Chapter 20
Occupational cancers: what recognition in Europe?

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The International Agency for Research on Cancer (IARC) estimated the number of new cases of cancer in the EU-27 at 2.6 million in 2012. Various international studies consider that between 4 and 8.5% of these cancers may be attributable to occupational factors, amounting to roughly 100,000 to 200,000 new cases of work-related cancers in Europe each year.

The link to work is not however easy to identify, for various reasons:

— medically, a tumour due to occupational exposure is indistinguishable from other tumours, and cancers are often multifactorial diseases, making it hard to pinpoint them as work-related;
— these diseases have a long latency period between exposure and the onset of symptoms (20 years on average, but up to 40 years); so it is hard to identify the risk factors and any occupational exposure;
— at the time of diagnosis, doctors tend to pay little heed to the patient's work history.

The above figures raise the issue of recognition of occupational cancers. Assisted by experts from national occupational risk insurance agencies from eleven European countries[1], EUROGIP[2] has studied the insurance-related aspect of occupational cancers[3] in terms of what and how many cancers are apt to be recognized as occupational.

The first thing to say is that the legal concept of an occupational disease is narrower than that of a work-related illness. The occupational nature of a cancer (like any other disease) can be recognized by the national occupational diseases insurance agency if the requirements relating to the nature of the disease, the type of exposure and the job performed are met. The sufferer will be then cared for and compensated in line with prevailing national legislation on compensation for occupational injuries and diseases. But every country has its own criteria and social insurance system.

While in practice a number of cancers are covered in the different countries, the figures for recognized cases lead to the conclusion that occupational cancers are under-reported.

1. Germany, Austria, Belgium, Denmark, Spain, Finland, France, Italy, Luxembourg, Portugal and Switzerland linked together in the European Forum of the insurance against accidents at work and occupational diseases, www.europeanforum.org.
2. www.eurogip.fr
3. The findings of this cooperative survey were published in the report Eurogip (2010).

1. Cancers that could be recognized as occupational

Almost all the European countries in the Eurogip study have a national list of occupational diseases, conferring on them a presumption – of varying conclusiveness according to the country – of occupational origin.

Entering a cancer on a list does not prevent each country from setting its own criteria for its recognition (name of pathology, duration and/or intensity of exposure, list of jobs, etc) and its own method of examination.

The tables below list almost all the cancers currently registered on national lists of occupational diseases by tumour location, broken down by causal agent.

The European Schedule is contained in a Recommendation that has no binding legal effect in EU Member States. It is, however, noteworthy that cancers included in the European Schedule more consistently feature in the various national lists that those that are not. This points to the importance of regular revisions of the European Schedule to prompt movement forward in national systems. The Schedule was last revised in 2003.

Table 1 **Cancers that could be recognized under national lists of occupational diseases**

Pathology and/or Agent	DE	AT	BE	DK	ES	FI	FR	IT	LU	PT	CH	EU
Skin cancers												
Arsenic and mineral compounds	●	●	●	●	●	●	●	●	●		●	●
Coal pitch	●	●	●	●	●		●	●	●	●	●	●
Petroleum derivatives	●	●	●	●	●		●	●	●	●	●	
Coal tars	●	●	●	●	●		●	●	●	●	●	●
Coal oils	●	●	●	●	●		●	●	●		●	●
Soot from coal combustion	●	●	●	●	●		●	●	●		●	●
Carbon black	●	●	●	●	●		●		●			
Paraffin and its compounds	●	●	●	●	●				●	●	●	●
Anthracene	●	●	●	●	●		●	●	●	●	●	●
Resins		●			●				●			
Carbazole and its compounds	●	●	●						●			●
Bitumen	●	●	●	●	●			●	●	●	●	●
Ionizing radiation	●	●	●		●			●	●	●	●	●
Mineral oil	●	●		●	●		●			●	●	●
Bladder cancers												
Aromatic amines and their salts	●	●	●	●	●	●	●	●	●		●	●
N-nitroso-dibutylamine and its salts					●		●			●		
Tars, oils and coal pitch (* except for oils)				● (*)	●		●	● (*)		●		
Soot from coal combustion							●					

Pathology and/or Agent	DE	AT	BE	DK	ES	FI	FR	IT	LU	PT	CH	EU
	Bronchopulmonary cancers											
Primary cancer caused by:												
Ionizing radiation	●	●	●		●		●		●	●	●	●
Chromic acid, chromates, alkaline or alkaline earth bichromates, zinc chromates	●	●	●	●	●	●	●	●	●	●	●	●
Tars, oils, coal pitch and soot from coal combustion	●		●	●			●	●	●	●	●	
Inhalation of dust or fumes of arsenic and its compounds	●	●	●	●	●	●	●	●	●		●	●
Inhalation of beryllium dusts	●	●	●	●	●	●		●	●	●	●	●
Inhalation of asbestos dusts	●	●	●	●	●	●	●	●	●	●	●	●
Inhalation of nickel dusts or fumes	●	●	●	●	●	●	●	●	●	●	●	●
Inhalation of iron oxide dusts or fumes							●					
Inhalation of cadmium dusts		●		●	●	●	●	●		●	●	●
Inhalation of cobalt dusts combined with tungsten carbide before sintering				●			●		●	●	●	
Bis(chloromethyl)ether	●	●	●	●	●		●	●				
Malignant degeneration of the lung following:												
Inhalation of asbestos dusts	●	●	●	●	●	●	●	●	●	●	●	●
Silicosis or silicotuberculosis	●	●		●			● (1)	●			●	
	Bone cancers											
Sarcoma due to ionizing radiation	●		●				●	●	●	●	●	●
Cancer of the ethmoid bone and paranasal sinuses due to wood dusts	●		●	●	●		●	●	●	●	●	●
Cancer of the ethmoid bone and paranasal sinuses due to nickel	●		●	●	●	●	●	●	●	●	●	●
Cancer of the nasal cavities due to chromium	●		●	●	●	●	●	●	●	●	●	
Cancer of the nasal cavities due to leather dusts			●	●	●			●			●	
	Leukaemia											
Benzene	●		●	●	●	●	●	●	●	●	●	●
Ionizing radiation	●		●	●	●		●	●	●	●	●	●
	Hepatic cancers											
Arsenic and mineral compounds	●		●		●		●	●	●		●	
Vinyl chloride monomer	●		●	●	●	●	●	●	●		●	●
Hepatitis viruses	●		● (2)	● (3)			●	(4)	● (5)			●
Ionizing radiation	●								●			

(1) For primary cancer (2) B, C and delta (3) B and C (4) B and C recognized as work accidents (5) B

Pathology and/or Agent	DE	AT	BE	DK	ES	FI	FR	IT	LU	PT	CH	EU
	Other types of cancers											
Cancers due to inhalation of asbestos dusts (other than lung cancers):												
Cancer of the larynx	●	●	●	●					●	●		●
Pleural mesothelioma	●	●	●	●	●	●	●	●	●	●	●	●
Mesothelioma of the peritoneum	●	●	●	●	●		●	●	●		●	●
Mesothelioma of the pericardium	●	●	●	●	●	●	●	●	●	●	●	
Other cancers:												
Thyroid cancer due to ionizing radiation	●	●	●	●				●	●		●	
Cancer of the larynx/oral cavities due to coal tars/ pitches		●						●	●	●	●	
Cancer of the pancreas due to inhalation of arsenic	●	●							●			
Kidney cancer due to trichloroethylene	●								●			
Cancer of the larynx due to chromium		●			●				●	●		
Lung cancer caused by passive smoke inhalation				●								

Almost every country surveyed also operates a complementary system of recognition under which sufferers must prove the link between their disease and their work activity[4].

In practice, this off-list system is a residual means of recognition, especially so for cancers, partly because the most numerous types of cancers are usually already listed and partly because the difficulty of producing evidence of the origin of cancers renders the burden of proof harder. Recognized cases not on the prescribed list in 2008 accounted for 1.1% of cancers recognized in Germany, 2.2% in France, but 13% in Italy. This form of recognition is extremely rare for cancers in Switzerland and Austria, and non-existent in Belgium and Luxembourg.

There is little data available on cancers recognized under the off-list system in recent years. In Germany, it almost exclusively concerns skin cancer caused by exposure to ultraviolet radiation, cancer of the oesophagus caused by nitrosamines and lung cancer caused by exposure to 1,3-Propanesultone. In France, by contrast, the sixty-odd cases recognized each year are widely varied. In Denmark, breast cancer due to performing night shift work has been recognizable since 2007 (by the end of 2011, more than a hundred women, mostly hospital sector workers, had received compensation).

In very rare cases the courts have recognized atypical cases of cancers linked to occupational exposures, such as that in Italy in 2012 where a brain tumour was held to be caused by intensive use of a mobile phone.

The last decade has seen few major changes in the cancers appearing on national lists of occupational diseases. Spain and Denmark published new occupational disease lists in 2006 and 2005, respectively, which included new types of cancer or likely occupational carcinogens, while a handful of countries sporadically add a new type of cancer or exposure to their list (skin cancer caused by exposure to ultraviolet radiation was added

4. Apart from Sweden which does not have a mixed system but only a proof-based system, and Spain which has a list system only.

to the German list in January 2015) or amend the regulatory requirements for the recognition of certain cancers (the duration of exposure to certain aromatic amines was reduced for bladder cancer in France in 2012).

2. Detailed figures on occupational cancers

Figures are available on the number of cancers recognized as occupational by national occupational injury and disease insurance organisations. However, the scope of the population insured by these bodies may vary between countries (according to whether they include public sector workers, self-employed workers, etc.).

Table 2 **Number of new cancer cases recognized as work-related by the competent insurance organization, 2000-2008, by country**

Number of cancers recognized as an occupational disease	2000	2001	2002	2003	2004	2005	2006	2007	2008
Austria	28	29	47	41	53	70	84	76	91
Belgium	114	118	148	178	144	178	245	168	219
Czech Republic	50	55	49	45	26	39	38	37	24
Denmark	154	100	105	110	112	136	135	153	187
France	1 033	1 400	1 511	1 734	1 951	1 856	1 894	2 051	1 898
Germany	-	-	-	-	2 173	2 107	2 194	2 054	2 240
Italy	nd	625	750	755	783	876	911	853	694
Luxembourg	2	6	5	5	10	16	13	15	16
Spain	6	4	14	7	6	13	4	15	62
Sweden	-	-	-	-	-	33	43	34	19
Switzerland	55	56	62	69	89	99	128	116	-

The figures provided by the insurance organizations show an almost across-the-board rise in the number of recognized occupational cancers in all bar a few countries. The trends must be interpreted with caution, however, for countries where the absolute number of recognitions is low and where a handful of cases more or less from one year to the next can result in significant variations.

More recent studies of a small number of countries compare the number of declared and recognized occupational cancers with their insured population in 2011 (Eurogip 2015).

Ratios aside, cancers are the only occupational diseases that most countries agree on as being heavily under-reported, mainly due to the long latency period between exposure to the hazard and the onset of symptoms (20-40 years) and their multifactorial nature. These factors make it hard for doctors to establish a cause related to employment (or the past employment of retired sufferers).

Table 3 **Declared and recognized cancers relative to the insured population in 2011**

Country	Insured population	Applications for recognition	Declarations per 100 000 insured	Recognized cases	Recognitions per 100 000 insured
Denmark	2 676 095	612	23	162	6
France	18 492 444	2 536	14	2 050	11
Germany	40 861 230	8 000	20	2 408	6
Italy	17 294 329	2 272	13	908	5
Spain	15 756 800	Not available	-	75	<1

A distinction has to be made between this aspect of under-reporting and the recognition issue inasmuch as the recognition rates of cancers tend to be higher than other types of occupational disease.

Cancer recognition ratios are comparable for Denmark, Italy and Germany, but twice as high in France. It owes this top position to bronchopulmonary cancers due to asbestos, which are recognized in many more cases in France than in other countries, presumably because the conditions for their recognition in France are rather more open, especially in terms of exposure (no exposure intensity criterion).

Spain stands out for its extremely low recognition ratio; work-related cancers are manifestly under-reported in this country, much more so compared with the other countries surveyed.

Looking at the cancers with the highest recognition rates (in all countries producing statistics per affected organ for 2008), bronchopulmonary cancers - including the pleura – alone account for 86% of recognized cancer cases, trailed far behind by bladder (4%), sinus (3%), blood (2%), and skin (1%) cancers. Recognized work-related cancers affecting other organs account for only 4% of the recognized total (ranging from 0.9% in Belgium to 25% in Denmark).

Since most national statistics allow cases of occupational cancers caused by asbestos to be isolated, it can be concluded that on average 80% of recognized work-related cancers were caused by asbestos dust in 2008 (ranging from 20% in the Czech Republic to 93% in Austria).

3. Conclusions

Data on the recognition of occupational diseases are not enough to account for the real impact of carcinogens in the workplace. Figures on the number of workers exposed (e.g. from CAREX, Sumer ...) are also vital. By contrast, a comparative analysis of data from occupational disease recognition systems is needed to understand the national peculiarities of recognition in a bid to improve their effectiveness.

References

EUROGIP (2010) Work-related cancers: what recognition in Europe? http://www.eurogip.fr/images/publications/EUROGIP_RecoCancerspro_49E.pdf

EUROGIP (2015) Reporting of occupational diseases: issues and good practices in five European countries. http://www.eurogip.fr/images/documents/3933/Report_DeclarationMP_EUROGIP_102EN.pdf