HEARING PROTECTION, SOUND, AUDIOMETRY REPRESENTATIVE EXAMPLES OF EUROPEAN PUBLICATIONS INDEXED IN DATABASE

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CIOP PIB

Noise is still the most common problem

54%
noise

Risk factor	Percentage
Noise	54.0
Dusts	18.3
Hot and cold microclimates	9.0
Biological factors	5.8
Chemicals	5.0
Vibrations	4.0
Others	3.9

Percentage share of employees exposed to risk factors arising from work environment by physical health risk factors in 2022

data of the Statics Poland

- In 2022, just like in previous years, noise was the most common factor among hazards related to the working environment.
- In Poland noise was the factor that covered more than half of the people affected by physical health risk factors present in the work environment

The aim of this study

How often issues related to **noise and noise exposure prevention** are discussed in scientific articles?

The number of responses may indicate how serious efforts are to support the health protection of workers exposed to noise.

*This type of analysis can be performed based on the number of responses to **keywords** on websites providing indexing services for scientific publications.*

4 keywords (1 of 2)

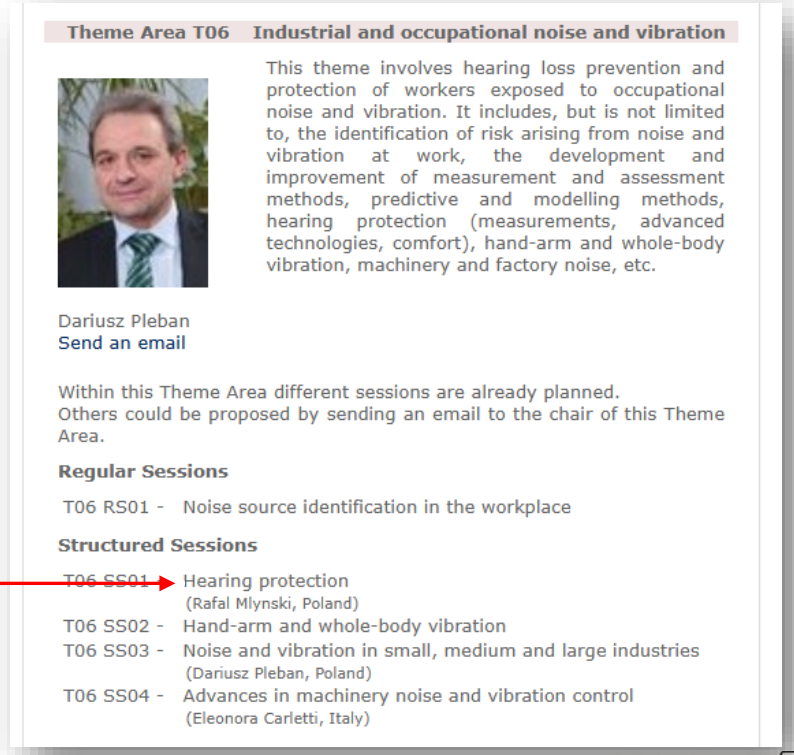
The word “noise” may refer to both acoustics and also includes, for example, noise in electronic systems.

The closest term related to acoustic is **sound**.

1

- Exposure to noise in the work environment must also include **hearing protection**.
  This may be understood as any actions aimed at limiting an employee's exposure to harmful and undesirable sounds including hearing protection.

2



Theme Area T06 Industrial and occupational noise and vibration

This theme involves hearing loss prevention and protection of workers exposed to occupational noise and vibration. It includes, but is not limited to, the identification of risk arising from noise and vibration at work, the development and improvement of measurement and assessment methods, predictive and modelling methods, hearing protection (measurements, advanced technologies, comfort), hand-arm and whole-body vibration, machinery and factory noise, etc.

Dariusz Pleban
Send an email

Within this Theme Area different sessions are already planned.
Others could be proposed by sending an email to the chair of this Theme Area.

Regular Sessions

T06 RS01 - Noise source identification in the workplace

Structured Sessions

T06 SS01 - Hearing protection
(Rafal Mlynski, Poland)
T06 SS02 - Hand-arm and whole-body vibration
T06 SS03 - Noise and vibration in small, medium and large industries
(Dariusz Pleban, Poland)
T06 SS04 - Advances in machinery noise and vibration control
(Eleonora Carletti, Italy)

https://icsv30.org/index.php?va=viewpage&vaid=11

4 keywords (2 of 2)

- An important preventive measure is hearing monitoring, i.e. **audiometry:** 3
  - Audiometric testing before starting work at a specific job position, during subsequent years of work, or after finishing work at a specific place;
  - Testing whether the employee is wearing hearing protectors correctly.

Hearing status may be assessed using the classifications provided by World Health Organization

4 → **Hearing threshold** and grades of hearing loss provided by World Health Organization

Hearing threshold, average of values at 500, 1000, 2000, 4000 Hz in the better ear, (dB)	Grade of hearing loss
< 20	Normal hearing
≥ 20 and < 35	Mild hearing loss
≥ 35 and < 50	Moderate hearing loss
≥ 50 and < 65	Moderately severe hearing loss
≥ 65 and < 80	Severe hearing loss
≥ 80 and < 95	Profound hearing loss
≥ 95	Complete or total hearing loss/deafness
< 20 in the better ear, ≥ 35 dB in the worse ear	Unilateral

Hearing is considered normal when the average of the results (Hearing threshold) at frequencies of 500, 1000, 2000 and 4000 Hz in the better ear is less than 20 dB.

Not strictly 4 keywords

1 **sound**

- It sometimes happens that the keyword “sound” has a different meaning than that referring to an acoustic wave, e.g. when talking about the repercussions of a specific situation.
- The meaning of word „noise” will not always be consistent with the area of acoustics.

1b **sound *AND* noise**

2 **hearing protection**

3 **audiometry**

4 **hearing threshold**

- “audiometry” - general term.
- At the same time a reference to the hearing status → when considered: “audiometry AND hearing threshold”

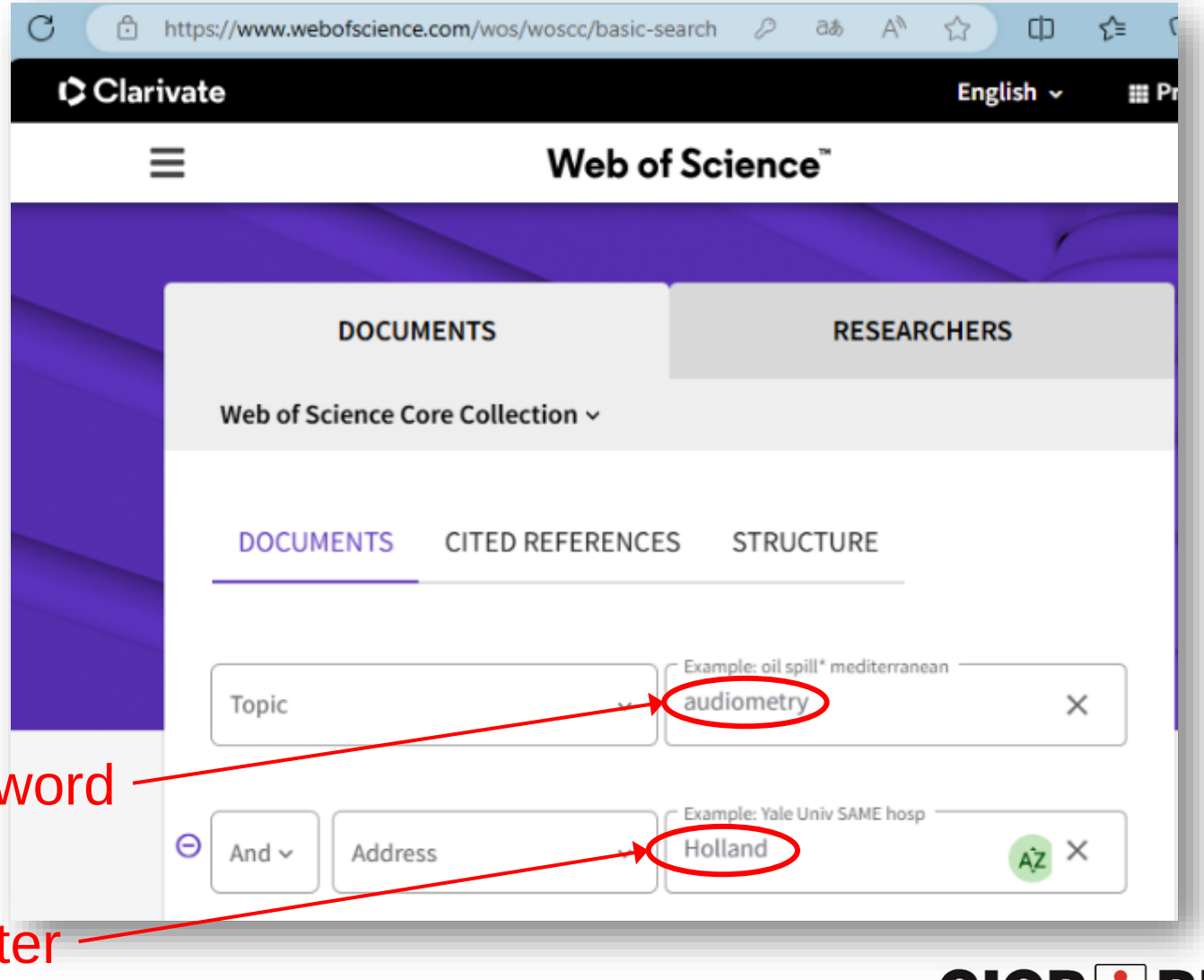
4b **audiometry *AND* ”hearing threshold”**

Methods (1 of 2)

In order to learn about the status of studies on **noise and noise exposure prevention**:

- queries were formulated using keywords in the Web of Science Core Collection (WoS CC) database,
  → as one of the main providers of information about scientific publications

- results have been filtered …



Methods (2 of 2)

Results have been filtered:

- articles affiliated by authors from four EU countries have been chosen.
- period: 2013-01-01 - 2023-12-31 (the last full 10 years)

The search results were filtered according to the country:

- Poland – country from which the authors of this work come;
- Holland/Netherlands - country hosting participant of the 30th International Congress on Sound and Vibration in 2024;
- France and Germany - examples of countries with a highly developed economy
- All countries

- data presented were obtained on March 22-28, 2024.

Results: *Number of publications*

Keyword	All countries	Poland	Holland	Netherlands	France	Germany
sound	162 659	2 570	37	4 158	7 601	12 062
sound *AND* noise	25 415	577	4	677	1 117	1 781
hearing protection	710	22	0	10	25	16
audiometry	5 485	169	1	189	161	405
hearing threshold	1 681	72	0	0	36	140
audiometry *AND* hearing threshold	533	20	0	0	9	45

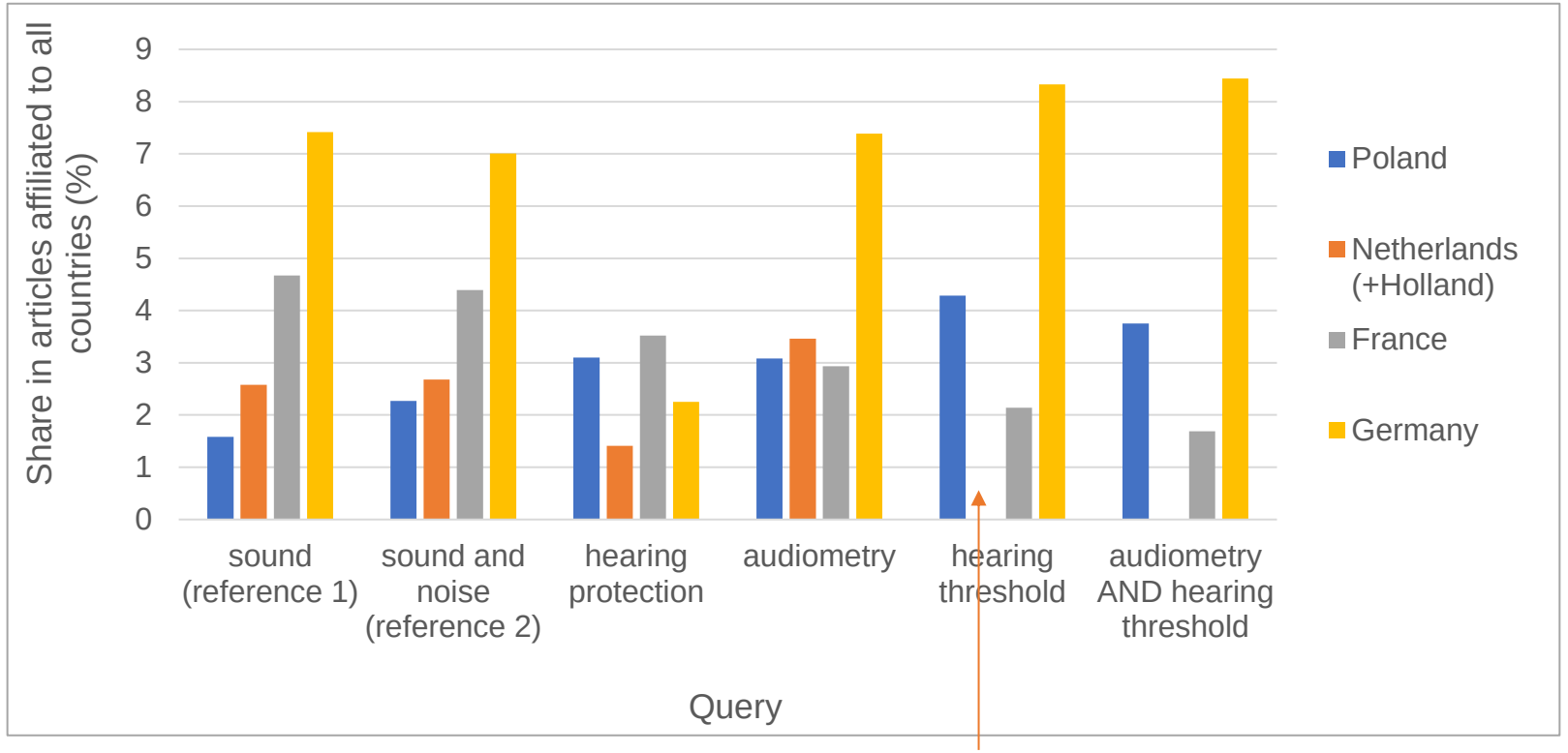
In our paper:

- The results are also limited to cases where articles were not cited, had 1 citation, or were cited at least 2 times.
- Examples of articles that meet the search criteria and are the most frequently cited are also provided.

It should be borne in mind that searching for articles corresponding to specific queries in certain situations may lead to incorrect classification of a given document in relation to the researcher's expectations. ← The most cited publications with Holland affiliation (Haji and others, 2013, abstract) is not related to sound (in terms of acoustics)

Results: *Percentage of responses*

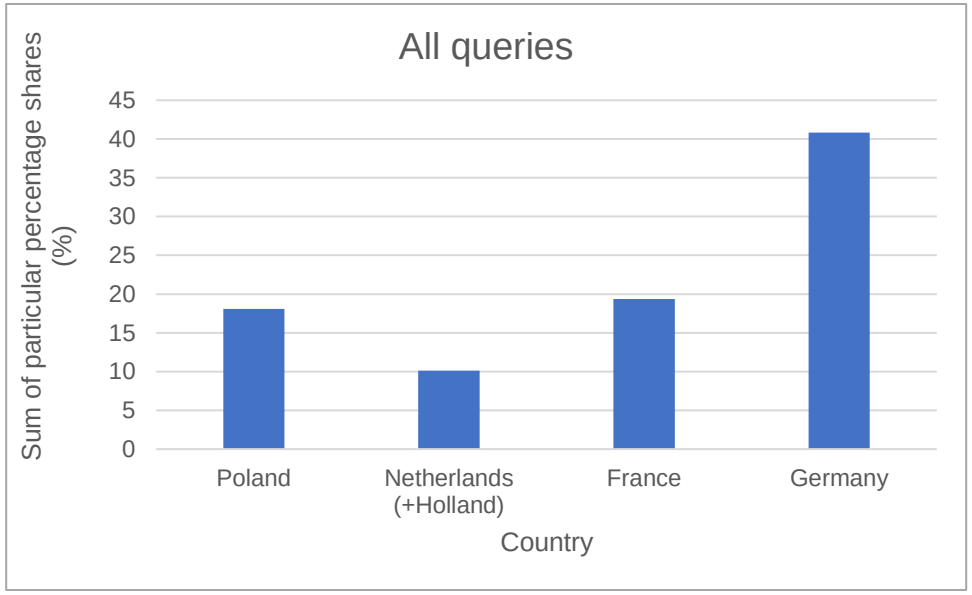
Percentage of responses to individual queries in specific countries of document publication in relation to the total number of publications meeting the conditions of the query.



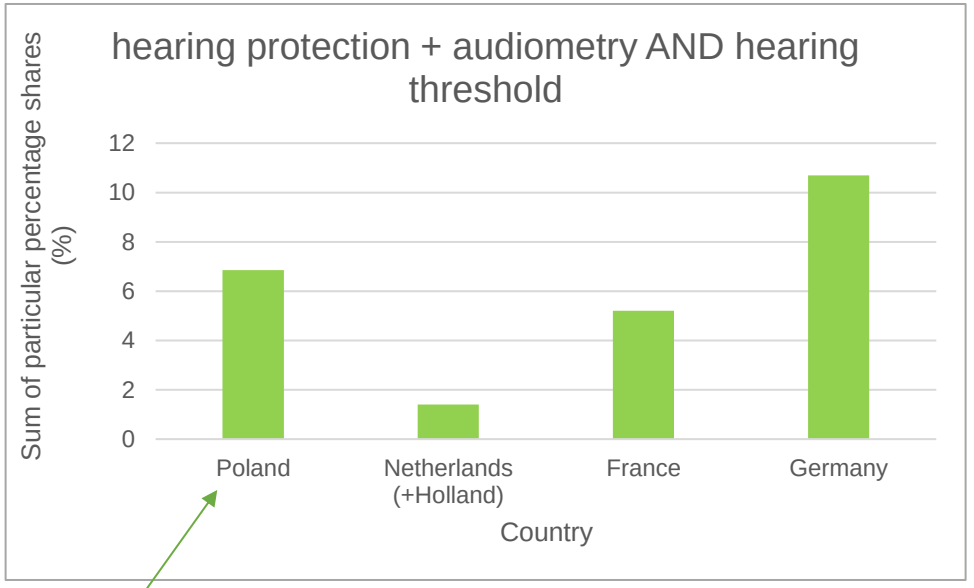
- The best results in the Web of Science CC database were obtained for detailed questions e.g. after adding further keywords that provide details.

- The percentage of German documents is large, both in the general query and in categories detailing the issues.
- Poland's share in the general term (“sound” is the smallest), in the case of specific queries (“hearing threshold”, “hearing protection”, “audiometry”) the percentage share increases significantly compared to other countries. This proves attempts to solve problems related to exposure to noise in this country.

Results: *Share of individual countries*



all aspects of noise



protection against noise and prevention

Attempts to solve problems related to exposure to noise in Poland are relatively high

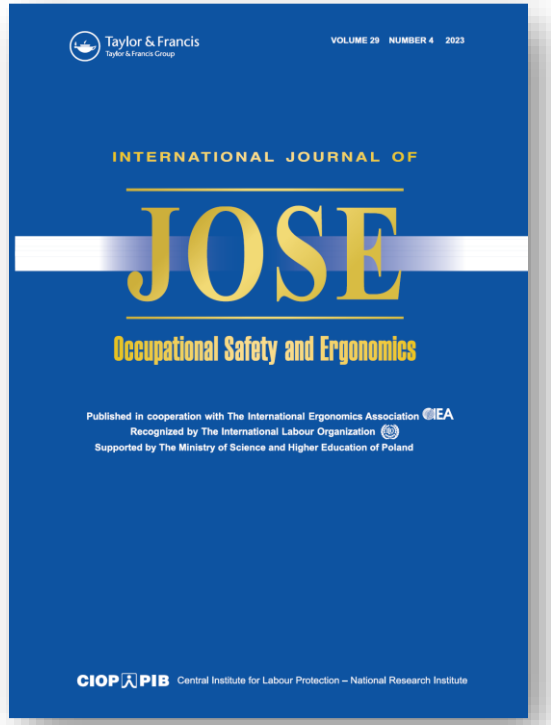
In some situations when searching databases of scientific publications, filters should be used carefully. This was shown by the example of the duality of nomenclature used regarding the country of publication, i.e. "Holland" and "Netherlands„. → In the final analysis, however, the number of responses obtained for the "Holland" filter and the "Netherlands" filter should be added up.

Results:
JOSE – International Journal edited in Poland

Keyword	Number of indexed articles published in JOSE*	Number of cited articles published in JOSE*	Number of citations published in JOSE*
sound	44	38	286
sound *AND* noise	40	34	258
hearing protection	17	15	99
audiometry	4	4	81
hearing threshold	7	6	100
audiometry *AND* hearing threshold	3	3	68

general queries

protection /prevention



www.tandfonline.com/r/jose

* - *search in* WoS CC (2024-07-04)

almost all or all articles were cited

relatively high number of citations related to numer of articles published

Conclusions

- The problem of noise exposure, as statistical data show, is still significant, which makes the issues of hearing protection and prevention in this area also important.
- The analysis of the number of scientific articles in relation to keywords assigned to the problem of noise, protection against it and prevention (audiometry) showed that such issues are **often discussed in selected European Union countries**.
- However, it seems that the number of articles focusing on aspects related to selected areas related to **hearing testing and hearing protection is still too rare** compared to the total number of articles in the area of noise, taking into account the scale of the threat of this factor.

…postpandemic time – do we want less or more noise in the office?

Thank you

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task no: 1.ZS.10

entitled "Development of an app-controlled device for monitoring hearing status and for checking correct insertion of earplugs".

The Central Institute for Labour Protection – National Research Institute is the Programme's main co-ordinator.