EVALUATION OF THE PRACTICAL IMPLEMENTATION OF THE EU OCCUPATIONAL SAFETY AND HEALTH (OSH) DIRECTIVES IN EU MEMBER STATES

REPORT BY DIRECTIVE: DIRECTIVE 2003/10/EC ON THE MINIMUM HEALTH AND SAFETY REQUIREMENTS REGARDING THE EXPOSURE OF WORKERS TO THE RISKS ARISING FROM PHYSICAL AGENTS (NOISE)
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<td>ACSH (WP)</td>
<td>Advisory Committee on safety and health at work (Working party)</td>
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<tr>
<td>Art.</td>
<td>Article</td>
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<td>CPM</td>
<td>Common process and mechanism</td>
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<td>dB</td>
<td>Decibel unit</td>
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<tr>
<td>dB (A)</td>
<td>A weighted decibel unit</td>
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<td>CSR</td>
<td>Country summary report</td>
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<td>DWEA</td>
<td>Danish Working Environment Authority</td>
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<td>EAV</td>
<td>Exposure action value</td>
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<td>ELV</td>
<td>Exposure limit value</td>
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<td>EODS</td>
<td>European Occupational Disease Statistics</td>
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<td>EQC</td>
<td>Evaluation question Coherence</td>
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<td>EQE</td>
<td>Evaluation question on Effectiveness</td>
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<td>ESAW</td>
<td>European statistics of accidents at work</td>
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<td>ESENER</td>
<td>European Survey on New and Emerging Risks</td>
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<td>EU</td>
<td>European Union</td>
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<td>EU-OSHA</td>
<td>European Agency for Safety and Health at Work</td>
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<td>EWCS</td>
<td>European Working Conditions Survey</td>
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<td>HLPP</td>
<td>Hearing loss prevention programme</td>
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<td>HSE</td>
<td>Health and Safety Executive</td>
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<td>Hz</td>
<td>Hertz</td>
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<td>ILO</td>
<td>International Labour Organisation</td>
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<td>KR</td>
<td>Key requirement</td>
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<td>LFS</td>
<td>Labour Force Survey</td>
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<td>MQ</td>
<td>Mapping question</td>
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<tr>
<td>NIR</td>
<td>National Implementation Report</td>
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<tr>
<td>OSH</td>
<td>Occupational Safety and Health</td>
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<td>PPE</td>
<td>Personal protective equipment</td>
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<tr>
<td>SBS</td>
<td>Structural Business Statistics</td>
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<tr>
<td>SIL</td>
<td>Sound intensity level</td>
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<tr>
<td>SLIC</td>
<td>Senior Labour Inspectors Committee</td>
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<tr>
<td>SME</td>
<td>Small and medium sized enterprise</td>
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### Acronym and Definition

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Definition</th>
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<tr>
<td>SPL</td>
<td>Sound pressure level</td>
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<tr>
<td>SWL</td>
<td>Sound power level</td>
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<tr>
<td>W</td>
<td>Watt</td>
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<td>WHO</td>
<td>World Health Organisation</td>
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Executive Summary

The present report is a Directive-specific report, which forms part of the overall reporting of the evaluation of the 24 Directives on occupational Safety and Health (OSH) commissioned by the European Commission. The aim of the evaluation is to evaluate the practical implementation of EU OSH Directives in Member States (MS) with a view to assessing their relevance, effectiveness and coherence, and identifying possible improvements to the regulatory framework. This report presents the evaluation of Directive 2003/10/EC concerning the minimum health and safety requirements regarding the exposure of workers to the risks arising from physical agents (noise), which we refer to as the “Noise Directive”.

The evaluation covers 24 Directives consisting of a Framework Directive (89/391), which describes the overall responsibilities of workers and employers and forms the basis of the specific 23 OSH Directives, including the Noise Directive.

The Main Report provides a comprehensive overview of cross-cutting findings, conclusions and recommendations from the evaluation. The report includes the 24 Directive-specific reports (enclosed in Appendix A in the Main Report) and 27 Country Summary Reports (CSRs) on implementation of the Directives in the Member States (enclosed in Appendix B in the Main Report). Furthermore, the Main Report is complemented by a synthesis report providing a summarised version of the key findings, conclusions and recommendations.

Methodology

The evaluation is based on the analysis of transposition and implementation of OSH legislation in each Member State, official statistics at national and EU-level, National Implementation Reports (NIRs) submitted to the Commission by Member States in 2013, scientific literature, existing studies and interviews with national and EU stakeholders. However, statistical data on the compliance in enterprises and the health and safety impact is limited. Thus, we had to rely on other sources of information. The analyses of the effectiveness is therefore also based on data from the available scientific literature and qualitative information.

The Noise Directive

The Noise Directive, adopted in 2003, replaced an earlier Directive (86/188/EEC) on the protection of workers from the risks related to exposure to noise at work. The Directive applies to “all activities in which workers are likely to be exposed to
risks from noise as a result of their work”. (art. 1,2). Hence, the Directive applies to all sectors comprised by the Framework Directive, where workers are or are likely to be exposed to noise. This is a change compared to the previous Directive, which did not apply to the maritime and air navigation sectors. Recognising the difficulties in relation to compliance for the two sectors of shipping (personnel on board seagoing vessels), and music and entertainment, Member States were granted a later deadline for transposition of the Directive in respect to these sectors (five years and two years, respectively).

Objective

The Noise Directive lays down minimum requirements for the protection of workers from risks to their health and safety arising from or likely to arise from exposure to noise and in particular the risk to hearing\(^1\). The main objective of the Directive is thus to prevent workers from impairing/losing their hearing, as well as any condition which might arise from exposure to noise, for example permanent ringing in the ears (tinnitus).

On this background, the Directive includes obligations for implementation of the common processes and mechanisms set out in the Framework Directive (risk assessment, protective and preventive services, information and training for workers, health surveillance and consultation of workers). In addition, the Directive provides for a set of exposure limit values and exposure action values in respect of the daily noise exposure levels and peak sound pressure and it requires that measures to eliminate or reduce exposure to noise are introduced and provides a set of principles to be taken into account in framing such measures.

The Directive furthermore requires Member States to draw up in consultation with the social partners, a code of conduct providing practical guidelines for workers and employers in the music and entertainment sectors.

Implementation

All Member States have transposed the Directive and four Member States have adopted more detailed/stringent requirements in respect to limit values.

The available evidence on compliance at the enterprise level is limited. Based on the data available, it is assessed that compliance with the Directive is generally at a reasonable level. However, when considering the music and entertainment industry, there is quite strong evidence to suggest that compliance is low in the sector as whole – probably with a few exceptions of large and well-established orchestras. The data indicates that some Member States have put considerable effort into developing comprehensive codes of conduct for the music and entertainment industry whereas others have merely referred to the EU level guidance on the Noise Directive or other guidance and have taken only a limited action in this field.

Relevance

About a quarter of the EU workforce across all Member States is exposed to noise at work. The Directive can therefore be considered to remain relevant across all Member States.

\(^1\) Article 1, 1
Although technological change will possibly reduce noise emissions in some circumstances, and economic changes means that many traditionally noisy industries are declining within the EU, it seems likely that exposure to noise will continue for some workers and the Noise Directive will therefore remain relevant for the immediate future. However, some consideration should be given to exploring the possible implications of an aging workforce, both in terms of ‘older ears’ being exposed and of workers working for longer and therefore being exposed to noise for a longer period.

A minority of Member States have adopted lower exposure limit values than those mentioned in the Directive. The evaluation has not found any adjustments to scientific thinking, which would argue for a change in the limit values provided in the Directive.

In its definitions (Article 2) the Directive cites ISO 1999: 1990 in reference to daily and weekly noise exposure levels. Although outside the formal scope of the current review (2007-2012) it should be noted that a new version ISO 1999: 2013 has been published. This new version has made minor changes to the equations relating to these two parameters. However, the changes made will have no material impact on such calculations or therefore on the provisions within the Directive. Nevertheless, it could be relevant to update the Directive to reflect that the most recent version of ISO 1999 should be applied.

**Effectiveness**

Data on the incidence of noise induced hearing loss is limited and weak, but trend data on exposure to noise is relatively strong and provides that levels of exposure have remained fairly stable in the period 1991-2010. The data on health outcomes (although weak) does similarly not indicate a falling trend as could be expected as a result of the implementation of the Directive. Although we do not know what would have happened if the Directive had not been in place (potentially exposure could have increased), the data indicates that the Directive has had limited effect in terms of reducing exposure and noise-induced hearing damages. Data on the music and entertainment industry indicates that the Directive has had little or no effect.

This indicates that the Directive is not entirely fulfilling its objective of protecting workers from risks to their health and safety arising or likely to arise from exposure to noise. It should be considered that it is not known what would have happened without the Directive. Also to be taken into account is that the levels of exposure and hearing problems seem to be fairly stable – and thus not rising – which does indicate that the issue is under a certain level of control.

Even so, it does seem that in order to fulfil the objective of protecting workers entirely from exposure to harmful levels noise at work, more focus would be needed on achieving higher compliance with the Directive’s requirements, in particular focusing on risk assessment targeted at noise risks and on implementation of collective/preventive rather than individual/protective measures.

**Coherence**

Some inconsistencies have been identified between the four physical agents directives (noise, vibration, electromagnetic fields and artificial optical radiation), in
particular with regard to the provisions on risk assessment and derived risk management measures, information, training and health surveillance.

The review of coherence with non-OSH EU instruments has not revealed any overlaps or inconsistencies, but some synergies with Directive 2006/42/EC (machinery) as this Directive includes several requirements which are aimed at ensuring noise reduction from machinery and equipment.

**Recommendations**

The evaluation shows that the Directive is generally relevant in its current form. No needs for major revisions – for example concerning exposure limit values - of the Directive have been identified. However, in order to enhance relevance of the Noise Directive, it could be considered to:

› Amend the Directive to refer to the most recent version of ISO 1999.

› Support knowledge building in relation to the aging workforce and the possible implications for regulation of risks of exposure to noise (i.e. to determine needs for future amendments of Directive or of guidance material to take into account the specific risks related to noise exposure and the aging workforce)

The evaluation shows that despite the implementation of the Directive in national legislation in all Member States, the share of workers exposed to noise at work is unchanged during the evaluation period (and not falling as could be expected). This points to a need for more effective implementation of the Directive. In order to enhance effectiveness, it is therefore recommended to:

› Support awareness raising and strengthened inspection and guidance regimes to ensure better implementation of existing requirements in the Directive

The evaluation shows that implementation of the Directive in the music and entertainment sector has been weak and codes of conduct have not been developed by all Member States. It is therefore recommended to:

› Initiate a renewed dialogue with the Member States and the social partners on how to achieve a better implementation of the Directive in the sector

In order to enhance coherence between the Noise Directives and the other physical agents Directives, it could be considered to take the following actions in so far as the structure of Directives remains unchanged:

› Review and streamline the information for workers requirements under the physical agents directives to ensure that they remain consistent across the four physical agents Directives.

› Review the health surveillance provisions to ensure that they remain consistent across the four physical agents Directives. This relates to provisions on consideration of health surveillance in the application of risk management measures, on information to workers on the results which relate to them personally, information to the employer of any significant findings from
the health surveillance, obligation to review the risk assessment based on the findings from health surveillance and employer’s obligation to take account of advice from health surveillance bodies.

› Ensure that the procedure of adoption/amendment of limit values and action values is clarified and where relevant harmonised with the other physical agents Directives.
1 Introduction

About this report

This report is a Directive-specific report which forms part of the reporting of an overall evaluation of 24 Directives on Occupational Safety and Health (OSH) commissioned by The European Commission, Directorate Genera Employment Social Affairs and Inclusion (from here on referred to as DG Employment). The report concerns Directive 2003/10/EC concerning the minimum health and safety requirements regarding the exposure of workers to the risks arising from physical agents (noise), from here on referred to as the “Noise Directive”.

Evaluation of OSH Directives

The evaluation of 24 OSH Directives was initiated in 2013 and finalised in June 2015. The evaluation produced cross-cutting findings on the implementation of the 24 Directives, which have been documented in the Main Report. Annexed to this Main Report are Directive-specific reports – such as this one – for each of the 24 Directives (Annex A) and reports on the implementation of the 24 Directives in the Member States (Annex B comprising 27 reports as, during the evaluation period: 2007-2012).

Objective of the evaluation

The objective was to evaluate the practical implementation of EU OSH Directives in EU Member States with a view to assessing their impact and identifying their strengths and weaknesses in order to suggest possible improvement to the regulatory framework. Two sets of questions, and subsequent evaluation criteria, were formulated to address and clarify the various impacts of the directives in the Member States. These questions have guided the evaluation of the individual Directives as well as the overall assessment across the 24 Directives.

The first set dealt with the implementation of the Directives within the Member States:

› Implementation: MQ1-MQ7 are mapping questions which, apart from addressing the overall implementation of the Directives, looks at specific implementation issues, such as derogations, transitional periods, compliance and enforcement:

MQ1: Across the Member States, how are the different Common Processes and Mechanisms foreseen by the Directives put in place, and how do they operate and interact with each other?
MQ2: What derogations and transitional periods are applied or have been used under national law under several of the Directives concerned?

MQ3: What are the differences in approach to and degree of fulfilment of the requirements of the EU OSH Directives in private undertakings and public-sector bodies, across different sectors of economic activity and across different sizes of companies, especially for SMEs, microenterprises and self-employed?

MQ4: What accompanying actions to OSH legislation have been undertaken by different actors (the Commission, the national authorities, social partners, EU-OSHA, Eurofound, etc.) to improve the level of protection of safety and health at work, and to what extent are they actually used by companies and establishments to pursue the objective of protecting safety and health of workers? Are there any information needs that are not met?

MQ5: What are the enforcement (including sanctions) and other related activities of the competent authorities at national level and how are the priorities set among the subjects covered by the Directives?

MQ6: What are the differences of approach across Member States and across establishments with regard to potentially vulnerable groups of workers depending on gender, age, disability, employment status, migration status, etc., and to what extent are their specificities resulting in particular from their greater unfamiliarity, lack of experience, absence of awareness of existing or potential dangers or their immaturity, addressed by the arrangements under question?

MQ7: What measures have been undertaken by the Member States to support SMEs and microenterprises (e.g. lighter regimes, exemptions, incentives, guidance, etc.)?

The second set addressed the three main evaluation criteria which were relevance, effectiveness and coherence (a total of 11 evaluation questions):

› Relevance: EQR1-EQR2 relates to the extent to which Directive provisions are relevant for current and future risks as well as the composition of industrial sectors:

EQR1: To what extent do the Directives adequately address current occupational risk factors and protect the safety and health of workers?

EQR2: Based on known trends (e.g. new and emerging risks and changes in the labour force and sectoral composition), how might the relevance of the Directives evolve in the future, and stay adapted to the workplaces of the future in light of the horizon of 2020? Does the need for EU level action persist?

› Effectiveness: EQE1-EQE7 explore whether or not the introduction of a Directive has led to changes to enterprise behaviour and the occupational safety and health of workers:

EQE1: To what extent has the Directive influenced workers’ safety and health, the activities of workers’ representatives, and the behaviour of establishments?

EQE2: What are the effects on the protection of workers’ safety and health of the various derogations and transitional periods foreseen in several of the Directives concerned?

EQE3: How and to what extent do the different Common Processes and Mechanisms that were mapped contribute to the effectiveness of the Directives?

EQE4: To what extent do sanctions and other related enforcement activities contribute to the effectiveness of the Directives?
EQE5: What benefits and costs arise for society and employers as a result of fulfilling the requirements of the Directives?

EQE6: To what extent do the Directives generate broader impacts (including side effects) in society and the economy?

EQE7: To what extent are the objectives achieving their aims and, if they are not, what cause could play a role? What factors have particularly contributed to the achievement of the objectives?

Coherence: EQC1-EQC2 address the extent to which objectives and actions from a given OSH Directive interact, or overlap, with other OSH Directives and/or with other EU policies:

EQC1: What, if any, inconsistencies, overlaps, or synergies can be identified across and between the Directives (for example, any positive interactions improving health and safety outcomes, or negative impact on the burdens of regulation)?

EQC2: How is the interrelation of the Directives with other measures and/or policies at European level also covering aspects related to health and safety at work, such as EU legislation in other policy areas (e.g. legislation: REACH, Cosmetics Directive, Machinery Directive, policy: Road Transport Safety, Public Health, Environment Protection), European Social Partners Agreements or ILO Conventions?

Methodology and sources of information

The overall methodology used for the evaluation, and thus, also for the analysis presented in this report, is described, in detail, in Chapter 2 of the Main Report. The Directive-specific report findings are based on the analysis of the OSH legislation in each of the Member States, official statistics at national and EU level, National Implementation Reports (NIRs) submitted to the Commission by each of the Member States before the end of 2013, as well as selected scientific articles, studies and interviews with both national and EU stakeholders.

Report structure

The report is structured according to the themes and issues listed above:

Chapter 2 presents the overall understanding of the Directive, i.e. its rationale, its provisions and its intervention logic. It also describes issues relating to measuring impacts resulting from the Directive.

Chapter 3 provides the relevant findings with regard to the implementation of the Directive in the Member States (addressing questions MQ1-MQ7).

Chapter 4 provides the relevant findings with regard to the relevance of the Directive (addressing questions EQR1-EQR2).

Chapter 5 provides the relevant findings with regard to the effectiveness of the Directive (addressing questions EQE1-EQE7).

Chapter 6 provides the relevant findings with regard to the coherence of the Directive (addressing questions EQC1-EQC2).
Chapter 7 describes the main conclusions emanating from the findings presented in Chapters 3-6.
2 The Directive

This chapter introduces the Noise Directive explaining its background and scope as well as the intended impacts of the Directive in workplaces and on the safety and health of workers at work. We identify the indicators and key sources of data, which were used to assess whether intended impacts are achieved. This serves as background for answering evaluation questions in subsequent chapters.

2.1 Background and objective

Protection against noise effects has been one of the priorities at European level since an early stage of the development of the occupational health and safety policy. In 1986, the Council adopted Directive 86/188/EEC on the protection of workers from the risks related to exposure to noise at work (here referred to as the previous Directive). The previous Directive made provisions for a later re-examination, particularly taking into account scientific and technical process since its introduction.

The 1988 Communication from the Commission on its programme concerning safety, hygiene and health at work provided for extending the scope of the previous Directive and a re-evaluation of the threshold values set for noise exposure. The 1989 Communication from the Commission concerning its action programme relating to the implementation of the Community Charter of the Fundamental Rights of Workers provided for the introduction of minimum health and safety requirements regarding the exposure of workers to the risks caused by physical agents. In September 1990, the European Parliament adopted a resolution concerning this action programme, inviting the Commission to draw up a specific directive on the risks caused by noise, vibration and other physical agents.

In 1993, the Commission put forward a proposal on the minimum requirements applicable to the exposure of workers to the risks arising from physical agents (comprising vibration, noise, electromagnetic fields and optical radiation). However, it was not until 1999 that discussions were initiated on the proposal and it was decided that the proposal should be split into a proposal for each physical agent.

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2 OJ C 28, 3.2 1988, p. 3
The Vibration Directive was then adopted in 2002\(^3\). This was followed by the Noise Directive in 2003. Following the Directive, Member States were required to bring into force the necessary national provisions by 15 February 2006. The Directive was considered appropriate owing to the risks arising from exposure to noise, in particular damage to hearing\(^4\).

Compared to the previous Directive, the present Directive marked some important changes. First of all, the present Directive is the 17th individual Directive within the meaning of the Framework Directive and thus follows the preventive approach enshrined in the Framework Directive. Secondly, it applies to all activities, whereas the previous Directive excluded some activities, and thirdly, it introduces the concepts of ‘exposure limit values’ (ELV) and ‘exposure action values’ (EAV) with the objective of allowing employers to optimise the protection of workers from the adverse effects of noise. The measures introduced by the Directive are intended not only to ensure the health and safety of each worker on an individual basis, but also to create a minimum basis for protection of all Community workers in order to avoid possible distortions of competition.

**Objective**

The Noise Directive lays down minimum requirements for the protection of workers from risks to their health and safety arising from or likely to arise from exposure to noise and in particular the risk to hearing\(^5\). The main objective of the Directive is thus to prevent workers from impairing/losing their hearing, as well as any condition which might arise from exposure to noise, for example permanent ringing in the ears (tinnitus).

### 2.2 Risks

In the Directive, only one specific risk is mentioned as being covered by the Directive – risks to hearing (deafness or partial loss of hearing). Despite the fact that the directive specifies only one risk in particular: the risk to hearing, it should be noted that the Directive refers to (and thus covers) risks to the health and safety of the workers (Art. 1 (1)). This, indirectly includes all noise-related risks. This interpretation seems to be corroborated by:

- a) the use of the pluralized form of risk in Article 4 of the Directive.
- b) the reference, in Article 4 (6) to Article 6 (3) of Directive 89/391/EEC which foresees the obligation on the employer to assess (all) risks.
- c) the reference to any effects concerning the health and safety of workers belonging to particularly sensitive risk groups (Article 4 (6) c)

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\(^3\) 2002/44/EEC. See separate Directive evaluation report on this Directive.
\(^4\) Preamble (7)
\(^5\) Article 1, 1
In 2008, DG Employment published a non-binding guide to the implementation of the Noise Directive\(^6\), which mentioned that one of the challenges of combatting risks, which lead to deafness and hearing damage is that the risk is not obvious as deafness develops over time. The guide further mentions other risks caused by exposure to noise, that are not specifically referred to in the Directive. Risks caused by noise preventing concentration and reducing performance, risks caused by noise creating stress and thus reducing ability, risks due to overheard warnings and hindered communications between workers. EU-OSHA has also published several reports and studies on noise at work and adverse effects. Notably, a literature review from 2009 on the combined exposure to noise and ototoxic substances\(^7\). It is worth noting that the Directive also mentions the combination between noise and vibrations\(^8\).

Basically, hearing impairment corresponds to a dysfunction of the auditory receptor and more rarely, to the auditory neural pathways. The characteristics are a bilateral decrease in hearing sensitivity: A loss of frequency discrimination and a loss of speech intelligibility in a noisy environment. Besides age-related auditory deficits (presbycusis), there are environmental factors that can induce hearing dysfunctions.

Among them, the most prominent and recognised occupational factor which affects hearing is noise. However, exposure to certain chemical substances may harm hearing as well.\(^9\)

Basically, the notion of noise refers to an annoying sensation i.e. noise is generally perceived as any unwanted sound, that can nevertheless also be informative (alarm, horn, scream). Sound is pressure variations propagating in the air from the sound source (sound waves). This can be illustrated by the rings generated on a water surface, when a stone is thrown into the water.

Sound is characterised by its frequency (basic unit: Hertz (Hz); 1 Hz is equal to one cycle per second) and by its intensity I (basic unit: Watt/m\(^2\) (W/m\(^2\)) which is measured on a linear scale. This linear intensity scale is not practical to use for calculations and measuring purposes, so the logarithmic scale is used instead. This is also in line with the human auditory system, which perceives the sound intensity in an approximate logarithmic way.

The terms used in acoustics are sound intensity level (SIL), sound power level (SWL) and sound pressure level (SPL), all with the unit dB, where dB stands for decibel. Usually, the occupational sound pressure level is measured in so-called A-weighted decibels (dB (A)) which takes the human ear's specific sensitivity into account.

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\(^7\) EU-OSHA (2009) Combined exposure to noise and ototoxic substances

\(^8\) Article 4 (6) d

\(^9\) EU-OSHA (2009) Combined exposure to noise and ototoxic substances, p.7
The degree to which sound is damaging to the auditory system depends on the interaction of parameters such as frequency, intensity, duration of exposure (acute vs chronic), nature of the sound (e.g. continuous, impulsive, intermittent), distance of the worker from noise sources, workplace conditions (close or open field), and individual factors such as individual sensitivity, age, etc. In addition, hearing damage may be reversible or irreversible.\(^{10}\)

Noise-induced hearing loss is often accompanied by tinnitus, or ringing in the ears. According to EU-OSHA’s 2007 guide, hearing loss caused by noise is one of the 10 most common occupational diseases\(^{11}\).

### Table 2-1 Relevant health and safety impacts arising from exposure to noise

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<th>Risks</th>
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<td><strong>Immediate impacts</strong></td>
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<tr>
<td>Accidents caused by overheard warnings and hindered communication</td>
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<tr>
<td>Acoustic shock</td>
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<tr>
<td><strong>Long term impacts</strong></td>
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<tr>
<td>Hearing loss (hypoacusis)</td>
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<tr>
<td>Tinnitus</td>
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<tr>
<td>Interference with speech communication, loss of sensitivity to sounds</td>
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<tr>
<td>Combined effects (noise combined with vibration, chemicals or heat)</td>
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<tr>
<td>Non-auditory effects, like psychological disturbances</td>
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The Noise Directive is in particular linked to the Directive on Personal and Protective Equipment (89/656/EEC), which lays down specific requirements to the equipment to be worn or held by the worker to protect him (against noise and/or other hazards). Noise risks are also addressed in non-OSH Directives such as the Machinery Directive (2006/42/EC), which requires manufacturers of specific machinery and equipment to provide information of the declared sound power emission values (SWL) for the product as well as Directive on Noise Emission in the Environment (2000/14/EC). Reference is made to Chapter 6, which provides an analysis of the coherence with other Directives.

### 2.3 Provisions

Table 2-2 lists the Key Requirements (KRs) of the Noise Directive which firstly emphasise that it applies to:

"all activities in which workers are likely to be exposed to risks from noise as a result of their work". (art. 1,2)

\(^{10}\) EU-OSHA (2009) Combined exposure to noise and ototoxic substances, p.7

Hence, the Directive applies to all sectors comprised by the Framework Directive, where workers are or are likely to be exposed to noise. This is a change compared to the previous Directive, which did not apply to the maritime and air navigation sectors. Recognising the difficulties in relation to compliance for the two sectors of shipping (personnel on board seagoing vessels), and music and entertainment, Member States were granted later deadline for transposition of the Directive in respect to these sectors (five years and two years, respectively).

CPMs and other KRs

Table 2-2 lists the provisions of the Noise Directive, which are particularly important in respect to assessing the impact of the Directive. The assessment focuses on the so-called Common Processes and Mechanisms (CPMs) and other KRs. Table 2-2 shows that the Noise Directive reflects on all the six CPMs introduced in the Framework Directive:

› **Conducting a risk assessment**: In carrying out the general requirements in the Framework Directive, the Noise Directive requires employers to assess, and if necessary, measure the level of noise to which workers are exposed, and to take into account a number of specific noise-related factors in the assessment, including the specified limit values, length of exposure, characteristics of the noise, ambient factors, sensitive risk groups, ototoxic substances, interactions between noise and warning signals, noise emissions from work equipment, noise exposure beyond normal working hours as well as information from health surveillance.

› **Ensuring protective and preventive services**: The Noise Directive specifies that risk assessment and measurement of noise shall be planned and carried out at suitable intervals by competent services.

› **Information and training for workers**: The Directive specifies that the workers who are exposed (and/or their representatives) receive information and training relating to the risks resulting from exposure to noise, including results of measurements, measures taken, safe working practises and hearing protection, detection and reporting of hearing damage and access to health surveillance.

› **Health surveillance**: The Directive specifies conditions under which workers should have their hearing checked to ensure early diagnosis. There are also specific requirements to keeping of health records as well as to actions to be taken in the cases where health surveillance shows that a worker has suffered hearing damage as a result of exposure to noise at work (review risk assessment and measures).

› **Consultation of workers**: The Directive emphasises that consultation should in particular concern the risk assessment and identified measures, actions taken to eliminate or reduce risks arising from exposure to noise., and choice of individual hearing protectors.

In addition, the Directive provides for a number of other KRs, which are listed and explained in Table 2-2. Most importantly, the Directive provides for:
› **Exposure limit values (ELV) and exposure action values (EAV)** that are in line with ISO standards and which are all lower than those specified in the previous Directive.

› **Measures to avoid and reduce exposure** provide requirements to the measures to be taken to reduce exposure, in particular if the upper EAV is exceeded, and the principles to be taken into account in framing such measures. These include the use of other working methods that imply less exposure to noise, the choice of work equipment, the design and layout of workplaces and work stations, noise reduction by technical means, limitations to the duration and intensity of the exposure, and appropriate work schedules.

› **Hearing protection**, which shall be made available to workers where lower EAV is exceeded and used where upper EAV is matched or exceeded, in those cases where it is not possible to reduce the level of noise through the programme of measures.
Table 2-2  Directive 2003/10/EC

Directive 2003/10/EC on the minimum health and safety requirements regarding the exposure of workers to the risks arising from physical agents (noise)

Key requirements: Scoping and definitions

Scope of application

Art. 1 and 2

The Directive applies to activities in which workers are or are likely to be exposed to risks from noise as a result of their work, measured in accordance with the principles defined in Art. 2.

Key requirements: Common processes and mechanisms

<table>
<thead>
<tr>
<th>CPM</th>
<th>Conducting a risk assessment</th>
<th>Preventive and protective services</th>
<th>Information for workers</th>
<th>Training of workers</th>
<th>Health surveillance</th>
<th>Consultation of workers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Relevant Articles</td>
<td>4, 4 (6), 4(7)</td>
<td>4(4)</td>
<td>8</td>
<td>8</td>
<td>10</td>
<td>9</td>
</tr>
</tbody>
</table>

Key requirements: Directive-specific provisions

Exposure limit values and action values

Art. 3

The Directive provides for a set of exposure limit values and exposure action values in respect of the daily noise exposure levels and peak sound pressure.

The method of calculating the peak sound measure, daily noise exposure and weekly noise exposure is defined (art. 3), and the following exposure limit values are set:

- Exposure limit values: \( L_{\text{EX,8h}} = 87 \text{ dB(A)} \) and \( p_{\text{peak}} = 200 \text{ Pa} \) respectively;
- Upper exposure action values: \( L_{\text{EX,8h}} = 85 \text{ dB(A)} \) and \( p_{\text{peak}} = 140 \text{ Pa} \) respectively;
- Lower exposure action values: \( L_{\text{EX,8h}} = 80 \text{ dB(A)} \) and \( p_{\text{peak}} = 112 \text{ Pa} \) respectively.

Individual hearing protectors

Art. 6

If the risks arising from exposure to noise cannot be prevented by other means, properly fitting individual hearing protectors shall be made available to workers in accordance with the conditions set out in Art. 6.

Measures to avoid and reduce exposure

Art. 5 and 7

The Directive requires that measures to eliminate or reduce exposure to noise are introduced and provides a set of principles to be taken into account in framing such measures. If the upper exposure action values are exceeded, the employer shall establish and implement a programme of technical and/or organisational measures intended to reduce the exposure. If, despite the measures taken to implement the Directive, the exposures above the exposure limit values are detected, measures to reduce the exposure and to avoid recurrence shall be adopted.

National Codes of conduct (MS level)

Art. 14

The Directive requires Member States to draw up in consultation with the social partners, a code of conduct providing practical guidelines for workers and employers in the music and entertainment sectors.

2.4 Intervention logic

Impact logic

Figure 2-1 illustrates the logical steps of how the Noise Directive - represented by its KRs – leads to impact, i.e.:

CPMs and other KRs are as discussed above the provisions of the Directive that during the analysis have been identified as the ones that in particular need to be addressed when assessing impacts. The figure illustrates that, because of the multifaceted nature of the Directive, it is not possible to identify how each of the KRs in itself will impact. In other words, the KRs work in tandem to produce impacts and, consequently, are analysed as such.
**Workplace impacts** constitute the direct changes/improvements that occur at the workplace as a result of implementing the KRs. For instance, better safety and health surveillance, organisational changes, higher awareness among workers about potential safety and health issues, etc. These changes come at a cost to the workplace, but are also the drivers by which the better or improved safety and health impacts occur.

**Safety and health impacts** constitute the actual removal and/or reduction in safety and health risks arising from exposure to noise. These impacts occur as a result of the Directive (KR) through the above-mentioned workplace impacts.

**Broader impacts** constitute the impacts that may occur more broadly speaking as a result of the above mentioned safety and health impacts.

---

**Impact storyline**

Figure 2-1 shows that the Noise Directive in the first place is expected to lead to increased and improved noise measurement activities at the workplaces where workers are exposed to noise. The increased knowledge of noise exposure levels will in itself improve the quality of the parts of the enterprises' health surveys that focus on noise exposure, and it will help to determine which new work equipment with lower levels of noise to procure that may be most effective regarding compliance with exposure limit values.

The introduction of new equipment will take place alongside the adjustment of work processes, which will reduce time exposed to noise and the intensity of exposure. Where new equipment and adjustments are not sufficient to reduce noise to acceptable levels (below upper action values), workers will be required to wear individual hearing protection, and individual hearing protection will also be made available to workers in cases where noise levels are above the lower exposure limit value. Such adjustments and requirements will be accompanied by and implemented through information, training, and consultation of workers. These activities will also lead to a higher degree of awareness and implementation of preventive and protective measures among workers, i.e. correct use of equipment and wearing of hearing protection.

Follow-up through health surveillance will provide information as to whether the implemented measures are sufficient to reduce exposure and can then cause the risk assessment or measures implemented to be reviewed and changed to arrive at better and more effective preventive and protective measures to be implemented.

These workplace impacts will thus lead to reductions in noise exposure levels. Hence, the immediate safety and health impacts are that of a reduction in the number of workers exposed to noise levels, which present a risk to their hearing. However, it will often take some time before such exposure reductions materialise in reductions in the number of workers suffering from hearing damage.

Since actions taken to reduce noise at the workplace involve the introduction of new equipment and new work processes, this is likely to have broader impacts on productivity, which may also lead to economic and employment growth within the
affected enterprises. Finally, the developments are likely to contribute to improved well-being and job satisfaction among the affected workers.

*Figure 2.1 Intervention logic for the Noise Directive*
## Key requirements

### CPMs

**Conducting a risk assessment**
- (4) assess risks and (if needed) measure the levels of noise workers are exposed to; record the assessment of risk on a suitable medium; and keep the risk assessment up-to-date.

**Ensuring internal and/or external preventive and protective services**
- (4.4) ensure competent services and persons for planning and carrying out measurements.

**Information for workers**
- (8) who are exposed to the risks from noise about measures taken, exposure limit and action values etc.

**Training for workers**
- (8) who are exposed to the risks from noise on measures taken, exposure limit and action values etc.

**Health surveillance**
- (10) rapid diagnosis, keeping of health records and actions to be taken when results of HS shows that workers have suffered hearing damage.

**Consultation of workers**
- (9) particular focus on the risk assessment and identified measures, actions taken, and choice of hearing protectors.

### Other KRs

**Exposure limit values (ELV), exposure action values (EAV)**
- (3) Measures to avoid and reduce exposure.

**Hearing protectors**
- (6) shall be made available to workers where lower EAV is exceeded and used where upper EAV is exceeded, if the principles to be taken into account in framing such measures.

**National code of conduct (MS level)**
- (34) to be drawn up for the music and entertainment industry.

## Workplace impacts

### Indicators

**Workplace impacts** are measurable changes that occur at the workplace as a result of the Directive:
- Increase in number of (share) establishments which conduct risk assessment with special emphasis on noise issues.
- Increase in number of establishments conducting measurement of noise levels and exposure.
- Increased harmonization in method/approaches to noise measurement and increased professionalisation.
- Increase in number of enterprises conducting health surveys focusing on noise exposure.
- Increased effectiveness of measures introduced (indicated by decreasing infringements/fines).
- Introduction of new equipment with lower levels of noise.
- Adjustment of work processes, e.g. time exposed to noise.
- Increase in number (share) of workers who wear hearing protection when required.
- Higher degree of awareness and implementation of preventive and protective measures among workers.
- No. of MS where national code of conduct has been drawn up.
- Stakeholder assessment of degree of application of national code of conduct.

## Safety and health impacts

### Indicators

**Safety and health impacts** are measurable changes that result from the Directive through workplace changes:
- Reduction in the number of workers exposed to noise above Directive EAV.
- Reduction in concerns about exposure to noise at enterprises (workers and management).
- Reduction in the number of work-related hearing damages.
- Reduction in number of accidents / injuries taking place due to overheard warnings.
- Reduction in number of workers experiencing other disorders / ill-health related to high noise levels, e.g. psychological effects.

Above indicators to be reflected in general, and specifically for the music and entertainment industry.

## Broader impacts

### Assessed at acquis level

Broader impacts are assessed across all Directives and include areas such as:
- Employment growth.
- Economic growth.
- Increased productivity.
- Improved quality of products and services.
- Improved well-being and job satisfaction.
2.5 Measuring impacts

In continuation of the above impact storyline, the assessment of whether the initial impact hypotheses prove to be correct takes place via analysing impacts at three levels; namely (i) workplace impacts; (ii) safety and health impacts; and (iii) broader impacts. There are two important considerations in regard to the above:

1. While workplace impacts do not necessarily say anything about specific improvements concerning occupational accidents work-related health or exposure levels, they provide important indications about these; relating to the fact that the safety and health impacts from the Directive stem from the associated changes at the workplace.

2. As indicated in the intervention logic, the broader effects of the Directive are assessed at the acquis level, and for the Framework Directive. It is thus not addressed specifically for the Noise Directive and therefore not reflected in this report.

Table 2-3 lists indicators for workplace as well as safety and health impacts that ideally should be considered in the evaluation of the Directive. Measuring the precise impacts of the Directive on this basis requires that the indicators used for the analysis are quantifiable via available statistics – and this is not always possible.

<table>
<thead>
<tr>
<th>Workplace Impacts</th>
<th>Safety and health impacts</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Increase in number of (share) establishments which conduct risk assessment with special emphasis on noise issues</td>
<td>• Reduction in the number of workers exposed to noise above Directive EAV (incidence based if possible)</td>
</tr>
<tr>
<td>• Increase in number/share of establishments conducting measurement of noise levels and exposure</td>
<td>• Reduction in management or workers’ concerns about exposure to noise at establishments (workers and management)</td>
</tr>
<tr>
<td>• Increased harmonization in methods/approaches to noise measurement and increased professionalisation</td>
<td>• Reduction in the incidence of work-related hearing damages</td>
</tr>
<tr>
<td>• Increase in number/share of establishments conducting health monitoring/surveys focusing on noise exposure</td>
<td>• Reduction in incidence of accidents / injuries taking place due to overheard warnings</td>
</tr>
<tr>
<td>• Increase in number/share of establishments which provide information and training related to reducing exposure to noise (e.g. in use of equipment, suitable work processes, use of hearing protection)</td>
<td>• Reduction in number of workers experiencing other disorders / ill-health related to high noise levels, e.g. psychological effects</td>
</tr>
<tr>
<td>• Share of establishments which have taken measures to prevent or reduce noise through: Introduction of new equipment with lower levels of noise or adjustment of work processes</td>
<td>• Above indicators to be reflected in general, and specifically for the music and entertainment industry</td>
</tr>
<tr>
<td>• Increase in number (share) of workers who wear hearing protection when required</td>
<td>• Higher degree of awareness and implementation of preventive and protective measures among workers</td>
</tr>
<tr>
<td>• Increased effectiveness of measures introduced</td>
<td>• Increased effectiveness of measures introduced</td>
</tr>
</tbody>
</table>
EVALUATION OF THE PRACTICAL IMPLEMENTATION OF THE EU OCCUPATIONAL SAFETY AND HEALTH (OSH) DIRECTIVES IN EU MEMBER STATES

Workplace Impacts | Safety and health impacts
--- | ---
(indicated by decreasing infringements/fines) | 
- Share of establishments in the music and entertainment industry which apply the respective national code of conduct | 

Statistical data available to analyse impacts

It should be noted that the fact that an indicator is potentially quantifiable does not necessarily mean that data exists which can fully inform the indicator. Hence, Table 2-3 should be seen as a list of indicators for which potential data sources could exist. Table 2-4 provides an overview of identified statistical data variables and sources that are used in this report to provide useful quantified information on the above indicators in the evaluation of the Directive.

As detailed in the notes to Table 2-4, we have sought to find means to extract data, which is specific to implementation of the Noise Directive, but due to the way the statistical data available is organised, this is not always possible.

We also seek to shed light on indicators for which quantitative data does not exist through using qualitative data (mainly stakeholder perceptions), but this evidence is not as strong as quantified statistical information on the indicators.

Table 2-4  Available data

<table>
<thead>
<tr>
<th>Workplace Impacts</th>
<th>Variable</th>
<th>Data source</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PPE</strong></td>
<td>Share of workers who report that they are required to wear PPE and who actually use it when required to</td>
<td>Eurofound: EWCS (2010), Q28/29*</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Safety and health impacts</th>
<th>Variable</th>
<th>Data source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exposure to noise</td>
<td>Share of workers who report that they are exposed at work to noise so loud that you would have to raise your voice to talk to people</td>
<td>Eurofound: EWCS (2010), Q23, b*</td>
</tr>
<tr>
<td>Health affected by noise</td>
<td>Share of workers who report that their work affects their health and the health effect is hearing problems</td>
<td>Eurofound: EWCS (2010), Q69**</td>
</tr>
<tr>
<td>Injuries/diagnoses related to hearing damages</td>
<td>Number of persons reporting a hearing problem</td>
<td>Eurostat, Labour Force Survey, hsw_hp_svdwa</td>
</tr>
<tr>
<td></td>
<td>Number of injuries reported</td>
<td>Eurostat, ESAW (hsw_mi07)</td>
</tr>
</tbody>
</table>

* And similar questions in previous EWCS when available (work place indicator data cross-tabulated with Q23, b so that only responses from those who indicated that they are exposed to noise ¼ of the time to all of the time are included)

Data challenges

Data to inform us about the extent to which workplace impacts and health and safety impacts have been achieved is very limited. The data itself is reported in chapter 5. Below, some of the main constraints are highlighted.
As shown in the table above, EWCS data can provide some insight into compliance with certain requirements, however, the only meaningful way to extract data is to focus on respondents who indicate that they are exposed to noise. This is a problem, because we do not know whether the responses provided refer to that exposure or some other factor in the respondent's work environment. We consider that it is still relevant to include data from questions on use of PPE as this still gives an indication whether noise-related PPE (hearing protection devices) is used.

In respect to exposure to noise, EWCS can also provide some indications as shown in the table above. It can provide a fairly strong picture of the proportion of workers who are exposed to noise, however, the data is self-reported and is not directly linked to the limit values in the Directive. Hence, it does not give a precise picture of fulfillment of the Directive. Nevertheless, it does provide a basis for judging whether the Directive has led to a reduction in exposure (as intended), especially since the data is available in a time series (although not annual).

In regard to health effects of exposure to noise, data covering the EU-27 is extremely scarce. EWCS provides some indications of health effects, however, it suffers from the same deficiencies as those reported above for EWCS data on compliance and exposure. The EODS dataset from Eurostat contains some standardised information from the years 2001-2005 relating to hearing damage (i.e. outside the evaluation period of 2007-2012). The dataset is not officially available and the data is associated with considerable uncertainties and for these reasons it is not referred in this report.

While national data on incidence of work related hearing damage exists for some countries, it is not directly comparable as the rules of recognition and reporting of occupational diseases vary between the Member States. Also, trends in some countries are not necessarily representative of the entire EU-27.

Concerning accidents, the ESAW dataset from Eurostat contains information on number of accidents by type of injury, which enables an overview of the accidents involving injuries related to noise, vibration and pressure. It is not possible to separate the accidents involving noise in the dataset. Further, the ESAW data provides the number of accidents at work and is not incidence based, i.e. does not take the size of the workforce into account.

Interview data can only to a very limited extent be used to make up for the lack of availability of statistical information. Firstly because of its qualitative nature, but also because relatively few interviewees have made detailed comments on the implementation of the specific Directive. The interview data and the associated methodological challenges and choices are discussed in the Main Report.

Summing up on the above mentioned challenges and deficiencies in relation to available statistical and interview data, it is evident that data to inform an assessment of the implementation and impacts of the Directive is very scarce and does not provide a firm basis for making conclusions. The best evidence exists on exposure to noise. Where possible, we seek to use data from NIRs and from academic studies and policy studies to further strengthen the data basis.
3 Implementation in Member States

As part of the evaluation, a mapping exercise of the implementation of the 24 Directives in the Member States has been conducted. This has been done via seven mapping questions (MQs). This chapter provides a summary of the findings of the mapping exercise relevant for the Noise Directive. The main basis for the findings presented below is the information collected from 27 Member States, including the NIRs, and documented in the evaluation's Country Summary Reports (CSRs). In addition, EU level information sources have been used where relevant.

The chapter is structured in accordance with the seven mapping questions data is presented across Member States. For the purpose of presenting information across Member States, country codes are used in the tables in this chapter.\(^\text{12}\)

3.1 MQ1: Transposition

**MQ1:** Across the Member States, how are the different Common Processes and Mechanisms foreseen by the Directives put in place, and how do they operate and interact with each other?

The first mapping question focuses on the six common processes and mechanisms (CPMs as defined in section 2.3) – i.e. the requirements to conducting a risk assessment, to ensuring internal and/or external preventive and protective services, to inform workers, to train workers, to carry of health surveillance, and to consult workers. Here, we look into how the CPMs have been transposed in the Member States, and whether there has been any infringement proceedings or delays or any major inconsistencies, or whether more detailed or stringent requirements than those directly specified in the Directive have been implemented the Member States.

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\(^{12}\) Eurostat country codes: Austria (AT), Belgium (BE), Bulgaria (BG), Czech Republic (CZ), Denmark (DK), Germany (DE), Estonia (EE), Ireland (IE), Greece (EL), Spain (ES), France (FR), Italy (IT), Cyprus (CY), Latvia (LV), Lithuania (LT), Luxembourg (LU), Hungary (HU), Malta (MT), Netherlands (NL), Poland (PL), Portugal (PT), Romania (RO), Slovenia (SI), Slovakia (SK), Finland (FI), Sweden (SE), United Kingdom (UK)
According to the information gathered from the Member States, all Member States have transposed the Directive. The list of infringement proceedings provided by the Commission includes a number of infringement proceedings, which were initiated by the Commission mainly in 2006-2008. These all concerned non-communication of national measures and were closed during the period as the relevant Member States adopted and communicated the relevant national measures to the Commission following either a letter of formal notice or a reasoned opinion from the Commission\(^\text{13}\). On this basis we tentatively conclude that infringement proceedings have not caused major delays in the implementation of the Directive.

As part of the analysis of the national implementation, the evaluation has looked for observed discrepancies between the Directive’s requirements and the transposing legislation. This covers instances where the text of the national transposing legislation is different from the transposed Directive’s provisions, and where this difference could lead to the non-application or partial application of the relevant CPM due to contradiction between the national provision and the corresponding one in the Directive. One case of discrepancy in transposition has been found\(^\text{14}\). Thus, in general, the Member States have correctly transposed the CPM requirements in the Directive.

The comparison of the Directive key requirements with the transposing national legislation indicates that the majority (24 of 27) of the Member States have implemented more detailed or stringent requirements regarding one or more CPMs. The most prevalent national requirements (where the national legislation in eight or more Member States comprises such requirements) include:

- The national legislation requires employers to submit risk assessment to national authorities whether on request or automatically (10 Member States)
- The sources of information and persons in charge of the risk assessment described in the legislation in a more specific manner than in the Directive (12 Member States)
- The national legislation requires health surveillance prior to exposure to noise (13 Member States)
- The conditions in which health surveillance is required are more specifically described in the legislation (9 Member States)
- The periodicity of health surveillance is provided in national law (18 Member States)

\(^{13}\) For the following Member States: AT; CY; DE; EL; FR; IE; IT; LU; MT; PT; RO; and UK. Source: Overview of infringement proceedings 1999-2008 provided by the Commission. The overview does not show when the cases were closed.

\(^{14}\) Luxembourg legislation has set a transitional period not foreseen by the Directive. The provisions of Article 7 of the Noise GDR on reduction of exposure were declared as not applicable to any workers until end of 2006.
In addition, it is noteworthy that four Member States (DK, EE, PL, SE) have implemented more stringent requirements in respect to limit values than those specified in the Directive.

3.2 MQ2: Derogations and transitional periods

MQ2: What derogations and transitional periods are applied or have been used under national law under several of the Directives concerned?

The Noise Directive was to be implemented by the Member States by 15 February 2006, however, Member States were allowed to apply transitional periods in relation to personnel on board sea-going vessels (five years from 15 February 2006) and the music and entertainment sectors (two years from 15 February 2006). The condition in both cases is that the levels of protection already achieved, with regard to personnel in these sectors, are maintained.

The Noise Directive does not provide for any derogations (provisions which explicitly permit Member States to derogate from certain requirements in the Directive).

The data collected for the evaluation shows that 20 out of the 27 Member States have applied the transitional periods and all of the Member States have respected the transitional periods. However, as further explained below under compliance, there is some contention over the issue whether Member States in fact did elaborate the code of conduct for the music and entertainment industry, which was part of the rationale for having a transitional period for this sector. The two EU-level sector organisations interviewed for the evaluation agree that the transitional period was necessary in order for the sector to understand the problems and find the necessary solutions, however, there are different understandings as to the degree that this was actually achieved.

3.3 MQ3: Compliance

MQ3: What are the differences in approach to and degree of fulfilment of the requirements of the EU OSH Directives in private undertakings and public-sector bodies, across different sectors of economic activity and across different sizes of companies, especially for SMEs, microenterprises and self-employed?

In this section, the data available on levels of compliance by establishments is described. Referring to chapter 2.5, this concerns the data available on workplace impacts, as compliance relates to the behaviour of the establishments in fulfilling the requirements of the Directive.

15 See Country Summary Reports for details.
In the NIRs, Member States were asked several questions with relevance to levels of compliance with the Directive.

The Member States were asked about the practical experience of ensuring that the employer in the risk assessment gives particular attention to the level, type and duration of exposure to noise (including impulsive noise). 14 Member States provided answers which gave an indication about whether or not establishments are complying with this requirement. Out of the 14, nine considered that this was (usually) the case, and five considered that it was rarely or not so.

The Member States were asked a similar question about attention in the risk assessment to vulnerable groups. Here, 13 Member States provided relevant answers of which eight considered that attention was afforded to vulnerable groups and five considered that it was rarely or not at all the case.

Finally, a similar question was asked about taking into account interactions between noise and work-related ototoxic substances and noise and vibration. Here, 14 Member States provided a relevant answer. Of these, only two indicate that this is taken into account while the rest indicates that it is not (or not in a comprehensive way) considered.

The Member States were also asked in the NIRs about the extent to which they have made use of the possibility to authorise derogations from the use of PPE and limit values. 23 Member States have answered this question and the general picture is that this is only done to a very limited extent.

The NIRs also encompassed a question on whether SMEs face particular difficulties in implementing the Directive. 21 Member States answered this question, and out of these, 12 responded ‘no’ and 9 responded ‘yes’. Those who responded ‘no’ often emphasised that noise is the best known and easiest (and least costly) hazard to detect and measure. It was also expressed by some that difficulties in implementation are linked to certain sectors rather than to size of establishment and that SMEs in these sectors would also (and perhaps in particular) have more challenges (sectors mentioned: discoteques/nightclubs, construction, industry, agriculture\(^\text{16}\)). Those who replied that SMEs do have difficulties often offered the view that SMEs do not have the necessary knowledge to estimate noise (difficulties with the measurement including the physical expressions and mathematical correlations) and they do not take appropriate measures (overly focus on hearing protection instead of prevention).

Although not asked about specifically in the NIRs, some Member States do report about various general issues in relation to implementation of the Directive. The issues listed briefly below were generally raised by only a few Member States – and since they cannot be seen as a response to a particular question it is not known to which extent the remaining Member States share similar views.

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\(^{16}\) The sectors mentioned are quoted from the NIRs, so it is not known what is meant precisely
Information on noise emission from machinery is generally insufficient with the consequence that employers do not make the right choices when buying new equipment. This is indicates lack of implementation of Directive 2006/42/EC on machinery (see chapter 6 on coherence).

The rules on impulsive noise are not sufficiently precise.

Hearing protection equipment is the most common measure. Too often risk assessments are not translated into risk reduction programmes.

Other national data
As part of preparing the CSRs, data on compliance with the CPMs was gathered from national sources. It was only possible to gather data in 11 Member States: Belgium, Denmark, Finland, Lithuania, the Netherlands, Poland, Romania, Slovakia, Spain, Sweden and the United Kingdom. The data from these countries show a medium to high degree of compliance (most countries in the range 60-79% of establishments in compliance).

EWCS data
As explained in chapter 2.5, data from EWCS can provide an indication of levels of compliance with the requirement to use hearing protection because it includes a question on wearing of personal protective equipment (PPE). The data shows that 90% of respondents indicate that they wear PPE when it is required (data only for 2010, ref EWCS survey Q28 and 29). The data is based on responses from those respondents who have indicated that they are exposed at work to noise so loud it is necessary to raise the voice in order to have a conversation. It thus gives an indication of compliance with the requirement to apply hearing protectors, but it is not known whether the basis for responses is the exposure to noise or other factors and thus whether the response concerns hearing protection or other forms of PPE.

EU interviews
Only few EU stakeholders commented very specifically on compliance with the Directive. Four EU stakeholders assessed compliance on average to be high (both workers’ and employers’ organisations represented). In addition, two EU stakeholders were interviewed to shed light on the specificities with regard to implementation of the Directive in the music and entertainment sector (see below).

Implementation of the Directive in the music and entertainment industry
As mentioned in chapter 2.3, Article 14 of the Directive requires Member States to draw up in consultation with the social partners, a code of conduct providing practical guidelines for workers and employers in the music and entertainment sectors. The NIRs did not include any information in this regard (and no question on this was posed to the Member States in the NIR questionnaire).

For the purpose of the evaluation, two main EU level stakeholders representing the sector were interviewed: Pearle (Performing Arts Employers Associations League Europe) representing the employers and FIM (International Federation of Musicians) representing the workers.

The message from FIM on the subject of whether or not a code was prepared by the Member States was that a few Member States had a proper process to develop the code of conduct, however, in most cases this was not done as intended in the Directive. FIM established this assessment based on asking their member
organisations in the Member States. FIM also states that many Member States seem to refer to chapter 8 of the EU guidance document on the Noise Directive and regard that as sufficient, however, this view is not supported by FIM. They consider that implementation/enforcement in the music sector requires a lot of efforts, involvement and a great deal of sensitization of various partners (promoters, conductors, managers, instrument or PA manufacturers, sound engineers, acoustic specialists and musicians themselves). Therefore, the purpose of the transitional period to draft the code of conduct was very much about involving all the possible partners to identify innovative but realistic solutions. According to FIM, this "educational process" was out of reach without a robust debate at national level, which did not occur in most of the EU MS.

The message from Pearle on the same subject is that the approach has been different in different Member States. Some countries took the EU drafted noise guidance (chapter 8) as a basis, others had a sectoral initiative and others developed a code of conduct at the company level. Pearle states that the sector itself often refers to the guidance developed by the sectoral social partners in the UK of which the information is available online.

A subject which came up during interviews with these two organisations is that it seems to be unclear in the Directive what the intended status of the code of conduct was. Some comments were made as to whether guidance was sufficient or whether the code of conduct should be a regulatory document.

On the question of degree of compliance with the Directive of the music and entertainment sector, the two organisations offered different views albeit with some agreement on key challenges.

FIM reported that, in a few countries, there is a reasonable level of compliance, but in general, compliance is very poor. The Directive contributed to raise the awareness of musicians about the noise related risks, however, it is only in the big, well-established orchestras that real changes are seen. There is too much focus on hearing protectors instead of collective/preventive measures. Key challenges emphasized by FIM relate to funding for collective/preventive measures, freelance musicians, and handling the different actors involved (not only a question of employers and workers – how to factor in conductors/managers).

Pearle considered that the classical sector is in reasonably good compliance whereas the main challenges concerned amplified music. It was emphasised that the Directive has helped to open discussions and research into health of performers and has triggered interest for sharing knowledge between specialists across Europe. Pearle emphasised that the Directive has raised general awareness on effects from exposure to excessive noise levels and how to prevent and protect against this through hearing protection and other preventive/collective measures. Earplugs were considered to be the way to protect musicians but the Directive has meant that other measures are being used to a greater extent – e.g. screens between various groups of instruments.
A 2012 study on occupational noise exposure and regulatory adherence in music venues in the United Kingdom\(^{17}\) (the country emphasised by both FIM and Pearle to be the most advanced in terms of implementation of the Directive) concluded that:

“Results showed that the majority of staff (70%) in all venues exceeded the daily noise exposure limit value in their working shift. Use of hearing protection was rare (<30%) and not enforced by most venues. The understanding of the hazard posed by noise was low, and the implementation of the noise regulations was haphazard, with staff regularly exceeding regulatory limits. The implication is that industry is failing to meet regulatory requirements.” \(^{18}\)

Another study from 2014 evaluating the noise exposure of symphonic orchestra musicians concluded that these musicians are exposed to high noise levels that can damage their hearing and are in excess of legal requirements\(^{19}\).

Data on compliance is limited. Based on the data presented above, it is assessed that compliance with the Directive is generally at a reasonable level. However, when considering the music and entertainment industry, there is quite strong evidence to suggest that compliance is low in the sector as whole – probably with a few exceptions of large and well-established orchestras. The data indicates that some Member States have put considerable effort into developing comprehensive codes of conduct for the music and entertainment industry whereas others have merely referred to the EU level guidance on the Noise Directive or other guidance and have taken only a limited action in this field.

The data points to a tendency to focus on hearing protection rather than preventive measures in general – and also in the music and entertainment industry.

### 3.4 MQ4: Accompanying actions

**MQ4**: What accompanying actions to OSH legislation have been undertaken by different actors (the Commission, the national authorities, social partners, EU-OSHA, Eurofound, etc.) to improve the level of protection of safety and health at work, and to what extent are they actually used by companies and establishments to pursue the objective of protecting safety and health of workers? Are there any information needs that are not met?

When answering the fourth mapping question we distinguish between accompanying actions taken at Member State level – mainly based on information presented in the Country Summary Reports developed within the present

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\(^{18}\) Ibid, p. 86

evaluation, and accompanying actions taken at EU level – mainly based on information obtained through desk research and interviews with EU level stakeholders.

3.4.1 Accompanying actions at Member State level

We have looked into the existence of different types of accompanying actions taken at Member State level to encourage the implementation of and compliance with the Noise Directive. This is illustrated in Table 3-1, which shows the existence of guidance documents and support tools.

Table 3-1 Guidance documents and support tools

<table>
<thead>
<tr>
<th>Guidance documents and support tools</th>
<th>No support tools</th>
<th>1-2 support tools</th>
</tr>
</thead>
<tbody>
<tr>
<td>No guidance doc.</td>
<td>BG, EL</td>
<td>CZ</td>
</tr>
<tr>
<td>1-10 guidance doc.</td>
<td>BE, CY, DE, EE, ES, FI, FR, HU, IE, LT, LU, LV, MT, NL, PT, RO, SE, SK, UK</td>
<td>DK, IT, PL, SI</td>
</tr>
<tr>
<td>Above 10 guidance doc.</td>
<td>AT</td>
<td></td>
</tr>
</tbody>
</table>

Source: Country Summary Reports.

Table 3-1 shows that this investigation has led to the identification of a number of guidance documents and support tools – hereunder IT tools. It shows that most countries have developed guidance documents – and this has been combined with support tools in some countries, but only a minority.

Considering the national codes of conduct for the music and entertainment industry, which the Member States were required to develop following the Directive, see section 3.3 above.

Table 3-1 does, however, not necessarily suggest that the available guidance documents and support tools are sufficient. In fact, several stakeholders consulted via the development of the Country Summary Reports state that they are not always sufficient. In this context, Table 3-2 shows that information gaps in relation to the Noise Directive, some of which are especially relevant for SMEs, have been found in most Member States.

Table 3-2 Information gaps

<table>
<thead>
<tr>
<th>No information gaps</th>
<th>Information gaps – some specifically SME-related</th>
<th>Information gaps – none specifically SME-related</th>
</tr>
</thead>
<tbody>
<tr>
<td>DE, DK, HU, IE, SE, UK</td>
<td>BE, BG, CY, FR, IT, LV, MT, PT, SI, SK</td>
<td>AT, CZ, DE, EE, EL, ES, FI, LT, LU, NL, PL, RO</td>
</tr>
</tbody>
</table>

Source: Country Summary Reports.

A few Member States have also made use of more active accompanying actions such as awareness-raising campaigns, and the education and training of employers and workers within the establishments as shown in Table 3-3.
Table 3-3  

<table>
<thead>
<tr>
<th>No campaigns</th>
<th>1 or more education and training activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>AT, BE, CZ, DE, DK, EE, ES, FI, FR, HU, IE, IT, LT, LV, PT, SE, SI, SK, UK</td>
<td>CY, EE</td>
</tr>
<tr>
<td>BG, EL, LU, MT, NL, PL</td>
<td>RO</td>
</tr>
</tbody>
</table>

Source: Country Summary Reports

Financial incentives

The data from national data collection indicates that only one Member State – the Netherlands – has made use of financial incentives for establishments to comply with safety and health provisions related specifically to the Noise Directive. It should be noted that several countries have general arrangements for financial incentives – these are described in the Directive report on the Framework Directive.

3.4.2 Accompanying actions at EU level

The EU has initiated a number of accompanying actions to support the implementation of the Noise Directive.

› The European Commission published a Non-binding guide to good practice for the application of the directive. The publication aims at clarifying the principles of acoustics, the risks of exposure and how to avoid exposure. It also aims at helping establishments, especially SMEs and all stakeholders in the practical implementation of the provisions of the Directive.

Based on a review of the NIRs, it was found that Greece and Hungary promoted both a printed and electronic form of the publication and distributed these to involved partners such as companies and workers who are exposed to noise-hazards. In the NIR for Germany it could be seen that the non-binding guide to good practice was published and made available to users on the State of Brandenburg Occupational Safety and Health Office website.

Pearle has informed during interview that chapter 8 (on the music and entertainment sector) of the guide was distributed widely among Pearle members and is regarded as very useful.

› The European Agency for Safety and Health at Work published a noise-Wikipedia, OSH-WIKI networking knowledge. It is a source of knowledge sharing in the EU, where the health effects, noise sources and reduction measures are described. The document is a guide to assess and eliminate noise for workers in construction.

OSHA-EU have published different e-facts publications aimed at different industries and populations which may be exposed to noise-hazards. For an example one of these is aimed at young workers. This publication is aimed at informing young workers on the risks of exposure to noise and how these might affect hearing in the long run. Another publication aimed at the textile-industry and informs on the occupational safety and health exposures from noise in this industry.

3.5 MQ5: Enforcement

**MQ5:** What are the enforcement (including sanctions) and other related activities of the competent authorities at national level and how are the priorities set among the subjects covered by the Directives?

The data from the national analysis shows that the Member States typically have a general enforcement authority responsible for OSH enforcement and inspections related to all OSH matters, including noise. The same can be said about enforcement strategies. Thus, the national studies have not led to the identification special enforcement authorities, enforcement strategies or types of sanctions, which are focusing in particular on compliance with national legislation pertaining to the Noise Directive. Reference is therefore made to the report on the Framework Directive, which describes the general enforcement frameworks applied in the Member States.

In the NIRs, one Member State (DK) reports about a fall of 15% in the number of employees exposed to noise harmful to hearing (2005-2010) due to a prioritisation of noise as a particularly serious working-environment problem. It is not clear from the text whether this prioritisation is related to enforcement in particular, but it is considered likely.

3.6 MQ6: Vulnerable groups

**MQ6:** What are the differences of approach across Member States and across establishments with regard to potentially vulnerable groups of workers depending on gender, age, disability, employment status, migration status, etc., and to what extent are their specificities resulting in particular from their greater unfamiliarity, lack of experience, absence of awareness of existing or potential dangers or their immaturity, addressed by the arrangements under question?

The findings from the national studies show that, most Member States have general approaches to vulnerable groups, which are not targeted at specific Directives (except those Directives, which are specifically designed to address vulnerable groups). As part of the process of preparing the CSRs, we have

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23 Reference is made to the Directive report on implementation of the Framework Directive, which provides a summary of the general systems in force.
identified a few specific tools or approaches which focus in particular on vulnerable groups and the risks associated with noise:

› AT: Women, pregnant women being influenced by noise at the workplace
› EE: Working environment in the night clubs. Practical guideline
› NL: Oorverdovend; geluid in discotheken (Noise in discotheques)

In the National Implementation Reports, the Member States were asked about the practical experience of ensuring that, in the risk assessment, the employer gives particular attention to any effects concerning the health and safety of workers belonging to a particularly sensitive risk groups. The data from the NIRs show that about half of the Member States have not answered this question in a conclusive manner. About a third of the Member States answer that due attention to this issue is given. The answers from five Member States indicate that this receives limited or no attention.

3.7 MQ7: SMEs and Microenterprises

Table 3-4 shows the degree to which the Member States have made use of measures to support SMEs and microenterprises in complying with national Noise Directive provisions.

Table 3-4  Measures to support SMEs and microenterprises – use by Member State

<table>
<thead>
<tr>
<th>Exemptions</th>
<th>Lighter regimes</th>
<th>Incentives</th>
</tr>
</thead>
<tbody>
<tr>
<td>CZ, PL</td>
<td>CZ, PL</td>
<td>EE, EL, FR, PL</td>
</tr>
</tbody>
</table>

Source: Country Summary Reports

Table 3-4 illustrates that such measures are used only to a limited degree in the Member States. It should be noted that in the National Implementation Reports, the Member States often emphasise that the general tools and measures (as described above in section 3.4) are equally applicable in SMEs and that they have been devised taking into account that a large share of the establishments concerned are, in fact, SMEs. Some Member States also mention other types of measures targeted at SMEs, for example the NIR for Estonia mentions that direct assistance to establishing the risk assessment is available to SMEs.

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24 https://www.arbeitsinspektion.gv.at/AI/Personengruppen/Frauen/default.htm
4 Assessment of Relevance

In this section, the relevance of the Directive in relation to the coverage of workforce and Member States, and the severity and extent of risks covered is investigated. The conclusions from the five parameters used to assess relevance are summarised in the table below.

<table>
<thead>
<tr>
<th>Coverage of Workforce and Member States</th>
<th>Accidents and health problems</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Member State where the Directive is potentially relevant</td>
<td>Proportion of EU workforce to whom the Directive is potentially relevant</td>
</tr>
<tr>
<td>27</td>
<td>25.4%</td>
</tr>
</tbody>
</table>

* see text

As with the Vibration Directive, entries in the NIRs indicate that the Noise Directive has been transposed into national legislation in all Member States\(^{26}\). Data from the most recent EWCS indicates that workers report exposure to noise at work at least 25% of the time across all Member States\(^{27}\). The Directive can therefore be considered to remain relevant across all Member States.

Turning to the labour market, determination of the proportion of the labour market covered by the provisions of this Directive is therefore a matter of establishing the number of persons employed within the relevant sectors. There are a variety of sectors and occupations where exposure to noise is possible. In some cases the risk of noise exposure is common. In others however the risk tends to be amongst sub-groups within a sector making it difficult to establish the numbers of workers potentially exposed. In order to provide an approximate estimate of the proportion of the EU-27 workforce possibly exposed to noise, without estimating numbers in

\(^{26}\) Individual NIRs

\(^{27}\) http://www.eurofound.europa.eu/surveys/ewcs/2010/datatables.htm
such subsectors, a procedure was adopted whereby the whole employment figure was adopted for those sectors where the majority can be assumed to be at risk of exposure (not necessarily exposed) and to omit those in relatively small subsectors. This will clearly result in, on the one hand, an overestimate of those potentially at risk and, on the other hand, an underestimate. However, it was considered that this provided a reasonably accurate overall estimate where the intention was to provide a broad view of the proportion of the workforce covered, rather than any detailed calculation.

Consideration of NACE coding of economic sectors by OSH experts identified the following sectors as ones where the proportion of workers who might potentially be exposed to noise justified inclusion of the entire sector (or subsector). Although other sector subdivisions were identified these were either at a level of division where separate statistics were not available or the proportion potentially exposed was not considered to warrant inclusion. On this basis, the following sectors: Forestry and logging (NACE Code A2), Mining and quarrying (Code B), Manufacturing (Code C), Electricity, gas, steam and air conditioning supply (Code D), Water supply; sewerage; waste management and remediation activities (Code E), Construction (Code F), Air transport (Code H51), and Creative, arts and entertainment (Code R90) were selected for inclusion.

LFS data documents that, for 2012, a total of 215,678,600 people were employed within the EU-27 (15-74 years). Of these, 841,000 were employed within the mining and quarrying sector; 33,632,500 were employed within the manufacturing sector; 1,664,900 were employed within the electricity, gas, steam and air conditioning supply sectors; 1,663,700 were employed within the sewerage, waste management and remediation activities sectors; and 15,438,900 were employed within the construction sector.

To calculate the proportion of workers in the air transport sector for whom the Noise Directive is relevant SBS data was consulted because the LFS data only extends to the first NACE Code level. In the SBS database the most up to date data was used, which was recorded in 2010. The population of employees working in the transportation and storage sector was 10,948,400, of which 30,655 employees worked in the air transport sector. Therefore the Noise Directive is relevant to 0.28% of the workers in the transport and storage sector work within the air transport sector. By applying this percentage to the number of workers in the transport and storage sector from the LFS data the Noise Directive can be regarded as relevant to 1,035,257 workers, employed in the air transport sector, in the EU-27 (15-74 years).

To calculate the proportion of worker in the forestry sector for whom the Noise Directive is relevant, the forestry statistics Eurostat pocketbook was consulted. According to the data reported in the Eurostat pocketbook, gathered in 2005, 492,000 workers were employed in the forestry sector. This accounted for 0.25% of the 200,384,000 workers employed in all sectors in 2005 across the EU-27. By

28 Employment by sex, age and economic activity (from 2008 onwards, NACE Rev. 2) - 1 000 [Ifsa_egan2
29 Eurostat pocketbooks: Forestry statistics
applying this percentage to the total number of workers from the LFS data the Noise Directive can be regarded as relevant to 539,196 workers, employed in the forestry sector, in the EU-27 (15-74 years).

To calculate the proportion of workers in the creative, arts and entertainment activities sector for whom the Noise Directive is relevant, the cultural statistics Eurostat pocketbook\textsuperscript{30} was consulted. According to the data reported in the Eurostat pocketbook, gathered in 2009, 1,045,600 workers were employed in the creative, arts and entertainment activities sector. This accounted for 0.48% of the 217,828,000 workers employed in all sectors in 2009 across the EU-27. By applying this percentage to the total number of workers from the LFS data the Noise Directive can be regarded as relevant to 1,035,257 workers, employed in the creative, arts and entertainment activities sector, in the EU-27 (15-74 years).

By calculating the sum of the workers in all these sectors, the Noise Directive can be regarded as relevant to 54,846,108 of the total number of workers in the LFS data, which amounts to 25.4% of the EU workforce.

This calculation can be compared to data from the EWCS, 2010 survey which asked respondents “Are you exposed at work to - Noise so loud that you would have to raise your voice to talk to people?” This criterion is often used as a rough guide to whether or not noise is sufficiently loud to present a risk of injury. From this survey, 29.9% reported exposure at least 25% of the time, a reasonably similar figure to that estimated above.

4.1 EQR1: Current relevance

\textbf{EQR1: To what extent do the Directives adequately address current occupational risk factors and protect the safety and health of workers?}

\textit{Fatal accidents at work}

Although it can be argued that noise can act as a distraction and could therefore contribute to accidental injuries there is no means of identifying such cases within any of the databases.

Noise exposure does not directly cause fatal injuries and therefore none are considered relevant to this Directive.

\textit{Non-fatal accidents at work}

The same ESAW database also documents non-fatal accidents at work, including a categorisation of types of injury\textsuperscript{31}. This includes a cluster relating to ‘the effects of sound, vibration and pressure’. However, OSH experience suggests that few of

\textsuperscript{30} Eurostat pocketbooks: Cultural statistics

\textsuperscript{31} Accidents at work by type of injury and severity (NACE Rev. 2, A, C-N) [hsw_mi07]
these will relate to sound, with them more likely to include, for example, construction workers working in compressed air (e.g. tunnelling workers), especially as noise-related injuries are usually documented as health-effects rather than acute injuries. It is possible that a small proportion of these relates to severe acute exposures (e.g. explosions or other extremely loud noises) but there is no way of identifying these from the published figures. Given that the total of such injuries (2,026 across the whole EU-27 in 2012 i.e. fewer than 0.1% of the total for all causes of 2,482,415) is so small, any small proportion of such numbers will clearly be of little significance.

Work-related health problems

The LFS 2007 database includes statistics relating to those who report having had what they perceive as a work-related health problem within the last 12 months. According to these statistics, 2.1% of all respondents indicated ‘hearing problems’ as their most serious health problem.

By comparison, the EWCS 2010 survey included the question: “Does your work affect your health: hearing problems? The results from this survey indicated that approximately 6% of respondents indicated that they did experience such problems (see Figure 4-1).

Figure 4-1 Percentage of workers considering their work to affect their health in the form of hearing problems (EU-27, 2010)

Source: EWCS 2010. Question asked: Does your work affect your health: hearing problems? (Shows percentage of workers who believe their work have caused hearing problems).

32 Persons reporting their most serious work-related health problem work in the past 12 months, by type of problem - % [hsw_pb5]
As with some other work-related hazards, one of the problems with noise exposure is its cumulative effect, which often fails to become apparent until age-related losses of hearing are superimposed on the noise-induced effects. A considerable degree of hearing damage can occur before an individual becomes subjectively aware of any loss of hearing. Thus, exposure to loud noise could have ceased – but the person will nevertheless become aware of a loss of hearing, in part attributable to prior noise exposure, as they age.

Few stakeholders (EU or National) expressed any specific views regarding the current relevance of this Directive. However, the fact that some expressed the view that its relevance would increase (see below) it can be assumed that this indicates that they regard it as currently relevant.

A subject matter expert suggested that the Directive was very relevant, referring to what were seen as a large proportion of the population exposed with a considerable experiencing work-related deafness.

### 4.2 EQR2: Future relevance

**EQR2:** Based on known trends (e.g. new and emerging risks and changes in the labour force and sectoral composition), how might the relevance of the Directives evolve in the future, and stay adapted to the workplaces of the future in light of the horizon of 2020? Does the need for EU level action persist?

One national stakeholder suggested that the aging demographics of the EU population could increase the future relevance of the Noise Directive. It is not known whether older workers have an increased susceptibility to additional damage, as the confounding effects of aging itself make this difficult to establish. However, these aging influences will make it increasingly important to protect what hearing abilities individuals retain, thus increasing the future relevance of this Directive.

No other national or EU stakeholders offered any opinions on future relevance.

One Member State (Austria) raised the issue of the non-auditory effects of noise (i.e. the mental and vegetative effects), suggesting that amendments to the Directive to accommodate any effects of these should be considered to increase its relevance to noise-related problems in the workplace. A UK-based literature review of such effects found that it was not possible to determine any consistent relationships with quantifiable physical characteristics because of the variability introduced by individual psychological influences (e.g. one person’s ‘music’ is another person’s ‘noise’).

Some Member States indicated that they had adopted a lower exposure limit value of 85 dB(A), in contrast with the 87 dB(A) of the Directive (see also section 3.1 and the relevant CSRs). Adopting this lower limit could be regarded as increasing the

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relevance of the Directive in respect of current (or future) risks. However, these were only a minority of Member States which would not suggest a need to consider implementing such a change across the whole of the EU. The evaluation has not found any adjustments to scientific thinking, which would argue for a change in the limit values provided in the Directive.

Finally, one Member State reported adopting a requirement for assessment and, if necessary, measurement to be renewed every five years. Again this isolated change does not appear to warrant more widespread consideration of this measure.

It is interesting to note that, although the issue of non-work exposures was raised in respect of some risks, such as the use of display screen equipment and psychosocial risks, in consideration of future changes in relevance, no stakeholders expressed similar views regarding noise, despite the widespread use of personal audio systems in everyday life.

Although technological change will possibly reduce noise emissions in some circumstances, and economic changes means that many traditionally noisy industries are declining within the EU, it seems likely that exposure to noise will continue for some workers and the Noise Directive will therefore remain relevant for the immediate future. However, some consideration should be given to exploring the possible implications of an aging workforce, both in terms of ‘older ears’ being exposed and of workers working for longer and therefore being exposed to noise for a longer period.

In its definitions (Article 2) the Directive cites ISO 1999: 1990 in reference to daily and weekly noise exposure levels. Although outside the formal scope of the current review (2007-2012) it should be noted that a new version ISO 1999: 2013 has been published. This new version has made minor changes to the equations relating to these two parameters. However, the changes made (for example reference to $L_{eq,Te}$ rather than to $L_{Aeq,Te}$) appear to have been made to bring the abbreviations used into line with some other noise standards and will have no material impact on such calculations or therefore on the provisions within the Directive. Nevertheless, it could be relevant to update the Directive to reflect that the most recent version of ISO 1999 should be applied.
5   Assessment of effectiveness

The assessment of the Noise Directive takes its point of departure in the impact storyline presented in Chapter 2 of this report. On the basis of data gathered from statistics, studies and interviews, we examine whether the intentions and associated hypotheses regarding the impacts of the Directive can be confirmed. We do this by looking into the data on the impact indicators defined in Chapter 2. As already explained in Chapter 2, there is limited statistical data on the impacts of the Directive.

The evaluation encompasses seven questions on effectiveness. These questions form the structure of this chapter. Reflecting the methodology of the evaluation, not all questions are addressed at the level of the individual Directives. In these cases, reference is made to the Main Report, which provides an analysis of these questions at the overall acquis level.

5.1   EQE1: Effect on occupational safety and health

EQE1: To what extent has the Directive influenced workers’ safety and health, the activities of workers’ representatives, and the behaviour of establishments?

This first evaluation question on effectiveness concerns a key element in relation to effectiveness – the impact of the Directive. The methodology of the evaluation builds on the intervention logic looking first at data on workplace impacts and next on data on health and safety impacts.

5.1.1   Workplace impacts

Workplace impacts are concerned with the changes that take place as a result of implementing the Directive in the individual workplaces. I.e. that the workplaces perform the tasks and live up to the requirements specified in the Directive. As explained in Chapter 3.3 on compliance in this report there is limited data in this regard. Based on the data available, it is assessed that compliance with the Directive is generally at a reasonable level. However, when considering the music and entertainment industry, there is quite strong evidence to suggest that
compliance is low in the sector as whole – probably with a few exceptions of large and well-established orchestras.

The data points to a tendency to focus on hearing protection rather than preventive measures in general – and also in the music and entertainment industry.

5.1.2 Health and safety impacts

Exposure to noise

Figure 5-1 shows data from EWCS on self-reported exposure to noise in the period 1991-2010.

Source: EWCS, question 23 (b)

Most striking in the trends depicted in Figure 5-1 is that reported exposure to noise is very stable throughout the period. The data indicates a slight increase in exposure in the period 2000/2001 - 2005 with the level subsequently dropping back to the level of previous years in 2010. This does give rise to questions on the extent to which the Directive has had an effect. Obviously, it is not known what would have happened without the Directive (the exposure could potentially have increased instead of remaining stable). Considering the indication as shown in Figure 5-1 that 25% of workers are exposed to noise at least 25% of the time, the Directive should be expected to lead to an improvement in this situation, which according to the data has not been the case.

Accidents/injuries related to noise

Table 5-1 shows the available ESAW data on number of accidents at work with more than 3 days of absence and fatal accidents at work involving injuries in the group 'effects of sound, vibration and pressure'.
Table 5-1  
**ESAW data on injuries related to noise, vibration and pressure**

<table>
<thead>
<tr>
<th>Year</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>European Union (27 countries)</td>
<td>2,636</td>
<td>2,298</td>
<td>n.a.</td>
<td>2,552</td>
<td>2,026</td>
</tr>
</tbody>
</table>

Source: ESAW, Accidents at work by type of injury and severity (NACE Rev. 2, A, C-N) [hsw_mi07]

Table 5-1 does not show a clear trend as the number of accidents involving noise, vibration and pressure related injuries has varied over the years for which data is available. It should be noted that data is based on number of accidents and not incidence, meaning that the size of the workforce is not taken into account. Even so, it not likely that a large share of these accidents can be ascribed to noise.

Figure 5-2 shows whether those who answered that they are exposed to noise also mention that they have suffered from hearing problems. The data is consistent over the years (just below 30% indicate that they have suffered from hearing problems) with the exception of the responses in 2010. However, this difference is most likely ascribed to a considerable change in the wording of this question in the survey, which makes the 2010 data effectively incomparable to the other years.

Source: EWCS, question 69

The Labour Force Survey includes self-reported information on health problems related to hearing damage\(^{34}\). Principally, the data is available for 1999, 2007 and 2013, however, the format of the data is different in 1999 and thus not directly

\(^{34}\) Eurostat Table HSW_pb5 and HSW_Healthpb
comparable. The share of persons in the EU-27 who report hearing disorder as a work related health problem is at the same level in 1999 and 2007 (2.1% of those who report a health problem). This corresponds well with the stable trend in exposure to noise as presented above. There is no data for 2013, which makes the data in appropriate for assessing the effect of the Directive in the period 2007-2013.

The data mentioned above consistently shows that males are more exposed to noise and thus also more likely to suffer from hearing damages. There is no statistical data specifically showing the development in exposure to work-related noise or health effects of this exposure in the music and entertainment industry. However, as mentioned above in section 3.3 there are studies which indicate that exposure to noise has not been reduced as a result of the Directive – even in the United Kingdom, which is the Member State generally recognised to be most active in this field.

In the NIRs, some Member States report on the trend with regard to incidence or number of noise related diseases (although not specifically required to). No uniform picture emerges from these reports. Both increases, decreases and stable developments are reported.

Interviews with EU stakeholders show that both workers’ and employers’ organisations on average rate the Directive’s effect in terms of improving health and safety at a medium level (data from 2 interviews with employer organisations and 3 interviews with workers organisations). In respect to the music and entertainment industry, the employers’ organisation (Pearle) considers that the Directive has had an impact in terms of better protection of workers from exposure to noise whereas the workers’ organisation (FIM) considers that the effect in this respect has been little or non-existent. Considering that it was concluded above in section 3.3 that compliance in the sector is low, it is assessed that the effect in terms of protection from exposure to noise and consequent hearing damages in the sector is also low.

**Combined assessment**

As shown in several literature reviews, there is considerable evidence that occupational exposure to noise is associated with hearing damage. Data on the incidence of noise induced hearing loss is limited and weak, but trend data on exposure to noise is relatively strong and provides that levels of exposure have remained fairly stable in the period 1991-2010. The data on health outcomes (although weak) does similarly not indicate a falling trend as could be expected as a result of the implementation of the Directive. Although we do not know what would have happened if the Directive had not been in place (potentially exposure could have increased), the data indicates that the Directive has had limited effect in terms of reducing exposure and noise-induced hearing damages. Data on the music and entertainment industry indicates that the Directive has had little or no effect.

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35 See e.g. WHO: Occupational noise, Environmental Burden of Disease Series, No. 9, 2004 and The Cochrane Collaboration: Interventions to prevent occupational noise-induced hearing loss (review), 2012 (Issue 10)
5.2 EQE2: Derogations and transitional periods

EQE2: What are the effects on the protection of workers’ safety and health of the various derogations and transitional periods foreseen in several of the Directives concerned?

The Noise Directive was to be implemented by the Member States by 15 February 2006, however, Member States were allowed to apply transitional periods in relation to personnel on board sea-going vessels (five years from 15 February 2006) and the music and entertainment sectors (two years from 15 February 2006). The condition in both cases is that the levels of protection already achieved, with regard to personnel in these sectors, are maintained.

The Noise Directive does not provide for any derogations (provisions which explicitly permit Member States to derogate from certain requirements in the Directive).

The data collected for the evaluation shows that 20 out of the 27 Member States have applied the transitional periods and all of the Member States have respected the transitional periods36.

The data from interviews with the two main EU-level organisations representing workers (FIM) and employers (Pearle) in the music and entertainment industry indicates that the transitional period was required in order to develop EU guidance on the implementation of the Directive in the sector. Further, for those countries where a code of conduct was developed, it also seems from this interview data that the transitional period was sufficient. However, as mentioned in section 3.3 it does seem that a code of conduct has not been developed in all Member States.

5.3 EQE3: Effect of Common Processes and Mechanisms

EQE3: How and to what extent do the different Common Processes and Mechanisms that were mapped contribute to the effectiveness of the Directives?

A Cochrane review of interventions to prevent occupational noise-induced hearing loss has explored the issue of implementation of measures37. This review concluded that the evidence to support that hearing loss prevention programmes are an effective means to prevent noise induced hearing loss is unclear. The authors summarised that they found 15 studies with 79986 participants that evaluated the long-term effects of protection against noise exposure in hearing loss.

36 See Country Summary Reports for details.
prevention programmes (HLPP). Here, the use of hearing protection devices in well-implemented HLPP was associated with less hearing loss but this could not be shown for other elements such as worker training or audiometry alone or noise monitoring. Further, they identified six studies with 188 workers, which showed that hearing protection reduced noise exposure of workers about 20 dB(A). However, one high quality study showed that if workers lack proper instructions in the use of earplugs, the attenuation offered is much reduced. The authors concluded that better implementation and reinforcement of hearing loss prevention programmes is needed.

The interview data with EU and Member State stakeholders point to risk assessment, information and health surveillance as the most important CPMs. The interviews thus confirm that the instruments as such are suitable for the purpose. One Member State (NL) in the NIR applauds the Directive for taking a goal-based approach. The data from the review provides a basis for questioning the suitability of focusing on noise measuring and risk assessment alone and an emphasis that this should be complemented with a focus on implementation – or risk management.

As also mentioned above under MQ3 the data suggests that implementation of the Directive relies too much on use of hearing protection devices rather than prevention of exposure to noise, despite that risk assessments are conducted. This can be an important explanatory factor why exposure to noise at work is not being reduced.

Further, given the importance of providing the right instructions in use of hearing protection devices as evidenced by the above review, it is potentially possible that insufficient instructions in use of hearing protection devices could be one important contributing factor to the lack reduction in exposure to noise.

Based on the data from interviews with the two main EU-level stakeholders in the music and entertainment industry, it appears that this industry faces the additional challenge that musicians are often unwilling to wear hearing protection because they consider that it prevents them from performing properly. Further, the data from these two interviews indicates that collective/preventive measures are not sufficiently employed.

5.4  EQE4: Effect of enforcement

EQE4: To what extent do sanctions and other related enforcement activities contribute to the effectiveness of the Directives?

The data from the interviews with EU and Member State stakeholders indicates that enforcement is regarded as important in relation to implementation of the Directive. Some stakeholders emphasise the guiding role of labour inspectorates whereas others regard the sanctions and legal approach as the most effective (most emphasise that it is not a question of one or the other).
Considering that it is found that the exposure to noise at work seems to have remained quite stable during the period of implementation of the Noise Directive, this could indicate that enforcement has not been sufficiently targeted at the issue of noise at work.

The Directive does not set any particular requirements with regard to inspection or enforcement by Member State authorities. However, as mentioned in section 6.2, 19 Member States have ratified the ILO Convention No. 148, which does provide some requirements in this regard. Article 16 of the Convention states that each Member shall:

› (a) by laws or regulations or any other method consistent with national practice and conditions take such steps, including the provision of appropriate penalties, as may be necessary to give effect to the provisions of this Convention;

› (b) provide appropriate inspection services for the purpose of supervising the application of the provisions of this Convention, or satisfy itself that appropriate inspection is carried out.

Such requirements could potentially be considered for the EU OSH legislation, but it is considered that it is more relevant at the level of the Framework Directive rather than as a Directive-specific requirement.

5.5 EQE5: Benefits and costs

EQE5: What benefits and costs arise for society and employers as a result of fulfilling the requirements of the Directives?

This question is not dealt with at the individual directive level. Please refer to the Main report.

5.6 EQE6: Broader impacts

EQE6: To what extent do the Directives generate broader impacts (including side effects) in society and the economy?

This question is not dealt with at the individual directive level. Please refer to the Main Report.

5.7 EQE7: Objective achievement

EQE7: To what extent are the objectives achieving their aims and, if they are not, what cause could play a role? What factors have particularly contributed to the
achievement of the objectives?

The Noise Directive does not include an objective clearly spelled out as part of its articles. Article 1 which concerns itself with the aim and scope of the Directive emphasises the protection of workers from risks to their health and safety arising or likely to arise from exposure to noise and in particular the risk to hearing.

As mentioned above in section 5.1, the data available indicates that there have been no significant changes in the share of workers who are exposed to noise and who report hearing problems. This indicates that the Directive is not entirely fulfilling its objective. It should be considered that it is not known what would have happened without the Directive. Also to be taken into account is that the levels of exposure and hearing problems seem to be fairly stable – and thus not rising – which does indicate that the issue is under a certain level of control.

Even so, it does seem that in order to fulfil the objective of protecting workers entirely from exposure to noise, more focus would be needed on higher compliance with the Directive’s requirements, in particular focusing on risk assessment targeted at noise risks and on implementation of preventive rather than protective measures.
6   Assessment of Coherence

This chapter provides the findings in respect to internal coherence (i.e. coherence between the Noise Directive and the other OSH Directives) in section 6.1, and external coherence (i.e. coherence between the Directive and non-OSH regulation) in section 6.2.

6.1   EQC1: Coherence and complementarity between Directive 2003/10/EC (noise) and the other OSH Directives (Internal coherence)

**EQC1:** What, if any, inconsistencies, overlaps, or synergies can be identified across and between the Directives (for example, any positive interactions improving health and safety outcomes, or negative impact on the burdens of regulation)?

The assessments below are based on the analysis of the evaluation team. The NIRs and interviews with national and EU stakeholders generally did not identify many coherence issues, but in the few instances where they did, they have been considered as part of the judgements below.

**Scope of application**

Directive 2003/10/EC (noise) lays down minimum requirements for the protection of workers from risks to their health and safety arising or likely to arise from exposure to noise and in particular the risk to hearing. These requirements must apply to activities in which workers are or are likely to be exposed to risks from noise as a result of their work.

**Risk assessment**

Directive 2003/10/EC (noise) as the majority of OSH Directives contains provisions on risk assessment. It cross-referes and specifies the provisions of Directive 89/389/EEC (Framework Directive) on risk assessment in order to cover the

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particular risks caused by noise. The risk assessment procedure is very similar to the one set by the other three physical agent directives but also contains specific provisions related to noise (e.g. exposure to impulsive noise, interactions between ototoxic substances and between noise and vibration, availability of hearing protectors with adequate attenuation characteristics). One provision under Directive 2003/10/EC (noise) could however apply to workers exposed to vibration under Directive 2002/44/EC (vibration):

- The employer obligation to give particular attention to the extension of exposure beyond normal working hours under the employer's responsibility.

The extension of exposure beyond normal work hours can also increase the risk from vibration. This is sometimes taken into account by national legislation. The Physical Agents Directives have quite similar approaches to control risks from exposure. All the Directives mention that the risk arising from exposure must be eliminated or reduced to a minimum. They all set two types of management measures derived from the risk assessment procedure depending on either the exceedance of action limit values/action levels, or exceedance of exposure limit values with the exception of Directive 2006/25/EC (artificial optical radiation), which requires employers to take risk management measures only if the risk assessment indicates that exposure limit values may be exceeded and in cases where they are exceeded. Furthermore the content of the risk management measures despite certain specificities for certain physical hazards are quite similar between the four Directives.

It is difficult to consider this as a potential overlap since the risk management measures must be adapted to each specific physical hazard. However, such finding raises the question on whether it would be more coherent to merge part of the four Directives on physical agents that contain quite similar provisions on risk assessment (see above) and the derived risk management measures.

Despite similarities in the risk management measures between the four physical agents, only Directive 2003/10/EC (noise) sets as a follow-up measure to eliminate or reduce exposure to a minimum appropriate work schedules with adequate rest periods. Such requirement could however apply to workers exposed to all physical agents independently of their specificities and level of risk.

Directive 2003/10/EC (noise) like the other physical agent Directives requires that the risk assessment and measurement shall be planned and carried out by competent services at suitable intervals, taking particular account of the provisions of Article 7 of Directive 89/391/EEC concerning the necessary internal or external competent services or persons. This does not create any issue of coherence.

39 For example, the UK Regulation on vibration (The Control of Vibration at Work Regulations 2005) requires that the risk assessment must take into account any extension of exposure at the workplace to whole-body vibration beyond normal working hours, including exposure in rest facilities supervised by the employer.
Directive 2003/10/EC (noise) simply specifies the duties of the services in relation to the risk covered.

Information to workers

In relation to information to be provided to workers, Directive 2003/10/EC includes a ‘without prejudice’ clause referring to the relevant Article of the Framework Directive while containing additional requirements which are relatively general and found in an almost systematic way in all physical agents directives.

Despite the almost identical legal drafting of the information for workers provisions between the four physical agents directives, there are some instances where requirements that could be applicable to all physical agents, are not included in every physical agent directive:

- Only Directive 2003/10/EC (noise) includes a requirement to provide information relating to ‘the nature of the risks’.
- Only Directive 2003/10/EC (noise) and Directive 2006/25/EC (artificial optical radiation) include a requirement on information for workers relevant to the proper/correct use of PPE (see also specific directive report on PPE).
- Finally, only Directive 2013/35/EU (electromagnetic fields) sets a specific information requirement concerning workers at particular risk, as referred to in this Directive (i.e. workers who wear active or passive implanted medical devices, such as cardiac pacemakers, workers with medical devices worn on the body, such as insulin pumps, and pregnant workers).

Training

All four physical agents directives include a common provision for information and training, without distinguishing what should constitute the object of information and what should be part of training. Therefore, the above findings on information for workers also apply as regards training.

Health surveillance

Directive 2003/10/EC (noise) is one of the fourteen directives that set requirements on health surveillance. The relevant provision contains a ‘without prejudice’ clause referring specifically to Article 14 of the Framework Directive while at the same time it establishes more detailed requirements regarding health surveillance.

The health surveillance provisions are very similar to those set by the other three physical agent directives, with the following exceptions:

- Health surveillance to be taken into account in the application of risk management measures. This particular requirement only applies in relation to vibration and not to all physical agents but this difference does not seem to be justified by the scope of the specific Directive and could be extended to the other physical agents directives.
- Workers to be informed by whoever carries out the health surveillance on the results which relate to them personally. This requirement is set in all physical agents directive except Directive 2003/10/EC (noise).
Out of the four physical agents directives, only Directive 2002/44/EC (vibration) and Directive 2006/25/EC (artificial optical radiation) require that the employer shall be informed of any significant findings from the health surveillance, taking into account any medical confidentiality.

Two requirements are included in all physical agents directives with the exception of the Directive 2013/35/EC (electromagnetic fields): the obligation placed on the employer to review the risk assessment on the basis of findings from health surveillance and the requirement for the employer to take into account advice from the persons/authority responsible for health surveillance in implementing risk management (including the possibility to assign alternative work).

Health records
The Framework Directive does not regulate health records, whereas almost all individual directives contain a provision dedicated to health surveillance, including Directive 2003/10/EC (noise). It contains specific requirements and specifications relevant to health records. The relevant requirements are approached in a common way throughout the physical agents Directives, although it should be noted that the (new) electromagnetic fields Directive 2013/35 presents less common elements.

Consultation of workers
Article 9 of Directive 2003/10/EC (noise) provides that, in addition to the general requirements set by Article 11 of the Framework Directive, consultation and participation of workers must cover the assessment of risks and identification of measures to be taken, the actions aimed at eliminating or reducing risks arising from exposure to noise, the choice of individual hearing protectors. Such requirement could overlap with Article 11(2) of the Framework Directive requiring consulting the worker and/or their representatives on the risk assessment. In practice such overlaps does not lead to double regulation.

Limit values
Unlike Directive 2006/25/EC (optical radiation), Directive 2003/10/EC (noise) does not include provisions related to the procedure of adoption of new or amended limit values. The Directive neither mentions how the action values must be amended. It only provides that amendments of a purely technical nature shall be adopted by the Commission in line with:

- the adoption of directives in the field of technical harmonisation and standardisation with regard to the design, building, manufacture or construction of work equipment and/or workplaces;
- technical progress, changes in the most appropriate harmonised European standards or specifications and new findings concerning noise.

The limit values and action levels set under Directive 2013/35/EC (electromagnetic fields) and the risk they cover cannot be compared to the ones under Directive 2006/25/EC (artificial optical radiation) without taking into account any medical confidentiality.

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40 Article 11(2)(c) of the Framework Directive provides that workers shall be consulted in advance and in good time by the employer with regard to the information referred to in Article 9(1) of this Directive. Article 9(1)(a) mentions that the employer must be in possession of an assessment of the risk to safety and health.
2003/10/EC (noise) concerning action values. It is however noteworthy that under Directive 2013/35/EC, the Commission must be empowered to adopt delegated acts under certain conditions amending, in a purely technical way, the Annexes, so as to, among others, make adjustments to the action levels where there is new scientific evidence, provided that employers continue to be bound by the existing emission limit values.

Workers at particular sensitive risk

Directive 2003/10/EC (noise) like the other physical agents Directives requires employers when carrying the risk assessment to give particular attention to any effects concerning the health or safety of workers at particular risk. The Directive, similarly to Directive 2002/44/EC (vibration), requires that pursuant to Article 15 of the Framework Directive, the employer must adapt the measures derived from the risk assessment to the requirements of “workers at particular risk”. Such provisions could overlap with the Framework Directive provisions on workers at particularly sensitive risks. This overlap should however have no consequences since it does not entail double regulation in practice.

Other aspects

Inspection and enforcement measures

Directive 2003/10/EC (noise) does not include any provisions relating to inspections or penalties. It should be noted, however, that out of the four physical agents directives only Directive 2013/35/EU (electromagnetic fields) and Directive 2006/25/EC (artificial optical radiation) provide for adequate penalties to be applicable in the event of infringement of the national transposing legislation. This does not seem to be justified by the scope of the two aforementioned Directives and such requirements should cover the OSH acquis as a whole (see relevant analysis in the Framework Directive report).

6.2 EQC2: Coherence between Directive 2003/10/EC (noise) and other EU measures and policies/international instruments (External coherence)

 Directive 2006/42/EC (machinery) applies to machines and equipment which include interchangeable equipment, safety components, lifting accessories, chains ropes and webbing and removal mechanical transmission devices. In order to be allowed to place machinery and equipment on the market the employer must ensure among others that it complies with relevant health and safety requirements set under Annex I of the Directive. With regard to noise, Annex I to the Directive
provides that machinery and equipment must be designed and constructed in such a way that risks resulting from the emission of airborne noise are reduced to the lowest level, taking account of technical progress and the availability of means of reducing noise, in particular at source. It also requires that machinery and equipment must contain instructions relating to installation and assembly for reducing noise and information on airborne noise emissions.

Therefore employers can rely on information on machinery and equipment noise generated under Directive 2006/42/EC (machinery) where carrying a risk assessment on noise.

Directive 2000/14/EC (noise emission in the environment by equipment for use outdoors) aims at harmonising the Member State legislation relating to noise emission standards conformity assessment procedures, marking, technical documentation and collection of data concerning the noise emission in the environment of equipment for use outdoors. It sets sound power level (SWL) that must not be exceeded by certain types of outdoor equipment (e.g. compaction machines, compressors, construction winches, dozers, dumpers). It also defines the method of measurement of airborne noise emitted by equipment for use outdoor. There is no direct link between this Directive and Directive 2003/10/EC (noise) in the sense that Directive 2000/14/EC sets its own requirements developed through standardisation. There is an indirect link between the two Directives in that the correct application of Directive 2000/14/EC would to some extent reduce workers exposure to noise in line with the OHS Noise Directive.

The 1977 ILO Working Environment (Air Pollution, Noise and Vibration) Convention (No. 148) has been ratified by 19 EU Member States. For the Member States that have ratified an ILO Convention, any more stringent provisions compared to the EU OSH acquis, lead to additional compliance obligations.

The 1977 ILO Working Environment (Air Pollution, Noise and Vibration) Convention (No. 148) applies to all branches of economic activity. Directive 2003/10/EC (noise) applies also in all sectors with no differentiation of workplaces. Overall, there is a consistent approach between the abovementioned ILO instrument and Directive 2003/10/EC (noise). The Convention also lays an obligation to set limit values, adopt preventive and protective measures. It stipulates most of the obligations existing under the Directive e.g. the use of personal protective equipment, health surveillance, information and instructions etc.

It should be noted, however, that some of the minimum requirements established by the Convention are more stringent than the EU acquis; these concern the determination of exposure limits, the obligation to take account of national conditions and resources in promoting research and penalties and inspection.

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41 Note that Article 4(4)(f) requires that employers must give particular attention to information on noise emission provided by manufacturers of work equipment in accordance with the relevant Community directives;

42 European Commission – DG Employment, Social Affairs and Inclusion, Analysis – in the light of the European Union acquis- of the ILO Conventions that have been
Thus, the more stringent provisions in the Convention are not related to the methods to determine limit values but to the participation of stakeholders in the determination of limit values, i.e. there is no link between more stringent ELV in some Member States and the application of the Convention.

classified by the International Labour Organisation as up to date, Luxembourg, 2014, p.90.
7 Conclusions and recommendations

7.1 Relevance

The Noise Directive can be regarded as relevant to approximately 25% of the EU workforce. The Directive has been transposed into national legislation in all Member States. Data from the most recent EWCS indicates that workers report exposure to noise at work at least 25% of the time across all Member States. The Directive can therefore be considered to remain relevant across all Member States.

Although technological change will possibly reduce noise emissions in some circumstances, and economic changes means that many traditionally noisy industries are declining within the EU, it seems likely that exposure to noise will continue for some workers and the Noise Directive will therefore remain relevant for the immediate future. However, some consideration should be given to exploring the possible implications of an aging workforce, both in terms of ‘older ears’ being exposed and of workers working for longer and therefore being exposed to noise for a longer period.

A minority of Member States have adopted lower exposure limit values than those mentioned in the Directive. The evaluation has not found any adjustments to scientific thinking, which would argue for a change in the limit values provided in the Directive.

In its definitions (Article 2) the Directive cites ISO 1999: 1990 in reference to daily and weekly noise exposure levels. Although outside the formal scope of the current review (2007-2012) it should be noted that a new version ISO 1999: 2013 has been published. This new version has made minor changes to the equations relating to these two parameters. However, the changes made will have no material impact on such calculations or therefore on the provisions within the Directive. Nevertheless, it could be relevant to update the Directive to reflect that the most recent version of ISO 1999 should be applied.
7.2 Effectiveness

There is limited data on workplace impacts. Based on the data available, it is assessed that compliance with the Directive is generally at a reasonable level. However, when considering the music and entertainment industry, there is quite strong evidence to suggest that compliance is low in the sector as whole – probably with a few exceptions of large and well-established orchestras. The data indicates that some Member States have put considerable effort into developing comprehensive codes of conduct for the music and entertainment industry whereas others have merely referred to the EU level guidance on the Noise Directive or other guidance and have taken only a limited action in this field.

Data on the incidence of noise induced hearing loss is limited and weak, but trend data on exposure to noise is relatively strong and provides that levels of exposure have remained fairly stable in the period 1991-2010. The data on health outcomes (although weak) does similarly not indicate a falling trend as could be expected as a result of the implementation of the Directive. Although we do not know what would have happened if the Directive had not been in place (potentially exposure could have increased), the data indicates that the Directive has had limited effect in terms of reducing exposure and noise-induced hearing damages. Data on the music and entertainment industry indicates that the Directive has had little or no effect.

This indicates that the Directive is not entirely fulfilling its objective of protecting workers from risks to their health and safety arising or likely to arise from exposure to noise. It should be considered that it is not known what would have happened without the Directive. Also to be taken into account is that the levels of exposure and hearing problems seem to be fairly stable – and thus not rising – which does indicate that the issue is under a certain level of control.

Even so, it does seem that in order to fulfil the objective of protecting workers entirely from exposure to harmful levels noise at work, more focus would be needed on achieving higher compliance with the Directive’s requirements, in particular focusing on risk assessment targeted at noise risks and on implementation of collective/preventive rather than individual/protective measures.

7.3 Coherence

With regard to internal coherence, this section focuses primarily on coherence between Directive 2003/10/EC (noise) and the other three physical agent directives, on vibration, electromagnetic fields and artificial optical radiation. Some inconsistencies have been identified between the four directives in particular with regard to the provisions on risk assessment and derived risk management measures, information, training and health surveillance.

The review of coherence with non-OSH EU instruments has not revealed any overlaps or inconsistencies, but some synergies with Directive 2006/42/EC (machinery) as this Directive includes several requirements which are aimed at ensuring noise reduction from machinery and equipment.
7.4 Recommendations

The evaluation shows that the Directive is generally relevant in its current form. No needs for major revisions – for example concerning exposure limit values - of the Directive have been identified. However, in order to enhance relevance of the Noise Directive, it could be considered to:

› Amend the Directive to refer to the most recent version of ISO 1999.

› Support knowledge building in relation to the aging workforce and the possible implications for regulation of risks of exposure to noise (i.e. to determine needs for future amendments of Directive or of guidance material to take into account the specific risks related to noise exposure and the aging workforce)

The evaluation shows that despite the implementation of the Directive in national legislation in all Member States, the share of workers exposed to noise at work is unchanged during the evaluation period (and not falling as could be expected). This points to a need for more effective implementation of the Directive. In order to enhance effectiveness, it is therefore recommended to:

› Support awareness raising and strengthened inspection and guidance regimes to ensure better implementation of existing requirements in the Directive

The evaluation shows that implementation of the Directive in the music and entertainment sector has been weak and codes of conduct have not been developed by all Member States. It is therefore recommended to:

› Initiate a renewed dialogue with the Member States and the social partners on how to achieve a better implementation of the Directive in the sector

In order to enhance coherence between the Noise Directives and the other physical agents Directives, it could be considered to take the following actions in so far as the structure of Directives remains unchanged:

› Review and streamline the information for workers requirements under the physical agents directives to ensure that they remain consistent across the four physical agents Directives.

› Review the health surveillance provisions to ensure that they remain consistent across the four physical agents Directives. This relates to provisions on consideration of health surveillance in the application of risk management measures, on information to workers on the results which relate to them personally, information to the employer of any significant findings from the health surveillance, obligation to review the risk assessment based on the findings from health surveillance and employer’s obligation to take account of advice from health surveillance bodies.
Ensure that the procedure of adoption/amendment of limit values and action values is clarified and where relevant harmonised with the other physical agents Directives.
Appendix A References


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43 OJ C 28, 3.2 1988, p. 3

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