Asbestos-related occupational diseases in Central and East European Countries

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FOREWORD

This research report is one of the results of the Project: Asbestos-related Occupational Diseases in Europe commissioned and coordinated by the European Federation of Building and Woodworkers (EFBWW) and its project partners International Ban Asbestos Secretariat (IBAS) and the European Trade Union Confederation (ETUC), with the financial support of the European Commission (VS/2012/0256).

EUROGIP conducted a similar campaign in 2006, consequently publishing a report on asbestos-related diseases, which focused on recognition status and procedures, and forms of compensation. The report covered 13 countries, largely in Western and Central Europe (EUROGIP, 2006).

The goal in the current project is to provide the contractor with similar information for 14 Central and East European (CEE) countries: Bulgaria, Croatia, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Serbia, Slovakia, Slovenia, Turkey and Cyprus. This report provides an overview of asbestos-related occupational diseases: the regulations and practice of monitoring and surveillance, recognition and compensation. The report is one crucial element in a complex project by EFBWW and the European Construction Industry Federation (FIEC), whose goals are to a) disseminate information that facilitates social dialogue in Central and East European Member States and candidate countries and b) to improve cooperation between trade unions and asbestos victims organizations.

The report was prepared by the Kooperationsstelle Hamburg IFE. This institute provides national and international services and studies in the field of occupational safety, health and environmental protection, as well as project management, standardization, and labour market development.

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1. Introduction

Whilst asbestos is still responsible for an important and serious burden of disease all over the world, bans of the substance, which were put in place from the 1970s until the 2000s, have now begun to have a positive impact, and rates of mortality may peak in the future. Occupational exposure, however, persists in some countries, despite the fact that use in the workplace is prohibited by EU law. There are many sources of exposure: e.g. materials containing asbestos may still be in use where inventories and decontaminations are rare, poor handling of hazardous waste containing asbestos, lack of information about exposed locations.

EU-Legislation has established protective and preventive rules for asbestos exposure risks in the workplace. Article 8 of the ILO Convention 121 on 'Employment Injury Benefits' (1964) sets out how occupational diseases are to be identified and recognised, and which diseases entitle workers to compensation. This convention has thus far been ratified by twenty four countries. Legal provisions on compensation for victims in European countries are varied. In this context, more attention is focussed on recognition procedures and regulations, as well as the quality and quantity of compensation throughout Europe.

1.1. Asbestos properties

Asbestos is a descriptive term given to a group of minerals that occur naturally in the environment as bundles of fibres. Asbestos minerals are divided into two major groups: serpentine asbestos and amphibole asbestos. Serpentine asbestos includes the mineral chrysotile, which has long, curly fibres that can be woven. Chrysotile asbestos is the form that has been used most widely in commercial applications. Amphibole asbestos includes the minerals actinolite, tremolite, anthophyllite, crocidolite and amosite. Amphibole asbestos has straight, needle-like fibres that are more brittle than those of serpentine asbestos and are more limited in their ability to be fabricated (NCI, 2013). The WHO describes fibres critical to human health as fibres having an aspect ratio of 3:1 or greater, a diameter below 3 µm and a length greater than 5 µm (IARC, 2002)[1]. Asbestos types and CAS (Chemical Abstracts Service) Registry Numbers are shown in table 1.

Asbestos combines high qualities, in some applications still unmatched, with low price.
Asbestos:

- is resistant to heat up to 1,000°C
- is resistant to many aggressive chemicals
- has good electrical and thermal insulating properties
- has high elasticity and tensile strength
- is easily incorporated into binding materials.

1. For details of asbestos such as chemical/ physical properties, human health effects, environmental fate and exposure or occupational exposure standards see the Toxicology Data Network (TOXNET)

Table 1: Asbestos types followed by CAS number

Asbestos type	CAS number	Other common names
Asbestos	1332-21-4	Unspecified
Asbestos serpentine		
Chrysotile	12001-29-5	White asbestos
Asbestos amphibole		
Asbestos amosite	12172-73-5	Brown asbestos
Asbestos anthophyllite	77536-67-5	Grey asbestos
Asbestos actinolite	77536-66-4	Unspecified
Crocidolite	12001-28-4	Blue asbestos
Asbestos tremolite	77536-68-6	Tremolite

CAS - Chemical Abstracts Service Registry Number

Commercial exploitation, with little thought for environmental controls, increased over the 20th century, particularly in the period of strong economic growth after 1945. The unique technical properties led to a boom in consumption; asbestos was used in huge quantities in buildings or ships, and also for many smaller applications, such as cigarette filters. In the first substitution projects of the 1980s, alternatives for more than 3,000 technical applications had to be found.

1.2. Asbestos use

Data on the production, export and import of asbestos and asbestos containing materials is incomplete.

The main data sources used in this report[2]:

- US Geological Survey (hereafter USGS)
- British Geological Survey (hereafter BGS)
- European Association of Mining Industries, Metal Ores & Industrial Minerals (hereafter Euromines)

Data that was missing from the main sources was obtained via auxiliary sources, if available.

World production of asbestos was estimated to be 1.98 million tons in 2012. According to the United States Geological Survey (USGS, 2013), Russia was the leading producer of asbestos, followed by China, Brazil, Argentina, Kazakhstan and Canada. These six countries accounted for 99% of world production in 2013 (table 2).

2. Statistical data used for this chapter are present in the annex

Table 2: Asbestos world production in metric tons (USGS, 2012 and USGS, 2013)

Country	2007	2008	2009	2010	2011	2012
Argentina	282.00	298.00	290.00	300.00	NA	NA
Brazil	254.00	288.00	288.00	302.00	302.00	300.00
Canada	180.00	160.00	150.00	100.00	50.00	-
China	390.00	380.00	440.00	400.00	440.00	440.00
India	21.00	20.00	19.00	20.00	19.00	NA
Kazakhstan	293.00	230.00	230.00	214.00	223.00	240.00
Russia	1,030.00	1,020.00	1,000.00	1,000.00	1,000.00	1,000.00
Zimbabwe	84.00	11.50	4.97	2.40	-	NA
Total	2,250.00	2,110.00	2,130.00	2,040.00	2,030.00	1,980.00

NA not available, - Zero

The world has still 200 million tons of identified resources of asbestos. Most resources are placed in Canada, China, Kazakhstan and Russia. An overview of the world resources is presented in table 3.

Table 3: Asbestos world resources (USGS, 2013)

Country	Reserves
United States	small
Brazil	moderate
Canada	large
China	large
Kazakhstan	large
Russia	large
Other countries	moderate
World total	large

According to the USGS, four Eastern European countries produced asbestos between 1990 and 2010: Serbia, Slovakia, Bulgaria and Romania. The leading producer was Serbia with 2,680 to 4,500 tons annually between 2003 and 2006.

An overview of production, export and import covering the years 2000 to 2010 from the British Geological Survey (BGS: 2006, 2010 and 2012) indicates that Slovakia was the main producer of asbestos with 200 to 1,000 tons annually between 2006 and 2008, followed by Bulgaria with 66 tons in 2000. Turkey was the leading exporter of asbestos in 2003 (42,000 tons), followed by Lithuania and Bulgaria.

Import data indicate large asbestos-related use in Eastern and Central European countries between 2000 and 2010. The negative health impact of this massive use will be felt for many years. In 1992, Hungary became the first country in the region to ban the processing of asbestos.

Turkey and Romania imported approx. 10,000 tons annually, followed by Croatia, Czech Republic, Hungary, Slovenia and Latvia. Bulgaria, Estonia and Poland imported up to 500 tons per year. Lithuania imported 1,356 tons in 2006 only. No import data can be found by BGS for Serbian.

EUROMINES data shows that, for the years 2003-2006, Serbian asbestos production annually exceeded 100 tons. According to the Serbian Customs Administration, Serbia imported 2 tons of asbestos that was contained in tapes and seals in 2009 (EPTISA and PM, 2007).

According to the Hungarian Central Statistics Office, 3.7 tons of pure asbestos and approx. 17,800 tons of asbestos products were imported into Hungary in 2010. Approx. 3,000 tons of asbestos products were exported (NLO, 2013). It should be noted that EU Directive 1999/77/EC, banning all types of asbestos use, came into force on 1st January 2005. Moreover, Directive 2003/18/EC bans the extraction of asbestos and the manufacture and processing of asbestos products.

Data from Croatia suggests that approx. 1,500 tons of insulation and construction materials containing asbestos were produced in that country between 2008 and 2010 (NIPH, 2013), despite the 2005 ban.

Sectors with significant asbestos use were: the asbestos textile industry, the asbestos cement industry (sheets, pipes), the construction industry (processing of asbestos cement products), the chemical industry (fillers for paints and sealant materials, synthetic resin materials, thermoplastics, rubber products, filters), insulation industry (heat, sound and fire insulation), paper industry (asbestos paper, cord board), brake and clutch lining manufacture, shipbuilding and wagon construction. Exposure to asbestos fibres is also significant during demolition, renovation and maintenance work.

Exposure to asbestos fibres can occur when asbestos-containing materials are removed or maintained. Companies and workers specialised in removing asbestos should be instructed on how to deal safely with these materials. Other workers can unintentionally be exposed to asbestos-containing materials.
There is also non-occupational asbestos exposure. Turkey, for example, has widespread natural deposits of asbestos central and eastern regions. 1,320 cases of mesothelioma were recognised in Turkey between 2005 and 2009 (WHO, 2011). Some cases, however, may have been due to environmental asbestos exposure.

The European Framework Directive (89/391/EC) on Safety and Health at work established basic rules for the protection of the health of asbestos exposed workers. It sets out obligations for employers and workers, particular with regard to limiting accidents at work and occupational diseases. The Directive also aims to improve worker training, information and consultation.

Providing information about safer substitutes as well as developing economic and technological mechanisms to stimulate substitution should be a major goal of the current asbestos policies in occupational health. The SUBSPORT Substitution Portal[3], for example, presents numerous materials available to replace asbestos-cement construction materials and other asbestos products. Substitutes include synthetic and natural fibres such as polyvinyl alcohol, polypropylene, cellulose, softwood pulp, bamboo, sisal, coir, rattan shavings and tobacco stalks with optional silica fume, fly ash, or rice husk ash, etc. (SUBSPORT - 2013, WHO - 2005).

3. Useful information on substitution including relevant legislation, tools and successful examples are presented on the SUBSPORT website at www.subsport.eu

1.3. Medical consequences

The health hazards of asbestos had already been recognised in the late 19th century. In 1973, the International Agency for Research on Cancer (IARC) Monograph Working Group concluded that there was sufficient evidence for carcinogenicity in humans and in cancer bioassays. All asbestos types have harmonised classification, according to CLP Regulation (No 1272/2008): H350 - May cause cancer, H372 - Causes damage to organs through prolonged or repeated exposure.

Asbestos is dangerous for human health when it is inhaled. Even low concentrations of asbestos dust in the atmosphere can cause very serious diseases. Asbestos is dangerous because its fibres have a crystalline structure. When they are handled mechanically, the fibres split lengthwise into increasingly fine fibrils, which can be spread over a large area. If they are inhaled during handling, it is difficult for the body to break them down or get rid of them.

Asbestos fibres may stay in the lung tissue for many years, and can cause various diseases. Therefore, exposure to airborne asbestos fibres must be minimized. All asbestos-related diseases have a long latency period (usually between 10 and 40 years from the start of exposure). The risk raises with both the length of exposure as well its intensity. Table 4 shows a short overview of asbestos-related diseases on the national lists of occupational disease in CEE countries.

Table 4: Asbestos-related occupational diseases in CEE countries

Main diseases	• Asbestosis • Mesothelioma (pleura, peritoneum, pericardium) • Lung cancer • Pleural plaques
Other diseases	• Acute and chronic bronchitis • Bronchial cancer • Gastrointestinal cancer • Laryngeal cancer • Pericardial thickening and plaques • Pleural thickening, effusion, hyalinosis, exudates and atelectasis
Latency period	• 10 to 40 years
Factors	• Fibre type, size and dose • Length and type of exposure (work, home, environment) • Smoking • Pre-existing lung diseases

The following section provides information about asbestos-related diseases from the IBAS database[4] (modified).

Asbestosis - This condition is a scarring of the lung tissue that hinders the elasticity of the lung. This restricts expansion of the lungs and delays their ability to exchange gases, leading to inadequate oxygen in the blood. It results in victims experiencing very unpleasant shortness of breath, and in severe cases it can be fatal. This disease can take between 15-20 years from initial exposure to the onset of the disease.

Lung cancer - Lung cancer is a disease of uncontrolled cell growth in the tissues of the lung which form a malignant tumour. The tumour then grows through the surrounding tissue obstructing the air passage. Lung Cancer is also commonly caused by smoking. This disease can take up to 20 years between initial exposures to the onset of the disease; this delay is referred to as the latency period.

Mesothelioma - Considered the most severe asbestos-related disease. This form of cancer mainly affects the pleura (lining surrounding the lungs) and peritoneal (lining surrounding the lower digestive tract), but can also develop in the pericardium (double layered membrane covered the heart) or tunica vaginalis (serous covering of the testis). It is almost exclusively connected with exposure to asbestos. It can take 30-40 years between initial exposure to the onset of the disease, and fatality is almost certain within one or two years of diagnosis. There is no cure for this disease.

Other cancer types - Other tumours to which asbestos has been linked include carcinoma of the larynx, bronchi and kidney and other location such as gastrointestinal tract cancer.

Other respiratory diseases - Pleural disease is the most commonly encountered manifestation of asbestos-related disease. The pleurae are thought to be more sensitive to asbestos than the lung parenchyma (functional parts of lung). Pleural disease can occur as pleural effusion (excess fluid that accumulates between the two pleural layers, the fluid-filled space that surrounds the lungs), plaques (discrete fibrous or partially calcified thickened area), hyalinosis (hyaline degeneration), or thickening (scarring, calcification, and/or thickening of the pleura), as well as atelectasis (collapse or closure of the lung resulting in reduced or absent gas exchange). Pleural plaques tend to occur 20–30 years after exposure. The only known medical reason for this disease is asbestos. Pleural thickening is a chronic condition with no cure, and the latency period is normally ten years.

Acute and chronic bronchitis can also result from occupational or environmental asbestos exposure. Bronchitis means that the tubes that carry air to the lungs are inflamed and irritated. Acute bronchitis usually comes on quickly and gets better after two to three weeks. It can be more serious in the elderly, children, and those with other health problems. Chronic bronchitis keeps coming back and can last a long time. The patient has a cough with mucus most days of the month for three months of the year, and for at least two years in a row.

4. IBAS – International Ban Asbestos Secretari at, http://www.ibasecretariat.org/

1.4 Legal Issues

In the 1970s, some European countries took the first measures to control asbestos use, including the first prohibitions.

The Asbestos Convention of ILO C162 (1986) the 'Safety in the use of asbestos' was issued by the International Labour Conference in 1986.

The European Union has banned all use of asbestos (1907/2006/EC) and extraction, manufacture and processing of asbestos products (2003/18/EC).

The following table displays a chronological list of national asbestos bans, according to CEE countries that are covered by this study (IBAS (2013), modified):

Year	Event
1992	**Hungary** bans processing of non-chrysotile asbestos
1993	**Croatia** bans crocidolite and amosite
1996	**Slovenia** bans production and trade of asbestos products
1997	**Poland** bans asbestos
1998	**Czech Republic** bans the import of asbestos **Lithuania** issues first law restricting asbestos use; ban expected by 2004
2001	**Latvia** bans asbestos (exemption for asbestos products already installed, which must, however, be labelled) **Hungary** bans amphibolite asbestos products
2002	**Slovak Republic** announces plans to adopt EU asbestos restrictions banning all asbestos
2003	**Hungary** bans asbestos cement products
2005	**Bulgaria** bans the import, production and use of all types of asbestos and asbestos products **EU** bans chrysotile asbestos **Cyprus**, the **Czech Republic**, **Estonia**, **Hungary**, **Lithuania**, **Romania** and **Slovakia** ban all forms of asbestos and asbestos products, under EU rules until 2005.
2006	**Croatia** bans asbestos, as of January 1, 2006. Six weeks later, the manufacturing asbestos-containing products for export was again permitted. However, upon some indications that the ban is not as strictly enforced as Croatian laws demand.
2007	**Romania** bans the marketing and use of asbestos and asbestos-containing products as of January 1, 2007, with a one year exemption until January 1, 2008, allowing the use of existing chrysotile-containing diaphragms for selected electrolysis processes.
2010	**Turkey** bans the use of all types of asbestos by national regulation as of December 31, 2010 with the implementation of legislation issued in the Official Gazette on August 29, 2010.

1.5. Methodology

The project consisted of three stages:

1. Preparatory stage, including literature review, development of templates for a survey to national experts, identification of experts
2. Data collection (survey plus literature)
3. In-depth analysis, workshop, synthesis and reporting

The access to information sources differs across countries, thus data collection and analysis was based on various sources:

- Desk research, literature review
- National data based on literature and interviews, provided by national experts
- Documentation, email contacts and interviews with occupational disease experts, experts from social partner associations, and other stakeholder representatives
- Conference participation, e.g. Seminar on Raising Asbestos In-depth Awareness, Warsaw, Oct 2012; Seminar on Recognition and Compensation of Asbestos Related Diseases in Europe, Brussels, Sept 2012

In this research study, prepared between Nov. 2012 and August 2013, 61 national experts from government and non-government organisations from 14 CEE countries were asked to provide us with information on asbestos-related diseases, recognition and compensation rules. Finally, we received no responses from Bulgaria. The following organisations provided specific national information:

◊ Cyprus: Department of Labour Inspection
◊ Croatia: National Institute of Public Health
◊ Czech Republic: Department of Occupational Medicine, Charles University in Prague
◊ Estonia: Järva County Vocational Training Center
◊ Hungary: National Labour Office, Department of Occupational Health; Ministry of Rural Development; Central Statistics Office
◊ Latvia: Ministry of Welfare, Institute of Occupational safety and environmental health
◊ Lithuania: Institute of Hygiene; State Labour Inspectorate, Department of Accidents and Occupational Diseases: Forest and Wood Industry Workers Trade Union Federation
◊ Poland: Labour Hygiene Division, Department of Environmental Hygiene
◊ Romania: National Institute of Public Health; National House of Public Pensions
◊ Serbia: University of Belgrade, Serbian Institute of Occupational Health
◊ Slovakia: Regional Authority of Public Health, Dpt. Occupational Health and Toxicology; Public Health Authority of the Slovak Republic
◊ Slovenia: University Medical Center in Ljubljana, Clinical Institute of Occupational, Traffic and Sports Medicine
◊ Turkey: Turkish Medical Association; Istanbul Health and Safety Labour Watch

The template used for a survey to national experts can be found in Annex 1.

2. Recognition of occupational asbestos-related diseases

Generally, the legislation in CEE countries has followed the recommendations of international agencies such as the ILO and the World Health Organization. Additionally, 2003/670/EC included recommendations for recognition, compensation, prevention, target setting, recording and reporting of occupational diseases that shall be adopted nationally.

According to the 2002 Protocol of the ILO Occupational Safety and Health Convention, 1981 (No. 155), the term "occupational disease" covers any disease contracted as a result of exposure to risk factors arising from work activity.

The ILO Recommendation No. 121 from 1964, Paragraph 6(1), defines occupational diseases in the following terms: "Each Member should, under prescribed conditions, regard diseases known to arise out of the exposure to substances and dangerous conditions in processes, trades or occupations as occupational diseases."

The ILO definition of an occupational disease has two main elements: first, a causal relationship between exposure in a specific working environment or work activity and a specific disease; second, the disease occurs among a group of exposed persons with a frequency significantly higher than the average morbidity in the rest of the population.

The EU list of occupational diseases includes six diseases caused by asbestos inhalation, (2003/670/EC):

- Asbestosis
- Mesothelioma
- Complication of asbestosis in the form of bronchial cancer
- Fibrotic diseases of the pleura, with respiratory restriction
- Lung cancer
- Laryngeal cancer[5]

Asbestosis, Mesothelioma, Lung cancer and pleural laques are recognised as the main occupational asbestos-related diseases.

All EU Member States covered by this study have adopted the EU list of occupational diseases into their own legal framework. These lists are established for recognition and compensation purposes. EU candidate countries, **Serbia** and **Turkey**, have also introduced the EU-list into their own legislation. National lists of occupational diseases from CEE countries are described in table 5.

The EU list of diseases only indicates the kind of disease and/or causative agent; it does not include the criteria for causation, such as dose-response relationships, or exposure duration. The national lists also vary, as they are components of different national legal systems. Some are worded in a quite open and general way, whilst others contain concrete terms and specific definitions. In **Bulgaria** and the **Czech Republic**, for example, the list of occupational diseases itself contains useful information for the diagnosis of diseases.

5. Cancer of the larynx is included on an additional list of diseases (Annex 2) which are suspected of originating in the workplace, and which should be subject to notification. These diseases may be considered at a later stage for inclusion in Annex I to the European schedule.

Article 8 of the ILO Employment Injury Benefits Convention indicates the various possibilities for identification and recognition of occupational diseases that entitle workers to compensation benefits. Generally, there are three systems:

- Open system - every disease proven to be caused by occupational exposure is an occupational disease
- Closed system - only diseases which are listed on the national list of occupational diseases can be recognized as such
- Mixed system - a combination of open and closed systems.

The mixed system is more popular in the CEE counties, and is applied in **Bulgaria**, the **Czech Republic**, **Estonia**, **Hungary**, **Latvia**, **Romania**, **Slovakia**, **Slovenia** and **Turkey**. The closed system is in operation in **Croatia**, **Cyprus**, **Lithuania**, **Poland** and **Serbia**.

Table 5: National lists of occupational diseases by country[6,7]

Country	List of occupational diseases
Bulgaria	List of diseases that are exclusively or primarily caused by harmful factors in the working environment. Other diseases may be recognised where it is found that they have been caused mainly and directly by the usual working activity resulting in permanent incapacity for work or death. Any aggravation or delayed effects of the disease are also covered. The list of diseases is approved by the Council of Ministers.
Croatia	Diseases which are caused by long-term exposure to working conditions and are listed by law, in accordance with ILO Convention No. 121. All enterprises are covered and no minimum periods of exposure are required.
Cyprus	Diseases specified as occupational diseases under the Social Insurance (Benefit) Regulations. Regulations also specify the type of profession which caused the disease.
Czech Republic	Enumerative list of occupational diseases issued by the Ministry of Health.
Estonia	A list of occupational diseases set by the regulation of the Minister of Social Affairs (sotsiaalminister). The list includes certain diseases and physical, physiological and chemical risk factors causing occupational disease or tumour.
Hungary	Recognised diseases appear on a list created and adjusted by the National Health Fund (Egészségbiztosítási Alap), subject to Government decision.
Latvia	List of recognised occupational diseases approved by the Ministry of Welfare (Labklājības ministrija).
Lithuania	The list of occupational diseases is determined by Government decree of 30 November 1994.
Poland	An official list of occupational diseases created and adjusted by Government Resolution of 18 November 1983.
Romania	Occupational diseases are listed in the Appendix to the Norms for the application of the provisions of Law 319, 11 October 2006, on Safety and Health at Work (Legea securitatii si sanatatii in munca), with subsequent amendments. They are defined as afflictions occurring as a result of exercising a trade, caused by harmful physical, chemical or biological workplace factors, or the overburdening of bodily organs or systems during working process (including vocational training for unemployed, apprentices, pupils, and students).

6. The Mutual Information System on Social Protection of the Council of Europe (MISSCEO), http://www.coe.int/t/dg3/socialpolicies/socialsecurity/MISSCEO/missceo_en.asp
7. The Mutual Information System on Social Protection of the European Union (MISSOC), http://ec.europa.eu/social/main.jsp?catId=815&langId=en

Serbia	List of occupational diseases, approved by the Ministry of Labour and Social Policy and the Ministry of Health. These ministries also approve a List of Bodily Injuries. The insurance is applied to all organisations and there is no minimum period of exposure to risk.
Slovakia	List of 47 occupational diseases, mentioned in Annex No.1 of Law No. 461/2003 on Social Insurance (Zákon o sociálnom poistení).
Slovenia	List of occupational diseases, maintained by the Ministry of Labour, Family and Social Affairs (Ministrstvo za delo, družino in socialne zadeve).
Turkey	A list of recognised occupational diseases, included in the Social Insurance Regulation for the Medical Affairs. The list defines the active agents to which a person must have been exposed, and sets minimum exposure periods for the presumption that the disease is occupational in nature. Diseases not on the list may be accepted by the Supreme Health Board of Social Insurance if they are convinced that the disease was caused by working conditions.

The **Bulgarian** list of occupational diseases includes diseases caused by harmful factors in the working environment. Other diseases may be recognised where it is found that they have been caused mainly and directly by the regular working activity, which results in permanent incapacity for work, or death. Any aggravation or delayed effects of the disease are also covered. The insurance for occupational disease is applied to every organisation.

Slovenia has a list of occupational diseases; however, for gastrointestinal cancer and other cancers, the victim has to prove occupational causality (via a complementary system). In **Hungary**, in personal injury lawsuits, the victim must prove occupational causality.

Of the countries with a list, only **Bulgaria** and **Latvia** have a complementary system, through which it is possible to recognise the work-related diseases that do not appear on the national list. This system is more restrictive than the list system, because the onus of proof lies with the victim and not the insurance organization.

2.1. The way of recognition

All CEE countries recognise the main asbestos-related diseases: asbestosis, mesothelioma, and lung cancer. Other non-malignant pleural, pericardial and bronchial diseases are recognised only by some countries as occupational diseases, attributable to inhalation of asbestos fibres. Cancers in other locations such as laryngeal, bronchial and gastro-intestinal, are only recognised by some countries. The other recognised asbestos-related diseases include acute and chronic obstructive bronchitis, and other pleural and pericardial diseases. The table below shows the occupational asbestos-related diseases recognised in CEE countries.

Table 6: Occupational asbestos-related diseases in CEE countries

Country	Asbestosis	Lung cancer	Mesothelioma	Pleural plaques	Others
Bulgaria	Asbestosis	Lung cancer	Malignant pleural mesothelioma	Pleural plaques	Pleural thickenings
Croatia	Lung and pleural asbestosis	Lung cancer	Malignant pleural mesothelioma	Pleural plaques	Bronchial cancer, Laryngeal cancer, Pleural thickening and effusions

Cyprus	Asbestosis	Lung cancer	Mesothelioma	Fibrotic diseases of the pleura, with respiratory restriction	Complication of asbestosis in the form of bronchial cancer, Fibrotic diseases of the pleura, with respiratory restriction, Laryngeal cancer
Czech Republic	Asbestosis	Lung cancer	Mesothelioma	Pleural plaques	Laryngeal cancer, Pleural hyalinosis
Estonia	Asbestosis	Lung cancer	Mesothelioma	Pleural plaques	-
Hungary	Asbestosis	Lung cancer	Mesothelioma	Pleural plaques	Not specified
Latvia	Asbestosis	Lung cancer	Mesothelioma	Pleural plaques	Laryngeal cancer
Lithuania	Asbestosis	Lung cancer	Mesothelioma	Fibrotic diseases of the pleura, with respiratory restriction	Complication of asbestosis in the form of bronchial cancer, Fibrotic diseases of the pleura, with respiratory restriction, Laryngeal Cancer
Poland	Asbestosis	Lung cancer	Pleural and peritoneal mesothelioma	Extensive pleural plaques and pericardium	Diseases of the pleura or pericardium: Extensive pleural thickening, Pleural effusion, Bronchial cancer, Chronic obstructive bronchitis
Romania	Asbestosis	Lung cancer	Pleural and peritoneal mesothelioma	Pleural plaques	Chronic obstructive pulmonary disease, Acute and chronic bronchitis
Serbia	Asbestosis	Malign neoplasms (for lung cancer)	Malign neoplasms (for mesothelioma)	-	-
Slovakia	Asbestosis	Asbestosis with lung Cancer	Pleural mesothelioma	Pleural plaques	-
Slovenia	Asbestosis	Lung cancer	Mesothelioma	Pleural diseases	Pleural diseases, Cancer other locations
Turkey	Asbestosis	Lung cancer	Mesothelioma	Pleural diseases	Rounded atelectasis, Cancer other locations

In **Poland**, the current regulations specify the list of occupational diseases and procedures for diagnosis and medical certification of occupational diseases. The procedure has three stages:

- Reporting a suspected occupational disease
- Diagnosis and medical certification of the disease
- Administrative decision on whether the case can be regarded as an occupational disease

According to the Polish ordinance of the Council of Ministers (Law Gazette No. 86, Point 394), a disease is determined to be occupationally related if it can be judged to be caused by a health hazard occurring in the work environment, and the disease is included in the list of occupational diseases. In the assessment of health hazards, the following factors are taken into account: the degree and duration of occupational exposure and the mode of work. The rules for evaluating the causality of occupational diseases are very similar in **Poland**, **Slovakia**, and the **Czech Republic** (Fabianova et al., 1999).

In **Romania**, the process for the notification of occupational diseases is:

- Flagging up occupational diseases: any suspicion of occupational disease must be flagged up during any medical investigation by a physician, regardless of specialty and workplace
- Occupational disease investigation: an occupational specialist physician from the Department of Public Health investigates the causes of the occupational illness
- Occupational diseases notification: the Romanian notification is made by the public health department, including the statement of the occupational physician who performed the investigation
- Reporting occupational diseases by the public health department to the National Centre for monitoring the risks from the Community environment (in the month of the notification)

Additional information about recognition of occupational asbestos-related diseases can be found in Annex 2.

The type of asbestos-related diseases in CEE countries and the date of entry into the national list of occupational diseases are shown in following table.

Table 7: Recognition of asbestos-related diseases and year of entry onto national lists of occupational diseases

Country	Asbestosis	Lung cancer	Mesothelioma	Pleural plaques	Others
Bulgaria	+	+	+	+	+
Croatia[8]	1990	1990	1990	1990	1990
Cyprus	2007	2007	2007	2007	2007
Czech Republic	1947	1947	1996	1996	1996, 2011
Estonia	2005	2005	2005	2005	-
Hungary	1958	1996	1996	1996	1996
Latvia	+	+	+	+	+
Lithuania	1992	1992	1992	1992	1992
Poland	1976	1976	1976	2002	1976, 1989, 2002
Romania	1985	1998	2005	2005	2005
Serbia	1975	+	+	-	-
Slovakia	1947	2003	2003	-	-
Slovenia	1997	1997	1997	1997	1997
Turkey	1972	1972	1972	1972	1972

+ Date unknown, - no recognition

8. The list of occupational diseases exists voluntary from 1984

Asbestosis was the first disease caused by asbestos to be registered on the national lists of occupational diseases: in **Czechoslovakia** in 1947, followed by **Hungary** (1958), **Serbia** (1975) and **Poland** (1976). **Romania** included asbestosis from the 1980s. 'Young' European countries, such as **Croatia**, **Estonia**, **Latvia**, **Lithuania**, **Slovakia** and **Slovenia**, became independent at the beginning of the 1990s. In **Lithuania**, for example, the new list of occupational diseases (based on European recommendations) was approved in 2006, but some other lists existed before. In the list approved in 1992 asbestos-related diseases were listed too, named as pneumoconiosis and respiratory tumours. Former lists were adopted from former Soviet Union. **Turkey** has a list of occupational diseases, it has included dust-related lung diseases, according to ILO since 1972. All four main asbestos-related diseases are recognised. The last countries to include asbestosis in their lists were **Estonia** (2005) and **Cyprus** (2007).

Pleural plaques are non-malignant diseases, hitherto unrecognised by **Hungary**, **Serbia** and **Slovakia**. This disease was included in the list of occupational diseases by other European countries in the 1990s and 2000s.

Other diseases that are recognised as asbestos-related are **laryngeal**, **bronchial** and **gastrointestinal tract cancer**, as well as **acute** and **chronic obstructive bronchitis**, pleural and pericardial diseases. Table 7 shows that other diseases, attributable to the inhalation of asbestos fibres, are not recognised by all countries as occupational diseases.

Laryngeal cancer was recognised as an occupational disease in the 1990s in **Lithuania**, **Latvia** and **Slovenia. Cyprus**, the **Czech Republic** and **Romania** followed suit in the 2000s. Bronchial cancer was recognised as an occupational disease in **Poland** (1976), **Croatia** (1990), **Lithuania** (2006) and **Cyprus** (2007). Acute bronchitis was included in the national list in **Romania** (2005); chronic obstructive bronchitis in **Poland** (1989). Other pleural diseases are recognised in countries such as **Bulgaria**, **Croatia**, **Czech Republic** and **Poland,** whilst some pericardial diseases are recognised in **Bulgaria** and **Poland**. The **Slovenian** list includes other cancers, but the victim must prove occupational causality (via a complementary system). In **Turkey**, rounded atelectasis and other cancers are also recognised, according to the Turkish occupational diseases list.

2.2. Recognition criteria

The procedures for obtaining a diagnosis for an asbestos-related disease require medical examinations, work histories, and clinical examinations. The chest x-ray is currently the most common tool used to detect asbestos-related diseases. These x-rays cannot detect asbestos fibres in the lungs but they can help identify early signs of lung disease resulting from asbestos exposure (ATSDR, 2001). Studies have shown that computed tomography (CT, a series of detailed pictures of areas inside the body, taken from different angles) may be more effective than conventional chest x-rays for detecting asbestos-related lung abnormalities (ATSDR, 2013). A lung biopsy is a procedure in which tissue samples are removed to confirm the presence of asbestos-related abnormalities. A bronchoscopy is a less invasive test than a biopsy, detecting asbestos fibres in material rinsed out of the lungs.

There are many tools to aid the diagnosis of occupational diseases that are specific for each county. These are mostly handbooks, guidelines and protocols for assessment which are useful for experts when it comes to recognition of claims submitted by victims. Nonetheless, it would be useful to have agreed criteria for diagnosing, recognising, and compensating occupational diseases.

The current document from 2004 'Criteria for the diagnosis of occupational diseases' is a result of the efforts of a new EU expert working group. This updated document was intended as a guide and resource for clinicians, occupational health practitioners, hygienists, scientists, social partners, national authorities, etc. However, the recognition criteria differ from country to country.

Croatia, **Poland** and **Slovakia**, for example, use the 1997 Helsinki criteria for the diagnosis and attribution of asbestosis and cancer. **Cyprus** is currently working on the drafting of national guidelines on diagnostic criteria for occupational diseases, and so relies on the expertise and experience of other European countries. It uses the 2007 document from the German DGUV entitled "Prophylaxis in occupational medicine - Guidelines for occupational medical examination". Cyprus also uses the 2009 Commission document "Information notices on occupational diseases: a guide to diagnosis". In **Latvia** it is the only tool used. **Estonia** has not established a way to recognise occupational diseases.

Bulgaria, the **Czech Republic**, **Hungary**, **Serbia**, **Slovenia** and **Turkey** use the ILO International Classification of Radiographs of Pneumoconioses[9].

In the **Czech Republic**, for example, an occupational disease cannot be reported without being supported by an appropriate hygienist's report. According to Czech legislation, asbestosis can be acknowledged by means of the ILO classification of chest radiographs. Pleural hyalinosis and lung cancer (in case of accompanying pleural hyalinosis and/ or asbestosis) can be acknowledged according to Lebedová et al. (2003). No additional criteria have been formulated for mesothelioma.

Recognition criteria for asbestosis, lung cancer, mesothelioma and pleural plaques provided by the national occupational experts can be found in Annex 3.

3. Number of cases recognised as occupational diseases

3.1. Statistics concerning the main asbestos-related diseases

Not all data concerning asbestos-related diseases were available. The Eastern European countries which are not EU members are currently often subject to fundamental reform processes, so the numbers of occupational diseases are not always available. Moreover, in **Estonia**, no systematic data on asbestos-related occupational diseases is collected. In contrast, **Polish** data on asbestos-related diseases is available for free from the NOFER Institute of Occupational Medicine[10] website.

The main sources of data used in this report are:

- National occupational physicians
- Research articles
- Research data from international asbestos seminars

Data that was missing from the main sources was obtained via auxiliary sources, if available. Data from various fragmented sources was used for verification purposes.

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9. http://www.ilo.org/wcmsp5/groups/public/---ed_protect/---protrav/---safework/documents/publication/wcms_168260.pdf
10. NOFER Institute of Occupational Medicine, http://www.imp.lodz.pl/home_en/dep/department_of_environmental_epidemiology/ref_cent_asbestos/

Tables 8 – 11 present the number and rates[11] of recognised cases of asbestos-related diseases in CEE countries.

Table 8: Recognised cases of asbestosis

Country	Period	Cases	Asbestosis rate[11]
Bulgaria	NA	NA	NA
Croatia	1990-2013	538	5.3
Cyprus	-	-	-
Czech Republic	1964-2012	253	0.5
Estonia	NA	NA	NA
Hungary	1990-2011	218	1.0
Latvia	1993-2012	11	0.3
Lithuania	1990-2012	5	0.07
Poland	1976-2011	2,863	2.1
Romania	1985-2011	385	0.7
Serbia	1994-2012	8	0.06
Slovakia	2000-2011	9	0.2
Slovenia	1998-2013	448	14.9
Turkey	NA	NA	NA

- no cases, NA not applicable

Table 9: Recognised cases of lung cancer

Country	Period	Cases	Lung cancer rate[11]
Bulgaria	NA	NA	NA
Croatia	1990-2013	7	0.1
Cyprus	-	-	-
Czech Republic	1964-2012	103	0.2
Estonia	NA	NA	NA
Hungary	1990-2011	11	0.1
Latvia	NA	NA	NA
Lithuania	-	-	-
Poland	1976-2011	564	0.4
Romania	1999-2011	6	0.02
Serbia	-	-	-
Slovakia	NA	NA	NA
Slovenia	1998-2013	52	1.7
Turkey	NA	NA	NA

- no cases, NA not applicable

11. Annual cases rate per million (following EUROSTAT population statistics of the 2010)

Table 10: Recognised cases of mesothelioma

Country	Period	Cases	Mesothelioma rate[11]
Bulgaria	NA	NA	NA
Croatia	1990-2013	32	0.6
Cyprus	1998-2011	65	6.3
Czech Republic	1964-2012	107	0.2
Estonia	NA	NA	NA
Hungary	1990-2011	29	0.3
Latvia	NA	NA	NA
Lithuania	-	-	-
Poland	1976-2011	297	8.5
Romania	2006-2011	2	0.02
Serbia	-	-	-
Slovakia	NA	NA	NA
Slovenia	1998-2013	128	4.3
Turkey	NA	NA	NA

- no cases, NA not applicable

Table 11: Recognised cases of pleural plaques

Country	Period	Cases	Pleural plaques rate[11]
Bulgaria	NA	NA	NA
Croatia	1990-2013	810	14.2
Cyprus	-	-	-
Czech Republic	1996-2012	219	1.3
Estonia			NA
Hungary	-	-	-
Latvia	NA	NA	NA
Lithuania	-	-	-
Poland[12]	2003-2011	464	1.5
Romania	2006-2011	9	0.08
Serbia	-	-	-
Slovakia	-	-	-
Slovenia	1998-2013	1,189	39.6
Turkey	NA	NA	NA

- no cases, NA not applicable

12. All cases of pleural or pericardium

By 2013, almost all countries covered by this study had registered **asbestosis** as occupational disease. **Cyprus** and **Latvia** are exceptions and have not recognised any asbestosis case, as of 2013. Moreover, in **Estonia**, the number of asbestosis is even unknown, because there is no systematic data collected. General, large differences are observed from country to country regarding the number of recognised asbestos-related cases. In **Slovenia**, for example, the annual asbestosis rate (cases of asbestosis/ population) amounts to 14.9, in **Croatia** 5.3 and in **Poland** 2.1. In other CEE countries the annual asbestosis rate amounts to one or lower than 1.

From 1993-2012, 133 cases of pneumonconiosis (all types) and 11 of asbestosis were recognised in **Latvia**. According to expert opinion only a small fraction of asbestos-related diseases are diagnosed and linked to occupational exposures. For example, most lung cancer patients are not asked whether they have been exposed to asbestos, and are therefore registered in the general cancer registry, and not in the register of occupational patients. It is similar for mesothelioma or pleural plaques; there has only been one case of occupational mesothelioma over the last 10 years. Other expert opinion[13] suggests that large numbers of asbestos-related diseases remain undiagnosed, due to a lack of medical training and outdated diagnostic techniques.

Little data exists about the respiratory health effects of occupational asbestos exposure in **Turkey**. Asbestosis incidences are estimated at up to 10 cases per year. According to a research study of asbestos cement plant workers in Turkey from 2006, median worksite asbestos dust concentration in tested plants was 0.22 fibre/cm^3 of air (Akkurt et al., 2006). The concentration was higher than that of the strictest occupational exposure limits in the world for chrysotile asbestos (Directive 83/477/EEC: 0.1 fibre/ cm^3 of air). An increased risk of asbestosis and lung function abnormality is expected.

Researchers from the National Centre for Occupational Diseases in **Bulgaria** examined 9,142 workers from 1967-1982, finding 206 cases of asbestosis (IBAS, 2010). Data from 1980-2000 shows a small number of asbestos-related cases, ranging from 136 to 201 cases of asbestosis, asbestos-induced pleural thickenings and pleural plaques annually (KAPAZ, 2010).

Asbestosis is the most well-known asbestos-related disease to occupational physician. The asbestosis latency period (between 10 and 20 years) is shorter than that for other asbestos-related diseases. This could be why so many asbestosis cases were recognised compared to asbestos-related cancer in central and east European countries.

In **Slovenia**, the annual lung cancer rate is much lower than the annual rate of recognised asbestosis cases, amounting to 1.7. In **Croatia**, **Czech Republic**, **Hungary**, **Poland**, **Romania** and **Slovakia,** the annual lung cancer rate is lower than 1.

According to the findings of a study, 3.4% of lung cancer cases in **Lithuania** could be attributed to heavy occupational exposure to asbestos (using the Helsinki criterion of > or =25 fibre years). Consequently, 50 lung cancer cases annually could be asbestos-related, compensable occupational diseases (Everatt et al., 2007). Officially, in Lithuania there are no recognised cases of lung cancer.

The annual **mesothelioma** rate amounts to 8.5 in **Poland**, 6.3 in **Cyprus** and 4.3 in **Slovenia**. Mesothelioma is the only asbestos-related disease registered in **Cyprus**. As of 2013, **Lithuania** and **Serbia** have not registered any cases of mesothelioma. In **Croatia**, **Czech Republic**, **Hungary**, **Romania** and **Slovakia** the annual mesothelioma rate is lower than 1.

13. Professor Maija Eglite, Institute of Occupational and Environmental Health in Riga, Source: IBAS (2010)

In **Bulgaria**, 159 cases of mesothelioma were diagnosed between 1991 and 2008 (WHO (2011), most of which come from regions where asbestos was widely used. This suggests a relationship between increasing numbers of mesothelioma diagnoses and high levels of occupational asbestos exposure. Over the last 20 years, in Bulgaria an increasing number of cases of mesothelioma have been observed. The number of cases of malignant pleural mesothelioma per 100.000 in Bulgaria has risen from six in 1991, to nine in 1992, 14 in 1993 to 16 in 1997 (IBAS and ABEVA, 2000).

An evaluation of the incidence of mesothelioma in **Slovakia,** based on statistics from the Oncological Mesothelioma Register, shows that, between 1978 and 1997, the number of malignant mesotheliomas cases was 285. All cases were approved clinically and histologically (IBAS and ABEVA, 2000).

In **Turkey**, 1,320 cases of mesothelioma were recognised between 2005 and 2009 (WHO, 2011). However, a certain share of these diseases was possibly due to environmental asbestos exposure.

The data regarding official recognition of occupational cancer is widely believed to underestimate the situation. The diagnosis of an occupational cancer caused specifically by exposure to asbestos is very difficult. The latency period for these cancers is between 20 and 40 years. Furthermore, multiple problems exist which result in low rates of certification of occupational diseases, such as the lack of medical expertise, and organisational, economic and legislative hurdles/ obstacles.

The recognition of **pleural plaque** in the European countries has been authorised since the 1990s or 2000s. Consequently, pleural plaques are the most common manifestation of asbestos-related disease (see table 8 - 11). There is a long latency period, typically 20 to 30 years, between the onset of exposure and the manifestation of this condition.

The data available on pleural plaques (not a disease, but a condition) indicates a large number of recognised cases. The annual pleural plaque rate in **Slovenia** is 39.6, in **Croatia** 14.2, in **Poland** 1.5, in the **Czech Republic** 1.3, and in **Romania** 0.08.

The **Hungarian** and **Slovakian** list of occupational disease do not include pleural plaques as asbestos-related disease.

Seven hundred and twenty cases of pleural plaques were identified in **Bulgaria** in 1973-1978 (IBAS and ABEVA, 2000). However, it is not known whether these diseases were recognised as occupational.

Detailed statistics for asbestos-related recognised occupational diseases for **Czech Republic** show a constant number of asbestosis, mesothelioma and lung cancer cases in period 1964-2012. Number of pleural plaque cases has been increased in last ten years. According to **Hungarian** statistics the number of asbestosis cases has been increased between 1995 and 2005, wherein the number of mesothelioma and lung cancer cases remained constant. **Polish** statistics show that the number of asbestosis, lung cancer and mesothelioma cases has been significantly increased between 2001 and 2010, while the number of other neoplasm and non-malignant asbestos-related diseases has dropped. Following **Romanian** statistics the number of asbestosis cases has been increased between 1995 and 1999, and between 2003 and 2011. Detailed statistics for selected countries can be found in Annex 4.

3.2. Statistics concerning other asbestos-related diseases

Apart from the four main asbestos-related diseases mentioned above, few cases of asbestos-related cancer were recognised in the **Czech Republic**, **Lithuania**, **Romania** and **Slovenia**. Seventy-nine cases of chronic bronchitis were recognised in **Poland** between 1989 and 2011. Many cases of other diseases of pleura or pericardium were registered in **Poland** (427) from 2001 to 2010 and in the **Czech Republic** (103) from 1996 to 2005. They are the most common manifestation of asbestos-related diseases. The cases rate of other diseases in CEE countries amounts to 1.2 to 0.01.

Table 12: Data of some other recognised asbestos-related diseases

Country	Disease	Period	Cases	Cases rate[10]
Czech Republic	Pleural hyalinosis	1996-2005	103	1.1
Lithuania	Cancer of larynx	1990-2012	1	0.01
Poland	Chronic bronchitis	1989-2011	79	0.09
	Other diseases of pleura or pericardium	2001-2010	427	1.2
Romania	Cancer of larynx	2006-2011	2	0.02
Slovenia	Cancer of larynx	1990-2010	2	0.05
	Cancer of gastrointestinal tract	1990-2010	2	0.05

4. Specific insurance systems for asbestos-related diseases

4.1. Monitoring of asbestos-related diseases

4.1.1. Measurements and medical surveillance

All of the countries considered within the remit of this project have established a policy for the prevention of risks that potentially cause occupational diseases, as listed in Annex I, Recommendation 2003. According to an EU report (2013), officially, only **Slovenia** has set risk prevention priorities primarily focused on asbestos (EC, 2013).

The **Bulgarian** system for the medical monitoring of exposed workers is overseen by the National Centre for Occupational Diseases. The monitoring should be carried out regionally across eight departments. However, mandatory periodic medical examinations are not carried out because of the failure to establish systems for keeping card registries, and for diagnostics and health surveillance of exposed workers. This means that the country has no reliable information on occupational morbidity caused by asbestos exposure. It has also been suggested that the occupational medicine service is not adequately supporting employers to protect workers from asbestos, according to KAPAZ (2010).
Furthermore, accredited Bulgarian laboratories for measuring work environment factors are not equipped with modern facilities to assess airborne asbestos-fibre dust and to determine the type of asbestos.

Periodic check-ups of **Croatian** workers in asbestos-related occupations have been performed regularly, according to legal obligations. If an employee is suspected of having occupational asbestosis, a general practitioner or occupational physician is consulted. Medical documentation regarding asbestosis should include hematologic and radiologic findings, lung function tests, and immunology tests. Asbestos bodies are sought in expectorant, as well as in bronchoalveolar lavage, lung scintiscans, and biopsies of lung or pleural tissue. Positive findings on medical examination and the presence of 0.1 fibre/cm3 of tremolite, or 0.2 fibre/cm3 of crocidolite and anthophyllite, or 0.5 fibre/cm3 of amosite, or 2 fibres/cm3 of actinolite or chrysotile in the workplace are important in the final diagnosis of asbestosis (Trosic and Milcovic-Kraus, 2004).

The **Cyprus** Safety and Health at Work Regulations require medical follow- up examination for workers exposed to asbestos only during the time of exposure. During that period, a written medical assessment should be kept by the employer and this should be renewed every three years for as long as the exposure lasts. Additionally, the employer is obliged to retain medical records for his employees for at least 40 years.

According to Pärg and Aaviksoo (2009), **Estonia** had no occupational disease insurance system in 2009. The Estonian law does not specify who has to pay expenses for diagnosing workers. Government does not cover the costs of the medical service in any way. Bigger companies run their own clinics. Some private occupational health clinics also offer their services to enterprises. The provided medical coverage is low, with some estimates suggesting that only 30% of the population is covered. Furthermore, there are too few occupational health physicians in Estonia, and most of them are located in Tallinn (NDPHS (2008) and HPM (2013)).

In **Lithuania**, people who work with asbestos or asbestos-containing products must be examined at least once every three years. Health examinations of these workers are carried out by either a general physician, who has attended a 36-hour course in occupational medicine, or a primary level occupational physician, or a secondary level radiologist or pulmonologist. Blood and urine samples are taken and clinical chest and respiratory function examinations are compulsory. Cytological examination of expectoration or chest X-ray or tomodensitometry is also carried out.

Polish legal regulations on the effects of asbestos dust and management of asbestos waste are in compliance with international standards and European Union legislation (EU Convention No. 162 and Recommendation No. 172, and EU Directives 83/477, 91/382, 98/24, 91/689, 94/31, 03/18). The occupational health services in **Poland** are responsible for providing prophylactic health care for workers. The preventive measures for asbestos-exposed workers are specified in EU legislation and International Labour Office conventions. The Polish Labour Code obliges both employer and employee to arrange for the prophylactic examinations of workers, especially those working under hazardous conditions. Polish regulations provide for special health care for workers (current and former) exposed to asbestos dust, including prophylactic examinations, free medications for asbestos -related diseases, and treatment in health resorts. For workers occupationally exposed to asbestos the prophylactic activities include: pre-placement examinations; periodic examinations - the first one after three years' working, then every two years, and then annually after ten years of work; active counselling; and health promotion activities. The physician determines the frequency of prophylactic examinations, taking into account: the worker's health condition, job description, exposure level, duration of employment, and the latency period for asbestos-related diseases.

In **Slovakia**, ´secondary prevention´ is provided by health personnel, e.g. factory physicians, occupational medicine units, institutes of public health, in cooperation with employers and employees.
The measures are:

- All workers exposed to asbestos undergo obligatory, regular medical examinations during their employment, and also after leaving the job
- Restriction of tobacco smoking
- Reduction and registration of occupational exposure to asbestos
- Early detection, adequate therapy and rehabilitation of asbestos-related changes

The CEE countries have national and/ or private laboratories for measuring asbestos dust concentration in the workplace atmosphere. Optical microscopy examination with phase contrast is the most common method for exposure monitoring (see following table). An overview of the current Social Protection Systems in CEE countries can be found in Annex 5.

Table 13: Measurements of asbestos fibres in CEE countries

Country	Official methods
Europe	Determination of airborne fibre number concentrations, WHO; NIOSH Manual of Analytical Methods; Asbestos Sampling, EPA; ISO methods
Bulgaria	IR (spectral photometric) and XRD (X-ray diffractometric; Optical microscopy with phase contrast (BSS 16909-89)
Croatia	Optical microscopy with phase contrast (according to WHO methods)
Cyprus	Regulations of 2006 (P.I. 316/2006) on Safety and Health at Work; Act relating to the protection of the security and health of workers exposed to asbestos in workplaces (No. 23(I) 1993); Act on Mandatory Health Monitoring of Workers Occupationally Exposed to Asbestos (No. 011-01/07-01/89 - Reg. No. 71-05-03/01-07-2)
Czech Republic	Number of fibres
Estonia	Optical microscopy (according to NIOSH methods (Method 9002); EPA methods)
Hungary	Optical microscopy with phase contrast (according to WHO methods) or equivalent; Scanning and transmission electron microscopy (not accredited method)
Latvia	Air quality measurements of asbestos fibres
Lithuania	Optical microscopy with phase contrast (according to ISO 8672:2001)
Poland	Optical microscopy with phase contrast (according to WHO methods, PN-91/Z-04030/05 and PN-88/Z-04200/02); Laser monitoring (FM-7400 Mineral fibre Laser Monitor)
Romania	Optical microscopy with phase contrast
Serbia	Optical microscopy with phase contrast
Slovakia	Optical microscopy with phase contrast; Transmission electron microscopy (according to ISO 10312 and ISO 13794)
Slovenia	Optical microscopy with phase contrast
Turkey	NA

NA not applicable

4.1.2. Medical follow-up of former exposed workers

In **Bulgaria**, **Cyprus**, **Estonia**, **Hungary**, **Slovenia** and **Turkey**, there are no legal requirements to follow-up on former exposed workers. But general physicians can send former asbestos exposed workers for periodic medical examinations, if deemed necessary. Workers in **Hungary** from large asbestos processing plants, such as Eternit and Nyergesújfalu, are followed up in the Pulmonology ward of the Occupational Health Department free of charge.

In **Croatia,** monitoring of formerly exposed workers includes the obligatory preventive examinations performed at least every three years. Monitoring has to be carried out over a 40-year period after the end of occupational exposure to asbestos, irrespective of whether an occupational disease has been diagnosed.

Several Departments of Occupational Medicine in the **Czech Republic** perform a follow-up of the subjects (pensioners are also covered). However, the whole population of workers is not covered. A decree about occupational health services is currently being drafted by the Ministry of Health and it should cover all employees.

The **Polish** AMIANTUS Programme of prophylactic examinations designated for former workers is a legal act which stipulates when medical care is required after exposure to asbestos has ceased. This Programme only includes 28 asbestos processing plants in Poland, so not all former asbestos exposed workers are covered.

In **Lithuania** and **Romania**, an occupational physician may recommend that medical surveillance continues after the exposure, for as long as is considered necessary. In Lithuania, health examination records must be kept for at least 40 years after working with asbestos. Romanian pensioners are, however, not covered by medical follow-up of former exposed workers.

Serbian regulations on preventive occupational and safety measures for working with asbestos (Gazette No 106 from 2009) cover previously exposed workers, but only if recommended by occupational health. Since Serbian employers are not obliged to contract occupational health service, the feasibility of regulations focused on former exposed employees is not clear.

In **Slovakia**, medical preventative examinations are performed by health at work service practitioners after employment has been terminated (Act No. 355/ 2007). Pensioners exposed to asbestos also have the right to preventive check-ups, covered by the employer.

4.2. Statistical inventory and problem of under-reporting

The European countries have a national system for recording occupational diseases. There is a great diversity of recording systems, in their management (insurance organisation, Ministry, other organisation). Mostly they are Registries of Occupational Diseases, Cancer Registries and other databases. Only Croatia and Slovenia have a separate inventory of asbestos-related diseases. In other CEE countries, asbestos-related diseases are included in other inventory systems. The inventory is present in table 14.

Table 14: Inventory of asbestos-related diseases

Country	Inventory
Bulgaria	National Registry of *Occupational Diseases*
Croatia	Register of workers with asbestos-related diseases Register of Occupational Diseases National Cancer Registry
Cyprus	Cancer registry Mesothelioma registry
Czech Republic	Registry of Occupational Diseases National Cancer Registry
Estonia	Registry of Occupational Accidents and Diseases
Hungary	Database of the Occupational Health Department of the National Labour Office National Cancer Registry (for mesothelioma cases) Database of the National Pension Fund (for asbestosis cases)
Latvia	State Register of Occupational Diseases
Lithuania	State Occupational Diseases Register
Poland	Central Register of Occupational Diseases Cancer Registries
Romania	National Register of Occupational Diseases Cancer Registry
Serbia	Occupational Disease Register
Slovakia	Registry at the Clinics of Occupational Medicine Oncological Mesothelioma Register Oncological Registry
Slovenia	Register of asbestos-related diseases
Turkey	Registry for asbestosis and mesothelioma cases

Almost all countries struggle with the problem of underreporting of occupational diseases. The main causes for underreporting include:

- lack of knowledge and information
- lack of occupational physicians
- motivation among doctors (especially general physicians)
- bureaucracy; long and complicated way of reporting
- scale of benefit in comparison to other benefits or income options
- pressure from employers, meaning occupational physicians are not independent
- workers' fear of the consequences of a report for their job
- scale of undeclared work; major influence on the applicability and use of the reporting system

According to Fabianova et al., statistics for 1999 in the **Czech Republic** show an underreporting of occupational cancers, probably due to the historical low awareness of the association of exposure with this disease. Czech physicians should focus more on the occupational history of these patients, and refer them to the Departments of Occupational Diseases. Benefits are available for all patients with confirmed exposure to asbestos, corresponding to the latency period.

The number of registered cases in **Estonia**, according to HPM (2013) is low due to under-registration of work-related diseases, whose treatment and rehabilitation costs are covered by the health insurance fund. General physicians are not trained to diagnose occupational diseases, and occupational health physicians are not involved in diagnosing occupational diseases. The number of occupational health physicians in Estonia is far below the EU average. According to EU data, there is one occupational health physician for every 1,400-1,600 employees.

Most likely, official figures for asbestos occupational diseases in **Slovakia** do not represent all diseases. In 1992, there were a total of 1,056 cases of newly diagnosed occupational diseases and poisonings. The total number of these diseases decreased over the next 5 years. In 1997, only 697 new cases were counted (Fabianova et al., 1999). This decline is most probably related to the disintegration of the dominantly curative occupational health services in many plants and the slow creation of new preventive occupational health services (Slovakia become independent in 1993). The other reasons are connected to problems with diagnosis of occupational diseases: the long latency period, the retirement status of most patients when they are diagnosed, the possible role of smoking habits and other lifestyle factors, and the long duration of the evaluation and certification process.

4.3. Compensation

4.3.1. Compensation rules

Systems of insurance in the world vary widely, and this has a bearing on the level of costs which the patient is able to recover. In principle, there are three basic possibilities:

- The worker bears the cost himself
- The individual employer bears the costs (US, UK system). In some European countries such as Lithuania, Poland, Slovakia a state or private-sector insurance scheme covers these costs for the employer, so the liability is with this organisation
- The state is responsible for compensation and funds it from general taxation (Hungary, Romania, Slovenia, Turkey)

Compensation covers the medical costs of occupational diseases, financial compensation for loss of income, and benefits for the person's dependants if the subject should die. The scale of this reimbursement and its economic impact depends both on the quantities of asbestos used in a given country and, above all, on the social security provisions in place for workers (ISSA, 2006).

Most EU Member States (except **Estonia**) have a specific occupational diseases compensation system. The specific systems give different benefits to those given for non-occupational diseases. In countries which have specific compensation systems, benefits are often more generous. Cash benefits may be higher, the way of calculating the pension (in case of permanent injury) is more favourable to the victim, and other benefits can be offered, such as rehabilitation. In those countries that do not have a specific system of compensation, a temporary loss of ability to work is covered under the general health insurance system, while disability and death are covered by the relevant disability or pension insurance provisions (EC, 2013). **Croatia** and **Slovenia**, however, have a specific compensation system for occupational asbestos-related diseases.

The **Croatian** law from 2007 concerning compensation of workers occupationally exposed to asbestos stipulates the authorities to process of claims, and the funds and coefficients for

compensation payments. The 2007 law defines the conditions for fulfilling criteria for retirement pension for workers exposed to asbestos at work.
In case of a judicial process, the employer has to prove occupational causality. Courts can establish the presence of an occupational disease on the basis of the findings and opinions of appointed medical experts. For claims, it is necessary to establish the worker's long-term occupational exposure to asbestos dust. If the court establishes that a claimant has been affected by occupational asbestosis, and that the cause of the disease was long-term exposure to asbestos dust, then the employer must compensate the worker for all damage suffered. Compensation of the damage follows general guidelines, which include the damage assessment, the intended purpose of compensation, and (especially) the intensity, fear and duration of suffering. The compensation amount corresponds to the degree of damage caused by the occupational asbestosis. The court takes an individual approach to every claimant when determining the compensation amount (Trosic and Milcovic-Kraus, 2004).

Cyprus issued specific regulations on occupational diseases in 1980, under the Social Insurance Laws. They determine the list of occupational diseases which can be compensated, including asbestos-related ones. This list includes pneumoconiosis, silicosis, siderosilicosis, asbestosis and any of the previously mentioned diseases combined with pulmonary tuberculosis and mesothelioma. Benefits and pensions are given to sufferers of asbestos-related diseases, if these diseases are caused by the occupations on the above list.

In the **Czech Republic**, every case of occupational disease must be verified by one of the 18 branches of the Department of Occupational Diseases; the disease must be on the List of Occupational Diseases, and exposure must be confirmed by occupational physicians. The Department (not an insurance company or law court) recognises the claim, and they decide on compensation, usually within a matter of weeks (GUE and NGL, 2006).
In **Estonia**, generally, there is no national insurance for occupational diseases. The calculation and indexing of benefits is not regulated by law. The company must prove that causes of occupational diseases are not caused by risks in the workplace. The employer pays compensation. In some cases, victims have to partially finance treatment expenses themselves. Such expenses are: visitation fees, daily costs for beds, rehabilitation, and dental care fees. There is no medical rehabilitation service (HPM, 2013).

In **Hungary**, registered occupational diseases can be compensated. However, the compensation is not automatic, and must be applied for. The regional branches of the National Office for Rehabilitation and Social Affairs (Nemzeti Rehabilitációs és Szociális Hivatal – NRSZH) decide if benefits are applicable (based on the actual health impairment). Furthermore, reimbursement of medical costs can be granted by the Health Insurance Fund (Országos Egészségbiztosítási Pénztár, OEP). Theoretically, any disease can be recognised if the exposure, the medical diagnosis and the causation can be confirmed (via an open list). Since 2007, all workers have the right to ask the inspection authority to investigate their disease, suspected of having an occupational origin.
From 1st January 2007, sufferers of occupational diseases have the right to accident-related health care (sick-pay, health care services, and pension), in accordance with a Constitutional Court decision (21/2006, V.31). The legal avenue is also available. In court cases, the victim has to prove occupational causality.

The benefits in **Latvia** for occupational diseases include: sickness benefit, compensation for incapacity to work, lump sum benefits, compensation for additional medical treatment and rehabilitation expenses, care, purchase and repair of technical aids, and medical travel costs incurred. To be

entitled, a person's must be socially insured, and the working incapacity (temporary or permanent), injury or death must due to a job injury or occupational disease (EURAXESS, 2013).

In **Lithuania**, the process of evaluation and notification of occupational disease is as follows:

- a general physician or occupational physician must inform the local labour inspectorate about the case;
- a three-person commission is formed to investigate whether exposure at the workplace occurred;
- the conclusions reached by the commission form the basis for the subsequent judgment made by a licensed occupational physician.

Patients, many of whom are seriously ill, must be present at time-consuming meetings throughout the adjudication process. Proof of causation is required, even for people who were affected by specific illnesses (mesothelioma or lung cancer) and had worked in high-risk sectors, such as the asbestos-cement industry or insulators. Research in Lithuania suggests that there are at least 50 cases of asbestos-related lung cancers annually, none of which are recognised as occupational (GUE and NGL, 2006). A person who has (partly or fully) incapacity to work caused by an occupational disease receives the following benefits from the State Social Insurance Fund: sickness benefit, lump-sum compensation, periodic work compensation, additional expenses, such as nursing, prosthetics, and medical treatment.

In **Poland**, the basis for claiming compensation for an occupational disease is a legally binding administrative decision confirming the occupational etiology of the disease. The decision is made by the State Sanitary Inspector based on medical certification, epidemiologic surveillance of work environment and occupational exposure data. Certifying and determining the degree of health impairment and whether the death of the insured worker has been related to an occupational disease is the responsibility of a physician dealing with medical certifications for the Social Insurance Agency. The types of compensation, the procedures for granting them, calculating the amount due and determining the mode of payment are regulated separately. The health consequences of the disease rather than the presence of the occupational disease itself are compensated for.
Indemnity benefits connected with an occupational disease are paid by the Social Insurance Agency (ZUS) from the Social Insurance Fund. The social insurance benefits pertaining to occupational asbestos-related occupational diseases include (Szeszenia-Dąbrowska and Wilczyńska, 2011): sickness benefit, rehabilitation benefit, top-up benefit, one-time indemnity, work disability pension, vocational training pension, nursing allowance, medical costs reimbursement of dental treatment and preventive vaccinations, as well as providing orthopaedic care measures. The family members of the worker who has died from an occupational disease are also entitled to one-time compensation. They also receive the family pension and supplement to survivor's pension.
Lump-sum work injury compensation is calculated, based on average gross earnings in the national economy, for each percent of the permanent or long-term health impairment (10 to 100%).

According to the 2002 **Romanian** Law (No. 346) on working accident insurance and occupational diseases when a victim of an occupational disease loses 20-50% working capacity, they have the right to compensation, depending on the severity of the disease. The compensation limit is 12 average gross salaries. In case of death, the surviving spouse, children, parents or executor can receive compensation (4x national average gross salaries).

Serbian social insurance is financed by contributions from employees and employers, providing an earnings-related benefit. Pension insurance covers long-term benefits, and health insurance covers short-term benefits. A specific long-term benefit is paid (separate scheme) in case of permanent injury/disease that does not result in invalidity.
In case of asbestoses, the employer covers the therapy costs and the employee receives a full salary. Employees are entitled to sue the employer through the justice system, and receive compensation for direct and indirect losses.

The **Slovakian** system of working injury and occupational disease insurance has been reformed into the new accident insurance system (Sociálna Poisťovňa, 2013). This insurance is mandatory for the employer, except the employer as a judge and prosecutor. There is no minimum qualifying period required. Within the accident insurance the whole range of benefits is provided depending on the character of events, either repeatedly or as lump-sum payments. The categorization of accident benefits is as follows: additional accidental benefit, accidental rent, lump-sum settlement, survivor's rent, lump–sum compensation, professional rehabilitation and rehabilitation benefit, retraining and retraining benefit, pain compensation and compensation for difficulties with social reintegration, compensation for medical expenses, funeral expenses reimbursement. The entitlement to accident benefits in the case of working injury and occupational disease of the damaged person is in compliance with the legislation granted only in proportion to the employer´s responsibility, i.e. the benefit provided to the damaged employee is reduced by the rate of his/her evincible infliction.

The **Turkish** list of recognised occupational diseases included in the Social Insurance Regulation for the Medical Affairs. The list defines both the active agents to which a person must have been exposed and sets minimum periods of exposure after which there is a presumption that the disease is occupational in nature. Mixed system is in operation in that diseases not contained on the list may be accepted by the Supreme Health Board of Social Insurance if that body is convinced that the disease stems from working conditions. Occupational disease is a case of sickness, invalidity or mental trouble, temporary or permanent, suffered by an insured person due to continuing causal factor, which is characteristic of the nature of the work he is doing, or arising out of conditions required for the execution of such work[14].
In order to receive occupational disease benefits, a medical report must determine that the insured person contracted the disease during employment. For benefit entitlement when the disease manifested after the person left the occupation, the period between leaving the job and the manifestation of the disease must not be longer than the period specified in the regulations for that particular disease[15].

Table 15 presents level of incapacity giving entitlement to compensation and compensation forms in CEE countries.

14. The Mutual Information System on Social Protection of the Council of Europe (MISSCEO), http://www.coe.int/t/dg3/socialpolicies/socialsecurity/MISSCEO/missceo_en.asp
15. The Mutual Information System on Social Protection of the European Union (MISSOC), http://ec.europa.eu/social/main.jsp?catId=815&langId=en

Table 15: Compensation granted to the victims for permanent incapacity, according to MISSCEO[14] and MISSOC[15]

Country	Level of incapacity giving entitlement to compensation	Minimum amount or formula of monthly pension by permanent incapacity	Other benefits
Bulgaria	50 [%]	€ 74.0	-
Croatia	More than 50 [%]	less than € 455.0	Lump-sum cash benefit
Cyprus	10-20 [%]	€ 314.8	-
Czech Republic	No levels of incapacity	income is equal to the individual's average earnings before the damage occurred	Compensation for material damage, Compensation for adequate expenditure connected with treatment, Compensation of funeral costs
Estonia	10 [%]	€ 134.1	Prosthesis and aids, Prescribed medicinal products, Treatment in a sanatorium, Travel expenses to health establishment or sanatorium, Expenses for auxiliary care
Hungary	13 [%]	Percentage of the average monthly earnings depending upon reduced capacity: 14-20% by 8%; 21-28% by 10%; 29-39% by 15%; over 39% by 30%	Nursing fee
Latvia	25 [%]	Percentage of the average monthly earnings depending upon reduced capacity: 100% by 80%; 90-99% by 75%; 80-89% by 70%; 70-79% by 65%; 60-69% by 60%; 50-59% by 55%; 40-49% by 50%; 30-39% by 45%; 25-29% by 35%	Prosthetic devices, Expenses for a companion who provides support during hospital treatment, Travel expenses to institutions for medical treatment, Expenses for the purchase of technical assistance equipment and repair of such, as well as pay for a person's medical treatment, care, medical and professional rehabilitation
Lithuania	30 [%]	0.5 x d x k x D, where, d: lost capacity coefficient; k: compensation coefficient; D: current year's insured monthly income valid on month of payment	-
Poland	No minimum level	Total Incapacity Pension: R = kb x (wpw x os x 1.3% + wpw x on x 0.7% + wpw x oh x 0.7% + 24%), where, kb: "Basic Amount" equal to national; wpw: reference wage coefficient; os: periods during which contributions have been paid; on: periods during which no contributions have been paid; oh: hypothetical periods. Partial Incapacity Pension: 75% of the amount of the pension for total incapacity	One-off payment by the employer: € 167.0 for each percentage point of deterioration

Country	Level of incapacity giving entitlement to compensation	Minimum amount or formula of monthly pension by permanent incapacity	Other benefits
Romania	50 [%]	IP = PPV x AAS, where, IP: Invalidity Pension; PPV: Pension Point Value: RON 762.1 (€ 172.0); AAS: Annual Average Score	Indemnity for Temporary Assignment to another Work, Indemnity for reduction of working time, Integrity compensations, Indemnity for attendance of vocational training or retraining courses, Reimbursements of expenditures e.g. emergency transportation, spectacles, hearing aids, prostheses, etc
Serbia	30 [%]	Percentage of the average monthly earnings (net average wage) depending upon reduced capacity: € 16.0 (5%) by 30%; € 21.4 (7%) by 40%; € 26.7 (8%) by 50%; € 32.1 (10%) by 60%; € 37.4 (12%) by 70%; € 42.8 (13%) by 80%; € 48.1 (15%) by 90%; € 53.5 (17%) by 100%	-
Slovakia	41 [%], 10 [%] (one-off redemption benefit)	Benefit = 30.4167 x 0.8 x E x t, where, E: average daily gross earnings in the year preceding the injury; t: degree of incapacity	Compensation of costs non-reimbursed by health insurance agencies up to a max. of € 25,187.50, Compensation for pain and compensation for reduced social opportunities: 1 point = € 15.72
Slovenia	No fixed percentage	57.3% of the Pension Rating Basis	Partial benefit as a percentage corresponding to the reduction of the full working time: 50% when the insured person works 4 hours a day, 37.5% when 5 hours a day, 25% when 6 hours a day, 12.5%, when 7 hours a day, Assistance and attendance allowance: available to lawfully permanent resident recipients of old-age, early retirement, invalidity, widow/ widower's and survivor's pension
Turkey	10 [%]	Full rate permanent incapacity benefit (FRPIB): daily earnings (DE) x 360 x 0.70/12 = (DE) x21, Reduced rate permanent incapacity benefit: (RRPIB) = (FRPIB)x level of incapacity for work (LIW)=DE x 21 x LIW	-

A list of national regulations and compensation rules can be found in Annex 6. More on national regulations can be found at NATLEX[16], the database maintained by the ILO's International Labour Standards Department.

16. Database of national labour, social security and related human rights legislation maintained by the ILO's International Labour Standards Department, http://www.ilo.org/dyn/natlex/natlex_browse.home

4.3.2. Support for asbestos victims

The following table shows groups, government and non-governmental organizations (NGOs), charities and trade unions that are active in raising awareness of the asbestos issue in CEE countries. Most groups are governmental bodies, but examples of NGOs are the Croatian Asbestosis Patient Association, the Hungarian Clear Action Group, the Polish Green Federation GAJA Association, and the Slovenian Association of patients with asbestos-related diseases.

Table 16: Active groups in raising awareness of the asbestos issue

Country	Name
Bulgaria	• NA
Croatia	• Croatian Parliament - Environment and Nature Conservation Committee • Ministry of Environmental and Nature Protection- Environmental Inspection • Ministry of Health • Environmental protection and energy efficiency Fund • Croatian Institute for Public Health • Croatian Institute for Health Protection and Safety at Work • Croatian Institute for Toxicology • The Croatian Asbestosis Patient Association, Vranjic • The Association for Environmental Protection 'Barbarinac' • The Association for Environmental Protection 'Eko Kvarner'
Cyprus	• The Department of Labour Inspection
Czech Republic	• National Institute of Public Health, http://www.ianphi.org/member-countries/country.cfm/count_id/48B7847F-2588-4C1C-A82A-8C955DE3ED93
Estonia	• The National Institute for Health Development
Hungary	• Országos Környezetegészségügyi Intézet, http://oki.wesper.hu/ • Épületfenntartási K+F Alapítvány • Nemzeti Munkaügyi Hivatal - Munkavédelmi és Munkaügyi Igazgatóság, http://www.ommf.gov.hu/ • Magyar Azbesztmentesítők Szövetsége, http://www.kszgysz.hu/mazbesz.htm • Vidékfejlesztési Minisztérium, http://www.kvvm.hu/szakmai/hulladekgazd/hulladekgazdalkodas/hulladektipusok_azbeszt_hulladek.htm, • Clean Air Action Group (NGO), http://www.levego.hu/sites/default/files/kiadvany/vegyianyag/napsajto.pdf
Latvia	• No active groups
Lithuania	• Institute of Hygiene (Occupational Health Centre) • State Labour Inspectorate of the Republic of Lithuania • Institute of Oncology Vilnius University
Poland	• Programme for Asbestos Abatement in Poland 2009 – 2032 • NOFER Institute of Occupational Medicine founded in 2004 • Green Federation GAJA Association (NGO)
Romania	• NA
Serbia	• NA
Slovakia	• Associations of flats owners
Slovenia	• Clinical Institute of Occupational Medicine, University Medical Center, Ljubljana • Association of patients with asbestos-related diseases, Deskle, info@drustvo-oza.si • Clinical Institute of Occupational Medicine, University Medical Center, Ljubljana • Association of patients with asbestos-related diseases (NGO), Deskle, info@drustvo-oza.si • Trade union SABS
Turkey	• Ministry of Labor- OSH Department, Occupational Diseases Hospitals, Ministry of Health Department of Workers Health

NA not applicable

5. Conclusions

Import data indicates large scale production and use of asbestos products-related in East and Central European countries between 2000 and 2010, according to the United States and British Geological Survey. The health consequences of using asbestos will be apparent for many years. The first asbestos processing ban in the CEE-countries was introduced in Hungary in 1992.

The results of this research report show that all countries within the scope of this project have adopted the EU-list of occupational diseases into their own legal framework. Most of these countries recognise the main asbestos-related diseases, such as asbestosis, mesothelioma, lung cancer, and pleural plaques. Other non-malignant diseases, such as pleural, pericardial and bronchial diseases, are not well-known. They are not recognised by all countries as occupational diseases, attributable to inhalation of asbestos fibres. Cancers in other locations, such as laryngeal, bronchial, and gastrointestinal cancer, are, similarly, recognised by only some countries.

Obtaining an asbestos-related disease diagnosis requires medical examinations and work history documentation. There are many tools to aid the diagnosis of occupational diseases, specific to each country. The guidelines most commonly used are the Helsinki criteria (1997) for diagnosis and attribution of asbestosis and cancer, and the ILO practical guide ´National System for Recording and Notification of Occupational Diseases´. **Cyprus** is currently working on the drafting of national guidelines on the diagnostic criteria for occupational diseases. **Estonia**, however, has no established way of recognising occupational diseases. It would be useful to agree on the criteria for diagnosing, recognising, and compensating occupational diseases, e.g. those related to asbestos.

Almost all countries struggle with the problem of under-reporting of occupational diseases. The causes mentioned include: lack of knowledge, information, motivation among doctors, and the bureaucracy of the system. Other major influences on the applicability and use of the reporting system include: the scale of benefit when compared to other benefits or income options, the pressure from employers on occupational physicians, workers' fear of reprisals if they report, and the scale of undeclared work.

Meanwhile, the number of recognised asbestos-related cases differs greatly between countries, due to:

- the size of the exposed population due to economic activities (e.g. production or repair)
- the year of the provisions for protection of workers exposed to asbestos; the policy of detecting workers exposed to asbestos dust in the past; **Poland** and **Slovenia** are particularly active in this area, and the results of their initiatives are reflected in recent statistics
- political, economic and legislative obstacles in CEE countries: **Croatia**, **Estonia**, **Latvia**, **Lithuania**, **Slovakia** and **Slovenia** became independent in the 1990s
- the system for recognising occupational diseases: late registration of non-malignant diseases on the occupational disease list
- low rates of certification of occupational diseases: lack of medical expertise and diagnostic equipment, organisational problems

All CEE countries have established a policy for the prevention of risks that potentially cause occupational diseases, as listed in Annex I to the Recommendation 2003 (EC, 2013). However, national conditions are specific for each country.

The CEE countries have accredited laboratories for measuring asbestos dust concentration in the workplace atmosphere. There are public and private units. Optical microscopy examination with phase contrast is still the most common method for exposure monitoring.

In general, official post-exposure monitoring of workers is not carried out. There are exceptions, such as the **Polish** AMIANTUS Programme of prophylactic examinations for former workers of asbestos processing plants. In **Croatia,** monitoring of formerly exposed workers includes obligatory preventive examinations, performed at least every 3 years, and carried out over a 40-year period after the end of occupational exposure to asbestos.

Inventories of asbestos-related diseases are generally not kept separately. They are included in other registers; exceptions are the **Slovenian** Register of Asbestos-related diseases, maintained by the Institute of Occupational, Traffic and Sports Medicine and the **Croatian** Register of workers with asbestos-related diseases.

The compensation systems are, by and large, the same as for other occupational diseases. On average, compensation is granted when working capacity decreases by 20 - 50%, or if the worker dies. Only **Croatia** and **Slovenia** have specific regulations for compensating asbestos-related diseases. In some countries, employees that worked in hazardous conditions can take early retirement.

Although it is mainly governmental bodies that raise asbestos awareness, examples of NGOs are:

- Croatian Asbestosis Patient Association
- Hungarian Clean Air Action Group
- Polish Green Federation GAJA Association
- Slovenian Association of patients with asbestos-related diseases

6. Recommendations

After examining the issue of asbestos-related occupational diseases in Central and East European Countries we make five key recommendations.

Recognition and Compensation:

- Transparent and uniform procedures for recognition and compensation of asbestos-related diseases
- Training courses for improving technical supervisory officers´ knowledge on qualitative determination of occupational working conditions. The technical supervisory officers must be able to reconstruct and evaluate the working conditions over 30 years ago
- Improvement and better access to rehabilitation and convalescence services

Governmental and surveillance system:

- Establishment of national programmes of prophylactic examinations, designed for former workers from asbestos processing plants
- Improvement of governmental regulatory activities to reduce exposure, surveillance of diseases and proper use of preventive measures (Ratification of ILO Convention No. 162 is recognised as being representative of high level commitment)

- Improvement of the reporting systems for asbestos-related diseases. The main tasks should include rationalization of national occupational disease registries and setting up registries of people with current and past exposure. Other tasks should include ensuring of the effectiveness of workers' compensation schemes and publishing national statistics and periodic updated reports
- Improvement of support and control systems by EU external experts
- Improvement of occupational working conditions. This task should be accomplished in collaboration with all parties responsible for the Occupational Health and Safety of employees working on processing or removing asbestos
- Introduction of specific certification for companies that remove asbestos

Medical and governmental surveillance:

- Training courses aiming at improving the knowledge of physicians on asbestos-related diseases; information on these. Diseases should be included in basic medical curricula and in programmes of continuing medical education
- Improvement of diagnostic techniques
- Development of new treatment methods for asbestos-related diseases
- Harmonization of criteria for diagnosing occupational asbestos-related diseases and programs for minimising disease in at-risk individuals in occupationally-exposed groups
- Harmonization of other relevant aspects according to ILO, WHO and EU protocols

Measures for elimination and reduction of the current and future exposure risk:

- Stopping the use of asbestos and asbestos-products is the most effective preventive measure for eliminating asbestos-related diseases
- Develop an information system about buildings which identifies asbestos–containing materials

Information and communication:

- Formation and Networking by victims groups. More advice and support for asbestos victims and their families is required
- Formation and Networking by occupational physicians as well as government representatives responsible for issues relating to the risks posed by asbestos to workers' health
- Publication of information materials on the asbestos hazards, the detection and safe handling of asbestos products
- Providing information about safer substitutes, as well as developing economic and technological mechanisms to stimulate substitution

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8. Annex

Annex 1: Template for a survey to national experts

Analysis of adequate data sources on recognition of asbestos-related diseases in the Central and East European countries

QUESTIONNAIRE

GENERAL INFORMATION

1. **Name:**
2. **Organization:**
3. **Postal /email address, telephone number:**

RECOGNITION OF ASBESTOS-RELATED DISEASES

1. The way of recognition of asbestos-related diseases:

a) list of occupational diseases (please specify disease and since when (year/disease):

b) complementary system (victim has to prove occupational causality):

c) others (please specify):

2. Recognition criteria (e.g. medical condition, duration & intensity of exposure latency etc) for:

a) asbestosis:

b) lung cancer caused by asbestos:

c) mesothelioma:

d) pleural plaques:

e) others (please specify):

3. Compensation for workers exposed to asbestos is (please specify since when):

a) the same as for other occupational disease (please specify):

b) specific (please specify):

NUMBER OF CASES RECOGNISED AS OCCUPATIONAL DISEASES

1. Statistics concerning the asbestos-related diseases (preferably since 1990 or before):

a) asbestosis:

b) lung cancer caused by asbestos:

c) mesothelioma:

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d) pleural plaques:

e) others (e.g. cancer of larynx/ pharynx/trachea/colon/retroperitoneal fibrosis/other):

MONITORING OF ASBESTOS EXPOSURE AND RELATED DISEASES

1. Are there accredited laboratories for asbestos monitoring?

2. Are there official methods for asbestos monitoring (i.e. standardized, recommended by legislation)? Please specify method type and legislation.

3. Are there other methods used in practice?

4. Is medical follow-up of former exposed workers?

a) a legal requirement (if yes, please specify the law and if it includes pensioners):

b) an isolated practice (if yes, please exemplify and mention if pensioners are included):

c) not preformed

5. Inventories of asbestos-related diseases are kept:

a) separately, for the following diseases (please specify the disease and the name of Inventory, i.e. mesothelioma register):

b) included in other:

6. Are there proactive initiatives in the search for new cases of asbestos-related diseases?

ADDITIONAL INFORMATION

Please indicate sources of information.

1. Production and imports of asbestos (preferably since 1990 or before; amount, types, highest national consumption, main purposes):

2. Restrictions and banns of asbestos:

3. Groups (governmental and non-governmental organizations, charities or trade unions) they are active in raising awareness of the asbestos issue:

4. Any other aspect you consider important about asbestos in your country e.g. technological (like safer substitutes, waste dealt), social, medical, past relevant events/ foreseen developments:

5. Other information sources:

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Annex 2: Regulations concerning occupational asbestos-related diseases

Regulations concerning recognition of occupational asbestos-related diseases in CEE countries

Country	Regulations
Bulgaria	Ordinance No 3 on the mandatory preliminary and periodical medical examinations of workers; Ordinance on the Order for reporting, registration, verification, appeal and accountability of occupational diseases, adopted by Decree No 79 of the Council of Ministers of 2001
Croatia	Act on Mandatory Health Monitoring of Workers Occupationally Exposed to Asbestos (Class: 541 -01/07-01/03)
Cyprus	Regulations of 2007 (P.I. 530/2007) - The Safety and Health at Work (Occupational Diseases Notification)
Czech Republic	Governmental Decree 361/2007 Coll; Decree 432/2003 Coll; Order no 290/1995
Estonia	NA
Hungary	Current legislation (27/1996. (VIII. 28.) NM rendelet a foglalkozási betegségek és fokozott expozíciós esetek bejelentéséről és kivizsgálásáról
Latvia	NA
Lithuania	Resolution No. 1198, dated 1994-11-30, regarding the Schedule of occupational diseases and the State register of occupational diseases, and its provisions; Resolution No. 487, dated 2004-04-28, regarding Regulation of investigation and record of occupational diseases; Order of the Minister of Health of the Republic of Lithuania No. V-888, dated 2009-10-29, regarding description of criteria for determination of asbestos-related occupational diseases
Poland	Rozporządzenie Rady Ministrów z dnia 30 czerwca 2009 r. w sprawie chorób zawodowych
Romania	Law no. 319/2006 of health and safety at work, further amended and completed Decision no. 1425 from 2006 approving the Methodological Norms for applying; Law no. 319/2006 of health and safety at work, further amended and completed; Law No. 346 from 5th of June 2002 on insurance against work accidents and occupational diseases, republished, further amended and completed; Order no. 450/825 from 2006 approving the Methodological Norms for applying; Law no. 346/2002 on insurance against work accidents and occupational diseases, republished, further amended and completed
Serbia	Serbian Gazette No 106 from 2009
Slovakia	NA
Slovenia	Gazette No. 26, 1997 - rules determining the occupational diseases due to asbestos exposure; Gazette of the Republic of Slovenia, No. 92, 2008 - rules determining the changes and supplementation of the rules on conditions for the determination of the diseases due to asbestos exposure and criteria
Turkey	NA

Annex 3: Recognition criteria for asbestos-related occupational diseases

Recognition criteria for asbestosis, where MC: Medical criteria, E: Criteria for asbestos dust exposure, LP: Latency period

Country	Recognition criteria
Bulgaria	MC: X-ray (s, t, and s/t small irregular opacities of Category 2/1 to 3/3+), low value of diffusion capacity (DLCO, DM); low value of static ventilatory parameters (VC, FVC, TLC etc.), high resolution computed tomography (HRCT), perfusion scintigraphy; Fibrobronchoscopy with transbronchial lung biopsy (TBLB), pleural biopsy (PB) etc. E: 5 and more years LP: 10 and more years
Croatia	**MC:** CT or radiographic/ HRCT or histo-pathological findings, spirometry findings and / or diffusion capacity for CO, arterial blood gas analysis, medical examination done by occupational medicine specialists **E:** evidence of occupational exposure to asbestos, the start of exposure and length of exposure, the company statement about asbestos exposure, job description to which the worker was exposed to asbestos, risk assessment - a copy of the part, which shows that the workplace asbestos was present as an integral part of the technological process, the level of exposure **LP:** 10 and more years
Cyprus[17]	The Cyprus Department of Labour Inspection is currently working on the drafting of national guidelines on the diagnostic criteria for occupational diseases including asbestos-related diseases.
Czech Republic [18]	**MC:** hygienists confirm sufficient exposure for every subject individually, X-ray (ILO s2, t2, u2 and higher) **E:** several years - high exposure or several decades - medium exposure **LP:** NA
Estonia	Estonia has no way established to recognize these conditions when related to work hazards and collects no data on this topic
Hungary[19]	**MC:** disease history (onset, latency, clinical features), confounding factors (other diseases), typical fibrotic pattern on the X-ray (minimum s1-s2 ILO grade) **E:** around 150-200 fibre-years of asbestos, around two years in an average exposure scenario when asbestos had been used **LP:** NA
Latvia	NA
Lithuania[20]	**MC:** disease history, work activities, occupational disease clinic, other illness not related to the work, individual susceptibility to exposure to asbestos, laboratory, instrumental and other clinical research, similar cases of diseases in the company, science-based causal relationship between hazardous work environment factor (asbestos) and occupational diseases **E:** Not less than 5 years **LP:** NA

17. Department of Labour Inspection is seriously considering the possibility of preparing national guidelines for recognition criteria of the above mentioned diseases. The preparation of the national guidelines shall be done in accordance with various EU documents, e.g. the information notices on occupational diseases, a guide to diagnosis prepared by European Commission, the document produced by the German DGUV in 2007 entitled "Prophylaxis in occupational medicine - Guidelines for occupational medical examination"
18. The list of occupational diseases itself contains factors for diagnosing diseases entitled to compensation. Tools from societies of occupational medicine and from Ministries of Health or Social Affairs are also used.
19. Recognition criteria are not set in legislation. The occupational physician takes case-by-case decisions, disease history (onset, latency, and clinical features), the exposure data (if available) and the confounding factors (other diseases).
20. Detailed diagnostic criteria (for asbestosis, mesothelioma, fibrotic diseases of the pleura, lung cancer and cancer of the larynx separately) are approved by the Minister of Health of the Republic of Lithuania ("Description of criteria for determination of asbestos-related occupational diseases")

Country	Recognition criteria
Poland	Helsinki criteria[21]
Romania	**MC:** results of medical examination (type not specified) **E:** proof of occupational exposure (job/task), exposure level is considered (no threshold criteria) **LP:** NA
Serbia	**MC:** X-ray (at 1/1 with medium ventilator insufficiency); proof of asbestos exposure **E:** duration is not explicitly mention in Serbian regulation but it is considered at least 5 years **LP:** NA
Slovakia	Helsinki criteria
Slovenia	**MC:** X-ray (ILO recommendations from 2000), pulmonary fibrosis shown in HRCT, pathohistological changes typical of pulmonary fibrosis, restrictive/ obstructive impairment, reduced CO diffusing capacity, clinical presentation in the late phase of the disease: dyspnoea, cough, finger clubbing, signs of right heart failure, in addition to the obligatory criteria, one of the criteria: radiological changes, pulmonary fibrosis or pathohistological changes have to be fulfilled to confirm the diagnosis of asbestosis **E:** minimum intensity of asbestos exposure: usually more than 0.1 fibres/cm^3, minimum duration of asbestos exposure: several months to several years and/ or repeated short-term exposure to a high intensity of asbestos fibres, induction period: several years, **LP:** several years
Turkey	**MC:** chest x-ray (ILO recommendations); pneumoconiosis classification **E:** at least 3 years period exposure to asbestos **LP:** NA

NA not applicable; s, t, u: ILO categories (**s**-opacities with widths up to about 1.5 mm, **t**-opacities with widths exceeding about 1.5 mm and up to about 3 mm, **u**-opacities with widths exceeding about 3 mm and up to about 10 mm)

Recognition criteria for asbestos-related lung cancer, where MC: Medical criteria, E: Criteria for asbestos dust exposure, LP: Latency period

Country	Medical criteria
Bulgaria	**MC:** X-rays, FID, CT / HRCT, estimated by TBLB, asbestos bodies or asbestos fibres in area of lung malignant process or pleural malignant tumour **E:** proven impact - at least 5 years **LP:** 30 years
Croatia	**MC:** CT or radiographic/ HRCT or histo-pathological findings, spirometry findings and/ or diffusion capacity for CO, arterial blood gas analysis, medical examination done by occupational medicine specialists **E:** evidence of occupational exposure to asbestos, the start of exposure and length of exposure, the company statement about asbestos exposure, job description to which the worker was exposed to asbestos, risk assessment - a copy of the part, which shows that the workplace asbestos was present as an integral part of the technological process, the level of exposure **LP:** a minimum lag-time of 10 years

21. The Helsinki criteria are available at: http://www.sjweh.fi/show_abstract.php?abstract_id=226

Country	Medical criteria
Cyprus	The Cyprus Department of Labour Inspection is currently working on the drafting of national guidelines on the diagnostic criteria for occupational diseases including asbestos-related diseases
Czech Republic	**MC:** hygienists confirm sufficient exposure for every subject individually, lung cancer is diagnosed in parallel with hyalinosis or asbestosis (ILO s1, t1, u1 and higher) **E:** NA **LP:** NA
Estonia	Estonia has no established way to recognize these conditions when related to work hazards and collects no data on this topic
Hungary	**MC:** histology/ cytology **E:** exposure to asbestos, around 25 fibre/years **LP:** NA
Latvia	NA
Lithuania	**MC:** disease history, work activities, occupational disease clinic, other illness not related to the work, individual susceptibility to exposure to asbestos, laboratory, instrumental and other clinical research, similar cases of diseases in the company, science-based causal relationship between hazardous work environment factor (asbestos) and occupational diseases **E:** not less than 5 years **LP:** maximum 20-40 years
Poland	Helsinki criteria Specific for medicine occupational units
Romania	Not specified
Serbia	**MC:** NA **E:** no specific criteria apart from long term asbestos exposure **LP:** NA
Slovakia	Helsinki criteria
Slovenia	**MC:** pathohistological changes that confirm lung cancer, lung function may be impaired, in addition to the obligatory criteria, pathohistological changes have to be fulfilled to confirm the diagnosis **E:** minimum duration of asbestos exposure: several years and/ or repeated short-term exposure to a high intensity of asbestos fibres, induction period: more than 10 years **LP:** more than 10 years
Turkey	**MC:** disease history, clinical-radiological-pathological confirmed diagnosis **E:** not specified **LP:** NA

NA not applicable; s, t, u: ILO categories (s-opacities with widths up to about 1.5 mm, t-opacities with widths exceeding about 1.5 mm and up to about 3 mm, u-opacities with widths exceeding about 3 mm and up to about 10 mm)

Recognition criteria for mesothelioma, where MC: Medical criteria, E: Criteria for asbestos dust exposure, LP: Latency period

Country	Recognition criteria
Bulgaria	**MC:** X-rays, FID, CT/ HRCT, estimated according to PB, asbestos bodies ore asbestos fibres in area of lung malignant process or pleural malignant tumour **E:** proven impact - at least 5 years **LP:** 30 years
Croatia	**MC:** CT or radiographic/ HRCT or histo-pathological findings, spirometry findings and/ or diffusion capacity for CO, arterial blood gas analysis, medical examination done by occupational medicine specialists **E:** evidence of occupational exposure to asbestos, the start of exposure and length of exposure, the company statement about asbestos exposure, job description to which the worker was exposed to asbestos, risk assessment - a copy of the part, which shows that the workplace asbestos was present as an integral part of the technological process, the level of exposure **LP:** a minimum lag-time of 10 years
Cyprus	The Cyprus Department of Labour Inspection is currently working on the drafting of national guidelines on the diagnostic criteria for occupational diseases including asbestos-related diseases
Czech Republic	**MC:** hygienist confirm sufficient exposure for every subject individually, histology, cytology **E:** NA **LP:** no latency prescribed
Estonia	Estonia has no way established to recognize these conditions when related to work hazards and collects no data on this topic
Hungary	**MC:** histology/cytology or unmistakable progressive malign nature **E:** occupational exposure to asbestos **LP:** no latency prescribed
Latvia	NA
Lithuania	**MC:** disease history, work activities, occupational disease clinic, other illness not related to the work, individual susceptibility to exposure to asbestos, laboratory, instrumental and other clinical research, similar cases of diseases in the company, science-based causal relationship between hazardous work environment factor (asbestos) and occupational diseases **E:** not less than 10 years **LP:** maximum 20-40 years
Poland	Helsinki criteria
Romania	NA
Serbia	**MC:** NA **E:** no specific criteria apart from long term asbestos exposure **LP:** NA
Slovakia	Helsinki criteria
Slovenia	**MC:** pathohistological changes that confirm malignant mesothelioma, lung function may be impaired, in addition to the obligatory criteria, pathohistological changes have to be fulfilled to confirm the diagnosis **E:** minimum duration of asbestos exposure: several years and/or repeated short-term exposure to a high intensity of asbestos fibres, induction period: more than 15 years **LP:** NA
Turkey	**MC:** disease history, clinical-radiological-pathological confirmed disease **E:** not specified **LP:** NA

NA not applicable; s, t, u: ILO categories (s-opacities with widths up to about 1.5 mm, t-opacities with widths exceeding about 1.5 mm and up to about 3 mm, u-opacities with widths exceeding about 3 mm and up to about 10 mm)

Recognition criteria for pleural plaques, where MC: Medical criteria, E: Criteria for asbestos dust exposure, LP: Latency period

Country	Recognition criteria
Bulgaria	**MC:** X-rays, FID, CT/ HRCT, low value of static ventilatory parameters (VC, FVC, TLC etc.) in cases with pleural damages; HRCT (t or s/t irregular opacities, additional criteria: conventional chest CT, pleural echography, Fibrobronchoscopy with transbronchial lung biopsy (TBLB), pleural biopsy (PB) etc. **E:** proven impact - at least 5 years **LP:** 20 years
Croatia	**MC:** CT or radiographic/ HRCT or histopathological findings, spirometry findings and/ or diffusion capacity for CO, arterial blood gas analysis, medical examination done by occupational medicine specialists **E:** evidence of occupational exposure to asbestos, the start of exposure and length of exposure, the company statement about asbestos exposure, job description to which the worker was exposed to asbestos, risk assessment - a copy of the part, which shows that the workplace asbestos was present as an integral part of the technological process, the level of exposure **LP:** a minimum lag-time of 10 years
Cyprus	The Cyprus Department of Labour Inspection is currently working on the drafting of national guidelines on the diagnostic criteria for occupational diseases including asbestos-related diseases
Czech Republic	**MC:** hygienists confirm sufficient exposure for every subject individually, restrictive ventilatory disorder must be present **E:** NA **LP:** NA
Estonia	Estonia has no established way to recognize these conditions when related to work hazards and collects no data on this topic
Hungary	Pleural plaques is not recognised
Latvia	NA
Lithuania	**MC:** disease history, work activities, occupational disease clinic, other illness not related to the work, individual susceptibility to exposure to asbestos, laboratory, instrumental and other clinical research, similar cases of diseases in the company, science-based causal relationship between hazardous work environment factor (asbestos) and occupational diseases **E:** not less than 5 years **LP:** maximum 15-30 years
Poland	Helsinki criteria
Romania	Not specified
Serbia	Pleural plaques is not recognised
Slovakia	Pleural plaques is not recognised
Slovenia	**MC:** X-ray (ILO recommendations from 2000), typical radiological changes in HRCT, reduced lung function in extensive pleural impairment, in addition to the obligatory criteria, radiological changes in X-rays or in HRCT have to be fulfilled to confirm the diagnosis. **E:** minimum intensity of asbestos exposure: usually more than 0.1 fibres/cm^3, minimum duration of asbestos exposure: several months to several years and/or repeated short-term exposure to a high intensity of asbestos fibres, induction period: 10 years **LP:** 10 years
Turkey	**MC:** disease history, clinical-radiological-pathological confirmed disease **E:** Not specified **LP:** NA

NA not applicable; s, t, u: ILO categories (s-opacities with widths up to about 1.5 mm, t-opacities with widths exceeding about 1.5 mm and up to about 3 mm, u-opacities with widths exceeding about 3 mm and up to about 10 mm)

Annex 4: Other statistics concerning asbestos-related recognised occupational diseases

Asbestos-related occupational diseases recorded in the Czech Republic in 1964–2012 (questionnaire)

Year	Cases					Total
	Asbestosis	Pleural plaques	Mesothelioma	Lung cancer	Cancer of larynx	
1964	3		0	0		3
1965	4		0	0		4
1966	6		0	0		6
1967	8		0	0		8
1968	4		0	1		5
1969	4		0	0		4
1970	4		0	0		4
1971	4		0	0		4
1972	6		0	0		6
1973	7		0	1		8
1974	12		0	0		12
1975	1		0	0		1
1976	3		0	1		4
1977	5		0	1		6
1978	2		0	0		2
1979	2		0	0		2
1980	0		0	0		0
1981	1		0	3		4
1982	0		0	4		4
1983	2		0	3		5
1984	2		0	3		5
1985	1		0	1		2
1986	2		0	1		3
1987	5		0	2		7
1988	9		0	4		13
1989	4		0	5		9
1990	0		0	6		6
1991*	7		0	5		12
1992	9		1	4		14
1993	12		1	3		16
1994	7		1	2		10
1995	18		0	6		24

*only since 1991 (establishment of the National Registry of Occupational Diseases in the Czech Republic) has mesothelioma lung or peritoneum been reported separately from lung cancer from asbestos

Year	Cases					Total
	Asbestosis	Pleural plaques	Mesothelioma	Lung cancer	Cancer of larynx	
1996	11	3	1	3		18
1997	8	2	8	2		20
1998	7	5	4	3		19
1999	7	8	5	3		23
2000	2	4	7	1		14
2001	3	15	7	7		32
2002	5	21	6	2		34
2003	8	10	5	1		24
2004	4	12	3	4		23
2005	9	23	8	2		42
2006	1	17	5	5		28
2007	4	22	7	2		35
2008	9	14	5	0		28
2009	8	20	4	4		36
2010	4	27	9	4		44
2011	5	13	5	2	0	25
2012	4	3	15	2	0	24
Total	**253**	**219**	**107**	**103**	**0**	**682**

Asbestos-included occupational diseases in the Czech Republic in 1991-2005 (Peclova et al., 2007)

Disease	Year														
	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
A	7	9	12	7	18	11	8	7	7	2	3	5	8	4	9
PH	-	-	-	-	-	**3**	**2**	**5**	**8**	**4**	**15**	**21**	**10**	**12**	**23**
LC	**5**	**3**	**3**	**1**	**4**	**3**	**2**	**3**	**3**	**1**	**7**	**2**	**1**	**4**	2
M	-	**1**	**1**	**2**	**2**	**1**	**8**	**4**	**5**	**7**	**7**	**6**	**5**	**3**	**8**
Total	**12**	**13**	**16**	**10**	**24**	**18**	**20**	**19**	**23**	**14**	**32**	**34**	**24**	**23**	42

A Asbestosis, PH Pleural hyalinosis, LC Lung cancer, M Mesothelioma

Asbestos-related occupational diseases recorded in Hungary in 1990–2011, questionnaire

Year	Asbestosis	Mesothelioma	Lung cancer
1990	4	NA	NA
1991	**6**	**NA**	**NA**
1992	3	NA	NA
1993	**3**	**NA**	**NA**
1994	6	NA	NA
1995	**7**	**NA**	**NA**
1996	5	0	0
1997	**3**	**0**	**0**
1998	4	1	1
1999	**23**	**1**	**0**
2000	28	3	1
2001	**24**	**4**	**1**
2002	10	0	1
2003	**14**	**0**	**0**
2004	15	0	0
2005	**22**	**0**	**0**
2006	18	3	2
2007	**5**	**2**	**4**
2008	5	1	0
2009	**8**	**6**	**0**
2010	2	4	0
2011	**3**	**4**	**1**
Total	218	29	11

NA not available

Asbestos-related occupational diseases recorded in Lithuania in 1990–2010, questionnaire

Period	Cases				
	Asbestosis	Pleural diseases	Mesothelioma	Lung cancer	Larynx cancer
1990-2000	**0**	**0**	**0**	**0**	0
2001-2010	**5**	**0**	**0**	**0**	**1**
Total	**5**	**0**	**0**	**0**	1

Asbestos-related occupational diseases recorded in Poland in 1976–2010 (Szeszenia-Dąbrowska and Wilczyńska (2011))

Period	Cases					
	Asbestosis	Lung cancer	Pleural meso-thelioma	Diseases of pleura or pericardium*	Other neoplasm	Other non-malignant diseases
1976-1980	**106**	**4**	**2**	**-**	**1**	**-**
1981-1990	**771**	**54**	**15**	**-**	**29**	**13**
1991-2000	**702**	**173**	**69**	**-**	**82**	**54**
2001-2010	**1,222**	**306**	**193**	**427**	**18**	**12**
Total	**2,801**	**537**	**279**	**427**	**130**	**79**

* Listed among occupational diseases since 2002

Asbestos-related occupational diseases recorded in Romania in 1985-2011, questionnaire

Year	New cases	Asbestosis	Lung cancer	Mesothelioma	Pleural plaques	Others
1985	2	2				
1986	3	3				
1987	1	1				
1988	4	4				
1989	1	1				
1990	3	3				
1991	2	2				
1992	0	0				
1993	4	4				
1994	1	1				
1995	11	11				
1996	26	26				
1997	21	21				
1998	8	8				
1999	56	55	1			
2000	7	7				
2001	2	2				
2002	6	6				
2003	24	22	2			
2004	7	7				
2005	12	12				
2006	12	9		1	1	1 (larynx)
2007	10	10				
2008	8	8				
2009	24	23			1	
2010	41	34	3		3	1 (larynx)
2011	108	103		1	4	
Total	**404**	**374**	**6**	**2**	**9**	**2**

Annex 5: Regulation concerning medical surveillance in CEE

Medical surveillance in CEE countries

Country	Regulation
Europe	Overview at: http://ec.europa.eu/social/main.jsp?catId=815&langId=en
Bulgaria	Ordinance No 3 on Preliminary and Periodical Medical Examinations of Workers; Decree No. 1 of 27 February 2003 on the protection of workers from risks related to exposure to asbestos at work
Croatia	Regulation on workers protection from the risk related to asbestos exposure (OG 40/07) for the monitoring of asbestos; Act on list of occupational disease No 162, 1998
Cyprus	Regulations of 2006 (P.I. 316/2006) on Safety and Health at Work; Act relating to the protection of the security and health of workers exposed to asbestos in workplaces (No. 23(I) 1993); Act on Mandatory Health Monitoring of Workers Occupationally Exposed to Asbestos (No. 011-01/07-01/89 - Reg. No. 71-05-03/01-07-2)
Czech Republic	Governmental Decree 361/2007 Coll Decree 432/2003 Coll
Estonia	NA
Hungary	Act of 12/2006. (III. 23.) EüM rendelet az azbeszttel kapcsolatos kockázatoknak kitett munkavállalók védelméről
Latvia	Regulations No. 317, passed on 25 August, 1998 cover issues of occupational safety and health for asbestos-related work under the Law on Labour Protection
Lithuania	Order No. V34, 2006 "Regarding Methodological guidelines for measurement of asbestos fibre concentration in the air"; Order No. 301, 2000, "Regarding the preventive health examination in health care institutions"
Poland	Act of 19 June 1997, on the prohibition of use of asbestos contained materials (Law Gazette, 1997,101, 628); Regulation of the Minister of Health, Law Gazette 2005, 73, 645 and Regulation of the Minister for Labour and Social Policy, Law Gazette 2002, 217, 1833
Romania	Decision (HG) no. 1875/2005 on protection of health and safety of workers against the risks due to exposure to asbestos; Order no. 108/2005 concerning the methods of sampling and determining the quantities of asbestos into the environment; Decision no. 355/2007 on the supervision of workers' health.
Serbia	WHO methodology adopted by Ministry of Labor Regulation on preventive occupational and safety measures for work with asbestos (Serbian Gazette No 106 from 2009)
Slovakia	Law No. 272 / 1994 on the Protection of Human Health; Law No. 330 /1996 on the Occupational Health and Safety; Regulation No. 4 /1985 Bull. of the Ministry of Health on Health Principles; Regulation No. 8 / 1990 Bull. of the Ministry of Health on control of Asbestos
Slovenia	Rules on the protection of workers against the risks related to the exposure to asbestos at work (Official Gazette of the Republic of Slovenia, No. 93, 2001)
Turkey	Law on Protection of Workers from the Risks Related to Exposure to Carcinogen and Mutagen Substances at Work (Official Gazette of 26.12.2003)

NA not applicable

Annex 6: Regulations concerning compensation rules

National regulations concerning compensation rules

Country	Regulation
Europe	Overview at: http://ec.europa.eu/employment_social/missceec/
Bulgaria	Social Security Code, 1999, title amended 2003. Social insurance contributory scheme providing earnings -related benefits to economically active persons
Croatia	Act on Compensating Workers Occupationally Exposed to Asbestos (Class: 543-04/07-01/01); Act on the Requirements for Obtaining an Old Age Pension by Workers Occupationally Exposed to Asbestos (Class: 543-04/07-01/02); Obligatory Relations Act from 1991
Cyprus	Social Insurance (Diseases) Regulations from 1980, revised
Czech Republic	Act No 65/1965 Labour Code (last amendment 155/2000); Ordinance No 108/1994 to implement the Labour Code (last amendment 461/2000); Directive MOLSA No 115/1992 on transaction working rehabilitation citizen with changed capacity of work (last amendment 232/1997); Directive MF No 125/1993 on responsibility employer under claims at work injury or vocational disease (last amendment 74/2000)
Estonia	Health Insurance Act 1991; State Pension Insurance Act 2001 Government regulation No 172 on interim procedure of compensation of injuries or other health damage occurring in the course of fulfilling work duties 1992
Hungary	Act LXXXI of 1997 on Social Insurance Pension (1997). Act LXXXIII of 1997 on Compulsory Health Care Insurance (1997).
Latvia	Act of November 2, 1995 on Compulsory Social Insurance against Occupational Accidents and Occupational Diseases, 2000; Act on State Social Insurance, 2001
Lithuania	Resolution No. 309/2004, regarding regulation of social insurance benefits of accidents at work and occupational diseases
Poland	Act on social insurance for occupational accident or disease, 2002; Act on benefits payable for employment injuries and occupational diseases, 1975
Romania	Law No. 346/2002; Order no. 450/825 from 2006 approving the Methodological Norms for applying Law no. 346/2002 on insurance against work accidents and occupational diseases
Serbia	Act on Health Care, 2005; Act on Health Insurance, 2005; Labour Law of the Republic of Serbia, 2005; Act on pension and disability insurance, 2003
Slovakia	Act No. 461/2003 on Social Insurance; Act No. 231/2002 amending Act No. 95/2000 on labour inspection; Act No. 320/1993 on benefits for salary loss due to work disablement resulting from an occupational accident or disease
Slovenia	Gazette No. 61, 2007; Gazette No. 28, 2008 on asbestos exposure and criteria for the determination of the amount of indemnity
Turkey	List of occupational diseases including dust related lung diseases from 1972; Social Insurance Law No. 506, 1964; provisional articles supplemented by Law No. 4447, 1999 and by Law No. 4958, 2003

Annex 7: Statistical data for production, export and import of asbestos

Asbestos fibre production in CEE countries: 1990 - 2010, in tons per year (USGS, 2013a)

Country	Production																				
	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Bulgaria	500	400	500	500	500	450	300	300	300	300	-	-	-	300	237	-	-	-	-	-	-
Romania	-	-	-	-	-	-	300	300	300	300	300	-	-	-	-	-	-	-	-	-	-
Serbia	-	-	-	-	-	-	-	-	-	-	-	-	-	2860	7300	4080	4500	-	-	-	-
Slovakia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1000	1000	400	200	200	-

- not known/ no data

Asbestos export and import in CEE countries: 2000 - 2005, in tons per year[1] (BGS (2006), BGS (2010))

Country	Export						Import					
	2000	2001	2002	2003	2004	2005	2000	2001	2002	2003	2004	2005
Bulgaria	-	36	9	0	83	83	139	271	160	50	196	-
Croatia	-	-	-	-	-	-	2,586	2,666	3,274	1,958	3,251	2,429
Cyprus	-	-	-	-	-	-	-	-	-	-	-	-
Czech Republic	-	-	-	-	-	-	1,402	2,322	785	1,464	2,891	0
Estonia	-	-	-	-	-	-	180	58	61	-	-	-
Hungary	-	-	-	-	-	-	3,558	2,167	740	574	-	-
Latvia	-	-	-	-	-	-	857	664	-	-	34	4
Lithuania	643	139	0	0	-	-	1,356	-	-	-	-	-
Poland	-	-	-	-	-	-	19	19	19	-	16	6
Romania	-	-	-	-	-	-	10,244	13,644	12,137	11,859	13,036	9,077
Serbia	-	-	-	-	-	-	-	-	-	-	-	-
Slovakia	-	-	-	-	-	-	-	-	-	-	-	-
Slovenia	-	-	-	-	-	-	893	-	-	-	10	25
Turkey	-	5	3	42,000	0	0	19,455	10,557	13,977	14,645	13,509	12,576

- not known/ no data

Asbestos export and import in CEE countries: 2006 - 2010, in tons per year[1] (BGS (2010), BGS (2012))

Country	Export					Import				
	2006	2007	2008	2009	2010	2006	2007	2008	2009	2010
Bulgaria	-	-	-	-	-	-	20	-	-	-
Croatia	-	-	-	-	-	-	-	-	-	-
Cyprus	-	-	-	-	-	-	-	-	-	-
Czech Republic	-	-	-	-	-	-	1	1	-	-
Estonia	-	-	-	-	-	-	-	-	-	-
Hungary	-	-	-	-	-	-	-	-	-	-
Latvia	-	-	-	-	-	28	-	-	-	-
Lithuania	-	-	-	-	-	-	-	-	-	-
Poland	-	-	-	-	-	52	-	-	-	-
Romania	-	-	-	-	-	3,272	0	1	0	-
Serbia	-	-	-	-	-	-	-	-	-	-
Slovakia	-	-	-	-	-	-	-	-	-	-
Slovenia		-	-	-	-	-	-	-	-	-
Turkey	3	990	685	-	3	6,124	2,518	585	-	-

- not known/ no data

Serbian asbestos production, in tons per year (Euromines, 2013)

Year	2003	2004	2005	2006
Production	111	110	143	157

Reported quantities of generation and collection of insulation materials containing asbestos and construction materials containing asbestos for period 2008 to 2010 in Croatia, in tones (NIPH, 2013)

Waste	2008		2009		2010	
	Generation	Collection	Generation	Collection	Generation	Collection
Insulation Materials	3.9	3.9	52.3	52.3	27.0	27.0
Construction materials	510.5	438.3	412.0	366.0	610.0	421.9