

# Biological agents and work-related diseases: results of a literature review, expert survey and analysis of monitoring systems

European Risk Observatory  
Annex to a literature Review

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## Annex 1: Methodology scientific literature search

### A. Development of search strategy

A well-defined search strategy was employed, for which the strategy described in the project proposal (see Part C of this annex) was used as a starting point. However, after the first searches showed that the output of these searches was too large to handle, the search strategy was adapted to be able to limit the output to a number that could be handled during the following screening. This included, among other things, a restriction of the search to title and abstract or to title, abstract and keywords. Furthermore, sometimes concepts were combined in a certain way (e.g. searching for biological agents and health effects instead of biological agents and/or health effects). In addition, separate searches were also performed for 'allergens' and 'other biological agents', to be able to perform the screening in a more efficient way.

During the development of the search strategy the search engine PubMed was used as a starting point for the literature screening, after which the search was adapted to fit the requirements of other search engines and databases (see Part D of this annex). The search strategy consisted of the following primary concepts (search strings, #), which are defined in more detail in Part C of this annex:

1. reviews;
2. work-relatedness;
3. adverse health outcomes;
4. biological agents (separate for allergens and other biological agents);
5. publication date;
6. language;
7. monitoring systems;
8. databases;
9. EU Directive 2000/54/EC.

These concepts were combined to gather information on the following subjects:

- health effects or biological agents: ((#1 AND #2 AND (#3 OR #4)) AND #5 AND #6);
- monitoring systems: ((#7 AND #2 AND (#3 OR #4)) AND #6 AND #7);
- databases: ((#8 AND #2 AND (#3 OR #4)) AND #6 AND #7);
- the EU directive: ((#9 AND #2 AND (#3 OR #4)) AND #6 AND #7).

After the initial searches, alternative searches also were used to check the relevance separately in some cases. Furthermore, the searches for information on monitoring systems, databases and the EU directive were not limited to reviews, since this restriction did not result in any output. In addition, the websites of EU-OSHA, OECD and Eurostat were searched for relevant studies.

To check the performance of the search strategy, a set of systematic reviews that were expected to be found was identified (Montano et al., 2014; Haagsma et al., 2012; Walser et al., 2015; Wiggins et al., 2015) to optimise the search strings. 'To illustrate that our search was limited to reviews', although beforehand the paper of Eduard et al. (2012) was expected to be found, this paper was not retrieved with our searches since none of the search terms as defined in the concept 'review' was included in the text or the keywords of this paper.

### B. Initial screening of output literature search

A web-based publication screening tool developed by TNO was used for most of the preliminary check, based on the output of the searches via PubMed and of the Scopus database. This tool was used to record all search queries used, the resulting publication details, the criteria used to select papers to be moved to the next step and the match of each publication to these criteria. It allowed an efficient, traceable and sustainable execution of the screening process by avoiding unnecessary manual handling and recording essential information in a database. Furthermore, it automatically removed the duplicates from the output of the searches via PubMed and of Scopus after the output of the comparable searches was uploaded into the tool.

However, since the output of the searches of the databases OpenGrey and OSH-update could not be exported to a file type that could then be imported into this tool, the output from these databases had to be screened manually. Details of the selected relevant publications were copied to a Word document from OSH-update search results (initial output was HTMS files). Details of the selected relevant publications from the searches of OpenGrey were copied to a Word document directly from output of the individual searches via the OpenGrey website.

An initial screening was performed to check publications retrieved from the literature search for relevance regarding the inclusion criteria, based on title and abstract, before the publications were retrieved and a full evaluation was performed. The following inclusion criteria were applied:

- description of exposure to biological agents and/or description of health effects due to exposure to biological agents in a work-related context;
- the more specific searches for monitoring systems, databases or information on Directive 2000/54/EC, these subjects were added to the first criterion;
- review of existing studies or case reports.

Regarding allergens, papers about food allergens and exotoxins of microorganisms were excluded, because food allergens fall outside the scope of the literature search and the allergenic effects of exotoxins were considered to be of less relevance in an occupational context. Furthermore, exotoxins are included in the search term 'other biological agents' and were thus covered in the literature search as a whole.

After the project team discussed the inclusion criteria and evaluated a small sample of the output based on the inclusion criteria, a project team member performed the screening of papers on 'allergens' and another project team member performed the screening of papers on 'other biological agents'. In cases of uncertainty, the paper was discussed within the project team.

## C. Search strings as described in the project proposal

A summary of the proposed search strategy as presented in the project proposal is given below.

### Groups of search terms (#)

1. For search terms for work-relatedness we will use the strategy developed by Mattioli et al. to find studies on the occupational origin of disease: (occupational diseases [MH] OR occupational exposure [MH] OR occupational exposure\* [TW] OR occupational health OR occupational medicine OR work-related OR working environment [TW] OR at work [TW] OR work environment [TW] OR occupations [MH] OR work [MH] OR workplace\* [TW] OR workload OR occupation\* OR work\* OR work place\* [TW] OR work site\* [TW] OR job\* [TW] OR occupational groups [MH] OR employment OR worksite\* OR industry).
2. Search terms for adverse health effects caused by biological agents (excluding allergenic effects and infectious diseases): "communicable diseases"[MH] OR zoonoses[MH] OR "virus diseases"[MH], "bacterial infections"[MH], parasitic diseases[MH], mycoses[MH] OR "Infectious Disease Transmission, Patient-to-Professional"[MH].
3. Search terms for allergenic effects and infectious diseases caused by biological agents: infection OR infectious OR infectious disease\* OR allergy OR sensitization OR allergen\*.
4. Search terms for biological agents: "environmental microbiology"[MH] OR microorgan\* OR micro-organis\* OR vir\* OR bacteria\* OR fung\* OR mould\* OR parasit\* OR helminth\* OR bioaerosol\* OR air-microbiology OR biological agent\*.
5. For reviews we will use the sensitive search as developed by CRD York: "meta-analysis as topic"[MeSH Terms] OR meta-analysis[pt] OR meta-analysis[tiab] OR review[pt] OR review[tiab] NOT (letter[pt] OR editorial[pt] OR comment[pt]) NOT ("animals"[MeSH Terms:noexp] NOT "humans"[MeSH Terms]).
6. Search terms for monitoring systems "monitoring system"[MH].
7. Search terms for and databases: OR "database"[MH].
8. Search terms for studies of the EU Directive: "EU directive"[TW] OR 2000/54/EC OR "government regulation"[MH] OR "Legislation as topic"[MH].
9. Applied filters:

- a. Publication date between 1 January 2010 and 15 April 2016;
- b. Publication language restricted to English, German, Dutch, French, Danish.

#### Combinations of groups of search terms to answer a certain question

The number of hits represent the initial output of these search terms when applying the search string in PubMed.

- a) Existing information on health problems related to exposure to biological agents: #1 AND (#2 OR #4) AND #5 → 6126 hits;
- b) Identify emerging exposures to biological agents in new professions and new industrial activities: #1 AND #3 AND #4 AND 5 → 2146 hits;
- c) Identify recognised and compensated occupational diseases linked to exposure to biological agents in Europe: #1 AND (#2 OR #3) AND 5 → 7175 hits;
- d) Identify monitoring systems that record occupational diseases linked to exposure to biological agents and describe their limitations: #1 AND (#2 OR #3) AND #6 → 0 hits;
  - o Alternative search: #1 AND #4 AND #6 → 0 hits;
- e) Identify databases that provide systematic information on biological agents and risks to workers and identify and explore existing EU or national datasets which contain information on work-related diseases linked to biological agents and/or exposure to biological agents: #1 AND (#2 OR 3) AND #7 → 0 hits;
  - o Alternative search: #1 AND #4 AND #6 → 0 hits;
- f) Identify major reviews related to the implementation of Directive 2000/54 on the protection of workers from risks related to occupational exposure to biological agents in the European Union: #1 AND (#2 OR 3) AND #8 → 188 hits.

## **D. Final search strings as applied in the different databases**

### ***Information about biological agents and/or health effects***

The proposed search strings are shown below for PubMed. The same keywords but different refinements were used for Scopus and the other databases to limit the publications found to acceptable numbers for review. These are indicated for each database separately in the sections below.

- **Definition of search terms (#):**
  1. Review
    - PubMed: (meta analysis[Publication Type] OR meta analysis[Title/Abstract] OR meta analysis[MeSH Terms] OR review[Publication Type] OR review [Title/Abstract] OR search\*[Title/Abstract])
    - Non-PubMed: (“meta analysis” OR meta-analysis OR review OR search)
  2. Work-related: (occupation\*[tiab] OR worker\*[tiab] OR workplace\*[tiab]) OR job\*[tiab] OR work-related [tiab] OR “working environment”[tiab] OR “work environment”[tiab] OR “work place”[tiab] OR “work places”[tiab] OR “work site”[tiab] OR “work sites”[tiab])
  3. Health effects
    - Allergens: (allergy[Title/Abstract] OR sensitization[Title/Abstract] OR asthma[Title/Abstract] OR rhinitis[Title/Abstract] OR “atopic dermatitis” [Title/Abstract] OR “hypersensitivity pneumonitis” [Title/Abstract] OR HP[Title/Abstract] OR “extrinsic allergic alveolitis”[Title/Abstract] OR EAA[Title/Abstract] OR hypersensitivity[Title/Abstract])

- Other biological agents: (zoonose\*[Title/Abstract] OR “Infectious Disease Transmission” [Title/Abstract] OR “communicable disease” [Title/Abstract] OR “communicable diseases” [Title/Abstract] OR “virus disease” [Title/Abstract] OR “virus diseases” [Title/Abstract] OR “bacterial infection” [Title/Abstract] OR “bacterial infections” [Title/Abstract] OR “parasitic diseases” [Title/Abstract] OR “parasitic diseases” [Title/Abstract] OR mycosis[Title/Abstract] OR mycoses[Title/Abstract] OR infection\*[Title/Abstract] OR “infectious disease” [Title/Abstract] OR “infectious diseases” [Title/Abstract] OR “organic dust toxic syndrome” [Title/Abstract] OR ODTs[Title/Abstract])

#### 4. Biological agents

- Allergens: (allergen\*[Title/Abstract] OR aeroallergen\*[Title/Abstract])
- Other biological agents: (bioaerosol\*[Title/Abstract] OR “biological agents” [Title/Abstract] OR “biological agent” [Title/Abstract] OR “organic dust” [Title/Abstract] OR “organic dusts” [Title/Abstract] OR “environmental microbiology” [MH] OR “air-microbiology” [Title/Abstract] OR microorgan\*[Title/Abstract] OR “micro-organism” [Title/Abstract] OR “micro-organisms” [Title/Abstract] OR “virus” [Title/Abstract] OR bacteria[Title/Abstract] OR fung\*[Title/Abstract] OR yeast\*[Title/Abstract] OR mould\*[Title/Abstract] OR prion\*[Title/Abstract] OR protozoic\*[Title/Abstract] OR “genetically modified organism” [Title/Abstract] OR GMO\*[Title/Abstract] OR parasite\*[Title/Abstract] OR helminth\*[Title/Abstract] OR endotoxin\*[Title/Abstract] OR exotoxin\*[Title/Abstract] OR glucan\*[Title/Abstract] OR mycotoxin\*[Title/Abstract] OR “biological hazard” [Title/Abstract] OR “biological hazards” [Title/Abstract])

5. PubDate: > 2009

6. Language: English OR German OR Dutch OR French OR Danish

#### ▪ **Application/search strategy**

##### **PUBMED:**

- String health effects or biological agents: ((#1 AND #2 AND (#3 OR #4)) AND #5 AND #6)
  - Allergens
  - Other biological agents
- String health effects: #1 AND #2 AND #3 AND #5 AND #6
  - Allergens
  - Other biological agents
- String biological agents: #1 AND #2 AND #4 AND #5 AND #6
  - Allergens
  - Other biological agents
- String health effects and biological agents: #1 AND #2 AND #3 AND #4 AND #5 AND #6
  - Other biological agents

##### **SCOPUS**

For Scopus, first strings #1 to #4 are used, where relevant. Then a selection is made for publication year and language. Since large numbers were found, it was also decided to apply the ‘TITLE-ABS-KEY’ for all key words and to further refine searches with DOCTYPE ‘reviews’.

- String health effects or biological agents: (#3 OR #4) AND #1 AND #2 AND #5 AND #6
  - Allergens
- String health effects and agents: #1 AND #2 AND #3 AND #4 AND #5 AND #6
  - Other biological agents
- String health effects: #1 AND #2 AND #3 AND #5 AND #6
  - Allergens:
- String biological agents: #1 AND #2 AND #4 AND #5 AND #6

- Allergens:
- Other biological agents

## OPENGREY

For OpenGrey, fewer hits are found and, considering the expected types of studies searched for (e.g. theses, reports), #1 (review) was excluded.

- String health effects or biological agents: ((#2 AND (#3 OR #4)) AND #5 AND #6)
  - Allergens
  - Other biological agents
- String health effects: #2 AND #3 AND #5 AND #6
  - Allergens
- String agents: #2 AND #4 AND #5 AND #6
  - Allergens

## OSH-UPDATE

- String health effects or biological agents: ((#1 AND #2 AND (#3 OR #4)) AND #5 AND #6)
  - Allergens
  - Other biological agents
- String health effects: #1 AND #2 AND #3 AND #5 AND #6
  - Allergens
- String biological agents: #1 AND #2 AND #4 AND #5 AND #6
  - Allergens

## ***Information about monitoring systems for biological agents and/or health effects***

The proposed search strings shown below are for searching via PubMed. The same keywords but different refinements were used for Scopus and the other databases to limit the publications found to acceptable numbers for review. These are indicated for each database separately in the sections below.

### ▪ **Definition of search terms (#):**

1. Review: not applicable
2. Work-related: (occupation\*[tiab] OR worker\*[tiab] OR workplace\*[tiab]) OR job\*[tiab] OR work-related [tiab] OR “working environment”[tiab] OR “work environment”[tiab] OR “work place”[tiab] OR “work places”[tiab] OR “work site”[tiab] OR “work sites”[tiab])
3. Health effects:
  - Allergens: (allergy[Title/Abstract] OR sensitization[Title/Abstract] OR asthma[Title/Abstract] OR rhinitis[Title/Abstract] OR “atopic dermatitis” [Title/Abstract] OR “hypersensitivity pneumonitis” [Title/Abstract] OR HP[Title/Abstract] OR “extrinsic allergic alveolitis”[Title/Abstract] OR EAA[Title/Abstract] OR hypersensitivity[Title/Abstract])
  - Other biological agents: (zoonose\*[Title/Abstract] OR “Infectious Disease Transmission” [Title/Abstract] OR “communicable disease” [Title/Abstract] OR “communicable diseases” [Title/Abstract] OR “virus disease” [Title/Abstract] OR “virus diseases” [Title/Abstract] OR “bacterial infection” [Title/Abstract] OR “bacterial infections” [Title/Abstract] OR “parasitic diseases”[Title/Abstract] OR “parasitic diseases” [Title/Abstract] OR mycosis[Title/Abstract] OR mycoses[Title/Abstract] OR infection\*[Title/Abstract] OR “infectious disease”[Title/Abstract] OR “infectious diseases”[Title/Abstract] OR “organic dust toxic syndrome”[Title/Abstract] OR ODTs[Title/Abstract])
4. Biological agents:
  - Allergens: (allergen\*[Title/Abstract] OR aeroallergen\*[Title/Abstract])

- Other biological agents: (bioaerosol\*[Title/Abstract] OR “biological agents”[Title/Abstract] OR “biological agent”[Title/Abstract] OR “organic dust”[Title/Abstract] OR “organic dusts”[Title/Abstract] OR “environmental microbiology”[MH] OR “air-microbiology”[Title/Abstract] OR microorgan\*[Title/Abstract] OR “micro-organism”[Title/Abstract] OR “micro-organisms”[Title/Abstract] OR “virus”[Title/Abstract] OR bacteria[Title/Abstract] OR fung\*[Title/Abstract] OR yeast\*[Title/Abstract] OR mould\*[Title/Abstract] OR prion\*[Title/Abstract] OR protozoic\*[Title/Abstract] OR “genetically modified organism”[Title/Abstract] OR GMO\*[Title/Abstract] OR parasite\*[Title/Abstract] OR helminth\*[Title/Abstract] OR endotoxin\*[Title/Abstract] OR exotoxin\*[Title/Abstract] OR glucan\*[Title/Abstract] OR mycotoxin\*[Title/Abstract] OR “biological hazard”[Title/Abstract] OR “biological hazards”[Title/Abstract])
5. PubDate: > 2009
  6. Language: English OR German OR Dutch OR French OR Danish
  7. Monitoring systems:
    - PubMed: (“monitoring system” [MH] OR monitoring[tiab])
    - Scopus: (“monitoring system”)
    - OpenGrey: (monitoring)
    - OSH Update: (monitoring)

- **Application/search strategy**

**PUBMED:**

- String health effects or biological agents: ((#7 AND #2 AND (#3 OR #4)) AND #5 AND #6)
  - Allergens
  - Other biological agents
- String biological agents: (#7 AND #2 AND #4 AND #5 AND #6)
  - Other biological agents
- String health effects and biological agents: (#7 AND #2 AND #3 AND #4 AND #5 AND #6)
  - Other biological agents

**SCOPUS:**

For Scopus, first strings #2 to #4 are used, where relevant. Then a selection is made for publication year and language. Since large numbers were found, it was decided to apply the ‘TITLE-ABS-KEY’ for all key words.

- String health effects or biological agents: ((#3 OR #4) AND #7 AND #2 AND #5 AND #6)
  - Allergens
  - Other biological agents

**OPENGREY**

- String health effects or biological agents: ((#3 OR #4) AND #7 AND #2 AND #5 AND #6)
  - Allergens
  - Other biological agents

**OSH-UPDATE**

- String health effects or biological agents: ((#7 AND #2 AND (#3 OR #4)) AND #5 AND #6)
  - Allergens
  - Other biological agents

***Information about databases for biological agents and/or health effects***

The proposed search strings shown below are for searching via PubMed. The same keywords but different refinements were used for Scopus and the other databases to limit the publications found to acceptable numbers for review. These are indicated for each database separately in the sections below.

▪ **Definition of search terms (#):**

1. Review: not applicable
2. Work-related: (occupation\*[tiab] OR worker\*[tiab] OR workplace\*[tiab]) OR job\*[tiab] OR work-related [tiab] OR “working environment”[tiab] OR “work environment”[tiab] OR “work place”[tiab] OR “work places”[tiab] OR “work site”[tiab] OR “work sites”[tiab])
3. Health effects:
  - Allergens: (allergy[Title/Abstract] OR sensitization[Title/Abstract] OR asthma[Title/Abstract] OR rhinitis[Title/Abstract] OR “atopic dermatitis”[Title/Abstract] OR “hypersensitivity pneumonitis” [Title/Abstract] OR HP[Title/Abstract] OR “extrinsic allergic alveolitis”[Title/Abstract] OR EAA[Title/Abstract] OR hypersensitivity[Title/Abstract])
  - Other biological agents: (zoonose\*[Title/Abstract] OR “Infectious Disease Transmission”[Title/Abstract] OR “communicable disease”[Title/Abstract] OR “communicable diseases” [Title/Abstract] OR “virus disease” [Title/Abstract] OR “virus diseases” [Title/Abstract] OR “bacterial infection” [Title/Abstract] OR “bacterial infections”[Title/Abstract] OR “parasitic diseases”[Title/Abstract] OR “parasitic diseases”[Title/Abstract] OR mycosis[Title/Abstract] OR mycoses[Title/Abstract] OR infection\*[Title/Abstract] OR “infectious disease”[Title/Abstract] OR “infectious diseases”[Title/Abstract] OR “organic dust toxic syndrome”[Title/Abstract] OR ODTs[Title/Abstract])
4. Biological agents:
  - Allergens: (allergen\*[Title/Abstract] OR aeroallergen\*[Title/Abstract])
  - Other biological agents: (bioaerosol\*[Title/Abstract] OR “biological agents”[Title/Abstract] OR “biological agent”[Title/Abstract] OR “organic dust”[Title/Abstract] OR “organic dusts”[Title/Abstract] OR “environmental microbiology”[MH] OR “air-microbiology”[Title/Abstract] OR microorgan\*[Title/Abstract] OR “micro-organism”[Title/Abstract] OR “micro-organisms”[Title/Abstract] OR “virus”\*[Title/Abstract] OR bacteria[Title/Abstract] OR fung\*[Title/Abstract] OR yeast\*[Title/Abstract] OR mould\*[Title/Abstract] OR prion\*[Title/Abstract] OR protozoic\*[Title/Abstract] OR “genetically modified organism”[Title/Abstract] OR GMO\*[Title/Abstract] OR parasite\*[Title/Abstract] OR helminth\*[Title/Abstract] OR endotoxin\*[Title/Abstract] OR exotoxin\*[Title/Abstract] OR glucan\*[Title/Abstract] OR mycotoxin\*[Title/Abstract] OR “biological hazard”[Title/Abstract] OR “biological hazards”[Title/Abstract])
5. PubDate: > 2009
6. Language: English OR German OR Dutch OR French OR Danish
7. Monitoring systems:
8. Databases:
  - PubMed: (database\*[tiab] OR dataset\*[tiab])
  - Non-PubMed: (database OR dataset OR database\* OR dataset\*)

▪ **Application/search strategy**

**PUBMED:**

- String health effects or biological agents: ((#8 AND #2 AND (#3 OR #4)) AND #5 AND #6)
  - Allergens
  - Other biological agents

- String biological agents: (#8 AND #2 AND #4 AND #5 AND #6)
  - Other biological agents
- String health effects and biological agents: (#8 AND #2 AND #3 AND #4 AND #5 AND #6)
  - Other biological agents

#### SCOPUS:

For Scopus, first strings #2 to #4 are used, where relevant. Then a selection is made for publication year and language. Since large numbers were found, we also decided to apply the 'TITLE-ABS-KEY' for all key words.

- String health effects or biological agents: ((#3 OR #4) AND #8 AND #2 AND #5 AND #6)
  - Allergens
  - Other biological agents

#### OPENGREY

- String health effects or biological agents: ((#3 OR #4) AND #8 AND #2 AND #5 AND #6)
  - Allergens
  - Other biological agents

#### OSH-UPDATE

- String health effects or biological agents: ((#8 AND #2 AND (#3 OR #4)) AND #5 AND #6)
  - Allergens
  - Other biological agents

### ***Information about EU Directive 2000/54/EC***

The proposed search strings shown below are for searching via PubMed. The same keywords but different refinements were used for Scopus and the other databases to limit the publications found to acceptable numbers for review. These are indicated for each database separately in the sections below.

- **Definition of search terms (#):**

1. Review: not applicable
2. Work-related: (occupation\*[tiab] OR worker\*[tiab] OR workplace\*[tiab]) OR job\*[tiab] OR work-related [tiab] OR "working environment"[tiab] OR "work environment"[tiab] OR "work place"[tiab] OR "work places"[tiab] OR "work site"[tiab] OR "work sites"[tiab])
3. Health effects:
  - Allergens: (allergy[Title/Abstract] OR sensitization[Title/Abstract] OR asthma[Title/Abstract] OR rhinitis[Title/Abstract] OR "atopic dermatitis" [Title/Abstract] OR "hypersensitivity pneumonitis" [Title/Abstract] OR HP[Title/Abstract] OR "extrinsic allergic alveolitis"[Title/Abstract] OR EAA[Title/Abstract] OR hypersensitivity[Title/Abstract])
  - Other biological agents: (zoonose\*[Title/Abstract] OR "Infectious Disease Transmission"[Title/Abstract] OR "communicable disease"[Title/Abstract] OR "communicable diseases"[Title/Abstract] OR "virus disease"[Title/Abstract] OR "virus diseases" [Title/Abstract] OR "bacterial infection" [Title/Abstract] OR "bacterial infections" [Title/Abstract] OR "parasitic diseases"[Title/Abstract] OR "parasitic diseases" [Title/Abstract] OR mycosis[Title/Abstract] OR mycoses[Title/Abstract] OR infection\*[Title/Abstract] OR "infectious disease"[Title/Abstract] OR "infectious diseases"[Title/Abstract] OR "organic dust toxic syndrome"[Title/Abstract] OR ODTs[Title/Abstract])
4. Biological agents:
  - Allergens: (allergen\*[Title/Abstract] OR aeroallergen\*[Title/Abstract])
  - Other biological agents: (bioaerosol\*[Title/Abstract] OR "biological agents"[Title/Abstract] OR "biological agent"[Title/Abstract] OR "organic dust"[Title/Abstract] OR "organic dusts"[Title/Abstract])

stract] OR "environmental microbiology"[MH] OR "air-microbiology"[Title/Abstract] OR microorgan\*[Title/Abstract] OR "micro-organism"[Title/Abstract] OR "micro-organisms"[Title/Abstract] OR "virus\*\*"[Title/Abstract] OR bacteria[Title/Abstract] OR fung\*[Title/Abstract] OR yeast\*[Title/Abstract] OR mould\*[Title/Abstract] OR prion\*[Title/Abstract] OR protozoic\*[Title/Abstract] OR "genetically modified organism"[Title/Abstract] OR GMO\*[Title/Abstract] OR parasite\*[Title/Abstract] OR helminth\*[Title/Abstract] OR endotoxin\*[Title/Abstract] OR exotoxin\*[Title/Abstract] OR glucan\*[Title/Abstract] OR mycotoxin\*[Title/Abstract] OR "biological hazard"[Title/Abstract] OR "biological hazards"[Title/Abstract])

5. PubDate: > 2009
6. Language: English OR German OR Dutch OR French OR Danish
7. Monitoring systems: not applicable
8. Databases: not applicable
9. EU Directive 2000/54/EC:
  - PubMed: ("EU directive"[TW] OR 2000/54/EC OR "government regulation"[MH] OR "Legislation as topic"[MH])
  - Non-PubMed: ("EU directive" OR 2000/54/EC OR "government regulation" OR "Legislation as topic")

#### ▪ **Application/search strategy**

##### **PUBMED:**

- String health effects or biological agents: ((#9 AND #2 AND (#3 OR #4)) AND #5 AND #6)
  - Allergens
  - Other biological agents

##### **SCOPUS:**

For Scopus, first strings #2 to #4 are used, where relevant. Then a selection is made for publication year and language. Since large numbers were found, it was decided to apply the 'TITLE-ABS-KEY' for all key words.

- String health effects or biological agents: ((#3 OR #4) AND #9 AND #2 AND #5 AND #6)
  - Allergens
  - Other biological agents

##### **OPENGREY**

- String health effects or biological agents: ((#3 OR #4) AND #9 AND #2 AND #5 AND #6)
  - Allergens
  - Other biological agents

##### **OSH-UPDATE**

- String health effects or biological agents: ((#9 AND #2 AND (#3 OR #4)) AND #5 AND #6)
  - Allergens
  - Other biological agents

## Annex 2: Questionnaire about work-related diseases due to biological agents

Biological agents are microorganisms and other carriers of plant or animal origin, including genetically modified organisms, cell cultures and human endoparasites that can cause (severe) health effects after exposure, such as infection, allergy or toxicity. They can be broadly divided into two groups, namely living (micro)organisms (such as bacteria, viruses, fungi, yeasts and prions) and substances or structures that originate from alive or dead organisms (such as exotoxins, endotoxins, glucans, mycotoxins and allergens).

Worldwide, an estimated 320,000 employees die annually from work-related infectious diseases, 5,000 of them in the EU (Hämäläinen et al., 2007). Thus, a large group of employees is potentially at risk. In Europe, Directive 2000/54/EC (biological agents at work) lays down minimum requirements for the health and safety of workers exposed to biological agents at work. However, knowledge about work-related diseases due to biological agents is limited.

With this questionnaire we intend to identify national monitoring systems, campaigns or projects and reviews on biological agents and work-related diseases caused by exposure to biological agents.

The results will serve as input for a review on diseases caused by biological agents in the workplace funded by the European Agency for Safety and Health at Work (EU-OSHA) (PRU/2015/P/12). The aim of the project is to improve the knowledge and awareness of exposures to biological agents and the related health problems and provide support for a systematic approach to workplace prevention regarding these risk factors at work, identify databases that provide systematic information on biological agents and risks to workers, provide an overview of recognised and compensated occupational diseases linked to exposure to biological agents in Europe, identify monitoring systems that record these diseases, identify major reviews related to the implementation of Directive 2000/54 on the protection of workers from risks related to occupational exposure to biological agents in the European Union, identify and explore existing datasets which contain information on work-related diseases linked to biological agents and/or exposure to biological agents, and identify gaps in data/knowledge.

With this questionnaire we hope to identify initiatives all across Europe. We need your help for this and we ask you kindly to complete this questionnaire.

### Instructions for answering the questions

This questionnaire consists of four parts:

- Part 1 — General questions;
- Part 2 — National monitoring systems, sentinel and alert systems and national health provisions;
- Part 3 — Initiatives on (inter)national level;
- Part 4 — Description of cases.

We do not expect you as a respondent to provide us with a complete (literature) overview. We kindly ask you to use your current knowledge and expertise to answer the questions. We very much appreciate all information we can gather with regard to this topic, and thus also welcome suggestions sent by email.

Furthermore, when answering the questions of this questionnaire we kindly ask you to:

- answer precisely and clearly;
- keep your answers as short as possible;
- answer each question.

In the case of open questions, we kindly ask you to fill in your answer in the accompanying text box. In the case of multiple-choice questions (for instance 'Yes'/'No'), we kindly ask you to select the appropriate answer.

In the final report, all results will be presented anonymously; your input will mainly be presented on the level of the country you represent.

For any questions or suggestions, you can contact [eelco.kuijpers@tno.nl](mailto:eelco.kuijpers@tno.nl)

**Thank you for participating in this research.**

## **Part 1: General questions**

1) Name

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2) For which organisation/company do you work?

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3) What is your current working position(s)? (More answers possible.)

- Researcher
- Policy-maker
- Public administration
- Occupational hygienist
- Occupational physician
- Other, namely: \_\_\_\_\_

4) Country you represent

---

5) Via which network/contact did you receive this questionnaire? (More answers possible.)

- National focal point of EU-OSHA
- Modernet
- Perosh
- EurWORK (Eurofound) network
- Other, namely: \_\_\_\_\_

6) To what extent are you familiar with the topic of biological agents at the workplace?

- Much experience
- Some experience
- No experience

## Part 2: National monitoring systems, sentinel and alert systems and national health provisions

In Europe, various systems are used to monitor/register occupational exposures to substances and/or work-related diseases. Although information on exposure to biological agents and recording of diseases related to these exposures may not cover all exposures in all sectors, it is known that considerable progress has been made on characterising exposures in certain (emerging) professions such as green jobs and home care.

In this part of the questionnaire we focus on existing monitoring systems (7 and 8) in European countries. Furthermore, we would like to get an idea of any (national) sentinel and alert systems (9) and public health provisions (10) that are in place.

**Monitoring/registration systems:** the regular observation and recording of activities taking place in relation to occupational exposures to substances and/or work-related diseases. Existing systems for occupational diseases essentially have two main functions: monitor the trends in prevalence and incidence of occupational diseases and adequately alert to newly occurring occupational or work-related diseases. However, in general the monitoring is primarily aimed at 'established' occupational diseases and are often mainly related and limited to compensation. A number of relevant infectious diseases are covered by (obligatory) recording systems (e.g. blood-borne diseases or tuberculosis) under other systems.

**7) Are you aware of a national monitoring system (or systems) on work-related diseases or accidents in which work-related diseases caused by biological agents are (also) covered? Examples are infectious diseases such as hepatitis B that occur owing to blood contact.**

- Yes
- No → proceed to the following question

*If yes, please answer the following questions for each known monitoring system (max. three) on work-related diseases. If you are familiar with more than three monitoring systems, please specify the three that you consider to be most relevant.*

Monitoring system on work-related diseases 1:

a) Name/description of the system: \_\_\_\_\_

b) Is information gathered with this system publicly available?

- Yes → please provide a reference/website: \_\_\_\_\_
- No

c) In what language is the information from this system made available?

\_\_\_\_\_

d) Do you know which organisation and/or person to contact for further information on this system?

- Yes → please specify: \_\_\_\_\_
- No

e) Do you know in what way the information collected with this system is used (e.g. for research purposes, as input for policy-making, as input for prevention programmes)?

- Yes → please specify: \_\_\_\_\_
- No

Monitoring system on work-related diseases 2:

f) Name/description of the system: \_\_\_\_\_

g) Is information gathered with this system publicly available?

- Yes → please provide a reference/website: \_\_\_\_\_

- No

h) In what language is the information from this system made available?

\_\_\_\_\_

i) Do you know which organisation and/or person to contact for further information on this system?

- Yes → please specify: \_\_\_\_\_
- No

j) Do you know in what way the information collected with this system is used (e.g. for research purposes, as input for policy-making, as input for prevention programmes)?

- Yes → please specify: \_\_\_\_\_
- No

Monitoring system on work-related diseases 3:

k) Name/description of the system: \_\_\_\_\_

l) Is information gathered with this system publicly available?

- Yes → please provide a reference/website: \_\_\_\_\_
- No

m) In what language is the information from this system made available?

\_\_\_\_\_

n) Do you know which organisation and/or person to contact for further information on this system?

- Yes → please specify: \_\_\_\_\_
- No

o) Do you know in what way the information collected with this system is used (e.g. for research purposes, as input for policy-making, as input for prevention programmes)?

- Yes → please specify: \_\_\_\_\_
- No

8) Are you aware of a national monitoring system (or systems) **on worker exposure** in which occupational exposure to biological agents is (also) covered?

- Yes
- No → proceed to the following question

*If yes, please answer the following questions per known monitoring system on worker exposure (max. three). If you are familiar with more than three monitoring systems, please specify the three that you consider to be most relevant.*

Monitoring system on worker exposure 1:

a) Name/description of the system: \_\_\_\_\_

b) Is information gathered with this system publicly available?

- Yes → please provide a reference/website: \_\_\_\_\_
- No

c) In what language is the information from this system made available?

\_\_\_\_\_

d) Do you know which organisation and/or person to contact for further information on this system?

- Yes → please specify: \_\_\_\_\_

- No
- e) Do you know in what way the information collected with this system is used (e.g. for research purposes, as input for policy-making, as input for prevention programmes)?
  - Yes → please specify: \_\_\_\_\_
  - No

Monitoring system on worker exposure 2:

- f) Name/description of the system: \_\_\_\_\_
- g) Is information gathered with this system publicly available?
  - Yes → please provide a reference/website: \_\_\_\_\_
  - No
- h) In what language is the information from this system made available?  
\_\_\_\_\_
- i) Do you know which organisation and/or person to contact for further information on this system?
  - Yes → please specify: \_\_\_\_\_
  - No
- j) Do you know in what way the information collected with this system is used (e.g. for research purposes, as input for policy-making, as input for prevention programmes)?
  - Yes → please specify: \_\_\_\_\_
  - No

Monitoring system on worker exposure 3:

- k) Name/description of the system: \_\_\_\_\_
- l) Is information gathered with this system publicly available?
  - Yes → please provide a reference/website: \_\_\_\_\_
  - No
- m) In what language is the information from this system made available?  
\_\_\_\_\_
- n) Do you know which organisation and/or person to contact for further information on this system?
  - Yes → please specify: \_\_\_\_\_
  - No
- o) Do you know in what way the information collected with this system is used (e.g. for research purposes, as input for policy-making, as input for prevention programmes)?
  - Yes → please specify: \_\_\_\_\_
  - No

**Sentinel and alert systems:** Systems that identify emerging diseases and exposures, identify groups at risk and activities linked to exposure, target prevention, set up evidence-based prevention schemes and obtain trends information on some incidents and diseases. Examples are SHEO (Sentinel Health Event notification in Occupational health), SENSOR (Sentinel Event Notification of Occupational Risks) in the USA and SIGNAAL in the Netherlands.

- 9) Are you aware of a sentinel or alert system (or systems) in which biological agents and/or work-related diseases due to biological agents are covered?
  - Yes

- No → proceed to the following question

*If yes, please answer the following questions per known sentinel/alert system (max. three). If you are familiar with more than three sentinel/alert systems, please specify the three that you consider to be most relevant.*

Sentinel/alert system 1:

- a) Name/description of the system: \_\_\_\_\_
- b) Is information gathered with this system publicly available?
- Yes → please provide a reference/website: \_\_\_\_\_
  - No
- c) Do you know which organisation and/or person to contact for further information on this system?
- Yes → please specify: \_\_\_\_\_
  - No
- d) Do you know in what way the information collected with this system is used (e.g. for research purposes, as input for policy-making, as input for prevention programmes)?
- Yes → please specify: \_\_\_\_\_
  - No

Sentinel/alert system 2:

- e) Name/description of the system: \_\_\_\_\_
- f) Is information gathered with this system publicly available?
- Yes → please provide a reference/website: \_\_\_\_\_
  - No
- g) Do you know which organisation and/or person to contact for further information on this system?
- Yes → please specify: \_\_\_\_\_
  - No
- h) Do you know in what way the information collected with this system is used (e.g. for research purposes, as input for policy-making, as input for prevention programmes)?
- Yes → please specify: \_\_\_\_\_
  - No

Sentinel/alert system 3:

- i) Name/description of the system: \_\_\_\_\_
- j) Is information gathered with this system publicly available?
- Yes → please provide a reference/website: \_\_\_\_\_
  - No
- k) Do you know which organisation and/or person to contact for further information on this system?
- Yes → please specify: \_\_\_\_\_
  - No
- l) Do you know in what way the information collected with this system is used (e.g. for research purposes, as input for policy-making, as input for prevention programmes)?
- Yes → please specify: \_\_\_\_\_
  - No

**(National) public health provisions:** *These include health surveillance systems for individual workers, especially for (groups of) workers that are likely to be exposed to biological agents, guidelines for vulnerable (groups of) workers, or preventive measures like mandatory or voluntary vaccination programmes for (groups of) workers (e.g. hepatitis B vaccination for laboratory or healthcare workers).*

- 10) Are you aware of national public health provisions (e.g. health surveillance of individual workers) that focus on or cover workplace biological agents?
- Yes
  - No → proceed to the following question

*If yes, please answer the following questions per known public health provision system (max. three). If you are familiar with more than three public health provisions, please specify the three that you consider to be most relevant.*

Public health provision 1:

- a) Name/description of the provision: \_\_\_\_\_
- b) Is information gathered with this provision publicly available, e.g. in a regular report?
- Yes → please provide a reference/website: \_\_\_\_\_
  - No
- c) Do you know which organisation and/or person to contact for further information on this provision?
- Yes → please specify: \_\_\_\_\_
  - No
- d) Do you know in what way the information collected with this public health provision is used (e.g. for research purposes, as input for policy-making, as input for prevention programmes)?
- Yes → please specify: \_\_\_\_\_
  - No

Public health provision 2:

- e) Name/description of the provision: \_\_\_\_\_
- f) Is information gathered with this provision publicly available, e.g. in a regular report?
- Yes → please provide a reference/website: \_\_\_\_\_
  - No
- g) Do you know which organisation and/or person to contact for further information on this provision?
- Yes → please specify: \_\_\_\_\_
  - No
- h) Do you know in what way the information collected with this public health provision is used (e.g. for research purposes, as input for policy-making, as input for prevention programmes)?
- Yes → please specify: \_\_\_\_\_
  - No

Public health provision 3:

- i) Name/description of the provision: \_\_\_\_\_
- j) Is information gathered with this provision publicly available, e.g. in a regular report?
- Yes → please provide a reference/website: \_\_\_\_\_
  - No
- k) Do you know which organisation and/or person to contact for further information on this provision?
- Yes → please specify: \_\_\_\_\_

- No
- l) Do you know in what way the information collected with this public health provision is used (e.g. for research purposes, as input for policy-making, as input for prevention programmes)?
  - Yes → please specify: \_\_\_\_\_
  - No

## Part 3: Initiatives at (inter)national level

In this part of the questionnaire we would like to identify relevant national policy or campaigns/strategies in your country. In addition, we would like to get an idea of the availability of national reviews and/or national or local networks of experts that focus on this topic. If you are aware of similar issues on an international level, these can also be mentioned, but this is not the main focus of our questionnaire.

**Policy/regulation:** As stated before, in Europe, Directive 2000/54/EC (biological agents at work) lays down minimum requirements for the health and safety of workers exposed to biological agents at work. This directive classifies biological agents into four risk categories according to their potential to cause diseases and the possibilities of prevention and treatment. The directive also lays down requirements for notification of selected activities to authorities. For workers likely to be exposed to certain biological agents, employers have to keep records including information about exposure and health surveillance. However, these regulations are minimum requirements and have been implemented into national legislation. Some Member States have introduced codes of practice and guidelines for safe handling of biological agents including selected sectors and occupations.

11) Are you aware of national policy with regard to biological agents, beyond the minimum regulations as indicated in Directive 2000/54/EC (e.g. code of practice, standard)?

- Yes
- No → proceed to the following question

If yes, please answer the following questions per known policy (max. three). If you are familiar with more than three policies, please specify the three that you consider to be most relevant.

### Policy 1:

a) Please provide a short description of this policy, including the aim of this policy:

b) Is information on the policy publicly available?

- Yes → please provide a reference/website: \_\_\_\_\_
- No

c) Do you know which organisation and/or person to contact for further information on this policy?

- Yes → please specify: \_\_\_\_\_
- No

### Policy 2:

d) Please provide a short description of this policy, including the aim of this policy:

e) Is information on the policy publicly available?

- Yes → please provide a reference/website: \_\_\_\_\_
- No

f) Do you know which organisation and/or person to contact for further information on this policy?

- Yes → please specify: \_\_\_\_\_
- No

### Policy 3:

g) Please provide a short description of this policy, including the aim of this policy:

h) Is information on the policy publicly available?

- Yes → please provide a reference/website: \_\_\_\_\_

- No
- i) Do you know which organisation and/or person to contact for further information on this policy?
  - Yes → please specify: \_\_\_\_\_
  - No

**Campaign/strategy:** Here we focus on, for instance, campaigns (series of actions or events) focusing on prevention and/or raising awareness of health problems and diseases due to exposure to biological agents at work (e.g. with regard to prevention of needlestick injuries amongst healthcare workers, careful handling of human tissue by laboratory workers), or an inspection campaign with a focus on risks of biological agents in a specific sector/industry.

- 12) Are you aware of national or local campaigns/strategies which focus on the risks of biological agents at work?
- Yes
  - No → proceed to the following question

*If yes, please answer the following questions per known campaign (max. three). If you are familiar with more than three campaigns, please specify the three that you consider to be most relevant.*

Campaign 1:

- a) What is the focus of this campaign/strategy (e.g. aiming at a specific profession or sector, or a specific biological agent)?  
\_\_\_\_\_
- b) Is information about the campaign publicly available?
  - Yes → please provide a reference/website: \_\_\_\_\_
  - No
- c) Do you know which organisation and/or person to contact for further information on this campaign?
  - Yes → please specify: \_\_\_\_\_
  - No

Campaign 2:

- d) What is the focus of this campaign/strategy (e.g. aiming at a specific profession or sector, or a specific biological agent)?  
\_\_\_\_\_
- e) Is information about the campaign publicly available?
  - Yes → please provide a reference/website: \_\_\_\_\_
  - No
- f) Do you know which organisation and/or person to contact for further information on this campaign?
  - Yes → please specify: \_\_\_\_\_
  - No

Campaign 3:

- g) What is the focus of this campaign/strategy (e.g. aiming at a specific profession or sector, or a specific biological agent)?  
\_\_\_\_\_

- h)** Is information about the campaign publicly available?
- Yes → please provide a reference/website: \_\_\_\_\_
  - No
- i)** Do you know which organisation and/or person to contact for further information on this campaign?
- Yes → please specify: \_\_\_\_\_
  - No

- 13)** Are you aware of existing expert networks that pay specific attention to exposure to biological agents at the workplace and/or work-related diseases due to exposure to biological agents? For instance, expert networks that focus on prevention of this type of occupational diseases or raising awareness with regard to this topic or that can be consulted by occupational hygienists or occupational physicians that have a question with regard to this subject.
- Yes
  - No → proceed to the following question

*If yes, please answer the following questions per known network (max. three). If you are familiar with more than three networks, please specify the three that you consider to be most relevant.*

Network 1:

- a)** What is the focus of this network (e.g. a specific profession or sector, or a specific biological agent)?  
\_\_\_\_\_
- b)** Is information on the network publicly available?
- Yes → please provide a reference/website: \_\_\_\_\_
  - No
- c)** Do you know which organisation and/or person to contact for further information on this network?
- Yes → please specify: \_\_\_\_\_
  - No

Network 2:

- d)** What is the focus of this network (e.g. a specific profession or sector, or a specific biological agent)?  
\_\_\_\_\_
- e)** Is information on the network publicly available?
- Yes → please provide a reference/website: \_\_\_\_\_
  - No
- f)** Do you know which organisation and/or person to contact for further information on this network?
- Yes → please specify: \_\_\_\_\_
  - No

Network 3:

- g)** What is the focus of this network (e.g. a specific profession or sector, or a specific biological agent)?  
\_\_\_\_\_
- h)** Is information on the network publicly available?

- Yes → please provide a reference/website: \_\_\_\_\_
  - No
- i) Do you know which organisation and/or person to contact for further information on this network?
- Yes → please specify: \_\_\_\_\_
  - No

- 14)** Are you aware of existing (major) national reports that are published with regard to exposure to biological agents and/or work-related diseases due to exposure to biological agents, or currently ongoing projects that focus on this subject? We are mainly interested in grey literature sources (e.g. reports of reviews performed on this topic, working papers, government documents).
- Yes
  - No → proceed to the following question

*If yes, please answer the following questions per known report/project (max. three). If there are many of these reports or projects present for your country, please specify the three that you consider to be most important/relevant.*

Report/project 1:

a) Name/description of the report/project

\_\_\_\_\_

b) Is this report and/or information of this project publicly available?

- Yes → please provide a reference/website: \_\_\_\_\_
- No

c) Do you know which organisation and/or person to contact for further information on this report or project?

- Yes → please specify: \_\_\_\_\_
- No

Report/project 2:

d) Name/description of the report/project

\_\_\_\_\_

e) Is this report and/or information of this project publicly available?

- Yes → please provide a reference/website: \_\_\_\_\_
- No

f) Do you know which organisation and/or person to contact for further information on this report or project?

- Yes → please specify: \_\_\_\_\_
- No

Report/project 3:

g) Name/description of the report/project

\_\_\_\_\_

h) Is this report and/or information of this project publicly available?

- Yes → please provide a reference/website: \_\_\_\_\_
- No

i) Do you know which organisation and/or person to contact for further information on this report or project?

- Yes → please specify: \_\_\_\_\_
- No

## Part 4: Description of cases

Here we would like to get an idea of reported cases or clusters of occupational exposure to biological agents and/or work-related diseases caused by exposure to biological agents, as well as specific industries, sectors and/or professions that are considered to be (most) at risk. We are therefore asking for your expert opinion/judgement with regard to this topic.

- 15)** Are you aware of reported cases with regard to work-related diseases due to exposure to biological agents (e.g. a case of farmer's lung at a pig farm, organic dust toxic syndrome (ODTS)-related complaints reported in a vegetable seed plant or hypersensitivity pneumonitis reported amongst dental workers)?

- Yes
- No → proceed to the following question

*If yes, please answer the following questions per known case (max. three). If there are many of these cases described in your country, please specify the three cases that you consider to be most important/relevant.*

### Case 1:

- a)** Please give a short description of this case.

\_\_\_\_\_

- b)** Can you provide us with a reference for this case?

- Yes → please provide a reference/website: \_\_\_\_\_
- No

- c)** Do you know which organisation and/or person to contact for further information on this case?

- Yes → please specify: \_\_\_\_\_
- No

### Case 2:

- d)** Please give a short description of this case.

\_\_\_\_\_

- e)** Can you provide us with a reference for this case?

- Yes → please provide a reference/website: \_\_\_\_\_
- No

- f)** Do you know which organisation and/or person to contact for further information on this case?

- Yes → please specify: \_\_\_\_\_
- No

### Case 3:

- g)** Please give a short description of this case.

\_\_\_\_\_

- h)** Can you provide us with a reference for this case?

- Yes → please provide a reference/website: \_\_\_\_\_
- No

- i) Do you know which organisation and/or person to contact for further information on this case?
- Yes → please specify: \_\_\_\_\_
  - No

*An 'emerging occupational safety and health (OSH) risk' is often defined as any occupational risk that is both new and increasing. The risk is new if it was previously unknown and is caused by new processes, new technologies, new types of workplaces or social or organisational change; or a long-standing issue is newly considered to be a risk due to changes in social or public perceptions; or new scientific knowledge allows a long-standing issue to be identified as a risk. The risk is increasing if the number of hazards leading to the risk is growing; or the likelihood of exposure to the hazard leading to the risk is increasing (exposure level and/or the number of people exposed); or the effect of the hazard on the worker's health is getting worse (seriousness of health effects and/or the number of people affected).*

16) For which occupation(s) do you consider exposure to biological agents at the workplace to be an emerging risk, for which more awareness should be generated? (More answers possible.)

- Waste treatment (including composting)
- Wastewater treatment (including sewage)
- Biotechnology
- Laboratories (including laboratory animal workers)
- Healthcare (human and veterinary)
- Education (schools)
- Child care/day care
- Agriculture
- Food processing
- Outdoor workers
- Workers travelling to other countries as part of their work
- Wood industry
- Detergent industry
- Metal industry (metalworking fluids)
- Other, namely: \_\_\_\_\_
- Not applicable

-

17) Which biological agent (or agents) do you consider to be most important (and therefore for instance should be taken into account in specific campaigns on this subject in the (near) future), and why?

- Not applicable → proceed to the following question
- Biological agent I: \_\_\_\_\_ Why? \_\_\_\_\_
- Biological agent II: \_\_\_\_\_ Why? \_\_\_\_\_
- Biological agent III: \_\_\_\_\_ Why? \_\_\_\_\_
- Biological agent IV: \_\_\_\_\_ Why? \_\_\_\_\_
- Biological agent V: \_\_\_\_\_ Why? \_\_\_\_\_

18) Which work-related disease (or diseases) caused by a biological agent do you consider to be most important (and therefore for instance should be taken into account in specific campaigns on this subject in the (near) future), and why?

- Not applicable → proceed to the following question
- Work-related disease I: \_\_\_\_\_ Why? \_\_\_\_\_
- Work-related disease II: \_\_\_\_\_ Why? \_\_\_\_\_

- Work-related disease III: \_\_\_\_\_ Why? \_\_\_\_\_
- Work-related disease IV: \_\_\_\_\_ Why? \_\_\_\_\_
- Work-related disease V: \_\_\_\_\_ Why? \_\_\_\_\_

19) Do you have any other issues with regard to this topic which need to be mentioned?

- Yes, namely: \_\_\_\_\_
- No

**We thank you for your help by completing this questionnaire.**

## Annex 3: List of papers that met inclusion criteria

### 3A Reviews of biological agents (excluding allergens)

- Adam, B.D., 2011. Epistemic fault lines in biomedical and social approaches to HIV prevention. *J. Int. AIDS Soc.* 14, 1–9. doi:10.1186/1758-2652-14-S2-S2
- Adler, B., de la Peña Moctezuma, A., 2010. *Leptospira* and leptospirosis. *Vet. Microbiol.* 140, 287-296. doi:10.1016/j.vetmic.2009.03.012
- Aguilar-Díaz, F.D.C., Jiménez-Corona, M.E., Ponce-de-León-Rosales, S., 2011. Influenza vaccine and healthcare workers. *Arch. Med. Res.* 42, 652-657. doi:10.1016/j.arcmed.2011.12.006
- Ahmed, A., Al-Mekhlafi, H.M., Surin, J., 2011. Epidemiology of soil-transmitted helminthiases in Malaysia. *Southeast Asian J. Trop. Med. Public Heal.* 42, 527-538.
- Alavi, S.M., Hajiani, E., 2011. Hepatitis C infection: A review on epidemiology and management of occupational exposure in healthcare workers for general physicians working in Iranian health network setting. *Jundishapur J. Microbiol.* 4, 1-9.
- Alavi, S.M., Alavi, L., 2013. Review on epidemiology, diagnosis, occupational hazards and management of pulmonary tuberculosis in elderly: A guide for general physicians working in the health network setting, Khuzestan, Iran. *Jundishapur J. Microbiol.* 6, 1-5. doi:10.5812/jjm.6677
- Alavi, S.M., Motlagh, M.E., 2012. A review of epidemiology, diagnosis and management of brucellosis for general physicians working in the Iranian health network. *Jundishapur J. Microbiol.* 5, 384-387.
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## Annex 4: Detailed overview of questionnaire results

### Data on the respondents

Table A4-1: Overview of characteristics of questionnaire respondents

Resp. no	No within country	Country	Occupation	Organisation	Level of experience	Network
1	1	Albania	Other	State Labour Inspectorate and Social Services	Some	EurWORK
2	1	Austria	Public administration	Social Ministry	Some	EU-OSHA focal points
3	2	Austria	Occupational hygienist	AUVA	Much	PEROSH
4	3	Austria	Public administration/occupational physician	AUVA	Some	Other
5	4	Austria	Occupational physician	AUVA	None	PEROSH
6	5	Austria	Occupational physician/other	AUVA	Some	PEROSH
7	6	Austria	Occupational physician	AUVA	Some	Other
8	7	Austria	Occupational physician/public administration	Federal Ministry of Labour, Social Affairs and Consumer Protection	Much	EU-OSHA focal points
9	8	Austria	Other	FCIO/WKO	Much	EU-OSHA focal points
10	1	Belgium	Policy-maker	Not specified	Much	EU-OSHA focal points
11	2	Belgium	Not specified	Not specified	Not specified	Not specified
12	1	Bulgaria	Public administration	Ministry of Labour and Social Policy	Some	EU-OSHA focal points

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Resp. no	No within country	Country	Occupation	Organisation	Level of experience	Network
13	1	Cyprus	Policy-maker/occupational physician	Department of Labour Inspection	Much	EU-OSHA focal points
14	1	Czechia	Researcher	National Institute of Public Health	Some	Modernet
15	1	Denmark	Policy-maker/public administration	Danish Working Environmental Authority	Much	EU-OSHA focal points
16	2	Denmark	Researcher	National Research Centre for the Working Environment (NRCWE)	Much	PEROSH
17	3	Denmark	Researcher	Aarhus University and National Research Centre for the Working Environment (NRCWE)	Much	EU-OSHA focal points
18	1	Estonia	Public administration	Labour Inspectorate	Some	EU-OSHA focal points
19	1	Finland	Public administration/occupational physician	Ministry of Social Affairs and Health	Much	Modernet
20	2	Finland	Researcher	Finnish Institute of Occupational Health	Some	PEROSH
21	1	France	Public administration	ANSES	Some	EU-OSHA focal points
22	1	Germany	Researcher/policy-maker/occupational physician	Institute for Prevention and Occupational Medicine of the German Social Accident Insurance/Institute of the Ruhr-University (Bochum)	Much	Modernet

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Resp. no	No within country	Country	Occupation	Organisation	Level of experience	Network
23	2	Germany	Researcher	Federal Institute for Occupational Safety and Health (Bundesanstalt für Arbeitsschutz und Arbeitsmedizin, BAuA)	Some	EU-OSHA focal points/other
24	1	Greece	Policy-maker/public administration	Ministry of Labour, Social Security and Social Solidarity/Greek FOP of EU-OSHA	Some	EU-OSHA focal points
25	1	Hungary	Occupational hygienist	Ministry for National Economy	Much	EU-OSHA focal points
26	2	Hungary	Researcher/public administration/occupational hygienist/occupational physician	Office of the Chief Medical Officer — Department of Occupational Health	Much	EU-OSHA focal points
27	1	Ireland	Occupational physician	Health Service Executive	Much	Modernet
28	2	Ireland	Policy-maker/public administration	Health and Safety Authority	Some	EU-OSHA focal points
29	1	Italy	Researcher/occupational physician	University of Cagliari	Much	Modernet
30	2	Italy	Researcher	University of Milan	Some	Modernet
31	3	Italy	Researcher	Campo	Some	Not specified
32	4	Italy	Occupational physician/other	University of Cagliari	Much	Modernet
33	5	Italy	Public administration	Not specified	Much	EU-OSHA focal points

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Resp. no	No within country	Country	Occupation	Organisation	Level of experience	Network
34	1	Latvia	Other	State Labour Inspectorate	Some	EU-OSHA focal points
35	1	Lithuania	Public administration/occupational hygienist	State Labour Inspectorate	Some	EU-OSHA focal points
36	1	Luxembourg	Occupational physician	STM	Some	Modernet
37	2	Luxembourg	Occupational physician	Division de la santé au travail et de l'environnement	Much	EU-OSHA focal points
38	1	Malta	Occupational physician	OHSA	Some	EU-OSHA focal points
39	1	Netherlands	Other	TNO	None	EU-OSHA focal points
40	2	Netherlands	Occupational hygienist	Directorate of Personnel and Organisation, University Medical Centre	Much	EU-OSHA focal points
41	3	Netherlands	Policy-maker/occupational physician	National Institute for Public Health and the Environment (RIVM), at the National Coordination Centre for communicable disease control	Some	Other
42	4	Netherlands	Occupational physician	AMC	Much	EU-OSHA focal points
43	1	Poland	Researcher	National Research Institute	Much	PEROSH
44	1	Portugal	Researcher/public administration/occupational physician/other	Authority for Working Conditions (ACT)	Some	EU-OSHA focal points

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Resp. no	No within country	Country	Occupation	Organisation	Level of experience	Network
45	1	Slovakia	Researcher	Institute for Labour and Family Research	Some	EurWORK
46	2	Slovakia	Policy-maker/occupational hygienist/occupational physician	Public Health Authority of the Slovak Republic	Much	EU-OSHA focal points
47	1	Spain	Researcher/public administration	INSHT	Much	EU-OSHA focal points, PEROSH
48	2	Spain	Occupational hygienist	INSHT	Much	PEROSH
49	3	Spain	Other	INSHT	Some	EU-OSHA focal points
50	4	Spain	Researcher/occupational physician	University of Zaragoza	Some	Modernet
51	1	Sweden	Public administration	Swedish Work Environment Authority	Much	EU-OSHA focal points
52	1	United Kingdom	Occupational physician	Health and Safety Laboratory (HSL)	Some	PEROSH
53	2	United Kingdom	Other	Health and Safety Laboratory (HSL)	Much	PEROSH
54	3	United Kingdom	Policy-maker	Health and Safety Executive (HSE)	Much	EU-OSHA focal points
55	1	Macedonia	Researcher	Medical Faculty	Some	Modernet
56	1	Norway	Researcher	National Institute of Occupational Health (NIOH/STAMI)	Much	PEROSH

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Resp. no	No within country	Country	Occupation	Organisation	Level of experience	Network
57	2	Norway	Occupational physician	Norwegian Labour Inspection Authority	Much	Modernet
58	3	Norway	Researcher/occupational physician/other	National Institute of Occupational Health (NIOH/STAMI)	Some	Modernet
59	4	Norway	Policy-maker/public administration	Norwegian Labour Inspection Authority	Much	EU-OSHA focal points
60	5	Norway	Researcher/occupational physician	National Institute of Occupational Health (NIOH/STAMI)	Much	Modernet
61	1	Switzerland	Public administration	SECO	Much	EU-OSHA focal points
62	2	Switzerland	Researcher	Suva	Some	Modernet

## National monitoring systems, sentinel and alert systems and national health provisions

### National monitoring systems on diseases and accidents

Table A4-2: Overview of national monitoring system (or systems) on work-related diseases or accidents in which work-related diseases caused by biological agents are (also) covered as indicated by respondents (showing only the individual response of respondents who indicated that they know one or more system) (question 7)

Resp. no	Country	Name/description of system	Information publicly available	Language	Organisation and/or person to contact for further info.	Way the information collected is used	Assigned category (see Table 12)
4	AT	Registration of occupational diseases	No	German	Austrian Workers Compensation Board, Department for Statistics	Prevention, compensation	Registration of occupational diseases
6	AT	List of occupational diseases	<a href="http://www.auva.at">www.auva.at</a>	German; some parts in English	AUVA	Input for prevention	Registration of occupational diseases
7	AT	Labour inspection	<a href="http://www.arbeitsinspektion.gv.at/">www.arbeitsinspektion.gv.at/</a>	German	Arbeitsinspektorat	Input for prevention programmes and for policy-making	Labour Inspectorate
8	AT	Recognised occupational disease	<a href="http://www.auva.at/portal27/portal/auvapor-tal/content/contentWindow?contentid=10007.671002&amp;action=2">http://www.auva.at/portal27/portal/auvapor-tal/content/contentWindow?contentid=10007.671002&amp;action=2</a>	German	AUVA	Insurance	Registration of occupational diseases
9	AT	Work-related diseases listed by obligatory occupational health insurance (AUVA)	<a href="http://www.auva.at/portal27/portal/auvapor-tal/content/contentWindow?&amp;content-">http://www.auva.at/portal27/portal/auvapor-tal/content/contentWindow?&amp;content-</a>	German	AUVA	Prevention programmes	Registration of occupational diseases

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Resp. no	Country	Name/description of system	Information publicly available	Language	Organisation and/or person to contact for further info.	Way the information collected is used	Assigned category (see Table 12)
			<a href="https://tid=10008.541831&amp;action=b&amp;cacheability=PAGE">tid=10008.541831&amp;action=b&amp;cacheability=PAGE</a>				
10	BE	Fund for occupational diseases (fonds voor Beroepsziekten)		Dutch, French	No	No	Fund for occupational diseases
11	BE	Fund for occupational diseases (Fonds voor de Beroepsziekten)	<a href="http://www.fbz.be">www.fbz.be</a>	Dutch, French	Fonds voor de beroepsziekten	No	Fund for occupational diseases
12	BG	Occupational diseases system	<a href="http://www.nssi.bg">www.nssi.bg</a>	Bulgarian	National Social Security Institute	Policy-making	Registration of occupational diseases
13	CY	National system for the notification of OD. According to Safety and Health (Notification of Occupational Diseases) Regulations currently enforced in Cyprus, every doctor who diagnoses an occupational disease (OD) to a worker or suspects that a worker is suffering from OD, is obliged to notify the disease to the Department of Labour Inspection. This system allows monitoring of ODs including also diseases from biological agents that are included in their European List of ODs (Annex I and II). The same obligation applies to the employer, if the employer has information or a medical report from the examining phy-	<a href="http://www.mlsi.gov.cy/dli">www.mlsi.gov.cy/dli</a>	Greek, English	Department of Labour Inspection/Advisor Occupational Physician, Dr Athanasios Athanasiou info@dli.mlsi.gov.cy/aathanasiou@dli.mlsi.gov.cy	Information collected with this system is used as input for policy-making, as input for inspections at workplaces where affected workers have been exposed to hazardous agents and as input to enforce protective and preventive measures in compliance with the legislation	Registration of occupational diseases

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Resp. no	Country	Name/description of system	Information publicly available	Language	Organisation and/or person to contact for further info.	Way the information collected is used	Assigned category (see Table 12)
		<p>sician that his employee is suffering from OD or a disease that might be of occupational origin. Due to underreporting of ODs, only very few ODs have been recorded so far.</p> <p>The annual report of the Department of Labour Inspection contains information on notified ODs and any other diseases that have been investigated by the advisor occupational physician and labour inspectors as of possible occupational origin. This report is published on the website of the Department of Labour Inspection</p>					
14	CZ	Czech National Registry of Occupational Diseases	<a href="http://www.szu.cz/publikace/data/nemoci-z-povolani">http://www.szu.cz/publikace/data/nemoci-z-povolani</a>	Czech, English	I am able to provide more information or to mediate contact on a competent person	Everything mentioned in the question	Registration of occupational diseases
15	DK	Registry of occupational diseases and health-damaging exposures	<a href="http://arbejdstil-synet.dk/da/statistik/arbejdsskader/arbejdsskader-arsopgorelser">http://arbejdstil-synet.dk/da/statistik/arbejdsskader/arbejdsskader-arsopgorelser</a>	Danish	The Danish Working Environmental Authority, att. Birgit Bülow	The data are used to make the right strategy for planning inspections and other prevention initiatives, also in some degree for policy-making	Registration of occupational diseases

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Resp. no	Country	Name/description of system	Information publicly available	Language	Organisation and/or person to contact for further info.	Way the information collected is used	Assigned category (see Table 12)
15	DK	Registry of occupational accidents	<a href="http://arbejdstil-synet.dk/da/statistik/ar-bejdsskader/ar-bejdsskader-arsop-gorelser">http://arbejdstil-synet.dk/da/statistik/ar-bejdsskader/ar-bejdsskader-arsop-gorelser</a>	Danish	Working Environment Authority, att. Anders Christensen	The data are used to make the right strategy for planning inspections and other prevention initiatives, also in some degree for policy-making	Registration of occupational accidents/injuries
16	DK	MRSA	No	Danish	No	No	Specific agent/effect (MRSA)
17	DK	The National Board of Industrial Injuries	<a href="http://www.ask.dk/da/English.aspx">http://www.ask.dk/da/English.aspx</a>	Danish, to some extent English and Turkish	The National Board of Industrial Injuries	Policy-making and prevention programmes	Registration of occupational accidents/injuries
17	DK	Statens Serum Institut	<a href="http://www.ssi.dk/Smitteberedskab.aspx">http://www.ssi.dk/Smitteberedskab.aspx</a>	Danish, to some extent English	Statens Serum Institut	Surveillance, prevention and to some extent research	Surveillance studies/programme
18	EE	Labour Inspectorate database. Notifications of diagnosis of a work-related illness come from occupational health doctors. All notifications are registered in Labour Inspectorate database. Labour Inspectorate exchanges information with Health Board. From the Health Board website, you can find occupational diseases and work-related illnesses analyses, where the diagnoses of occupa-	No	Estonian	Labour Inspectorate; Health Board	Research purposes, as input for policy-making	Registration of occupational diseases

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Resp. no	Country	Name/description of system	Information publicly available	Language	Organisation and/or person to contact for further info.	Way the information collected is used	Assigned category (see Table 12)
		tional healthcare doctors are mentioned (including those caused by biological hazards) <a href="http://terviseamet.ee/tervishoid/toeoeter-vishoid/aruated.html">http://terviseamet.ee/tervishoid/toeoeter-vishoid/aruated.html</a>					
19	FI	The Register of Occupational Diseases	Annual reports: <a href="https://www.julkari.fi/handle/10024/126928">https://www.julkari.fi/handle/10024/126928</a>	Finnish; 2012 also in English	Finnish Institute of Occupational Health	For research purposes, as input for policy-making, as input for prevention programmes	Registration of occupational diseases
19	FI	Physicians' reports to OSH inspection administration	No	(Missing)	Riitta Sauni, Ministry of Social Affairs and Health	To target OSH inspections of the workplaces	Labour Inspectorate
20	FI	FROD	<a href="http://www.ttl.fi">www.ttl.fi</a>	Finnish, Swedish, English	FIOH	FIOH as a national diagnostic centre for occupational diseases and the occupational medicine clinic of the Helsinki University Central Hospital	Diagnostic centre for occupational diseases
21	FR	National health insurance system/statistics on occupational diseases and work injuries	<a href="http://www.risquesprofessionnels.ameli.fr/statistiques-et-analyse/sinistralite-atmp.html">http://www.risquesprofessionnels.ameli.fr/statistiques-et-analyse/sinistralite-atmp.html</a>	French	Direction of occupational risks	Input for prevention programme in relation with occupational health services	Health insurance system

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Resp. no	Country	Name/description of system	Information publicly available	Language	Organisation and/or person to contact for further info.	Way the information collected is used	Assigned category (see Table 12)
21	FR	Institute for health surveillance/work-related diseases surveillance programme	Institute for health surveillance website	French	Health at work department	Information given to the General Direction of Labour (French Ministry)	Surveillance studies/program
21	FR	ANSES/national network for monitoring and prevention of occupational diseases (rnv3p)	ANSES website	French, some in English	Rnv3p team, Melina Lebarbier	Reporting and alert about emergent cases and diseases to ministries and prevention organisations or agencies	Registration of occupational diseases
22	DE	German Social Accident Insurance	<a href="http://www.dguv.de">www.dguv.de</a>	German	No	No	Registration of occupational accidents/injuries
22	DE	LASI	<a href="http://www.lasi-info.com">www.lasi-info.com</a>	German	No	No	Unknown
22	DE	RKI	<a href="http://www.rki.de">www.rki.de</a>	German	No	No	Unknown
23	DE	Mandatory notification of infectious diseases <sup>(1)</sup> , also covers occupational infections, even though these cases are not necessarily specified as work-related diseases; doctors are obliged to report cases of certain infectious diseases (out of a list of infectious diseases) to the local authority. The concerned diseases represent a particularly high risk for	Available at the Robert Koch Institute (RKI) <a href="http://www.rki.de">www.rki.de</a> <a href="http://www.rki.de/DE/Content/Infekt/Jahrbuch/jahrbuch_node.html">www.rki.de/DE/Content/Infekt/Jahrbuch/jahrbuch_node.html</a> <a href="http://www.rki.de/DE/Content/Infekt/IfSG/Meldeboegen/Meldungen_node.html">www.rki.de/DE/Content/Infekt/IfSG/Meldeboegen/Meldungen_node.html</a>	German, partly English	Robert Koch Institute <a href="http://www.rki.de/EN/Service/Contact/Contact_node.html">www.rki.de/EN/Service/Contact/Contact_node.html</a>	Cure and prevention of infectious diseases, epidemiological analysis, policy consultation, consultation on preventive measures	Registration of infectious diseases

<sup>(1)</sup> Meldepflicht bei Infektionskrankheiten

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Resp. no	Country	Name/description of system	Information publicly available	Language	Organisation and/or person to contact for further info.	Way the information collected is used	Assigned category (see Table 12)
		public health and in case of zoonoses also for animal health.					
23	DE	Mandatory notification of suspected occupational diseases <sup>(2)</sup> ; doctors are obliged to report suspects and employers are obliged to report indications of occupational diseases to the accident insurance. Mandatory notification is based on the social act VII (SGB VII).	Available at the Federal Institute for Occupational Safety and Health (BAuA) <a href="http://www.baua.de/de/Informationen-fuer-die-Praxis/Statistiken/Berufskrankheiten/Berufskrankheiten.html">www.baua.de/de/Informationen-fuer-die-Praxis/Statistiken/Berufskrankheiten/Berufskrankheiten.html</a> <a href="http://www.baua.de/de/Publikationen/Fachbeitraege/Suga-2014.html">http://www.baua.de/de/Publikationen/Fachbeitraege/Suga-2014.html</a>	German, partially English	German Accident Insurance (Deutsche Gesetzliche Unfallversicherung (DGUV)) <a href="http://www.dguv.de">www.dguv.de</a> . Federal Institute for Occupational Safety and Health (BAuA) <a href="http://www.baua.de/en/Service/Contact/Contactform.html">www.baua.de/en/Service/Contact/Contactform.html</a>	Cure, prevention and compensation of occupational diseases, research, policy consultation, implementation of regulations and measures to improve work conditions	Registration of occupational diseases
23	DE	National Health Monitoring, issues also occupational diseases	Available at the Robert Koch Institute (RKI) <a href="http://www.rki.de/EN/Content/Health_Monitoring/Health_Reporting/HealthInGermany/health_germany_node.html">www.rki.de/EN/Content/Health_Monitoring/Health_Reporting/HealthInGermany/health_germany_node.html</a> <a href="http://www.rki.de/DE/Content/Gesundheitsmonitoring/Health_Monitoring/Health_Reporting/HealthInGermany/health_germany_node.html">www.rki.de/DE/Content/Gesundheitsmonitoring/Health_Monitoring/Health_Reporting/HealthInGermany/health_germany_node.html</a>	German, English	Robert Koch Institute <a href="http://www.rki.de/EN/Service/Contact/Contact_node.html">www.rki.de/EN/Service/Contact/Contact_node.html</a>	Prevention, research, regulative policies	Surveillance studies/programme

<sup>(2)</sup> Meldepflicht bei Verdacht auf Berufskrankheiten

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Resp. no	Country	Name/description of system	Information publicly available	Language	Organisation and/or person to contact for further info.	Way the information collected is used	Assigned category (see Table 12)
			<a href="http://ing/Gesundheitsberichterstattung/GesInDtId/GesInDtId_node.html">ing/Gesundheitsberichterstattung/GesInDtId/GesInDtId_node.html</a>				
24	EL	Occupational diseases registration system (Greek Labour Inspectorate). The Greek Labour Inspectorate receives information from occupational physicians, hospitals and social security services concerning work related diseases, including those due to biological agents. The declaration is based on the list of occupational diseases included in the Recommendation No 194/2002, which was transposed into the national legislation framework with the Presidential Degree 41/2012. A database with the reported cases (including diseases caused by biological agents) is used in order to decide strategies and/or any other necessary interventions at the workplaces.	No	Greek	Greek Labour Inspectorate Central Authority — Directorate for OSH Inspections Planning and Coordination Contact details: Mrs Chryssa Toufekoula ctoufekoula@gmail.com, ctoufekoula@ypakp.gr)/ Mrs Daniela Vamvaka (vamvaka@ypakp.gr) 10 Agisilaou str., GR - 104 37, Athens, Greece tel.: 0030-210-52 89 184 Fax: 0030-210-52 31 201	OSH strategy and policies planning, decision-making and/or for any other necessary intervention planning at the workplaces	Registration of occupational diseases
24	EL	National Mandatory Notification System for Communicable Diseases (Hellenic Centre for Disease Control and Prevention-(HCDCP)). The National Manda-	www.keelpno.gr	Greek	Hellenic Centre for Disease Control and Prevention (HCDCP), Dr. Theano Georgakopoulou, M.D., Head of the Dept.	Epidemiological surveillance and systematic monitoring of infectious diseases, analysis and interpretation of the collected	Registration of infectious diseases/surveillance programme

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Resp. no	Country	Name/description of system	Information publicly available	Language	Organisation and/or person to contact for further info.	Way the information collected is used	Assigned category (see Table 12)
		<p>tory Notification System for Communicable Diseases, supported by the HCDCP, carries the epidemiologic surveillance of 45 infectious diseases. Some of the diseases covered by this system pertain to biological agents that may be work-related (such as brucellosis, echinococcal disease, hepatitis B and C, HIV, rabies). Nevertheless, this system is neither specifically aimed at the surveillance of work-related exposures, nor does it reproduce this specific information.</p>			of Epidemiological Surveillance and Interventions	epidemiological data for planning and implementation of prevention strategies and public health programmes, input for policy-making and strategic planning in the health sector.	
24	EL	<p>Brucellosis programme (Ministry of Rural Development and Food). The brucellosis programme in Greece is regulated by the Ministerial Decision 258735/17.7.2007 (amended by the MD 258963/29.8.2008)</p>	<a href="http://www.minadmin.gov.gr">www.minadmin.gov.gr</a>	Greek	<p>Ministry of Rural Development and Food Directorate of Animal Health, Department of Zoonosis Contact details: Mrs Tzani Myrsini, ka6u013@minagric.gr Mr. Katsiolis Aristomenis, ka6u058@minagric.gr</p>	Prevention programmes, input for policy-making	Specific agent/effect (brucellosis)
25	HU	Database of occupational diseases	<a href="http://www.omfi.hu/index.php">http://www.omfi.hu/index.php</a>	Hungarian	Hungarian Institute of Occupational Health	Scientific research, preparation of government decisions and OSH strategies, education, training	Registration of occupational diseases

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Resp. no	Country	Name/description of system	Information publicly available	Language	Organisation and/or person to contact for further info.	Way the information collected is used	Assigned category (see Table 12)
26	HU	National registry of occupational diseases and excessive exposure cases (according to Decree No 27/1996 of the Minister for Welfare)	No	Hungarian	Office of the Chief Medical Officer — Department of Occupational Health (titkarsag@omfi.hu)	Statistical, policy-making	Registration of occupational diseases
33	IT	Surveillance of occupational exposure to blood-borne pathogens in healthcare workers (SIROH). Hospitals are enrolled in SIROH on a voluntary basis. Participating hospitals should actively encourage reporting of exposures and must have a worker health team. The team is in charge of the management of the exposed HCW and of data collection, i.e. interviewing the exposed HCW about circumstances of the exposure, counselling about the risk of occupational infections, offering prophylaxis, advising on the follow-up schedule, investigating each incident and recording the details of exposure.	<a href="http://www.inmi.it/progetto_SIROH.html">http://www.inmi.it/progetto_SIROH.html</a>	Italian	Centro di Coordinamento SIROH Dipartimento di Epidemiologia e Ricerca Preclinica INMI "Lazzaro Spallanzani" IRCCS	Prevention programmes, research purposes	Surveillance studies/programme (exposure to blood-borne pathogens)
33	IT	Registry of cases of disease and death due to exposure to biological agents. All cases identified in accordance with Italian Legislative	No	Italian	INAIL — Dipartimento di Medicina, Epidemiologia, Igiene del Lavoro e Ambientale	Policy-making and research purposes	Registration of occupational diseases

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Resp. no	Country	Name/description of system	Information publicly available	Language	Organisation and/or person to contact for further info.	Way the information collected is used	Assigned category (see Table 12)
		Decree 81/2008 shall be notified to the competent authority.					
33	IT	FLUSSI INFORMATIVI	No	Italian	INAIL DC PREVENZIONE	Policy-making, input for prevention programmes	Unknown
34	LV	The information system of the State Labour Inspectorate — for the first time approved occupational diseases	<a href="http://www.vdi.gov.lv/lv/p-ar-mums/parskati/">http://www.vdi.gov.lv/lv/p-ar-mums/parskati/</a>	Latvian	agnija.murane@vdi.gov.lv	Information is collected from information system database — information about inspection of companies	Information system
35	LT	The Occupational Diseases Registry	No	Lithuanian	Lithuanian Hygiene Institute	Prevention programmes	Registration of occupational diseases
37	LU	Accident insurance (assurance accident)	No	(Missing)	aaa.lu		Registration of occupational accidents/injuries
37	LU	Inventory of at-risk workplaces (inventaire des postes à risques)	No	(Missing)	Division de la santé au travail et de l'environnement — direction de la santé	Recommendations to occupational medicine services	Registration of occupational diseases
38	MT	Social Security claims for injury benefits due to work-related injuries or diseases	No	Maltese, English	Department of Social Security social.security@gov.mt	For claim for injury benefits	Registration of occupational accidents/injuries
38	MT	Surveillance system in place for all notifiable infectious diseases which include biological agents	No	English	Infectious disease prevention and control unit disease.surveillance@gov.mt	For prevention measures to be in place to avoid such incidents from happening in the first	Registration of infectious diseases

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Resp. no	Country	Name/description of system	Information publicly available	Language	Organisation and/or person to contact for further info.	Way the information collected is used	Assigned category (see Table 12)
						place and to prepare standard operation procedures for health workers to protect themselves from getting infected	
38	MT	Occupational Disease Reporting System	No	English	Occupational Health and Safety Authority <a href="http://ohsa.org.mt/Home/Sectors/OccupationalHealth/OccupationalDiseaseReporting-Form.aspx">http://ohsa.org.mt/Home/Sectors/OccupationalHealth/OccupationalDiseaseReporting-Form.aspx</a>	As input for investigations and prevention programmes. Unfortunately, reporting and information collected is very little on this system	Registration of occupational diseases
39	NL	Netherlands Centre for Occupational Diseases (NCvB) — national notification and registration system	<a href="http://www.beroepsziekten.nl/statistiek-intro-ductie/ncvb-statistiek-nationale-registratie-beroepsziekten">http://www.beroepsziekten.nl/statistiek-intro-ductie/ncvb-statistiek-nationale-registratie-beroepsziekten</a>	Dutch, partly English	Netherlands Centre for Occupational Diseases (NCvB), Henk van der Molen	All	Registration of occupational diseases
39	NL	KIZA	<a href="http://www.kiza.nl">http://www.kiza.nl</a>	Dutch	Helpdesk: 020-5665387	The objective of Kadir is to collect, record, categorise information about infectious diseases and try to relate them to the occ. health context	Information system
40	NL	NCVB Ned. Centrum voor beroepsziekten	Partly	(Missing)	NCVB, website KIZA, I-SZW	(Missing)	Registration of occupational diseases

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Resp. no	Country	Name/description of system	Information publicly available	Language	Organisation and/or person to contact for further info.	Way the information collected is used	Assigned category (see Table 12)
40	NL	GGD	No	(Missing)	(Missing)	(Missing)	Surveillance studies/programme
41	NL	NCvB (National Centre for Occupational Diseases)	<a href="http://www.beroepsziekten.nl">www.beroepsziekten.nl</a>	Dutch	j.j.maas@amc.uva.nl	For policy-making and for prevention purposes. For further details please ask Mr J.J. Maas	Registration of occupational diseases
42	NL	Nederlands Centrum voor Beroepsziekten: registration occupational diseases	<a href="http://www.beroepsziekten.nl">www.beroepsziekten.nl</a>	Dutch	Netherlands Centre for Occupational Diseases	Policy-making	Registration of occupational diseases
42	NL	OSIRIS, public health registration of infectious diseases	No	Dutch	RIVM	Policy-making	Registration of infectious diseases
43	PL	National Information Point for Biological Agents	<a href="http://www.imp.lodz.pl/home_pl/o_insty-tucie/reg_and_databases/biol_elem_r/">http://www.imp.lodz.pl/home_pl/o_insty-tucie/reg_and_databases/biol_elem_r/</a>	Polish	Institute of Occupational Medicine, Lodz, Poland, Dr Anna Kozajda, anias@imp.lodz.pl	All above, i.e. research, policy-making, prevention programmes	Information system
43	PL	Chief Labour Inspectorate	Official governmental publications	Polish	Ms. Izabela Waga, iwaga@gip.pl	Policy-making, prevention programmes	Labour Inspectorate
44	PT	Systematic and mandatory registration of all industrial and other activities where there is biological risk groups 2, 3 and 4	<a href="http://www.dgs.pt">www.dgs.pt</a>	Portuguese	<a href="http://www.dgs.pt/saude-ocupacional.aspx">www.dgs.pt/saude-ocupacional.aspx</a> - Carlos Silva Santos	It is only used as warning and control system of professional risk	Registration of infectious diseases
44	PT	Participation and communication of occupational diseases	<a href="http://www4.seg-social.pt">www4.seg-social.pt</a>	Portuguese	Departamento de Proteção contra Riscos Profissionais	It is used for repair of occupational disease and intervention in	Registration of occupational diseases

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Resp. no	Country	Name/description of system	Information publicly available	Language	Organisation and/or person to contact for further info.	Way the information collected is used	Assigned category (see Table 12)
						secondary and primary prevention of occupational risks	
46	SK	Occupational Diseases or Occupational Disease Threats in the Slovak Republic	<a href="http://www.nczisk.sk/Publications/Edition%20Health%20Statistics">www.nczisk.sk/Publications/Edition Health Statistics</a> <a href="http://www.nczisk.sk/Aktuality/Pages/Chorobou-z-povolania-trpi-viac-ludi.aspx">http://www.nczisk.sk/Aktuality/Pages/Chorobou-z-povolania-trpi-viac-ludi.aspx</a>	Slovakian, English	National Health Information Centre in Bratislava	Statistically processes data from the Slovak Republic and from the regions about notified occupational diseases and threats from occupational disease, information for the purposes of preventative programmes, for informing of state administration bodies, media, public	Registration of occupational diseases
46	SK	Central register of notifications of recognised occupational diseases	No	Slovakian	University hospital in Bratislava — Clinic of occupational medicine and clinical toxicology	Information for occupational physicians, for scientific-research and educational purposes	Registration of occupational diseases
47	ES	EDO (Enfermedades de declaración obligatoria, compulsory notification of diseases)	<a href="http://www.isciii.es/ISCIII/es/contenidos/fd-serVICIOS-cientifico-tecnicos/fd-vigilancias-alertas/enfermedades.shtml">http://www.isciii.es/ISCIII/es/contenidos/fd-serVICIOS-cientifico-tecnicos/fd-vigilancias-alertas/enfermedades.shtml</a>	Spanish	Centro Nacional de Epidemiología, Instituto de Salud Carlos III	Surveillance system in Public Health frame	Registration of occupational diseases
47	ES	Accidents at work	No	(Missing)	Subdirección de Estadística. Ministerio de	Policy-makers. OSH national Strategy. Surveillance	Registration of occupational accidents/injuries

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Resp. no	Country	Name/description of system	Information publicly available	Language	Organisation and/or person to contact for further info.	Way the information collected is used	Assigned category (see Table 12)
					Empleo y Seguridad Social		
47	ES	Enfermedades profesionales	<a href="http://www.seg-social.es/Internet_1/Estadistica/Est/Observatorio_de las Enfermedades Profesionales/cepross2k11/index.htm">http://www.seg-social.es/Internet_1/Estadistica/Est/Observatorio_de las Enfermedades Profesionales/cepross2k11/index.htm</a>	Spanish	Dirección General de Ordenación de la Seguridad Social. Ministerio de Empleo y Seguridad Social	Policy-makers. OSH national strategies. Surveillance	Registration of occupational diseases
50	ES	CEPROSS/Occupational Diseases Registry of the Social Security System	<a href="http://www.seg-social.es/prdi00/groups/public/documents/binario/145097.pdf">http://www.seg-social.es/prdi00/groups/public/documents/binario/145097.pdf</a>	Spanish	Social Security System (Spanish Ministry of Labour)	Compensation, policy-making, and secondarily as a possible input for prevention	Registration of occupational diseases
51	SE	ISA, Reported occupational diseases	<a href="http://www.av.se">www.av.se</a>	Swedish	Kjell Blom, Swedish Work Environment Authority	These statistics are used by media, for policy-making, initiatives to inspect workplaces with high incidence of work-related diseases. Sometimes it is used for research about work-related health problems	Registration of occupational diseases
52	UK	RIDDOR	<a href="http://www.hse.gov.uk">www.hse.gov.uk</a>	English	HSE	Research and policy	Registration of occupational diseases
52	UK	THOR University of Manchester	melanie.carder@manchester.ac.uk	English	See above	Research	Registration of occupational diseases

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Resp. no	Country	Name/description of system	Information publicly available	Language	Organisation and/or person to contact for further info.	Way the information collected is used	Assigned category (see Table 12)
52	UK	Industrial Injury Disablement Benefit	<a href="http://www.gov.uk/industrial-injuries">www.gov.uk/industrial-injuries</a>	English	No	Research and policy	Registration of occupational accidents/injuries
53	UK	RIDDOR	No	English	Health and Safety Executive	Policy, research and enforcement	Registration of occupational diseases
54	UK	Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 2013 (RIDDOR) — this is secondary legislation made under the Health and Safety at Work etc. Act 1974 and sets out the requirements for reporting work related accidents and ill-health, which includes those involving biological agents	<a href="http://www.hse.gov.uk/statistics/tables/index.htm#riddor">http://www.hse.gov.uk/statistics/tables/index.htm#riddor</a>	English	Health and Safety Executive	Measuring trends via statistical analysis; evidence base for policy-making	Registration of occupational diseases
54	UK	The Health and Occupational Research Network (THOR) — Voluntary reporting of occupational diseases by specialist doctors and General Practitioners	<a href="http://www.population-health.manchester.ac.uk/epidemiology/COEH/research/thor/">http://www.population-health.manchester.ac.uk/epidemiology/COEH/research/thor/</a>	English	University of Manchester (melanie.carder@manchester.ac.uk)	Research and statistical analysis	Registration of occupational diseases
54	UK	For cases of Legionnaires' disease, Public Health England collects data under the National Surveillance Scheme established to collect enhanced surveillance data on all cases of Legionnaires' disease in residents of England and Wales	<a href="https://www.gov.uk/government/publications/legionnaires-disease-national-surveillance-scheme">https://www.gov.uk/government/publications/legionnaires-disease-national-surveillance-scheme</a>	English	Public Health England (for National Surveillance Scheme)	Statistical analysis used as evidence base for policy-making and to: identify clusters to prevent potential outbreaks; validate and assure the quality of the data submitted to the	Specific agent/effect (Legionnaires' disease)

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Resp. no	Country	Name/description of system	Information publicly available	Language	Organisation and/or person to contact for further info.	Way the information collected is used	Assigned category (see Table 12)
						scheme; issue notifications and alerts to Health Protection Teams; support the management and control of outbreaks and incidents; monitor trends over time; identify risk group and categories; report travel-associated cases of Legionnaires' disease to the European Legionnaires' Disease Surveillance Network	
55	MK	Register of Occupational; Diseases	No	Macedonian	Public Health Institute, Prof. Elisaveta Stikova	Policy-making and prevention programmes	Registration of occupational diseases
57	NO	Medical practitioner's notification obligation	No	Norwegian	The Norwegian Labour Inspection Authority — Yogindra Samant	Mainly research, surveillance and policy-making	Registration of occupational diseases
57	NO	MSIS	<a href="http://www.msis.no/">http://www.msis.no/</a>	Norwegian, English	Norwegian Institute of Public Health	Surveillance and statistics	Unknown
58	NO	RAS, Labour Inspectorate, doctors' notifications	No	Norwegian	Yogindra Samanth, Tonje Strømholm	For research purposes, as input for policy-making, as input for prevention programmes	Registration of occupational diseases

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Resp. no	Country	Name/description of system	Information publicly available	Language	Organisation and/or person to contact for further info.	Way the information collected is used	Assigned category (see Table 12)
58	NO	MSIS	<a href="http://www.fhi.no/helse-registre/msis/statistikk">http://www.fhi.no/helse-registre/msis/statistikk</a>	Norwegian	<a href="http://www.fhi.no/helse-registre/msis/statistikk">http://www.fhi.no/helse-registre/msis/statistikk</a>	For research purposes, as input for policy-making, as input for prevention programmes	Unknown
59	NO	Registry of work-related diseases	No	Norwegian	The Norwegian Labour Inspection Authority/Ms. Tonje Strømholm	Used for follow-up of reported incidents, statistical analysis, some projects and research but also to decide where our inspection efforts should be prioritised	Registration of occupational diseases

## National monitoring systems on worker exposure

Table A4-3: Overview of national monitoring system (or systems) on worker exposure in which occupational exposure to biological agents is (also) covered as indicated by the respondents (showing only the individual response of respondents who indicated that they know one or more system) (question 8)

Resp. No	Country	Name/description of this system	Information publicly available	Language	Organisation and/or person to contact for further information	Way the information collected is used	Assigned category (see Table 13)
7	AT	Labour inspection controls	<a href="http://www.arbeitsinspektion.gv.at/">www.arbeitsinspektion.gv.at/</a>	German		For policy making	Labour Inspectorate
13	CY	Establishment and operation of a health surveillance system of employed persons. According to this system every employer is obliged to ensure that health surveillance (medical examinations) is offered to his employees, if it's necessary and in relation to hazards identified from the risk assessment procedure. This system aims to protect workers health but also to monitor workers exposure, in which occupational exposure to biological agents is also covered, for example exposure to blood-borne pathogens in the healthcare sector.	No	Greek, English	Department of Labour Inspection/Advisor Occupational Physician, Dr Athanasios Athanasiou (info@dli.mlsi.gov.cy/aathana-siou@dli.mlsi.gov.cy)	Information collected with this system is used as input for policy making, as input for inspections at workplaces where affected workers have been exposed to hazardous agents and as input for prevention campaign at the healthcare sector	Surveillance studies
14	CZ	Registry of Job Categorization	No	Czech	Ministry of Health	Mainly for prevention purposes	Registry of job categorization

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Resp. No	Country	Name/description of this system	Information publicly available	Language	Organisation and/or person to contact for further information	Way the information collected is used	Assigned category (see Table 13)
15	DK	Registry of occupational diseases and health damaging exposures	<a href="http://arbejdstil-synet.dk/da/statistik/ar-bejdsskader/ar-bejdsskader-arsopgorelser">http://arbejdstil-synet.dk/da/statistik/ar-bejdsskader/ar-bejdsskader-arsopgorelser</a>	Danish	The Danish Working Environmental Authority, att. Birgit Bülow	The data are used to make the right strategy for planning inspections and other prevention initiatives, also to some degree for policy making	Registration of exposure risk
16	DK	Exposure is measured in different working environments where organic material is handled	No	English	Contact NRCWE	Research	Exposure assessment
17	DK	The National Board of Industrial Injuries	<a href="http://www.ask.dk/da/English.aspx">http://www.ask.dk/da/English.aspx</a>	Danish, to some extent English and Turkish	The National Board of Industrial Injuries	Policy making and prevention programmes	Registration of occupational accidents/injuries
17	DK	Statens Serum Institut	<a href="http://www.ssi.dk/Smitteberedskab.aspx">http://www.ssi.dk/Smitteberedskab.aspx</a>	Danish, to some extent English	Statens Serum Institut	Surveillance, prevention and to some extent research	Surveillance studies
18	EE	Labour Inspectorate database. The employer is required to notify the Labour Inspectorate at least 30 days before starting to work with 2, 3 or 4 biological hazards of risk groups. But there are only some notifications during the years; one reason is, that the act came into force later, a lot of organisations already were dealing with biological agents and it was decided that afterwards the data	No	Estonian	Labour Inspectorate	Research purposes, as input for policy making	Notification system

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Resp. No	Country	Name/description of this system	Information publicly available	Language	Organisation and/or person to contact for further information	Way the information collected is used	Assigned category (see Table 13)
		would not be requested. Notifications about GMO before starting to work with them are in database.					
20	FI	Biomonitoring of worker exposure	<a href="http://www.ttl.fi">www.ttl.fi</a>	Finnish, English, Swedish	www.ttl.fi	Risk assessment	Exposure assessment
21	FR	National health insurance system/statistics on occupational diseases	cf. previous question	French	Direction of occupational risks	Prevention programmes, policy making	Health insurance system
21	FR	Work-related disease surveillance system/Institute for health surveillance	Institute for health surveillance	French	Health at Work Department	Information given to general direction of labour (Ministry)	Surveillance studies
21	FR	Rnv3p/national network for monitoring and prevention of occupational diseases	ANSES website	French, to some extent English	Rnv3p team, Melina Lebarbier	Reporting and alert for ministries, prevention organizations and agencies	Registration of occupational diseases
22	DE	GESTIS-Biostoffdatenbank	<a href="http://www.dguv.de/ifa/GESTIS/GESTIS-Biostoffdatenbank/index.jsp">http://www.dguv.de/ifa/GESTIS/GESTIS-Biostoffdatenbank/index.jsp</a>	German	No	No	Database on biological agents
23	DE	BAuA exposure assessment: exposure measurements are conducted within research on exposure of workers to hazardous substances including biological agents; results are put in correlation with background levels and with occurrence of health adversities among exposed workers	<a href="http://www.baua.de/en/Publications/Publications_form.html">www.baua.de/en/Publications/Publications_form.html</a>	German, English	Federal Institute for Occupational Safety and Health (BAuA) <a href="http://www.baua.de/en/Service/Contact/Contact_form.html">www.baua.de/en/Service/Contact/Contact_form.html</a>	Exposure data are collected and published. Based on these outcomes, recommendations as well as legally binding guidelines and regulatory policies are being developed and implemented to reduce occupational health	Exposure assessment

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Resp. No	Country	Name/description of this system	Information publicly available	Language	Organisation and/or person to contact for further information	Way the information collected is used	Assigned category (see Table 13)
						risks from exposure to biological agents at work	
23	DE	IFA exposure assessment on hazardous substances (chemicals)	<a href="http://www.dguv.de/ifa/Fachinfos/Exposition-Risiko-Beziehung-%28ERB%29/index.jsp">www.dguv.de/ifa/Fachinfos/Exposition-Risiko-Beziehung-%28ERB%29/index.jsp</a>	German, English	German Accident Insurance, Deutsche Gesetzliche Unfallversicherung (DGUV) www.dguv.de	Exposure data are collected and published. Regulatory policies are being developed and implemented to reduce occupational health risks from exposure to hazardous substances at work.	Exposure assessment
25	HU	Database of occupational health network	No	Hungarian	Hungarian Institute of Occupational Health	Scientific research, OSH strategies, education, training	Database on occupational health network
26	HU	Employers' registration of activities with type 2-4 microorganisms (according to Decree No 61/1999 of the Minister for Health)	No	n.a.	Ministry for National Economy — Department of OSH Inspection (munkafelugyeletifoo@ngm.gov.hu)	As input for prevention programmes	Notification system
26	HU	Employers' mandatory reporting of health and safety risk arising from sharps in the healthcare sector (according to Decree No 51/2013 of the Minister for Human Capacities)	No	n.a.	Ministry for National Economy — Department of OSH Inspection (munkafelugyeletifoo@ngm.gov.hu)	No	Notification system
28	IE	H.S.A IR 3 Notification system which requires notification to the au-	No	English	Health and Safety Authority	Prevention, statistics and inspection purposes	Registration of exposure risk

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Resp. No	Country	Name/description of this system	Information publicly available	Language	Organisation and/or person to contact for further information	Way the information collected is used	Assigned category (see Table 13)
		thority where there has been an uncontrolled or accidental release or the escape of any substance or pathogen from any apparatus, equipment, pipework, pipe-line, process plant, storage vessel, tank, in-works conveyance tanker, land-fill site, or exploratory land-drilling site, which, having regard to the nature of the substance or pathogen and the extent and location of the release or escape, might have been liable to cause serious injury to any person <a href="http://www.hsa.ie/eng/Topics/Managing_Health_and_Safety/General_Application_Regulations_2007/Accident_Reporting/">http://www.hsa.ie/eng/Topics/Managing_Health_and_Safety/General_Application_Regulations_2007/Accident_Reporting/</a>					
29	IT	SIROH	<a href="http://www.inmi.it/progetto_SIROH.html">http://www.inmi.it/progetto_SIROH.html</a>	Italian, English	Vincenzo Puro	Research purposes, policy making, prevention programmes	Unknown
33	IT	SIREP/The system collects information concerning occupational exposures to biological agents in Italy on the basis of a law (Legislative Decree n. 81/2008). Biological agents included are those that belong to risk Group 3 and 4 of EU classification	No	Italian	INAIL — Dipartimento di Medicina, Epidemiologia, Igiene del Lavoro e Ambientale	Research purposes and policy-making	Information system

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Resp. No	Country	Name/description of this system	Information publicly available	Language	Organisation and/or person to contact for further information	Way the information collected is used	Assigned category (see Table 13)
33	IT	FLUSSI INFORMATIVI	No	Italian	INAIL DC PREVENZIONE	Policy making, input for prevention programmes	Unknown
33	IT	MALPROF. MAL.PROF is the information system for the surveillance of occupational diseases, in collaboration with Regions	<a href="http://www.inail.it">www.inail.it</a>	Italian	INAIL_ Dipartimento di Medicina, Epidemiologia, Igiene del Lavoro e Ambientale_and REGIONS	Policy making, input for prevention programmes	Surveillance studies
37	LU	cf supra	No				Unknown
39	NL	Netherlands Centre for Occupational Diseases (NCvB) — national notification and registration system	<a href="http://www.beroepsziekten.nl/statistiek-introductie/ncvb-statistiek-nationale-registratie-beroepsziekten">http://www.beroepsziekten.nl/statistiek-introductie/ncvb-statistiek-nationale-registratie-beroepsziekten</a>	Dutch, partly English	Netherlands Centre for Occupational Diseases (NCvB), Henk van der Molen	All	Registration of occupational diseases
39	NL	KIZA	<a href="http://www.kiza.nl">http://www.kiza.nl</a>	Dutch	Helpdesk: 020-5665387	The objective of KIZA is to collect, register, categorise information about infectious diseases and try to (back) translate them into the occupational medicine context	Information system
40	NL	I-SZW	No	Dutch	Call on website of call I-SZW		Labour Inspectorate
43	PL	National Information Point for Biological Agents	<a href="http://www.imp.lodz.pl/home_pl/o_instytucie/reg_and_databases/biol_element/">http://www.imp.lodz.pl/home_pl/o_instytucie/reg_and_databases/biol_element/</a>	Polish	Institute of Occupational Medicine, Lodz, Poland, Dr Anna Kozajda, anias@imp.lodz.pl	All above, i.e. research, policy making, prevention programmes	Information system

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Resp. No	Country	Name/description of this system	Information publicly available	Language	Organisation and/or person to contact for further information	Way the information collected is used	Assigned category (see Table 13)
44	PT	(Ordinance n. 55/2010 of 21st of January) Single report — is a source of administrative information required for all Portuguese employers. The single report has a specific annex (Annex D: Occupational Safety and Health activities). In this annex, the field 5 — identification assessment and control of risk factors — has specifically the Identification of Biological risk factors. The information required is related to: 1. biological agent identification, 2. number of exposed workers, 3. number of risk assessments, 4. adopted preventive measures	<a href="http://www.gep.msess.gov.pt/estatistica/condicoes/sst2013pub.pdf">http://www.gep.msess.gov.pt/estatistica/condicoes/sst2013pub.pdf</a> . and <a href="http://www.gep.msess.gov.pt/estatistica/condicoes/sst2013sint.pdf">http://www.gep.msess.gov.pt/estatistica/condicoes/sst2013sint.pdf</a>	Portuguese	Planning and Strategy of office — Minister of Labour, Solidarity, and Social Security	Used for research purposes, to guide the occupational health policy and to develop prevention programmes	Information system
46	SK	Central register of risk works	No	Slovakian	Public Health Authority of the Slovak Republic	Information for purposes of preventive programmes, for purposes of performance of state health supervision, for informing of state administration bodies, media, public	Registration of exposure risk
46	SK	Regional registers of risk work	No	Slovakian	36 Regional Public Health Authorities in the Slovak Republic	For purposes of performance of state health supervision in the area of health protection at work, for securing of	Registration of exposure risk

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Resp. No	Country	Name/description of this system	Information publicly available	Language	Organisation and/or person to contact for further information	Way the information collected is used	Assigned category (see Table 13)
						preventive measures for health protection of employees, information for purposes of preventive programmes, for informing of state administration bodies, media, public	
51	SE	Reports on serious accidents and near accidents to the Swedish Work Environment Authority according to chapter 3, section 3a in the Work Environment Act. This reporting system is not specifically about diseases but some reports on serious work-related diseases sometimes appear in this system	No	Swedish	Kjell Blom, +460107309000	These statistics are used by media, for policy making, initiatives to inspect workplaces with high incidence of accidents, near accidents and work-related diseases. Sometimes it is used for research. However, there are few reports on cases by biological agents	Reporting of occupational accidents/disease
53	UK	THOR — The Health and Occupation Research Network	<a href="http://www.population-health.manchester.ac.uk/epidemiology/COEH/research/thor/">http://www.population-health.manchester.ac.uk/epidemiology/COEH/research/thor/</a>	English	<a href="http://www.population-health.manchester.ac.uk/epidemiology/COEH/research/thor/">http://www.population-health.manchester.ac.uk/epidemiology/COEH/research/thor/</a>	Utilise voluntarily submitted, medically certified data	Research network
54	UK	Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 2013 (RIDDOR) — this is secondary legislation made under the Health and Safety at Work Act	<a href="http://www.hse.gov.uk/statistics/tables/index.htm#riddor">http://www.hse.gov.uk/statistics/tables/index.htm#riddor</a>	English	Health and Safety Executive	As input for possible investigation, prevention programmes and evidence base for policy making	Reporting of occupational accidents/disease

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Resp. No	Country	Name/description of this system	Information publicly available	Language	Organisation and/or person to contact for further information	Way the information collected is used	Assigned category (see Table 13)
		1974 and sets out the requirements for reporting work related dangerous occurrences including certain types of exposure to biological agents					
54	UK	In addition to RIDDOR, as Legionnaires' disease is a notifiable disease in England and Wales, health professionals must inform local health protection teams of suspected cases in employees and members of the public. PHE collects data under the National Surveillance Scheme	<a href="https://www.gov.uk/government/publications/legionnaires-disease-national-surveillance-scheme">https://www.gov.uk/government/publications/legionnaires-disease-national-surveillance-scheme</a>	English	Public Health England (for National Surveillance Scheme)	For research purposes, input for possible investigation, prevention programmes and evidence base for policy making and to: identify clusters to prevent potential outbreaks; issue notifications and alerts to Health Protection Teams; support the management and control of outbreaks and incidents; monitor trends over time; identify risk group and categories	Surveillance studies
56	NO	EXPO	No	Norwegian	STAMI National Institute of Occupational Health/Nils Petter Skaugset	Research and policy making	Unknown
57	NO	Medical practitioner's notification obligation	No	Norwegian	The Norwegian Labour Inspection Authority — Yogindra Samant	Mainly research, surveillance and policy making	Registration of exposure risk

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Resp. No	Country	Name/description of this system	Information publicly available	Language	Organisation and/or person to contact for further information	Way the information collected is used	Assigned category (see Table 13)
58	NO	LKU, Statistics Norway	<a href="https://www.ssb.no/statistikbanken/select-table/hovedtabellHjem.asp?KortNavnWeb=ar-bmiljo&amp;CMSSubjectArea=arbeid-og-lonn&amp;checked=true">https://www.ssb.no/statistikbanken/select-table/hovedtabellHjem.asp?KortNavnWeb=ar-bmiljo&amp;CMSSubjectArea=arbeid-og-lonn&amp;checked=true</a> <a href="http://noa.stami.no/ar-beidsmiljoindikatorer/kjemiskfysiskbiologisk/biologiskmateriale/">http://noa.stami.no/ar-beidsmiljoindikatorer/kjemiskfysiskbiologisk/biologiskmateriale/</a>	Norwegian	Me and Statistics Norway	For research purposes, as input for policy making, as input for prevention programmes	Unknown
58	NO	RAS, Norwegian Labour Inspectorate	No	Norwegian	Yogindra Samanth, Tonje Strømholm	For research purposes, as input for policy making, as input for prevention programmes	Labour Inspectorate
58	NO	Expo, NIOH, Oslo	No	Norwegian	Ragnhild Østrem	For research purposes, as input for policy making, as input for prevention programmes	Unknown
59	NO	List of exposed workers as outlined in Directive 2000/54/EC. These lists are kept on site only to be turned in to the Norwegian Labour Inspection Authority when the business is terminated	No	Norwegian	The Norwegian Labour Inspection Authority/Ms. Monica Seem	Information contained in lists which have been sent to the Norwegian Labour Inspection Authority is available only to the specific individual who it pertains to and has requested it	Reporting of occupational accidents/disease

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## Sentinel and alert systems

Table A4-4: Sentinel or alert systems in which biological agents and/or work-related diseases due to biological agents are covered as indicated by the respondents (showing only the individual response of respondents who indicated that they know one or more sentinel or alert system) (question 9)

Resp. no	Country	Name/description of this system	Information publicly available	Organisation and/or person to contact for further info.	Way the information collected is used	Assigned category (see Table 14)
7	AT	Labour inspection	No	<a href="http://www.arbeitsinspektion.gv.at/">www.arbeitsinspektion.gv.at/</a>	For policy-making	Labour Inspectorate
11	BE	Signaal	No	Lode Godderis	Research, policy and input for prevention	Sentinel system
11	BE	FBZ/aangiftes beroepsziekten	FBZ.be	FBZ	No	Reporting of occupational accidents/disease
12	BG	The regular system for notification on occupational diseases	No	No	For starting the procedure for investigation and confirming the professional disease	Registration of occupational diseases
17	DK	Statens Serum Institut	<a href="http://www.ssi.dk/Smitteberedskab.aspx">http://www.ssi.dk/Smitteberedskab.aspx</a>	Statens Serum Institut	Surveillance, prevention and to some extent research	Surveillance system
21	FR	Rnv3p	ANSES website	Rnv3p team, Melina Lebarbrier	Reporting and alert, information for research purposes and prevention programmes	Registration of occupational diseases
22	DE	Risikoobservatorium der DGUV		No	No	Unknown

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Resp. no	Country	Name/description of this system	Information publicly available	Organisation and/or person to contact for further info.	Way the information collected is used	Assigned category (see Table 14)
23	DE	Mandatory notification of infectious diseases <sup>(3)</sup> , covers also occupational infections, even though these cases are not necessarily specified as work-related diseases; doctors are obliged to report cases of certain infectious diseases (out of a list of infectious diseases) to the local authority. The concerned diseases represent a particularly high risk for public health and in case of zoonoses also for animal health	Available at the Robert Koch Institute (RKI) <a href="http://www.rki.de">www.rki.de</a> <a href="http://www.rki.de/DE/Content/Infekt/Jahrbuch/jahrbuch_node.html">www.rki.de/DE/Content/Infekt/Jahrbuch/jahrbuch_node.html</a> <a href="http://www.rki.de/DE/Content/Infekt/IfSG/Meldeboegen/Meldungen_node.html">www.rki.de/DE/Content/Infekt/IfSG/Meldeboegen/Meldungen_node.html</a>	Robert Koch Institute <a href="http://www.rki.de/EN/Service/Contact/Contact_node.html">www.rki.de/EN/Service/Contact/Contact_node.html</a>	Cure and prevention of infectious diseases, epidemiological analysis, policy consultation, consultation on preventive measures	Registration of infectious diseases
23	DE	Mandatory notification of suspected occupational diseases <sup>(4)</sup> ; doctors are obliged to report suspects and employers are obliged to report indications of occupational diseases to the accident insurance. Mandatory notification is based on the social act VII (SGB VII).	Available at the Federal Institute for Occupational Safety and Health (BAuA) <a href="http://www.baua.de/de/Informationen-fuer-die-Praxis/Statistiken/Berufskrankheiten/Berufskrankheiten.html">www.baua.de/de/Informationen-fuer-die-Praxis/Statistiken/Berufskrankheiten/Berufskrankheiten.html</a> <a href="http://www.baua.de/de/Publikationen/Fachbeitraege/Suga-2014.html">http://www.baua.de/de/Publikationen/Fachbeitraege/Suga-2014.html</a>	German Accident Insurance, Deutsche Gesetzliche Unfallversicherung (DGUV) <a href="http://www.dguv.de">www.dguv.de</a> . Federal Institute for Occupational Safety and Health (BAuA) <a href="http://www.baua.de/en/Service/Contact/Contactform.html">www.baua.de/en/Service/Contact/Contactform.html</a>	Cure, prevention and compensation of occupational diseases, research, policy consultation, implementation of regulations and measures to improve work conditions	Registration of occupational diseases

<sup>(3)</sup>Meldepflicht bei Infektionskrankheiten

<sup>(4)</sup> Meldepflicht bei Verdacht auf Berufskrankheiten

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Resp. no	Country	Name/description of this system	Information publicly available	Organisation and/or person to contact for further info.	Way the information collected is used	Assigned category (see Table 14)
24	EL	Sentinel System for Severe Influenza Infections (Hellenic Centre for Disease Control and Prevention (HCDCP)). This system is not specifically aimed at the surveillance of work-related exposures and it doesn't reproduce this specific information. Nevertheless, it provides information pertinent to worker-related exposures.	<a href="http://www.keelpno.gr">www.keelpno.gr</a>	Hellenic Centre for Disease Control and Prevention (HCDCP) Dr. Theano Georgakopoulou, M.D., Head of the Dept. of Epidemiological Surveillance and Interventions	Epidemiological surveillance and systematic monitoring of severe influenza infections (hospitalised patients), analysis and interpretation of the collected epidemiological data for planning and implementation of prevention strategies and programmes, input for policy making and strategic planning in the health sector	Sentinel system
26	HU	Mandatory reporting system of infectious diseases (according to Decree No 1/2014 of the Minister of Human Capacities)	<a href="http://www.oek.hu/oek.web?to=839&amp;nid=41&amp;pid=12&amp;lang=hun">http://www.oek.hu/oek.web?to=839&amp;nid=41&amp;pid=12&amp;lang=hun</a>	National Centre for Epidemiology — Department of Epidemiology (oekfoigazgatóság@oek.antsz.hu)	Statistics, policy making, prevention measures	Registration of infectious diseases
28	IE	The Health and Occupation Research (THOR) network in the Republic of Ireland (ROI-THOR)	<a href="http://www.population-health.manchester.ac.uk/epidemiology/COEH/research/thor/">http://www.population-health.manchester.ac.uk/epidemiology/COEH/research/thor/</a>	Health and safety authority	Research and prevention	Registration of occupational diseases
39	NL	SIGNAAL (Signalering Nieuwe Arbeidsgerelateerde Aandoeningen Loket)	<a href="https://www.signaal.info">https://www.signaal.info</a>	NCvB: Annet Lenderink: a.f.lenderink@amc.uva.nl	Signaal is a pilot project initiated by the Netherlands Centre for Occupational Diseases, KU Leuven and IDEWE to check whether a more structured detection of possible new risks through notifications by occupational	Reporting/sentinel system

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Resp. no	Country	Name/description of this system	Information publicly available	Organisation and/or person to contact for further info.	Way the information collected is used	Assigned category (see Table 14)
					physicians gives more insight into the prevention of new combinations of health problems and exposure in the workplace	
40	NL	via RIVM, LCI	(Missing)	(Missing)	(Missing)	National contact centre on infectious diseases
42	NL	PIM Registration System	<a href="http://www.beroepsziekten.nl/ncvb-nieuws">www.beroepsziekten.nl/ncvb-nieuws</a>	NCVB	Policy and prevention	Registration of occupational diseases
44	PT	SINAVE — Sistema Nacional de Vigilância Epidemiológica (National Surveillance System for obligatory notifiable infectious diseases)	<a href="https://www.dgs.pt/paginas-de-sistema/saude-de-a-a-z/sinave.aspx">https://www.dgs.pt/paginas-de-sistema/saude-de-a-a-z/sinave.aspx</a>	www.dgs.pt/saude-ocupacional.aspx; Francisco George	For prevention programmes on infectious diseases	Surveillance system
46	SK	National epidemiological system EPIS for surveillance of infectious diseases according to the International Classifications of Diseases (ICD)	Monthly and Annual Reports on Incidence of infectious diseases, <a href="http://www.epis.sk">www.epis.sk</a>	Public Health Authority of the Slovak Republic	Surveillance of infectious diseases	Epidemiological system
50	ES	At a regional level (not national) in the region of Navarre. Navarre sentinel clinical watch system of Occupational Diseases	<a href="http://www.navarra.es/home_es/Temas/Portal+de+la+Salud/Profesionales/Informacion+tec">http://www.navarra.es/home_es/Temas/Portal+de+la+Salud/Profesionales/Informacion+tec</a>	Institute of Public and Occupational Health of Navarre	For all those purposes	Clinical watch system

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Resp. no	Country	Name/description of this system	Information publicly available	Organisation and/or person to contact for further info.	Way the information collected is used	Assigned category (see Table 14)
			<a href="http://nca/Salud+laboral/accidentes+trabajo+enfermedades+profesionales.htm">nca/Salud+laboral/accidentes+trabajo+enfermedades+profesionales.htm</a>			
50	ES	At a regional level (not national). Region of Asturias, named as EVESCAP. It includes an evaluation system (EVESCAP) and a specific register of Occupational cancer (cancERT)	<a href="https://www.asturias.es/Astur-salud/Ficheros/AS_Salud%20Publica/As_Vigilancia/Informes%20epidemiologicos/Laboral/Cáncer%20Laboral/Informe%20sobre%20cáncer%20Laboral%20en%20Asturias.2011-junio%202015.pdf">https://www.asturias.es/Astur-salud/Ficheros/AS_Salud%20Publica/As_Vigilancia/Informes%20epidemiologicos/Laboral/Cáncer%20Laboral/Informe%20sobre%20cáncer%20Laboral%20en%20Asturias.2011-junio%202015.pdf</a>	Asturian Institute of Prevention of Occupational Risks (IAPRLs)	For all those purposes	Evaluation system/Registration of occupational diseases
50	ES	At a Regional level (not national). In the region of Valencia. SISVEL/Valencia Health Information and Occupational Health Surveillance System	<a href="http://www.sp.san.gva.es/ssc/c/progSalud.jsp?CodProg=PS47&amp;Opcion=SANMS48&amp;MenuSup=SANMS4">http://www.sp.san.gva.es/ssc/c/progSalud.jsp?CodProg=PS47&amp;Opcion=SANMS48&amp;MenuSup=SANMS4</a>	Department of Public Health of the Government of Valencia	Policy making and as input for prevention programmes	Surveillance system
52	UK	COIN	dave.guyers@hse.gsi.gov.uk	See above	Research and policy	Unknown
54	UK	Advisory Committee for Dangerous Pathogens	<a href="https://www.gov.uk/government/groups/advisory-committee-on-dangerous-pathogens">https://www.gov.uk/government/groups/advisory-committee-on-dangerous-pathogens</a>	ACDP (acdp@phe.gov.uk) or Health and Safety Executive (bioagents@hse.gov.uk)	For research, policy making, prevention programmes and advising on approved classification of biological agents	Advisory committee

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Resp. no	Country	Name/description of this system	Information publicly available	Organisation and/or person to contact for further info.	Way the information collected is used	Assigned category (see Table 14)
54	UK	Human animal infections and risk surveillance group (HAIRS)	<a href="https://www.gov.uk/government/collections/human-animal-infections-and-risk-surveillance-group-hairs">https://www.gov.uk/government/collections/human-animal-infections-and-risk-surveillance-group-hairs</a>	Public Health England (PHE)	HAIRS focuses on public health but regularly updates ACDP (who are interested in occupational health)	Surveillance system
56	NO	Arbeidsmiljøindikatorer	<a href="http://noa.stami.no/">http://noa.stami.no/</a>	Berot Bakke	Research and policy making	Unknown
57	NO	MSIS	<a href="http://www.msis.no/">http://www.msis.no/</a>	Norwegian Institute of Public Health	Surveillance and statistics	Unknown
58	NO	RAS might give some information, none other	No	Yogindra Samanth, Tonje Strømholm	No	Labour Inspectorate
59	NO	Norwegian Food Safety Authority	No	<a href="http://www.mattilsynet.no/language/english/about_us/notify_us/">http://www.mattilsynet.no/language/english/about_us/notify_us/</a>	No	Food safety authority
59	NO	Norwegian Institute of Public health	<a href="http://www.fhi.no/eway/default.aspx?pid=239&amp;trq=MainContent_6263&amp;Main_6157=6263:0:25,6748&amp;MainContent_6263=6487:0:25,8264">http://www.fhi.no/eway/default.aspx?pid=239&amp;trq=MainContent_6263&amp;Main_6157=6263:0:25,6748&amp;MainContent_6263=6487:0:25,8264</a>	Folkehelseinstituttet@fhi.no	Prevention programmes, policy making, research	Public health authority
59	NO	CBRNE-Centre (Chemical, Biological, Radiological, Nuclear and Explosives)	No	Cbrne@ous-hf.no	This is an emergency response centre for acute/critical threats regarding CBRNE materials. Information gathered is expected to be used to improve future response procedures	Emergency response centre

Resp. no	Country	Name/description of this system	Information publicly available	Organisation and/or person to contact for further info.	Way the information collected is used	Assigned category (see Table 14)
61	CH	Sentinel	<a href="http://www.bag.admin.ch/k_m_meldesystem/00736/00816/index.html?lang=en">http://www.bag.admin.ch/k_m_meldesystem/00736/00816/index.html?lang=en</a>	The Federal Office of Public Health (FOPH)	No	Sentinel system
62	CH	SSUV data pool	No	SSUV	Trend monitoring for prevention programmes	Database

### National public health provisions

Table A4-5: National public health provisions that focus on or cover work biological agents as indicated by the respondents (showing only the individual response of respondents who indicated that they know one or more provision) (question 10)

Resp. no	Country	Name/description of provision	Information publicly available	Organisation and/or person to contact for further info.	Way the information collected is used	Assigned category (see table 15)
1	AL	Labour Inspectorate in relation to health at work of employees is based on CMD Nr. 742 dated 06.11.2003 'On some additions and changes to the Decision no 692 dated 13.12.2001, the Council of Ministers 'On the Special Security Measures and Health Protection at Work', and in Instruction No 2, dated 25.06.2014 'On the implementation of the Decision of the Council of Ministers	No	No	No	Labour Inspectorate

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Resp. no	Country	Name/description of provision	Information publicly available	Organisation and/or person to contact for further info.	Way the information collected is used	Assigned category (see table 15)
		Nr.742', dated 06.11.2003 On some additions and changes to the Decision no 692 dated 13.12.2001, the Council of Ministers 'On the Special Security Measures and Health Protection at Work'				
2	AT	Ordinance on health surveillance (Verordnung über die Gesundheitsüberwachung)	<a href="https://www.ris.bka.gv.at/GeltendeFassung.wxe?Abfrage=Bundesnormen&amp;Gesetzesnummer=10009034">https://www.ris.bka.gv.at/GeltendeFassung.wxe?Abfrage=Bundesnormen&amp;Gesetzesnummer=10009034</a>	Central Labour Inspectorate, Unit for occupational medicine	No	Labour Inspectorate
4	AT	Free vaccination provided by AUVA or similar institutions of the social insurance	<a href="http://www.auva.at">www.auva.at</a>	AUVA, Department for prevention, Mr Rosenmayer	Prevention programme	Vaccination programme
4	AT	Voluntary health surveillance for the exposed	It's a law	Ministry of social affairs, Dr. Kernmayer	No	Surveillance studies
5	AT	Labour inspection	Website	No	Policy making, prevention	Unknown
6	AT	Vaccination against hepatitis B	<a href="http://www.auva.at">www.auva.at</a>	ingrid.hallstroem@auva.at	Input for prevention	Vaccination programme
7	AT	Ordinance on biological agents (Verordnung biologische Arbeitsstoffe — VbA)	<a href="https://www.ris.bka.gv.at/GeltendeFassung.wxe?Abfrage=Bundesnormen&amp;Gesetzesnummer=10009126">https://www.ris.bka.gv.at/GeltendeFassung.wxe?Abfrage=Bundesnormen&amp;Gesetzesnummer=10009126</a>	Arbeitsinspektion	For policy making	Labour Inspectorate

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Resp. no	Country	Name/description of provision	Information publicly available	Organisation and/or person to contact for further info.	Way the information collected is used	Assigned category (see table 15)
7	AT	Ordinance on health surveillance 2014 (Verordnung über die Gesundheitsüberwachung am Arbeitsplatz 2014 (VGÜ 2014))	<a href="https://www.ris.bka.gv.at/GeltendeFassung.wxe?Abfrage=Bundesnormen&amp;Gesetzesnummer=10009034">https://www.ris.bka.gv.at/GeltendeFassung.wxe?Abfrage=Bundesnormen&amp;Gesetzesnummer=10009034</a>	Arbeitsinspektion	For prevention programmes	Labour Inspectorate
7	AT	AUVA/vaccinations	<a href="http://www.auva.at">www.auva.at</a>	AUVA Mr. Oswin Rosenmayer	Prevention programme	Vaccination programme
8	AT	Ordinance on health surveillance	<a href="http://www.arbeitsinspektion.gv.at/inspektorat/Gesundheit_im_Betrieb/Gesundheitsueberwachung/">http://www.arbeitsinspektion.gv.at/inspektorat/Gesundheit_im_Betrieb/Gesundheitsueberwachung/</a>	Labour Inspectorate	Prevention of occupational diseases	Labour Inspectorate
9	AT	Decree on biologicals agents at work	No	ZAI/BMASK	Prevention programmes	Prevention programme
9	AT	Decree on health surveillance of workers	No	ZAI/BMASK	Prevention programmes	Prevention programme
10	BE	Occupational health care (arbeidsgeneeskunde)	No	No	No	Occupational healthcare
11	BE	ARAB/Codex wellbeing at work (welzijn op het werk)	No	FOD Waso	No	Unknown
12	BG	Hepatitis B vaccination for healthcare	No	Ministry of Health	All	Vaccination programme

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Resp. no	Country	Name/description of provision	Information publicly available	Organisation and/or person to contact for further info.	Way the information collected is used	Assigned category (see table 15)
18	EE	Health statistics and health research <a href="http://pxweb.tai.ee/esf/pxweb2008/dia-log/statfile1.asp">http://pxweb.tai.ee/esf/pxweb2008/dia-log/statfile1.asp</a> ; national Health Plan 2009-2020 <a href="http://www.sm.ee/sites/default/files/content-editors/eesmar-gid_ja_tegevused/Tervis/2012_rta_pohitekst_ok_5.pdf">http://www.sm.ee/sites/default/files/content-editors/eesmar-gid_ja_tegevused/Tervis/2012_rta_pohitekst_ok_5.pdf</a>	Health statistics and health research <a href="http://pxweb.tai.ee/esf/pxweb2008/dia-log/statfile1.asp">http://pxweb.tai.ee/esf/pxweb2008/dia-log/statfile1.asp</a> ; <a href="http://www.sm.ee/sites/default/files/content-editors/eesmar-gid_ja_tegevused/Tervis/2012_rta_pohitekst_ok_5.pdf">national Health Plan 2009-2020</a>	Ministry of Social Affairs, National Institute for Health Development	Research purposes, as input for policy making, prevention programmes	Health statistics/research
19	FI	Health examinations in occupational healthcare system 1485/2001	No	Pekka Humalto, Ministry of Social Affairs and Health	As input for prevention actions in workplaces	Occupational healthcare
20	FI	Vaccination	<a href="http://www.thl.fi">www.thl.fi</a>	<a href="http://www.thl.fi">www.thl.fi</a>	Prevention, risk assessment	Vaccination program
22	DE	Occupational health surveillance according to ordinance ArbMedVV (Arbeitsmedizinische Vorsorge nach ArbMedVV)	<a href="http://www.baua.de">www.baua.de</a>	BAuA	No	Occupational healthcare
22	DE	Guidelines for occupational medical examinations	<a href="http://dnb.dbb.de">http://dnb.dbb.de</a>	German Social Accident Insurance	No	Accident insurance
23	DE	Arbeitsmedizinische Vorsorge (Occupational healthcare)	Verordnung zur Arbeitsmedizinischen Vorsorge,	Federal Ministry of Work and Social Affairs (BMAS):	Risk assessment and measures of safety and health on company level	Occupational healthcare

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Resp. no	Country	Name/description of provision	Information publicly available	Organisation and/or person to contact for further info.	Way the information collected is used	Assigned category (see table 15)
			ArbMedVV; Ordinance on Occupational Healthcare (BMAS, 2013)	www.bmas.de/EN/Services/Contact/contact_node.html. Federal Institute of Occupational Safety and Health (BAuA); www.baua.de/en/Service/Contact/Contact form.html		
23	DE	Vaccination offers in the context of occupational health provision	Regulation on Occupational Medicine 6.5 (Arbeitsmedizinische Regel AMR 6.5), GMBI 76-77, p. 1577 (BAuA, 2014)	Federal Ministry of Work and Social Affairs; www.bmas.de/EN/Services/Contact/contact_node.html. Federal Institute for Occupational Safety and Health; www.baua.de/en/Service/Contact/Contact form.html	Data are evaluated at the stage of the individual case	Vaccination program
23	DE	Maternity Protection Act (Mutterschutzgesetz)	Guidance to Maternity Protection (Leitfaden zum Mutterschutz; BMFSFJ, 2015)	Federal Ministry of Family, Elderly, Women, and Youth (BMFSFJ); www.bmfsfj.de/BMFSFJ/Service/servicetelefonkontakt.html	(Missing)	Unknown

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Resp. no	Country	Name/description of provision	Information publicly available	Organisation and/or person to contact for further info.	Way the information collected is used	Assigned category (see table 15)
25	HU	Occupational health network (primary service and special service)	No	Hungarian Institute of Occupational Health	OSH strategies, scientific research, education, training	Occupational healthcare
26	HU	Mandatory vaccination of healthcare workers against HBV from 1993	No	National Centre for Epidemiology — Department of Epidemiology (oek-foigazgatosag@oek.antsz.hu)	No	Vaccination programme
27	IE	<a href="https://www.hpsc.ie/A-Z/Hepatitis/Blood-borneVirus/File,4352,en.pdf">https://www.hpsc.ie/A-Z/Hepatitis/Blood-borneVirus/File,4352,en.pdf</a>	No	Health Service Executive in relation to Healthcare workers	Compliance with requirement to provide safe and effective vaccines in relation to occupational biological risk of exposure and EC Biological Agents Directive, hierarchy of risk control measures	Occupational healthcare
28	IE	Code of practice for 2013 Biological Agent Regulations specify relevant vaccinations for certain biological agents <a href="http://www.hsa.ie/eng/Topics/Biological_Agents/">http://www.hsa.ie/eng/Topics/Biological_Agents/</a>	No	Health and Safety Authority	No	Regulation
33	IT	Voluntary vaccination (hepatitis B) programmes for healthcare workers		No	Prevention programmes	Vaccination
33	IT	Recommendations for seasonal influenza. The influenza vaccine should be made available for specific categories of	No	Ministry of Health	Input for policy making and input for prevention programmes	Vaccination programme

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Resp. no	Country	Name/description of provision	Information publicly available	Organisation and/or person to contact for further info.	Way the information collected is used	Assigned category (see table 15)
		workers: farmers, healthcare workers, veterinarians, fire workers, etc.				
33	IT	Medical surveillance for workers	Annual report (ATT.3B Legislative decree 81/2008) from the regions	Regions	Input for policy making and input for prevention programmes	Surveillance studies
34	LV	Health surveillance	No	vm@vm.gov.lv; vi@vi.gov.lv; info@spkc.gov.lv	No	Surveillance studies
35	LT	Guidelines on healthcare associated infections	<a href="http://www.hi.lt">www.hi.lt</a>	No	Prevention programmes	Guidelines/guidance
37	LU	Occupational medicine health services	stm.lu, sti.lu, aastf.lu rapport annuel	Division de la santé au travail et de l'environnement	Recommendations	Occupational healthcare
38	MT	National immunisation services Floriana	No	Tel. +356 25680222-3	For immunisation records purposes	Vaccination programme
38	MT	Occupational Health Unit (Primary Healthcare Department) provides pre-employment and periodic medical examinations of government employees	No	ohu.mhec@gov.mt	For medical record purposes	Occupational healthcare
38	MT	Infection Control Unit (Mater Dei Hospital Malta) provide vaccination programmes for hospital healthcare and laboratory workers	No	Prof Michael Borg: infection.control@gov.mt	For records purposes	Infection control unit
39	NL	Note 'Occupational health surveillance (AGO) in the context of work and biolog-	<a href="http://www.ar-boportaal.nl/docu-">http://www.ar-boportaal.nl/docu-</a>	Min. SZW	No	Occupational healthcare

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Resp. no	Country	Name/description of provision	Information publicly available	Organisation and/or person to contact for further info.	Way the information collected is used	Assigned category (see table 15)
		ical agents' (Notitie 'Arbeidsgezondheidskundig Onderzoek (AGO) in de context van werk en biologische agentia')	<a href="https://www.rivm.nl/menten/publicatie/2016/03/15/arbeidsgezondheidskundig-onderzoek-ago-bij-werk-en-biologische-agentia">menten/publicatie/2016/03/15/arbeidsgezondheidskundig-onderzoek-ago-bij-werk-en-biologische-agentia</a>			
41	NL	Committee for Prevention of iatrogenic <sup>5</sup> Hepatitis B	No	jim.van.steenbergen@rivm.nl	Preventing transmission in healthcare settings by identifying healthcare workers at high risk of transmitting hepatitis B virus to patients and banning them from performing exposure prone procedures	Prevention programme
44	PT	National occupational health programme: medical surveillance at enterprise level	General Directorate of Health at <a href="http://www.dgs.pt/saude-ocupacional/programa-nacional/pns-oc-2013-2017.aspx">http://www.dgs.pt/saude-ocupacional/programa-nacional/pns-oc-2013-2017.aspx</a>	Francisco Henrique Moura George	Used for research, occupational health policy and local prevention programmes (vaccination)	Occupational healthcare
46	SK	State health surveillance performed by 36 Regional Public Health Authorities in the Slovak Republic	Annual reports on Regional Public Health Authorities activity,	Public Health Authority of the Slovak Republic	For purposes of performance of state health supervision in the area of health protection at work,	Occupational healthcare

<sup>5</sup> induced inadvertently by a physician or surgeon or by medical treatment or diagnostic procedures

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Resp. no	Country	Name/description of provision	Information publicly available	Organisation and/or person to contact for further info.	Way the information collected is used	Assigned category (see table 15)
			<a href="http://www.uvzsr.sk">www.uvzsr.sk</a> , Slovak language		for securing of preventive measures for health protection of employees, for the purpose of state health supervision in the area of prevention of infectious diseases	
46	SK	Occupational Health Services	No	Public Health Authority of the Slovak Republic	Expert and advisory service for employers in the area of health protection at work, for informing of employers and employees	Occupational healthcare
47	ES	Regional surveillance system for needlestick accidents in healthcare sector	No	Different public health authorities	Surveillance. Seroconversion for HIV, HBV, HCV	Surveillance studies
50	ES	Biosecurity Guide for Health Workers 2015 (Guía de Bioseguridad para trabajadores sanitarios, 2015)	<a href="http://www.msssi.gob.es/ciudadanos/saludAmbLaboral/docs/guiabioseg.pdf">http://www.msssi.gob.es/ciudadanos/saludAmbLaboral/docs/guiabioseg.pdf</a> . Is information gathered with this provision publicly available, e.g. in a regular report?	Ministry of Health	Input for policy making and for prevention programmes	Guidelines/guidance
50	ES	Guidelines for Health Surveillance of workers exposed to biological agents (Protocolo de Vigilancia específica de	<a href="http://www.msssi.gob.es/ciudadanos/saludAmbLaboral/docs/">http://www.msssi.gob.es/ciudadanos/saludAmbLaboral/docs/</a>	Ministry of Health	No	Guidelines/guidance

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Resp. no	Country	Name/description of provision	Information publicly available	Organisation and/or person to contact for further info.	Way the information collected is used	Assigned category (see table 15)
		los trabajadores ante agentes biológicos)	<a href="#">agentes biologicos.pdf</a>			
50	ES	Technical guide for evaluation and prevention of occupational risks related to biological agents' exposure at work, 2014 (Guía técnica para la evaluación y prevención de los riesgos relacionados con la exposición a agentes biológicos, 2014)	<a href="http://www.insht.es/portal/site/insht/menu-item.1f1a3bc79ab34c578c2e8884060961ca?vgnextoid=dfae3fa2919a5110VgnVCM100000dc0ca8c0RCRD&amp;vgnextchannel=75164a7f8a651110VgnVCM100000dc0ca8c0RCRD">http://www.insht.es/portal/site/insht/menu-item.1f1a3bc79ab34c578c2e8884060961ca?vgnextoid=dfae3fa2919a5110VgnVCM100000dc0ca8c0RCRD&amp;vgnextchannel=75164a7f8a651110VgnVCM100000dc0ca8c0RCRD</a>	Spanish National Institute of Hygiene and Security at Work (Instituto Nacional de Higiene y Seguridad en el Trabajo; INHST)		Guidelines/guidance
52	UK	Health Protection Agency, UK	<a href="http://www.gov.uk/health-protection-agency">www.gov.uk/health-protection-agency</a>	No	Research and policy	Health protection agency
53	UK	PHE	<a href="https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/213339/Towards-a-Public-Health-Surveillance-Strategy.pdf">https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/213339/Towards-a-Public-Health-Surveillance-Strategy.pdf</a>	No	No	Unknown
54	UK	Notifications of infectious diseases (NOID) — medical practitioners in England and Wales have a statutory duty to notify their local authority or local Health	<a href="https://www.gov.uk/government/collect/notifications-of-">https://www.gov.uk/government/collect/notifications-of-</a>	Public Health England	Determining public health strategy and policy	Registration of infectious diseases

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Resp. no	Country	Name/description of provision	Information publicly available	Organisation and/or person to contact for further info.	Way the information collected is used	Assigned category (see table 15)
		Protection Team of suspected cases of certain infectious diseases	<a href="#">infectious-diseases-noids</a>			
54	UK	Green Book — this sets the guidelines for vaccinations against infectious diseases including some occupational settings	<a href="https://www.gov.uk/government/collections/immunisation-against-infectious-disease-the-green-book">https://www.gov.uk/government/collections/immunisation-against-infectious-disease-the-green-book</a>	Public Health England	To provide information for public health professionals on immunisation	Guidelines/guidance
55	MK	Rule book for mandatory vaccination	No	Ministry of Health	Prevention programmes	Vaccination programme
57	NO	The Working Environment Act	<a href="http://www.arbeidstilsynet.no/lov.html?tid=78120">http://www.arbeidstilsynet.no/lov.html?tid=78120</a>	The Norwegian Labour Inspection Authority	Provides regulation regarding medical examinations, vaccination and so on	Labour Inspectorate
58	NO	Folkehelse, MSIS + special notification MRSA etc	www.fhi.no	www.fhi.no	No	Unknown
59	NO	Regulation pertaining to protection of workers from risks related to exposure to biological agents at work	No	The Norwegian Labour Inspection Authority	Prevention programmes and conceivably to determine inspection campaign prioritisation	Regulation

## National policies, campaigns, networks and reports

### National policies

Table A4-6: National policies with regard to biological agents as indicated by the respondents (showing only the individual response of respondents who indicated that they know one or more policy) (question 11)

Resp. no	Country	Short description of this policy, including aim	Information publicly available	Organisation and/or person to contact for further info.	Assigned category (see Table 17)
1	AL	Pursuant to the law on safety and health at work is adopted Regulation, DCM. 550, dated 27.08.2014 for approval of the Regulation 'On protection of safety and health of workers from risks related to exposure of biological agents at work'.	No	No	Legislation/ regulation
5	AT	Company control system	<a href="http://www.arbeitsinspektion.gv.at/in-spektorat/">http://www.arbeitsinspektion.gv.at/in-spektorat/</a>	No	Control system
7	AT	Arbeitsinspektion	<a href="http://www.arbeitsinspektion.gv.at/in-spektorat/Arbeitsstoffe/biologische/">http://www.arbeitsinspektion.gv.at/in-spektorat/Arbeitsstoffe/biologische/</a>	No	Inspection
7	AT	AUVA eval.at	<a href="https://www.eval.at/arbeitsplatzevaluierung/spezielleevaluierungspflichten.aspx#bio">https://www.eval.at/arbeitsplatzevaluierung/spezielleevaluierungspflichten.aspx#bio</a>	Mag. Karin Sturm	Risk assessment
8	AT	Regulation of biological agents	<a href="https://www.ris.bka.gv.at/GeltendeFassung.wxe?Abfrage=Bundesnormen&amp;Gesetzesnummer=10009126">https://www.ris.bka.gv.at/GeltendeFassung.wxe?Abfrage=Bundesnormen&amp;Gesetzesnummer=10009126</a>	Labour Inspectorate	Regulation
8	AT	Regulation of needlestick injuries	<a href="https://www.ris.bka.gv.at/GeltendeFassung.wxe?Abfrage=Bundesnormen&amp;Gesetzesnummer=20008197">https://www.ris.bka.gv.at/GeltendeFassung.wxe?Abfrage=Bundesnormen&amp;Gesetzesnummer=20008197</a>	Labour Inspectorate	Regulation

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Resp. no	Country	Short description of this policy, including aim	Information publicly available	Organisation and/or person to contact for further info.	Assigned category (see Table 17)
8	AT	Regulation of medical assessment	<a href="https://www.ris.bka.gv.at/GeltendeFassung.wxe?Abfrage=Bundesnormen&amp;Gesetzesnummer=10009034">https://www.ris.bka.gv.at/GeltendeFassung.wxe?Abfrage=Bundesnormen&amp;Gesetzesnummer=10009034</a>	Labour Inspectorate	Regulation
9	AT	Guidance on evaluation of workplaces in regard to biological agents	<a href="https://www.sozialversicherung.at/portal27/portal/auvaportal/content/contentWindow?action=2&amp;viewmode=content&amp;contentid=10007.672004">https://www.sozialversicherung.at/portal27/portal/auvaportal/content/contentWindow?action=2&amp;viewmode=content&amp;contentid=10007.672004</a>	AUVA, see booklet	Guidance/guidelines
9	AT	Ministerial decree on disinfection of hands	<a href="http://www.gesundearbeit.at/cms/V02/V02_7.12.3.a/1442400395758/service/aktuelles/2015/erlass-haendedesinfektion-und-beschaef-tigungsverbot-gemaess-4-2-z-4-mutter-schutzgesetz">http://www.gesundearbeit.at/cms/V02/V02_7.12.3.a/1442400395758/service/aktuelles/2015/erlass-haendedesinfektion-und-beschaef-tigungsverbot-gemaess-4-2-z-4-mutter-schutzgesetz</a>	See document	Legislation/regulation
9	AT	Guidance on waste treatment	<a href="https://www.bmlfuw.gv.at/greentec/abfall-ressourcen/behandlung-verwertung/behandlung-mechanisch/MBA.html">https://www.bmlfuw.gv.at/greentec/abfall-ressourcen/behandlung-verwertung/behandlung-mechanisch/MBA.html</a>	See website	Guidance/guidelines
13	CY	Framework agreement for the prevention of sharp injuries in the healthcare sector. In Cyprus specific Regulations have been enforced adopting EU Directive 2010/32/EE for the implementation of the above framework agreement. These specific regulations provide measures to prevent needlestick injuries in the hospital and healthcare sector and therefore protect workers from the exposure to biological agents during their working activities in the healthcare sector	Department of Labour Inspection website ( <a href="http://www.dli.mlsi.gov.cy/dli">www.dli.mlsi.gov.cy/dli</a> )	Department of Labour Inspection/Advisor Occupational Physician, Dr Athanasios Athanasios (info@dli.mlsi.gov.cy/athanasios@dli.mlsi.gov.cy)	Framework agreement
16	DK	The Danish working authority	<a href="http://arbejdstilsynet.dk/da/">http://arbejdstilsynet.dk/da/</a>	No	Unknown

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Resp. no	Country	Short description of this policy, including aim	Information publicly available	Organisation and/or person to contact for further info.	Assigned category (see Table 17)
19	FI	Decree 1155/1993 <a href="http://www.finlex.fi/fi/laki/smur/1993/19931155?search%5Btype%5D=pika&amp;search%5Bpika%5D=1155%2F1993">http://www.finlex.fi/fi/laki/smur/1993/19931155?search%5Btype%5D=pika&amp;search%5Bpika%5D=1155%2F1993</a>	<a href="http://www.finlex.fi/fi/laki/smur/1993/19931155?search%5Btype%5D=pika&amp;search%5Bpika%5D=1155%2F1993">http://www.finlex.fi/fi/laki/smur/1993/19931155?search%5Btype%5D=pika&amp;search%5Bpika%5D=1155%2F1993</a>	Reetta Orsila, Ministry of Social Affairs and Health	Decree
19	FI	Decree on classification of biological agents	<a href="http://www.finlex.fi/fi/laki/alkup/2010/20100921">http://www.finlex.fi/fi/laki/alkup/2010/20100921</a>	Reetta Orsila, Ministry of Social Affairs and Health	Decree
20	FI	Classification of biological agents	<a href="http://www.stm.fi">www.stm.fi</a>	www.stm.fi	Classification of biological agents
21	FR	Labour code: legislation and regulation concerning occupational risks assessment and management at the workplace	French Ministry of Labour website	General Direction of Labour (Ministry of Labour)	Legislation, regulation
21	FR	Public health code: regulation concerning general prevention of diseases, vaccination	Ministry of Health website, High Council of Public Health website	General Direction of Health (Ministry), High Council of Public Health	Regulation
22	DE	BioStoffV	<a href="http://www.baua.de">www.baua.de</a>	BAuA	Unknown
22	DE	GenTSV	<a href="http://www.baua.de">www.baua.de</a>	BAuA	Unknown
23	DE	Practical implementation of national and European laws by means of ordinances and technical regulations. Biostoffverordnung (Biological Agents Ordinance)	Available at the Federal Institute for Occupational Safety and Health, BAuA; <a href="http://www.baua.de/de/Themen-von-A-Z/Biologische-Arbeitsstoffe/Biologische-Arbeitsstoffe.html">www.baua.de/de/Themen-von-A-Z/Biologische-Arbeitsstoffe/Biologische-Arbeitsstoffe.html</a> <a href="http://www.baua.de/en/Topics-from-A-to-Z/Biological-Agents/Biological-Agents.html">www.baua.de/en/Topics-from-A-to-Z/Biological-Agents/Biological-Agents.html</a>	Federal Institute for Occupational Safety and Health, BAuA; <a href="http://www.baua.de/en/Service/Contact/Contactform.html">www.baua.de/en/Service/Contact/Contactform.html</a>	Technical regulation

Resp. no	Country	Short description of this policy, including aim	Information publicly available	Organisation and/or person to contact for further info.	Assigned category (see Table 17)
23	DE	Classification of biological agents in risk groups RG1 (lowest risk) to RG4 (highest risk), thereby exceeding the classifications of Directive 2000/54/EC by various means. Classifications are being evaluated by the expert group of the Ausschuss für Biologische Arbeitsstoffe, ABAS (Committee for Biological Agents). Classifications serve as a reference for the qualitative risk assessment of occupational activities with biological agents. Classifications are available in the following Technical Rules on Biological Agents: TRBA 450 — general evaluation process; TRBA 460 — fungi; TRBA 462 — viruses; TRBA 464 — parasites; TRBA 466 — prokaryotes; TRBA 468 — cell lines	Available at the BAuA (German and partially English); <a href="http://www.baua.de/de/Themen-von-A-Z/Biologische-Arbeitsstoffe/TRBA/TRBA.html">www.baua.de/de/Themen-von-A-Z/Biologische-Arbeitsstoffe/TRBA/TRBA.html</a>	Federal Institute for Occupational Safety and Health; <a href="http://www.baua.de/en/Service/Contact/Contactform.html">www.baua.de/en/Service/Contact/Contactform.html</a>	Technical regulation
23	DE	DGUV-Regeln und DGUV-Informationen zu Gefahrstoffen und Biologischen Arbeitsstoffen; publications and technical regulations of the Accident Insurance (DGUV). The Accident Insurance (DGUV) provides detailed descriptions on risks and hazards at work including biological agents. Issues from specific working environments are issued in comprehensive reviews which cover also preventive measures against illness from biological agents at work	<a href="http://www.bgrci.de/fachwissen-portal/start/biologische-arbeitsstoffe">www.bgrci.de/fachwissen-portal/start/biologische-arbeitsstoffe</a>	<a href="http://www.bgrci.de/kontakt">www.bgrci.de/kontakt</a>	Publications/ technical regulation
25	HU	Harmonized national legislation: decree No 61/1999. (XII. 1.) EüM, transposing Directive 2000/54/EC	<a href="http://njt.hu/cgi_bin/njt_doc.cgi?docid=40838.291465">http://njt.hu/cgi_bin/njt_doc.cgi?docid=40838.291465</a> (Language: Hungarian)	Hungarian Institute of Occupational Health	Decree

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Resp. no	Country	Short description of this policy, including aim	Information publicly available	Organisation and/or person to contact for further info.	Assigned category (see Table 17)
25	HU	The requirements of the inspections: targeted OSH inspections by the Hungarian Labour Inspectorate	<a href="http://www.ommf.gov.hu/index.html?akt_menu=172&amp;hir_reszlet=486">http://www.ommf.gov.hu/index.html?akt_menu=172&amp;hir_reszlet=486</a> (Language: Hungarian)	No	Inspection
26	HU	The methodology letters on vaccination provide up-to-date guidelines on the vaccination of workers. This annual publication is cited in the Hungarian legislation as the proper procedure	<a href="http://www.oek.hu/oek.web?to=16&amp;nid=444&amp;pid=1&amp;lang=hun">http://www.oek.hu/oek.web?to=16&amp;nid=444&amp;pid=1&amp;lang=hun</a>	National Centre for Epidemiology — Department of Epidemiology (oekfoigazgatosag@oek.antsz.hu)	Guidance/guidelines
26	HU	Methodological letters on the prevention of viral infection of workers exposed to blood and bodily fluids. This guideline contains the recommended procedures for the primary and secondary prevention and surveillance of HBV, HCV and HIV	<a href="http://www.oek.hu/oek.web?nid=444&amp;pid=2&amp;to=16&amp;lang=hun">http://www.oek.hu/oek.web?nid=444&amp;pid=2&amp;to=16&amp;lang=hun</a>	National Centre for Epidemiology — Department of Epidemiology (oekfoigazgatosag@oek.antsz.hu)	Guidance/guidelines
27	IE	Prevention of bloodborne diseases in the healthcare setting	<a href="https://www.hpsc.ie/A-Z/Hepatitis/BloodborneVirus/File.4352.en.pdf">https://www.hpsc.ie/A-Z/Hepatitis/BloodborneVirus/File.4352.en.pdf</a>	Health Protection surveillance centre, Dr Kevin Keller <a href="http://www.hse.ie/eng/about/Who/Population_Health/">http://www.hse.ie/eng/about/Who/Population_Health/</a>	Unknown
27	IE	Guidelines on the prevention and control of tuberculosis in Ireland	<a href="https://www.hpsc.ie/A-Z/VaccinePreventable/TuberculosisTB/Publications/File.4349.en.pdf">https://www.hpsc.ie/A-Z/VaccinePreventable/TuberculosisTB/Publications/File.4349.en.pdf</a>	HPSC Dublin	Guidance/guidelines
27	IE	Guidelines for the Emergency Management of Injuries (including needlestick and sharps injuries, sexual exposure and human bites) where there is a risk of transmission of blood-borne viruses and other infectious diseases	<a href="http://www.hpsc.ie/A-Z/EMIToolkit/">http://www.hpsc.ie/A-Z/EMIToolkit/</a>	Health Protection Surveillance Centre, 25–27 Middle Gardiner St, Dublin 1, Ireland. t: +353 1 8765300 f:	Guidance/guidelines

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Resp. no	Country	Short description of this policy, including aim	Information publicly available	Organisation and/or person to contact for further info.	Assigned category (see Table 17)
				+353 1 8561299 e:hpsc@hse.ie	
28	IE	Code of Practice for the 2013 Biological Agents Regulations which transposes some aspects of the Directive 2000/54/EC i.e. classification of biological agents and also provides guidance on dispensation measures for work with some Group 3 biological agents	<a href="http://www.hsa.ie/eng/Topics/Biological_Agents/">http://www.hsa.ie/eng/Topics/Biological_Agents/</a>	Health and Safety Authority	Code of practice
29	IT	DLgs 81/08 for safety and health at workplace	<a href="http://www.lavoro.gov.it/sicurezza/lavoro/ms/normativa">www.lavoro.gov.it/sicurezza/lavoro/ms/normativa</a>	No	Legislation/regulation
30	IT	Law decree 81/08. How to perform a risk assessment and health surveillance of workers exposed to biological agents	No	No	Decree
33	IT	Promotion of good practice regarding the prevention and recording of incidents/accidents: prevention from sharp injuries in the hospital and healthcare sector. The aim is to prevent workers' injuries caused by all medical sharps (including needlestick injuries)	Servizio Prevenzione e Protezione dell'Ospedale San Martino di Genova, Italy	Ospedale San Martino di Genova, Italy (Dr. Dimitri Sossai)	Code of practice
33	IT	Ministerio della Sanità D.M. 29 settembre 2000 e s. m. i. regulating the use of material presenting risks as regards transmissible spongiform encephalopathies	Ministry of Health	Ministry of Health	Regulation
33	IT	Accordo Conferenza Stato Regioni 7 febbraio 2013 'Prevenzione della tubercolosi in operatori sanitari e soggetti ad essi equiparati' — Tuberculosis prevention in healthcare workers —	<a href="http://www.salute.gov.it/imgs/C_17_pubblicazioni_1901_allegato.pdf">http://www.salute.gov.it/imgs/C_17_pubblicazioni_1901_allegato.pdf</a>	Ministry of Health	Surveillance

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Resp. no	Country	Short description of this policy, including aim	Information publicly available	Organisation and/or person to contact for further info.	Assigned category (see Table 17)
		Health surveillance of healthcare workers exposed to Mycobacterium tuberculosis			
34	LV	National policy	No	vm@vm.gov.lv; vi@vi.gov.lv; info@spkc.gov.lv	Legislation/regulation
35	LT	Regulation on the protection of workers from risks related to exposure to biological agents at work	<a href="https://www.e-tar.lt/poral/le-galAct.html?document-tid=TAR.F5D05E9675B0">https://www.e-tar.lt/poral/le-galAct.html?document-tid=TAR.F5D05E9675B0</a>	No	Regulation
36	LU	Legislation about biological agents	Legilux website	Ministry of Health, occupational health services	Legislation/regulation
38	MT	Policy for the prevention and control of occupational infections at Mater Dei Hospital (Main Government General Hospital) — this document provides instruction and guidance to hospital infection control in their ward or section	No	Infection Control unit — Mater Dei Hospital infection.control@gov.mt	Guidance/guidelines
39	NL	Arboportaal	<a href="http://www.arboportaal.nl/onderwerpen/themas/biologische-agentia">http://www.arboportaal.nl/onderwerpen/themas/biologische-agentia</a>	Min. SZW	Information
39	NL	Find out more at: as part of several sectoral 'OSH catalogues'	For instance: <a href="http://www.handreikingin-haleerbareallergenen.nl/nl/welkom/1/">http://www.handreikingin-haleerbareallergenen.nl/nl/welkom/1/</a>	No	Information
40	NL	Zie Arbo-Informatieblad 9 Biologische agentia, Arbocatalogus NFU	www.arbozone.nl (fee)	BVF-Platform, EBSA, colleague in other umc, NVvA	Information
41	NL	Arbo-informatie Legionella (biosafety at work)	<a href="https://www.sdu.nl/ai-32-legionella-4e-druk.html">https://www.sdu.nl/ai-32-legionella-4e-druk.html</a>	See website	Information

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Resp. no	Country	Short description of this policy, including aim	Information publicly available	Organisation and/or person to contact for further info.	Assigned category (see Table 17)
41	NL	Information on working in laboratories	<a href="https://www.bol.com/nl/p/arboinformatie-18-gevaarlijke-stoffen-laboratoria/9200000021756693/">https://www.bol.com/nl/p/arboinformatie-18-gevaarlijke-stoffen-laboratoria/9200000021756693/</a>	(Missing)	Information
41	NL	The Directive 2000/54/EC in national perspective	<a href="http://www.arboportaal.nl/onderwerpen/themas/biologische-agentia">http://www.arboportaal.nl/onderwerpen/themas/biologische-agentia</a>	(Missing)	Legislation/regulation
41	NL	Legislation, technical information and two guides to good practice	www.dgs.pt	www.dgs.pt/saude-ocupacional.aspx	Legislation/regulation
44	SK	Act No 355/2007 Coll. of Laws on protection, promotion and development of public health and on change and amendment of some acts in wording of later regulations (mainly § 12 which deals with measures for prevention of origination and spread of communicable diseases) • Decree of the Ministry of Health of the Slovak Republic No 585/2008 Coll. of Laws on details on prevention and control of communicable diseases in wording of later regulations	<a href="http://www.uvzsr.sk/Legislativa">www.uvzsr.sk/Legislativa</a> (Slovak language) or <a href="http://www.slov-lex.sk">www.slov-lex.sk</a>	Public Health Authority of the Slovak Republic	Legislation/regulation
45	ES	A specific guideline	<a href="http://www.insht.es/portal/site/Insht/menu-item.1f1a3bc79ab34c578c2e8884060961ca/?vgnextoid=dfae3fa2919a5110VgnVCM10000dc0ca8c0RCRD&amp;vgnnextchannel=25d44a7f8a651110VgnVCM10000dc0ca8c0RCRD">http://www.insht.es/portal/site/Insht/menu-item.1f1a3bc79ab34c578c2e8884060961ca/?vgnextoid=dfae3fa2919a5110VgnVCM10000dc0ca8c0RCRD&amp;vgnnextchannel=25d44a7f8a651110VgnVCM10000dc0ca8c0RCRD</a>	INSHT	Guidance/guidelines
48	ES	Royal Decree 664/1997 (BOE no 124 24/05/1997) de 12 de mayo, sobre la protección	<a href="http://www.insht.es/portal/site/Insht/menu-item.1f1a3bc79ab34c578c2e8884060961ca">http://www.insht.es/portal/site/Insht/menu-item.1f1a3bc79ab34c578c2e8884060961ca</a>	Spanish National Institute of Hygiene and	Decree

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Resp. no	Country	Short description of this policy, including aim	Information publicly available	Organisation and/or person to contact for further info.	Assigned category (see Table 17)
		de los trabajadores contra los riesgos relacionados con la exposición a agentes biológicos durante el trabajo	<a href="http://?vgnextoid=a70817815b2d5110VgnVCM100000dc0ca8c0RCRD&amp;vgnextchannel=ff3cc6b33a9f1110VgnVCM100000dc0ca8c0RCRDNo">/?vgnextoid=a70817815b2d5110VgnVCM100000dc0ca8c0RCRD&amp;vgnextchannel=ff3cc6b33a9f1110VgnVCM100000dc0ca8c0RCRDNo</a>	Security at Work (Instituto Nacional de Higiene y Seguridad en el Trabajo; INHST)	
51	SE	Control of Substances Hazardous to health (COSHH), which includes potential exposure to biological agents and provides information on related risk assessment in the workplace	<a href="http://www.hse.gov.uk/coshh/">http://www.hse.gov.uk/coshh/</a>	Health and Safety Executive, GB	Regulation
52	UK	The Control of Substances Hazardous to Health Regulations (COSHH) implements directive 2000/54/EC in GB. Specific guidance is available on controlling exposure from deliberate work (e.g. laboratory) with biological agents	<a href="http://www.hse.gov.uk/biosafety/index.htm">www.hse.gov.uk/biosafety/index.htm</a> ; <a href="http://www.hse.gov.uk/biosafety/laboratories.htm">www.hse.gov.uk/biosafety/laboratories.htm</a>	Health and Safety Executive and Advisory Committee for Dangerous Pathogens	Regulation
53	UK	Supplementary to COSHH Regulations, 'Legionnaires' disease: the control of legionella bacteria in water systems — Approved Code of Practice' (L8) provides specific guidance on controlling exposure to legionella from work activities	<a href="http://www.hse.gov.uk/pubns/books/l8.htm">http://www.hse.gov.uk/pubns/books/l8.htm</a> ; <a href="http://www.hse.gov.uk/legionnaires/index.htm">http://www.hse.gov.uk/legionnaires/index.htm</a>	Health and Safety Executive and Advisory Committee for Dangerous Pathogens	Regulation
54	UK	Supplementary to COSHH Regulations there is specific guidance on how to assess and ways to reduce the risks of workplace exposure to blood-borne viruses	<a href="http://www.hse.gov.uk/biosafety/blood-borne-viruses/index.htm">http://www.hse.gov.uk/biosafety/blood-borne-viruses/index.htm</a>	Health and Safety Executive and Advisory Committee for Dangerous Pathogens	Regulation
55	NO	Disinfection of workwear in healthcare	<a href="http://www.arbeidstil-synet.no/fakta.html?tid=245524">http://www.arbeidstil-synet.no/fakta.html?tid=245524</a>	The Norwegian Labour Inspection Authority	Unknown

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Resp. no	Country	Short description of this policy, including aim	Information publicly available	Organisation and/or person to contact for further info.	Assigned category (see Table 17)
56	NO	See answer from Tone Eriksen, Norwegian Labour Inspectorate	No	Tone Eriksen, +4797984156	Unknown

## National campaigns

Table A4-7: National or local campaigns/strategies which focus on the risks of biological agents at work as indicated by the respondents (showing only the individual response of respondents who indicated that they know one or more campaign/strategy) (question 12)

Resp. no	Country	Focus of campaign/strategy	Information publicly available	Organisation and/or person to contact for further info.	Assigned category (see table 18)
4	AT	Vaccinations against hepatitis, FSME, tetanus are provided for exposed workers	<a href="http://www.auva.at">www.auva.at</a>	AUVA, Department for Prevention	Vaccination
7	AT	AUVA Legionellen am Arbeitsplatz	Article in the magazine 'Sichere Arbeit'	AUVA Mr. DI Manfred Hinker	Unknown
7	AT	AUVA Fachseminar "Biologische Arbeitsstoffe"	<a href="http://www.auva.at">www.auva.at</a>	AUVA Mr. Mag. Christian Schenk	Seminar/conference
8	AT	Needle insurance	<a href="http://www.arbeitsinspektion.gv.at/inspektorat/Arbeitsstoffe/biologische/Nadelstichverletzungen">http://www.arbeitsinspektion.gv.at/inspektorat/Arbeitsstoffe/biologische/Nadelstichverletzungen</a>	Labour Inspectorate	Workplace inspection
9	AT	Needlestick injuries	<a href="http://www.auva.at/portal27/portal/auvaportal/content/contentWindow?contentid=10008.601435&amp;action=b&amp;cacheability=PAGE&amp;version=1407917705">http://www.auva.at/portal27/portal/auvaportal/content/contentWindow?contentid=10008.601435&amp;action=b&amp;cacheability=PAGE&amp;version=1407917705</a>	See website	Unknown
13	CY	The Department of Labour Inspection is implementing specific campaign in the healthcare sector to ensure that employers are taking the necessary actions and measures for the prevention of sharp injuries and protection of workers health from biological	No	Department of Labour Inspection/Advisor Occupational Physician, Dr Athanasios Athanasiou (info@dli.mlsi.gov.cy/aathanasiou@dli.mlsi.gov.cy)	Workplace inspection/prevention

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Resp. no	Country	Focus of campaign/strategy	Information publicly available	Organisation and/or person to contact for further info.	Assigned category (see table 18)
		agents in compliance with the above specific regulations			
21	FR	Vector-borne diseases (including general and occupational exposure, prevention)	Ministry of Health, Ministry of Environment websites, High Council of Public Health website	General Direction of Health (Ministry of Health)	Unknown
22	DE	ABAS-BiostoffTage	<a href="http://www.baua.de">www.baua.de</a>	BAuA	Seminar/conference
23	DE	Inspection of workplaces by local and regional competent authorities. Safety of workplaces, inspection of proper implementation of safety measures at the technical and organisational level as well as personal protection equipment; focuses are safe working conditions with regard to hazardous substances including biological agents, hygienic conditions, fire hazard, hazards through machinery and other mechanical devices, and more	No	State competent authorities; <a href="http://www.baua.de/cae/servlet/contentblob/677886/publicationFile">www.baua.de/cae/servlet/contentblob/677886/publicationFile</a> . Federal Institute for Occupational Safety and Health (BAuA); <a href="http://www.baua.de/en/Service/Contact/Contact%20form.html">www.baua.de/en/Service/Contact/Contact form.html</a>	Workplace inspection
23	DE	Biostofftag. The Biostofftag (Day of Biological Agents) is a one-day conference held annually and organised by the Committee for Biological Agents (Ausschuss für Biologische Arbeitsstoffe, ABAS). At this conference, representatives of	<a href="http://www.baua.de/de/Themen-von-A-Z/Biologische-Arbeitsstoffe/ABAS/Veranstaltungen/Veranstaltungen.html">www.baua.de/de/Themen-von-A-Z/Biologische-Arbeitsstoffe/ABAS/Veranstaltungen/Veranstaltungen.html</a>	Federal Institute for Occupational Safety and Health (BAuA); <a href="http://www.baua.de/en/Service/Contact/Contact%20form.html">www.baua.de/en/Service/Contact/Contact form.html</a>	Seminar/conference

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Resp. no	Country	Focus of campaign/strategy	Information publicly available	Organisation and/or person to contact for further info.	Assigned category (see table 18)
		stakeholders (e.g. those responsible for occupational safety in companies, employers, experts in occupational medicine) meet representatives of the legal authorities to exchange and evaluate experiences and current issues of occupational health in relation to biological agents from the viewpoints of occupational practice and legal regulation			
23	DE	Sicherheitsunterweisungen für Beschäftigte (Safety briefings for employees). Safety briefings are held at least annually, and before newly hired employees commence their work. They are mandatory for all persons working in the presence of biological agents, which includes also repair and service personnel	TRBA 400 BGI 527 (BGHM, 2012) Leitfaden für die betriebliche Unterweisung (BG ETEM)	Federal Institute for Occupational Safety and Health (BAuA); www.baua.de/en/Service/Contact/Contact form.html German Accident Insurance, Deutsche Gesetzliche Unfallversicherung (DGUV); www.dguv.de	Safety briefings for workers
25	HU	2014: sharps injuries in the hospital and healthcare sector — targeted OSH inspections	<a href="http://www.ommf.gov.hu/index.html?akt_menu=172&amp;hir_reszlet=413">http://www.ommf.gov.hu/index.html?akt_menu=172&amp;hir_reszlet=413</a> (Language: Hungarian)	No	Workplace inspection
26	HU	Special inspection campaign of activities that pose risk of injury or infection due to sharps used in the healthcare sector (2014)	<a href="http://ommf.gov.hu/index.php?akt_menu=172&amp;hir_reszlet=413">http://ommf.gov.hu/index.php?akt_menu=172&amp;hir_reszlet=413</a>	Ministry for National Economy — Department of OSH Inspection (munkafelugyeletifoo@ngm.gov.hu)	Workplace inspection

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Resp. no	Country	Focus of campaign/strategy	Information publicly available	Organisation and/or person to contact for further info.	Assigned category (see table 18)
26	HU	Special inspection campaign of the prevention of infections and diseases due to biological agents (2015)	<a href="http://ommf.gov.hu/index.php?akt_menu=172&amp;hir_reszlet=486">http://ommf.gov.hu/index.php?akt_menu=172&amp;hir_reszlet=486</a>	Ministry for National Economy — Department of OSH Inspection (munkafelugyeleti-foo@ngm.gov.hu)	Workplace inspection
27	IE	Guidelines are intended for use in emergency medical settings where a patient first presents	<a href="http://www.hpsc.ie/A-Z/EMIToolkit/leaflets-and-letters.html">http://www.hpsc.ie/A-Z/EMIToolkit/leaflets-and-letters.html</a>	Health Protection Surveillance Centre, 25–27 Middle Gardiner St, Dublin 1, Ireland. t: +353 1 8765300 f: +353 1 8561299 e:hpsc@hse.ie	Guidelines
27	IE	Increase flu vaccination in healthcare workers	<a href="http://www.hse.ie/eng/health/immunisation/pubinfo/flu vaccine/in-fohcw/">http://www.hse.ie/eng/health/immunisation/pubinfo/flu vaccine/in-fohcw/</a>	<a href="https://www.hse.ie/eng/health/immunisation/pubinfo/flu vaccine/in-fohcw/importanceoffluhcws.pdf">https://www.hse.ie/eng/health/immunisation/pubinfo/flu vaccine/in-fohcw/importanceoffluhcws.pdf</a>	Vaccination
28	IE	The Health and Safety Authority have ongoing inspection programmes or short campaigns which focus on biological agents at work, in particular around legionella management in the accommodation sector, sharps in the healthcare sector, and risk of exposure to biological agents in other sectors such as waste (including composting) and the cleaning sector	No	Health and Safety Authority	Workplace inspection
30	IT	Use of safe and tested equipment to reduce the risk of injuries	It is not a website but a national law	Italian Ministry of Labour	Campaign
34	LV	National campaign	No	vm@vm.gov.lv; vi@vi.gov.lv; info@spkc.gov.lv	Campaign

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Resp. no	Country	Focus of campaign/strategy	Information publicly available	Organisation and/or person to contact for further info.	Assigned category (see table 18)
37	LU	Needlestick injuries	(Missing)	Division de la santé au travail et de l'environnement	Unknown
38	MT	National Hospital Hand washing campaign launched in October 2008	<a href="http://theific.org/wp-content/uploads/2014/10/017-Hand-Hygiene-Noel.pdf">http://theific.org/wp-content/uploads/2014/10/017-Hand-Hygiene-Noel.pdf</a>	infection.control@gov.mt	Campaign
41	NL	Risk of health effects following work in risky settings (i.e. child-care, healthcare, agricultural)	www.voorkomberoepsinfectieziekten.nl	(Missing)	Unknown
41	NL	Annually hospitals develop campaigns on flu vaccination for their employees (healthcare workers)	Most institutions will organise their own campaign, but an example is the academic hospitals. <a href="http://www.dokterhoe.nl/onderwerp/17/infectiepreventie/">http://www.dokterhoe.nl/onderwerp/17/infectiepreventie/</a> Also on European level vaccination of healthcare workers has been in the spotlight: <a href="http://www.hproim-mune.eu/">http://www.hproim-mune.eu/</a>	(Missing)	Vaccination
42	NL	'Week van de teek' (week of the tick) regarding exposure to Lyme disease	www.weekvandeteek.nl	Stigas	Campaign
44	PT	The national strategy 2015-2020 predicts in the objective 2 — Prevention of occupational accidents and diseases: Measure 13 — development of prevention actions relating specific risks such as chemi-	Yes, it is. The national strategy was published by the Resolution of the ministers council n. 77/2015, Portugal official journal of 18th September	Carlos Pereira — Head of Department — Promotion of Occupational Safety and Health	National strategy

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Resp. no	Country	Focus of campaign/strategy	Information publicly available	Organisation and/or person to contact for further info.	Assigned category (see table 18)
		cal risks, psychosocial risks, nanotechnologies, biological risks, MSD. At the moment, it's not established the targeted specific professions, sector or biological agents object of the above-mentioned preventive actions			
44	PT	Tuberculosis prevention in health professionals	<a href="http://www.dgs.pt">www.dgs.pt</a>	<a href="http://www.dgs.pt/saude-ocupacional.aspx">www.dgs.pt/saude-ocupacional.aspx</a>	Prevention
44	PT	Prevention of hepatitis B	<a href="http://www.dgs.pt">www.dgs.pt</a>	OSH Services and Health establishments	Prevention
47	ES	Needlestick accidents in healthcare sector	Different health regional authorities involved	Different health regional authorities involved	Unknown
50	ES	A(H1N1) campaign	Reference/website <a href="http://www.msssi.gob.es/servCiudadanos/alertas/preguntas-Frecuentes.htm">http://www.msssi.gob.es/servCiudadanos/alertas/preguntas-Frecuentes.htm</a>	Ministry of Health	Campaign
50	ES	Ebola Virus	<a href="http://www.msssi.gob.es/profesionales/saludPublica/ccayes/alertasActual/ebola/infProfesionales.htm">http://www.msssi.gob.es/profesionales/saludPublica/ccayes/alertasActual/ebola/infProfesionales.htm</a>		Unknown
50	ES	HIV campaign	<a href="http://www.msssi.gob.es/campanas/campanas14/diaSida.htm">http://www.msssi.gob.es/campanas/campanas14/diaSida.htm</a>	(Missing)	Campaign
52	UK	NHS workers	<a href="http://www.nhshealthatwork.co.uk">www.nhshealthatwork.co.uk</a>	No	Unknown
53	UK	Multiple educational initiatives run by the Health and Safety Executive Biological Agents Unit	<a href="http://www.hse.gov.uk/biosafety/">http://www.hse.gov.uk/biosafety/</a>	HSE — see link provided: <a href="http://www.hse.gov.uk/biosafety/">http://www.hse.gov.uk/biosafety/</a>	Educational initiatives

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Resp. no	Country	Focus of campaign/strategy	Information publicly available	Organisation and/or person to contact for further info.	Assigned category (see table 18)
54	UK	Legionella intervention programme	<a href="http://www.hse.gov.uk/aboutus/meetings/hseboard/2013/.../pocbt13102.pdf">www.hse.gov.uk/aboutus/meetings/hseboard/2013/.../pocbt13102.pdf</a>	Health and Safety Executive	Intervention programme
54	UK	Controlling exposure to <i>Mycobacterium bovis</i> in abattoir workers — raising the standard for control of exposure to this bacterium in abattoirs processing reactor cattle	<a href="http://www.hse.gov.uk/biosafety/acdp-m-bovis-working-group.pdf">www.hse.gov.uk/biosafety/acdp-m-bovis-working-group.pdf</a>	Health and Safety Executive and Advisory Committee for Dangerous Pathogens	Control programme
54	UK	Operational strategy for interventions at new builds of high containment biosafety facilities in Great Britain — approach to ensuring laboratories working with the most hazardous biological agents apply safety principles at the design stage	<a href="http://www.hse.gov.uk/foi/internal-ops/hid_circs/administration/spc-admin-83.htm">http://www.hse.gov.uk/foi/internal-ops/hid_circs/administration/spc-admin-83.htm</a>	Health and Safety Executive	Intervention programme
57	NO	LA-MRSA/MRSA	<a href="http://www.mattilsynet.no/dyr_og_dyrehold/dyre-helse/smitte_mel-lom_dyr_og_mennesker/MRSA/ny_veileder_og_nye_anbefalinger_for_lamsamrsa.21294">http://www.mattilsynet.no/dyr_og_dyrehold/dyre-helse/smitte_mel-lom_dyr_og_mennesker/MRSA/ny_veileder_og_nye_anbefalinger_for_lamsamrsa.21294</a>	Norwegian Food Safety Authority	Unknown
57	NO	HIV at the workplace	<a href="https://helsenorge.no/sykdom/kjonnssykdommer/hiv-og-aids/hiv-i-arbeidslivet">https://helsenorge.no/sykdom/kjonnssykdommer/hiv-og-aids/hiv-i-arbeidslivet</a>	The Norwegian Directorate of Health	Unknown
57	NO	Infection risk at work in reception centres	<a href="http://www.arbeidstilsynet.no/binfil/download2.php?tid=255165">http://www.arbeidstilsynet.no/binfil/download2.php?tid=255165</a>	The Norwegian Labour Inspection Authority	Unknown

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Resp. no	Country	Focus of campaign/strategy	Information publicly available	Organisation and/or person to contact for further info.	Assigned category (see table 18)
58	NO	Tone Eriksen again	No	Tone Eriksen, +4797984156	Unknown
59	NO	(Missing)	<a href="http://www.fhi.no/eway/?pid=240">http://www.fhi.no/eway/?pid=240</a>	No	Unknown
62	CH	(Missing)	<a href="https://extra.suva.ch/suva/b2c/b2c/start.do.jsessionid=pp1D9tPrqqETx6ak8u7QaR9PcbUEVA-FzkRoe_SAPGB6TZcl_Oqx-ODG9luLQ-YZP2:saplb_*(J2EE505057620)505057651">https://extra.suva.ch/suva/b2c/b2c/start.do.jsessionid=pp1D9tPrqqETx6ak8u7QaR9PcbUEVA-FzkRoe_SAPGB6TZcl_Oqx-ODG9luLQ-YZP2:saplb_*(J2EE505057620)505057651</a>	Suva Dept of Occupational Medicine	Unknown

### Expert networks

Table A4-8: Expert networks that pay specific attention to exposure to biological agents at the workplace and/or work-related diseases due to exposure to biological agents as indicated by the respondents (showing only the individual response of respondents who indicated that they know one or more network) (question 13)

Resp. no	Country	Focus of network	Information publicly available	Organisation and/or person to contact for further info.	Assigned category (see Table 19)
7	AT	Cooperation AUVA SUVA DGUV	No	AUVA Mr. DI Manfred Hinker	Cooperation of institutes
7	AT	CEN-AG Biological Agents	No	No	Unknown
10	BE	Arbeidsgeneesheren (occupational physicians)	Bbvag	No	Occupational physicians
10	BE	Arbeidsgeneesheren (occupational physicians)	Vwva	No	Occupational physicians
15	DK	There is a network regarding the exposure to MRSA in pig farms	No	There are several representatives in the network, me included. In addition to the WEA the health authorities and the agricultural authority is also represented. I can be the contact person in this case	Cooperation of institutes
15	DK	The focus of this group is epidemics in general and not only work-related exposures	No	The Danish Health Authority, att.: Stine Ulendorf Jacobsen	Network within/from (national) institute
16	DK	MRSA	No	Anne Mette Madsen	Unknown
17	DK	Occupational physician employed at seven different hospital departments across the country	<a href="http://www.arbejdsmedicin.dk/">http://www.arbejdsmedicin.dk/</a>	Ole Carstensen, head of the Scientific Society for Occupational and Environmental Medicine (www.DASAM.DK). E mail ole.carstensen@vest.rm.dk	Occupational physician operating in several hospitals
19	FI	Tripartite committee on occupational diseases	No	Riitta Sauni, Ministry of Social Affairs and Health	Tripartite committee

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Resp. no	Country	Focus of network	Information publicly available	Organisation and/or person to contact for further info.	Assigned category (see Table 19)
19	FI	Inspectorates	<a href="http://www.tyosuojelu.fi">www.tyosuojelu.fi</a>	Satu Auno, Inspectorate	Inspectors
20	FI	Prevention of exposure, risk assessment	<a href="http://www.ttl.fi">www.ttl.fi</a>	www.ttl.fi	Network within/from (national) institute
21	FR	INRS (National Institute for Research and Safety): focus on occupational risks prevention, including biological risks	INRS website	Department of medical studies and aid	Network within/from (national) institute
21	FR	rnv3p/network of occupational medical experts)	ANSES rnv3p website	ANSES, Melina Lebarbier	Network of occupational physicians/hygienists
22	DE	ABAS	<a href="http://www.baua.de">www.baua.de</a>	BAuA	Committee of experts from different organisations
22	DE	KOBAS	<a href="http://www.dguv.de">www.dguv.de</a>	German Social Accident Insurance	Unknown
23	DE	Ausschuss für Biologische Arbeitsstoffe, ABAS (Committee for Biological Agents). Evaluation, policy consultation and generation of regulatory frameworks for occupational safety with regard to biological agents	<a href="http://www.baua.de/de/Themen-von-A-Z/Biologische-Arbeitsstoffe/ABAS/ABAS.html">www.baua.de/de/Themen-von-A-Z/Biologische-Arbeitsstoffe/ABAS/ABAS.html</a> <a href="http://www.baua.de/en/Topics-from-A-to-Z/Biological-Agents/Biological-Agents.html">www.baua.de/en/Topics-from-A-to-Z/Biological-Agents/Biological-Agents.html</a>	Federal Institute for Occupational Safety and Health (BAuA); <a href="http://www.baua.de/en/Service/Contact/Contact-form.html">www.baua.de/en/Service/Contact/Contact form.html</a>	Committee of experts from different organisations
27	IE	BBV committee for HCWs	No	Dr Kevin Kelleher, Assistant National Director Integrated Services Directorate — Health	Committee
29	IT	Protection to biological risk in healthcare sector	No	Giovanna Spatari	Unknown

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Resp. no	Country	Focus of network	Information publicly available	Organisation and/or person to contact for further info.	Assigned category (see Table 19)
29	IT	Spread information on biological risk	No	Paolo Durando	Unknown
30	IT	The Italian Institute for insurance of occupational accidents and diseases	<a href="http://www.inail.it">http://www.inail.it</a>	INAIL	Network of experts with various expertise within/from (national) institute
32	IT	Occupational exposure to biological agents in hospital workers	No	<a href="mailto:stefano.porru@unibs.it">stefano.porru@unibs.it</a>	Unknown
33	IT	Experts from the Ministry of Labour	<a href="http://www.lavoro.gov.it">www.lavoro.gov.it</a>	Ministry of Labour	Network within ministry
33	IT	Experts from INAIL (Occupational physicians, researchers, coroners, engineers, biologists)	<a href="http://www.inail.it">www.inail.it</a>	INAIL	Network of experts with various expertise within/from (national) institute
33	IT	Experts from SIMLII (Italian Association on Occupational Medicine and Industrial Hygiene)	<a href="http://www.simlii.it">www.simlii.it</a>	SIMILII	National association on occupational medicine/hygiene
39	NL	Exchange of knowledge between experts on biological factors	<a href="http://www.arbeidshygiene.nl/vereniging/contact-groepen/biologische-factoren/">http://www.arbeidshygiene.nl/vereniging/contact-groepen/biologische-factoren/</a>	E. Hagelen, NVvA	Network of occupational physicians/hygienists
40	NL	BVF-Platform (network of biosafety officers), EBSA, colleague in other umc, NVvA (= occupational hygienist)	(Missing)	(Missing)	Network of biosafety officers; network of occupational hygienists between hospitals; national association on occupational medicine/hygiene
41	NL	A network of occupational hygienists and occupational physicians, working in settings where work-related infections can occur	No	<a href="mailto:fleur.meerstadt@rivm.nl">fleur.meerstadt@rivm.nl</a>	Network of occupational physicians/hygienists

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Resp. no	Country	Focus of network	Information publicly available	Organisation and/or person to contact for further info.	Assigned category (see Table 19)
		(i.e. healthcare, agricultural, childcare). Meetings are held twice a year, covering topics that are of interest at the time and giving the opportunity of sharing issues			
41	NL	Occupational health physicians working in healthcare	No	<a href="mailto:fleur.meerstadt@rivm.nl">fleur.meerstadt@rivm.nl</a>	Network of occupational physicians/hygienists
42	NL	Knowledge Network infectious diseases and work (Kennisnetwerk infectieziekten en werk)	No	NCvB/www.kiza.nl	Knowledge network (website)
42	NL	Contact Group Biological Agents (Contactgroep biologische agentia), NVVA	<a href="http://www.nvva.nl">www.nvva.nl</a>	No	National association on occupational medicine/hygiene
42	NL	Working group on infectious diseases and work (Werkgroep infectieziekten en arbeid)	<a href="http://www.nvab-online.nl">www.nvab-online.nl</a>	NVAB	Network of occupational physicians/hygienists
44	PT	Tuberculosis prevention	National programme of respiratory diseases (including tuberculosis)	Coordinator of the National Programme of respiratory diseases of the Health General Directorate (Coordenador do Programa Nacional das doenças respiratórias da Direção-Geral da Saúde)	Unknown
46	SK	Physicians — specialising in clinical occupational medicine and clinical toxicology, in preventive	No	No	Network of occupational physicians/hygienists

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Resp. no	Country	Focus of network	Information publicly available	Organisation and/or person to contact for further info.	Assigned category (see Table 19)
		occupational medicine and toxicology, in epidemiology, in public health; public health workers.			
50	ES	Focus: among others they have delivered guides or protocols for Workers Health Surveillance. Also on Biological Agents	<a href="http://www.msssi.gob.es/ciudadanos/saludAmbLaboral/docs/agentes_biologicos.pdf">http://www.msssi.gob.es/ciudadanos/saludAmbLaboral/docs/agentes_biologicos.pdf</a>	Working Group of Occupational Health of the National and Interregional Commission of the National Health System. Ministry of Health	Network within ministry
52	UK	NHS	Health Protection Agency	No	Unknown
53	UK	Sharps injury prevention and British standards	<a href="http://www.saferneedles.org.uk/">http://www.saferneedles.org.uk/</a> and <a href="https://standardsdevelopment.bsigroup.com/Home/Committee/50250976">https://standardsdevelopment.bsigroup.com/Home/Committee/50250976</a>	No	Unknown
54	UK	British Occupational Hygiene Society (BOHS)	<a href="http://www.bohs.org/">http://www.bohs.org/</a>	admin@bohs.org/	National association on occupational medicine/hygiene
54	UK	Institute for Occupational Medicine (IOM)	<a href="http://www.iom-world.org/">http://www.iom-world.org/</a>	info@iom-world.org	Network within/from (national) institute
54	UK	Institute for Safety in Technology and Research (ISTR) — Biosafety section	<a href="http://www.istr.org.uk/biosaf.shtml">http://www.istr.org.uk/biosaf.shtml</a>	istr-secretary@istr.org.uk	Network within/from (national) institute
58	NO	NOA, NIOH, Oslo	<a href="http://www.noa.stami.no">www.noa.stami.no</a>	Me and Eva Løvseth	Network within/from (national) institute
58	NO	Norwegian Labour Inspectorate	www.arbeidstilsynet.no	Tone Eriksen, +4797984156	Inspectors

## National reports and projects

**Table A4-9: National reports or ongoing projects with regard to exposure to biological agents and/or work-related diseases due to exposure to biological agents as indicated by the respondents (showing only the individual response of the respondents who indicated that they know one or more report) (question 14)**

Res n	Cou ntry	Name/description of report/pro- ject	Report and/or information of pro- ject publicly available	Organisation and/or person to contact for further info.	Assigned category (see Table 5)
7	AT	Labour inspection	<a href="http://www.arbeitsinspektion.gv.at/in-spektorat/Arbeitsstoffe/biologische/">http://www.arbeitsinspektion.gv.at/in-spektorat/Arbeitsstoffe/biologische/</a>	No	Labour Inspectorate
8	AT	Progress report of Labour Inspec- torate	<a href="http://www.arbeitsinspektion.gv.at/in-spektorat/Kontakt_Service/Ber-ichte_Schwerpunkte/Taetigkeitsber-ichte">http://www.arbeitsinspektion.gv.at/in-spektorat/Kontakt_Service/Ber-ichte_Schwerpunkte/Taetigkeitsber-ichte</a>	Labour Inspectorate	Labour Inspectorate
8	AT	List of recognised occupational dis- eases	<a href="http://www.auva.at/portal27/por-tal/auvaportal/content/contentWin-dow?contentid=10007.671002&amp;ac-tion=2">http://www.auva.at/portal27/por-tal/auvaportal/content/contentWin-dow?contentid=10007.671002&amp;ac-tion=2</a>	AUVA	National Institute on occupational /environmental health
16	DK	Exposure of wastewater workers to viruses and bacteria causing gastro- enteritis	No	Anne Mette Madsen, NRCWE	National Institute on occupational/ environmental health
16	DK	Greenhouse workers exposure to bi- oaerosols and association to inflam- mation	No	Anne Mette Madsen, NRCWE	National Institute on occupational/ environmental health
16	DK	Exposure to MRSA in occupational settings	No	Anne Mette Madsen, NRCWE	National Institute on occupational/ environmental health
18	EE	That statistics from the Labour In- spectorate are published in Labour Inspectorate Annual Reports of Work Environment	Labour Inspectorate Annual report <a href="http://ti.ee/en/media-publica-tions-statistics/statistics/annual-re-ports-of-work-environment/">http://ti.ee/en/media-publica-tions-statistics/statistics/annual-re-ports-of-work-environment/</a>	Labour Inspectorate	Labour Inspectorate
19	FI	National Institute of Welfare and Health	www.thl.fi	No	National Institute on occupational/ environmental health

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Res n	Cou ntry	Name/description of report/pro- ject	Report and/or information of pro- ject publicly available	Organisation and/or person to contact for further info.	Assigned category (see Table 5)
20	FI	Anna-Liisa Pasanen. A review: fun- gal exposure assessment in indoor environments	Indoor Air 2001:11:87–98	Anna-Liisa Pasanen	Unknown
21	FR	Report and ANSES opinion on risk assessment of sewer workers	No	ANSES, Direction of Risk Assess- ment, Henri Bastos	National Institute on occupational/ environmental health
23	DE	Epidemiology of Occupational Infec- tious Diseases (Epidemiologie ar- beitsbedingter Infektionskrank- heiten), Fischer et al., 2013	<a href="http://www.baua.de/de/Publikationen/Fachbeitraege/F5198.html">www.baua.de/de/Publika- tionen/Fachbeitraege/F5198.html</a>	Federal Institute for Occupational Safety and Health (BAuA); <a href="http://www.baua.de/en/Service/Contact/Contact%20form.html">www.baua.de/en/Service/Con- tact/Contact form.html</a>	National Institute on occupational/ environmental health
24	EL	Brucellosis: the epidemiological situ- ation in Greece	HCDCP E-bulletin ( <a href="http://www2.keel-pno.gr/blog/?p=1979&amp;lang=en">http://www2.keel- pno.gr/blog/?p=1979&amp;lang=en</a> )	Hellenic Centre for Disease Control and Prevention (HCDCP), Athens, Greece <a href="http://www.keelpno.gr/diseaseshealthtopics">www.keelpno.gr/dis- easeshealthtopics</a>	National Institute on occupational/ environmental health
25	HU	Summary assessment of the annual data of occupational diseases and cases of increased exposures	Central European Journal of Occu- pational and Environmental Medi- cine <a href="http://www.omfi.hu/cejoem/in-&lt;br/&gt;dex.html">http://www.omfi.hu/cejoem/in- dex.html</a> (Language: English)	Hungarian Institute of Occupational Health	National Institute on occupational/ environmental health
26	HU	Annual activity reports of occupa- tional health services. It contains data on exposures but not only on biological agents	(Missing)	Office of the Chief Medical Officer — Department of Occupational Health ( <a href="mailto:titkarsag@omfi.hu">titkarsag@omfi.hu</a> )	Occupational health services
26	HU	University post-graduate thesis on the biological exposures of veteri- naries caring for pets (survey)	No	The author (contact <a href="mailto:kudasz@omfi.hu">kudasz@omfi.hu</a> to contact the au- thor)	University
30	IT	INAIL statistics website	<a href="http://www.inail.it">www.inail.it</a>	INAIL	National Institute on occupational/ environmental health

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Res n	Country	Name/description of report/project	Report and/or information of project publicly available	Organisation and/or person to contact for further info.	Assigned category (see Table 5)
32	IT	Guidelines of the Italian Society of Occupational Medicine and Industrial Hygiene	<a href="http://www.aogarbagnate.lombardia.it/salvin-iweb/uoom/linee%20guida/Linee%20Guida%20SIMLII%20Rischio%20Biologico.pdf">http://www.aogarbagnate.lombardia.it/salvin-iweb/uoom/linee%20guida/Linee%20Guida%20SIMLII%20Rischio%20Biologico.pdf</a>	stefano.porru@unibs.it	National association of occupational hygiene/medicine
34	LV	National reports	No	vm@vm.gov.lv; vi@vi.gov.lv; info@spkc.gov.lv	Unknown
39	NL	OSH knowledge dossier on biological agents	<a href="http://www.arbokennisnet.nl/images/dynamic/Dossiers/Biologische_agentia/D_Biologische_agentia.pdf">http://www.arbokennisnet.nl/images/dynamic/Dossiers/Biologische_agentia/D_Biologische_agentia.pdf</a>	See list of authors in the dossier	Various experts
39	NL	Chapter 8 — Occupational diseases by biological agents, in 'Key figures on occupational Diseases 2015 ('Beroepsziekten door biologische agentia, in 'Kerncijfers Beroepsziekten 2015')	<a href="http://www.beroepsziekten.nl/sites/default/files/documents/ncvb_kerncijfers2015.pdf">http://www.beroepsziekten.nl/sites/default/files/documents/ncvb_kerncijfers2015.pdf</a>	NCvB	Centre for occupational diseases
41	NL	BIC (Beroepsziekten in cijfers (Occupational illnesses in figures)) report from the national institute for occupational diseases (NCvB); a chapter of the annual report focuses on biological agents and work	<a href="http://www.beroepsziekten.nl">www.beroepsziekten.nl</a>	j.j.maas@amc.uva.nl	Centre for occupational diseases
42	NL	RIVM: Infectieziekten bestrijding en werknemersgezondheid jaarrapportage (Infectious diseases control and worker health annual reporting)	(Missing)	Fleur Meerstadt	National Institute/Authority on Public Health

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Res n	Country	Name/description of report/project	Report and/or information of project publicly available	Organisation and/or person to contact for further info.	Assigned category (see Table 5)
44	PT	<p>ACT has a department that supports studies and projects, financially and technically, concerning different sectors and areas namely related to biological risks. Some of supported studies were:</p> <ul style="list-style-type: none"> <li>▪ Diagnosing allergies and exposure assessment to allergens in fish processing industry (2009);</li> <li>▪ Diagnosis and risk management in occupational health (2010);</li> <li>▪ Policies, strategies and practices to prevent and combat HIV/AIDS at work (2011);</li> <li>▪ Exposure to particles and fungi and potential health effects in baking and the production of cookies and crackers (2012);</li> <li>▪ Wastewater treatment plants</li> </ul>	<p>Only one of the publications is available in the ACT website:  <a href="http://www.act.gov.pt/(pt-PT)/Publicacoes/ProjetosApoiados/2009/Documents/Avaliacao_exposicao_fungos_particulas_exploracoes%20avicolas%20e%20sulinicolas_estudo.pdf">http://www.act.gov.pt/(pt-PT)/Publicacoes/ProjetosApoiados/2009/Documents/Avaliacao_exposicao_fungos_particulas_exploracoes%20avicolas%20e%20sulinicolas_estudo.pdf</a></p>	(Missing)	National Institute on occupational/environmental health
46	SK	Annual report on Public Health Authority of the Slovak Republic and Regional Public Health Authorities activity	<a href="http://www.uvzsr.sk">www.uvzsr.sk</a> , Slovak language	Public Health Authority of the Slovak Republic	National Institute/Authority on public health
47	ES	Occupational Diseases annual report	<a href="http://www.seg-social.es/Internet/1/Estadistica/Est/Observatorio%20de%20las%20Enfermedades%20Profesionales/index.htm">http://www.seg-social.es/Internet/1/Estadistica/Est/Observatorio de las Enfermedades Profesionales/index.htm</a>	Dirección general de Ordenación de la Seguridad Social. Ministerio de Empleo y Seguridad Social	Ministry
47	ES	Estudio descriptivo de las Enfermedades profesionales (Descriptive study of occupational diseases)	<a href="http://www.oect.es/Observatorio/5%20Estudios%20tecnicos/Otros%20estudios%20tecnicos">http://www.oect.es/Observatorio/5%20Estudios%20tecnicos/Otros%20estudios%20tecnicos</a>	INSHT	Unknown

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Res n	Country	Name/description of report/project	Report and/or information of project publicly available	Organisation and/or person to contact for further info.	Assigned category (see Table 5)
			<a href="#">cos/Publicado/Ficheros/IN-FORME_EEPP2007-2012_JU-NIO2013.pdf</a>		
50	ES	Biological agents at work. Technical guide for prevention and evaluation of risks (Guía Técnica para la Evaluación y Prevención de los Riesgos relacionados con la exposición a Agentes Biológicos, INHST and Ministerio de Empleo y Seguridad Social, 2014).	<a href="http://www.insht.es/portal/site/Insht/menuitem.1f1a3bc79ab34c578c2e8884060961ca/?vgnextoid=dfae3fa2919a5110VgnVCM100000dc0ca8c0RCRD&amp;vgnnextchannel=75164a7f8a651110VgnVCM100000dc0ca8c0RCRD">http://www.insht.es/portal/site/Insht/menuitem.1f1a3bc79ab34c578c2e8884060961ca/?vgnextoid=dfae3fa2919a5110VgnVCM100000dc0ca8c0RCRD&amp;vgnnextchannel=75164a7f8a651110VgnVCM100000dc0ca8c0RCRD</a>	Spanish National Institute of Hygiene and Safety at Work (INHST), Spanish Ministry of Labour	National Institute on occupational/environmental health
51	SE	The Swedish Work Environment Authority has commissioned a project to review what is written in the scientific literature about antibiotics and work environment. The project has just started.	No	Jenny Persson Blom, Swedish Work Env. Auth.	National Institute on occupational/environmental health
52	UK	The health protection agency has produced several.	HPA website	No	National Institute on occupational/environmental health
53	UK	Eye of the needle	<a href="https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/385300/EoN_2014_-_FINAL_CT_3_sig_occ.pdf">https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/385300/EoN_2014_-_FINAL_CT_3_sig_occ.pdf</a>	PHE, UK	National Institute on occupational/environmental health
53	UK	RIDDOR	<a href="http://www.hse.gov.uk/riddor/carcinogens.htm">http://www.hse.gov.uk/riddor/carcinogens.htm</a>	No	National Institute on occupational/environmental health
54	UK	Legionella outbreaks and HSE investigations; an analysis of contributory factors.	<a href="http://www.hse.gov.uk/research/hsl_pdf/2012/hex1207.pdf">www.hse.gov.uk/research/hsl_pdf/2012/hex1207.pdf</a>	Health and Safety Executive	National Institute on occupational/environmental health

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Res n	Country	Name/description of report/project	Report and/or information of project publicly available	Organisation and/or person to contact for further info.	Assigned category (see Table 5)
54	UK	Human factors that lead to non-compliance with standard operating procedures (RR919). Following analysis of recurrent incidents in Containment Level 3 (CL3) laboratories working with biological agents, this study provides an insight into why these accidents occur	<a href="http://www.hse.gov.uk/research/rrpdf/rr919.pdf">www.hse.gov.uk/research/rrpdf/rr919.pdf</a>	Health and Safety Executive	National Institute on occupational/environmental health
54	UK	An evaluation of the efficacy of safer sharps devices — A systematic review was undertaken to consider the evidence related to safer sharps devices and their impact on needle-stick injury reduction within the healthcare sector	<a href="http://www.hse.gov.uk/research/rrpdf/rr914.pdf">www.hse.gov.uk/research/rrpdf/rr914.pdf</a>	Health and Safety Executive	National Institute on occupational/environmental health
57	NO	MRSA guidelines	<a href="http://www.fhi.no/dokumenter/9bc2e5e450.pdf">http://www.fhi.no/dokumenter/9bc2e5e450.pdf</a>	Norwegian Institute of Public Health	National Institute on occupational/environmental health
58	NO	NOA, NIOH, Oslo Faktabok 2015	<a href="https://stami.no/publikasjon/faktabok-om-arbeidsmiljo-og-helse-2015-status-og-utviklingstrekk/">https://stami.no/publikasjon/faktabok-om-arbeidsmiljo-og-helse-2015-status-og-utviklingstrekk/</a>	Me and Eva Løvseth	Unknown
58	NO	NOA website	<a href="http://www.noa.stami.no">www.noa.stami.no</a>	Me and Eva Løvseth	National Institute on occupational/environmental health
59	NO	Ongoing project: Toxigenic fungi, mycotoxins and endotoxins in the Norwegian pig producing industry.	<a href="https://stami.no/prosjekt/sopp-mykotoksiner-og-endotoksiner-grisefjos/">https://stami.no/prosjekt/sopp-mykotoksiner-og-endotoksiner-grisefjos/</a>	STAMI — The National Institute of Occupational Health	National Institute on occupational/environmental health
59	NO	Exposure to chemical and biological agents at work in facilities that clean and recover waste from oil drilling	<a href="https://stami.no/prosjekt/eksponering-kjemiske-og-biologiske-arbeidsmiljofaktorer-ved-arbeid-pa-">https://stami.no/prosjekt/eksponering-kjemiske-og-biologiske-arbeidsmiljofaktorer-ved-arbeid-pa-</a>	STAMI — The National Institute of Occupational Health	National Institute on occupational/environmental health

Res n	Cou ntry	Name/description of report/pro- ject	Report and/or information of pro- ject publicly available	Organisation and/or person to contact for further info.	Assigned category (see Table 5)
			<a href="#">anlegg-som-reanser-og-gjenvinner- avfall-fra-oljeboring/</a>		

### Description of cases and outbreaks

Table A4-10: Cases with regard to work-related diseases due to exposure to biological agents as indicated by the respondents (showing only the individual response of respondents who indicated that they know one or more case) (question 15)

Resp. No	Country	Short description of case	Reference for case	Organisation and/or person to contact for fur- ther info.
12	BG	<i>Mycobacterium tuberculosis</i>	<a href="http://www.nssi.bg/images/bg/about/statisticsandanalysis/statistics/trs/Prof_bolesti_2009-2013.pdf">http://www.nssi.bg/images/bg/about/statisticsandanalysis/statistics/trs/Prof_bolesti_2009-2013.pdf</a>	nssi.bg; d.konova@mlsp.government.bg
12	BG	Hepatitis A virus	<a href="http://www.nssi.bg/images/bg/about/statisticsandanalysis/statistics/trs/Prof_bolesti_2009-2013.pdf">http://www.nssi.bg/images/bg/about/statisticsandanalysis/statistics/trs/Prof_bolesti_2009-2013.pdf</a>	nssi.bg; d.konova@mlsp.government.bg
12	BG	Cotton dust	<a href="http://www.nssi.bg/images/bg/about/statisticsandanalysis/statistics/trs/Prof_bolesti_2009-2013.pdf">http://www.nssi.bg/images/bg/about/statisticsandanalysis/statistics/trs/Prof_bolesti_2009-2013.pdf</a>	nssi.bg; d.konova@mlsp.government.bg
15	DK	MRSA: There has been a substantial focus on MRSA in pig farms in Denmark. The number of infected farms has increased since 2006 when it was first identified in Denmark. There have been several cases of employees who have been infected with MRSA	No	I am not sure what information you are interested in. The specific information on the persons involved are confidential

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Resp. No	Country	Short description of case	Reference for case	Organisation and/or person to contact for further info.
16	DK	ODTS associated with exposure to high concentrations of bioaerosols associated with handling of grass seeds	A paper has been published in English	Anne Mette Madsen, NRCWE
16	DK	ODTS associated with handling of fish meal	(Missing)	Randi Bertelsen, UIB Norway
16	DK	MRSA-positive farmers going to the hospital	No	Anne Mette Madsen, NRCWE
18	EE	Needlestick injury, which was contaminated with hepatitis C virus (a nurse in the emergency department)	No	Labour Inspectorate
18	EE	Tuberculosis in a nurse, who worked in the emergency department	No	Labour Inspectorate
18	EE	Needlestick injury, which was contaminated with hepatitis C virus (a nurse in prison)	No	Labour Inspectorate
19	FI	Epidemic nephritis of farmers (22 cases in 2012)	No	FIOH
19	FI	Tuberculosis, 4 cases in 2012	No	FIOH
19	FI	Tularaemia, 5 cases in 2012 in farmers	No	FIOH
21	FR	Asthma in maintenance staff of coffee machines exposed to <i>Chrysonilia sitophila</i>	Rnv3p scientific report	ANSES rnv3p staff, Melina Lebarbier
21	FR	Occupational respiratory infectious risk in workers already taking inhaled steroids for asthma	(Missing)	(Missing)
21	FR	Case of atypical mycobacteriosis in an exposed house painter	ANSES rnv3p	ANSES rnv3p staff, Melina Lebarbier

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Resp. No	Country	Short description of case	Reference for case	Organisation and/or person to contact for further info.
22	DE	HP in waste workers	Hagemeyer O, Bünger J, van Kampen V, Raulf-Heimsoth M, Drath C, Merget R, Brüning T, Broding HC. Occupational allergic respiratory diseases in garbage workers: relevance of moulds and actinomycetes. Adv Exp Med Biol. 2013;788:313-20	Prof. Bünger
23	DE	Air contaminants in different European farming environments	Radon et al., Ann Agric Environ Med 2002, 9:41-8	(Missing)
23	DE	Farmer's lung in a case after bullectomy	Koschel et al., Int. Arch. Allergy Immunol. 2012, 158:313-6	(Missing)
25	HU	In early August 2014, investigations revealed 43 leptospirosis cases. Workers contaminated by puddle and soil that contained animal urine in a cornfield	No	Hungarian Institute of Occupational Health
26	HU	An epidemic of leptospirosis was detected in a county. Victims were working barefoot on the corn fields. Due to rainfall the soil was soaked and muddy while common voles were increasing. The public health authority investigated and forwarded the cases to the labour inspection but in most cases the employer could not be identified (black labour) did not initiate reporting to the occupational disease system. Only four cases were still not officially registered as occupational diseases: those who were employed by the local government in the public employment scheme. The employment status of the victims is unclear. The case draws attention to the lack of cooperation between public health and labour inspection	<a href="http://epa.oszk.hu/00300/00398/00643/pdf/EPA00398_epinfo_2015_28.pdf">http://epa.oszk.hu/00300/00398/00643/pdf/EPA00398_epinfo_2015_28.pdf</a> (p. 323)	Office of the Chief Medical Officer — Department of Occupational Health (titkarsag@omfi.hu)

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Resp. No	Country	Short description of case	Reference for case	Organisation and/or person to contact for further info.
		bodies, which reside in the same local government office. Furthermore, it highlights the legal difficulties arising from seasonal, informal (atypical) employment, and sub-contracting, which are common in agriculture in poorer regions.		
26	HU	Dozens of Q-fever cases were diagnosed in a small region. The source was an infected sheep flock whose manure was not properly treated and the dry weather plus the wind dispersed the biological agent. Diseases were present not only among the sheep tenders but also among the park maintenance staff of the near village and coach drivers who drove through the area. The case emphasises the emerging qualities of this sort of zoonosis	<a href="http://epa.oszk.hu/00300/00398/00573/pdf/EPA00398_epinfo_2014_6.pdf">http://epa.oszk.hu/00300/00398/00573/pdf/EPA00398_epinfo_2014_6.pdf</a> (p. 57-64)	Office of the Chief Medical Officer — Department of Occupational Health (titkarsag@omfi.hu)
26	HU	During the last years there were repeated ornithosis cases from a big poultry slaughterhouse and processing plant. Despite the substantial investment into the ventilation system (plus training, provision of PPE) the disease appeared last year too. A peculiar pattern has formed: these last victims were newly hired workers and white-collar workers. The exposure of the latter is substantially lower than of those working on the line. Due to the awareness of the GPs, cases were identified in time and there were no serious complications	<a href="http://www.oek.hu/oekfile.pl?fid=6541">http://www.oek.hu/oekfile.pl?fid=6541</a> (p. 93), <a href="http://epa.oszk.hu/00300/00398/00671/pdf/EPA00398_epinfo_2016_6.pdf">http://epa.oszk.hu/00300/00398/00671/pdf/EPA00398_epinfo_2016_6.pdf</a> (p. 72)	Office of the Chief Medical Officer — Department of Occupational Health (titkarsag@omfi.hu)

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Resp. No	Country	Short description of case	Reference for case	Organisation and/or person to contact for further info.
27	IE	Thermoactinomyces, mushroom/mushroom compost dust and fungal spores, allergic alveolitis	<a href="http://www.population-health.manchester.ac.uk/epidemiology/COEH/research/thor/schemes/ireland/">http://www.population-health.manchester.ac.uk/epidemiology/COEH/research/thor/schemes/ireland/</a>	Raymond Agius COEH
27	IE	Toxoplasma	<a href="http://www.population-health.manchester.ac.uk/epidemiology/COEH/research/thor/schemes/ireland/">http://www.population-health.manchester.ac.uk/epidemiology/COEH/research/thor/schemes/ireland/</a>	Prof Raymond Agius
27	IE	Tinea infection	<a href="http://www.population-health.manchester.ac.uk/epidemiology/COEH/research/thor/schemes/ireland/">http://www.population-health.manchester.ac.uk/epidemiology/COEH/research/thor/schemes/ireland/</a>	Raymond Agius
29	IT	Measles outbreak in five healthcare workers in hospital of northern Sardinia, Italy	Copello F, Garbarino S, Messineo A, Campagna M, Durando P; Collaborators. Occupational medicine and hygiene: applied research in Italy. J Prev Med Hyg. 2015 Aug 5;56(2):E102-10.	Paolo Durando
29	IT	Measles outbreak in hospital of south Sardinia with more than 40 nosocomial transmission	Emerg Infect Dis. 2015 Aug;21(8):1444-6. doi:10.3201/eid2108.141105. Extensive nosocomial transmission of measles originating in cruise ship passenger, Sardinia, Italy, 2014. Filia A, Bella A, Cadeddu G, Milia MR, Del Manso M, Rota MC, Magurano F, Nicoletti L, Declich S.	(Missing)
30	IT	Pseudopox virus infection in a cow milker	Published in a book of abstracts of a congress	International Centre for Rural Health, Milano, Italy
34	LV	Cattle-breeder, agriculture. Person is taking care of cattle. Occupational disease — respiratory diseases, hypersensitivity pneumonitis caused by organic dust (2015)	No	agnija.murane@vdi.gov.lv
34	LV	Confectioner, food processing branch. Person is working with flour, preparing confectionery with	No	agnija.murane@vdi.gov.lv

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Resp. No	Country	Short description of case	Reference for case	Organisation and/or person to contact for further info.
		hands. Occupational disease — under the skin and tissue disorders, dermatitis, eczema, allergy (2014)		
37	LU	Needlestick injuries, tuberculosis, scabies concerning nurses	No	aaa.lu
42	NL	On Kiza.nl you can find several cases. There are several Dutch publications regarding occupational biological cases		(Missing)
44	PT	There is national data on occupational diseases regarding exposure to biological agents, available in the National department of occupational hazards, which are periodically communicated to the Authority for working conditions. The communication of occupational diseases is mandatory (Law no 98/2009 of 4th of September). From the database (2015) : <ul style="list-style-type: none"> <li>one case of Brucellosis (animal care)</li> <li>one case of virus <i>Varicella-zoster</i> (physician) confirmed</li> </ul>	This data is not public	(Missing)
44	PT	As former director of an occupational risks prevention service for compensation system I know the existence of several biological agents-related occupational diseases, mainly tuberculosis, brucellosis, hepatitis and aspergillosis	www.seg-social.pt	Francisco Marques
44	PT	Professional tuberculosis outbreak in health sector workers	Director Clínico do Serviço de Saúde Ocupacional do hospital (Faro)/Clinical Director of Occupational Health Service Hospital (Faro)	www.dgs.pt

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Resp. No	Country	Short description of case	Reference for case	Organisation and/or person to contact for further info.
47	ES	Q-fever cluster in wasting processes	No	OSALAN (Basque Country OSH institute)
47	ES	Brucellosis in slaughterhouses	No	Public health authority in Aragon region
47	ES	Measles outbreaks in health sector	No	Centro Nacional de Epidemiología. Instituto de Salud Carlos III
49	ES	Tuberculosis cases reported amongst nursing auxiliaries in healthcare settings	Occupational Diseases reported to the CEPROSS Information System	Social Security — Ministry of Employment and Social Security
49	ES	Ebola in healthcare worker	<a href="http://www.msssi.gob.es/profesionales/saludPublica/ccayes/alertasActual/ebola/infProfesionales.htm">http://www.msssi.gob.es/profesionales/saludPublica/ccayes/alertasActual/ebola/infProfesionales.htm</a>	Federation of public health services (Federacion de Servicios Públicos Sanidad), UGT and Ministry of Health, Social Services and Equality (Ministerio de Sanidad, Servicios Sociales e Igualdad)
50	ES	Brucellosis. This zoonosis is primarily associated with rural areas and livestock, and its incidence has declined significantly in recent years due to farm sanitation campaigns. However, in 2011 there were three outbreaks through occupational contact with sick animals	<a href="http://revista.isciii.es/index.php/bes/article/view-File/761/862">http://revista.isciii.es/index.php/bes/article/view-File/761/862</a>	(Missing)
50	ES	<i>Legionella pneumophila</i> outbreak that affected 27 people and killed seven. The infection came from a big hospital cooling tower. Health workers and patients were infected. Legionnaires' disease is a notifiable disease in Spain, although it is suspected of being under-reported and therefore underdiagnosed. Spain has the dubious honour of being one of the European countries with most reported cases across Europe	<a href="http://www.elsevier.es/es-revista-revista-administracion-sanitaria-siglo-xxi-261-articulo-legionelosis-epidemias-recurrentes-brotos-zaragoza--13096560">http://www.elsevier.es/es-revista-revista-administracion-sanitaria-siglo-xxi-261-articulo-legionelosis-epidemias-recurrentes-brotos-zaragoza--13096560</a>	(Missing)

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Resp. No	Country	Short description of case	Reference for case	Organisation and/or person to contact for further info.
51	SE	We have read some of the notifications to the Swedish Social Insurance Agency on work-related diseases that may have been caused by biological agents. These documents are classified. Among these notifications there are descriptions from persons working in healthcare that in some instances have become carriers of MRSA, were infected by MRSA or in other cases are very worried about becoming carriers of those antibiotic resistant bacteria. An example is a nurse working in a department for intensive care of premature babies. She became a carrier of MRSA, which led to her being unable to continue working in that department. In her description on possible causes she pointed out several factors. The workload was high. Many of the children had been treated with antibiotics. The turnover of staff was high. There was shortage of nurses and the premises were cramped, worn down and not suitable for intensive care of children. She was very worried about the consequences for herself regarding the possibility of continuing work in the intensive care of premature babies and her economic future	No	No
51	SE	In September 2010 an outbreak occurred, in a coastal county in the middle of Sweden, where five persons acquired legionnaire's disease (LD). Two of the infected conducted maintenance works at an industrial biological treatment plant (BTP) at a paper mill, by cleaning one aeration	No	Public Health Agency of Sweden

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Resp. No	Country	Short description of case	Reference for case	Organisation and/or person to contact for further info.
		and two sedimentation ponds with high pressure washer. Environmental sampling two weeks after confirmed LD diagnose, showed 3,200,000,000 cfu/L of Legionella pneumophila SG 1 in the aeration pond. This was the third time cases were associated with a BTP in Sweden		
52	UK	Several	See published scientific literature	No
53	UK	Exposure to biological agents from contaminated metal working fluids in an engineering workshop	No	No
54	UK	<i>Mycobacterium bovis</i> infection of abattoir worker	<a href="http://www.hse.gov.uk/biosafety/acdp-m-bovis-working-group.pdf">www.hse.gov.uk/biosafety/acdp-m-bovis-working-group.pdf</a>	Health and Safety Executive
54	UK	Q-fever infection of abattoir workers in Scotland	<a href="http://www.ncbi.nlm.nih.gov/pubmed/19912614">http://www.ncbi.nlm.nih.gov/pubmed/19912614</a>	Health and Safety Executive
54	UK	Laboratory acquired infections involving enteric pathogens (e.g. <i>E. coli</i> , <i>Shigella</i> )	No	Health and Safety Executive
56	NO	A cluster of allergic alveolitis in sawmill workers	<a href="http://www.ncbi.nlm.nih.gov/pubmed/24999852">http://www.ncbi.nlm.nih.gov/pubmed/24999852</a>	Oslo university hospital, section for environmental and occupational medicine (Oslo Universitetssykehus, Seksjon for Miljø- og arbeidsmedisin)/Karl Færden
57	NO	MRSA in healthcare workers	No	The Norwegian Labour Inspection Authority or Norwegian Institute of Public Health
58	NO	Manufacture of food products, farmers	<a href="http://noa.stami.no/arbeidsmiljoindikatorer/kjemiskfysiskbiologisk/biologisk-materiale/dyrfisk/">http://noa.stami.no/arbeidsmiljoindikatorer/kjemiskfysiskbiologisk/biologisk-materiale/dyrfisk/</a> see bottom of page with references <a href="http://noa.stami.no/arbeidsmiljoindikatorer/kjemiskfysiskbiologisk/innanding/organisk-stov/">http://noa.stami.no/arbeidsmiljoindikatorer/kjemiskfysiskbiologisk/innanding/organisk-stov/</a> see bottom of page and references	Eva Løvseth ekl@stami.no

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Resp. No	Country	Short description of case	Reference for case	Organisation and/or person to contact for further info.
58	NO	Green jobs	<a href="http://noa.stami.no/arbeidsmiljoindikatorer/kjemiskfysiskbiologisk/biologisk-materiale/kloakkkompost/">http://noa.stami.no/arbeidsmiljoindikatorer/kjemiskfysiskbiologisk/biologisk-materiale/kloakkkompost/</a> see bottom of page and references	Eva Løvseth ekl@stami.no
58	NO	Mainly health sector	<a href="http://noa.stami.no/arbeidsmiljoindikatorer/kjemiskfysiskbiologisk/biologisk-materiale/kroppsvasker-vev/">http://noa.stami.no/arbeidsmiljoindikatorer/kjemiskfysiskbiologisk/biologisk-materiale/kroppsvasker-vev/</a> less information, some at bottom of page in Norwegian	Eva Løvseth ekl@stami.no
59	NO	Toxigenic fungi, mycotoxins and endotoxins in the Norwegian pig producing industry	<a href="https://stami.no/en/">https://stami.no/en/</a>	STAMI — The National Institute of Occupational Health

## Annex 5: Overview of evaluated literature per topic

### 5A Overview of literature evaluated on biological agents (excluding allergens)

(For full references, see Annex 3, Part 3A)

#### Annex 5 — Part A: Overview of literature evaluated on biological agents (excluding allergens)

Author(s)/ year	Title	Occupation(s)	Disease(s)	Biological agent(s)	Remarks
Adam, B.D., 2011	Epistemic fault lines in biomedical and social approaches to HIV prevention	Sex workers	AIDS	HIV	Publication concerns review of approaches towards HIV prevention. It was concluded that HIV prevention studies could look towards ways in which biomedical and social approaches to HIV prevention would work synergistically by moving past the technoschatology that currently characterises much of the field and working seriously with the social and community resources already to hand
Adler, B., de la Peña Moctezuma, A., 2010	Leptospira and leptospirosis	Abattoir workers Agriculture (crop workers, livestock farmers)	Leptospirosis	<i>Leptospira</i>	Review of <i>Leptospira</i> . There is a worldwide occupational association, especially in developed countries, with agriculture and animal production (cropping, dairy farming, pig production, abattoirs). Humans most commonly become infected through occupational, recreational or domestic contact with the urine of carrier animals, either directly or via contaminated water or soil
Aguilar-Díaz, F.D.C., et al., 2011	Influenza vaccine and healthcare workers	Healthcare workers	Influenza	Influenza	Publication concerns influenza vaccination rates among HCWs and their reasons for vaccination reluctance. HCWs are noted to be a risk group and may be acting as potential amplifiers of infection

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Author(s)/ year	Title	Occupation(s)	Disease(s)	Biological agent(s)	Remarks
Alavi, S.M., Alavi, L., 2013	Review on epidemiology, diagnosis, occupational hazards and management of pulmonary tuberculosis in elderly: A guide for general physicians working in the health network setting Khuzestan Iran	Healthcare workers			Concern by healthcare workers for pulmonary tuberculosis in elderly as an occupational hazard. The risk of transmission of M. tuberculosis from patients to HCWs is a neglected problem in many low- and middle-income countries. Prevention measures are discussed. No clear indication of increased risk is provided. Study in Iran: considered of limited relevance
Alavi, S.M., Hajjani, E., 2011	Hepatitis C infection: a review on epidemiology and management of occupational exposure in health care workers for general physicians working in Iranian health network setting	Healthcare workers	Hepatitis	Hepatitis C virus	Concerns management of HCV in the healthcare workplace (Iran). Percutaneous exposure to infected blood is the primary mode of transmission to HCW. Splashes of blood from infected patients to HCWs' mucous membranes are reported as route of transmission for HCV. Epidemiology of HCV in Iran is affected by, for example, geographical location, mass immigration from Afghanistan, frequent population movement to and from Turkey and Iraq, and illegal drug traffic from Pakistan and Afghanistan
Alghamdi, K.M., Alkhodair, R.A., 2011	Practical techniques to enhance the safety of healthcare workers in office-based surgery	Healthcare workers	AIDS, hepatitis	HIV, hepatitis B and C	Publication concerns review of published techniques designed to protect the HCW from pathogens. Limited relevance, as potential infection is the reason for the review
Alonso, M., et al., 2015	Hepatitis C in key populations in Latin America and the Caribbean: Systematic review and meta-analysis	Sex workers	Hepatitis	Hepatitis C virus	Review of hepatitis C as an occupational disease for sex workers

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Author(s)/ year	Title	Occupation(s)	Disease(s)	Biological agent(s)	Remarks
Alonso, V.A., et al., 2013	Fungi and mycotoxins in silage: An overview	Agriculture workers	Pulmonary and respiratory diseases	<i>Aspergillus fumigatus</i> Mycotoxins	Review on silage fungi and mycotoxins. For mycotoxin the major concern is presence in cows' milk of aflatoxin M1, due to transfer to milk products (not occupational). <i>Aspergillus fumigatus</i> , present in silos at storage, is a high risk to farm workers who handle them improperly. Significant list of fungi and mycotoxins, but not related to occupational disease
Amicizia, D., et al., 2013	Epidemiology of tick-borne encephalitis (TBE) in Europe and its prevention by available vaccines	Agriculture Forest workers Gardeners, orchard-ers	Encephalitis	Tick-borne encephalitis virus	Review of TBE vaccines and European policies. Occupation relation only for professionally exposed persons, which may be related to forest and grassland work (agriculture, forest workers, etc.)
Anzivino-Viricel, L., et al., 2012	Domestic waste management: state of current knowledge and health effects assessment in general and occupational populations [Gestion des déchets ménagers et assimilés: bilan des connaissances et évaluation des effets sanitaires en population générale et au travail]	Waste management workers	Respiratory, gastro-intestinal and skin disorders	Bioaerosols	Review of the impact of the management of household and similar waste (collection and sorting, composting, incineration and storage) on the health of waste management workers and the nearby population. Full text not available; evaluation based on abstract only. Health effects related to inhalation of bioaerosols
Applebaum, K.M., et al, 2016	An overview of occupational risks from climate change	Agriculture	Tick-borne encephalitis, tularaemia, brucellosis, leptospirosis, rabies and anthrax		Suspected increased risk due to climate change because of flooding and contamination of soil and water

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Author(s)/ year	Title	Occupation(s)	Disease(s)	Biological agent(s)	Remarks
Applebaum, K.M., et al., 2016	An overview of occupational risks from climate change	Agriculture (animal farmers)	Rift Valley fever, yellow fever, malaria, dengue and chikungunya		Suspected increased risk due to climate change because geographical range is expanding
		Construction workers (plumbers, water system workers)	Legionellosis	<i>Legionella</i>	Publication focuses on climate change and occupational health
		Fishing industry	Infectious disease	<i>Vibrio vulnificus</i>	Suspected increased risk due to climate change because of flooding and contamination of soil and water
		Forest workers	Tick-borne encephalitis, tularaemia, brucellosis, leptospirosis, rabies and anthrax		Publication focuses on climate change and occupational health
		Meat handling industry Veterinarians	Rift Valley fever, yellow fever, malaria, dengue and chikungunya		Suspected increased risk due to climate change because geographical range is expanding
		Outdoor workers	Infectious disease	Pathogenic microorganisms, vector-borne infectious agents	Suspected increased risk due to climate change because of flooding and contamination of soil and water, increased range of vectors, and expanding of geographical range of vector-borne infections
		Septic or sewage system workers	Infectious disease	Pathogenic microorganisms	Suspected increased risk due to climate change because of flooding and contamination of soil and water

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Author(s)/ year	Title	Occupation(s)	Disease(s)	Biological agent(s)	Remarks
Askarian, M., et al., 2011	Precautions for healthcare workers to avoid hepatitis B and C virus infection	Healthcare workers (nurses, physicians, dentists)	Hepatitis	Hepatitis B, C	Publication concerns precautions healthcare workers should take to avoid hepatitis B virus (HBV) and hepatitis C virus (HCV) infections. A total of 14.4 % and 1.4 % of hospital workers are infected with HBV and HCV, respectively. The highest prevalence of HBV is seen in dentists
Barros, M.B., et al., 2011	<i>Sporothrix schenckii</i> and sporotrichosis	Agriculture (farmers) Caretakers Gardeners Mine workers Technicians Veterinarians Wood exploitation	Sporotrichosis	<i>Sporothrix schenckii</i> (fungi)	Review of the <i>Sporothrix schenckii</i> fungus, including epidemiology. Indicated as new risk category
Basinas, I., et al., 2015	A comprehensive review of levels and determinants of personal exposure to dust and endotoxin in livestock farming	Agriculture (livestock farmers)	Respiratory diseases (lung function decline, chronic obstructive pulmonary disease, wheezing)	Organic dust, endotoxin	Non-allergic diseases associated with endotoxin exposure in farming. Authors reported no clear downwards trend
Bechini, A., et al., 2012	Acellular pertussis vaccine use in risk groups (adolescents, pregnant women, newborns and health-care workers): A review of evidences and recommendations	Healthcare workers	Whooping cough	<i>Bordetella pertussis</i>	Concerns impact of acellular pertussis vaccination in adolescents and adults, with particular focus on specific risk groups: adolescents, pregnant women and their newborns, and healthcare workers (HCWs). Vaccination against pertussis is recommended for HCWs because they are at increased risk of acquiring and transmitting such disease to susceptible contacts, especially in neonatal care units

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Author(s)/ year	Title	Occupation(s)	Disease(s)	Biological agent(s)	Remarks
Bente, D.A., et al., 2013	Crimean-Congo hemorrhagic fever: History, epidemiology, pathogenesis, clinical syndrome and genetic diversity	Agriculture workers Abattoir workers	Crimean-Congo haemorrhagic fever (CCHF)	Tick-borne disease (CCHF virus)	Review of CCHF virus. Geographically also found in Southeastern Europe. Vector = Hyalomma ticks. Agricultural workers via tick bite, slaughterhouse workers via infected livestock blood and tissues, medical personnel through infected patients' body fluids. Virological or serological evidence with vector present also in Spain and Portugal
Breitschwerdt, E.B., et al., 2010	Bartonellosis: An emerging infectious disease of zoonotic importance to animals and human beings	Veterinarians and other animal health professionals	Bartonellosis	Bacteria ( <i>Bartonella</i> spp.)	An increasing number of <i>Bartonella</i> species have been identified as zoonotic pathogens, transmitted by animal bites, scratches, arthropods and even needlestick injuries
Brewczyńska, A., et al., 2015	The influence of the workplace-related biological agents on the immune systems of emergency medical personnel	Healthcare workers	Various	<b>Blood-borne:</b> hepatitis B, C and D, HIV. <b>Airborne:</b> mumps, rubella, measles, influenza, tuberculosis, SARS. Enteric viruses of intestinal origins, RSV	Review of occupational biological pathogens for emergency medical personnel

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Author(s)/ year	Title	Occupation(s)	Disease(s)	Biological agent(s)	Remarks
Cambra-López, M., et al., 2010	Airborne particulate matter from livestock production systems: A review of an air pollution problem	Agriculture (livestock farmers)	Respiratory health effects (chronic cough and/or phlegm, chronic bronchitis, allergic reactions and asthma-like symptoms)	Organic dust (endotoxins, dust mites, beta-glucans, bacteria, fungi, viruses, toxins, allergens)	Review of organic dust in livestock production. Inhaled particles can penetrate the deeper respiratory airways, contributing to increased occurrence of chronic cough and/or phlegm, chronic bronchitis, allergic reactions and asthma-like symptoms among livestock farmers. The extent to which particulate matter from livestock houses can adsorb and contain pathogenic and non-pathogenic microorganisms is still uncertain. Attached to PM, these compounds, plus other bioactive components, can enhance the biological effect of PM and aggravate the potential health hazard
Canini, L., 2010	Zoonoses in France: Evaluation of the knowledge of physicians and veterinarians. [Les zoonoses en France — Evaluation des connaissances des médecins et vétérinaires]	Abattoir workers Animal breeders	Brucellosis, echinococcosis, anthrax, Q-fever, hydatidosis, leptospirosis, cat-scratch disease, ornithosis-psittacosis, pasteurellosis, salmonellosis, ringworm, toxoplasmosis, tuberculosis	<b>Bacteria:</b> <i>Brucella</i> , <i>Bacillus anthracis</i> , <i>Coxiella burnetii</i> , <i>Leptospira</i> , <i>Bartonella henselae</i> , <i>Chlamydia psittaci</i> , <i>Pasteurella</i> , <i>Mycobacterium tuberculosis/bovis/caprae</i> , <i>Salmonella</i> <b>Fungi</b> such as <i>Microsporium</i> spp. <b>Parasites:</b> <i>Echinococcus</i> , <i>Toxoplasma gondii</i>	Article in French. Veterinarians in France have a higher knowledge score than physicians/doctors with regard to zoonoses
		Fish farmers, fishing guards, water contact	Leptospirosis, Rouget/ <i>E. rhusiopathiae</i> infection	<i>Leptospira</i> , <i>Erysipelothrix rhusiopathiae</i>	
		Ground/soil work in uninhabited premises	Hantavirus infection	Hantaviruses	

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Author(s)/ year	Title	Occupation(s)	Disease(s)	Biological agent(s)	Remarks
		Forest workers	Tick-borne encephalitis (TBE), hantavirus infection, Lyme disease, tuberculosis, tularaemia	Tick-borne encephalitis (TBE) virus, hanta viruses, <i>Borrelia</i> , <i>Mycobacterium tuberculosis/bovis/caprae</i> , <i>Francisella tularensis</i>	
		Naturalists	Rouget/ <i>E. rhusiopathiae</i> infection	<i>Erysipelothrix rhusiopathiae</i>	
		Personnel in contact with birds	Avian influenza, ornithosis-psittacosis	Influenza A virus (e.g. H5N1 strain), <i>Chlamydophila psittaci</i>	
Canini L., 2010	Zoonoses in France: Evaluation of the knowledge of physicians and veterinarians [Les zoonoses en France — Evaluation des connaissances des médecins et vétérinaires]	Pet shop workers	Avian influenza, leptospirosis, cat-scratch disease, ornithosis-psittacosis, salmonellosis, toxoplasmosis, tularaemia	Influenza A virus (e.g. H5N1 strain), <i>Leptospira</i> spp., <i>Bartonella henselae</i> , <i>Chlamydophila psittaci</i> , <i>Salmonella</i> , <i>Toxoplasma gondii</i> , <i>Francisella tularensis</i>	Article in French. Veterinarians in France have a higher knowledge score than physicians/doctors with regard to zoonoses
		Taxidermist	Cat-scratch disease, ornithosis-psittacosis, tularaemia	<i>Bartonella henselae</i> , <i>Chlamydophila psittaci</i> , <i>Francisella tularensis</i>	
		Venison trade	Tularaemia	<i>Francisella tularensis</i>	

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Author(s)/ year	Title	Occupation(s)	Disease(s)	Biological agent(s)	Remarks
		Veterinarians Veterinary laboratory staff	Brucellosis, echinococcosis, anthrax, Q-fever, avian influenza, hydatidosis, leptospirosis, cat-scratch disease, ornithosis-psittacosis, pasteurellosis, rabies, rouget/ <i>E. rhusiopathiae</i> infection, salmonellosis, ringworm, toxoplasmosis, tuberculosis	<i>Brucella</i> spp., <i>Mycobacterium tuberculosis/bovis/caprae</i> , <i>Bacillus anthracis</i> , <i>Coxiella burnetii</i> , influenza A virus (e.g. H5N1 strain), <i>Leptospira</i> , <i>Bartonella henselae</i> , <i>Chlamydomphila psittaci</i> , <i>Pasteurella</i> spp., Rabies virus, <i>Erysipelothrix rhusiopathiae</i> , <i>Salmonella</i> , fungi such as <i>Microsporum</i> spp., parasites such as <i>Echinococcus</i> , <i>Toxoplasma gondii</i>	
Cassell, M.M., et al., 2014	'Getting to zero' in Asia and the Pacific through more strategic use of antiretrovirals for HIV prevention	Sex workers	AIDS	HIV	Publication concerns AIDS reduction strategies in Asia/Pacific. No (clear) discrimination between occupational and non-occupational. Questionable relevance for EU. Considered of limited relevance
Cheng, V.C.C., et al., 2011a	Infection control in dermatology practice	Healthcare workers	Various	Multiple, but only mentioned in passing. Most relevantly, pathogens that survive on inanimate surfaces (papillomavirus, <i>Chlamydia trachomatis</i> , <i>Neisseria gonorrhoeae</i> , MRSA)	Publication concerns precautionary measures for infection control. Focus is on hand hygiene of HCWs to reduce pathogens if present. Disease-related transmission is hardly mentioned
Cheng, V.C.C., et al., 2013	Clinical management and infection control of SARS: Lessons learned	Healthcare workers	SARS	Acute respiratory syndrome coronavirus	Review of SARS outbreak. No EU connection but good example of sudden outbreak with information on prevention measures taken for spreading the disease

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Author(s)/ year	Title	Occupation(s)	Disease(s)	Biological agent(s)	Remarks
Chethan Kumar, H.B., et al., 2013	Occupational zoonoses in zoo and wildlife veterinarians in India: A review	Veterinarians Zoo personnel	<b>Bacterial diseases:</b> anthrax, brucellosis, campylobacteriosis, colibacillosis, ehrlichiosis, leptospirosis, Lyme disease, chlamydial diseases, melioidosis, pasteurellosis, plague, salmonellosis, tetanus, tuberculosis, Q-fever, tularaemia, typhus, psittacosis, murine typhus, relapsing fever, rocky mountain spotted fever, etc.		Infection with various diseases. Publication concerns information regarding zoonotic diseases and recommendations for control and prevention. It was indicated that zoo and wildlife veterinarians have revealed that zoonotic diseases contribute up to 30 % of cases among the overall occupational illness reported in zoos
			<b>Fungal diseases:</b> aspergillosis, coccidioidomycosis, cryptococcosis, dermatophytosis, histoplasmosis		

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Author(s)/ year	Title	Occupation(s)	Disease(s)	Biological agent(s)	Remarks
Chethan Kumar, H.B., et al., 2013	Occupational zoonoses in zoo and wildlife veterinarians in India: A review		<b>Viral diseases:</b> Cercopithecine herpes virus 1 (B virus disease of macaques), Colorado tick fever, contagious ecthyma (Orf), buffalo pox, Crimean-Congo haemorrhagic fever, equine encephalomyelitis, foot-and-mouth disease, hantavirus pulmonary syndrome, Hendra virus infection, hepatitis E, influenza type A, Japanese encephalitis, Kyasanur Forest disease, louping ill, lymphocytic choriomeningitis, Murray Valley encephalitis, Newcastle disease, Nipah virus infection, rabies, Rift Valley fever, Russian spring-summer encephalitis, St. Louis encephalitis, tanapox, viral haemorrhagic fevers, West Nile fever, yabapox, yellow fever		Publication concerns information regarding zoonotic diseases and recommendations for control and prevention. It was indicated that zoo and wildlife veterinarians have revealed that zoonotic diseases contribute up to 30 % of cases among the overall occupational illness reported in zoos

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Author(s)/ year	Title	Occupation(s)	Disease(s)	Biological agent(s)	Remarks
Chethan Kumar, H.B., et al., 2013	Occupational zoonoses in zoo and wildlife veterinarians in India: A review	Veterinarians Zoo personnel	<b>Parasitic diseases:</b> babesiosis, balantidiasis, Chagas disease, coenuriasis, cryptosporidiosis, cutaneous larva migrans, dirofilariasis, giardiasis, echinococcosis, leishmaniasis, malaria of nonhuman primates, Malayan filariasis, taeniasis, toxoplasmosis, trichinellosis, trypanosomiasis, visceral larva migrans		Publication concerns information regarding zoonotic diseases and recommendations for control and prevention. It was indicated that zoo and wildlife veterinarians have revealed that zoonotic diseases contribute up to 30 % of cases among the overall occupational illness reported in zoos
Chin, T.L., et al., 2014	Viral infections in pregnancy: Advice for healthcare workers	Healthcare workers	AIDS, hepatitis, infections	HIV, hepatitis B and C, VZV, herpes simplex, parvovirus B19, <i>Cytomegalovirus</i> , rubella, measles, enteroviruses, mumps, influenza	Publication concerns risk of infection with pathogens for pregnant HCW: evidence of increased risk is weak
Chowdhury, K.K., et al., 2011	Electrosurgical smoke: A real concern	Healthcare workers Healthcare workers (surgeons)	Infection	<i>Mycobacterium tuberculosis</i> , hepatitis B and C, HIV, papillomavirus	Review of surgical smoke health effects. Bioaerosol produced at low temperature as in harmonic scissors may contain live multi-drug resistant <i>Mycobacterium tuberculosis</i> , viral DNA of HBV, HCV, HIV and HPV. Possibility of disease transfer not indicated
Coppola, N., et al., 2016	Hepatitis B virus and hepatitis C virus infection in healthcare workers	Healthcare workers	Hepatitis B, hepatitis C infection	Hepatitis B, C virus	Occupational hepatitis B and C infections in healthcare workers. Accidental exposure to infected human matrices (mucosal-cutaneous) or sharp contaminated objects (percutaneous)

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Author(s)/ year	Title	Occupation(s)	Disease(s)	Biological agent(s)	Remarks
Corrao, C.R.N., et al., 2013	Association between waste management and HBV among solid municipal waste workers: A systematic review and meta-analysis of observational studies	Waste management workers	Hepatitis	Hepatitis B virus	Review of hepatitis B risk for waste management workers
Correia, R.T.M., et al., 2010	Chromoblastomycosis: Study of 27 cases and review of medical literature	Agriculture Chapman Construction workers (civil) Drivers (lorry driver) Hotel staff (room maid) Legal consultant Locksmith	Chromomycosis	Fungi ( <i>Fonsecaea pedrosoi</i> , <i>Phialophora verrucosa</i> , <i>Cladosporium carrioni</i> , <i>Rhinoctadiella aquaspersa</i> )	Review of chromomycosis. Article mostly focused on histopathology/treatment, and covers only cases in Brazil. The majority of the patients studied were rural workers (37 %). However, various other occupations were found associated with the disease as follows: maid (11 %), locksmith (7.4 %), civil construction worker (7.4 %), lorry driver (3.7 %), legal consultant (3.7 %) and chapman (3.7 %)
Craig, A.P., et al., 2014	Spending of HIV resources in Asia and Eastern Europe: Systematic review reveals the need to shift funding allocations towards priority populations	Sex workers	AIDS	HIV	Evaluation of prevention programme resources

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Author(s)/ year	Title	Occupation(s)	Disease(s)	Biological agent(s)	Remarks
Cui, R.R., et al., 2013	Microenterprise development interventions for sexual risk reduction: A systematic review	Sex workers	AIDS, sexually transmitted infections (STIs)	HIV, STIs	About interventions for reducing HIV transmission among female sex workers by boosting women's economic independence and increasing their negotiating power through a direct income effect, reducing their need to rely on transactional sex. Sex worker studies showed significant reduction in sexual risk behaviours compared with the control group
Darius, S., et al., 2013	Occupational medicine aspects in general and abdominal surgery: Risk of infection attributable to needlestick injuries (what the surgeon should know) [Arbeitsmedizinische Aspekte in der allgemein-(viszeral-)chirurgie — Infektionsgefährdung durch Nadelstichverletzungen (was der Chirurg wissen sollte)]	Healthcare workers	Hepatitis B infection, hepatitis C infection, HIV infection	Hepatitis B and C virus, HIV	Article in German. Needlestick, stab, scratch and cut injuries are common and a significant health hazard among healthcare workers. If medical devices are contaminated with blood or other body fluids, there is a risk of infection with hepatitis B and C virus and HIV. The risk of transmission depends on the infection status of the patient and the immune status of the healthcare worker. In addition, the risk of infection is affected by the type and severity of injuries, the quantity (volume) of blood, the time between injury and cleaning, and the administration of post-exposure prophylaxis. Prevention measures, e.g. comprehensive programmes to prevent injuries (use of safety devices, surgical gloves and disposal containers) have to be continuously considered to minimise risk of infection to HCWs.
De Carli, G., et al., 2014	The importance of implementing safe sharps practices in the laboratory setting in Europe	Healthcare workers Laboratory personnel	Various	Bacteria, viruses, fungal, protozoa	Publication concerns risk management in hospital and healthcare centres. List with known infections and diseases is reported in Table 2 of the publication

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Author(s)/ year	Title	Occupation(s)	Disease(s)	Biological agent(s)	Remarks
De Kantor, I.N., et al., 2010	Human tuberculosis caused by <i>Mycobacterium bovis</i> in the United States, Latin America and the Caribbean	Agriculture (animal keepers) Meat industry workers	Tuberculosis	<i>Mycobacterium bovis</i>	Human tuberculosis caused by <i>Mycobacterium bovis</i> appears to be rare in most of the region of the Americas. Where human cases are observed, they appear to be associated, for example, with airborne acquired infection in animal keepers and meat industry workers from countries where bovine tuberculosis remains a problem. Human-to-human transmission of <i>Mycobacterium bovis</i> does occur but appears to account for a very small proportion of cases. Efforts to eradicate <i>Mycobacterium bovis</i> in humans in the Americas should therefore be directed at eradicating the disease in cattle
De Schryver, A., et al., 2015	Hepatitis E virus infection: An emerging occupational risk?	Agriculture (pig farmers)	Hepatitis	Hepatitis E virus	Investigation into whether or not hepatitis E is a zoonosis, which would make it an occupational disease for swine-related occupations. Conclusion is affirmative, but not very strong
Designated [CADTH 2014], 2014	Respiratory precautions for protection from bioaerosols or Infectious agents: A review of the clinical effectiveness and guidelines	Healthcare workers	Infections	Influenza, tuberculosis, SARS	Recommendations for type of respiratory protection against bioaerosol viruses
Deuffic-Burban, S., et al., 2011	Blood-borne viruses in healthcare workers: Prevention and management.	Healthcare workers	Hepatitis, AIDS	Hepatitis B virus, hepatitis C virus, HIV	Publication concerns blood-borne viruses in healthcare workers. The highest proportion of occupational transmission is due to percutaneous injury (PI) via hollow-bore needles with vascular access

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Diaz-Guzman, E., et al., 2012	Occupational chronic obstructive pulmonary disease: An update.	Agriculture (farmers) Woodworkers	COPD	Organic dust	Review of COPD, minor focus on biological agents
Djomand, G., Quaye, S., Sullivan, P.S., 2014	HIV epidemic among key populations in west Africa	Sex workers	AIDS	HIV	Publication concerns prevention, care and treatment programming for key populations programmes in West Africa; limited relevance for EU
Dokubo, E.K., et al., 2013	HIV incidence in Asia: A review of available data and assessment of the epidemic	Sex workers	AIDS	HIV	High HIV incidence is reported for commercial sex workers in Asia (0.4 - 27.5%). Considered of limited relevance for EU
Dorko, E., Rimárová, K., Pilipčinec, E., 2012	Influence of the environment and occupational exposure on the occurrence of Q fever	Agriculture (animal farmers) Laboratory personnel (bacteriologists, virologists) Meat workers Veterinarians (including technicians, students)	Q-fever	<i>Coxiella burnetii</i>	Review of Q-fever. Major infection route via inhaling aerosols; presence in urine, faeces and birth by-products. Persists in the environment in a resistant spore-like form
Downes, J., Rau, P.N., Vanheest, A.E., 2014	Occupational hazards for pregnant or lactating women in the orthopaedic operating room	Healthcare workers (operating room personnel)	AIDS, hepatitis	Hepatitis B virus, hepatitis C virus, HIV	Review of hazards and pregnant operating room personnel. No additional risk for pregnant or lactating workers identified
Doyle, M.E., Hartmann F.A., Lee Wong, A.C., 2012	Methicillin-resistant <i>Staphylococci</i> : Implications for our food supply?	Agriculture (animal farmers) Veterinarians		MRSA	Increased colonisation of MRSA, but no indication of increased illness in workers

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Author(s)/ year	Title	Occupation(s)	Disease(s)	Biological agent(s)	Remarks
Dungan, R.S., 2010	Board-invited review: Fate and transport of bioaerosols associated with livestock operations and manures	Agriculture (livestock farmers)	Anthrax, brucellosis, campylobacteriosis, botulism, gangrene, Q-fever, haemorrhagic colitis, leptospirosis, listeriosis, tuberculosis, salmonellosis, yersiniosis	<b>Bacteria:</b> <i>Bacillus anthracis</i> , <i>Brucella</i> , <i>Campylobacter</i> , <i>Clostridium</i> , <i>Coxiella burnetii</i> , enterohaemorrhagic <i>E. coli</i> , <i>Leptospira</i> , <i>Listeria monocytogenes</i> , <i>Mycobacterium bovis/tuberculosis</i> , <i>Salmonella</i> , <i>Yersinia</i>	Main focus of the article is emission of animal-related (zoonotic) pathogens from animal production facilities to the environment. Microorganisms identified in the air of livestock operations.
			Hepatitis, foot-and-mouth disease, swine influenza, SARS, rabies, vesicular stomatitis	<b>Viral:</b> Hepatitis E, picornaviruses, H1N1 influenza, coronavirus, rabies virus, vesicular stomatitis virus	
			Balantidiasis, cryptosporidiosis, giardiasis, microsporidiosis, toxoplasmosis	<b>Protozoal pathogens:</b> <i>Balantidiasis coli</i> , <i>Cryptosporidium parvum</i> , <i>Giardia lamblia</i> , <i>Microsporidia</i> , <i>Toxoplasma gondii</i>	
Dungan, R.S., 2010	Board-invited review: Fate and transport of bioaerosols associated with livestock operations and manures	Agriculture (livestock farmers) Cattle, swine, poultry barns		<i>Acinetobacter</i> spp., <i>Chryseomonas luteola</i> , <i>Citrobacter freundii</i> , <i>Escherichia coli</i> , <i>Enterobacter agglomerans</i> , <i>Klebsiella</i> , <i>Oligella urethralis</i> , <i>Moraxella</i> , <i>Pseudomonas</i> spp., <i>Xanthomonas maltophilia</i> , <i>Shewanella putrefaciens</i>	Main focus of the article is emission of animal-related (zoonotic) pathogens from animal production facilities to the environment. Microorganisms identified in the air of livestock operations

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		Agriculture (livestock farmers) cattle feedlot		<i>Bacillus</i> spp., <i>Chrysobacterium</i> sp., <i>Corynebacterium</i> spp., <i>Helcococcus</i> sp., <i>Micrococcus</i> sp., <i>Paenibacillus</i> sp., <i>Alternaria</i> sp., <i>Bipolaris</i> sp., <i>Chryso sporium</i> sp., <i>Cladosporium</i> sp., <i>Penicillium</i> spp.	
		Agriculture (livestock farmers) cattle shed		<i>Absidia</i> , <i>Alternaria</i> , <i>Aspergillus</i> , <i>Choanephora</i> , <i>Cladosporium</i> , <i>Corynespora</i> , <i>Curvularia</i> , <i>Drechslera</i> , <i>Ganoderma</i> , <i>Leptosphaeria</i> , <i>Memnoniella</i> , <i>Mucor</i> , <i>Nigrospora</i> , <i>Penicillium</i> , <i>Periconia</i> , <i>Rhizopus</i> , <i>Torula</i> , <i>Syncephalastrum</i>	
		Agriculture (livestock farmers) Duck-fattening unit		Enterobacteriaceae, Pseudomonadaceae, Vibrionaceae, Legionellaceae	
Dungan, R.S., 2010	Board-invited review: Fate and transport of bioaerosols associated with	Agriculture (livestock farmers) Poultry and duck facilities		<i>Salmonella</i>	Main focus of the article is emission of animal-related (zoonotic) pathogens from ani

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	livestock operations and manures	Agriculture (livestock farmers) swine barns/ concentrated swine animal feeding operations		<i>Actinomycetes, Aerococcus and Anaerococcus spp., Alternaria, Aspergillus, Aureobasidium, Bacillus, Botrytis, Candida, Cephalosporium, Cladosporium, Clostridium spp., Coliforms, Curvularia, Diplococcus, Drechslera, Enterococcus, Fusarium, Geotrichum, Lactobacillus, Listeria, Methanosphaera stadtmanae, other Methanobacteriales, Methanosarcinales, Monilia, Mucor, Nocardia, Oidium, Paecilomyces, Penicillium, Pseudomonas, Rhizopus, Sclerotium, Stemphyllium, Staphylococcus (aureus), Streptococcus spp., Trichoderma, Ulocladium, Zygomycetes</i>	mal production facilities to the environment. Microorganisms identified in the air of livestock operations
Dunkle, K.L., Decker, M.R., 2013	Gender-based violence and HIV: Reviewing the evidence for links and causal pathways in the general population and high-risk groups	Sex workers	AIDS	HIV	Publication concerns gender-based violence (GBV)-HIV relations. The authors concluded that survivors of GBV are clearly a high-risk group who must be supported in seeking the full range of HIV prevention and treatment services

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Duquenne, P., Marchand, G., Duchaine, C., 2013	Measurement of endotoxins in bioaerosols at workplace: A critical review of literature and a standardization issue	Agriculture (animal handling) Food processing (herb and grain) Greenhouse workers Office workers Textile industry Waste management/composting workers Wood industry	High fever, coughing, irritation of the respiratory system and chest congestion (inhalation exposure)	Organic dust (endotoxin)	Article reviews endotoxin measurement in organic dust/bioaerosols
Dutkiewicz, J., et al., 2011	Biological agents as occupational hazards: Selected issues	Agriculture (dairy workers) Butchers	Q-fever	<i>Coxiella burnetii</i>	Publication concerns biological agents as occupational hazards.
		Agriculture (farmers)	Lyme borreliosis, dirofilariasis, influenza, Q-fever, leptospirosis, cryptosporidiosis	<i>Borrelia burgdorferi</i> , <i>Dirofilaria repens</i> , <i>Dirofilaria immitis</i> , Influenza A (H7N7), <i>Coxiella burnetii</i> , <i>Leptospira</i> spp., <i>Cryptosporidium</i> spp.	In Central and Eastern Europe, cases of human dirofilariasis caused by the species <i>Dirofilaria repens</i> and <i>Dirofilaria immitis</i> are noted as an emerging zoonosis. Global climate change, extreme weather events such as cyclones and floods are expected to occur with increasing frequency and greater intensity and may potentially result in an upsurge in the disease incidence as well as the magnitude of leptospirosis outbreaks. Cryptosporidiosis: in immuno-compromised individuals, infection can become chronic and potentially deadly
		Butchers Wastewater/sewage workers	Leptospirosis	<i>Leptospira</i> spp.	Publication concerns biological agents as occupational hazards
		Forest workers	Lyme Borreliosis	<i>Borrelia burgdorferi</i>	

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Author(s)/ year	Title	Occupation(s)	Disease(s)	Biological agent(s)	Remarks
Dutkiewicz, J., et al., 2011	Biological agents as occupational hazards Selected issues	Automotive plant workers Construction including plumbers Cooling tower workers Drivers (bus) Gardeners Healthcare (dental care) Maintenance (ship repair) Mine workers Offshore workers (oil-drilling platform) Plastic factory workers Railway conductors Subway personnel Turbine operators Wastewater/sewage workers	Legionellosis	<i>Legionella</i> spp.	Publication concerns biological agents as occupational hazards
		Librarians and art conservators	Lung disease Bartonellosis Fever, borreliosis, anaplasmosis, Q-fever Hepatitis, AIDS Malaria, babesiosis	Bioaerosols (dust, bacteria, fungi, mycotoxins). Bacteria ( <i>Bartonella</i> , <i>Borrelia</i> , <i>Anaplasma</i> , MRSA). Viruses (Hantavirus, influenza), healthcare viruses (hepatitis B and C, HIV). Parasites ( <i>Plasmodium</i> , <i>Babesia</i> )	Fairly random selection of biological agents; occupational relevance is not mentioned for most pathogens, merely that they can be occupational

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Author(s)/ year	Title	Occupation(s)	Disease(s)	Biological agent(s)	Remarks
Dutkiewicz, J., et al., 2011	Biological agents as occupational hazards Selected issues	Healthcare workers	Influenza, MRSA infection, AIDS, hepatitis	Influenza A (H7N7), Methicillin-resistant <i>Staphylococcus aureus</i> , hepatitis B virus, hepatitis C virus, HIV	
		Veterinarians	Canine babesiosis, influenza, Q-fever, leptospirosis	<i>Babesia canis</i> , Influenza A (H7N7), <i>Coxiella burnetii</i> , <i>Leptospira</i> spp.	
Dutkiewicz, J., et al., 2015	<i>Pantoea agglomerans</i> : A mysterious bacterium of evil and good. Part I. Deleterious effects: dust-borne endotoxins and allergens — Focus on cotton dust	Cotton mill workers	Decrement of lung function by inflammation reactions	Endotoxin produced by <i>Pantoea agglomerans</i>	Review of the adverse health effects of a ubiquitous plant-related bacterium
Elseviers, M.M., et al., 2014	Sharps injuries amongst health-care workers: Review of incidence transmissions and costs	Healthcare workers	Hepatitis, AIDS	Hepatitis B virus, hepatitis C virus, HIV	Review of seroconversion risk after sharps injuries among healthcare workers. Incidence of sharps injuries: 3.7 % in healthcare workers, resulting in 0.42 % hepatitis B, 0.05-1.3 % hepatitis C and 0.04-0.32 % HIV infections upon sharps injury

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Author(s)/ year	Title	Occupation(s)	Disease(s)	Biological agent(s)	Remarks
EU-OSHA, 2007a	Expert forecast on emerging biological risks related to occupational safety and health	Healthcare workers	Blood-borne virus infections (hepatitis B and C, HIV), severe acute respiratory syndrome (SARS), avian influenza, Ebola and Marburg viruses, cholera, dengue, measles, meningitis, yellow fever, Q-fever, legionellosis, tuberculosis, tularemia	Contagious pathogens from human reservoirs as a consequence of long-distance travelling, resulting in global epidemics/zoonoses	Forecast, based on expert opinion among other sources. In many cases no direct link between occupation and occurrence of health effects is being made (mainly a list of pathogens and/or diseases, and a list of occupations where these can occur or activities that are at risk)
EU-OSHA, 2007a	Expert forecast on emerging biological risks related to occupational safety and health	Agriculture (livestock farmers) Food-processing industry Healthcare workers (hospitals) Veterinary services	Infectious diseases	Workers in contact with animals, being exposed to drug-resistant microorganisms, for instance methicillin-resistant <i>Staphylococcus aureus</i> (MRSA) as a result of overuse or misuse of antibiotics	Forecast, based on expert opinion among other sources. In many cases no direct link between occupation and occurrence of health effects is being made (mainly a list of pathogens and/or diseases, and a list of occupations where these can occur or activities that are at risk)

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Author(s)/ year	Title	Occupation(s)	Disease(s)	Biological agent(s)	Remarks
		<p>Agriculture (livestock farmers)</p> <p>Laboratory personnel (scientists working with rodents)</p> <p>Sewage workers</p> <p>Waste treatment</p>	<p>Fever, infectious diseases, acute toxic effects, allergies, organic dust toxic syndrome (ODTS), chronic bronchitis, asthma-like syndromes, septic shock, organ failure and death. Apart from the adverse health effects, exposure to endotoxin may protect from asthma, atopy, respiratory allergies and sensitisation to allergens</p>	Organic dust (endotoxin)	
		Maintenance workers (water and air systems with poor maintenance)	Legionellosis	<i>Legionella</i>	

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Author(s)/ year	Title	Occupation(s)	Disease(s)	Biological agent(s)	Remarks
EU-OSHA, 2007a	Expert forecast on emerging biological risks related to occupational safety and health	Abattoir workers Animal breeders Animal traders Cleaning and disinfection jobs in contaminated areas Laboratory personnel (research labs) Veterinary services Workers in contact with live or dead infected animals and/or with aerosols, dust or surfaces contaminated by animal secretions	Severe acute respiratory syndrome (SARS), avian influenza, Ebola and Marburg viruses, cholera, dengue, measles, meningitis, yellow fever, Q-fever, Legionellosis, tuberculosis, tularemia	Contagious pathogens from livestock as a reservoir resulting in global epidemics/zoonoses	Forecast, among others based on expert opinion. In many cases no direct link between occupation and occurrence of health effects is being made (mainly a list of pathogens and/or diseases, and a list of occupations where these can occur or activities that are at risk)
		Custom workers Pet shop workers Veterinary services Zoo personnel		Contagious pathogens from exotic animals and imported reservoirs, resulting in global epidemics/zoonoses	
		Airline personnel Epidemic control workers Global trade Journalists/media professionals Travellers (air) Workers in war zones		Contagious pathogens from human reservoirs as a consequence of long-distance travelling, resulting in global epidemics/zoonoses	

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Author(s)/ year	Title	Occupation(s)	Disease(s)	Biological agent(s)	Remarks
EU-OSHA, 2007a	Expert forecast on emerging biological risks related to occupational safety and health	Agriculture workers Construction workers (including hazardous materials removal) Cotton mill workers Education (teachers) Healthcare workers (at homes and in hospitals) Office workers Waste and sewage treatment activities	Sick building syndrome (SBS), asthma, upper respiratory diseases, infections, coughs, headaches and flu-like symptoms, allergic diseases and irritation of the nose, throat, eye and skin	Indoor moulds	Forecast, among others based on expert opinion. In many cases no direct link between occupation and occurrence of health effects is being made (mainly a list of pathogens and/or diseases, and a list of occupations where these can occur or activities that are at risk)
		Waste treatment (composting and recycling)	Upper airway inflammations and pulmonary diseases, ODTs, gastro-intestinal problems, allergic reactions, skin diseases and irritation of the eyes and mucous membranes	Bioaerosols/organic dusts (diversity of airborne microorganisms, including moulds, as well as their toxic products such as endotoxins and volatile organic compounds (VOCs))	

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Author(s)/ year	Title	Occupation(s)	Disease(s)	Biological agent(s)	Remarks
EU-OSHA, 2008	Occupational skin diseases and dermal exposure in the European Union (EU-25): Policy and practice overview	Abattoir workers, meat salvagers Agriculture (farmers) Animal breeders Animal handlers (occupations having contact with animals, e.g. dog groomers) Veterinary surgeons	<b>Bacterial infections</b> (sub)cutaneous tuberculosis, cutaneous brucellosis ('veterinary eczema'), dermatitis from swine erysipelas, pasteurellosis, granulomas, anthrax or malignant oedema of the face, cat-scratch disease, (purulent) pyodermatitis, erythema chronicum migrans, Lyme disease)	Bovine tubercle bacilli, <i>Brucella</i> antigen, Swine erysipelas bacilli, <i>Pasteurella multocida</i> , <i>Mycobacterium marinum</i> , <i>Bacillus anthracis</i> , blackleg (anthrax), <i>Bartonella henselae</i> , pyrogenic germs, <i>Borrelia burgdorferi</i> , inoculated through the bite of an infected tick	Biological agents, such as bacteria, viruses, fungi causing mycoses (for example among masons and tilers), yeasts and parasites, can cause various infections. These can include zoonotic diseases that affect professionals who have contact with animals
EU-OSHA, 2008	Occupational skin diseases and dermal exposure in the European Union (EU-25): Policy and practice overview	Abattoir workers, meat salvagers Agriculture (farmers) Animal breeders Animal handlers (occupations having contact with animals, e.g. dog groomers) Veterinary surgeons	<b>Mycotic infections</b> (ringworm; onychomycosis: mycosis of the nails; sycosis and suppurating tinea kerion: infection of hair; interdigital candidiasis)	Fungi, yeasts; Trichophyton, Epidermophyton, dermatophytes, <i>Candida</i> (yeast)	Biological agents, such as bacteria, viruses, fungi causing mycoses (for example among masons and tilers), yeasts and parasites, can cause various infections. These can include zoonotic diseases that affect professionals who have contact with animals
			<b>Parasitosis:</b> mange, scabies or itch	Animal parasites ( <i>Sarcoptes scabiei</i> , mites, acarida, fleas and worms)	
			<b>Viral infections</b> (plantar, butcher warts; contagious ecthyma; cowpox)	Papillomavirus, <i>Parapoxvirus</i> , Cowpox virus	

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Author(s)/ year	Title	Occupation(s)	Disease(s)	Biological agent(s)	Remarks
		Construction workers (bricklayers, tilers, carpenters, concreters)	Skin infections (dermatomycoses or intertrigo of the toes ('athlete's foot'); pyodermitis by irritation or allergic infection)	Infectious, mycotic or bacterial agents	
		Healthcare workers (dental care, nurses, nursing assistants, hospital service agents, ambulance attendants, physiotherapists, doctors, anaesthetists, surgeons, assistants) Veterinary surgeons	Skin infections	Bacterial agents (pyoderma), cutaneous herpes, mycotic agents (onychoses), scabies (acarida, (house) mites, fleas)	
EU-OSHA, 2008	Occupational skin diseases and dermal exposure in the European Union (EU-25): Policy and practice overview	Healthcare workers (nurses, nursing assistants, hospital service agents, ambulance attendants, physiotherapists, doctors, anaesthetists, surgeons, assistants)	Allergies (contact urticaria (immediate hypersensitivity); contact eczema (delayed hypersensitivity)) Allergies to the constituents of synthetic and natural rubber (allergic contact eczemas)	Vegetable proteins, powdered latex (Para rubber tree: natural rubber) Rubber gloves (natural)	Biological agents, such as bacteria, viruses, fungi causing mycoses (for example among masons and tilers), yeasts and parasites, can cause various infections. These can include zoonotic diseases that affect professionals who have contact with animals
EU-OSHA, 2009		Agriculture (farmers) Forest workers Veterinarians	Tularaemia	<i>Francisella tularensis holartica/tularensis</i>	The report presents examples of EU policies, practices and case studies concerning

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Author(s)/ year	Title	Occupation(s)	Disease(s)	Biological agent(s)	Remarks
	Biological agents and pandemics: Review of the literature and national policies	Agriculture (poultry farmers) Hunters Ornithologists Pest control worker Sewage workers	Avian influenza	Avian influenza virus	the prevention of emerging infectious diseases
		Airline personnel Drivers (public transport) Food processing (preparation, serving) Funeral services Laboratory personnel (sample handling)	Severe acute respiratory syndrome (SARS)	SARS coronavirus	
		Airline personnel	Lassa	Lassa virus	
EU-OSHA, 2009	Biological agents and pandemics: Review of the literature and national policies	Agriculture workers Cleaners dealing with dead rodents, their faeces and/or nesting materials Construction and maintenance (plumbers, electricians, telephone installers) Forest workers Veterinarians	Hanta	Hanta virus	The report presents examples of EU policies, practices and case studies concerning the prevention of emerging infectious diseases. All EU workers are protected by the framework Directive 89/391/EEC, which is supplemented by individual directives to cover safety and health requirements, such as Directive 2000/54/EC on the protection of workers from risks related to exposure to biological agents at work. Provisions of the biological agents Directive were implemented

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Author(s)/ year	Title	Occupation(s)	Disease(s)	Biological agent(s)	Remarks
		Beauticians' work Cleaners Maintenance (medical/dental equipment repair) Mortuary work Social services	Hepatitis B and C, human immunodeficiency	Hepatitis B virus (HBV), hepatitis C virus (HCV), human immunodeficiency virus (HIV)	in all EU countries. Some guidance and specific regulations related to specific infectious biological agents and the specific workplaces have also been developed. There are some EU good practices for assessment and prevention of risks related to infectious biological agents/diseases, such as influenza, avian influenza, SARS, tuberculosis and anthrax, but there is a need for further good practices. Supporting employers and workers in identification and prevention of infectious biological agents should be emphasised. Good practices, developed in countries such as the USA and Australia, could be used as examples for preparing European good practices addressed to all workplaces as well as to specific agents and specific groups of workers
		Education Emergency services (ambulance/fire/police/rescue) Healthcare workers (needle exchange services)	Hepatitis B and C, human immunodeficiency, tuberculosis	Hepatitis B virus (HBV), hepatitis C virus (HCV), human immunodeficiency virus (HIV), <i>Mycobacterium tuberculosis</i>	
		Laboratory personnel (forensic, research, etc.)	Hepatitis B and C, human immunodeficiency, avian influenza, tuberculosis, tularemia	Hepatitis B virus (HBV), hepatitis C virus (HCV), human immunodeficiency virus (HIV), avian influenza virus, <i>Mycobacterium tuberculosis</i> , <i>Francisella tularensis/holartica</i>	
EU-OSHA, 2009	Biological agents and pandemics: Review of the literature and national policies	Healthcare workers (e.g. hospitals, community nursing, associated cleaning services)	Hepatitis B and C, human immunodeficiency, Lassa, avian influenza, severe acute respiratory syndrome (SARS), Legionnaires' disease, tuberculosis	Hepatitis B virus (HBV), hepatitis C virus (HCV), human immunodeficiency virus (HIV), Lassa virus, avian influenza virus, SARS coronavirus, <i>Legionella</i> sp., <i>Mycobacterium tuberculosis</i>	The report presents examples of EU policies, practices and case studies concerning the prevention of emerging infectious diseases

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Author(s)/ year	Title	Occupation(s)	Disease(s)	Biological agent(s)	Remarks
		<p>Cooling towers (including air-conditioning systems, maintenance)</p> <p>Outdoor works, e.g. related to soil distribution (in areas with surface or aerosolised water discharge that can be contaminated)</p>	Legionnaires' disease	<i>Legionella</i>	
EU-OSHA, 2011	Legionella and Legionnaires' disease: A policy overview	Driver (professional drivers)	Legionellosis (range in severity from mild febrile illness (Pontiac fever) to a potentially fatal form of pneumonia (Legionnaires' disease))	<i>Legionella pneumophila</i> and related <i>Legionella</i> species	Risk factors include driving through industrial areas and driving or being a passenger in a vehicle with windscreen wiper fluid not containing added screen wash. It is generally accepted that working areas with air-conditioning systems, high humidity or systems containing stagnant warm water are amenable to the growth of <i>Legionella</i>

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Author(s)/ year	Title	Occupation(s)	Disease(s)	Biological agent(s)	Remarks
EU-OSHA, 2011	Legionella and Legionnaires' disease: A policy overview	Agriculture equipment manufacturing Biological treatment Biological wastewater treatment facilities Forest workers Healthcare workers and dental care Maintenance (technicians of air-conditioning or water supply systems) Mine workers Offshore workers (oil and gas installations) Print plants Sewage (food industry) Stagnant warm water: textile plants Paper industry (paper mills) Vehicle washers Welders Workers in places with mist machines	Legionellosis (range in severity from mild febrile illness (Pontiac fever) to a potentially fatal form of pneumonia (Legionnaires' disease))	<i>Legionella pneumophila</i> and related <i>Legionella</i> species	It is generally accepted that working areas with air-conditioning systems, high humidity or systems containing stagnant warm water are amenable to the growth of <i>Legionella</i> . In some European countries, relevant ministries, institutes, societies and associations have issued guidelines, codes of practice, safe working practices or other normative documents to tackle the risks from <i>Legionella</i> . These documents usually contain technical protocols for the proper operation and maintenance of cooling towers, spas, etc. In some countries similar protocols are part of national standards. In others, such protocols are promoted by the cooling industry, the textile industry, trade unions, etc.

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Author(s)/ year	Title	Occupation(s)	Disease(s)	Biological agent(s)	Remarks
EU-OSHA, 2013	Green jobs and occupational safety and health: Foresight on new and emerging risks associated with new technologies by 2020 — Report	Waste management workers			Potential emerging risks: biohazards linked to work with new bacteria developed in bio-engineering, and increased exposure to bacteria and fungi due to increased collection and separation of organic waste
Fiebelkorn, A.P., Seward, J.F., Orenstein, W.A., 2014	A global perspective of vaccination of healthcare personnel against measles: Systematic review	Healthcare workers	Measles	Measles virus	Half of European countries have no measles vaccine policies for healthcare personnel. Young healthcare personnel are much more likely to be susceptible in countries with low vaccine coverage
Fijan, S., Turk, S.Š., 2012	Hospital textiles, are they a possible vehicle for healthcare-associated infections?	Laundry workers	Infection	<i>Sarcoptes scabiei</i> , <i>Microsporum canis</i> , <i>Salmonella typhimurium/hadar</i> , hepatitis A virus	Review of hospital textiles and their ability to carry microorganisms

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Author(s)/ year	Title	Occupation(s)	Disease(s)	Biological agent(s)	Remarks
Freshwater, D.A., 2013a	Hepatitis B and C in the armed forces	Military personnel	Hepatitis	Hepatitis B virus, hepatitis C virus	Publication concerns UK armed forces operating in high hepatitis B prevalence areas for years. Concerns revolve around ballistic transmission of HBV from local persons during mass casualty scenarios. All persons directly injured with penetrating injuries should receive accelerated vaccination regimes to prevent HBV; this also concerns situations in low-HBV areas such as the 2005 London bombings incident. Universal vaccination of UK forces against HBV is recommended. Hepatitis C genotype 1 is most common (60-70 % of isolates) in the USA and Europe. Genotypes 2 and 3 are less common in these areas, while genotypes 4, 5 and 6 are rare
Fromme, H., et al., 2016	Overall internal exposure to mycotoxins and their occurrence in occupational and residential settings: An overview	Agriculture (poultry production) Feed production Food processing (food grain workers) Waste workers	Hepatotoxic, carcinogenic, immunosuppressive	Aflatoxin	Review of mycotoxins in general. Increased mycotoxin levels measured. Disease is indicated (generic) without relation to levels measured
Fromme, H., et al., 2016	Overall internal exposure to mycotoxins and their occurrence in occupational and residential settings: An overview	Food processing (coffee, cocoa beans, spices) Malt factory workers Waste handling	Carcinogenic, nephrotoxic, teratogenic, immunotoxic	Ochratoxin A	

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Author(s)/ year	Title	Occupation(s)	Disease(s)	Biological agent(s)	Remarks
Gangurde, H.H., et al., 2011	Swine influenza A (H1N1 Virus): A pandemic disease	Agriculture (pig and poultry farmers)	Influenza-like illness, namely chills, fever, sore throat, muscle pains, severe headache, coughing, weakness and general discomfort	Swine influenza (Orthomyxoviridae type A: H1N1 virus)	Review of swine influenza and influenza A H1N1. Swine flu is a rare disease in people who work with pigs; H1N1 is indiscriminate
Ganter, M., 2015	Zoonotic risks from small ruminants	Abattoir workers Agriculture (sheep and goat breeders) Butchers Laboratory personnel Veterinarians	Infection with bacteria (anthrax, brucellosis, campylobacter infection, caseous lymphadenitis, <i>Chlamydia</i> infection, <i>Erysipelothrix rhusiopathiae</i> infection, Leptospirosis, listeriosis, Q-fever, Salmonellosis, Staphylococcus, tuberculosis); mycotic (ringworm); virus (Orf, rabies, vesicular stomatitis)	Bacteria, fungi, viruses	Overview of prevention measures, occurrence and transmission routes associated with small ruminants. To a lesser degree, relations with specific occupations are indicated
Garbin, C.A., et al., 2014	Hepatitis C virus and dental health workers: An update	Healthcare workers (dental care)			Dental workers are at risk but hepatitis C virus infection in dentists is similar to or lower than that of the general population

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Gerardi, D.A., 2010	Building-related illness	Office workers	Building-related illnesses — non-specific	Infectious agents, allergens	Building-related illnesses represent a heterogeneous group of disorders. Non-specific building-related illnesses probably represent a multifactorial condition. Exposure to various indoor pollutants and environmental conditions can cause varying degrees of illness, which are based on individual factors. Ill-health effect of microbial contamination remains unclear (no demonstrated toxic effect of mould, any potential ill-effects of mycotoxins 'highly unlikely at best')
Gerardi, D.A., 2010	Building-related illness	Office workers	Building-related illnesses — specific (respiratory infections)	Mundane virus most common, influenza virus, <i>Mycobacterium tuberculosis</i> , <i>Legionella pneumophila</i>	With regard to specific building-related illnesses, mundane viral upper respiratory tract infections are the most common, but influenza, <i>Mycobacterium tuberculosis</i> and <i>Legionella pneumophila</i> infections are well known to cause serious disease and death
Goniewicz, M., et al., 2012	Injuries caused by sharp instruments among healthcare workers: International and Polish perspectives	Healthcare workers	AIDS, hepatitis, malaria, syphilis, tuberculosis, brucellosis, diphtheria and others	Hepatitis B virus, hepatitis C virus, herpes virus, HIV/AIDS virus, others	Short review of healthcare workers coming in contact with blood-borne diseases. The most frequent procedures associated with injury risk are intramuscular or subcutaneous injection (22 %), taking blood samples or during intravenous cannulation (20 %) and repeatedly replacing the cap on an already used needle (30 %). Prevention measures are indicated
Gottschalk, M., et al., 2010	<i>Streptococcus suis</i> : A new emerging or an old neglected zoonotic pathogen?	Agriculture (pig farmers)	<i>Streptococcus suis</i> infections (mainly meningitis)	<i>Streptococcus suis</i>	Full text not available; evaluation based on abstract only. Sporadic cases of <i>S. suis</i> infections in humans have been reported during the last 40 years, apart from a large outbreak in the summer of 2005 in China

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Author(s)/ year	Title	Occupation(s)	Disease(s)	Biological agent(s)	Remarks
Gralton, J., McLaws, M.-L., 2010	Protecting healthcare workers from pandemic influenza: N95 or surgical masks?	Healthcare workers	Influenza	Influenza	Publication concerns evaluation into protective value of N95 or surgical masks to protect HCW to influenza. It was concluded that the 1-metre respiratory zone may need to be extended and ocular inoculation protection should be included
Gruskin, S., Pierce, G.W., Ferguson, L., 2014	Realigning government action with public health evidence: The legal and policy environment affecting sex work and HIV in Asia	Sex workers	AIDS	HIV	Publication concerns legal and policy environment affecting sex work and HIV. Concerns Asia; limited relevance
Guardabassi, L., et al., 2013	Public health impact and antimicrobial selection of methicillin-resistant staphylococci in animals	Agriculture (farmers) Veterinarians	Infection	Methicillin-resistant <i>Staphylococcus aureus</i> (MRSA)	Review of a MRSA variant that primarily affects animals. Livestock related; human prevalence is low. LA-MRSA has been shown to have a limited ability to adapt to humans and spread from colonised humans to the general population
Haagsma, J.A., et al., 2012	Infectious disease risks associated with occupational exposure: A systematic review of the literature	Abattoir workers	Infectious disease	(Methicillin-resistant) <i>Staphylococcus aureus</i> , (swine) influenza virus, <i>Brucella</i> spp., <i>Campylobacter</i> spp., <i>Coxiella burnetii</i> , <i>Escherichia coli</i> , hepatitis B and E virus, <i>Leptospira hardjo/pomona</i> , <i>Streptococcus pyogenes</i> , <i>Toxocara canis</i>	<b>Human source</b> , entry via skin and mucous membranes — pathway cutaneous, or entry via respiratory tract <b>Animal source</b> , entry via skin and mucous membranes, pathway tick bites, or entry via respiratory tract, or entry via gastro-intestinal tract <b>Environmental source</b> , entry via respiratory tract — pathway animal reservoirs, or entry via gastro-intestinal tract — pathway animal reservoirs
		Airline personnel		Hepatitis E virus	<b>Environmental source</b> , entry via gastro-intestinal tract, pathway animal reservoirs

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Author(s)/ year	Title	Occupation(s)	Disease(s)	Biological agent(s)	Remarks
Haagsma, J.A., et al., 2012	Infectious disease risks associated with occupational exposure: A systematic review of the literature	Agriculture (farmers, crop workers)	Lyme disease, Q-fever, infectious disease	<i>Borrelia burgdorferi</i> , <i>Clostridium tetani</i> , <i>Coxiella burnettii</i> , <i>Escherichia coli</i> , <i>Leishmania</i> spp., <i>Strongyloides stercoralis</i> , <i>Toxocara canis</i>	<p><b>Animal source</b>, entry via skin and mucous membranes — direct contact or mosquito bites</p> <p><b>Environmental source</b>, entry via skin and mucous membranes — pathway human reservoirs or animal reservoirs, or entry via respiratory tract — pathway animal reservoirs or inanimate reservoirs, or entry via gastrointestinal tract — pathway animal reservoirs</p>
		Agriculture (animal handlers, farmers)	Infectious disease	(Methicillin-resistant) <i>Staphylococcus aureus</i> , (swine and avian) influenza virus, <i>Borrelia burgdorferi</i> , <i>Brucella</i> spp., <i>Campylobacter</i> spp., <i>Chlamydomphila psittaci</i> , <i>Clostridium tetani</i> , <i>Coxiella burnettii</i> , <i>Escherichia coli</i> , <i>Helicobacter pylori</i> , hepatitis E virus, <i>Leptospira icterohaemorrhagiae</i> , <i>Mycobacterium bovis</i> , <i>Strongyloides stercoralis</i> , <i>Toxocara canis</i> , <i>Toxoplasma gondii</i> , West Nile virus	<p><b>Human source</b>, entry via skin and mucous membranes — pathway cutaneous, or entry via respiratory tract, or entry via gastrointestinal tract</p> <p><b>Animal source</b>, entry via skin and mucous membranes — pathway direct contact or mosquito bites, or entry via gastrointestinal tract</p> <p><b>Environmental source</b>, entry via skin and mucous membranes — pathway human reservoirs or animal reservoirs, or entry via respiratory tract — pathway animal reservoirs, or entry via gastrointestinal tract — pathway animal reservoirs</p>
		Caregivers (childcare providers)		<i>Cryptosporidium parvum</i> , <i>Cytomegalovirus</i> , <i>Giardia lamblia</i> , hepatitis A virus, parvovirus, varicella zoster virus	<p><b>Human source</b>, entry via skin and mucous membranes — pathway cutaneous, or entry via respiratory tract, or entry via gastrointestinal tract</p> <p><b>Environmental source</b>, entry via gastrointestinal tract — pathway human reservoirs</p>

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Author(s)/ year	Title	Occupation(s)	Disease(s)	Biological agent(s)	Remarks
Haagsma, J.A., et al., 2012	Infectious disease risks associated with occupational exposure: A systematic review of the literature	Animal carers	Infectious disease	<i>Bartonella henselae</i> , <i>Borrelia burgdorferi</i> , <i>Capillaria hepatica</i> , <i>Chlamydophila psittaci</i> , hantavirus, influenza virus, <i>Leptospira</i> spp., simian foamy virus, simian parvovirus, simian type D retrovirus, <i>Toxocara canis</i> , <i>Toxoplasma gondii</i>	<b>Human source</b> , entry via respiratory tract <b>Animal source</b> , entry via skin and mucous membranes — pathway direct contact or tick bites, or entry via respiratory tract, or entry via gastro-intestinal tract <b>Environmental source</b> , entry via respiratory tract — pathway animal reservoirs, or entry via gastro-intestinal tract — pathway animal reservoirs
		Hunters		<i>Borrelia burgdorferi</i> , <i>Bruceella</i> spp., <i>Echinococcus granulosus/ multilocularis</i> , <i>Ehrlichia chaffeensis</i> , <i>Francisella tularensis</i> , hantavirus, <i>Leptospira icterohaemor-rhagia</i> , <i>Leptospira interrogans</i> , <i>Toxocara canis</i>	<b>Animal source</b> , entry via skin and mucous membranes — pathway direct contact or tick bites or animal reservoirs, or entry via respiratory tract — pathway animal reservoirs <b>Environmental source</b> , entry via skin and mucous membranes — pathway animal reservoirs, or entry via respiratory tract — pathway animal reservoirs, entry via gastro-intestinal tract — pathway animal reservoirs
		Archaeologists		<i>Coccidioides immitis</i>	<b>Environmental source</b> , entry via respiratory tract — pathway inanimate reservoirs
		Cleaners		Hepatitis A virus, hepatitis B virus, <i>Mycobacterium tuberculosis</i>	<b>Human source</b> , entry via skin and mucous membranes — pathway needlestick, or entry via respiratory tract <b>Environmental source</b> , entry via gastro-intestinal tract, pathway human reservoirs

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		Divers (other craft and related workers)		<i>Campylobacter jejuni</i> , enteroviruses, <i>Pseudomonas aeruginosa</i>	<b>Animal source</b> , entry via gastro-intestinal tract <b>Environmental source</b> , entry via skin and mucous membranes or entry via respiratory tract — pathway inanimate reservoirs, or entry via gastro-intestinal tract — pathway animal reservoirs
Haagsma, J.A., et al., 2012	Infectious disease risks associated with occupational exposure: A systematic review of the literature	Education (primary teachers)		<i>Cytomegalovirus</i> , <i>Neisseria</i>	<b>Human source</b> , entry via skin and mucous membranes — pathway cutaneous, or entry via respiratory tract;
		Fishers Fishmongers		<i>Anisakis simplex</i>	<b>Environmental source</b> , entry via gastro-intestinal tract — pathway animal reservoirs
		Forest workers		<i>Anaplasma phagocytophilum</i> , <i>Borrelia burgdorferi</i> , <i>Coxiella burnetii</i> , hantavirus, <i>Rickettsia conorii/helvetica</i> , tick-borne encephalitis virus, <i>Toxoplasma gondii</i>	<b>Animal source</b> , entry via skin and mucous membranes — pathway direct contact or tick bites <b>Environmental source</b> , entry via respiratory tract — pathway animal reservoirs, or entry via gastro-intestinal tract — pathway animal reservoirs
		Funeral service workers Prison guards		<i>Mycobacterium tuberculosis</i>	<b>Human source</b> , entry via respiratory tract
		Gardeners		<i>Francisella tularensis</i>	<b>Animal source</b> , entry via skin and mucous membranes — pathway direct contact or mosquito bites <b>Environmental source</b> , entry via skin and mucous membranes — pathway human reservoirs or animal reservoirs, or entry via respiratory tract — pathway animal reservoirs or inanimate reservoirs, or entry via gastro-intestinal tract — pathway animal reservoirs

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Author(s)/ year	Title	Occupation(s)	Disease(s)	Biological agent(s)	Remarks
		Healthcare workers (dental care)		Hepatitis B and C virus, HIV, etc.	<p><u>Dentist</u>  <b>Human source</b>, entry via skin and mucous membranes — pathway needlestick.</p> <p><u>Dentist assistant</u>  <b>Human source</b>, entry via skin and mucous membranes — pathway needlestick, or entry via respiratory tract</p>
Haagsma, J.A., et al., 2012	Infectious disease risks associated with occupational exposure: A systematic review of the literature	Healthcare workers	Infectious disease	(Methicillin-resistant) <i>Staphylococcus aureus</i> , <i>Bordetella pertussis</i> , <i>Cytomegalovirus</i> , <i>Helicobacter pylori</i> , hepatitis A, B, C and E virus, human herpes virus, HIV, human parvovirus, influenza virus, measles virus, monkey pox virus, mumps virus, <i>Mycobacterium bovis/tuberculosis</i> , rubella virus, <i>Salmonella</i> spp., SARS coronavirus, <i>Streptococcus pyogenes</i> , vancomycin-resistant Enterococci, Varicella zoster virus	<p><u>Nurse and midwife</u>  <b>Human source</b>, entry via skin and mucous membranes — pathway needlestick or cutaneous, or entry via respiratory tract, or entry via gastro-intestinal tract</p> <p><b>Environmental source</b>, entry via gastro-intestinal tract — pathway human reservoirs or animal reservoirs</p> <p><u>Nurse or midwife assistant</u>  <b>Human source</b>, entry via skin and mucous membranes — pathway needlestick or cutaneous, or entry via respiratory tract, or entry via gastro-intestinal tract</p> <p><b>Animal source</b>, entry via skin and mucous membranes — pathway direct contact</p> <p><b>Environmental source</b>, entry via gastro-intestinal tract — pathway human reservoirs or animal reservoirs</p>
		Healthcare workers (hospital dietary workers)		<i>Coxiella burnettii</i> , hepatitis A virus	<b>Environmental source</b> , entry via respiratory tract — pathway animal reservoirs, or entry via gastro-intestinal tract — pathway animal reservoirs
		Healthcare workers (medical doctors)		Hepatitis B and C virus, HIV, <i>Mycobacterium tuberculosis</i> , SARS coronavirus	<b>Human source</b> , entry via skin and mucous membranes — pathway needlestick, or entry via respiratory tract

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		Healthcare assistants		<i>Helicobacter pylori</i>	<b>Human source</b> , entry via gastro-intestinal tract
		Plant and machine operators and assemblers		<i>Histoplasma capsulatum</i> , <i>Legionella pneumophila</i> , <i>Mycobacterium chelonae</i>	<b>Human source</b> , entry via gastro-intestinal tract <b>Environmental source</b> , entry via respiratory tract — pathway animal reservoirs or inanimate reservoirs
Haagsma, J.A., et al., 2012	Infectious disease risks associated with occupational exposure: A systematic review of the literature	Laboratory personnel	Infectious disease	(Methicillin-resistant) <i>Staphylococcus aureus</i> , <i>Bartonella henselae</i> , <i>Brucella</i> spp., <i>Clostridium difficile</i> , <i>Coxiella burnettii</i> , <i>Giardia lamblia</i> , HIV, influenza virus, <i>Mycobacterium tuberculosis</i> , <i>Neisseria meningitidis</i> , <i>Pasteurella multocida</i> , rhinovirus, <i>Salmonella</i> spp., <i>Shigella</i> spp., simian foamy virus	<b>Human source</b> , entry via skin and mucous membranes — pathway cutaneous, or entry via respiratory tract, or entry via gastro-intestinal tract <b>Animal source</b> , entry via skin and mucous membranes — pathway direct contact, or entry via gastro-intestinal tract <b>Environmental source</b> , entry via respiratory tract — pathway animal reservoirs, or entry via gastro-intestinal tract — pathway human reservoirs or animal reservoirs
		Laboratory personnel (microbiologists)		<i>Neisseria meningitidis</i>	<b>Human source</b> , entry via respiratory tract
		Military personnel		<i>Leishmania</i> spp.	<b>Animal source</b> , entry via skin and mucous membranes — pathway mosquito bites

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		Sex workers (also adult movie actors)		<i>Chlamydia trachomatis</i> , hepatitis B and C virus, herpes virus, HIV, human papilloma virus, human T-lymphotropic virus, <i>Neisseria gonorrhoeae</i> , <i>Treponema pallidum</i> , <i>Trichomonas vaginalis</i>	<b>Human source</b> , entry via urogenital tract
		Waste collectors		<i>Brucella</i> spp., <i>Helicobacter pylori</i> , hepatitis A, B and C virus, <i>Toxoplasma gondii</i>	<b>Human source</b> , entry via skin and mucous membranes — pathway needlestick, or entry via gastro-intestinal tract <b>Animal source</b> , entry via skin and mucous membranes — path-way direct contact <b>Environmental source</b> , entry via gastro-intestinal tract — pathway human reservoirs or animal reservoirs
Haagsma, J.A., et al., 2012	Infectious disease risks associated with occupational exposure: A systematic review of the literature	Veterinarian assistants Veterinarians		(Methicillin-resistant) <i>Staphylococcus aureus</i> , (swine) influenza virus, <i>Brucella</i> spp., <i>Bartonella henselae</i> , <i>Campylobacter</i> spp., <i>Chlamydophila psitacci</i> , <i>Clostridium tetani</i> , <i>Coxiella burnettii</i> , <i>Pasteurella multocida</i> , <i>Salmonella</i> spp., <i>Toxoplasma gondii</i>	<b>Human source</b> , entry via skin and mucous membranes — pathway cutaneous <b>Animal source</b> , entry via skin and mucous membranes — pathway direct contact, or entry via respiratory tract, or entry via gastro-intestinal tract <b>Environmental source</b> , entry via skin and mucous membranes — pathway animal reservoirs, or entry via respiratory tract — pathway animal reservoirs, or entry via gastro-intestinal tract — pathway animal reservoirs
Hadaway, L., 2012	Needlestick injuries short peripheral catheters and healthcare worker risks	Healthcare workers	AIDS, hepatitis	HIV, hepatitis B, C virus	Review of occupational risks for healthcare workers. Seroconversion after needlestick or sharp injuries contaminated with an infected source is 6-30 % for HBV, 0.5-10 % for HCV and 0.09-0.3 % for HIV

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Halsby, K.D., et al., 2014	Healthy animals, healthy people: Zoonosis risk from animal contact in pet shops — A systematic review of the literature	Pet distributor	Tularaemia, psittacosis	<i>Francisella tularensis</i> , <i>Chlamydophila psittaci</i>	Review of pet zoonoses
		Pet shop workers	Leptospirosis, psittacosis, rat bite fever, tularaemia, salmonellosis, monkeypox, dermal lesions (ringworm), Ringworm, choriomeningitis	<i>Leptospira</i> , <i>Chlamydophila psittaci</i> , rat bite fever, <i>Francisella tularensis</i> , Lymphocytic choriomeningitis virus, ringworm	
Honarmand, H., 2012	Q fever: An old but still a poorly understood disease	Agriculture (animal farmers) Laboratory personnel Meat workers Veterinarians	Q-fever	<i>Coxiella burnetii</i>	Review on Q-fever
Hardin, A., Crandall, P.G., Stankus, T., 2011	The zoonotic tuberculosis syndemic: a literature review and analysis of the scientific journals covering a multi-disciplinary field that includes clinical medicine, animal science, wildlife management, bacterial evolution, and food safety	Agriculture (dairy farmers) Meat processing (meat packers) Veterinarians	Tuberculosis	<i>Mycobacterium bovis</i>	Review of tuberculosis due to <i>Mycobacterium bovis</i> . Primary focus is not occupational, but rather ingestion of contaminated products. Some occupational relations are mentioned

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Hossain, M.S., et al., 2011	Clinical solid waste management practices and its impact on human health and environment — A review	Healthcare workers	Infection	Human-transferred pathogens (bacteria, viruses, fungi)	Clinical waste disposal practices in the developing world rather than occupational disease. A list of possible microorganisms in clinical waste covering <i>Pseudomonas</i> spp., <i>Lactobacillus</i> spp., <i>Staphylococcus</i> spp., <i>Micrococcus</i> spp., <i>Kocuria</i> spp., <i>Brevibacillus</i> spp., <i>Microbacterium oxydans</i> , <i>Propionibacterium acnes</i> , coliform bacteria, <i>Escherichia coli</i> , <i>Enterobacter</i> , <i>Bacillus cereus</i> , <i>Salmonella</i> spp., Legionella, yeast and moulds. No microorganism transfer or disease is mentioned. The supercritical fluid carbon dioxide sterilisation technique to sterilise clinical solid waste at the point of initial collection is highly recommended to prevent infection and contamination
Islam, M.A., et al., 2013	A review of Brucella seroprevalence among humans and animals in Bangladesh with special emphasis on epidemiology risk factors and control opportunities	Agriculture (animal handlers, farmers) Meat workers Veterinarians	Brucellosis	<i>Brucella</i> bacteria ( <i>B. abortus</i> , <i>B. ovis</i> , <i>B. melitensis</i> , <i>B. suis</i> , <i>B. canis</i> )	Review of brucellosis in animals and humans
Jacobsen, G., et al., 2010	Non-malignant respiratory diseases and occupational exposure to wood dust. Part I. Fresh wood and mixed wood industry	Woodworkers	Respiratory disease	Organic dust (endotoxin, glucans, fungal spores)	Focus of the article is mainly on exposure to wood dust. Respiratory effects caused by work in the fresh wood industry is probably a combination of exposure to wood dust per se and other exposures, such as endotoxins, glucans and mould spores

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Jeffries, C.L., et al., 2014	Louping ill virus: An endemic tick-borne disease of Great Britain	Abattoir workers Agriculture (stockperson) Butchers Veterinarians	Influenza-like illness, sometimes severe neurological signs	Louping ill virus (LIV)	Review of Louping ill virus via tick bite
Johanning, E., et al., 2014	Review of health hazards and prevention measures for response and recovery workers and volunteers after natural disasters, flooding, and water damage: Mold and dampness	Constructive workers (recovery/restoration workers)	Respiratory infections, organic dust toxic syndrome, cognitive changes, endocrine changes, rheumatological changes	Fungi	Review of health hazards to recovery/restoration workers after natural disasters, mostly fungi
Johnson, E.S., Choi, K.-M., 2012	Lung cancer risk in workers in the meat and poultry industries: A review	Meat and poultry industry workers	Lung cancer	Food animal oncogenic viruses	Review investigating lung cancer risk in highly exposed workers in the meat and poultry industries. Full text not available; evaluation based on abstract only. A 30 % excess risk of lung cancer in meat and poultry plant workers, with evidence pointing to food animal oncogenic microorganisms as one of the main causes
Johnston, S., 2012	The effect of antimicrobial impregnated fabrics on the contamination of healthcare workers uniforms in clinical environments	Healthcare workers		Bacteria ( <i>Staphylococcus aureus</i> , MRSA and <i>Enterococcus</i> spp.)	Full text not available; evaluation based on abstract only. Transmission of pathogenic bacteria between wards within hospital. Antimicrobial impregnated fabrics used for healthcare workers' uniforms in clinical environments may not provide adequate protection

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Karjalainen, A., Niederlaender, E. (Eurostat), 2004	Occupational diseases in Europe in 2001. Statistics in focus — Population and social conditions	Agriculture Manufacturing workers	Brucellosis	<i>Brucella</i>	Out of 31,945 cases of recognised occupational diseases in 12 Member States in 2001 with biological agents as causative agent, 194 cases were caused by bacteria, 166 cases by viruses, 81 cases by fungi, 385 cases by plants, 232 cases by animals and 69 cases by other or unspecified biological agents. There were 436 cases of infections (83 cases of tuberculosis, 149 cases of brucellosis, 40 cases of hepatitis A, 10 of hepatitis B, 146 of hepatitis C, 8 other infections) and 4,507 cases of respiratory diseases (of which 248 cases of allergic rhinitis, 497 cases of chronic bronchitis, 1,075 cases of asthma, 189 cases of allergic alveolitis, 85 cases of upper respiratory inflammation). However, not all respiratory diseases are caused by biological agents. A total of 27 % of the cases of brucellosis were from agriculture
Karjalainen, A., Niederlaender, E. (Eurostat), 2004	Occupational diseases in Europe in 2001. Statistics in focus — Population and social conditions	Agriculture	Asthma	Organic dust	Not all respiratory diseases are caused by biological agents. There were 107 different causative agents reported, and among the most common causative agents specified were flour dust (10%), dusts from mammals (4%) and wood dusts (3%)
		Healthcare workers (health and social work and public administration)	Hepatitis A, B, C, tuberculosis	Viruses	Health and social work and public administration covered the majority of cases of hepatitis C (97%), hepatitis A (88%), tuberculosis (88%) and hepatitis B (60%)

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Keene, R.R., et al., 2011	Occupational hazards to the pregnant orthopaedic surgeon	Healthcare workers (pregnant orthopaedic surgeon)	AIDS, hepatitis	HIV, hepatitis B and C	Publication concerns evaluation of risks to pregnant orthopaedic surgeons including pathogens. HIV is of the greatest concern to the pregnant orthopaedic surgeon because of its potentially fatal health consequences to the foetus if the mother goes untreated
Kerrigan, D.L., et al., 2013	Community empowerment among female sex workers is an effective HIV prevention intervention: A systematic review of the peer-reviewed evidence from low- and middle-income countries	Sex workers	AIDS	HIV	Publication concerns meta-analysis of community empowerment interventions for HIV/STI prevention among sex workers in low- and middle-income countries. Overall, community empowerment-based HIV prevention was associated with significant improvements across HIV outcomes and settings. No EU-related information included; relevance limited
Khan, S., Attaullah, S., 2011	Share of Afghanistan populace in hepatitis B and hepatitis C infection's pool: Is it worthwhile?	Military personnel (troops, veterans)			HCV has been considered a potential health hazard for military troops and veterans, because of a lack of reliable screening of blood products (which still remains little developed)

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Khan, S., Attaullah, S., 2011	Share of Afghanistan populace in hepatitis B and hepatitis C infections pool: Is it worthwhile?	Healthcare workers	Hepatitis B and C	Hepatitis B and C virus (HBV, HCV)	Occupational injuries in healthcare settings are a major mode of transmission of HBV and HCV in developing countries. HCWs in Afghanistan are particularly disadvantaged owing to decades of neglect of their personal healthcare, and widespread inadequate infection control practices. There are no precise national data on the number of needlestick injuries. Based on the WHO model, estimates for Afghanistan are 6,800 for HBV and 3,200 for HCV infections. In a survey, 72.6 % hospital staff reported sharps injury in the preceding 12 months, mainly from hollow-bore needle injuries (46.3%), particularly during recapping (24.5%). 23 % of HCWs had evidence of previous exposure to HBV (HCV may also be present, since HCV shares transmission patterns with HBV). In 2004, only 8 % reported a history of previous hepatitis B immunisation. 27.9 % of HCWs in 10 national public hospitals in Kabul were not vaccinated against HBV. The medical histories and current symptoms were all self-reported and, in some cases, may represent underreporting.

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		Drivers (truck drivers)			Afghani truck drivers may spend long periods away from home and family and travel along routes with a higher prevalence of HBV/HCV and into neighbouring countries, which have large or developing sexually transmitted infection problems. , Truck drivers are often engaged in high-risk behaviour, such as visiting sex workers and using drugs. Rapid population mobility and migration is reducing the differences in infectious disease epidemiology between different regions of the world
Kim, H.R., Kim, T.W., 2010	Occupational hepatic disorders in Korea	Healthcare workers (doctors, nurses and clinical pathology technicians)	Hepatitis B, hepatitis C	Hepatitis B and C virus	Viral hepatitis is an endemic disease in Korea. It is also commonly reported as an occupational disease. Healthcare workers (and intravenous drug users) are especially at risk of HBV and HCV infections

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Korzeniewska, E., 2011	Emission of bacteria and fungi in the air from wastewater treatment plants: A review	Wastewater/sewage workers	Sewage worker's syndrome, organic toxic dust syndrome	Viruses, bacteria ( <i>Aeromonas</i> , <i>Acinetobacter</i> , <i>Campylobacter</i> , <i>Clostridium</i> , <i>Enterobacter</i> , <i>Enterococcus</i> , <i>Escherichia</i> , <i>Klebsiella</i> , <i>Mycobacterium</i> , <i>Pantoea</i> , <i>Pseudomonas</i> , <i>Serratia</i> , <i>Staphylococcus</i> , <i>Salmonella</i> , <i>Shigella</i> and <i>Vibrio</i> ); fungi ( <i>Alternaria</i> , <i>Aspergillus</i> , <i>Cladosporium</i> , <i>Penicillium</i> , <i>Trichoderma</i> , <i>Candida</i> , <i>Cryptococcus</i> , <i>Geotrichum</i> and <i>Rhodotorula</i> )	Workers at wastewater treatment plants would become infected within 1 year, unless they were already immune or suitably protected. Exposure to organic dust at workplaces of composting facilities is associated with adverse acute and chronic respiratory health effects, including mucosal membrane irritation, chronic bronchitis and an accelerated decline of forced vital capacity (FVC%). The pattern of health effects differs from those at other workplaces with exposures to organic dust, possibly because of high concentrations of thermotolerant/thermophilic Actinomycetes and filamentous fungi at composting plants. A causal relationship between exposure to non-infectious airborne biohazards [i.e. endotoxins, (1-3)-beta-D glucans, allergens of bacteria and fungi] and the occurrence of gastro-intestinal symptoms, fever, respiratory symptoms, skin disorders, eye irritation, headache, fatigue and nausea in workers at sewage treatment plants has also been considered by many authors
Kouyoumjian, S.P., et al., 2013	The epidemiology of HIV infection in Morocco: Systematic review and data synthesis	Military personnel	Sexually transmitted infections (HIV, herpes simplex virus type 2)	Viruses, bacteria	Potential bridging population with low HIV prevalence, generally well below 1%. However, also population that reports relatively high levels of risk behaviour (female sex worker partners, same-sex sexual relations, injecting drug use, no use of condom), which are not directly related to their work environment

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Kouyoumjian, S.P., et al., 2013	The epidemiology of HIV infection in Morocco: Systematic review and data synthesis	Healthcare workers	HIV	Viruses	Occupational injuries among healthcare workers are common though rarely declared. 59 % of healthcare workers in one study reported a needlestick injury in the previous year
		Drivers (truck drivers) Sailors	Sexually transmitted infections (HIV, syphilis)	Viruses, bacteria	Potential bridging population with low HIV prevalence, generally well below 1%. However, also population that reports relatively high levels of risk behaviour (female sex worker partners, same-sex sexual relations, injecting drug use, no use of condom), which are not directly related to their work environment. Prevalence of syphilis 9.5 % in truck drivers and 1.9-3.4% in sailors
		Hotel staff	Sexually transmitted infections (syphilis)	Bacteria	Prevalence of syphilis 0.4-0.9%
		Sex workers (female)	Sexually transmitted infections (HIV, chlamydia, gonorrhoea, syphilis)	Viruses, bacteria	Study in Morocco; HIV transmission dynamics were found to be focused in high-risk populations, with female sex workers (FSWs) and clients contributing to the largest share of new HIV infections. HIV prevalence among female sex workers at the national level has hovered around 2 % and appeared rather stable for over a decade now. Variability across regions; within the region of Sous Massa Draa, for example, HIV prevalence increased from 3.18 % in 2005 to 8.14 % in 2009. Prevalence of chlamydia 19%, prevalence of gonorrhoea 3.5-7.1%, prevalence of syphilis 9-13.8%

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Kozdruń, W., Czekaj, H., Styś, N., 2015	Avian zoonoses: A review	Abattoir workers (poultry) Agriculture (breeders of ornamental birds, poultry farmers) Veterinarians Zoo personnel	Ornithosis, Salmonellosis, Campylobacteriosis, Yersiniosis, Colibacteriosis, Erysipeloid, Listeriosis	Bacteria	Review of bird-related zoonoses
			Various mild to severe symptoms	Avian influenza, West Nile virus infection, Newcastle disease	
			Lyme disease, Q-fever, Salmonellosis, tick-borne encephalitis	Pathogens via ticks	
		Abattoir workers (poultry) Agriculture (poultry farmers) Veterinarians Zoo personnel	Histoplasmosis, Cryptococcosis	Fungi	
Kuijer, P.P.F.M., Sluiter, J.K., Frings-Dresen, M.H.W., 2010	Health and safety in waste collection: Towards evidence-based worker health surveillance	Waste collectors	Respiratory symptoms such as bronchitis, gastro-intestinal symptoms such as diarrhoea and nausea, hepatitis (A, B, or C), HIV, syphilis, allergic broncho-pulmonary aspergillosis	Hepatitis A, B and C virus, HIV, syphilis, organic dust (endotoxin)	Reviews health outcomes in waste collectors. Strong evidence is available that exposure to bioaerosols exceeds recommendations; moderate evidence is available for an increased risk of respiratory complaints; limited evidence exists for gastro-intestinal disorders
Kuster, S.P., et al., 2011	Incidence of influenza in healthy adults and healthcare workers: A systematic review and meta-analysis.	Healthcare workers	Influenza	Influenza virus	HCWs are at higher risk of asymptomatic but not symptomatic influenza infection. It might be that their cumulative exposure to influenza (or influenza vaccine) over time is higher than that of other workers, so that prior immunity reduces symptom severity

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Lagriffoul, A., et al., 2010	Bacterial-based additives for the production of artificial snow: What are the risks to human health?	Snowmakers		<i>Pseudomonas syringae</i> , endotoxin	Review of bacteria-derived additives in artificial snow. Certain health risks can exist for specific categories of professional workers (mainly snowmakers during additive-mixing and dilution tank cleaning steps, with risks estimated to be negligible to low if workers comply with safety precautions). <i>P. syringae</i> does not present any pathogenic capacity to humans and the level of its endotoxins found in artificial snow does not represent a danger beyond that of exposure to <i>P. syringae</i> endotoxins naturally present in snow
Lai, P.S., Christiani, D.C., 2013	Long-term respiratory health effects in textile workers	Textile industry workers	Lung disease (asthma, COPD)	Organic dust	Review on respiratory effects in textile workers
Lam, S., et al., 2015	Evidence for public health risks of wastewater and excreta management practices in Southeast Asia: A scoping review	Agriculture	Parasitic or bacterial infection	Parasites, bacteria	Risks associated with agriculture workers in Southeast Asia using human wastewater for fertilisation. The authors expressed concerns about the actual health risks due to lack of rigour study designs. Agricultural-related risk factors, including exposure to excreta for fertilising fields or exposure to wastewater for irrigation, are among the important determinants of health risks
Landelle, C., Pagani, L., Harbarth, S., 2013	Is patient isolation the single most important measure to prevent the spread of multidrug-resistant pathogens?	Healthcare workers			Publication concerns measures to prevent secondary infection to MRSA. Although transmission to HCW is investigated, no remark is made with respect to a possible resulting infection. Limited relevance

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Ławniczek-Wałczyk, A., Górny, R.L., 2010	Endotoxins and beta-glucans as markers of microbiological contamination: Characteristics, detection, and environmental exposure	Agriculture (farmers) Wood workers		Organic dust (endotoxin, beta-glucan)	The highest exposure to endotoxins occurs in agriculture, grain processing, the waste industry and landfills, as well as in wood processing and the metal and textile industries. Beta-glucans play important role in the development of occupational diseases in farmers (especially grain and poultry farming), the paper industry, wood processing and waste composting facilities and among sewage treatment plant workers  The highest exposure to endotoxins occurs in agriculture, grain processing, the waste industry and landfills, as well as in wood processing and the metal and textile industries. Beta-glucans play important role in the development of occupational diseases in farmers (especially grain and poultry farming), the paper industry, wood processing and waste composting facilities and among sewage treatment plant workers
		Grain processing Manufacturing (metal workers) Textile workers Waste industry		Organic dust (endotoxin)	
		Paper industry Sewage (treatment plant workers) Waste composting		Organic dust (beta-glucan)	
Lee, W.J., Cha, E.S., Moon, E.K., 2010	Disease prevalence and mortality among agricultural workers in Korea	Agriculture workers	Respiratory diseases (asthma, pneumonitis, spider-mite allergy, occupational pollinosis, hypersensitivity pneumonitis, chronic obstructive pulmonary disease, allergic rhinitis); infectious diseases (scrub typhus, brucellosis, tetanus, tuberculosis)		Overview of mortality and disease prevalence related to occupational diseases among agricultural workers in Korea. No relation to exposure is found (and at least part of the respiratory diseases could also be caused by exposure to non-biological agents)

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Lenters, V., et al., 2010	Endotoxin exposure and lung cancer risk: A systematic review and meta-analysis of the published literature on agriculture and cotton textile workers	Agriculture Cotton textile workers	Reduced risk of lung cancer	Organic dust (endotoxin)	Study adds weight to the hypothesis that occupational exposure to endotoxin in cotton textile production and agriculture is protective against lung cancer
Lewin, J.M., Brauer, J.A., Ostad, A., 2011	Surgical smoke and the dermatologist	Healthcare workers (dermatologists, surgeons)	Potential risk of infection	Viruses, bacteria	Review of surgical smoke health effects. Potential infection and pulmonary damage as a result of exposure to surgical plume
Lewis, C., Wichmann, O., Duizer, E., 2010	Transmission routes and risk factors for autochthonous hepatitis E virus infection in Europe: A systematic review	Agriculture (pig farmers) Sewage workers Veterinarians	Hepatitis	Hepatitis E virus	Review of hepatitis E infections originating in Europe
Lewis, J.D., Enfield, K.B., Sifri, C.D., 2015	Hepatitis B in health-care workers: Transmission events and guidance for management	Healthcare workers	Hepatitis	Hepatitis B virus	Review of occupational risk of hepatitis B for healthcare workers
Ling, D., Menzies, D., 2010	Occupation-related respiratory infections revisited	Healthcare workers	Tuberculosis, influenza, SARS	<i>Mycobacterium tuberculosis</i> , influenza viruses, coronavirus A	The risk of TB infection in healthcare workers is 5-10 times greater than in the general population, and risk of disease is 2-5 times higher. Greater risk of exposure to patients with TB, particularly undiagnosed patients. Some risk factors relate to specific work activities that can cause aerosolisation of tubercle bacilli. Also, information on preventive measures

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Lundin, J.I., Checkoway, H., 2010	Endotoxin and cancer	Agriculture (livestock farmers) Cotton textile workers Saw mill workers	Reduced risk of lung cancer	Organic dust (endotoxin)	There is very consistent epidemiological evidence that endotoxin is dose-related to risk reductions for lung cancer, and provocative evidence that risks for other cancers may be similarly reduced. Animal experimental research and limited therapeutic trial data are generally supportive of an anticarcinogenesis effect, and plausible biological mechanisms have been described. The health effects, including cancer outcomes associated with exposure to endotoxin, remain paradoxical
Lynch, L., Spivak, E.S., 2015	The pregnant healthcare worker: Fact and fiction	Healthcare workers (pregnant)			Review of infectious diseases and healthcare workers, with particular focus on pregnant workers. Pregnancy does not seem to be an independent risk factor in healthcare workers, highlighting the importance of influenza vaccination during pregnancy
Madsen, A.M., 2011	Occupational exposure to microorganisms used as bio-control agents in plant production	Agriculture (plant production)	Respiratory health effects	Microbiological pest control agents ( <i>Beauveria bassiana</i> , <i>Verticillium lecanii</i> , <i>Trichoderma harzianum/viride/poly-sporum</i> , <i>Paecilomyces fumosoroseus/lilacinus</i> , <i>Streptomyces griseoviridis</i> , <i>Bacillus subtilis</i> , <i>Bacillus thuringiensis</i> )	Full text not available; evaluation based on abstract only. People handling MPCAs in occupational settings may be exposed
Mahboobi, N., et al., 2010	Hepatitis B virus infection in dentistry: A forgotten topic: Review	Healthcare workers (dental care)	Hepatitis B	Hepatitis B virus	Deals with both dental care worker/dentist infections and worker-to-patient transmission. It is postulated that dentists and dental staff are infected and transmit the disease to their patients more than any other occupation

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Mahboobi, N., et al., 2014	Hepatitis C virus: Its implication for endodontists	Healthcare workers (dental care)			Dental workers are at risk but hepatitis C virus infection in dentists is similar to or lower than that of the general population
Malta, M., et al., 2010	HIV prevalence among female sex workers drug users and men who have sex with men in Brazil: A systematic review and meta-analysis	Sex workers (female)	HIV/AIDS	HIV	Prevalence of HIV among female sex workers in Brazil
Martins, T., Narciso-Schia-von, J.L., de Lucca Schiavon, L., 2011	Epidemiology of hepatitis C virus infection	Occupational exposure (not further specified)	Hepatitis C virus infection	Hepatitis C virus	Full text not available; evaluation based on abstract only. Occupational exposure mentioned as one of the most important risk factors for HCV infection, but not further specified
Maves, R.C., Crum-Cianflone, N.F., 2012	Coccidioidomycosis: A review	Archaeologists Desert workers Military personnel	Coccidiosis	<i>Coccidioides immitis</i> and <i>posadasii</i>	Possibly less relevance to the EU, as <i>Coccidioides</i> is native to soil in desert area in the USA
May, S., Romberger, D.J., Poole, J.A., 2012	Respiratory health effects of large animal farming environments	Agriculture (pig workers)	Organic dust toxic syndrome, COPD	Organic dust	Review of respiratory health effects in animal farming. Prevalence of organic dust toxic syndrome may be as high as 34 % in swine confinement workers. However, agents responsible for respiratory diseases are not completely understood, but it is increasingly appreciated that these environments are complex and include endotoxins, peptidoglycans and respirable dust particles

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McDaniel, C.J., et al., 2014	Humans and cattle: A review of bovine zoonoses	Abattoir workers, meat inspectors Agriculture (cattle workers, livestock handlers) Laboratory personnel Veterinarians	Infection; various effects, up to severe	<i>Bacillus anthracis</i> , <i>Borrelia burgdorferi</i> , <i>Brucella</i> spp., <i>Campylobacter</i> spp., <i>Coxiella burnetii</i> , <i>Leptospira</i> spp., <i>Listeria monocytogenes</i> , <i>Streptococcus</i> spp., <i>Staphylococcus aureus</i> New variant Creutzfeldt-Jacob disease <i>Trichophyton</i> spp.	Review on bovine zoonoses
Méheust, D., et al., 2014	Indoor fungal contamination: Health risks and measurement methods in hospitals, homes and workplaces	Indoor workers		Fungi, organic dust	Review of fungi in general workplaces. Methods for detection, assessment and control of fungal contamination evaluated. Effects linked to immunocompromised patients or to asthma (evaluated separately); no further occupational disease relation mentioned. Mycotoxins could not be related to occurrence of disease
Melhem, N.M., et al., 2015	Human immune-deficiency virus and viral hepatitis among high-risk groups: Understanding the knowledge gap in the Middle East and North Africa region	Sex workers	AIDS	HIV	Review of HIV and hepatitis viruses in sex workers (and other, non-occupational, groups). No (clear) discrimination between occupational/non-occupational transfer. Questionable relevance for the EU. Considered of limited relevance
Michelin, A., Henderson, D.K., 2010	Infection control guidelines for prevention of healthcare-associated transmission of hepatitis B and C viruses	Healthcare workers	Hepatitis B, C	Hepatitis B and C virus	Focus of the article is on strategies to prevent patient-to-worker, patient-to patient and worker-to-patient transmission of hepatitis B and hepatitis C

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Miller, W.M., et al., 2013	Systematic review of HIV prevalence studies among key populations in Latin America and the Caribbean	Sex workers	AIDS	HIV	HIV-oriented review in Latin America and the Caribbean; limited relevance
Mohan, S., Sarfaty, S., Hamer, D.H., 2010	Human immunodeficiency virus postexposure prophylaxis for medical trainees on international rotations	Healthcare workers (medical trainees)	HIV/AIDS	HIV	Medical trainees are at considerable risk of contracting HIV (as well as locally endemic diseases, such as malaria, dengue fever, traveller's diarrhoea and sexually transmitted infections, as well as nosocomial transmission of blood- or body fluid-borne pathogens such as hepatitis B and hepatitis C) when they participate in the healthcare systems in resource-poor countries
Mohebati, A., Davis, J.M., Fry, D.E., 2010	Current risks of occupational blood-borne viral infection	Healthcare workers	Hepatitis B and C, HIV/AIDS	HIV, hepatitis B virus, hepatitis C virus	The transmission of blood-borne pathogens continues to be a risk for members of the surgical team. Whereas HBV infection can largely be prevented with vaccination and HIV has not been documented to have been transmitted in the operating room to the surgeon, HCV infection remains a real risk
Monge-Maillo, B., López-Vélez, R., 2012	Migration and malaria in Europe	Travellers			Publication concerns imported malaria cases due to immigrants in Europe who travel to visit friends and relatives (VFRs) in their country of origin. No specific occupational context. Possibly relevant as emerging risk in the EU

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Author(s)/ year	Title	Occupation(s)	Disease(s)	Biological agent(s)	Remarks
Montano, D., 2014	Chemical and biological work-related risks across occupations in Europe: A review	Composting Flax threshing Grain processing (threshing and sieving) Wood processing	Non-atopic asthma, fatigue, inflammation, lung function decline	Endotoxins	Reviews occupational risks in Europe
Montano, D., 2014	Chemical and biological work-related risks across occupations in Europe: A review	Healthcare workers	Hepatitis, tuberculosis	Hepatitis B and C virus, tuberculosis	Reviews occupational risks in Europe
		Agriculture (farmers, labourers) Veterinarians	Various diseases Lyme disease, tick-borne encephalitis, Q-fever, leptospirosis, MRSA	Bacterial endotoxin, mycotoxin, beta-glucans. Hepatitis B and C virus	
Morrissey, H., Cotton, J., Ball, P., 2014	Q-fever and Australian farmers: Is the health system paying enough attention? A literature review	Abattoir workers Agriculture (farmers)	Q-fever	<i>Coxiella burnetii</i> (Q-fever bacterium)	Review of Q-fever among Australian farmers
Mowbray, N., et al., 2013	Is surgical smoke harmful to theater staff? A systematic review	Healthcare workers (operating room personnel)			Reviews occupational risks of surgical smoke. Viruses, bacteria and malignant cells may be present in surgical (laser) smoke, but their viability was not assessed. No existing literature is found with a direct link between the components of smoke and the transmission of disease. Potential emerging risk?

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Author(s)/ year	Title	Occupation(s)	Disease(s)	Biological agent(s)	Remarks
Myers, M.L., 2010	Review of occupational hazards associated with aquaculture	Aquaculture	Leptospirosis infection	<i>Leptospira</i> , <i>Schistosoma</i> , <i>Mycobacterium marinum/balnei</i> , <i>Pfiesteria piscicida</i> , <i>Vibrio vulnificus</i>	Occupational hazards associated with aquaculture. Infections with bacteria and parasites are mentioned, with leptospirosis indicated on several occasions related to trout farms and aquaculture. Other infections are mentioned only on a single occasion. In general, no indication of diseases are included
Narasimhan, P., et al., 2013	Risk factors for tuberculosis	Healthcare workers	Tuberculosis	<i>Mycobacterium tuberculosis</i>	Review of tuberculosis
Noll, M., Jirjis, R., 2012	Microbial communities in large-scale wood piles and their effects on wood quality and the environment	Biomass workers			About microbial effects on stored woody biomass and investigations of the fungal and bacterial community structure and identity. Presence of biological agents linked to being at risk without actual reported diseases as a result thereof. Presence of biological agents without evidence of disease: pathogenic fungi (e.g. <i>Candida</i> , <i>Aspergillus</i> , <i>Mucoraceae</i> , <i>Geotrichum</i> ) and bacteria (e.g. <i>Aeromonas</i> )
Noorali, S., Pace, D.G., Bagasra, O., 2011	Of lives and livers: Emerging responses to the hepatitis C virus	Healthcare workers	Hepatitis	Hepatitis C virus	Transmission of HCV in HCW mainly via needlestick injuries
Nordgren, T.M., Bailey, K.L., 2016	Pulmonary health effects of agriculture	Agriculture (animal farming, crop farming, greenhouse workers, mushroom workers) Pest control worker	Lung disease (COPD, interstitial lung disease)	Organic dust	Bacterial peptidoglycan and LPS, fungal spores, grain dust, 'particulate matter'

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Nowak-Chmura, M., Siuda, K., 2012	Ticks of Poland: Review of contemporary issues and latest research	Agriculture (farmers) Border guards Forest workers Gardeners, orcharders Hunters	Lyme borreliosis, encephalitis, anaplasmosis	Tick-borne infection ( <i>Borrelia burgdorferi</i> (Lyme disease), tick-borne encephalitis virus, <i>Anaplasma phagocytophilum</i> )	Review of ticks in Poland, minor focus on occupational disease
Okoshi, K., et al., 2015	Health risks associated with exposure to surgical smoke for surgeons and operation room personnel	Healthcare workers (operating room personnel)			Review on occupational risks of surgical smoke. Potential emerging risk: concern about risk of transmission of infectious disease which may occur if bacterial or viral fragments are inhaled that are present in surgical smoke, due to the use of ultrasonic scissors, laser and electrocautery. No transfer of disease indicated or evaluated
Omland, Ø., et al., 2014	Occupational chronic obstructive pulmonary disease: A systematic literature review	Agriculture (farmers)	COPD	Organic dust Endotoxin	Review of COPD. Relevant organic dust
		Cotton textile workers	Decline in lung function	Organic dust	
Ota, E., et al., 2011	Behavioral interventions to reduce the transmission of HIV infection among sex workers and their clients in high-income countries	Sex workers	AIDS	HIV	Review of effect of behavioural interventions to reduce HIV transmission. The authors concluded that there is limited evidence from randomised controlled trials for the effectiveness of behavioural interventions to reduce the transmission of HIV infection among sex workers and their clients in high-income countries

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Author(s)/ year	Title	Occupation(s)	Disease(s)	Biological agent(s)	Remarks
Pages, F., et al., 2010	The past and present threat of vector-borne diseases in deployed troops	Military personnel (overseas work)	Malaria, Dengue fever, West Nile encephalitis, chikungunya fever, sand-fly fever, Leishmaniasis, Rift Valley fever, African tick bite fever, tick-borne spotted fevers, Ehrlichiosis, Q-fever, tularaemia, Crimean-Congo haemorrhagic fever, scrub typhus, sleeping sickness, Chagas disease	<i>Plasmodium falciparum/vivax/ovale/malariae/knowlesi</i> ; Dengue virus, West Nile virus, chikungunya virus, <i>Phlebovirus</i> , <i>Rickettsia</i> , <i>Anaplasma</i> , <i>Coxiella burnetii</i> , <i>Francisella tularensis</i> , <i>Bunyaviridae</i> , typhus, <i>Trypanosoma</i>	Publication concerns vector-borne diseases of Western armies overseas. West Nile encephalitis and chikungunya fever are reported as new potential threats
Pavio, N., Mansuy, J.-M., 2010	Hepatitis E in high-income countries	Abattoir workers Agriculture (pig breeders) Hunters Veterinarians	Hepatitis E	Hepatitis E virus	Viral hepatitis E is frequently observed in people in animal care occupations. Possible animal reservoirs are swine, wild boar, deer, rabbits, rats, mongooses, horses, cats, dogs, sheep, goats, cows, chicken and ducks
Pearson, C., et al., 2015	Exposures and health outcomes in relation to bioaerosol emissions from composting facilities: A systematic review of occupational and community studies	Composting site workers	Qualitative evidence of respiratory disease	Fungi and spores thereof ( <i>Aspergillus fumigatus</i> ), Bacteria (Actinomycetes), endotoxins (LPS, LOS), microorganism fragments	Review of health outcomes related to bioaerosol (organic dust) exposure in composting facilities. Evidence for disease is limited owing to design limitations of studies. Qualitative evidence of adverse health outcomes

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Pereira Leite, D., et al., 2014	Dermatophytosis in military in the central-west region of Brazil: Literature review	Military personnel	Dermatomycosis, tinea	Anthropophilic fungi ( <i>Epidermophyton floccosum</i> , <i>Trichophyton rubrum/tonsurans/interdigitale</i> ); zoophilic fungi ( <i>Microsporum canis</i> , <i>Trichophyton verrucosum/men-tagrophytes</i> ); geophilic fungi ( <i>Microsporum gypseum</i> )	Review of dermatophytosis in the military
Pierce, J.S., et al., 2011	Laser-generated air contaminants from medical laser applications: A state-of-the-science review of exposure characterisation health effects and control	Healthcare workers	Infection	Viruses (papillomavirus), bacteria	Presence of intact viral DNA and bacteria is demonstrated in laser-generated surgical smoke. Reportedly, virological analyses confirmed or suggested a causative link between occupational exposure to human papilloma virus (HPV) DNA in the laser plume and laryngeal papillomatosis. No epidemiologic studies have been conducted for bacterial transfer. Evidence for pathogen transmission via surgical smoke is considered inconsistent
Platt, L., et al., 2013a	Systematic review examining differences in HIV sexually transmitted infections and health-related harms between migrant and non-migrant female sex workers	Sex workers	Hepatitis, infection, genital warts AIDS	Sexually transmitted infections (chlamydia, syphilis, gonorrhoea, hepatitis B and C, <i>Treponema pallidum</i> , herpes simplex virus 2, trichomoniasis) HIV	Comparison of migrant/non-migrant sex workers on risk of HIV and STIs. Female sex workers (FSWs) in lower income countries are more at risk of HIV than migrants working in higher income countries. HIV prevalence was high among migrant FSWs from Africa in high-income countries. Migrant FSWs in all countries are at an increased risk of acute sexually transmitted infections

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Platt, L., et al., 2013b	Factors mediating HIV risk among female sex workers in Europe: A systematic review and ecological analysis	Female sex workers	AIDS, infections	HIV, syphilis, gonorrhoea	About HIV risk in FSWs in Europe. HIV in Europe remains low among FSWs who do not inject drugs (< 1 %), but STIs are high, particularly syphilis in the east and gonorrhoea. Findings show that HIV prevention interventions should be included in strategies that address the social welfare of sex workers, including access to services, experience of violence and migration. Future epidemiological and intervention studies of HIV among vulnerable populations need to better systematically delineate how micro-environmental and macroenvironmental factors combine to increase or reduce HIV/STI risk
Poon, A.N., et al., 2011	Review of HIV and other sexually transmitted infections among female sex workers in China	Sex workers	AIDS, infections	HIV, syphilis, herpes, chlamydia, gonorrhoea, trichomoniasis	Publication concerns assessment of current trends in FSWs in China. Rapid increase of sexual transmittable infections found in China. HIV prevalence remains relatively low. High prevalence of co-infections; limited relevance for the EU
Pozzetto, B., et al., 2014	Healthcare-associated hepatitis C virus infection	Healthcare workers			Healthcare workers are at risk but hepatitis C virus prevalence in HCWs is similar to the general population
Qiao, S., Li, X., Stanton, B., 2014	Social support and HIV-related risk behaviours: A systematic review of the global literature	Sex workers	AIDS	HIV	Publication concerns social support and HIV-related risk behaviours
Rezaee-Zavareh, M.S., et al., 2015	Hepatitis A virus infection, vaccination and Iranian healthcare workers	Healthcare workers	Hepatitis	Hepatitis A virus	Review of occupational risk of hepatitis A for Iranian healthcare workers. Limited relevance for the EU

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Richard, S., Oppliger, A., 2015	Zoonotic occupational diseases in forestry workers: Lyme borreliosis, tularaemia and leptospirosis in Europe	Forest workers Hunters Natural science researchers Outdoor game managers	Lyme disease, tularaemia, leptospirosis	<i>Borrelia</i> , <i>Francisella tularensis (tularaemia)</i> , <i>Leptospira</i>	Review of zoonoses associated with forestry
Rim, K.T., Lim, C.H., 2014	Biologically hazardous agents at work and efforts to protect workers' health: A review of recent reports	Animal handlers	LCM, rat bite fever, monkeypox, plague, rabies, brucellosis, cat scratch fever, Capnocytophaga infection, pasteurellosis, tularaemia, Campylobacter enteritis, influenza, Newcastle disease, psittacosis, Hendra and Nipah virus diseases, leptospirosis, Q-fever, cryptosporidiosis	Bacteria, viruses, human-transferred pathogens, organic dust Bacteria, viruses, fungi, human-transferred pathogens, organic dust	Publication provides a very extensive list of diseases related to occupations (for Korea); these also include very rare diseases such as Lassa, Ebola and Hanta. The list therefore seems to be without nuance, for which reason the relevance for the EU is questionable
	Archaeologists Construction (demolition worker) Healthcare workers Hunters Outdoor workers (wildlife biologists)	Blastomycosis, coccidioidomycosis, paracoccidioidomycosis	Organic dust		
	Building cleaning worker	Murine typhus, plague, rickettsialpox, arenavirus infection, hantavirus infection, Lassa fever, leptospirosis, lymphocytic choriomeningitis, rat bite fever	Vector in fleas or mites of rodents, organic dust		

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Rim, K.T., Lim, C.H., 2014	Biologically hazardous agents at work and efforts to protect workers' health: A review of recent reports	Agriculture (farmers)	Rat bite fever, monkey-pox, plague, rabies, brucellosis, cat scratch fever, Capnocytophaga infection, pasteurellosis, tularaemia, Campylobacter enteritis, influenza, Newcastle disease, psittacosis, Hendra and Nipah virus diseases, leptospirosis, Q-fever, echinococcosis, leptospirosis, melioidosis, naegleriasis, schistosomiasis, arenavirus infection, hantavirus infection, Lassa fever, leptospirosis, lymphocytic choriomeningitis, histoplasmosis, blastomycosis, coccidioidomycosis, paracoccidioidomycosis		Publication provides a very extensive list of diseases related to occupations (for Korea): these also include very rare diseases as Lassa, Ebola and Hanta. The list therefore seems to be without nuance, for which reason the relevance for the EU is questionable
		Caretakers (child care workers)	Hepatitis A, cryptosporidiosis	Hepatitis A virus	
		Construction workers (incl. bridge painters) Healthcare workers Maintenance workers (heating and air-conditioning workers)	Histoplasmosis		

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Rim, K.T., Lim, C.H., 2014	Biologically hazardous agents at work and efforts to protect workers' health: A review of recent reports	Construction workers Dock workers Healthcare workers Hunters Outdoor workers (wildlife biologists) Pest control workers Maintenance workers (heating and air-conditioning workers)	Arenavirus infection, hantavirus infection, Lassa fever, leptospirosis, lymphocytic choriomeningitis, rat bite fever	Organic dust	Publication provides a very extensive list of diseases related to occupations (for Korea); these also include very rare diseases such as Lassa, Ebola and Hanta. The list therefore seems to be without nuance, for which reason the relevance for the EU is questionable
		Healthcare workers/dentistry/ human transference	Adenovirus, arenavirus, Crimean-Congo haemorrhagic fever, diphtheria, Ebola/ Marburg virus, influenza, Lassa fever, measles, Meningococcus, monkeypox, mumps, Mycoplasma infection, parvovirus, pertussis, rubella, SARS, tuberculosis, varicella, AIDS, hepatitis A, B and C, West Nile virus, leptospirosis, melioidosis, naegleriasis, schistosomiasis, cryptosporidiosis, echinococcosis		
		Healthcare workers (dental care)	AIDS, Crimean-Congo haemorrhagic fever, Ebola-Marburg virus infection, hepatitis B and C, Lassa fever	Viruses	

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Rim, K.T., Lim, C.H., 2014	Biologically hazardous agents at work and efforts to protect workers' health: A review of recent reports	Healthcare workers	Zoonoses: brucellosis, influenza, Hendra and Nipah viruses, leptospirosis, Q-fever, Campylobacter infection, Newcastle disease, psittacosis, cat scratch fever, pasteurellosis, plague, rabies, tularaemia, Capnocytophaga infection, monkeypox, rat bite fever, arenavirus infection, hantavirus, Lassa fever, LCM, Omsk haemorrhagic fever, B-virus infection, anthrax, Crimean-Congo haemorrhagic fever, glanders, Rift Valley fever, <i>Streptococcus suis</i> infection, babesiosis, Colorado tick fever, ehrlichiosis, Lyme disease, Powassan virus encephalitis, relapsing fever, Rocky Mountain spotted fever, southern tick-associated rash illness, tick paralysis, murine typhus, rickettsialpox, scrub typhus	Bacteria, viruses, human-transferred pathogens, organic dust	Publication provides a very extensive list of diseases related to occupations (for Korea); these also include very rare diseases such as Lassa, Ebola and Hanta. The list therefore seems to be without nuance, for which reason the relevance for the EU is questionable

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Rim, K.T., Lim, C.H., 2014	Biologically hazardous agents at work and efforts to protect workers' health: A review of recent reports	Laboratory personnel Veterinarians	Hepatitis A, hantavirus infection, LCM, rat bite fever, B-virus infection, plague, rabies, brucellosis, cat scratch fever, Capnocytophaga infection, pasteurellosis, tularaemia, Campylobacter enteritis, influenza, Newcastle disease, psittacosis, Hendra and Nipah virus diseases, leptospirosis, Q-fever	Bacteria, viruses, human-transferred pathogens, organic dust	Publication provides a very extensive list of diseases related to occupations (for Korea); these also include very rare diseases such as Lassa, Ebola and Hanta. The list therefore seems to be without nuance, for which reason the relevance for the EU is questionable
Rizzoli, A., et al., 2011	Lyme borreliosis in Europe	Agriculture (farmers) Forest workers	Lyme disease	<i>Borrelia burgdorferi</i>	Recent surveys show that the overall prevalence of Lyme borreliosis (LB) may be stabilising, but its geographical distribution is increasing. In Europe, the annual number of LB cases is increasing in some areas, and tick vectors are expanding their range, to higher altitudes and latitudes, suggesting that LB will remain an important health concern in the coming decades, especially in light of economic, land use and climate change predictions
Rohr, A.C., et al., 2015	Potential occupational exposures and health risks associated with biomass-based power generation	Biomass power generation workers	Irritation (ocular, dermal)	Bioaerosols (fungi, bacteria)	Review of occupational risks involved with biomass power generation. Indications of potential hazards are reported for pre-combustion risks related to bioaerosols, although the authors indicate that it remains to be seen if there is a higher risk of more severe respiratory diseases

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Ross, M.W., et al., 2012	Occupational health and safety among commercial sex workers	Sex workers	AIDS, infections	HIV, sexually transferable infections	Broad review of safety among sex workers. Vaginal douching was associated with a doubled history of sexually transferable infection. There was a strong association between decreased condom use and douching, and over a third of women believed that douching could help prevent STI
Rossouw, T.M., et al., 2014	Blood-borne infections in healthcare workers in South Africa	Healthcare workers	AIDS, hepatitis	HIV, hepatitis B and C	Publication concerns review of guidelines to prevent blood-borne infections in healthcare workers, as these are at risk of HIV/Hepatitis B/C; no info. on prevalence: limited relevance
Samadi, S., Wouters, I.M., Heederik, D.J., 2013	A review of bio-aerosol exposures and associated health effects in veterinary practice	Agriculture (farmers) Veterinarians	Organic dust toxic syndrome, COPD	Organic dust, endotoxins, glucans, bacteria, viruses	Review of diseases: veterinarians and farmers. Exposure to substantial levels of inhalable dust, endotoxin, and $\beta(1\rightarrow3)$ -glucan, especially those working with farm animals such as cows and poultry as well as horses. Limited health effects, indication of increased risk of respiratory effects (organic dust toxic syndrome, COPD)
Sayed, I.M., et al., 2015	Is hepatitis E virus an emerging problem in industrialized countries?	Agriculture (pig farmers) Travellers Veterinarians	Hepatitis E virus infection	Hepatitis E virus	Full text not available; evaluation based on abstract only. Review discussing the molecular virology of HEV, mode of transmission in industrialised countries and potential implications for different specific patient populations
		General	Hepatitis E infection; chronic infection (in immunocompromised patients); accelerated liver cirrhosis and increased mortality (in case of HEV-HIV co-infection)		

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Seyfarth, F., Hipler, U.C., Elsner, P., 2010	Dermatomycoses and occupational dermatology [Pilzinfektionen der Haut als Aufgabe für die Berufsdermatologie]	Agriculture (farmers) Industrial workers and meat factories	Dermatomycoses (e.g. tinea pedis, athlete's foot, onychomycosis)	Fungi (anthropophilic dermatophytes)	Article in German, dermatomycoses as occupational diseases
		Agriculture (farmers) Drivers (all transport) Shepherds	Dermatomycoses (e.g. <i>Trichophyton verrucosum</i> infections)	Fungi (zoophilic dermatophytes (calves, <i>T. verrucosum</i> ))	
		Agriculture (farmers) Aquarists Fishers Forest workers Gardeners Hunters Mine workers Veterinarians	Dermatomycoses	Mycoses ( <i>Sporothrix schenckii</i> , <i>Madurella mycetomatis</i> , <i>Fusarium</i> sp., <i>Acremonium</i> sp., <i>Pseudallescheria boydii</i> , <i>Scedosporium</i> sp., black fungi (pathogen of chromoblastomycosis), zygomycetes, <i>Conidiobolus</i> sp., <i>Basidiobolus rana-rum</i> , <i>Lacazia loboi</i> , <i>Phytium insidiosum</i> )	
		Agriculture (ruminant farmers) Workers in fur farms	Dermatomycoses (e.g. <i>Trichophyton verrucosum</i> infections)	Fungi (zoophilic dermatophytes)	
		Development workers Emergency services (police) Military personnel	Dermatomycoses (e.g. mycetoma)	Fungi (tropical fungi)	
		Florists Gardeners Greenhouse workers	Dermatomycoses (e.g. rose breeders' disease)	Fungi (geophilic dermatophytes (e.g. <i>Sporothrix schenckii</i> (rose breeders' disease), <i>Microsporum gypseum/fulvum</i> ))	

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Author(s)/ year	Title	Occupation(s)	Disease(s)	Biological agent(s)	Remarks
Seyfarth, F., Hipler, U.C., Elsner, P., 2010	Dermatomycoses and occupational dermatology	Laboratory personnel Veterinarians	Dermatomycoses	Fungi (zoophilic dermatophytes (cats, <i>Microsporum canis</i> ) (rodents, <i>Trichophyton mentagrophyte</i> ))	Article in German, dermatomycoses as occupational diseases
Shaheen, M.A., Idrees, M., 2015	Evidence-based consensus on the diagnosis, prevention and management of hepatitis C virus disease	Healthcare workers	Hepatitis	Hepatitis C virus	Hepatitis C virus has been a serious problem in centres where haemodialysis is done
Shannon, K., et al., 2015	Global epidemiology of HIV among female sex workers: Influence of structural determinants	Sex workers	AIDS	HIV	Occupational HIV among sex workers. Concerns high-HIV areas, but also Canada
Shrosbree, J., et al., 2011	Anaesthesia and intensive care in patients with HIV	Healthcare workers	AIDS	HIV	Reviews issues related to anaesthesia and intensive care of HIV patients. The average risk of HIV transmission following accidental percutaneous (needlestick) injury involving an HIV-infected source patient is approximately 0.3 %, assuming that no post-exposure chemoprophylaxis is given to the healthcare worker. The risk with a mucous membrane exposure is approximately 0.09 %. Factors affecting the risk of transmission include the type of needle
Singh, S., et al., 2014	Revitalizing the HIV response in Pakistan: A systematic review and policy implications	Sex workers	AIDS	HIV	Publication concerns discussion on implementation of locally (Pakistan) developed and integrated HIV prevention services. Considered of limited relevance for the EU

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Author(s)/ year	Title	Occupation(s)	Disease(s)	Biological agent(s)	Remarks
Smit, L.A.M., 2012	Respiratory health effects in agricultural workers: Are some more susceptible than others?	Agriculture (farmers handling grain and animal feed) Agriculture (poultry and pig farmers)	Respiratory disease, lower forced expiratory volume (FEV)	Organic dust (endotoxin, mould spores, allergens, infectious agents)	Focus is on genetic and acquired susceptibility factors as explanation for difference in (individual) susceptibility with regard to health effects/responses, as well as gene-environment interactions
		Agriculture (pig farmers)	Annual lung function decline	Organic dust (endotoxin)	Significant association between high endotoxin exposure levels and annual decline in lung function. Negative associations between endotoxin exposure and prevalence of wheeze and a lower lung function were found in farmers carrying the CD141-260 TT allele
Smit, L.A.M., 2012	Respiratory health effects in agricultural workers: Are some more susceptible than others?	Agriculture workers	Prevalence of wheeze and a lower lung function	Organic dust (endotoxin)	Positive associations between increased endotoxin levels and prevalence of wheeze and a lower lung function in agricultural workers (only in individuals carrying the CD141-260 C allele). The interaction between endotoxin exposure and the CD14 genotype was statistically significant
Smith, D.R., Ning, W., 2010	Emerging workplace issues for Chinese healthcare workers in the new millennium: HIV/AIDS	Healthcare workers	HIV/AIDS	HIV	HIV/AIDS prevalence in Chinese healthcare workers
Stephen, R., Chersich, M., De Vlas, S.J., 2012	Periodic presumptive treatment of curable sexually transmitted infections among sex workers: Recent experience with implementation	Sex workers	STIs	<i>Neisseria gonorrhoeae</i> , <i>Chlamydia trachomatis</i> , <i>Haemophilus ducreyi</i> , HIV	Discusses pre-emptive STI treatment. Periodic presumptive treatment (PPT) reduces prevalence of STI by half. Combined PPT, condom use and other control measures may lead to rapid control of curable STIs among sex workers. Publication concerns high endemic areas: limited relevance

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Author(s)/ year	Title	Occupation(s)	Disease(s)	Biological agent(s)	Remarks
Stefani, S., et al., 2012	Methicillin-resistant <i>Staphylococcus aureus</i> (MRSA): global epidemiology and harmonisation of typing methods	Agriculture (farmers, animal handlers)	Infections of variable clinical relevance, ranging from soft tissue infections to endocarditis, pneumonia and necrotising fasciitis	MRSA	Focus on typing methods of MRSA and spread. In Europe, carriage of LA-MRSA may be common in people who have frequent contact with livestock, although associated illness is rare. Although endemic in hospitals worldwide, MRSA is prevalent in only certain high-risk groups of workers in direct contact with live animals
Stewardson, A.J., Grayson, M.L., 2010	Psittacosis	Agriculture (poultry industry) Pet shop workers (bird related) Veterinarians	Psittacosis	Bacteria ( <i>Chlamydophila psittaci</i> )	Transmission via birds
Szczyrek, M., et al., 2011	Chronic obstructive pulmonary disease in farmers and agricultural workers: An overview	Agriculture (livestock farmers)	COPD	Organic dust	Review of COPD, particularly in agricultural workers
Thomas, P.A., Kalliamurthy, J., 2013	Mycotic keratitis: Epidemiology diagnosis and management	Outdoor workers	Mycotic keratitis (cornea infection)	Filamentous fungi ( <i>Fusarium</i> , <i>Aspergillus</i> , <i>Phaeohyphomycetes</i> and <i>Scedosporium apiospermum</i> are frequent causes); yeast-like fungi ( <i>Candida albicans</i> and other <i>Candida</i> species)	Review of mycotic keratitis: minimal occupational context ('outdoor workers'). Trauma is usually the sole predisposing factor for filamentous fungi related mycotic keratitis
Tortorano, A.M., et al., 2015	Primary cutaneous coccidioidomycosis in an Italian nun working in South America and review of published literature	Laboratory personnel	Primary cutaneous coccidioidomycosis	<i>Coccidioides</i>	Reports of coccidioidomycosis in laboratory workers upon accidental inoculation

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Author(s)/ year	Title	Occupation(s)	Disease(s)	Biological agent(s)	Remarks
Trajman, A., Menziés, D., 2010	Occupational respiratory infections	Agriculture (poultry and pig farmers) Healthcare workers	Tuberculosis, influenza, SARS	<i>Mycobacterium tuberculosis</i> , influenza (H5N1, H7N1, H7N7, H1N1), coronavirus A	Focus is on preventive measures, such as use of personal protective equipment and vaccination
Traxler, R.M., et al., 2013	A literature review of laboratory-acquired brucellosis	Laboratory personnel (microbiologists, clinical laboratory staff)	Brucellosis	<i>Brucella melitensis</i>	Review of laboratory-acquired brucellosis. Brucellosis symptoms include undulant fever, myalgia, arthralgia, night sweats and malaise. <i>Brucella</i> sp. infections can lead to spontaneous abortions and intrauterine foetal death in pregnant women
Trevisan, A., Nicolli, A., Chiara, F., 2015	Hepatitis B: Prevention protection and occupational risk	Healthcare workers	Hepatitis, AIDS	Hepatitis B and C virus, HIV	Review of occupational risk of hepatitis B for healthcare workers. Seroconversion after needlestick or sharp injuries contaminated with an infected source is 10-30 % for HBV, 4-10 % for HCV and 0.1-0.3 % for HIV. HBV seroconversion is high (approximately 30%) if the source patient is Hbe antigen (HbeAg) positive, though it is less than 6 % if the source is HBs antigen (HbsAg) positive

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Author(s)/ year	Title	Occupation(s)	Disease(s)	Biological agent(s)	Remarks
Tsapko, V.G., et al., 2011	Exposure to bioaerosols in the selected agricultural facilities of the Ukraine and Poland: A review	Agriculture workers	Infectious, toxic, carcinogenic effects	Organic dust (bacteria, fungi)	Review 1972-2009 on bioaerosols in agricultural facilities in Ukraine and Poland (cows and pig farms, animal feed facilities, production of biofuel from rape, herb farms and herb-processing facilities). Concentrations of dust and microorganisms in the air, bacterial endotoxin and species composition of microflora were evaluated. The respective MAC values for dust, microorganisms and endotoxins were exceeded in most cases. It was concluded that large concentrations of dust and a wide spectrum of microorganisms in the working environment show infectious, allergenic, toxic and carcinogenic effects which may be a cause of work-related diseases in the exposed agricultural workers. No trend in exposure over the investigated period is provided
Tso, D.K., Athreya, S., 2013	Reducing blood-borne exposure in interventional radiology: What the IR should know	Healthcare workers (radiologists)	Hepatitis, AIDS	Hepatitis B and C virus, HIV	Publication concerns safety measures to prevent HIV/HBV/HCV. The US reported that 12,000 HCWs acquire HBV infections on the job each year. Transfer via injuries reported for HBV (2-40%), HCV (2.7-10%) and HIV (0.3%)
Ulger, F., et al., 2015	Are healthcare workers' mobile phones a potential source of nosocomial infections? Review of the literature.	Healthcare workers			Publication concerns potential transfer of microorganisms on mobile phones of healthcare workers and patients. Presence of pathogenic microorganisms on mobile phones is demonstrated but no evidence was found for a direct relationship of healthcare-associated infections

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Author(s)/ year	Title	Occupation(s)	Disease(s)	Biological agent(s)	Remarks
Upapan, P., 2015	Human <i>Erysipelothrix rhusiopathiae</i> infection: Unsolved issues and possible solutions	Work-related contact with animals	<i>Erysipelothrix rhusiopathiae</i> infection	Bacteria ( <i>Erysipelothrix rhusiopathiae</i> )	Full text not available; evaluation based on abstract only. Review attempts to address the unsolved issues related to human <i>Erysipelothrix</i> infection and suggest possible solutions
Utsumi, M., et al., 2010	Types of infectious outbreaks and their impact in elderly care facilities: A review of the literature	Healthcare workers	Infection	<i>Chlamydomphila pneumoniae</i> , norovirus, scabies, giardiasis, rotavirus, <i>Bacillus cereus</i> , <i>Cryptosporidium parvum</i> and varicella zoster virus	Publication concerns review of outbreaks of diseases in elderly care facilities. HCW high attack rates: <i>Chlamydomphila pneumoniae</i> (41%), noroviruses (42%) and scabies (36%). HCW medium attack rates: giardiasis (40%), rotavirus (29%), <i>B. cereus</i> (24%), <i>Cryptosporidium parvum</i> (10%) and varicella zoster virus (1%)
Vun, M.C., et al., 2014	Achieving universal access and moving towards elimination of new HIV infections in Cambodia	Sex workers	AIDS	HIV	Publication covers evaluation of HIV prevention programme in Cambodia, not specifically the relation between HIV and occupation. Steady decline of HIV positives is observed. Considered of limited relevance
Walser, S.M., et al., 2015	Evaluation of exposure-response relationships for health effects of microbial bioaerosols: A systematic review	Agriculture (farmers, poultry workers and spouses)	Decrease in lung function parameters	Bacteria, fungi ( <i>Aspergillus</i> , <i>Penicillium</i> )	Review of health effects of microbial bioaerosol exposure; focus is on exposure-response relationship
		Education (teachers)	Nasal inflammation	Bacteria	
		Waste/composting workers	Decrease in lung function parameters	Fungi ( <i>Aspergillus fumigatus</i> )	
		Woodworkers (wood trimmers, joinery workers, sawmill/chip mill workers, green/dry mill workers)	Decrease in lung function parameters	Mould spores, Gram-negative bacteria	

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Wang, Q., Chang, B.J., Riley, T.V., 2010	<i>Erysipelothrix rhusiopathiae</i>	Abattoir workers Agriculture (farmers, poultry processing workers, animal caretakers, game handlers, stockyard workers) Bone button makers Butchers Fertiliser workers Fish industry (fishers, fish-handlers) Furriers Laboratory personnel (animal caretakers, bacteriology laboratory workers) Leather worker Meat processing (meat cutters, meat processors, meat inspectors)	Erysipeloid	Bacteria ( <i>Erysipelothrix rhusiopathiae</i> )	Infection due to <i>Erysipelothrix rhusiopathiae</i> (a facultative, non-spore-forming, non-acid-fast, small, Gram-positive bacillus) in humans is occupationally related, principally occurring as a result of contact with contaminated animals, their products or wastes, or soil. Erysipeloid is the most common form of infection in humans. Some other names have been used to describe this infection, including whale finger, seal finger, speck finger, blubber finger, fish poisoning, fish handler's disease and pork finger
Wang, Q., Chang, B.J., Riley, T.V., 2010	<i>Erysipelothrix rhusiopathiae</i>	Sewage workers Soap makers Veterinarians	Erysipeloid	Bacteria ( <i>Erysipelothrix rhusiopathiae</i> )	

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Wariki, W.M., et al., 2012	Behavioral interventions to reduce the transmission of HIV infection among sex workers and their clients in low- and middle-income countries	Sex workers	AIDS	HIV	Publication concerns review behavioural interventions to reduce HIV transmission in low- and middle-income countries. No focus on EU: limited relevance
Wéry, N., 2014	Bioaerosols from composting facilities: A review	Composting site workers	Cough, dyspnoea, eye irritation	Organic dust (bacteria, fungi, endotoxin, beta-glucans)	Review on bioaerosols on composting sites
Wild, C., Dellinger, J., 2013	Universal HIV testing in health-care settings: international guideline recommendations and actual occupational risks of HIV infections for healthcare workers [HIV-Testung an der Allgemeinbevölkerung: internationale Empfehlungen und reale Risiken für HIV-Infektionen für Gesundheitsberufe]	Healthcare workers	HIV infections	HIV	Article in German. International guidelines recommend universal screening for HIV in healthcare settings only when the undiagnosed prevalence of HIV is > 0.1 %, or the diagnosed prevalence is > 0.2 %. In Austria there have been four cases of occupational HIV infection in 15 years of documentation. There is no convincing evidence that knowledge of the serostatus of a patient leads to changes in the behaviour of healthcare workers. For low-prevalence countries, such as Austria, a rather focused testing strategy is recommended
Wilhelm, B.J., et al., 2011	A systematic review/meta-analysis of primary research investigating swine pork or pork products as a source of zoonotic hepatitis E virus	Agriculture (pig workers)	Hepatitis	Hepatitis E	Review of swine-originated zoonotic hepatitis E

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Author(s)/ year	Title	Occupation(s)	Disease(s)	Biological agent(s)	Remarks
Wilson, D., 2015	HIV programs for sex workers: Lessons and challenges for developing and delivering programs	Sex workers	AIDS	HIV	Paper focuses on relevance of HIV prevention programmes, not occupational transfer of virus
Wong, S.S.Y., Wong, S.C.Y., 2015	Ebola virus disease in nonendemic countries	Healthcare workers Laboratory personnel	Haemorrhagic shock, death	Ebola, Marburg virus	Review of Ebola infections in healthcare workers among others
Younai, F.S., 2010	Healthcare-associated transmission of hepatitis B & C viruses in dental care (dentistry)	Healthcare workers (dental care)	Hepatitis B and C	Hepatitis B virus, hepatitis C virus	The dental environment is associated with significant risk of HBV transmission and to a lesser degree HCV exposure and infection
Zandi, M., Alavian, S.-M., Bagheri-Lankarani, K., 2011	Hepatitis B prevention for the nurses: A review article	Healthcare workers	Hepatitis	Hepatitis B virus	Review of hepatitis B. Vulnerable group: nurses in training
Zhang, L., et al., 2015	A systematic review and meta-analysis of the prevalence trends and geographical distribution of HIV among Chinese female sex workers (2000-2011): Implications for preventing sexually transmitted HIV	Sex workers	AIDS	HIV	Authors indicate a decline in HIV infections (China)

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Author(s)/ year	Title	Occupation(s)	Disease(s)	Biological agent(s)	Remarks
Zukiewicz-Sobczak, W.A., et al., 2013b	Farmers occupational diseases of allergenic and zoonotic origin	Agriculture workers	Lyme disease, tick-borne encephalitis virus disease, tularaemia	Tick-borne infections	Review of agricultural occupational diseases. In 2010, the most common occupational diseases were (allergic) pneumoconioses (26.9 % of all occupational diseases) and infectious and parasitic diseases (24.9 %). The incidence of occupational diseases was 418.5 per 100,000 workers among agricultural workers and foresters. Infectious and parasitic diseases prevailed among the most commonly recognised diseases (92.4 %), and Lyme disease was the most common among them (96.7 %)
<b>Studies considered not of relevance (for the EU)</b>					
Ahmed, A., Al-Mekhlafi, H.M., Surin, J., 2011	Epidemiology of soil-transmitted helminthiases in Malaysia				Publication concerns helminth infections in Malaysia primarily related to children. Not of relevance for the EU; no occupational relation
Alavi, S.M., Mottagh, M.E., 2012	A review of epidemiology diagnosis and management of brucellosis for general physicians working in the Iranian health network	Agriculture (animal handlers) Education (biology teachers) General physicians Healthcare workers Laboratory personnel Veterinarians	Brucellosis	<i>Brucella (B. abortus, B. melitensis, B. suis, B. canis)</i>	Publication concerns recommendations to prevent infection. Iran is concerned whereas brucellosis is mentioned as rare in industrialised countries. Not relevant for the EU

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Author(s)/ year	Title	Occupation(s)	Disease(s)	Biological agent(s)	Remarks
Alavi, S.M., Sarmast Shushtari, M.H., 2013	HIV/AIDS among injecting drug users: A review on epidemiology and management of occupational exposure in Iranian health network setting	Healthcare workers Sex workers	AIDS	HIV	Publication concerns evaluation of preventive strategy and efficacy of post-exposure anti-viral therapy for general physicians when treating injecting drug users in Iran. No specific occupation-disease info. available (apart from HIV), whereas Iran is of limited relevance for the EU: not considered of relevance
Bajpai, S., Nadkar, M.Y., 2011	Crimean Congo hemorrhagic fever: Requires vigilance and not panic	Abattoir workers, livestock and agricultural industry, veterinarians	Crimean-Congo haemorrhagic fever	Nairovirus	Review of tick-borne Crimean-Congo haemorrhagic fever virus. Occupations only mentioned once, no detail
Barber, T.J., Benn, P.D., 2010	Postexposure prophylaxis for HIV following sexual exposure				Publication concerns review of current practice around prophylaxis prescription after sexual HIV exposure. Generic information, not specifically occupational related. Not relevant
Bauer, S., Kantayya, V.S., 2010	Improving access to primary care and health outcomes in migrant farm worker populations: Challenges and opportunities	Farm workers (migrants)			Not relevant, since no reference to occupational exposure to biological agents and related health effects
Bhat, M., et al., 2012	Hepatitis B and the infected healthcare worker: Public safety at what cost?	Healthcare workers			Publication concerns overview of the literature regarding transmission of HBV from the healthcare worker to the patient: not relevant
Bhumiratana, A., et al., 2013	Malaria-associated rubber plantations in Thailand	Rubber plantation workers			Biological agents (i.e. malaria) in rubber plantations are not of relevance for the EU

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Blais Le-cours, P., et al., 2014	Archaea in bioaerosols in dairy farms, poultry houses and wastewater treatment plants and their role in lung inflammation	Agriculture (dairy, poultry)	Lung disease	Organic dust (bacteria, endotoxins)	Allergen-related publication, evaluated separately
Blasi, F., et al., 2012	Compliance with anti-H1N1 vaccine among healthcare workers and general population				Publication concerns vaccination compliance and strategies to improve vaccination acceptance. No occupation-disease relation: not relevant
Bobinski, M.A., 2010	Healthcare-associated hepatitis B and C viruses: Legal aspects	Healthcare workers	Hepatitis B and C	Hepatitis B and C virus	Not relevant, since the focus of this article is on the law. It gives an overview of the relevant sources of the law, and then explores legal duties and liability arising from occupational risks to healthcare providers and healthcare-associated risks to patients and other parties
Bosan, A., et al., 2010	A review of hepatitis viral infections in Pakistan	Army recruits	Hepatitis B and C	Hepatitis B and C virus	Not relevant, since the prevalence of hepatitis infections is not directly relevant for Europe. The healthy individuals who were screened prior to their induction into the armed forces showed HBV prevalence ranging from 3 % to 7.3 % and HCV from 2.2 % to 5.2 %
Bosan, A., et al., 2010	A review of hepatitis viral infections in Pakistan	Female sex workers	Hepatitis B and C	Hepatitis B and C virus	Not relevant, since the prevalence of hepatitis infections is not directly relevant for Europe. HBV infection was found in 12 % of the commercial sex workers (women), prevalence of HCV 15.5 %

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		Healthcare workers			The prevalence of HBV in healthcare workers ranged from 2.4 % to 20 %. Highest prevalence was seen in dentists (17 %) and sweepers (20 %). The HCV prevalence ranged from 4 to 10 % with highest positivity of HCV (10 %) in healthcare workers who reported needlestick injuries while working
Broughton, A., Verger, C., Goffin, E., 2010	Pets-related peritonitis in peritoneal dialysis: Companion animals or Trojan horses?				Review of infection risk of patients with peritoneal dialysis owning pets or working with animals. Infections upon peritoneal dialysis occur regularly (0.54 % of dialysis episodes), with 0.03 % related to zoonotic microorganisms. No discrimination between pet ownership, contact with animals outside occupation and occupation-related contact with animals. Not relevant
Bunyan, D., et al., 2013	Respiratory and facial protection: A critical review of recent literature	Healthcare workers			Publication concerns a review of respiratory and facial protection equipment by healthcare workers. Not of relevance
Burnett, R.J., et al., 2012	An update after 16 years of hepatitis B vaccination in South Africa	Healthcare workers			Publication concerns effect of HBV vaccination in South Africa. Not relevant for the EU
Chakrabarti, A., Singh, R., 2011	The emerging epidemiology of mould infections in developing countries				All cases mentioned are related to developing countries. Not of relevance for the EU
Charbotel, B., Fervers, B., Droz, J.P., 2014	Occupational exposures in rare cancers: A critical review of the literature				Review of various cancers and associated occupational exposures. No biological agents indicated, but toxins generated by biological agents, e.g. aflatoxin.

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Chersich, M.F., et al., 2013	Priority interventions to reduce HIV transmission in sex work settings in sub-Saharan Africa and delivery of these services	Sex workers			Publication concerns interventions for reducing HIV transmission among female sex workers in sub-Saharan Africa. Not relevant
Colombo, A.L., et al., 2011	Epidemiology of endemic systemic fungal infections in Latin America	Agriculture (coffee, cotton, tobacco)	Paracoccidioidomycosis, Histoplasmosis, Coccidioidomycosis (lung infections)	Fungi ( <i>Paracoccidioides brasiliensis</i> , <i>Histoplasma capsulatum</i> , <i>Coccidioides</i> )	Publication concerns review of endemic mycosis in Latin America and concluded that new strategies into the healthcare system are needed for early diagnosis and prevention of such conditions in endemic areas. Most infections are reportedly endemic rather than work related. Moreover, <i>Paracoccidioides brasiliensis</i> and <i>Coccidioides</i> are specific to the (Latin) American region. Not of relevance for the EU
Crivellaro, M., et al., 2012	Immunological treatments for occupational allergy				Allergen-related publication, evaluated separately
D'Amelio, E., et al., 2015	Historical evolution of human anthrax from occupational disease to potentially global threat as bioweapon				Overview of history and use as biological weapon for anthrax. Currently rare in occupational context
Dahiya, N., Atreya, C.D., 2014	MicroRNAs and major blood-borne infectious viral diseases		Blood-borne infectious viral diseases	Viruses	Full text not available; evaluation based on abstract only. No direct link to occupational context, main focus on diagnostics and therapeutics
Dellagostin, O.A., et al., 2011	Recombinant vaccines against leptospirosis		Leptospirosis	<i>Leptospira</i>	Publication concerns evaluation of recombinant vaccines to leptospirosis. No occupations indicated. Not relevant

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Diel, R., Lampenius, N., Nienhaus, A., 2015	Cost effectiveness of preventive treatment for tuberculosis in special high-risk populations		Tuberculosis	<i>Mycobacterium tuberculosis</i>	Full text not available; evaluation based on abstract only
Dolan, G.P., et al., 2013	Vaccination of healthcare workers to protect patients at increased risk of acute respiratory disease: Summary of a systematic review				Publication concerns assessment if vaccination of HCWs provides indirect protection for those patients. Does not concern occupational disease. Not relevant. Most at risk of severe or complicated acute respiratory infection
Dorevitch, S., et al., 2010	Occupational needlestick injuries in a US airport	Airport workers			Not relevant; 14 needlestick injuries over a period of 6 years were observed among the personnel of a large US airport, but no cases of hepatitis B, hepatitis C or HIV seroconversion were documented
Duarte, S.C., Pena, A., Lino, C.M., 2011	Human ochratoxin A biomarkers: From exposure to effect		Nephrotoxicity	Ochratoxin A	Publication concerns biomarkers for ochratoxin A exposure. No reference to occupational exposure. Toxin is present in food and feed
Duchaine, C., et al., 2012	Workers exposed to metalworking fluids (MWF): Evaluation of bioaerosol exposure and effects on respiratory and skin health				Respiratory problems are observed in machinists working with soluble cutting fluids. Endotoxins, inhalable dust and microorganisms in the air are evaluated. No evidence of respiratory and/or skin pathology attributable to the work environment was found. Not relevant

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Author(s)/ year	Title	Occupation(s)	Disease(s)	Biological agent(s)	Remarks
EU-OSHA, 2008	Occupational skin diseases and dermal exposure in the European Union (EU-25): Policy and practice overview	Brewers, vine growers and wine merchants Cooks, restaurateurs, waiters, hotel keepers, café owners Food handlers, butchers, delicatessen dealers, bakers, pastry makers, grocers, cheesemakers and cheesemongers, fishmongers Cleaners, domestic help	Allergic contact eczemas	Animal and vegetable proteins, enzymes (detergents, flour), $\alpha$ -amylase, rye, flour, gloves and other rubber articles	Biological agents, such as bacteria, viruses, fungi causing mycoses (for example among masons and tilers), yeasts and parasites can cause various infections. These can include zoonotic diseases that affect professionals who have contact with animals
		Cooks, restaurateurs, waiters, hotel keepers, café owners Food handlers, butchers, delicatessen dealers, bakers, pastry makers, grocers, cheesemakers and cheesemongers, fishmongers	Contact urticarias	Marine products, enzymes, proteins (meat)	
		Construction workers (bricklayers, tilers, carpenters, concreters)	Allergic contact eczemas: 'cement disease'	Rubber gloves and boots (natural, latex)	
		Healthcare workers (dental care) Veterinary surgeons	Allergies (contact urticaria (immediate hypersensitivity); contact eczema (delayed hypersensitivity))	Vegetable proteins powdered latex (Para rubber tree: natural rubber)	

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EU-OSHA, 2008	Occupational skin diseases and dermal exposure in the European Union (EU-25): Policy and practice overview	Healthcare workers (dental care) Veterinary surgeons	Allergies to the constituents of synthetic and natural rubber (allergic contact eczemas)	Rubber gloves (natural)	Biological agents, such as bacteria, viruses, fungi causing mycoses (for example among masons and tilers), yeasts and parasites can cause various infections. These can include zoonotic diseases that affect professionals who have contact with animals
EU-OSHA, 2009	Expert forecast on emerging chemical risks related to occupational safety and health	Waste treatment (collection, reception, sorting, recycling of materials, biological treatment of organic material (e.g. composting), thermal treatment (including incineration with energy recovery), landfill		Bioaerosols	Waste treatment identified as 'emerging risk' owing to exposure to various substances among which organic dust/bioaerosols. The health effects depend on the type of waste and substances. While it is not possible to completely eliminate the risks inherent to waste-related activities, the most efficient prevention measure is to reduce the generation of dust, bioaerosols and VOCs in the workplace
Erlwein, O., McClure, M.O., 2010	Progress and prospects: Foamy virus vectors enter a new age				A review of foamy virus in for clinical exploitation (use as a vector). The virus does not cause a disease in humans. Not relevant
Eurostat, 2010	Health and Safety at Work in Europe (1999-2007): A statistical portrait				Not relevant, since no specific occupations, exposures and/or health effects are mentioned
Farr, A.C., Wilson, D.P., 2010	An HIV epidemic is ready to emerge in the Philippines		HIV/AIDS	HIV	Not relevant: not work related; focus on the status of HIV/AIDS prevalence in the Philippines
Francesconi, V.A., et al., 2014	Lobomycosis: epidemiology, clinical presentation, and management options	Bushmen Foresters Miners Rubber tappers	Subcutaneous mycosis	<i>Lacazia loboi</i> fungus	Review on forest fungi. Distribution almost exclusive to South America (high prevalence in Amazon basin). Not relevant for the EU

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Author(s)/ year	Title	Occupation(s)	Disease(s)	Biological agent(s)	Remarks
Freshwater, D.A., 2013a	Hepatitis E: The forgotten virus		Hepatitis	Hepatitis E	Hepatitis E is spread via contaminated food and water, and prevalence is high in Afghanistan (28.5 %) but also endemic in UK. Publication does not link occupation with infection/disease (apart from historical context). As no relation to occupation is concerned, not relevant
Fyumagwa, R.D., et al., 2011	Response to Rift Valley fever in Tanzania: Challenges and opportunities	Animal farmers, healthcare workers	Rift Valley fever	<i>Phlebovirus</i>	Rift Valley fever not related to EU countries
Gabrio, T., Weidner, U., 2010	Occurrence, health and allergological relevance of mould from point of view of environmental and occupational medicine indoor hygiene and epidemiology [Vorkommen und gesundheitliche / allergologische Relevanz von Schimmelpilzen aus der Sicht der Umweltmedizin]		Allergic skin and respiratory diseases	Moulds ( <i>Penicillium chrysogenum</i> m1, <i>Cladosporium herbarum</i> m2, <i>Aspergillus fumigatus</i> m3 and <i>Alternaria alternata</i> m6)	Article in German; not relevant, since the focus is on allergenic health effects (already included in 'Allergens')

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Author(s)/ year	Title	Occupation(s)	Disease(s)	Biological agent(s)	Remarks
Gangneux, J.-P., et al. 2012	Quantitative assessment of fungal risk in the case of construction works in health-care establishments: Proposed indicators for the determination of the impact of management precautions on the risk of fungal infection [Appréciation quantitative du risque fongique en cas de travaux en établissements de santé: Propositions d'indicateurs d'impact des mesures de gestion du risque infectieux fongique]	Healthcare workers	Fungal infection (for instance aspergillosis)	Fungi	Article in French; not relevant, since the focus is not directly work related (exposure and/or health effects). Article proposes an approach to control exposure to airborne fungal spores when construction works are planned in healthcare establishments, based on the characterisation of the environmental fungal risk and risk management methods
Garg, S.K., Mittal, S., Kaur, P., 2012	Dental unit waterline management: Historical perspectives and current trends	Healthcare workers (dental care)			Publication concerns prevention of microorganisms from waterline in dental instruments rather than disease relations. Not relevant

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Author(s)/ year	Title	Occupation(s)	Disease(s)	Biological agent(s)	Remarks
Ghosh, B., Lal, H., Srivastava, A., 2015	Review of bioaerosols in indoor environment with special reference to sampling, analysis and control mechanisms				Analytical paper. No occupational disease relation indicated. Not relevant
Godbert, B., Wissler, M.-P., Vignaud, J.-M., 2013	Desquamative interstitial pneumonia: An analytic review with an emphasis on aetiology				No occupational and/or biological agent relation indicated: not relevant
Harb, A.C., et al., 2015	Safety engineered injection devices for intramuscular, subcutaneous and intradermal injections in healthcare delivery settings: A systematic review and meta-analysis	Healthcare workers			Publication reports effect of sharps injuries between safety and other devices. No firm conclusions drawn, resulting in management advice only. No information on disease transfer included.
Hersi, M., et al., 2015	Effectiveness of personal protective equipment for healthcare workers caring for patients with filovirus disease: A rapid review	Healthcare workers			Evaluation of personal protective equipment for filoviridae (Ebola/Marburg virus). Authors concluded that there is insufficient evidence to draw conclusions. Not relevant

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Author(s)/ year	Title	Occupation(s)	Disease(s)	Biological agent(s)	Remarks
Holmberg, S.D., Suryaprasad, A., Ward, J.W., 2012	Updated CDC recommendations for the management of hepatitis B virus-infected health-care providers and students				Recommendations for the management of hepatitis B. Not relevant. Virus-infected healthcare providers and students to reduce transfer to patients
Hong, Y., Poon, A.N., Zhang, C., 2011	HIV/STI prevention interventions targeting FSWs in China: A systematic literature review	Sex workers	AIDS, infections	HIV/STIs	Review of prevention interventions for STIs in Chinese FSWs. Knowledge education and condom promotion is typical of intervention approach. Significant intervention effects were reported in most studies, although STI rates showed mixed results, some even reporting increased STIs despite higher condom use. Not relevant for the EU
Jadhav, P.B., Dabhade, M.P., Girish, K., 2013	Superbugs: Challenge to medicinal chemistry				Publication concerns general public, not occupational-related diseases
Janda, J.M., Abbott, S.L., 2014	The genus <i>Shewanella</i> : From the briny depths below to human pathogen				Review of <i>Shewanella</i> , a marine bacterium. No relation with occupation
Janša, V., et al., 2014	Impact of working place on reproduction [Vpliv delovnega mesta na reprodukcijo]	Not specified	Reproduction (fertility, pregnancy and birth)	Biological factors	Not included in review because full text is in Slovakian. Not direct link to occupational context. Focus is on pregnant women as vulnerable group that deserves special attention in terms of occupational safety, as the work environment can affect fertility, pregnancy and birth

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Author(s)/ year	Title	Occupation(s)	Disease(s)	Biological agent(s)	Remarks
Jayanthi, P., et al., 2013	Prion diseases in humans: Oral and dental implications	Healthcare workers (dental care)			There is no risk of transmission of TSE to healthcare workers including medical doctors and dentists through clinical contact or non-invasive clinical investigative procedure
Jeebhay, M.F., Cartier, A., 2010	Seafood workers and respiratory disease: An update	Seafood processing (crab)			Allergy related
Jenkins, E.J., et al., 2013	Tradition and transition: Parasitic zoonoses of people and animals in Alaska, northern Canada, and Greenland				Publication concerns generic overview of some zoonosis without specific occupational context. Not relevant
Jennissen, C., et al., 2011	Unintentional needlestick injuries in livestock production: A case series and review	Agriculture (farmers)			NSI with related disease is rather rare (nine cases over 6 years)
Jones, M., 2015	Laboratory animal allergy in the modern era				Allergen-related publication, evaluated separately

<p>Kampen, V. van, et al., 2012</p>	<p>Occupational sensitisers: Labelling and regulation [Sensibilisierende Arbeitsstoffe: Wie werden sie gekennzeichnet und wie werden Tätigkeiten mit ihnen geregelt?]</p>	<p>Not specified</p>	<p>Sensitisation (respiratory or skin), allergic health effects</p>	<p>Not specified</p>	<p>Article in German. Limited relevance, since not directly work related (exposure and/or health effects); focus is on regulation of sensitising substances in Germany, with reference to 'tolerance values' for biological agents (although no list is included). The classification of chemical substances as a sensitiser has been regulated in EU Directive 67/548/EEC transposed in Germany in the Ordinance on Hazardous Substances (GefStoffV) or the Ordinance for biological agents (BioStoffV). Technical Rules for Biological Agents (TRBA) are set out by the Committee for Biological Agents (ABAS). The term 'biological agent' covers microorganisms, cell cultures and human pathogenic endoparasites, and thus the sensitising effects of moulds and bacteria (including Actinomycetes) fall within the scope of the TRBA; those of, for example, enzymes, even if they are from the same microorganisms, fall within the scope of the Technical Rules for Hazardous Substances (TRGS). Animals, including mites (except endoparasites), plants and pollens, organic dust (e.g. wood dust, animal feed dust and cornmeal dust) and other products of vegetable or animal origin (e.g. animal hair and feathers) are not considered biological agents. Relevant rules are TRBA/TRGS 406 (Sensitising substances for the respiratory system), TRGS 401 (Risk of skin contact — determination, evaluation, measures), TRGS 907 (List of sensitising substances), TRBA 460 (Classification of fungi in risk groups) and TRBA 464 (Classification of parasites in risk groups). The 'Senate committee to examine the health effects of working material' (MAK Commission) proposes biological tolerance values (BAT values), a list published on an</p>
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					annual basis, with distinction between 'sensitising in the respiratory tract' (Sa) and 'sensitising on the skin' (Sh). High quality substance- and activity-related information, as well as risk assessment, is necessary for use at the workplace. Keep in mind that use of small quantities of sensitising substances (< 1 % by weight) in preparations usually does not need to be declared
Kampf, G., Löffler, H., 2010	Hand disinfection in hospitals: Benefits and risks [Händedesinfektion im Krankenhaus — Nutzen und Risiken]	Healthcare workers	Nosocomial infections	<i>Staphylococcus aureus</i> , <i>Pseudomonas</i> spp., <i>Escherichia coli</i> , yeasts including <i>Candida</i> spp., rotavirus, <i>Clostridium difficile</i>	Not relevant, since the focus is on worker-to-patient transmission of these diseases and ways to prevent this by washing hands or hand disinfection
Khajuria, A., et al., 2013	What about the surgeon?	Operating room personnel			Publication concerns strategies to prevent transfer of diseases from patient to surgeons. No actual information on risk of transfer of diseases
Khan, S., Attaullah, S., 2011	Share of Afghanistan populace in hepatitis B and hepatitis C infections pool: Is it worthwhile?	Sex workers (female)	Hepatitis B and C virus (HBV and HCV) infection	Hepatitis B and C virus	The prevalence rate of HCV was 1.92 % and HBV was 6.54 %. Sexual transmission of infection is more frequent among groups engaging in high-risk sexual behaviours such as working as a prostitute

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Kortepeter, M.G., et al., 2010	Healthcare workers and researchers traveling to developing-world clinical settings: Disease transmission risk and mitigation	Healthcare workers Researchers	Disease risk		Not relevant, since this article describes the risks (potential diseases that could be caught) by travelling to developing countries to work in hospitals but does not present the actual occurrence of these diseases among this group. This review provides practical advice for this special population of travellers (healthcare workers and researchers travelling to developing-world clinical settings), targeted to specific healthcare-related risks (needlestick, haemorrhagic fever viruses, severe viral respiratory disease, and tuberculosis), with suggestions for risk mitigation
Kroon, E.G., et al., 2011	Zoonotic Brazilian Vaccinia virus: From field to therapy	Agriculture (animal handlers, dairy farmers)			Vaccinia virus is related to handling dairy cattle in Brazil. Not of relevance for the EU
La Rosa, G., et al., 2013	Viral infections acquired indoors through airborne droplet or contact transmission				Publication concerns a generic overview of virus spread without clear focus on occupation. Conclusion is that more work is needed to get a clearer picture. Not relevant
Laheij, A.M.G.A., et al., 2012	Healthcare-associated viral and bacterial infections in dentistry	Healthcare workers (dental care)			No evidence for occupational infection; risk of infection is concluded to be low. Publication concerns cross-contamination for which it is not specified if it concerns HCW or not. Therefore, not relevant
Lavoie, M.-C., Verbeek, J.H., Pahwa, M., 2014	Devices for preventing percutaneous exposure injuries caused by needles in healthcare personnel	Healthcare workers			Publication concerns risk of needlestick injury, not disease transmission. Effectiveness of devices concerned not proven

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Author(s)/ year	Title	Occupation(s)	Disease(s)	Biological agent(s)	Remarks
Lemiere, C., et al., 2012	Occupational asthma: New deleterious agents at the workplace				Allergen-related publication, evaluated separately
Liebers, V., Brüning, T., Raulf, M., 2015	Molecular patterns and immune system — PAMPs MAMPs; DAMPs: Relevance for allergy and occupational airway diseases [Molekulare Muster und Immunsystem — PAMPs, MAMPs, DAMPs: Was ist relevant für Allergien und (berufliche) Atemwegserkrankungen?]			Bioaerosols (airborne particles and microorganisms as well as their constituents and allergen components of dust)	Article in German. Focus is on immune system and/or analysis. Refers to relation between bioaerosols and farming, etc. Allergy-related publication, evaluated separately
Lupton, K., 2015	Preparing nurses to work in Ebola treatment centres in Sierra Leone	Healthcare workers			Publication to inform international healthcare workers on the relative risk of deployment in West Africa (related to Ebola): not of relevance for the EU
MacAllister, J., et al., 2015	A comprehensive review of available epidemiologic and HIV service data for female sex workers, men who have sex with men, and people who inject drugs in select West and Central African countries	Sex workers	AIDS	HIV	No (clear) discrimination between occupational and non-occupational transfer. Africa: questionable relevance for the EU. Not of relevance

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Author(s)/ year	Title	Occupation(s)	Disease(s)	Biological agent(s)	Remarks
Maltezou, H.C., Tsakris, A., 2011	Vaccination of healthcare workers against influenza: Our obligation to protect patients	Healthcare workers			Publication concerns healthcare worker-to-patient transmission
Mani, A., Shubangi, A.M., Saini, R., 2010	Hand hygiene among healthcare workers	Healthcare workers			Not relevant, since the focus is on the prevention of worker-to-patient transmission by applying good hand hygiene
Mansour, E., et al., 2014	Assessment of health implications related to processing and use of natural wool insulation products		Obstructive lung disease and bronchitis	Organic dust	Review on wool dust health implications. No relation to occupation, no clear conclusions on disease
Mara, D., Sleigh, A., 2010	Estimation of norovirus and <i>Ascaris</i> infection risks to urban farmers in developing countries using wastewater for crop irrigation	Agriculture (particularly farm labourers working in raw wastewater-irrigated fields)	Diarrhoeal disease, infection with human nematode worms	Norovirus, human roundworm <i>Ascaris lumbricoides</i> , human hookworms <i>Ancylostoma duodenale</i> and <i>Necator americanus</i>	Not relevant, since the focus of the article is on the estimation of infection risks to urban farmers in developing countries watering their crops with wastewater
May, S., Romberger, D.J., Poole, J.A., 2012	Respiratory health effects of large animal farming environments				Allergen related
McClendon, C.J., Gerald, C.L., Waterman, J.T., 2015	Farm animal models of organic dust exposure and toxicity: Insights and implications for respiratory health	Agriculture (animal farmers)			Review of organic dust exposure in animal farming. Concerns description of pig model without conclusions on disease development etc. Not of relevance

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Author(s)/ year	Title	Occupation(s)	Disease(s)	Biological agent(s)	Remarks
McGuinness, S., Denholm, J., Leder, K., 2013	Notifiable Australian zoonotic infections	Not specified	Anthrax, Australian bat lyssavirus infection, brucellosis, leptospirosis, psittacosis, Q-fever, tularaemia and Hendra virus infection	<i>Bacillus anthracis</i> , <i>Australian bat Lyssavirus</i> , <i>Brucella</i> spp., <i>Leptospira</i> , <i>Chlamydophila psittaci</i> , <i>Coxiella burnetii</i> , <i>Francisella tularensis</i> , Hendra	Full text not available; evaluation based on abstract only. No direct link to occupational context
Méheust, D., et al., 2014	Indoor fungal contamination: Health risks and measurement methods in hospitals, homes and workplaces				Allergen related
Mitchell, A., Spencer, M., Edmiston, C., 2015	Role of healthcare apparel and other healthcare textiles in the transmission of pathogens: A review of the literature	Healthcare workers			Healthcare textiles, including uniforms or apparel, are considered a vector for transmission of microorganisms that cause infections and illnesses in healthcare workers. Innovative textiles show reduced contamination or growth of biological agents. However, no actual information on (reduction of) diseases in healthcare workers indicated
Newman, K.L., Newman, L.S., 2012	Occupational causes of sarcoidosis	Agriculture Manufacturing workers (metal industries) Office work (indoor air)	Sarcoidosis	Mould, bacteria, other microbial contaminants	Workplace exposures are associated with the development of sarcoidosis. Mycobacterial, fungal and other microbial antigens are targets for the granulomatous immune response
		Bird handling	Psittacosis	Bird protein antigens, bacterial antigens	

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Author(s)/ year	Title	Occupation(s)	Disease(s)	Biological agent(s)	Remarks
		Agriculture Bird handlers Lifeguards Manufacturing (metalworkers)	Hypersensitivity pneumonitis	Fungal antigens, bacterial antigens, including mycobacterial antigens	
Ng, B.E., et al., 2011.	Population-based biomedical sexually transmitted infection control interventions for reducing HIV infection				There is evidence that many STIs increase likelihood of HIV transmission. The authors failed to confirm the hypothesis that STI control is an effective HIV prevention strategy. Concerns general populations, excluding sex workers. Not relevant
No authors listed, 2010	Seasonal flu vaccination for healthcare workers?	Healthcare workers			Publication concerns efficiency of HCW vaccination for influenza to reduce worker-to-patient transmission
OECD, 1990	Employment Outlook 1990. Chapter 4: Occupational illness in OECD countries				Not relevant, since no specific occupations, exposures and/or health effects are mentioned
OECD, 2003	Biotechnology and sustainability: The fight against infectious disease				Not relevant, since the focus is on the general issue/general population instead of on the relation with the work environment
OECD, 2007	Best practices guidelines for biological resource centres	Biological resource centres			Not relevant, since the focus of the best practices is not on worker safety (thus not work-related exposures of the workers working in this type of facilities), but on general best practices for the acquisition, maintenance and provision of biological materials and on the management of biological resource centres

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Author(s)/ year	Title	Occupation(s)	Disease(s)	Biological agent(s)	Remarks
OECD, 2011	OECD issue paper on microbial contaminant limits for microbial pest control products	Agriculture (farmers)		Bacterial bioaerosols	In farmhouses (defined as residential buildings on farms), the concentration of indoor bacterial aerosols ranged from 587 to 9,752 cfu/m <sup>3</sup> (mean 3,235 cfu/m <sup>3</sup> ), and respirable fractions from 325 to 4,176 cfu/m <sup>3</sup> (mean 1,759 cfu/m <sup>3</sup> ). In urban dwellings, the corresponding values were in the range of 271 to 4858 cfu/m <sup>3</sup> (mean 1,792 cfu/m <sup>3</sup> ) and 218 to 2,088 cfu/m <sup>3</sup> (mean 1,013 cfu/m <sup>3</sup> ), respectively
		Animal housing		Bacteria	In animal houses in Switzerland and Spain the total bacteria counts ranged between 4 × 10 <sup>8</sup> and 4 × 10 <sup>9</sup> cfu/m <sup>3</sup>
		Greenhouses		Bacteria	In greenhouses in Spain, bacterial levels were at 1.5 × 10 <sup>7</sup> cfu/m <sup>3</sup>
				Airborne fungal spores	Airborne fungal spores of between 1 × 10 <sup>3</sup> and 1 × 10 <sup>5</sup> cells per m <sup>3</sup> in greenhouses
OECD, 2011	OECD issue paper on microbial contaminant limits for microbial pest control products	Greenhouses		Mesophilic bacteria	In untreated greenhouses, the highest concentration of total mesophilic bacteria, 1.1 × 10 <sup>6</sup> cfu/m <sup>3</sup> , was detected in a cucumber greenhouse; no significant difference in exposure to mesophilic bacteria between tomato greenhouses and vegetable fields was observed
		Herb-processing plants		Mesophilic bacteria	The respirable fraction of airborne microflora in herb-processing plants varied between 14.7 % and 67.7 %. The dominant microorganisms in the air were mesophilic bacteria, among which endospore-forming bacilli ( <i>Bacillus</i> spp.) and actinomycetes of the species <i>Streptomyces albus</i> were most numerous

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		Microbial pest control products (production, formulation, application)		Microorganisms	Not relevant, since the focus is on providing practical microbiological specifications for microbial pest control products (based on the food industry) to assess the overall acceptability of microbial pest control products. The airborne bacteria already present in the greenhouses (see below) might have a greater influence on growers' health than the applied biocontrol strains
		Pig houses		Airborne fungal spores	Airborne fungal spores of more than $1 \times 10^8$ cells per m <sup>3</sup> in pig houses
OECD, 2012	OECD guidance to the environmental safety evaluation of microbial biocontrol agents	Microbial pest control products		Microorganisms	Not relevant, since the focus is on an approach for environmental risk assessment, which does not include the work environment
OECD, 2013	Livestock disease policies: Building bridges between science and economics		Livestock diseases		Not relevant, since not directly work-related
Oliveira, A.C. de, Silva, M.D.M., Garbaccio, J.L., 2012	Clothing of healthcare professional as potential reservoirs of micro-organisms: An integrative review [Vestuario de profissionais de saude como potenciais reservatorios de micro-organismos: Uma revisao integrativa]		Various	MRSA, <i>Acinetobacter</i> , <i>Pseudomonas</i> , resistant Enterococci	Analysis of healthcare worker textiles' potential to carry pathogens. No focus on occupational disease; primary concern is worker-to-patient transmission. Not relevant

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Oppliger, A., Masclaux, F.G., Niculita-Hirzel, H., 2011	Assessment of airborne microorganisms by real-time PCR: Optimistic findings and research challenges	Not specified	Allergenic, toxic or irritant reactions	Fungi and bacteria	Full text not available; evaluation based on abstract only. No direct link to occupational context; focus is on assessment of airborne microorganisms by real-time PCR (methodological)
Paba, E., et al., 2013	Indoor exposure to airborne endotoxin: A review of the literature on sampling and analysis methods				Publication concerns a review of airborne endotoxin sampling and analytical methods. No occupational disease relations included. Not relevant
Panosian, C., 2010	Courting danger while doing good: Protecting global health workers from harm	Global health workers			Not relevant, not a review and also not directly work related
Papworth, E., et al., 2013	Epidemiology of HIV among female sex workers, their clients, men who have sex with men and people who inject drugs in West and Central Africa	Sex workers	AIDS	HIV	Publication concerns epidemiology of HIV in high-risk groups in West and Central Africa. FSWs appear to be the population group with highest prevalence. Not relevant for the EU
Peden, D.B., Bush, R.K., 2015	Advances in environmental and occupational disorders in 2014				Allergen-related publication, evaluated separately

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Pedrosa, P.B.S., Cardoso, T.A.O., 2011	Viral infections in workers in hospital and research laboratory settings: A comparative review of infection modes and respective biosafety aspects	Healthcare workers Laboratory personnel	Infection	Viruses, human-transferred pathogens	Accidental exposure in hospital and research laboratory settings. Most reports concern a small number of cases, with limited severity of clinical development, or are very outdated (at least 50 years ago) and laboratory facilities have changed quite significantly since then. Considering the limited incidence of cases described, these are not considered relevant occupational infections
Picheansanthian, W., Chotibang, J., 2015	Glove utilization in the prevention of cross transmission: A systematic review	Healthcare workers			Publication concerns a protocol to evaluate transmission of infection between patients via gloves of HCWs. No evaluation reported, no occupational disease concerned: not of relevance
Porru, S., Micheloni, G.P., Carrer, P., 2012	Fitness for work in healthcare workers: biological risk	Healthcare workers			Prevalence of HBV and HIV in healthcare workers overlap with those in the general population. Publication concerns fit for work issues. Not considered of relevance
Prematunge, C., et al., 2012	Factors influencing pandemic influenza vaccination of health-care workers: A systematic review	Healthcare workers			Review on influenza vaccine interventions and pandemic-planning processes to identify factors that are unique to pandemic influenza vaccination and similar to seasonal influenza vaccination research. Not relevant
Prester, L., 2011	Indoor exposure to mould allergens	Agriculture (farmers) Compost workers General exposure in buildings	Aspergilloma, pulmonary aspergillosis, rhinosinusitis, mycotoxicosis	Fungi ( <i>Stachybotrys</i> , <i>Aspergillus fumigatus</i> ) and toxins thereof (aflatoxins, trichothecenes, gliotoxin, ochratoxin (mycotoxicosis))	Allergies
Quirce, S., Diaz-Perales, A., 2013	Diagnosis and management of grain-induced asthma				Allergen-related publication, evaluated separately

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Quirce, S., et al., 2016	Occupational hypersensitivity pneumonitis: An EAACI position paper				Allergen-related publication, evaluated separately
Quirce, S., Bernstein, J.A., 2011	Old and new causes of occupational asthma				Allergies
Randall, L.H., Curran, E.A., Omer, S.B., 2013	Legal considerations surrounding mandatory influenza vaccination for healthcare workers in the United States	Healthcare workers			Review of the characteristics of influenza, how it is transmitted in the healthcare setting and relevance of vaccination of healthcare workers. This is to prevent transmission of influenza via healthcare workers to patients. Not of relevance for occupational disease
Raulf, M., 2016	Allergen component analysis as a tool in the diagnosis of occupational allergy				Allergen-related publication, evaluated separately
Rey, D., 2011	Post-exposure prophylaxis for HIV infection				Review of antiretroviral combinations used upon exposure to HIV. No specific occupational relation indicated. Not relevant
Rubin, H. (OECD), 2011	Future global shocks: Pandemics	Agriculture workers Correction officers Education (teachers) Healthcare workers Military	Infections		Not relevant, since the focus is on the general issue/general population instead of on the relation with the work environment. Those at higher risk are stratified according to the likelihood of extensive exposure to an individual or community in which infections are frequent, for example, healthcare workers, teachers, correction officers, agriculture workers and the military

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Roberge, B., Aubin, S., Cloutier, Y., 2012	Characterization of dusts in traditional bakeries	Bakery workers		Organic dust (flour)	Exposure study: exposure of bakery workers to total dusts, inhalable fractions and respirable fractions; collection of data on the particle size distribution of the flour dusts generated during operations using flour (dough mixer/weighing and moulding/rounding table). Daily average exposure values calculated (based on stationary sampling) were well below the reference values (10 mg/m <sup>3</sup> for total dust), but were all above the concentrations that can cause lung sensitisation (1-2 mg/m <sup>3</sup> )
Rockx, B., Wang, L.-F., 2013	Zoonotic henipavirus transmission	Animal handlers	Severe respiratory illness, encephalitis, neurological symptoms	Hendra virus (via horses), Nipah virus (via pigs)	Review of the zoonotic Hendra and Nipah viruses. Emerging zoonotic virus with high fatality rate found in Australia and South East Asia. Related to fruit bat as primary host. Owing to geographical location, not of relevance for the EU
Rothe, C., Schlaich, C., Thompson, S. 2013	Healthcare-associated infections in sub-Saharan Africa	Healthcare workers	Tuberculosis	Tuberculosis	HCW in sub-Saharan Africa are at risk for several infections owing to high prevalence. Lack of PPE, suitable facilities and organisational support are mentioned as cause of considerable risk. Not relevant for the EU
Sagnelli, C., et al., 2016	Occult HBV infection in the oncohematological setting				No relation with occupation
Sauni, R., Uitti, J., et al., 2013	Remediating buildings damaged by dampness and mould for preventing or reducing respiratory tract symptoms, infections and asthma (review)				Not included in review, since the content is covered by Sauni et al. (2015), which is an update of the previous versions

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Author(s)/ year	Title	Occupation(s)	Disease(s)	Biological agent(s)	Remarks
Sauni, R., et al., 2015	Remediating buildings damaged by dampness and mould for preventing or reducing respiratory tract symptoms, infections and asthma				Review concerns mould in buildings. No focus on occupational disease. Not relevant
Scorgie, F., et al., 2012	Socio-demographic characteristics and behavioral risk factors of female sex workers in sub-Saharan Africa: A systematic review	Sex workers	AIDS	HIV	Publication concerns review on the socio-demographics of female sex workers (FSWs) in sub-Saharan Africa, their occupational contexts and key behavioural risk factors for HIV. Not relevant for the EU
Smilowitz, N.R., Balter, S., Weisz, G., 2013	Occupational hazards of interventional cardiology	Healthcare workers (cardiologists)	Hepatitis, AIDS	Hepatitis B and C, HIV	Publication concerns prevention measures for several risks, including blood-borne pathogens. Not relevant
Smith, A.-L., 2011	Use of a systematic review to inform the infection risk for biomedical engineers and technicians servicing biomedical devices	Laboratory personnel			Publication concerns microbial contamination of laboratory or medical devices and effectiveness of cleaning agents. No disease indicated
Smolak, A., 2014	A meta-analysis and systematic review of HIV risk behaviour among fishermen	Fishers	AIDS	HIV	Publication concerns inventory of fishers in Africa and Asia, of whom 96 % have sex with partners other than their regular partners, with high HIV prevalence of 30 %. No occupational relation
Spankie, S., Cherrie, J.W., 2012	Exposure to grain dust in Great Britain	Grain workers in general			No occupational disease relation. Organic dust related to plant material for which discrimination between grain dust and microbiological contamination cannot be made

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Author(s)/ year	Title	Occupation(s)	Disease(s)	Biological agent(s)	Remarks
Stevens, W.W., Grammer, L.C., 2015	Occupational rhinitis: An update				Allergen-related publication, evaluated separately
Suwantarat, N., Apisarntharak, A., 2015	Risks to healthcare workers with emerging diseases: Lessons from MERS-CoV, Ebola, SARS and avian flu	Healthcare workers		Viruses: MERS-CoV, Ebola virus, SARS, avian influenza	Outside EU: not documented if the HCWs affected are native or international (Red Cross/WHO). As the majority of causalities are related to early stages of disease, most likely native HCWs are concerned: not relevant for the EU
Talbot, T.R., et al., 2010	Revised SHEA position paper: Influenza vaccination of healthcare personnel	Healthcare worker			Publication concerns HCW vaccination for influenza to reduce worker-to-patient transmission
Tangena, J.A., et al., 2016	Risk and control of mosquito-borne diseases in Southeast Asian rubber plantations	Natural rubber workers	Mosquito-borne diseases (malaria, dengue, chikungunya)	Malaria parasite, dengue virus, chikungunya virus	Rubber plantations are ideal habitats for disease-bearing mosquito species. Mosquito-borne diseases are considered an occupational risk for rubber workers. Not of relevance for Europe
Trafny, E.A., 2013	Microorganisms in metalworking fluids: Current issues in research and management	Manufacturing workers (metalworkers)			Allergen-related publication, evaluated separately
Tsuji, H., et al., 2016	Challenges and solutions in immigrant occupational health in the United States: A literature review and comparative analysis	Not specified	Infection (tuberculosis, human immunodeficiency virus/AIDS)	Not specified (bacterium <i>Mycobacterium tuberculosis</i> , HIV)	Full text not available. Not included in review because full text is in Japanese. Immigrant workers are seen as a group of vulnerable workers; however, lack of data on immigrant workers was found to be a common problem

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Author(s)/ year	Title	Occupation(s)	Disease(s)	Biological agent(s)	Remarks
Vallely, A., et al., 2010	The prevalence of sexually transmitted infections in Papua New Guinea: A systematic review and meta-analysis	Sex workers	AIDS, infections	HIV, STIs (chlamydia, gonorrhoea, syphilis, trichomonas)	Publication concerns review of HIV and other STIs in Papua New Guinea, including among sex workers. Considered the socio-demographics of Papua New Guinea: not relevant for the EU
Van Crombruggen, K., et al., 2011	Pathogenesis of chronic rhinosinusitis: Inflammation				No occupational relation: not relevant
Van Kerkhove, M.D., et al., 2011	Highly pathogenic avian influenza (H5N1): Pathways of exposure at the animal-human interface — A systematic review				Poultry-to-human transmission of avian influenza is rare; most articles reviewed showed no particular evidence of avian influenza being an occupational risk for healthcare workers or poultry workers
Volquind, D., et al., 2013	Occupational hazards and diseases related to the practice of anaesthesiology	Healthcare workers (anaesthesiologists)	Hepatitis, herpes, AIDS	Hepatitis B and C, herpes virus, HIV	Publication concerns potential risks of anaesthesiologists and measures to be taken. No information on specific risks/diseases. Not relevant
Waddell, L.A., et al., 2015	The zoonotic potential of <i>Mycobacterium avium</i> ssp. <i>paratuberculosis</i> : A systematic review and meta-analyses of the evidence				Review of a potentially zoonotic bacterium. No occupations indicated; insufficient evidence for disease related to <i>Mycobacterium avium</i> ssp. <i>paratuberculosis</i> ; not relevant for current evaluation
Wallace, R.J., et al., 2016	Risks associated with endotoxins in feed additives produced by fermentation				A calculation method is proposed to determine risk of endotoxin exposure (from additives produced by Gram-negative bacteria). No conclusions were drawn: article not relevant

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Author(s)/ year	Title	Occupation(s)	Disease(s)	Biological agent(s)	Remarks
Wunschel, J., Poole, J.A., 2016	Occupational agriculture organic dust exposure and its relationship to asthma and airway inflammation in adults				Allergen-related publication, evaluated separately
Yassi, A., et al., 2013	Workplace programmes for HIV and tuberculosis: A systematic review to support development of international guidelines for the health workforce	Healthcare workers			Publication concerns evaluation of intervention programme for HIV/tuberculosis in healthcare workers, mostly focused on Africa (one US study). Does not indicate if there is an actual difference between healthcare workers and general population. As the publication concerns mainly studies in Africa, and no information is present on prevalence in HCWs, the study is not considered relevant
Yezli, S., Barbut, F., Otter, J.A., 2014	Surface contamination in operating rooms: A risk for transmission of pathogens?	Operating room personnel			Publication concerns transfer from HCW hand/glove to patient. No occupational disease relation found. Therefore, not relevant
Zehri, A.A., Bhatti, A.A., Qureshi, M.M., 2013	Healthcare workers in sub-Saharan Africa and the risk of acquiring immunodeficiency virus: Let us build a better environment	Healthcare workers	AIDS	HIV	HCWs in sub-Saharan Africa are at risk of several infections owing to high prevalence. Lack of personal protective equipment and suitable facilities is indicated as leading cause of increased risk of transfer of disease. Not relevant for the EU
Zukiewicz-Sobczak, W., et al. 2013a	Allergenic potential of moulds isolated from buildings				Allergen-related publication, evaluated separately
Zukiewicz-Sobczak, W.A., 2013	The role of fungi in allergic diseases	General (building related)			Allergen-related publication evaluated separately

## 5B Overview of literature evaluated on allergens

(For full references, see Annex 3, Part 3B)

Authors/year	Title	Occupation(s)	Disease	Allergen, microorganism	Remarks
Blais Lecours, P., et al., 2014	Archaea in bioaerosols in dairy farms, poultry houses and wastewater treatment plants and their role in lung inflammation	Agriculture Wastewater plants		Archaea in bioaerosols	Authors suggest archaea as a new immunogenic agent in bioaerosols
Burton, C.M., 2012	Systematic review of respiratory outbreaks associated with exposure to water-based metalworking fluids	Metalworking industry	Asthma, hypersensitivity pneumonitis	Bacteria, fungi	Presence of microorganisms in water-based metalworking fluids with possible relation to asthma
Cano-Jimenez, E., et al., 2016	Farmers' lung disease: A review	Agriculture (farmers)	Hypersensitivity pneumonitis (farmer's lung disease)	Thermophilic actinomycetes and fungi. <b>Bacteria:</b> <i>Saccharopolyspora rectivirgula</i> (previously known as <i>Micropolyspora faeni</i> ), <i>Thermoactinomyces vulgaris</i> , <i>Thermoactinomyces viridis</i> and <i>Thermoactinomyces sacchari</i> . <b>Fungi:</b> <i>Alternaria</i> , <i>Aspergillus fumigatus</i> and <i>Botrytis</i>	Related to hay or grain stored in conditions of high humidity
Cartier, A., 2015	New causes of immunologic occupational asthma, 2012-2014	Agriculture (orange related)	Asthma	Plant protein	
		Driver	Asthma	Insect (dust mite)	
		Fish food production	Asthma	Annelida (tubifex)	

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Authors/year	Title	Occupation(s)	Disease	Allergen, microorganism	Remarks
Corradi, M., Ferdenzi, E., Mutti, A., 2012	The characteristics, treatment and prevention of laboratory animal allergy	Laboratory animal personnel	Immediate hypersensitivity reaction	Laboratory animals (urine, hair, dander, saliva)	Prevalence ranging from 6 % to 44 %
Darby, A., Fishwick, D., 2011	Other respiratory diseases review	Agriculture (mushroom workers)	Hypersensitivity pneumonitis		Farmer's lung disease related to pesticide exposure and not to biological agents
		Metal workers	Hypersensitivity pneumonitis	<i>Mycobacterium chelonae</i> , <i>Mycobacterium immunogenum</i> , <i>Pseudomonas</i> sp., <i>Acinetobacter</i> and <i>Ochrobactrum</i>	
Dickel, H., et al., 2014	[Seafood allergy in cooks: A case series and review of the literature]	Cooks	Sensitisation including anaphylaxis	Cod, salmon, trout, herring	Prevalence of anaphylaxis 16.7 %. Discontinuation of job at median of 6.3 years
Duchaine, C., et al., 2012	Workers exposed to metalworking fluids (MWF): Evaluation of bioaerosol exposure and effects on respiratory and skin health			Mycobacteria, pseudomonas	Study in workplaces with metalworking fluids. No diseases found; no relation could be found between bacteria detected and diseases
Dutkiewicz, J., et al., 2011	Biological agents as occupational hazards: Selected issues	Agriculture (greenhouse workers)	Pollinosis	Plant pollen (bell pepper, strawberry, chrysanthemum, sugar beet, cauliflower, broccoli)	Minor focus on allergies and related occupations

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Authors/year	Title	Occupation(s)	Disease	Allergen, microorganism	Remarks
EU-OSHA, 2013b	Green jobs and occupational safety and health: Foresight on new and emerging risks associated with new technologies by 2020	Green jobs (waste recycling, environmental remediation, biofuel industry, biomass production)		Allergens associated with biomass, bioaerosols	Allergens are hypothetical and undefined; no disease relation
EU-OSHA, 2014	Foresight on new and emerging risks associated with new technologies by 2020: Workshop for EU focal points	Waste management		Allergens associated with biomass, bioaerosols	The article is prospective; the allergens are hypothetical and undefined; no disease relation
Feary, J., Cullinan, P., 2016	Laboratory animal allergy: A new world	Laboratory animal personnel	Sensitisation	Mouse dander, hair, saliva, urine, serum	Drop in sensitisation due to rapid changes in technology; prevalence 5-8 %.
Fishwick, D., 2012	New occupational and environmental causes of asthma and extrinsic allergic alveolitis	Food production industry (olive farmers, orchard workers, table grape workers, soy flake-processing workers, insect breeding)	Asthma	Asthma: <i>Sinapis alba</i> pollen, 2-spotted spider mite, <i>Harmonia axyridis</i> , soybean proteins, Artemia, konjac glucomannan, gum arabic, wood, fish, insects, bell pepper pollens. Extrinsic allergic alveolitis (or hypersensitivity pneumonitis): <i>Aspergillus niger</i> , <i>Thermoactinomyces sacchari</i> , shiitake mushroom, sausage mould	Asthma prevalence for bell pepper pollen = 19 %

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Authors/year	Title	Occupation(s)	Disease	Allergen, microorganism	Remarks
Gerardi, D.A., 2010	Building-related illness	Indoor workers (including school and day care centres)	Asthma and hypersensitivity pneumonitis	Dust mites, domestic animals, cockroach antigens, silver fish insects, hamsters, gerbils, lizards, ornamental plants, airborne contaminations from food materials	General building-related non-mould allergens. Potential relation between fungi exposure and immunocompetent persons, but not in occupational setting
Hox, V., et al., 2015	A chest physician's guide to mechanisms of sinonasal disease				No occupational information included; publication not relevant
Jeal, H., Jones, M., 2010	Allergy to rodents: An update	Laboratory animal personnel, animal handlers	Allergic reactions up to anaphylactic, including asthma, urticaria	Urine, dander, hair (urinary: prealbumin and alpha-2u-globulin)	
Jeebhay, M.F., Lopata, A.L., 2012	Occupational allergies in seafood-processing workers	Ornament industry	Hypersensitivity pneumonitis	Molluscs	Ornament manufacture (dust of molluscs)
Jeebhay, M.F., Lopata, A.L., 2012	Occupational allergies in seafood-processing workers	Seafood processing	Asthma, contact urticaria, dermatitis	Crustaceans, molluscs, fish (tropomyosin and parvalbumin)	Higher prevalence of asthma from arthropods than from molluscs and bony fish. Aerosol-related exposure. Prevalence of protein contact dermatitis is between 3 % and 11 %
Jensen-Jarolim, E., et al., 2015	Caution: Reptile pets shuttle grasshopper allergy and asthma into homes	Insect breeding Laboratory workers	Allergic rhinoconjunctivitis, bronchial hyperreactivity and asthma	Grasshopper	

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Authors/year	Title	Occupation(s)	Disease	Allergen, microorganism	Remarks
Johanning, E., et al., 2014	Review of health hazards and prevention measures for response and recovery workers and volunteers after natural disasters, flooding, and water damage: Mold and dampness	Recovery workers		Fungi	Article is about prevention of potential exposure to fungi during recovery work. Not a specific focus on allergens
Jones, M., 2015	Laboratory animal allergy in the modern era	Laboratory animal workers	Allergic reactions	Hair, dander urine, serum, saliva	Recent evidence suggesting that lipocalins such as Mus m 1 could act as immunomodulatory molecules triggering the innate immune response proposes to be a new form of mechanism which could initiate laboratory animal allergy
Liebers, V., et al., 2012	Bioaerosols — more than just allergens: Complex situations at workplaces [Bioaerosole — mehr als nur Allergene: Komplexe Situationen an Arbeitsplätzen]	Waste recycling, composting, agriculture	Allergic complaints	Bioaerosols/airborne particles and microorganisms as well as their constituents	German language
Lopata, A.L., Jeebhay, M.F., 2013	Airborne seafood allergens as a cause of occupational allergy and asthma	Seafood processing	Allergic sensitisation Asthma, urticaria, contact dermatitis	Parasites ( <i>Anisakis</i> spp.) Fish, shellfish (parvalbumin and glyceraldehyde-phosphate dehydrogenase (fish), tropomyosin and arginine kinase (Crustacea))	Present as contaminant Prevalence of occupational asthma in seafood workers is between 2 % and 36 %

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Authors/year	Title	Occupation(s)	Disease	Allergen, microorganism	Remarks
Lucas, D., et al., 2010	Occupational asthma in the commercial fishing industry: A case series and review of the literature	Agriculture (chicken farm workers)	Asthma	Parasites ( <i>Anisakis simplex</i> )	
		Food industry (including cooks) Seafood processing	Asthma	Aerosolised proteins, parasites ( <i>Anisakis simplex</i> )	
		Seafood processing (oyster farm workers)	Asthma	Parasite — hoyá	Prevalence of 29 %
Macan, J., et al., 2012	Pyroglyphid mites as a source of work-related allergens	Hotel chambermaids, cinema employees, teachers, day care employees, library personnel, public transportation, fishing industry, submarine personnel	Atopic rhinitis, conjunctivitis, dermatitis and asthma	Pyroglyphid mites	Only occupations at a moderate to high risk level are indicated (being related to clinically significant exposure levels)
May, S., Romberger, D.J., Poole, J.A., 2012	Respiratory health effects of large animal farming environments	Agriculture (animal farming)	Respiratory diseases (asthma, hypersensitivity pneumonitis)	Animal dander, pollen, insect fragments, storage mites, fungi	No specific linkage of allergens in this article; however, the authors note that farming-related respiratory disorders are usually not IgE (allergic)
Méheust D. et al., 2014	Indoor fungal contamination: Health risks and measurement methods in hospitals homes and workplaces	Agriculture	Hypersensitivity pneumonitis	Mould, fungi ( <i>Absidia corymbifera</i> , <i>Eurotium amstelodami</i> and <i>Wallemia sebi</i> )	Focus on analytical techniques. Information on diseases, allergens and occupations is mentioned but not discussed further. See also Annex 5A
		Indoor workers	Asthma		
Merget R., 2012	Occupational allergic and non-allergic diseases of the airways and lungs	Automotive operations (exposure to cooling lubricants)	Suspicion of occupational asthma/ extrinsic allergic alveolitis	Moulds	German language

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Authors/year	Title	Occupation(s)	Disease	Allergen, microorganism	Remarks
	due to mould exposure [Allergische und nichtallergische Erkrankungen der Lungen und Atemwege durch Schimmelpilze im Beruf]	Biotechnological company	Occupational asthma	Moulds, <i>Aspergillus niger</i>	
		Cheese workers	Exogen allergic alveolitis	Moulds; <i>Penicillium</i> spp.	
		Sausage packaging	Allergic asthma	Moulds; <i>Penicillium camemberti</i>	
Montano D, 2014	Chemical and biological work-related risks across occupations in Europe: A review	Agriculture (veterinarians, agricultural labourers, farmers and workers in veterinary settings, workers in grain threshing and sieving, flax threshing, herb, composting and wood processing)	Respiratory hypersensitivity reactions	Bioaerosols, bacteria, fungi	Minor focus on biological agents, within which in turn a minor focus on allergies. Not much attention paid to specific occupations
Moscato, G., et al., 2011	EAACI position paper: Prevention of work-related respiratory allergies among pre-apprentices or apprentices and young workers	Bakers	Asthma, respiratory allergies	Flour	
		Dental hygiene technicians		Latex	
		Laboratory animal personnel		Laboratory animals	
Moscato, G., et al., 2014	Anaphylaxis as occupational risk	Agriculture (greenhouse workers, gardeners, park workers, construction workers)	Anaphylaxis	Insects	
		Breeders of insects or snakes		Bites/stings	
		Car drivers Laboratory workers		Insect bites/stings	
		Food processing		Food proteins	

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Authors/year	Title	Occupation(s)	Disease	Allergen, microorganism	Remarks
		Healthcare workers		Pharmaceutical plants, latex	
Newman, K.L., Newman, L.S., 2012	Occupational causes of sarcoidosis	Metal industry	Sarcoidosis	Mycobacteria	Hypothesis that mycobacteria cause work-related sarcoidosis
Nicholson, P.J. et al., 2010	Health surveillance of workers exposed to laboratory animal allergens	Laboratory animal personnel	Allergic reactions	Laboratory animals	
Nordgren, T.M., Bailey, K.L., 2016	Pulmonary health effects of agriculture	Agriculture	Farming — occupational asthma, hypersensitivity pneumonitis	Shiitake mushroom spores (hypersensitivity pneumonitis); fungi in hay due to dense packaging thereof (hypersensitivity pneumonitis); <i>Absidia corymbifera</i> , thermophilic actinomycetes	
Ochmann, U., Nowak, D., 2012	Allergological diagnostics following mould exposure [Allergologische Diagnostik bei Schimmelpilzexposition]	Farmers handling mouldy hay or straw, workers in landfills and composting plants, gardeners. Other occupations	Type I allergy, in rare cases hypersensitivity pneumonitis and allergic bronchopulmonary aspergillosis in patients with pre-existing lung diseases	Moulds/fungal allergens ( <i>Alternaria alternata</i> , <i>P. chrysogenum</i> , <i>A. versicolor</i> , <i>Eurotium</i> spp., <i>Wallemia sebi</i> , <i>Cladosporium herbarum</i> , <i>Aspergillus fumigatus</i> )	Ubiquitous: higher exposures at the workplace are caused by mouldy walls or contaminated working materials, contamination of buildings or workspaces or direct contact with mould-containing agents. Mould infestation in buildings is noticeable by a musty smell (dispensing MVOCs) and moist or black-coloured surfaces.  Even with exposure to other organic dusts such as food dust, mill dust or bakery dust, increased mould

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Authors/year	Title	Occupation(s)	Disease	Allergen, microorganism	Remarks
					concentrations were noticed. People who are exposed to a high allergen load have more sensitisation; for example, gardeners are significantly more sensitised to grey mould
Ochmann, U., Nowak, D., 2012	Allergological diagnostics following mould exposure	Operators of indoor fountains, humidifiers and air-conditioners	Type III/IV allergy, IgG-mediated interstitial pneumonia, humidifier lung, farmer's lung	Mould-containing water aerosols (humidifiers lung), organic dust (farmer's lung)	German language
Prester, L., 2011	Indoor exposure to mould allergens		Asthma, allergic alveolitis, sinusitis and rhinitis	Fungi ( <i>Alternaria alternata</i> , <i>Cladosporium</i> spp., <i>Aspergillus fumigatus</i> )	Diseases related to fungi exposure but not specifically linked to occupational diseases
Quirce, S., Sastre, J., 2011.	New causes of occupational asthma	Aquaculture: fish	Asthma		Emerging (first reported): <i>Chrysonilia sitophila</i> -related asthma found in coffee industry
		Coffee industry: mould			
		Fishing: crustaceans, molluscs and fish			
Quirce, S., Bernstein, J.A., 2011	Old and new causes of occupational asthma	Food processing: rice powder, organic (plant) dust, flour, malt	Asthma		Emerging (first reported): marigold flour related asthma
		Greenhouse workers			Emerging (first reported): <i>Amblyseius californicus</i> from predatory mites
		Laboratory animal personnel		Laboratory animals	

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		Meat industry		Wood	Emerging (first reported): <i>Penicillium nalgiovensis</i> -related asthma found in pork butcher industry
		Carpentry, logging, floor laying			
		Power company		Caddis flies	Emerging (first reported)
		Seafood processing: molluscs, fish		Octopus	Emerging (first reported): octopus-related asthma
Quirce, S., Bernstein, J.A., 2011	Old and new causes of occupational asthma	Agriculture (farmers, egg producers, grain store workers, greenhouse workers, horticulture)	Asthma	Cow dander, egg protein, grain mite, bell pepper pollen, Chrysanthemum	
		Agriculture (plant breeders, greenhouse workers and farmers)		Cauliflower and broccoli pollen, tomato and cellar spider, respectively	Indicated as new cause
		Animal handlers (animal rehabilitation workers)		Animal proteins	Indicated as new cause
		Aviation personnel		Insects (screw worm fly)	
		Carpet/glove manufacturing		Guar/latex	
		Detergent industry (cleaners)		Biologic enzymes	
		Fishing industry		Crab, prawn, hoyo, cuttlefish, salmon, red soft coral, insect/mealworm larvae	
		Food processing/trading (bakers, millers, food processors)		Grain dust (wheat, rye, soya flour), coffee bean, fungal enzymes	

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		Food processing/trading (grocers, herbal products traders and tea-packing, olive oil mill, seafood, malt company, pork butchers, animal fodder factory, rice mill and fish-farm workers)		Mushroom, Korean ginseng and sanyak, chamomile, olive fruit, octopus, malt, sausage mould, marigold flour, rice and turbot, respectively	Indicated as new cause
		Laboratory plant workers		<i>Arabidopsis thaliana</i>	Indicated as new cause
		Laboratory workers		Laboratory animals/insects, bovine serum albumin, gerbils	Indicated as new cause
Quirce, S., Bernstein, J.A., 2011	Old and new causes of occupational asthma	Others (florists, carpenters, parquet floor layers, chemists)	Asthma	Yarrow and ivy, cedrorana and chengal wood, cabreuva wood and linseed oilcake, respectively	Indicated as new cause
		Pharmaceutical workers		Papain, lactase	
		Sericulture		Silk worm larvae	
Quirce, S., Diaz-Perales, A., 2013	Diagnosis and management of grain-induced asthma	Bakery workers (bakers, confectioners, pastry factory workers, millers, farmers and cereal handlers)	Asthma	Fungi, grains, flour, insects, mites, mould ( $\alpha$ -amylase/trypsin inhibitor family, lipid transfer protein, peroxidase, thioredoxin, serine proteinase inhibitor, thau-matin-like protein and certain prolamins)	
Quirce, S., et al., 2016	Occupational hypersensitivity pneumonitis: An EAACI position paper	Agriculture (farmers, bird breeders, mushroom workers, potato riddlers, compost workers, wood workers, tobacco growers)	Hypersensitivity pneumonitis	Bacteria, fungi and plant, animal and insect proteins	
		Animal feeding		Enzymes	

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		Construction workers (stucco workers)		Fungi, plant proteins	
		Detergent industry (cleaners), florists		Bacteria, enzymes	
		Food processing (bagasse workers, cheese workers, wine makers, paprika slicers, seaweed workers)		Bacteria, fungi and animal and plant proteins	
		Laboratory workers		Rat serum proteins	
		Metalworkers		<i>Mycobacterium immunogenum</i> , <i>Acinetobacter</i> , <i>Ochrobactrum</i>	
Quirce, S., et al., 2016	Occupational hypersensitivity pneumonitis: An EAACI position paper	Pearl industry, nacre industry, textile workers		Animal proteins	
		Technicians (humidifiers, ventilation systems, machine operators, stucco workers)		Bacteria, fungi	
Raulf, M., 2016	Allergen component analysis as a tool in the diagnosis of occupational allergy	Bakers	Asthma	Wheat and rye flour proteins (various allergens in wheat (Tri a 12 — Tri a 45))	
		Healthcare workers	Asthma	Latex protein (various allergens in latex (Hev b 1 — 15))	
		Laboratory animal workers		Urine (lipocalins)	
Raulf-Heimsoth, M., et al., 2011	Rare and new occupational inhalation allergens	Farming	Asthma/Type I allergy	Cattle dander and dust mites (mostly grain mites), housefly	German language

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Authors/year	Title	Occupation(s)	Disease	Allergen, microorganism	Remarks
	[Seltene und neue berufliche Inhalationsallergene]	Laboratory animal personnel, healthcare workers	Type I allergy (rhinitis, conjunctivitis, bronchial asthma, etc.)	Natural latex	
		Locust breeders	Asthma/Type I allergy	Locust	
		Ornamental and useful plants (fruit and vegetables); gardeners, fruit growers, greenhouse workers	Pollen allergy; rhinitis, conjunctivitis, bronchial asthma	Pollen from insect-pollinated flowers and crops Green coffee dust, castor bean dust, chicory dust Chlorophyll-eating spider mites, predator mites	
		Pharmaceutical industry	Asthma/Type I allergy	Phytase from <i>Aspergillus niger</i> Lipase from <i>Rhizopus oryzae</i> Maize starch	
Raulf-Heimsoth, M., et al., 2011	Rare and new occupational inhalation allergens	Production of pasta and bakery products, pizza and pancake products	Asthma	Wheat, rye and barley flour, amaranth, buckwheat, lupin and soy flour. Enzymes or impurities such as wheat weevil, flour beetles, meal moths, cake cockroaches, mites or mould spores of <i>Aspergillus</i> and <i>Alternaria</i> (due to improper storage of flour)	
		Production, packaging and transport of food products	Asthma/Type I allergy	Food components and additives (from flaxseed to cinnamon)	

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Authors/year	Title	Occupation(s)	Disease	Allergen, microorganism	Remarks
		Sausage production	Asthma/Type I allergy	<i>Penicillium camemberti</i> , dust from dry spices (chili peppers, garlic and onion powder)	
		Seafood industry (fishers, seafood processing, seafood cooks)	Asthma/Type I allergy	Fish, shellfish and crustaceans	German language. Exposure to fish, shellfish and crustaceans takes place mainly through the inhalation of dust, aerosols and vapours emitted during cleaning, chopping, cooking or drying of animals. Haemoglobin of midge larvae (Chironomidae)
		Wood working	Asthma/Type I allergy	Abachi wood, robine ( <i>Robinia pseudoacacia</i> ) wood, needle wood	German language
Raulf-Heimsoth, M., 2011b	New aeroallergens with clinical relevance [Neue Inhalationsallergene mit Relevanz]	Gardeners, fruit growers, greenhouse workers	Pollen allergy	Pollen from insect-pollinated flowers and crops (peppers, broccoli, strawberries, maize)	German language

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Authors/year	Title	Occupation(s)	Disease	Allergen, microorganism	Remarks
Raulf-Heimsoth, M., et al., 2012	Workplace-related respiratory allergies [Inhalationsallergien am Arbeitsplatz]	Agriculture and horticulture, grain storage Construction workers (including renovation, moisture remediation), metal processing (including cooling lubricant application) Waste processing and sorting, composting, wastewater management (handling of sewage sludge), recycling Wood and paper processing, archives, libraries and possibly office workplaces with ventilation and air-conditioning	Sensitisation	Airborne mould fragments and their spores	German language
		Farmers, veterinarians and animal keepers/handlers	Allergic disease	Livestock animals (hair, urine, saliva, dander and other inhalable components): farm animals such as cattle, horses, pigs, sheep and goats. Especially at risk are farmers, as a major allergen was the bovine allergen Bos d 2; also, a lipocalin was identified	
		Food production and processing, especially in baking industry, in the production of detergents and in textile and pharmaceutical industry		Enzymes with professional relevance derived from <i>Aspergillus</i> and including $\alpha$ -amylases, xylanases and cellulases Lipase from <i>Rhizopus oryzae</i> (exposure to an enzyme mixture of lipase, amylase and pepsin)	

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Authors/year	Title	Occupation(s)	Disease	Allergen, microorganism	Remarks
		Food production/processing	Food products allergy	Green coffee dust, castor bean dust, chicory dust	
Raulf-Heimsoth, M., et al., 2012	Workplace-related respiratory allergies	Food processing	Allergic respiratory symptoms, occupational sensitisation and asthma	Moulds used to refine sausage or cheese (for example Type I allergy by <i>Penicillium camemberti</i> ) Mould infestation on spoiled food	German language
		Sausage production	Occupational asthma/Type I allergy	Dust from dry spices (chili peppers, garlic and onion powder)	
		Gardeners, fruit growers, greenhouse workers	Pollen allergy	Pollen from insect-pollinated flowers and crops (peppers, broccoli, strawberries, maize, chrysanthemum, cyclamen, freesia, lilies and tuberous begonias, cauliflower)	
		Gardeners, fruit growers and workers in greenhouses Baking industry in the storage of grain and flour	Sensitisation and respiratory allergies	Chlorophyll-eating spider mites such as <i>Tetranychus urticae</i> and <i>Panonychus citri</i> ; predatory mites. Cross-reactivity between house dust, storage and spider mites is given. Impurities of grain beetles, flour beetles, meal moths and cockroaches can also act as allergens	
		Healthcare workers	Latex allergy	Natural latex, milky sap of the rubber tree <i>Hevea brasiliensis</i>	

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Authors/year	Title	Occupation(s)	Disease	Allergen, microorganism	Remarks
		Pharmaceutical industry	Occupational asthma/Type I allergy	Maize starch, Arabic gum dust	
		Production of pasta and bakery products, pizza and pancake products	Baker's asthma	Wheat, rye and barley flour, amaranth, buckwheat, lupin and soya flour, barley, oats	
Raulf-Heimsoth, M., et al., 2012	Workplace-related respiratory allergies	Occurrence in stored grain, hay and straw (storage mites) Farmers, workers in mills, grain trading, bakeries	Sensitisation and allergic symptoms	Mites: families Glycyphagidae and Acaridae; species such as <i>Acarus siro</i> , <i>Lepidoglyphus destructor</i> , <i>Tyrophagus longior</i> , <i>T. palmarum</i> , <i>T. putrescentiae</i> , <i>Glycyphagus domesticus</i> , <i>Blomia tjobodas</i> Organic dust House dust	German language
		Research laboratories of the pharmaceutical industry and universities	Allergic respiratory diseases, laboratory animal allergy Rhinitis and conjunctivitis, contact urticaria is rare, asthma occurs	Laboratory animals (hair, urine, saliva, dander and other inhalable components): mice ( <i>Mus musculus</i> ), rats ( <i>Rattus norvegicus</i> ) and other (small) animals (rarely guinea pigs, hamsters, rabbits, cats and dogs). Rat and mouse urine are of special interest	

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Authors/year	Title	Occupation(s)	Disease	Allergen, microorganism	Remarks
		Seafood industry	Occupational asthma/Type I allergy	Exposure to fish, shellfish and crustaceans takes place mainly through the inhalation of dust, aerosols and vapours that emitted during cleaning, chopping, cooking or drying of animals. Tropomyosin (a muscle protein in crustaceans). Fish parasite <i>Anisakis simplex</i> (roundworm). Haemoglobins of midge larvae	
Raulf-Heimsoth, M., et al., 2012	Workplace-related respiratory allergies	Woodworking	Allergic airway diseases	Wood dust (red cedar, abachi, limba and oak, African zebra wood, spindle tree and pau marfim wood, pine, cherry, ash, South American timbers cedrorana, robine ( <i>Robinia pseudoacacia</i> ), needle wood	
Rosenman, K., 2015	Occupational diseases in individuals exposed to metal working fluids	Metalworking industry	Asthma, hypersensitivity pneumonitis	Bacteria ( <i>Mycobacterium immunogenum</i> )	Decrease in work-related asthma cases reported as from 2005

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Authors/year	Title	Occupation(s)	Disease	Allergen, microorganism	Remarks
Rosenman, K.D., Beckett, W.S., 2015	Web based listing of agents associated with new onset work-related asthma	Agriculture (farmers)	Asthma	Animal (dander, urine, eggs; <i>Anisakis simplex</i> ), insects ( <i>Eurygaster</i> , <i>Pyralis</i> , grain mite, barn mite, citrus red mite, two-spotted spider mite, fowl mite), fungi ( <i>Plasmodopara viticola</i> mould, <i>Agaricus bisporus</i> mushroom), plants (melon, bell pepper, cauliflower/broccoli pollen, aubergine, white mustard pollen, vetch)	Paper describes database; information obtained from website database
		Aviation personnel		Insect protein (screw worm fly)	
		Animal workers (frog catchers, veterinarians, zookeepers, ivory workers, nacre workers)		Animal protein (goat dander, frogs, ivory dust, nacre dust)	
		Bakers, millers		Plant proteins (grains, flours, sesame seed)	
Rosenman, K.D., Beckett, W.S., 2015	Web based listing of agents associated with new onset work-related asthma	Food industry (butchers, processors, traders, cooks)	Asthma	Animal protein (dander, pig), plant protein (herbs and spices, coffee, grain dust, rice, tea, vegetables), fungal proteins ( <i>Penicillium nalgiovenssis</i> , <i>Pleurotus ostreatus</i> , mushrooms)	Paper describes database; information obtained from website database
		Gardeners, florists		Plant proteins (date palm, cyclamen, chrysanthemum, rose, copperleaf, freesia, paprika, flowers)	

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Authors/year	Title	Occupation(s)	Disease	Allergen, microorganism	Remarks
		Insect workers (fish bait farming, fly producers, beekeepers, entomologists, sericulture)		Insect protein ( <i>Galleria mellonella</i> , <i>Ceratitis capitata</i> , moth, butterfly, honey-bee, silk worm)	
		Laboratory workers		Animals (dander), insect protein (grasshoppers, locusts, crickets), plant protein (pollen)	
		Seafood industry (fishers, seafood processing, seafood cooks)		Animal protein (crab, prawn, clam, fish, scallops, mollusc, coral; <i>Anisakis simplex</i> ), insect proteins (Chironomid midge)	
		Wood workers (sawmill, logging, wood processing)		Fungal proteins ( <i>Trichoderma koningii</i> , <i>Neurospora</i> , <i>Chrysonilia sitophila</i> )	
Rozas-Muñoz, E., et al., 2012	Allergic contact dermatitis to plants: Understanding the chemistry will help our diagnostic approach	Agriculture (food handlers, florists, horticulture, gardeners, farmers, forestry, food canning)	Contact dermatitis	Vegetables, fruit and other food (lettuce, endive, chicory, artichoke, garlic, citrus fruit, mango carrot, black mustard, cauliflower, caper bush) and ornamental plants (chrysanthemum, marguerites, dahlia, tulip, Peruvian lily, poison ivy, primula)	
Samadi, S., Wouters, I.M., Heederik, D.J., 2013	A review of bio-aerosol exposures and associated health effects in veterinary practice	Veterinary practice		Organic dust	Conclusion: indications for allergic respiratory symptoms but no evidence for sensitisation against animal allergens among veterinary populations

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Authors/year	Title	Occupation(s)	Disease	Allergen, microorganism	Remarks
Selman, M., et al., 2010	Hypersensitivity pneumonitis caused by fungi	Agriculture	Hypersensitivity pneumonitis (farmer's lung disease)	Organic particles, bacteria, fungi	
		Bird breeders	Hypersensitivity pneumonitis	Organic particles bird protein, bacteria, fungi	
Sennekamp, J., 2011	The current catalogue of antigens disease patterns and professions at risk of extrinsic allergic alveolitis			Cow's milk	German language
				Cornmeal dust	
				<i>Cladosporium (herbarum, cladosporoides)</i>	
		Activities in mouldy rooms	Extrinsic allergic alveolitis (hypersensitivity pneumonitis)	<i>Serpula lacrymans (Merulius lacrymans), Epicoccum nigrum, Pezizia domiciliana, Poria megalospora, Paecilomyces variotii or nivea</i>	
		NA (in Japan and Korea in damp houses)	Extrinsic allergic alveolitis (hypersensitivity pneumonitis)	<i>Trichosporon cutaneum</i>	
		Animal feed producers		Phytase from <i>Aspergillus</i> or <i>Trichoderma</i>	
		Bakers, flour producers		<i>Aspergillus oryzae</i> (enzyme)	
		Biologist, laboratory technician (animal houses, animal caging)		Rat proteins, gerbil	
		Bird breeders, bird dealers, veterinarians, bird photographers		Pigeon serum, pigeon droppings, pigeon feathers	

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Authors/year	Title	Occupation(s)	Disease	Allergen, microorganism	Remarks
Sennekamp, J., 2011	The current catalogue of antigens disease patterns and professions at risk of extrinsic allergic alveolitis	Bird breeders, bird dealers, veterinarians	Extrinsic allergic alveolitis (hypersensitivity pneumonitis)	Parakeet serum, parakeet droppings, parakeet feathers Canary, zebra finch and other ornamental birds	German language
		Poultry farmers, butchers		Chicken serum, chicken droppings, chicken feathers, turkey, wild birds, pheasant	
		Manufacturer of feather beds		Duck and goose serum, duck and goose feathers	
		Cheese producers		<i>Penicillium glaucum</i>	
		Cheese producers, workers in air-conditioned spaces, upholsterers		<i>Penicillium casei</i> (commune)	
		Chiropodists/pedicurists (human nails and skin)		<i>Torulopsis glabrata</i>	
		Cork workers, workers in air-conditioned spaces		<i>Penicillium frequentans</i>	
		Drug producers		Porcine pancreas	
		Farmers, citrus farmers, chiropodists/pedicurists, woodworkers, carpenters		<i>Penicillium brevicompactum</i>	

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Authors/year	Title	Occupation(s)	Disease	Allergen, microorganism	Remarks
		Farmers		<i>Erwinia herbicola</i> , <i>Aspergillus flavus</i> , <i>Aspergillus umbrosus</i> , <i>Sporobolomyces</i> , <i>Streptomyces thermohygroscopicus</i> , <i>Streptomyces olivaceus</i> , <i>Wallemia sebi</i> , <i>Ustilago esculenta</i>	
		Farmers (hay), food production (yeast (packaging production), brewer's yeast, wine yeast)		<i>Saccharomyces cerevisiae</i>	
		Farmers, gardeners, workers in air-conditioned spaces		<i>Absidia corymbifera</i> , <i>Eurotium amstelodami</i> , <i>Saccharopolyspora rectivirgula</i> ( <i>Micropolyspora faeni</i> ); <i>Thermoactinomyces dichotomicus</i>	
Sennekamp J., 2011	The current catalogue of antigens disease patterns and professions at risk of extrinsic allergic alveolitis	Farmers (mouldy hay), musicians ( <i>Candida</i> in human intestine, saxophone mouthpiece), workers in air-conditioned rooms (pools), chiropodists/pedicurists (human nails and skin)	Extrinsic allergic alveolitis (hypersensitivity pneumonitis)	<i>Candida albicans</i>	German language
		Farmers, workers in air-conditioned spaces		<i>Aspergillus versicolor</i> , <i>Absidia corymbifera</i> , <i>Eurotium amstelodami</i>	

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		Farmers, gardeners, upholsterers, poultry farmers, animal handlers, zoo workers, veterinarians Printers, workers in air-conditioned spaces Fruit farmers, citrus farmers, tobacco workers Plasterers, bricklayers in North Africa and Spain Woodworkers Waste sorters		<i>Aspergillus fumigatus</i>	
		Farmers, gardeners, workers in air-conditioned spaces, bagasse workers, cotton workers		<i>Thermoactinomyces vulgaris</i> , <i>Thermoactinomyces sacchari</i>	
		Farmers, mushroom growers		<i>Streptomyces albus</i>	
		Farmers, woodworkers, gardeners, workers in air-conditioned spaces		<i>Sporothrix schenkii</i>	
Sennekamp, J., 2011	The current catalogue of antigens disease patterns and professions at risk of extrinsic allergic alveolitis	Fish processors	Extrinsic allergic alveolitis (hypersensitivity pneumonitis)	Fish flour	German language
		Fishmongers, fish feed producers		Fish feed	
		Food producers		Spinach in powder form	
		Food producers (preparation of the drink horchata in Spain)		Nutsedge	
		Food producers (food dye)		Carmine (from coccus cactus)	

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		Gardeners, paper workers, woodworkers		<i>Trichoderma viride</i>	
		Ironing		<i>Sphingobacterium spiritivorum</i>	
		Jewellery producers (pearl)		Clam shell dust, snail shell dust	
		Shellfish processors (metal refining powder)		Oyster shell dust	
		Lab workers (animal feed with soy flour)		Soy flour dust	
		Lab technicians, dental technicians (extract of seaweed; alginates are widely used in dentistry, pharmaceutical, food and textile industries)		Alginate	
		Machine operators, workers in air-conditioned spaces		<i>Pseudomonas fluorescens</i> , <i>Pseudomonas aeruginosa</i>	
		Machine operators		<i>Acinetobacter Iwoffii</i> , Mycobacteria (MAC, <i>M. immunogenum</i> , <i>M. chelonae</i> , <i>M. fortuitum</i> )	
		Metal workers		<i>Aspergillus clavatus</i>	
Sennekamp, J., 2011		Millers, bakers		Grain weevils	German language

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Authors/year	Title	Occupation(s)	Disease	Allergen, microorganism	Remarks
	The current catalogue of antigens disease patterns and professions at risk of extrinsic allergic alveolitis	Mushroom workers	Extrinsic allergic alveolitis (hypersensitivity pneumonitis)	Bunashimeji ( <i>Hypsizigus marmoreus</i> ), mushroom, <i>Pholiota nameko</i> , <i>Pleurotus</i> edible mushroom spores, shiitake edible mushroom spores, shimeji ( <i>Lyophyllum aggregatum</i> ), Strophariaceae, <i>Tricholoma conglobatum</i>	
		Onion sorters, potato sorters, farmers		<i>Fusarium solani</i> , <i>Penicillia</i> , diverse	
		Paprika cleavage, no longer usual		Paprika dust	
		Peat workers		<i>Monocillium</i> , <i>Penicillium citreonigrum</i>	
		Pest controllers (disinfectors, exterminators) (vegetable insecticide in spray cans)		<i>Pyrethrum</i>	
		Pool attendants		<i>Exophiala jeanselmer</i> , <i>Aureobasidium</i>	
		Salami producers		<i>Penicillium casei/candidum</i>	
		Sericulture		Silkworm	
		Veterinarians		Cats	
		Vine growers		<i>Botrytis</i>	
		Woodworkers, carpenters, joiners, parquet layers		<i>Alternaria alternata</i> , <i>Rhizopus nigricans</i>	

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Authors/year	Title	Occupation(s)	Disease	Allergen, microorganism	Remarks
		Woodworkers		<i>Acremonium strictum</i> , <i>Graphium</i> (tree mould), <i>Leucogyrophana pinastri</i>	
Sennekamp, J., 2011	The current catalogue of antigens disease patterns and professions at risk of extrinsic allergic alveolitis	Woodworkers, carpenters, parquet layers	Extrinsic allergic alveolitis (hypersensitivity pneumonitis)	Sequoia wood dust, mahogany, cedar, ramin, pine, cabreuva	German language
		Woodworkers, gardeners		<i>Trichoderma koningii</i>	
		Woodworkers, orchid growers		<i>Cryptostroma corticale</i>	
		Woodworkers, workers in air-conditioned spaces		Mucores	
		Workers in air-conditioned spaces		<i>Achromobacter</i> , <i>Aspergillus niger</i> , <i>Aspergillus ochraceus</i> , <i>Penicillium chrysogenum</i> , <i>Penicillium cyclopium</i> , <i>Penicillium expansum</i> , <i>Thermoactinomyces candidus</i> , <i>Thermomonospora viridis</i> , Protozoa in air-conditioning	
		Workers in air-conditioned spaces, gardeners		<i>Aureobasidium pullulans</i> (Pullaria), <i>Cephalosporium</i>	
		Workers in air-conditioned spaces, gardeners, farmers		<i>Fusarium</i> , diverse	
		Workers in air-conditioned spaces, metalworkers, woodworkers		<i>Bacillus subtilis</i>	
Workers in air-conditioned spaces, sewage workers	<i>Alcaligenes</i>				

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Authors/year	Title	Occupation(s)	Disease	Allergen, microorganism	Remarks
		Nebuliser at work		<i>Fusarium culmorum</i>	
Sennekamp J, Forster F., 2012	Occupational extrinsic allergic bronchiolo-bronchitis [Berufsbedingte exogen-allergische bronchiolo-bronchitis]	Activities in humidified or conditioned rooms/spaces, sewage plants Activities in rooms with mould infestation	Extrinsic allergic bronchiolo-bronchitis		German language

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<p>ennekamp J, Forster F., 2012</p>	<p>Occupational extrinsic allergic bronchiolo-bronchitis [Berufsbedingte exogen-allergische bronchiolo-bronchitis]</p>	<p>Animal feed industry            Animal keepers, laboratory technicians, biologists            Bird and poultry keepers, veterinarians, zookeepers, butchers            Cheese washers            Chiropodists/pedicurists            Cleaning activities with biological cleaning agents            Cork workers            Cosmetics industry            Disinfectors, exterminators            Farmers            Fish dealers, fish processors            Food industry, sausage workers (salami)            Gardeners            Ironing            Machine operators            Malt workers, millers, bakers            Manufacturers of feather beds, upholsterers            Mushroom workers            Musicians            Paper workers            Peat workers            Pool attendants            Printers            Restorers            Shellfish processors, jewellery</p>	<p>Extrinsic allergic bronchiolo-bronchitis</p>		<p>German language</p>
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Authors/year	Title	Occupation(s)	Disease	Allergen, microorganism	Remarks
Sennekamp J, Forster F., 2012	Occupational extrinsic allergic bronchiolo-bronchitis	Tobacco workers Waste sorters Winegrowers Woodworkers, carpenters, joiners, caretakers (wood heating), parquet layers	Extrinsic allergic bronchiolo-bronchitis		German language
Smit, L.A.M., 2012	Respiratory health effects in agricultural workers: Are some more susceptible than others?	Agriculture (farmers)	Asthma	High molecular weight allergens such as those from citrus red mites	
Stanhope, J., Carver, S., Weinstein, P., 2015	The risky business of being an entomologist: A systematic review	Entomologists	Allergic reactions up to anaphylactic, including asthma	Insects; allergic reactions were associated with exposure to Coleoptera, Lepidoptera, Araneae, Blattodea, Orthoptera, Diptera, Hymenoptera, Ixodidae, Trombidiformes, Hemiptera, Isoptera, Neuroptera, Sarcoptiformes and Mesostigmata	
Tarlo, S.M., Lemiere, C., 2014	Occupational asthma	Agriculture (farmers, greenhouse workers)	Asthma	Animal allergens, plants, insects	
		Laboratory workers		Animal allergens, fungi, enzymes	
		Veterinary practice		Animal allergens	
		Food processing		Cereals and grains, enzymes, milk powder, egg powder and other foods	
		Office workers		Fungi	

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		Printers including carpet makers		Vegetable gums	
		Seafood processing		Fish, crustaceans	
Trafny, E.A., 2013	Microorganisms in metalworking fluids: Current issues in research and management	Metal industry	Hypersensitivity pneumonitis	<i>Mycobacterium immunogenum</i>	Various bacteria/fungi are named, but <i>M. immunogenum</i> is considered the primary suspect for HP
Westall, L., Graham, I.R., Bussell, J., 2015	A risk-based approach to reducing exposure of staff to laboratory animal allergens	Laboratory animal personnel	Asthma, hypersensitivity reactions, urticaria	Urinary proteins	
Zacharisen, M.C., Fink, J.N., 2011	Hypersensitivity pneumonitis and related conditions in the work environment	Agriculture (farmers)	Hypersensitivity pneumonitis (farmer's lung disease, bagasse's, tobacco worker's disease, wine grower's lung, peat moss processor's lung, mushroom picker's lung)	Fungi	
		Animal/bird industry	Hypersensitivity pneumonitis (pheasant rearer's lung)	Phytase enzyme, soybean hulls, pheasant	
		Detergent industry	Hypersensitivity pneumonitis	<i>Bacillus subtilis</i>	

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		Food industry (meat, dairy, milling, malt, soy)	Hypersensitivity pneumonitis (cheese worker's lung, wheat weevil disease, malt worker's lung)	Fungi, insect (weevil)	
		Laboratory workers	Hypersensitivity pneumonitis (gerbil keeper's lung)	Rat or gerbil urinary proteins	
		Machine operators/metalworkers	Hypersensitivity pneumonitis	<i>Mycobacterium immunogenum</i> , <i>Pseudomonas</i>	
Zacharisen, M.C., Fink, J.N., 2011	Hypersensitivity pneumonitis and related conditions in the work environment	Musicians (trombone)	Hypersensitivity pneumonitis	<i>Mycobacterium chelonae</i> , <i>Fusarium</i>	
		Textile/clothing industry	Hypersensitivity pneumonitis	Endotoxin, animal proteins (fur, shell dust, silkworm larvae cocoon fluff)	
		Wood processing	Hypersensitivity pneumonitis	Wood dust, fungi ( <i>Paecilomyces</i> , <i>Penicillium glabrum</i> , <i>Cryptostroma corticale</i> , <i>Alternaria</i> , <i>Rhizopus</i> , <i>Mucor</i> , <i>Pullaria</i> )	
Zahradnik, E., Raulf, M., 2014	Animal allergens and their presence in the environment	Agriculture (farmers)	Asthma	Animals (cattle, horses; lipocalin proteins)	
		Laboratory workers	Allergic reactions	Animals (rodents; lipocalin proteins)	
		Veterinary practice	Asthma	Horses (dander; lipocalin proteins)	

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Zukiewicz-Sobczak W. et al., 2013b	Allergenic potential of moulds isolated from buildings	Indoor workers (office workers; agricultural-food industry; museum, library and archive staff; art conservators)	Asthma, rhinitis, conjunctivitis, urticaria, atopic dermatitis	Mould spores ( <i>Penicillium</i> spp., <i>Aspergillus</i> spp. and <i>Cladosporium</i> spp.)	Spores of moulds can also cause infectious diseases and especially attack the lungs of people with strong immune system deficiency (patients with cancer or AIDS)
Zukiewicz-Sobczak W.A. et al., 2013a	Farmers' occupational diseases of allergenic and zoonotic origin	Agriculture	Allergic alveolitis, bronchial asthma, allergic rhinitis, allergic conjunctivitis, dermatitis, organic dust toxic syndrome	Moulds of genus <i>Penicillium</i> , <i>Aspergillus</i> and <i>Alternaria</i> (asthma); plant and animal allergens (eczema); organic dusts (allergic lung diseases)	
Zukiewicz-Sobczak, W.A., 2013	The role of fungi in allergic diseases	Agriculture (farmers)	Alveolitis alergica (farmer's lung)	Fungi	

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<b>Not considered</b>					
Barber, C.M., et al., 2012	Systematic review of respiratory case definitions in metalworking fluid outbreaks				It was concluded that workers exposed to metalworking fluids are at risk of allergic alveolitis and asthma; however, the cause is not discussed and no relation with biological agents is documented; publication not relevant
Barnes M., 2010	Occupational asthma				Could not be retrieved
Baur, X., 2013	A compendium of causative agents of occupational asthma				List of occupational asthma allergens without occupational context
Baur, X., Bakehe. P., 2014	Allergens causing occupational asthma: An evidence-based evaluation of the literature				List of occupational asthma allergens without occupational context
Bessonneau, V., 2011	Study of the spatial and temporal variability in volatile organic compounds contamination in different indoor environments				Could not be retrieved; French language

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Authors/year	Title	Occupation(s)	Disease	Allergen, microorganism	Remarks
Betelli, L., 2013	Development and evaluation of a method based on real time PCR for bioaerosols characterisation (application to the actinomycetes group). (Développement et évaluation d'une méthode fondée sur la PCR temps réel pour la caractérisation des bioaérosols: application au groupe des actinomycètes)				French language
Cımrın, A.H., Göksel, Ö., Demirel, Y.S., 2010	General aspects of hypersensitivity pneumonitis in Turkey				No occupational data included; publication not relevant
EU-OSHA, 2011	Legionella and Legionnaires' disease: a policy overview				Publication not relevant
EU-OSHA, 2013a	Priorities for occupational safety and health research in Europe 2013-2020				The article is prospective; the allergens are hypothetical and undefined; publication not relevant
Feary J.R., 2012	Asthma and allergic disease: Their relation with <i>Necator americanus</i> and other helminth infections				Reviews potential reduction of asthma through helminth infection. Not occupation related; publication not relevant

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Authors/year	Title	Occupation(s)	Disease	Allergen, microorganism	Remarks
Gabrio, T., Weidner, U., 2010	Occurrence health and allergological relevance of mould from point of view of environmental and occupational medicine indoor hygiene and epidemiology [Vorkommen und gesundheitliche sowie allergologische Relevanz von Schimmelpilzen aus der Sicht der Umweltmedizin]				German language; concerns school children. Not relevant for occupational exposure
Jeebhay, M.F., Cartier, A., 2010	Seafood workers and respiratory disease: An update				Updated version exists (Jeebhay, 2012). Therefore, not further evaluated
Peden, D.B., Bush, R.K., 2014	Advances in environmental and occupational disorders in 2013				No occupational information included; publication not relevant
Peden, D.B., Bush, R.K., 2015	Advances in environmental and occupational disorders in 2014				No occupational information included; publication not relevant
Perotin, J.-M. et al., 2012	Occupational asthma and rhinitis in Champagne vineyard workers				Could not be retrieved; French language; information gleaned from abstract

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Authors/year	Title	Occupation(s)	Disease	Allergen, microorganism	Remarks
Lavoie, J. et al., 2013	Development of a control banding method for selecting respiratory protection against bioaerosols				Publication not relevant
Liebers, V., Brüning, T., Raulf-Heimsoth, M., 2015	Molecular patterns and immune system — PAMPs MAMPs; DAMPs: Relevance for allergy and occupational airway diseases [Molekulare Muster und Immunsystem — PAMPs MAMPs DAMPs: Was ist relevant für Allergien und (berufliche) Atemwegserkrankungen?]				German language; immune mechanism related; publication not relevant
Müsken, H., Franz, J.-T., 2011	Storage mites — Most important allergens of agriculture in Germany [Vorratsmilben — Wichtigste Inhalationsallergene der Landwirtschaft in Deutschland]				Could not be retrieved
Poole, J.A., 2012	Farming-associated environmental exposures and effect on atopic diseases				Study focused on reduced allergenicity related to living on farms; not relevant for occupational exposure

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Authors/year	Title	Occupation(s)	Disease	Allergen, microorganism	Remarks
Raulf, M., et al., 2014	Monitoring of occupational and environmental aeroallergens: EAACI position paper				Paper on monitoring allergens. No specific information present on biological agents related to diseases and/or occupations; publication not relevant
Reynolds, S.J., et al., 2013	Systematic review of respiratory health among dairy workers				Article makes no distinction between allergens, chemicals, biological agents and/or disease. Therefore, insufficient relation between health effects and biological agents in farmers; publication not relevant
Sauni R., et al., 2013	Remediating buildings damaged by dampness and mould for preventing or reducing respiratory tract symptoms, infections and asthma				Article describes decrease in effects on renovation of buildings, not induction of disease. Moreover, no clear distinction between effect of moulds/high humidity, etc.; publication not relevant

## 5C Overview of literature evaluated on monitoring systems

(For full references, see Annex 3, Part 3C)

Reference	Monitoring system(s)	Occupational disease(s)	Biological agent(s)	Limitation(s)/remarks
Biradavolu et al., 2015	Monitoring system in question concerns the distribution of condoms and prevention of HIV; not registration of occupational disease	HIV infection, other STIs	HIV virus	The system is experimental, and some of the sex workers recruited into the initiative commit human errors regarding documentation
Cheng et al., 2011b	No monitoring system for occupational disease. Monitoring system in question concerns proper hand hygiene	N/A	N/A	N/A
EU-OSHA, 2014	Various (national) registers and databases (see p. 14) discuss carcinogens in general, presumably including biological agents (a minority)	Cancer	Various viruses, bacteria, fungi, bacterial and fungal toxins particularly in the food industry and waste management	Awareness and knowledge are considered very low for (physical and) biological factors
Flynn and Reid, 2012	An Irish hospital registers occupational blood exposure in healthcare workers and documents the incidence of seroconversion	Miscellaneous pathogens, HIV, hepatitis B	Blood-borne pathogens	Specialised (prophylactic) protocols for blood exposure, may not be representative. Additionally, the human element was identified as a critical limitation. Study was sometimes unable to identify the biological agent owing to patient unavailability, lack of patient ability or lacking/incomplete documentation. Speculated about issues of worker error (unexpected exposure due to non-compliance with safety standards, underreporting, incomplete recall of details due to blood exposure stress)
Gurung et al., 2011	A monitoring system run by Avahan is mentioned, but,	Primarily HIV	Sexually transmissible infectious agents	No information provided on the specifics of the monitoring system.

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Reference	Monitoring system(s)	Occupational disease(s)	Biological agent(s)	Limitation(s)/remarks
	given that it concerns STIs, the system monitors people, not their exposure			(Diseases described in this article would not be considered occupational (except possibly for sex workers))
Kuhar et al., 2013	NaSH is mentioned briefly, but only as a source of data	HIV	Pathogens borne by blood, body fluids, transferable via needlestick/sharps injury	N/A
Labrèche et al., 2014	Article does not discuss monitoring systems. It uses cancer data from various sources, though none are specifically linked to biological agents	Cancer	N/A	N/A
Lehman et al., 2012	No monitoring system. Article describes an inspection of safety standards, not monitoring of occupational disease	N/A	Blood-borne pathogens	N/A
Lewis et al., 2013	The purpose of the article is the detection of respiratory disease inside individuals; the causal biological agent is not part of the monitoring system	Respiratory disease	N/A	Monitoring system is intended to detect disease based on an individual's lung function, not connect that disease to the responsible biological agent
MacCannell et al., 2010	EpiNET, NHSC, NaSH, Department of Public Health: Massachusetts Sharps Injury Surveillance and Prevention Project and Boston Occupational Health Surveillance Program	Primarily hepatitis B and C	Pathogens borne by blood, body fluids, transferable via needlestick/sharps injury	Voluntary, so limited by participants. Article does not discuss monitoring systems in depth
Mehta et al., 2010	An Indian hospital registers possible exposure through needlestick injuries in healthcare workers and documents the incidence of sero-conversion	Risks exist of miscellaneous pathogens, HIV, hepatitis B. Because of 'universally successful' prophylaxis, no occupational disease was found	Pathogens borne by blood, body fluids, transferable via needlestick injury	Small scale (single hospital). Monitoring system is combined with pre- and post-exposure prophylaxis

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Reference	Monitoring system(s)	Occupational disease(s)	Biological agent(s)	Limitation(s)/remarks
Moscato et al., 2014	Article itself describes no monitoring system; individual clinics possibly have them	Asthma	Flour, latex, animal dander	Patients are already asthmatic; clinic monitoring systems could determine the causal biological agent to be occupational, but they would lack workplace information
Sabatini et al., 2013	The monitoring system monitors the emissions in the air, not human health. No occupational disease is observed by the researchers	N/A	Most emphasis is on chemical pollutants. Biological agents mentioned are primarily bacterial and fungal bioaerosols	N/A
Serdar et al., 2013	A Croatian hospital registers possible exposure through needlestick and sharps injuries in healthcare workers and documents the incidence of seroconversion	Primarily HIV, hepatitis B and C	Pathogens borne by blood, body fluids, transferable via needlestick/sharps injury	Small scale (single hospital). Monitoring system is combined with pre- and post-exposure prophylaxis
Yacisin et al., 2015	The monitoring system described in the article monitors the progression of Ebola virus disease in individuals. It does not monitor occupational exposure	N/A	Ebola virus	N/A (while Ebola may be interpreted as an occupational disease for a humanitarian aid worker in Africa, the second-hand infections discussed in this article may not)

N/A = No information is available

## 5D Overview of literature evaluated on databases

(For full references, see Annex 3, Part D)

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Reference	Database	Biological agents	Occupational diseases
Alavian et al., 2010	N/A	Animal matter	N/A
Bonneterre et al., 2010	Rnv3p database	None mentioned in article, possibly extant in database	All
Cadeddu et al., 2011	N/A — database mentioned indexes healthcare workers personal information, not their health	N/A	N/A
Camacho-Ortiz et al., 2013	Hospital database, records type of exposure and to what agent	Various blood-borne pathogens	Various
Chai et al., 2013	Databases mentioned are legal, not medical	N/A	N/A
Courandier et al., 2010	Health hazard list is referenced; article does not go into detail	Various	Various
Crewe et al., 2016	SABRE: voluntary registration of occupational asthma in Australia; small scale	Article mentions various agents that may cause asthma, but these are not necessarily part of the SABRE database	Asthma
Dulon et al., 2015 (in German)	Data on cases of occupational infectious diseases in healthcare workers were taken from the database of the Institution for Statutory Accident Insurance and Prevention in the Health and Welfare Services (BGW) (assumed that database contains information about all registered occupational diseases in the healthcare sector that are covered by this insurance)	N/A	Occupational infectious diseases (code: BK 3101), including tuberculosis, hepatitis B and C and scabies among others
Edison et al., 2014	N/A	N/A	N/A
Eskandarani et al., 2014	Hospital database	Various blood-borne pathogens	Various

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Reference	Database	Biological agents	Occupational diseases
Fähnrich et al., 2015	N/A	N/A	N/A
Ghonim et al., 2013	N/A	N/A	N/A
Haamann et al., 2011a	Data on cases of MRSA in healthcare workers were taken from the database of the Institution for Statutory Accident Insurance and Prevention in the Health and Welfare Services (BGW) (assumed that database contains information about all registered occupational diseases in the healthcare sector that are covered by this insurance)	MRSA	MRSA
Haamann et al., 2011b (in German)	Same study and database as described in Haamann et al., 2011a	MRSA	MRSA
Holden et al., 2011	WORC study; focused on depression, not occupational disease linked to biological agents	N/A	N/A
Honda et al., 2012	Hospital database records occupational health	Influenza	Influenza
Kakar et al., 2010	Clinic databases	Article does not go into detail	STDs
Koehoorn et al., 2013	Canadian 'provincial health registry'	N/A	N/A
Leedom et al., 2010	N/A	MRSA	MRSA
Lollis et al., 2010	National death index: registers cause of death	N/A	N/A
Moraes et al., 2013	None mentioned, databases referenced are probably national disease registers	<i>Bordetella pertussis</i>	Pertussis

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Reference	Database	Biological agents	Occupational diseases
Myong et al., 2013	KCOMWEL: registers compensation for confirmed occupational diseases	Various biological pathogens, primarily those contacted by healthcare workers	Various
Patrician et al., 2011	MiINOD: database of adverse events occurring to nurses	Various	Various
Rajaram et al., 2014	Private data	HIV, STDs	HIV, STDs
Rosenman et al., 2015	AOEC: web listing of substances and agents that sensitise or irritate, related to asthma	Organic material is included in the listing; article does not go into detail	Asthma
Stocks et al., 2016	Various mentioned, none examined closely. Primary databases mentioned are THOR, RNV3P, EUROSTAT and SHIELD	Presumably various. Example given in article is work with laboratory animals	Allergy, asthma
Suijkerbuijk et al., 2014	Clinic databases	STDs	STDs
Tang et al., 2013	Clinic database	Various STDs	Various STDs
Te Beest et al., 2010	N/A	N/A	N/A
Walters et al., 2013	SHIELD: voluntary registration of occupational asthma by UK physicians; small scale	None mentioned in article, possibly extant in database	Asthma
Walters et al., 2015	SHIELD: voluntary registration of occupational asthma by UK physicians; small scale	Presumably various. Example given in article is work with laboratory animals	Asthma
Wang et al., 2014	NHISD: Taiwan's National Health Insurance Research Database	Presumably various	Presumably various
Wariki et al., 2012	N/A	N/A	N/A

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Reference	Database	Biological agents	Occupational diseases
Wu et al., 2010	NHISD: Taiwan's National Health Insurance Research Database	Presumably various	Presumably various
Zhang et al., 2013	NCAIDS: Chinese national HIV/STD surveillance	HIV, STDs	HIV, STDs

N/A = No information is available

## 5E Overview of literature evaluated with respect to Directive 2000/54/EC

(For full references, see Annex 3, Part 3E)

Authors	Article name	Context	Relevant information	Remarks
Basketter et al., 2010	Defining occupational and consumer exposure limits for enzyme protein respiratory allergens under REACH	Review of occupational and consumer respiratory exposure to allergenic enzyme protein	No direct mention of Directive 2000/54; no discussion of 2000/54-related measures to limit exposure	Article is concerned with safe exposure limits; does not discuss measures of remaining under those limits
Brewczynska et al., 2015	The influence of the workplace-related biological agents on the immune systems of emergency medical personnel	Review of the effect of biological agents on medical personnel	Directive 2000/54 is mentioned mainly in the context of being inflexible	Review concerns itself with a situation in which Directive 2000/54 cannot be reliably adhered to. While preventative measures are easy to ensure in a controlled environment such as a laboratory, jobs in which emergencies are expected do not have this opportunity
EU-OSHA, 2009	Biological agents and pandemics: Review of the literature and national policies	Policy review; Directive 2000/54 gets a minor mention	The directive is potentially difficult to adhere to; risk assessment is considered difficult, and good practices are not always developed	No concrete information with regard to the topic
EU-OSHA, 2011a	Legionella and Legionnaires' disease: A policy overview	Policy overview concerning legionella-related diseases	Directive 2000/54 is noted to lack specific instructions for legionella	Overview, not review; lacks relevant information and provides no opinion on Directive 2000/54
EU-OSHA, 2011b	Factsheet 100 — Legionella and legionnaires' disease: European policies and good practices	Concise fact sheet of Dontas et al., 2011		
EU-OSHA, et al., 2013a	Green jobs and occupational safety and health: Foresight on new and emerging risks associated with new technologies by 2020 — Report	Predictive report concerning green jobs and OSH	Owing to the prospective nature of the report, no review of the directive or its implications	Article stresses risk assessment associated with green jobs; technically implies insufficiency of directive, though risk assessment is an obvious course of action to recommend

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Authors	Article name	Context	Relevant information	Remarks
EU-OSHA, 2013c	Priorities for occupational safety and health research in Europe: 2013-2020	Summary of Sas and Suarez, 2014	No direct mention of Directive 2000/54	
EU-OSHA, 2013d	Priorities for occupational safety and health research in Europe: 2013-2020 — Summary report	Report on prospective focuses of health research in the coming decade	Directive 2000/54 is mentioned in the context of being insufficient protection alone	This publication suggests in-depth study of individual biohazards is required. The implication exists that rough classification is insufficient, but no data are provided
Hofmann, 2010	Biological hazards in working life [Tätigkeitsbedingte biologische Belastungen]	Describes the classification of microbiological agents, significance of infectious diseases in working life and different methods of prevention in general in view of the current national and European regulations	The German and Austrian 'Biostoffverordnung' are derived from a European directive. No direct mention of 2000/54, merely a summary of available knowledge. No statements with regard to the current regulations	Description of the evolution of the subject of biological agents and infectious diseases. There are no reliable data on the epidemiology of occupational infectious diseases in Germany, since the statutory accident insurance system is severely fragmented. A significant proportion of cases of tuberculosis and hepatitis B (10-17 %) is considered to be occupational. With regard to control measures, prevention of accidents with sharp objects and use of personal protective equipment are mentioned
Lessmann et al., 2011	Classification of skin sensitizing substances: A comparison between approaches used by the DFG-MAK Commission and the European Union legislation	Comparison of German and European approaches to classifying skin-sensitising substances	No direct mention of 2000/54	Directive 2000/54 is a relatively generalised approach to risk management; substances are broadly classified, and this article raises the point that such classification is not without complications

## Annex 6: More detailed output from the Dutch registration system for occupational diseases

Table A6-1: Overview of reported occupational diseases known to be caused by exposure to biological agents, divided among the various categories of causes as indicated for biological agents (based on publicly available database) (2011-2015)

Diagnosis	Cause																			
	Bacteria					Viruses					Parasites					Fungi				
	2011	2012	2013	2014	2015	2011	2012	2013	2014	2015	2011	2012	2013	2014	2015	2011	2012	2013	2014	2015
<b>A409:</b> Tuberculosis	2	0	3	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>A439:</b> Other zoonoses	12	17	13	18	24	2	0	1	0	0	0	1	4	0	2	0	0	0	0	0
<b>A489:</b> Late effects of certain infectious diseases	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0
<b>A499:</b> Other infectious diseases	1	1	4	4	3	3	5	3	10	8	4	5	2	7	5	0	0	0	0	0
<b>A670:</b> Toxic inhalation fever	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>A677:</b> Allergic reaction	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>D409:</b> Unspecified viral infection characterised by skin and mucous membrane lesions	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0
<b>D419:</b> Fungal infection of skin and adnexa/superficial mycosis, unspecified	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	3	3	2
<b>D609:</b> Local infection of skin and subcutaneous tissue, unspecified	2	2	1	4	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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Diagnosis	Cause																			
	Bacteria					Viruses					Parasites					Fungi				
	2011	2012	2013	2014	2015	2011	2012	2013	2014	2015	2011	2012	2013	2014	2015	2011	2012	2013	2014	2015
<b>D610:</b> Atopic dermatitis, unspecified	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>D611:</b> Contact dermatitis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0
<b>D619:</b> Dermatitis, unspecified	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
<b>N400:</b> Viral infection of central nervous system	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0
<b>R409:</b> Respiratory tuberculosis	2	3	2	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>R501:</b> Corrosion of respiratory tract	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>R600:</b> Acute nasopharyngitis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>R602:</b> Acute upper respiratory infection, unspecified	0	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>R603:</b> Allergic rhinitis/hay fever/pollinosis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1
<b>R604:</b> [Chronic] sinusitis	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	1	0	1
<b>R609:</b> Disease of upper respiratory tract, unspecified	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>R611:</b> Airway disease due to specific organic dust/pneumoconiosis/byssinosis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>R612:</b> Occupational asthma	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1

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Diagnosis	Cause																			
	Bacteria					Viruses					Parasites					Fungi				
	2011	2012	2013	2014	2015	2011	2012	2013	2014	2015	2011	2012	2013	2014	2015	2011	2012	2013	2014	2015
<b>R613:</b> Hypersensitivity pneumonitis/extrinsic allergic alveolitis	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	2	1	0	2
<b>R619:</b> Respiratory conditions due to unspecified external agent	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
<b>R629:</b> Pleural condition, unspecified	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>R649:</b> Acute bronchitis	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
<b>R659:</b> Pneumonia	1	4	3	2	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
<b>R660:</b> Chronic bronchitis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
<b>R661:</b> Emphysema	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>R669:</b> Chronic obstructive pulmonary disease, unspecified	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
<b>R679:</b> Asthma (aggravated by work)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	1	0	2	0
<b>R699:</b> Other respiratory disorders	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>S400:</b> Intestinal infection	1	1	1	5	3	21	1	3	6	7	0	1	0	2	3	0	0	0	0	0
<b>S402:</b> Hepatitis B (acute) (viral)	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>S403:</b> Other forms of viral hepatitis	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0

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Diagnosis	Cause																			
	Bacteria					Viruses					Parasites					Fungi				
	2011	2012	2013	2014	2015	2011	2012	2013	2014	2015	2011	2012	2013	2014	2015	2011	2012	2013	2014	2015
<b>TOTAL (all diagnoses, incl. other than the ones listed above)</b>	<b>33</b>	<b>46</b>	<b>38</b>	<b>54</b>	<b>66</b>	<b>29</b>	<b>10</b>	<b>14</b>	<b>18</b>	<b>17</b>	<b>45</b>	<b>8</b>	<b>13</b>	<b>11</b>	<b>45</b>	<b>4</b>	<b>7</b>	<b>7</b>	<b>11</b>	<b>8</b>

Table A6-1 (continued): Overview of (some of the) reported occupational diseases known to be caused by exposure to biological agents, divided among the various categories of causes as indicated for biological agents (based on publicly available database) (2011-2015)

Diagnosis	Cause																					
	Plants/vegetable-based products					Animals					Other biological agents					Total	TOTAL (all causes)					
	2011	2012	2013	2014	2015	2011	2012	2013	2014	2015	2011	2012	2013	2014	2015		2011	2012	2013	2014	2015	2011-2015
<b>A409:</b> Tuberculosis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	2	0	3	2	1	8
<b>A439:</b> Other zoonoses	0	0	0	0	0	1	0	0	0	2	0	0	0	1	2	100	15	18	18	19	31	101
<b>A489:</b> Late effects of certain infectious diseases	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1	0	1	0	0	2
<b>A499:</b> Other infectious diseases	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	66	8	12	10	22	16	68
<b>A670:</b> Toxic inhalation fever	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2	1	0	0	3
<b>A677:</b> Allergic reaction																7						
<b>D409:</b> Unspecified viral infection characterised by skin and mucous membrane lesions	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1	0	1	0	0	2
<b>D419:</b> Fungal infection of skin and adnexes/superficial mycosis, unspecified	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	13	2	2	3	7	8	22
<b>D609:</b> Local infection of skin and subcutaneous tissue, unspecified	0	0	0	0	0	0	1	0	0	0	0	1	2	1	0	18	7	5	3	13	7	35

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Diagnosis	Cause																					
	Plants/vegetable-based products					Animals					Other biological agents					Total	TOTAL (all causes)					
	2011	2012	2013	2014	2015	2011	2012	2013	2014	2015	2011	2012	2013	2014	2015		2011	2012	2013	2014	2015	2011-2015
<b>D610:</b> Atopic dermatitis, unspecified	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	3	8	7	3	6	27
<b>D611:</b> Contact dermatitis	5	3	7	6	2	1	1	1	3	0	1	1	0	3	1	37	101	91	124	169	148	633
<b>D619:</b> Dermatitis, unspecified	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	3	14	17	7	2	7	47
<b>N400:</b> Viral infection of central nervous system	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	1	1	0	0	2
<b>R409:</b> Respiratory tuberculosis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	2	3	2	1	2	10
<b>R501:</b> Corrosion of respiratory tract	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	1
<b>R600:</b> Acute nasopharyngitis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	2
<b>R602:</b> Acute upper respiratory infection, unspecified	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	4	2	0	1	4	0	7
<b>R603:</b> Allergic rhinitis/hay fever/pollinosis	2	5	6	11	0	1	1	1	0	0	1	0	1	0	1	33	6	7	10	19	6	48
<b>R604:</b> [Chronic] sinusitis	2	0	0	0	0	0	0	0	0	0	0	0	0	1	0	7	5	4	4	3	3	19
<b>R609:</b> Disease of upper respiratory tract, unspecified	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	3	3	4	3	21

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Diagnosis	Cause																					
	Plants/vegetable-based products					Animals					Other biological agents					Total	TOTAL (all causes)					
	2011	2012	2013	2014	2015	2011	2012	2013	2014	2015	2011	2012	2013	2014	2015		2011	2012	2013	2014	2015	2011-2015
<b>R611:</b> Airway disease due to specific organic dust/pneumoconiosis/byssinosis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2
<b>R612:</b> Occupational asthma	5	6	14	7	4	2	0	1	4	2	1	0	0	3	1	53	18	9	20	33	19	99
<b>R613:</b> Hypersensitivity pneumonitis/extrinsic allergic alveolitis	0	0	0	0	2	0	0	0	0	0	1	0	0	0	0	10	5	2	2	1	4	14
<b>R619:</b> Respiratory conditions due to unspecified external agent	0	0	0	0	2	0	0	1	1	0	1	0	0	0	2	8	8	4	12	8	14	46
<b>R629:</b> Pleural condition, unspecified	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
<b>R649:</b> Acute bronchitis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	0	1	3
<b>R659:</b> Pneumonia	0	0	0	0	0	0	0	0	0	0	0	0	1	2	0	15	2	4	9	7	2	24
<b>R660:</b> Chronic bronchitis	2	0	0	0	0	0	0	0	0	0	1	0	0	0	0	4	8	3	10	23	26	70
<b>R661:</b> Emphysema	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	1	6	16	6	36
<b>R669:</b> Chronic obstructive pulmonary disease, unspecified	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	3	11	6	8	14	3	42

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Diagnosis	Cause																					
	Plants/vegetable-based products					Animals					Other biological agents					Total	TOTAL (all causes)					
	2011	2012	2013	2014	2015	2011	2012	2013	2014	2015	2011	2012	2013	2014	2015		2011	2012	2013	2014	2015	2011-2015
<b>R679:</b> Asthma (aggravated by work)	4	0	2	0	1	0	0	2	1	0	0	0	0	1	0	17	21	8	16	20	20	85
<b>R699:</b> Other respiratory disorders	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	2	4	7	5	2	2	20
<b>S400:</b> Intestinal infection	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	56	22	3	5	13	13	56
<b>S402:</b> Hepatitis B (acute) (viral)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	1
<b>S403:</b> Other forms of virus hepatitis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	1	0	1	0	2
<b>TOTAL (all diagnoses)</b>	22	14	34	33	12	6	3	9	10	5	7	4	5	16	11	675	6,989	6,451	6,391	8,513	8,073	36,417

\*Total number of reported cases for which biological agents were indicated as the cause of the disease, combined for the period 2011-2015

Table A6-2: Overview of reported occupational diseases known to be caused by exposure to biological agents, divided among occupations for which > 5 % of the total registered occupational disease are related to biological agents (based on publicly available database)

Diagnosis *	Occupation																			
	Officers	Petty officers	Scientists and engineers	Specialists in healthcare	Specialised specialists in healthcare	Caregivers	Trained farmers (market production)	Trained foresters, fishers and hunters (market production)	Farmers, cattle breeders, fishers, hunters and gatherers	Metal, machinery and related trades workers	Craftspeople and printing staff	Food processing occupations, carpenters, tailors and other artisans	Maintenance of stationary equipment	Assemblers	Domestic helpers and cleaners	Unskilled workers in agriculture, forestry and fisheries	Auxiliaries in the preparation of foodstuffs	Garbage collectors and processors	Other craftspeople, etc.	Other elementary occupations
<b>A409:</b> Tuberculosis	0	0	0	0	3	3	0	0	0	0	0	0	0	1	0	0	0	0	1	0
<b>A439:</b> Other zoonoses	1	9	3	2	0	0	0	15	8	0	0	2	0	0	4	0	1	8	21	1
<b>A489:</b> Late effects of certain infectious diseases	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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Diagnosis *	Occupation																			
	Officers	Petty officers	Scientists and engineers	Specialists in healthcare	Specialised specialists in healthcare	Caregivers	Trained farmers (market production)	Trained foresters, fishers and hunters (market production)	Farmers, cattle breeders, fishers, hunters and gatherers	Metal, machinery and related trades workers	Craftspeople and printing staff	Food processing occupations, carpenters, tailors and other artisans	Maintenance of stationary equipment	Assemblers	Domestic helpers and cleaners	Unskilled workers in agriculture, forestry and fisheries	Auxiliaries in the preparation of foodstuffs	Garbage collectors and processors	Other craftspeople, etc.	Other elementary occupations
<b>A499: Other infectious diseases</b>	0	1	4	2	3	12	0	0	0	0	2	0	0	0	0	0	2	0	2	0
<b>A670: Toxic inhalation fever</b>	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	1
<b>A677: Allergic reaction</b>	0	0	0	0	1	1	2	0	0	0	2	2	0	0	1	0	0	0	0	0

Diagnosis *	Occupation																			
	Officers	Petty officers	Scientists and engineers	Specialists in healthcare	Specialised specialists in healthcare	Caregivers	Trained farmers (market production)	Trained foresters, fishers and hunters (market production)	Farmers, cattle breeders, fishers, hunters and gatherers	Metal, machinery and related trades workers	Craftspeople and printing staff	Food processing occupations, carpenters, tailors and other artisans	Maintenance of stationary equipment	Assemblers	Domestic helpers and cleaners	Unskilled workers in agriculture, forestry and fisheries	Auxiliaries in the preparation of foodstuffs	Garbage collectors and processors	Other craftspeople, etc.	Other elementary occupations
<b>D409:</b> Unspecified viral infection characterised by skin and mucous membrane lesions	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>D419:</b> Fungal infection of skin and adnexes/superficial mycosis, unspecified	0	0	0	0	0	0	0	1	0	0	0	2	0	0	0	0	0	1	2	0
<b>D609:</b> Local infection of skin and subcutaneous tissue, unspecified	2	0	0	1	0	3	0	0	1	0	2	1	0	0	4	0	0	1	5	2

Diagnosis *	Occupation																			
	Officers	Petty officers	Scientists and engineers	Specialists in healthcare	Specialised specialists in healthcare	Caregivers	Trained farmers (market production)	Trained foresters, fishers and hunters (market production)	Farmers, cattle breeders, fishers, hunters and gatherers	Metal, machinery and related trades workers	Craftspeople and printing staff	Food processing occupations, carpenters, tailors and other artisans	Maintenance of stationary equipment	Assemblers	Domestic helpers and cleaners	Unskilled workers in agriculture, forestry and fisheries	Auxiliaries in the preparation of foodstuffs	Garbage collectors and processors	Other craftspeople, etc.	Other elementary occupations
<b>D610:</b> Atopic dermatitis, unspecified	0	0	0	0	1	4	0	0	0	0	2	0	0	2	1	1	0	0	1	0
<b>D611:</b> Contact dermatitis	0	2	1	12	18	71	4	0	3	5	17	63	10	21	9	3	2	27	13	31
<b>D619:</b> Dermatitis, unspecified	0	1	0	0	1	3	0	0	0	0	0	1	0	1	1	0	0	1	2	2
<b>N400:</b> Viral infection of central nervous system	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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Diagnosis *	Occupation																				
	Officers	Petty officers	Scientists and engineers	Specialists in healthcare	Specialised specialists in healthcare	Caregivers	Trained farmers (market production)	Trained foresters, fishers and hunters (market production)	Farmers, cattle breeders, fishers, hunters and gatherers	Metal, machinery and related trades workers	Craftspeople and printing staff	Food processing occupations, carpenters, tailors and other artisans	Maintenance of stationary equipment	Assemblers	Domestic helpers and cleaners	Unskilled workers in agriculture, forestry and fisheries	Auxiliaries in the preparation of foodstuffs	Garbage collectors and processors	Other craftspeople, etc.	Other elementary occupations	
<b>R409:</b> Respiratory tuberculosis	0	0	0	0	1	5	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
<b>R501:</b> Corrosion of respiratory tract	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
<b>R600:</b> Acute nasopharyngitis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
<b>R602:</b> Acute upper respiratory infection, unspecified	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	1	

Diagnosis *	Occupation																			
	Officers	Petty officers	Scientists and engineers	Specialists in healthcare	Specialised specialists in healthcare	Caregivers	Trained farmers (market production)	Trained foresters, fishers and hunters (market production)	Farmers, cattle breeders, fishers, hunters and gatherers	Metal, machinery and related trades workers	Craftspeople and printing staff	Food processing occupations, carpenters, tailors and other artisans	Maintenance of stationary equipment	Assemblers	Domestic helpers and cleaners	Unskilled workers in agriculture, forestry and fisheries	Auxiliaries in the preparation of foodstuffs	Garbage collectors and processors	Other craftspeople, etc.	Other elementary occupations
<b>R603:</b> Allergic rhinitis/hay fever/pollinosis	0	0	1	0	1	1	1	0	0	0	19	2	0	0	2	0	0	1	1	1
<b>R604:</b> [Chronic] sinusitis	0	0	0	0	1	0	0	0	0	0	1	1	0	2	0	0	0	1	1	1
<b>R609:</b> Disease of upper respiratory tract, unspecified	0	0	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2

Diagnosis *	Occupation																			
	Officers	Petty officers	Scientists and engineers	Specialists in healthcare	Specialised specialists in healthcare	Caregivers	Trained farmers (market production)	Trained foresters, fishers and hunters (market production)	Farmers, cattle breeders, fishers, hunters and gatherers	Metal, machinery and related trades workers	Craftspeople and printing staff	Food processing occupations, carpenters, tailors and other artisans	Maintenance of stationary equipment	Assemblers	Domestic helpers and cleaners	Unskilled workers in agriculture, forestry and fisheries	Auxiliaries in the preparation of foodstuffs	Garbage collectors and processors	Other craftspeople, etc.	Other elementary occupations
<b>R611:</b> Airway disease due to specific organic dust/pneumoconiosis/byssinosis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>R612:</b> Occupational asthma	0	0	5	2	1	0	3	0	1	0	28	8	1	3	3	1	0	6	2	7
<b>R613:</b> Hypersensitivity pneumonitis/extrinsic allergic alveolitis	0	0	0	0	3	0	2	1	1	0	0	1	0	0	1	0	0	0	1	0

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Diagnosis *	Occupation																			
	Officers	Petty officers	Scientists and engineers	Specialists in healthcare	Specialised specialists in healthcare	Caregivers	Trained farmers (market production)	Trained foresters, fishers and hunters (market production)	Farmers, cattle breeders, fishers, hunters and gatherers	Metal, machinery and related trades workers	Craftspeople and printing staff	Food processing occupations, carpenters, tailors and other artisans	Maintenance of stationary equipment	Assemblers	Domestic helpers and cleaners	Unskilled workers in agriculture, forestry and fisheries	Auxiliaries in the preparation of foodstuffs	Garbage collectors and processors	Other craftspeople, etc.	Other elementary occupations
<b>R619:</b> Respiratory conditions due to unspecified external agent	0	0	1	1	1	0	1	0	1	0	0	4	0	1	0	0	0	2	1	6
<b>R629:</b> Pleural condition, unspecified	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
<b>R649:</b> Acute bronchitis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>R659:</b> Pneumonia	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	1	0	0	2	3

Diagnosis *	Occupation																			
	Officers	Petty officers	Scientists and engineers	Specialists in healthcare	Specialised specialists in healthcare	Caregivers	Trained farmers (market production)	Trained foresters, fishers and hunters (market production)	Farmers, cattle breeders, fishers, hunters and gatherers	Metal, machinery and related trades workers	Craftspeople and printing staff	Food processing occupations, carpenters, tailors and other artisans	Maintenance of stationary equipment	Assemblers	Domestic helpers and cleaners	Unskilled workers in agriculture, forestry and fisheries	Auxiliaries in the preparation of foodstuffs	Garbage collectors and processors	Other craftspeople, etc.	Other elementary occupations
<b>R660:</b> Chronic bronchitis	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	1	1	2
<b>R661:</b> Emphysema	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	2
<b>R669:</b> Chronic obstructive pulmonary disease, unspecified	0	0	0	0	0	1	0	0	0	0	0	2	0	1	0	1	0	2	0	5
<b>R679:</b> Asthma (aggravated by work)	0	0	2	0	1	3	0	1	0	3	5	0	0	2	0	1	1	2	1	2

Diagnosis *	Occupation																			
	Officers	Petty officers	Scientists and engineers	Specialists in healthcare	Specialised specialists in healthcare	Caregivers	Trained farmers (market production)	Trained foresters, fishers and hunters (market production)	Farmers, cattle breeders, fishers, hunters and gatherers	Metal, machinery and related trades workers	Craftspeople and printing staff	Food processing occupations, carpenters, tailors and other artisans	Maintenance of stationary equipment	Assemblers	Domestic helpers and cleaners	Unskilled workers in agriculture, forestry and fisheries	Auxiliaries in the preparation of foodstuffs	Garbage collectors and processors	Other craftspeople, etc.	Other elementary occupations
<b>R699:</b> Other respiratory disorders	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	1	0	2
<b>S400:</b> Intestinal infection	0	0	1	3	5	32	0	0	2	0	0	0	0	1	0	0	0	0	1	0
<b>S402:</b> Hepatitis B (acute) (viral)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>S403:</b> Other forms of virus hepatitis	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Diagnosis *	Occupation																			
	Officers	Petty officers	Scientists and engineers	Specialists in healthcare	Specialised specialists in healthcare	Caregivers	Trained farmers (market production)	Trained foresters, fishers and hunters (market production)	Farmers, cattle breeders, fishers, hunters and gatherers	Metal, machinery and related trades workers	Craftspeople and printing staff	Food processing occupations, carpenters, tailors and other artisans	Maintenance of stationary equipment	Assemblers	Domestic helpers and cleaners	Unskilled workers in agriculture, forestry and fisheries	Auxiliaries in the preparation of foodstuffs	Garbage collectors and processors	Other craftspeople, etc.	Other elementary occupations
Total number of reported cases for selected diseases	3	13	18	24	46	148	13	18	17	73	8	79	92	12	36	26	8	6	56	59
Total number of reported cases (all diseases)	40	75	182	269	448	1,534	72	35	53	974	59	281	811	139	336	312	96	74	526	744
% of selected diseases compared with all reported diseases	7.5	17.3	9.9	8.9	10.3	9.6	18.1	51.4	32.1	7.5	13.6	28.1	11.3	8.6	10.7	8.3	8.3	8.1	10.6	7.9

\*The number of reported occupational diseases per occupation is based on a summation over the years 2011-2015.

Table A6-3: Overview of (some of the) reported occupational diseases known to be caused by exposure to biological agents, divided among age groups (based on publicly available database)

Diagnosis	Age group																			
	< 21 years					21-30 years					31-40 years					41-50 years				
	2011	2012	2013	2014	2015	2011	2012	2013	2014	2015	2011	2012	2013	2014	2015	2011	2012	2013	2014	2015
<b>A409:</b> Tuberculosis	0	0	0	0	0	1	0	1	0	1	0	0	0	0	0	0	0	2	0	0
<b>A439:</b> Other zoonoses	0	0	1	0	0	3	1	3	1	5	5	6	2	2	4	4	5	5	3	10
<b>A489:</b> Late effects of certain infectious diseases	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0
<b>A499:</b> Other infectious diseases	0	0	0	0	0	0	2	0	1	2	2	3	3	9	3	5	4	3	4	4
<b>A670:</b> Toxic inhalation fever	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
<b>A677:</b> Allergic reaction	0	0	0	0	0	2	1	0	1	0	0	0	1	2	0	1	0	1	1	1
<b>D409:</b> Unspecified viral infection characterised by skin and mucous membrane lesions	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0
<b>D419:</b> Fungal infection of skin and adnexes/superficial mycosis, unspecified	0	0	0	0	0	0	0	0	1	2	0	1	1	2	0	1	1	2	1	1
<b>D609:</b> Local infection of skin and subcutaneous tissue, unspecified	0	0	0	0	0	1	0	0	2	3	3	2	1	3	1	2	0	1	3	2

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Diagnosis	Age group																			
	< 21 years					21-30 years					31-40 years					41-50 years				
	2011	2012	2013	2014	2015	2011	2012	2013	2014	2015	2011	2012	2013	2014	2015	2011	2012	2013	2014	2015
<b>D610:</b> Atopic dermatitis, unspecified	0	0	0	0	0	2	2	0	1	1	1	3	1	0	1	0	0	3	1	2
<b>D611:</b> Contact dermatitis	1	4	1	3	1	10	10	18	27	14	31	19	26	27	35	27	31	39	41	37
<b>D619:</b> Dermatitis, unspecified	0	0	0	0	0	1	3	1	1	0	2	1	1	0	2	3	6	1	0	1
<b>N400:</b> Viral infection of central nervous system	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0
<b>R409:</b> Respiratory tuberculosis	0	0	0	0	0	0	1	2	0	0	1	0	0	0	0	1	1	0	1	0
<b>R501:</b> Corrosion of respiratory tract	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
<b>R600:</b> Acute nasopharyngitis	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>R602:</b> Acute upper respiratory infection, unspecified	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	2	0
<b>R603:</b> Allergic rhinitis/hay fever/pollinosis	0	0	0	0	0	1	1	3	3	1	1	3	2	6	2	1	1	2	6	1
<b>R604:</b> [Chronic] sinusitis	0	0	0	0	0	1	2	1	0	1	1	1	0	2	0	2	0	1	1	1
<b>R609:</b> Disease of upper respiratory tract, unspecified	0	0	0	0	0	1	0	0	2	0	4	1	3	1	1	2	1	0	0	1
<b>R611:</b> Airway disease due to specific organic	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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Diagnosis	Age group																			
	< 21 years					21-30 years					31-40 years					41-50 years				
	2011	2012	2013	2014	2015	2011	2012	2013	2014	2015	2011	2012	2013	2014	2015	2011	2012	2013	2014	2015
dust/pneumoconiosis/byssinosis																				
<b>R612:</b> Occupational asthma	0	1	0	0	0	1	4	5	6	1	4	2	9	5	4	8	1	3	9	7
<b>R613:</b> Hypersensitivity pneumonitis/extrinsic allergic alveolitis	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	1	0	1	0	3
<b>R619:</b> Respiratory conditions due to unspecified external agent	0	0	0	0	0	1	0	1	2	1	0	0	5	1	5	1	1	3	5	3
<b>R629:</b> Pleural condition, unspecified	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>R649:</b> Acute bronchitis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
<b>R659:</b> Pneumonia	0	0	0	0	0	0	0	1	0	0	0	1	2	1	0	0	2	3	2	1
<b>R660:</b> Chronic bronchitis	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	2	0	3	7	8
<b>R661:</b> Emphysema	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	3	0	3	5	1
<b>R669:</b> Chronic obstructive pulmonary disease, unspecified	0	0	0	0	0	0	0	0	2	0	3	2	0	0	0	1	2	2	1	0
<b>R679:</b> Asthma (aggravated by work)	0	1	0	1	0	2	1	1	5	2	6	2	2	3	2	5	3	5	5	10

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Diagnosis	Age group																			
	< 21 years					21-30 years					31-40 years					41-50 years				
	2011	2012	2013	2014	2015	2011	2012	2013	2014	2015	2011	2012	2013	2014	2015	2011	2012	2013	2014	2015
<b>R699:</b> Other respiratory disorders	0	0	0	0	0	1	1	1	1	1	2	1	2	0	0	0	4	1	0	1
<b>S400:</b> Intestinal infection	0	0	0	0	0	7	1	1	2	2	5	1	1	0	3	5	0	2	6	5
<b>S402:</b> Hepatitis B (acute) (viral)	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
<b>S403:</b> Other forms of virus hepatitis	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0
Total number of reported cases for selected diseases	1	6	2	4	1	35	32	40	59	37	74	49	66	66	66	76	66	87	104	100
Total number of reported cases (all diseases)	27	31	21	33	27	428	329	352	528	541	971	895	964	1,344	1,257	2,054	1,944	1,856	2,528	2,294
% of selected diseases compared with all reported diseases	3.7	19.4	9.5	12.1	3.7	8.2	9.7	11.4	11.2	6.8	7.6	5.5	6.8	4.9	5.3	3.7	3.4	4.7	4.1	4.4

Table A6-3 (continued): Overview of (some of the) reported occupational diseases known to be caused by exposure to biological agents, divided among age groups (based on publicly available database)

Diagnosis/Cause	Age group														
	51-60 years					61-70 years					> 70 years				
	2011	2012	2013	2014	2015	2011	2012	2013	2014	2015	2011	2012	2013	2014	2015
<b>A409:</b> Tuberculosis	1	0	0	1	0	0	0	0	1	0	0	0	0	0	0
<b>A439:</b> Other zoonoses	3	6	6	8	12	0	0	1	5	0	0	0	0	0	0
<b>A489:</b> Late effects of certain infectious diseases	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>A499:</b> Other infectious diseases	1	1	3	7	7	0	2	1	1	0	0	0	0	0	0
<b>A670:</b> Toxic inhalation fever	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0
<b>A677:</b> Allergic reaction	0	2	1	3	1	1	0	0	0	0	0	0	0	0	0
<b>D409:</b> Unspecified viral infection characterised by skin and mucous membrane lesions	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>D419:</b> Fungal infection of skin and adnexes/superficial mycosis, unspecified	1	0	0	3	5	0	0	0	0	0	0	0	0	0	0
<b>D609:</b> Local infection of skin and subcutaneous tissue, unspecified	1	2	1	5	0	0	1	0	0	1	0	0	0	0	0
<b>D610:</b> Atopic dermatitis, unspecified	0	2	3	1	2	0	1	0	0	0	0	0	0	0	0
<b>D611:</b> Contact dermatitis	31	24	33	65	53	1	3	7	6	8	0	0	0	0	0
<b>D619:</b> Dermatitis, unspecified	7	6	2	1	4	1	1	2	0	0	0	0	0	0	0
<b>N400:</b> Viral infection of central nervous system	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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Diagnosis/Cause	Age group														
	51-60 years					61-70 years					> 70 years				
	2011	2012	2013	2014	2015	2011	2012	2013	2014	2015	2011	2012	2013	2014	2015
<b>R409:</b> Respiratory tuberculosis	0	0	0	0	1	0	1	0	0	1	0	0	0	0	0
<b>R501:</b> Corrosion of respiratory tract	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>R600:</b> Acute nasopharyngitis	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
<b>R602:</b> Acute upper respiratory infection, unspecified	1	0	0	2	0	1	0	0	0	0	0	0	0	0	0
<b>R603:</b> Allergic rhinitis/hay fever/pollinosis	2	1	3	3	2	1	1	0	1	0	0	0	0	0	0
<b>R604:</b> [Chronic] sinusitis	1	1	2	0	1	0	0	0	0	0	0	0	0	0	0
<b>R609:</b> Disease of upper respiratory tract, unspecified	1	0	0	1	1	0	1	0	0	0	0	0	0	0	0
<b>R611:</b> Airway disease due to specific organic dust/pneumoconiosis/byssinosis	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0
<b>R612:</b> Occupational asthma	3	1	3	11	6	2	0	0	2	1	0	0	0	0	0
<b>R613:</b> Hypersensitivity pneumonitis/extrinsic allergic alveolitis	3	2	1	0	1	0	0	0	0	0	0	0	0	0	0
<b>R619:</b> Respiratory conditions due to unspecified external agent	5	3	3	0	4	1	0	0	0	1	0	0	0	0	0
<b>R629:</b> Pleural condition, unspecified	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
<b>R649:</b> Acute bronchitis	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0
<b>R659:</b> Pneumonia	2	1	2	3	0	0	0	1	1	1	0	0	0	0	0

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Diagnosis/Cause	Age group														
	51-60 years					61-70 years					> 70 years				
	2011	2012	2013	2014	2015	2011	2012	2013	2014	2015	2011	2012	2013	2014	2015
<b>R660:</b> Chronic bronchitis	6	3	5	12	13	0	0	0	4	3	0	0	0	0	0
<b>R661:</b> Emphysema	4	1	3	9	2	0	0	0	2	2	0	0	0	0	0
<b>R669:</b> Chronic obstructive pulmonary disease, unspecified	7	1	4	7	0	0	1	2	4	3	0	0	0	0	0
<b>R679:</b> Asthma (aggravated by work)	8	1	6	5	5	0	0	2	1	1	0	0	0	0	0
<b>R699:</b> Other respiratory disorders	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0
<b>S400:</b> Intestinal infection	3	1	0	5	3	2	0	1	0	0	0	0	0	0	0
<b>S402:</b> Hepatitis B (acute) (viral)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>S403:</b> Other forms of virus hepatitis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total reported cases for selected diseases	<b>92</b>	<b>61</b>	<b>85</b>	<b>154</b>	<b>124</b>	<b>10</b>	<b>12</b>	<b>18</b>	<b>29</b>	<b>22</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
Total reported cases (all diseases)	<b>3,121</b>	<b>2,779</b>	<b>2,610</b>	<b>3,313</b>	<b>3,161</b>	<b>388</b>	<b>473</b>	<b>581</b>	<b>763</b>	<b>787</b>	<b>0</b>	<b>0</b>	<b>7</b>	<b>4</b>	<b>6</b>
% of selected diseases compared with all diseases	<b>2.9</b>	<b>2.2</b>	<b>3.3</b>	<b>4.6</b>	<b>3.9</b>	<b>2.6</b>	<b>2.5</b>	<b>3.1</b>	<b>3.8</b>	<b>2.8</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>

Table A6-4: Overview of reported occupational diseases known to be caused by exposure to biological agents, by gender (based on publicly available database)

Diagnosis	Gender									
	Female					Male				
	2011	2012	2013	2014	2015	2011	2012	2013	2014	2015
<b>A409:</b> Tuberculosis	2	0	2	2	0	0	0	1	0	1
<b>A439:</b> Other zoonoses	3	4	3	0	3	12	14	15	19	28
<b>A489:</b> Late effects of certain infectious diseases	1	0	0	0	0	0	0	1	0	0
<b>A499:</b> Other infectious diseases	4	5	3	9	6	4	7	7	13	10
<b>A670:</b> Toxic inhalation fever	0	0	0	0	0	0	2	1	0	0
<b>A677:</b> Allergic reaction	0	0	1	2	0	4	3	2	5	2
<b>D409:</b> Unspecified viral infection characterised by skin and mucous membrane lesions	1	0	0	0	0	0	0	1	0	0
<b>D419:</b> Fungal infection of skin and adnexes/superficial mycosis, unspecified	0	1	0	2	0	2	1	3	5	8
<b>D609:</b> Local infection of skin and subcutaneous tissue, unspecified	1	0	0	5	1	6	5	3	8	6
<b>D610:</b> Atopic dermatitis, unspecified	2	2	3	1	0	1	6	4	2	6
<b>D611:</b> Contact dermatitis	32	32	36	41	38	69	59	88	128	110
<b>D619:</b> Dermatitis, unspecified	2	1	1	0	4	12	16	6	2	3

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Diagnosis	Gender									
	Female					Male				
	2011	2012	2013	2014	2015	2011	2012	2013	2014	2015
<b>N400:</b> Viral infection of central nervous system	0	0	0	0	0	0	1	1	0	0
<b>R409:</b> Respiratory tuberculosis	1	1	1	1	0	1	2	1	0	2
<b>R501:</b> Corrosion of respiratory tract	0	0	0	0	0	0	0	0	1	0
<b>R600:</b> Acute nasopharyngitis	0	0	0	0	0	0	1	0	1	0
<b>R602:</b> Acute upper respiratory infection, unspecified	1	0	0	3	0	1	0	1	1	0
<b>R603:</b> Allergic rhinitis/hay fever/pollinosis	4	2	2	4	1	2	5	8	15	5
<b>R604:</b> [Chronic] sinusitis	0	1	1	2	1	5	3	3	1	2
<b>R609:</b> Disease of upper respiratory tract, unspecified	5	2	1	3	2	3	1	2	1	1
<b>R611:</b> Airway disease due to specific organic dust/pneumoconiosis/byssinosis	0	0	0	0	0	0	0	2	0	0
<b>R612:</b> Occupational asthma	6	2	9	10	2	12	7	11	23	17
<b>R613:</b> Hypersensitivity pneumonitis/extrinsic allergic alveolitis	3	0	1	0	1	2	2	1	1	3
<b>R619:</b> Respiratory conditions due to unspecified external agent	0	1	1	1	3	8	3	11	7	11
<b>R629:</b> Pleural condition, unspecified	0	0	0	0	0	0	0	0	1	0

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Diagnosis	Gender									
	Female					Male				
	2011	2012	2013	2014	2015	2011	2012	2013	2014	2015
<b>R649:</b> Acute bronchitis	0	0	0	0	0	0	1	1	0	1
<b>R659:</b> Pneumonia	1	1	3	3	0	1	3	6	4	2
<b>R660:</b> Chronic bronchitis	0	0	0	3	0	8	3	10	20	26
<b>R661:</b> Emphysema	0	0	0	0	0	7	1	6	16	6
<b>R669:</b> Chronic obstructive pulmonary disease, unspecified	0	1	2	0	0	11	5	6	14	3
<b>R679:</b> Asthma (aggravated by work)	4	1	7	5	7	17	7	9	15	13
<b>R699:</b> Other respiratory disorders	0	2	0	0	0	4	5	5	2	2
<b>S400:</b> Intestinal infection	20	2	5	8	11	2	1	0	5	2
<b>S402:</b> Hepatitis B (acute) (viral)	0	0	0	0	0	1	0	0	0	0
<b>S403:</b> Other forms of virus hepatitis	0	0	0	0	0	0	1	0	1	0
Total reported cases for selected diseases	<b>93</b>	<b>61</b>	<b>82</b>	<b>105</b>	<b>80</b>	<b>195</b>	<b>165</b>	<b>216</b>	<b>311</b>	<b>270</b>
Total reported cases (all diseases)	<b>1,267</b>	<b>1,044</b>	<b>1,425</b>	<b>2,306</b>	<b>2,244</b>	<b>5,722</b>	<b>5,407</b>	<b>4,966</b>	<b>6,207</b>	<b>5,827</b>
% of selected diseases compared with all diseases	<b>7.3</b>	<b>5.8</b>	<b>5.8</b>	<b>4.6</b>	<b>3.6</b>	<b>3.4</b>	<b>3.1</b>	<b>4.3</b>	<b>5.0</b>	<b>4.6</b>

## Annex 7: More detailed output from the French registration system for occupational diseases

Table A7-1: Case reports related to occupational exposures by biological agents (based on TOE) from 2001 to 2015 in the database rnv3p

Code	Keyword	No of cases
<b>3</b>	<b>biological agent</b>	<b>3,210</b>
<b>31000000</b>	<b>microbiological</b>	<b>800</b>
31000000	<i>microbiological</i>	48
<b>31100000</b>	<b>bacteria</b>	<b>214</b>
31100000	<i>bacteria</i>	74
31106020	<i>actinobacillus actinomycetemcomitans</i>	2
31108000	<i>actinomyces</i>	5
3110M000	<i>arthrobacter</i>	1
3110P000	<i>bacille</i>	9
3110Q000	<i>bacillus</i>	1
31112000	<i>borrelia</i>	3
31112050	<i>borrelia burgdoferi</i>	1
31115000	<i>brucella</i>	1
3111L020	<i>chlamydia psittaci avian or non</i>	1
3111W010	<i>coxiella burnetii</i>	1
31127000	<i>bacterial endotoxin</i>	12
3112G000	<i>bacterial exotoxin</i>	2
3112L030	<i>francisella tularensis type a</i>	1
3112W030	<i>helicobacter pylori</i>	1
31131020	<i>kingella kingae (moraxella kingae)</i>	1

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Code	Keyword	No of cases
31132040	<i>klebsiella pneumoniae</i>	1
31136000	<i>lactobacillus</i>	1
31139000	<i>legionella</i>	3
311390T0	<i>legionella pneumophila</i>	4
3113C000	<i>leptospira</i>	3
3113Q010	<i>micropolyspora faeni</i>	4
31141000	<i>mycobacterium</i>	12
31141090	<i>mycobacterium bovis</i>	4
311410M0	<i>mycobacterium fortuitum fortuitum</i>	1
31141160	<i>mycobacterium marinum</i>	2
31141170	<i>mycobacterium microti</i>	1
31141200	<i>mycobacterium tuberculosis</i>	31
31141220	<i>mycobacterium vaccae</i>	1
31141230	<i>mycobacterium xenopi</i>	4
3114C010	<i>pasteurella aerogenes</i>	1
3115M000	<i>staphylococcus</i>	3
3115M020	<i>staphylococcus aureus</i>	7
3115M0P0	<i>staphylococcus pneumoniae (pneumococcus)</i>	2
3115Q000	<i>streptococcus</i>	2
3115R000	<i>streptomyces</i>	1
31161000	<i>thermoactinomyces</i>	3
31161020	<i>thermoactinomyces vulgaris</i>	3
311ZZ000	<i>other bacteria</i>	4

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Code	Keyword	No of cases
<b>31200000</b>	<b><i>fungi</i></b>	<b>410</b>
31200000	<i>fungi, moulds</i>	252
31210000	<i>ascomycetes</i>	1
31210N02	<i>pichia guilliermondii</i>	1
31210S01	<i>saccharomyces cerevisiae</i>	3
31211000	<i>fungi with ascospores formation</i>	1
31211100	<i>yeast</i>	25
31220000	<i>basidiomycetes</i>	1
31220700	<i>schizophylum</i>	1
3122ZZ00	<i>other basidiomycetes</i>	1
31230000	<i>cryptostroma</i>	8
31240300	<i>alternaria</i>	8
31240301	<i>alternaria alternata</i>	4
31240700	<i>aspergillus</i>	41
3124070A	<i>aspergillus fumigatus</i>	8
3124070D	<i>aspergillus niger</i>	1
31240F00	<i>candida</i>	1
31240F01	<i>candida albicans (candida stellatoidea, candida langeronii)</i>	6
31240H00	<i>cephalosporium (acremonium)</i>	1
31240N00	<i>cladosporium</i>	1
31240S01	<i>cryptococcus neoformans gattii</i>	1
31240W00	<i>dactylaria</i>	1
31242300	<i>penicillium</i>	16

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Code	Keyword	No of cases
31242S00	<i>scytalidium</i>	1
31242W00	<i>stachybotrys</i>	1
31243500	<i>trichophyton</i>	3
3124350H	<i>trichophyton raubitschekii</i>	1
3124350J	<i>trichophyton rubrum</i>	1
31260000	<i>sitophilus</i>	6
312Z0000	<i>other fungi and moulds</i>	14
<b>31300000</b>	<b>parasite</b>	<b>19</b>
31300000	<i>parasite</i>	15
313330Q1	<i>onchocerca volvulus</i>	1
31333170	<i>trichostrongylus</i>	1
313340G7	<i>schistosoma mansoni</i>	1
3136A000	<i>plasmodium</i>	1
3136A010	<i>plasmodium falciparum</i>	1
<b>31400000</b>	<b>virus</b>	<b>109</b>
31400000	<i>virus</i>	40
31410100	<i>avian adenovirus</i>	1
31410200	<i>bovine adenovirus</i>	1
31410700	<i>human adenovirus type c 1 2 5 6</i>	1
3141ZZ00	<i>other adenoviruses</i>	1
31440200	<i>hantavirus</i>	2
31440210	<i>hantaan</i>	1
31480L00	<i>hepatitis c virus hcv vhc</i>	11

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Code	Keyword	No of cases
31490100	<i>hepatitis b virus hbv vhb</i>	18
314A0300	<i>human cytomegalovirus</i>	2
314A0Q00	<i>varicella virus</i>	2
314A0T00	<i>herpes simplex type 2 virus</i>	1
314A0U00	<i>epsteinbarr virus</i>	5
314C0100	<i>papilloma virus</i>	1
314C0110	<i>papilloma virus of animal origin</i>	1
314F0200	<i>parvovirus b19</i>	1
314G0230	<i>porcine enterovirus</i>	1
314G0260	<i>acute haemorrhagic conjunctivitis virus (enterovirus 7c)</i>	1
314G0320	<i>hepatitis a hav virus</i>	1
314M0130	<i>chikungunya virus</i>	1
314N0000	<i>bacteria viruses (virus phages)</i>	5
314Y0000	<i>virus oncogene undefined</i>	11
<b>320000000</b>	<b>animal</b>	<b>987</b>
<b>32100000</b>	<b><i>invertebrate</i></b>	<b>629</b>
32110100	<i>arachnid</i>	3
32110110	<i>mite or scabies</i>	449
32110112	<i>demodex</i>	1
32110114	<i>dermanyssus</i>	1
32110116	<i>dermatophagoïdes pteronyssinus</i>	12
32110117	<i>dermatophagoïdes farinae</i>	6
32110118	<i>glyciphagus</i>	1

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Code	Keyword	No of cases
3211011F	<i>sarcoptes</i>	2
3211011G	<i>sarcoptes scabiei</i>	10
3211011J	<i>trombicula alfreddugesi</i>	4
3211011K	<i>tyroglyphus</i>	1
3211011N	<i>tyrophagus</i>	1
3211011Z	<i>other mites or scabies</i>	30
32110140	<i>ixode tick</i>	6
3211014C	<i>ixode</i>	1
3211014Z	<i>other arachnid</i>	1
32110300	<i>shellfish</i>	23
32110303	<i>shrimp</i>	11
32110400	<i>diplopod</i>	3
32110500	<i>insect</i>	26
32110510	<i>coleopterus</i>	4
32110520	<i>diptera</i>	1
32110525	<i>glossina</i>	1
3211052Y	<i>diptera larvae</i>	1
32110550	<i>hymenoptera</i>	5
32110551	<i>honey bee</i>	3
32110552	<i>bumble bee</i>	3
32110555	<i>wasps</i>	2
32110560	<i>lepidoptera butterfly</i>	1
3211056Y	<i>lepidoptera larvae</i>	5

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Code	Keyword	No of cases
32110570	<i>mosquito</i>	2
321105ZZ	<i>other insect</i>	1
3211ZZ00	<i>other arthropods</i>	1
32120000	<i>coelentera</i>	1
32120100	<i>sea anemone</i>	1
32150300	<i>pelecypoda</i>	1
32150302	<i>mould</i>	1
32150303	<i>clam</i>	1
32150400	<i>hirudine annelida</i>	1
321Z0000	<i>other invertebrate</i>	1
<b>32200000</b>	<b><i>vertebrate</i></b>	<b>358</b>
32210000	<i>amphibia</i>	1
32220000	<i>mammal and cetacean</i>	35
32220400	<i>beef or calf or cow</i>	13
32220800	<i>cat</i>	25
32220A00	<i>horse</i>	5
32220B00	<i>goat</i>	1
32220D00	<i>dog</i>	16
32220H00	<i>pig</i>	7
32220J00	<i>guinea pig</i>	7
32220R00	<i>ferret</i>	1
32220T00	<i>hamster</i>	6
32220U00	<i>rabbit</i>	6

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Code	Keyword	No of cases
32221700	<i>pork</i>	3
32221900	<i>swine</i>	1
32221A00	<i>rat</i>	77
32221F00	<i>mouse</i>	71
3222ZZ00	<i>other mammal and cetacean</i>	2
32230000	<i>bird</i>	30
32230100	<i>budgie</i>	1
32230300	<i>pigeon</i>	7
32230400	<i>chicken</i>	1
32230600	<i>duck</i>	3
32240000	<i>fish</i>	35
32240500	<i>codfish</i>	1
3224ZZ00	<i>other fish</i>	2
322Z0000	<i>other vertebrate</i>	1
<b>33000000</b>	<b>plant material</b>	<b>1,360</b>
<b>33100000</b>	<b>algae</b>	<b>8</b>
33100000	<i>algae</i>	1
33110000	<i>chlorella</i>	2
33120000	<i>prototheca</i>	1
331Z0000	<i>other algae</i>	4
<b>33200000</b>	<b>lichen and bryophyte</b>	<b>6</b>
<b>33300000</b>	<b>tree and plant</b>	<b>1,328</b>
33300000	<i>tree and plant</i>	56

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Code	Keyword	No of cases
33310000	<i>tree and shrub</i>	4
33310200	<i>alder</i>	1
33310300	<i>mahogany</i>	1
33310600	<i>birch</i>	8
33310700	<i>coffee tree</i>	5
33310800	<i>cedar tree</i>	4
33310900	<i>hornbeam tree</i>	1
33310B00	<i>oak tree</i>	25
33310F00	<i>cypress</i>	1
33310K00	<i>eucalyptus</i>	1
33310M00	<i>fraxinus (ash)</i>	2
33310N00	<i>frullania</i>	5
33310R00	<i>beech</i>	5
33310T00	<i>bay</i>	4
33310U00	<i>cork</i>	2
33311200	<i>nut tree</i>	3
33311400	<i>olive tree</i>	2
33311600	<i>palisander</i>	2
33311800	<i>poplar</i>	1
33311900	<i>pine</i>	5
33311A00	<i>plane</i>	1
33311F00	<i>castor bean plant</i>	1
33311G00	<i>fir</i>	7

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Code	Keyword	No of cases
33311L00	<i>teak</i>	4
33311N00	<i>thuya</i>	1
33311P00	<i>tulip tree</i>	2
3331XX00	<i>wood unspecified</i>	110
3331XX01	<i>exotic without precision</i>	82
3331XX02	<i>resinous wood unspecified</i>	14
3331XX03	<i>specified hardwood</i>	38
33320000	<i>flower and green plant</i>	94
33320400	<i>ambrosia</i>	1
33320500	<i>artemisia</i>	13
33320700	<i>artichoke</i>	1
33320800	<i>camomile</i>	2
33320900	<i>carrot</i>	3
33320A00	<i>celery</i>	3
33320B00	<i>chrysanthemum</i>	6
33320J00	<i>geranium pelargonium</i>	2
33320P00	<i>jute (plant)</i>	10
33320R00	<i>lupins</i>	3
33321000	<i>primula</i>	3
33321600	<i>tobacco</i>	282
33321700	<i>tulip</i>	5
3332ZZ00	<i>other flower and green plant</i>	2
33330000	<i>cereal grasses</i>	198

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Code	Keyword	No of cases
33330100	<i>oat</i>	3
33330200	<i>wheat</i>	83
33330300	<i>fescue</i>	1
33330500	<i>maize</i>	6
33330700	<i>barley</i>	3
33330900	<i>rice</i>	1
33330A00	<i>buckwheat</i>	10
33330B00	<i>rye</i>	48
33330C00	<i>soya</i>	7
3333ZZ00	<i>other cereal gramineae</i>	9
33340000	<i>herbaceous plant</i>	15
33340500	<i>beet</i>	1
33340700	<i>rapeseed</i>	1
33340800	<i>gypsophila</i>	1
33340D00	<i>lupin</i>	2
33340P00	<i>seepweeds</i>	13
33340Q00	<i>sunflower</i>	1
3334ZZ00	<i>other herbaceous plant</i>	2
33350000	<i>food plant, vegetable or fruit</i>	46
33350100	<i>garlic</i>	3
33350400	<i>anise</i>	1
33350A00	<i>lemon</i>	1
33350B00	<i>citronella</i>	1

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Code	Keyword	No of cases
33350F00	<i>ginger</i>	1
33350L00	<i>onion</i>	6
33350N00	<i>parsley</i>	2
33350Q00	<i>potato</i>	4
33350R00	<i>radish</i>	1
33351200	<i>tomato</i>	11
33351300	<i>vanilla</i>	1
3335ZZ00	<i>other food plant, vegetable or fruit</i>	13
333Z0000	<i>other vegetable leaf or flower or stem</i>	6
<b>33Z00000</b>	<b><i>other plant material</i></b>	<b>18</b>
<b>3V000000</b>	<b>specific biological rnv3p codes</b>	<b>63</b>
<b>3VY00000</b>	<b><i>various</i></b>	<b>59</b>
3VY10000	<i>chicken</i>	17
3VY20000	<i>rodent</i>	42
<b>3VZ00000</b>	<b><i>other non-listed causal biological agents</i></b>	<b>4</b>

**The European Agency for Safety and Health at Work (EU-OSHA)** contributes to making Europe a safer, healthier and more productive place to work. The Agency researches, develops, and distributes reliable, balanced, and impartial safety and health information and organises pan-European awareness raising campaigns. Set up by the European Union in 1994 and based in Bilbao, Spain, the Agency brings together representatives from the European Commission, Member State governments, employers' and workers' organisations, as well as leading experts in each of the EU Member States and beyond.

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