assess*)) OR cochran* OR (evidence* NEAR/1 based*)))
Results from the search for available systematic reviews and meta-analyses on environmental noise

2.5 ScienceDirect


2.6 TNO database

COMBINATION: environment

((environmental* OR communit* OR traffic* OR (wind* AND turbine*) OR (wind* AND farm*) OR airport* OR aircraft* OR railway* OR (road* AND traffic*) OR transportation* OR train* OR leisure* OR neighbourhood* OR household* OR (low* AND frequency*) OR classroom* OR school* OR (high* AND volume*) OR (personal* AND electronic* AND device*) OR (mp3* AND player*) OR toy* OR hospital* OR (combined* AND exposure*) OR nuisance* OR expos* OR truck* OR (motor* AND vehicle*) OR motorcycle* OR social* OR load*) AND (noise* OR sound*)) OR (high* AND volume* AND music*)) AND (noise* OR sound*)

COMBINATION: environment AND noise AND system* review:

(((environmental* OR communit* OR traffic* OR (wind* AND turbine*) OR (wind* AND farm*) OR airport* OR aircraft* OR railway* OR (road* AND traffic*) OR transportation* OR train* OR leisure* OR neighbourhood* OR household* OR (low* AND frequency*) OR classroom* OR school* OR (high* AND volume*) OR (personal* AND electronic* AND device*) OR (mp3* AND player*) OR toy* OR hospital* OR (combined* AND exposure*) OR nuisance* OR expos* OR truck* OR (motor* AND vehicle*) OR motorcycle* OR social* OR load*) AND (noise* OR sound*)) OR (high* AND volume* AND music*)) AND system* review

COMBINATION: environment AND noise AND meta-analysis:
Results from the search for available systematic reviews
and meta-analyses on environmental noise

(((environmental* OR communit* OR traffic* OR (wind* AND turbine*) OR (wind* AND farm*) OR airport* OR aircraft* OR railway* OR (road* AND traffic*) OR transportation* OR train* OR leisure* OR neighbourhood* OR neighborhood* OR household* OR (low* AND frequency*) OR classroom* OR school* OR (high* AND volume*) OR (personal* AND electronic* AND device*) OR (mp3* AND player*) OR toy* OR hospital* OR (combined* AND exposure*) OR nuisance* OR expos* OR truck* OR (motor* AND vehicle*) OR motorcycle* OR social* OR load*) AND (noise* OR sound*)) OR (high* AND volume* AND music*)) AND meta analys*)
3 References identified during systematic review

3.1 List of included studies


3.2 List of excluded studies


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Ireland
Israel
Italy
Kazakhstan
Kyrgyzstan
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Lithuania
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