European Agency for Safety and Health at Work

EUROPEAN RISK OBSERVATORY REPORT

EN 6

ISSN 1830-5946

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Cataloguing data can be found at the end of this publication.

Luxembourg: Office for Official Publications of the European Communities, 2008

ISBN 978-92-9191-161-5

Printed in Belgium

PRINTED ON WHITE CHLORINE-FREE PAPER

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Foreword

Skin diseases are among the most important emerging risks related to extensive use of, and exposure to, chemicals [65]. The skin is the largest organ of the body, and in addition to chemicals, it is exposed to physical and biological risk factors. However, there is no scientific method of measuring the results of the body's exposure to risks through dermal contact. Consequently **no dermal exposure standards have been set.** This increases the importance of recognising risk factors, and developing methods of assessing and controlling them. This report will attempt, as far as possible, to present an overview of dermal exposure, skin diseases and principal policies in relation to the recognition and recording of skin diseases. It will also examine the situation as regards recognition, assessment and control of dermal exposure to chemical, biological, and physical (excluding UV radiation and vibration) risk factors in the European Union (EU-25) (Chapters 2 to 6). It will conclude with some challenges, prospects and recommendations (Chapter 7).

In order to provide a broad overview, summaries of policies and practices were collected at EU level as well as national, regional and local administrative levels; these are analysed and discussed in this report. The focus of information collection was on the diverse policies and practices existing in European Union' Member States in terms of legislation, guidelines and recommendations, agreements, collective actions and programmes, existing practices and methodologies. The results of the information collected from the Member States are presented in the Appendix 2 to this report which is available in the electronic form from: http://osha.europa.eu/publications/reports/TE7007049ENC/view Background and additional information was obtained from scientific reference books, papers, articles and websites (see Bibliography).

As a practical tool, a detailed (but non-exhaustive) table in Appendix 1 lists a number of examples of skin diseases together with many causative (chemical, biological and physical) agents. The lesions are classified by economic sector/occupation. This important table also lists aggravating factors and complications and, last but not least, some specific preventive actions.

Executive summary

Background

Skin diseases are one of the most important emerging risks related to the exposure to, and extensive use of, chemicals. As the largest organ of the body, the skin is exposed to chemical, physical and biological risk factors. However, because there is no scientific method to measure the consequences and level of the body's exposures to risks via dermal contact, no dermal exposure standards are set. This increases the importance of recognising risk factors and developing methods of assessing and controlling them. This report will attempt as far as possible to present an **overview of dermal exposures and skin diseases**. It contains the principal policies relating to the recognition and recording of skin diseases, as well as the recognition, assessment and control of dermal exposure to chemical, biological and physical risk factors in the European Union (EU-25). The document concludes with some challenges, prospects and recommendations.

Methodology

In order to provide a broad overview, the report collects, analyses and discusses main lines of policies and collective practices throughout the EU.

The focus was on the diverse policies and collective practices existing in European Member States including legislation, collective guidelines and recommendations, agreements, actions and programmes, existing practices and methodologies. The information was collected at an EU-level, as well as at a national, regional and local level. The results of the information collection are included in the templates in Appendix 2, available from: http://osha.europa.eu/publications/reports/TE7007049ENC/view. Background and additional information was collected from scientific reference books, papers, articles and websites. As a practical tool, a detailed but non-exhaustive table in Appendix 1 offers many examples of skin diseases, classified by activity sector/occupation, together with a variety of chemical, biological and physical causes**.** The table also contains aggravating factors, potential complications and many specific preventive actions.

Types of skin diseases

The types of detrimental effects following exposure of the skin to dermal risk include: localised harmful effects and systemically harmful effects from dermal penetration and occupational dermatoses.

- **Localised harmful effects** can range from irritations, burning or urticaria to cancerisation and can include sensitisation or allergisation, phototoxicity and infections.
- **A systemic effect** can appear when the product in question passes from the surface of the skin into the general circulation through the horny layer (a relatively slow phenomenon), or the epidermis and dermis (a faster phenomenon).
- **Occupational dermatoses** have a variety of appearances and causes. Some come from inside the body (endogenous) while others come from outside the body (exogenous). Although they constitute a significant category among occupational diseases, their **complexity prevents any single classification**. As a result, the

recording of occupational diseases, which is important for national recognition and compensation systems, is of limited use.

The lack of a standard definition for skin diseases explains the difficulty in obtaining accurate epidemiological data.

Collecting accurate, specific statistical information on the distribution and prevalence of skin exposure and the different assessment, compensation and prevention systems across the EU is extremely difficult. The lack of any international clear-cut definition of occupational skin diseases also impedes the collection of high-quality epidemiological data. However, all studies have found trends suggesting both an underestimation of, and regular increase in, the frequency and gravity of observed skin diseases (in particular irritations, skin cancers and, above all, allergies of chemical origin).

Recognition of skin diseases and dermal exposure

The European schedule of occupational diseases lists diseases that have been scientifically recognised as occupational in origin.[1] As a result, they qualify for compensation and are the subject of compulsory preventive measures to reduce their prevalence. **European Member States determine for themselves the criteria for recognising occupational diseases** and are free to implement more comprehensive and detailed national laws and regulations. Occupational diseases caused by physical, chemical or biological factors are recognised in all EU Member States.

The official recognition of occupational skin diseases is in most countries based on the recognition of a so-called 'occupational risk' and the application of three key criteria:

- there has to be a causal relationship between the disease and exposure to a harmful situation or agent;
- this exposure is linked to the work place;
- the disease occurs among specific groups with a frequency exceeding the average morbidity of the rest of the population.

EU countries recognise the risks of dermal exposure leading to skin diseases and have transposed the requirements of all relevant Directives into their legislation. However, it remains unclear how far individual countries have translated this recognition into national law.

Methods of collecting data

Occupational diseases are usually reported by (occupational) physicians, although some differences exist in the way in which occupational diseases are reported and the path that those reports will follow. Data on occupational diseases is collected through these reports and is sent to the relevant insurance company, local / national authorities (e.g. the labour inspectorate or health officials of the ministry of labour), health and safety offices, or any national institute responsible for the monitoring and prevention of occupational diseases.

The main purpose of the data collection is to monitor occupational diseases in order to identify and keep track of the main problems and to detect new diseases and risk factors. The aim is to gain insight into the causes of occupational diseases, to predict

[1] Commission Recommendation 2003/670/EC of 19 September 2003 concerning the European schedule of occupational diseases, European Commission, 2003

and study trends (e.g. in industry sectors) and to learn how to prevent the diseases or how best to take precautions against them.

The data also provides a basis for further analysis and scientific research, vocational education and international comparison. Along with the European lists, national lists of skin diseases include the categories of harmful substances that lead to occupational skin diseases. However, more information about the extent of the hazards and workers' exposure is needed to fully recognise the risks of dermal exposure. The prevalence of occupational skin diseases in the EU shows that exposure assessment is necessary.

Diagnosis, measurement and risk assessment of skin diseases and dermal exposure

Diagnosis is based on the concordance between medical observations and those of the work environment. Allergology and skin tests are both important factors, particularly with the standard European battery and supplementary batteries (e.g. cosmetics, dyes, antiseptics, solvents, rubber products). Therapeutic care is based on avoiding causal agents (in other words, prevention at the source) and co-operating to instigate various other preventive measures. In more difficult cases, specialist consultations (for example, dermatologists and specialists in occupational diseases) can suggest steps for effective prevention and possible compensation to employees.

Several methods of cutaneous risk assessment are also specifically used in the EU: data on workers' exposure is mostly collected through questionnaires and surveys but widespread surveys are also conducted in France, Germany, the Nordic countries and the UK.

Methods of preventing/eliminating/minimising the risk of dermal exposure

Effective prevention of skin diseases requires a combination of technical, organisational and medical measures to eliminate or minimise the skin's exposure to risk factors. There needs to be a sense of responsibility about identifying the risks involved at each workstation and also about informing the workers and making them actively aware of the physical, biological or chemical risks, as well as protective measures.

Various measures aimed at eliminating, or at least reducing, contact with irritant or allergenic and/or carcinogenic products are possible.

Across the EU, countries use a variety of methods, including workers' health surveillance in workplaces and entry health inspections, collaboration between different specialists, plus information packages, training programmes and campaigns targeting occupational groups or sectors.

Conclusions

The prevention of skin diseases includes maintaining the natural protective function of the skin, as well as identifying and evaluating dermal exposure to harmful agents. It is therefore essential to promote a proactive approach, with effective evaluation and the establishment of clear standards of registration of diseases.

There is a clear, urgent and general need for a unifying European framework of criteria for recognition of occupational diseases.

Furthermore, much work is still needed to raise employees' awareness and keep doctors up to date with current developments in this field.

The new European policy about cosmetic products could possibly be adopted as a model by which other agents and industrial sectors can start to solve skin diseases, still one of the most important, but underestimated, problems in occupational health and safety.

1.

BRIEF DESCRIPTION OF SKIN DISEASES IN OCCUPATIONAL HEALTH

1.1. Structure of the skin

The skin is the most extensive organ in the human body, with a surface area of about 2 m^2 and a total weight in adults of about 3 kg. It plays an essential role in protecting the body against external threats. It consists of three layers: the epidermis on the outside, then the dermis and the hypodermis.

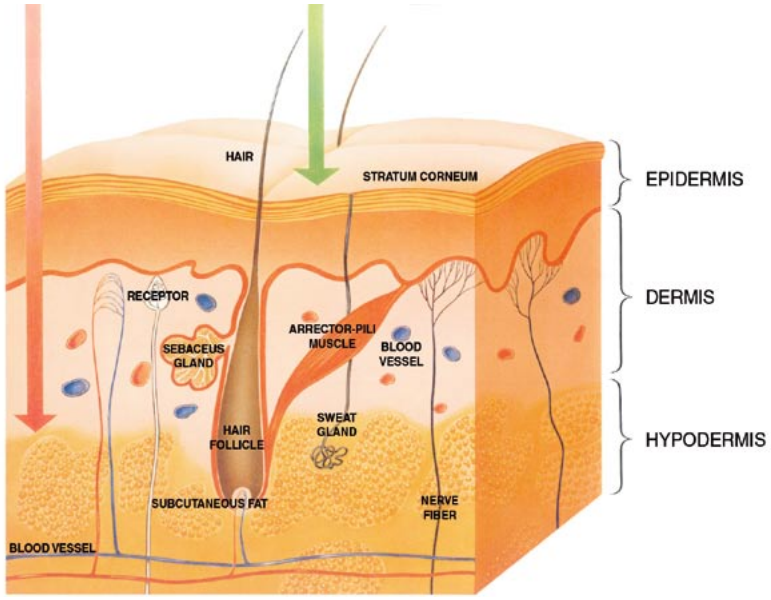
The **epidermis** in turn is composed of four layers: a superficial, protective, horny layer comprising fatty sebum and keratin which is worn away progressively; a granular layer which may be keratinised; the so-called Malpighi layer containing free nerve endings (responsible for sensations of pain); and a basal layer which continually produces new cells. Melanocytes, Langerhans cells and lymphocytes (which provide the body's immune system response) are found in this layer, but it has no blood vessels.

Skin plays an essential role in protecting the body against external threats.

The **dermis** is composed essentially of collagen and elastin, with terminal blood vessels (as blood vessels are absent from the epidermis, if there is no bleeding following an injury it is a sign that only the epidermis is involved; if bleeding occurs, then the dermis is also involved, and hence a scar forms). The dermis also contains sebaceous glands, fibroblasts, macrophages, histiocytes, mast cells and nerve endings (responsible for hypersensitivity and sense of touch).

The **hypodermis** or subcutis contains the hair follicles, sweat glands, nerve fibres and a capillary network, responsible for a sense of temperature.

Figure 1: Cross-section of human skin, showing the three layers (*Source:* Arbetsmiljö, Sweden, 1984 [19])



Some harmful or toxic agents coming into contact with the skin produce local effects; others which can cross the skin barrier can provoke systemic effects when they enter the general blood circulation [5] [36] [56] [73].

The principal effects, classified by activity sector/occupation, are listed in the table of skin diseases, together with the agents involved, in the Appendix 1.

1.2. Localised harmful effects

The skin is subject to a wide range of localised harmful effects, including irritations/burning/urticaria, the development of cancers, sensitisation/allergy, phototoxicity and infections.

1.2.1. Irritation/burning/urticaria

Numerous products — such as bases, acids, solvents, detergents, pesticides, biocides, metals, mineral fibres and the constituents of plastics and rubbers (including monomers and catalysers) — can cause local irritation to develop almost immediately after exposure. In certain cases this irritation can reach the level of chemical burns, ulceration and necrosis. The workplace exposure to them is regulated by the EU Directive 98/24/EC 'Chemical agents'. Insects (caterpillars), marine animals (jellyfish) and plants (nettles) can also cause urticaria reactions (with intense pruritus), by simple contact with the skin. This can pose a risk in certain occupations. For instance, urticaria with intense pruritus can be caused by processionary caterpillars from oak, pine and other trees among foresters and forestry producers (for other examples see the table in Appendix 1, Section 7: Animals and plants).

A wide range of chemical and biological agents can cause localised harmful effects.

1.2.2. Sensitisation/allergy/phototoxicity

Innate hypersensitivity reactions can be the result of an abnormal natural sensitivity in certain individuals to certain products. They may appear at first contact.

Allergic reactions, which are more frequent, require prior sensitisation to a substance and only develop when there is further contact with the substance after this induction period. Thousands of different products may trigger sensitisation and therefore cause allergic contact dermatitis [31] [50], including medicines, antioxidants, preservatives, antiseptics, biocides, pesticides, disinfectants and cleaning agents, metals, constituents of plastic and rubber materials, oils, pigments and dyes, cosmetics, depilatory waxes, Peru balsam ([1]), rosin ([2]), turpentine, plant (latex) and animal proteins and enzymes. Nearly 150 ingredients are classified by the EU as 'skin sensitisers' R43 — 'May cause sensitisation by skin contact' (EU: Directive 67/548/EC, Annex I). Certain substances, such as chlorothalonil (a pesticide) and latex, generate a giant urticaria (Quincke's oedema), that is associated with a risk of asphyxia, anaphylactic shock and even death among people exposed to them at work. Phototoxic reactions are triggered by light (sunlight in particular, but also artificial UV rays: Directive 2006/25/EC 'Physical agents — artificial optical radiation'), for example in people undergoing various forms of medical treatment or who are in contact with polycyclic aromatic hydrocarbons (PAHs; contained in soot, tars and coal-tar pitch, bitumens and asphalts, creosotes and wood-tar or their derivatives, such as those used in building among some roofers).

See the table in Appendix 1 for other examples classified by sector/occupation.

([1]) Peru balsam is a resin extracted from incisions in the bark of the Peruvian Balsam tree. It is used on its own or as an ingredient in medicinal products, food, drink and toiletries.

([2]) Formerly called colophony, rosin is a red-brown resin with a pine-tar base used in the manufacture of adhesive tape, among other products.

1.2.3. Skin cancers

PAHs, in association with exposure to the sun (UV radiation), can cause various cancers of the skin among bricklayers and tilers: these include malignant epithelioma, carcinomas and even the much-feared malignant melanoma (EU: Directive 2004/37/EC: 'Carcinogenic or mutagenic agents') [46].

According to the latest statistics, in 2006 in the United Kingdom 21 % of all reported skin diseases were cancers ([3]). It is estimated, that approximately 11 % of deaths caused by skin cancers — melanoma and non-melanoma — can be attributed to work exposures [60].

See Appendix 1 table for other examples classified by sector/job.

1.2.4. Skin infections

Biological agents — such as bacteria, viruses, fungi causing mycoses (for example among masons and tilers), yeasts and parasites — can cause various infections. These can include zoonotic diseases that affect professionals who have contact with animals (EU: Directive 2000/54/EC, 'Biological agents').

See the table in Appendix 1 for other examples classified by sector/occupation ([4]).

1.2.5. Effects on epidermal production

Chlorinated aromatic compounds — such as polychlorinated biphenyls (PCB), chlorobenzenes and chloronaphtalenes, dioxins, furans and chlorinated pesticides — can be responsible for chlorine acne or chloracne if they affect the hair follicles/sebaceous glands. This effect is found in farmers and florists, among other groups of workers.

The hair follicles/sebaceous glands can be obstructed by the application of various products and become infected (causing comedos, which are also known as blackheads, oil pimples and whiteheads). They can even become necrotic under the effect of certain agents (such as antimitotic medications, or CNS-depressant drugs in strong doses). For other examples, see the table in Appendix 1, specifically Section 3, Healthcare and Section 4, Hairdressing and cosmetology, as well as http://www.dermnetnz.org/acne/oil-folliculitis.html

([3]) More information at: http://www.hse.gov.uk/statistics/causdis/dermatitis/index.htm

([4]) See table in Appendix 1, sections 2.1.(5) and 7(a).

1.2.6. Skin diseases caused by solely physical agents

Handling of vibrating machines can provoke Raynaud's disease ('white finger' or 'dead finger'). Various traumas can cause hyperkeratosis, calluses, cuts, thromboses or necroses. Cold can be the cause of frostbite, which can lead in extreme cases to gangrene, for example, among agriculture or construction workers. Ionising radiation (X-rays, α, β, and γ rays) are the cause of radiodermatitis and radiation-induced skin cancer among healthcare professionals. (Directive 96/29/Euratom 'Ionising radiations') [36] [56] [66] [73].

Direct skin contact with external heat sources might result in occupational thermal injuries such as contact burns (in the case of an occupational accident) and heat urticaria. The latter is characterised by a well-demarcated urticarial lesion provoked by heat in direct contact with the skin.

Skin may also be affected by physical agents

Heat stress caused by high temperatures and humid conditions can cause heat rash. This is associated particularly with skin and clothing that remain damp due to unevaporated sweat. Possible symptoms are skin itching, skin prickling and clusters of red bumps. The rash may occur on small parts of the skin or the entire body. If large parts of the body are involved, sweat production might be compromised — resulting in a decreased capacity to work in the heat [6]. Impairment of the sweat mechanism can also lead to systemic effects known as sweat retention syndrome. Milder exposure to heat might also lead to prickly heat, intertrigo (chafing), skin maceration and supervening bacterial or fungal infection, especially in overweight and diabetic individuals [5].

See the table in Appendix 1 for other examples classified by sector/occupation.

Harmful systemic effects from dermal penetration

1.3.

Percutaneous or transcutaneous absorption of a substance is utilised in topical or transdermal administration for therapeutic purposes, but it can also have harmful consequences if the substance is toxic. A systemic effect can appear when the product in question passes from the surface of the skin into the general circulation through the horny layer (a relatively slow phenomenon), or through the epidermis and dermis (a more rapid process). Absorption through the skin (transcutaneous absorption) depends on several factors:

Some toxic substances can be absorbed through the skin, causing adverse systemic effects

— the physicochemical properties of the product, such as molecular weight, but also water and lipid solubility;

— the duration and frequency of exposure;

— the quantity per unit of the skin surface;

— the properties of the vehicle (which might be water or a solvent, for example): the more soluble the substance is in the vehicle, the more it is retained in it; conversely, if it is more soluble in the horny layer than in the vehicle, penetration is facilitated;

— the location of the spill on the horny layer. The horny layer varies in thickness in different parts of the body. Absorption is facilitated in places where the layer is thin

(back of the hand and foot); less so where it is thick (palm of the hand, sole of the foot). Impairments of the horny layer caused by lipid solvents, corrosives (acids and bases), surface-active agents, sunburn and dermatoses intensify penetration;

— a high skin temperature, humidity and heavy sweating (hyperhidrosis) greatly increase the permeability of the skin;

— other factors, such as age, fashions, or use of certain cosmetics can also have an effect [73].

For instance, leukaemia is a typical occupational disease brought about by the percutaneous absorption of benzene in super-grade gasolines that are often misused by garage mechanics for cleaning their hands.

See the table in Appendix 1 and references for other examples of systemic effects of exposure and causative substances.

1.4. Occupational skin diseases (SD)

Occupational dermatoses vary widely in appearance and causes. There are those with a source arising inside the body (endogenous) and those with a source outside the body (exogenous). They constitute a significant category among occupational diseases (OD). Unfortunately, their complexity does not permit the use of a single classification. The recording of occupational diseases is very much influenced by national recognition and compensation systems (Chapters 2 to 4). For this reason, their occurrence is very difficult to analyse [32].

1.4.1. Definition and categories

The lack of a standard definition for skin diseases would explain the difficulty in obtaining accurate epidemiological data [64].

Occupational skin diseases are caused- wholly or partially- by conditions in which the work is conducted

However, the following description seems to be the most appropriate: occupational dermatoses are those for which the cause can be found partly or wholly in the conditions in which the work is carried out.

This definition makes it possible to classify all dermatoses into three categories:

- **exclusively occupational dermatoses,** for which the relationship with the occupational activity is clearly established. It could be said that they are brought about by an imbalance between the working environment and the natural defence mechanisms of the skin. Their occurrence varies according to the sector of economic activity. Many examples are given in the table in Appendix 1;
- **dermatoses aggravated by occupational activity.** This implies pre-existing skin conditions that are reactivated or aggravated during the occupational activity [31];
- **'non-occupational' dermatoses:** those for which no relationship with occupational activity has been shown. They are not described here [36].

1.4.2. Significance, ranking and prevalence

1.4.2.1. European data on the prevalence of skin diseases

According to the European Occupational Diseases Statistics (EODS), in 2001 skin diseases accounted for 11.2 % of all occupational diseases. Since then, the records indicate that their incidence rate has decreased to 7.1 %. The fact that since 2004 the EODS collects information also from new Member States has to be taken into consideration. For detailed description of national recognition of occupational skin diseases as well as reporting and recording systems please see Appendix 2, available from: http://osha.europa.eu/publications/reports/TE7007049ENC/view

The statistical data on skin diseases have to be treated with caution for several reasons. Not all EU countries were included in the data collection and statistical data are only available up till 2005 ([5]). There is no standard definition to approach skin diseases and there are also clear indications that the number of cases and the extent of the diseases are underestimated in the EU (see below). Nevertheless a look at the data can facilitate understanding and provide some indication of the extent of the problem.

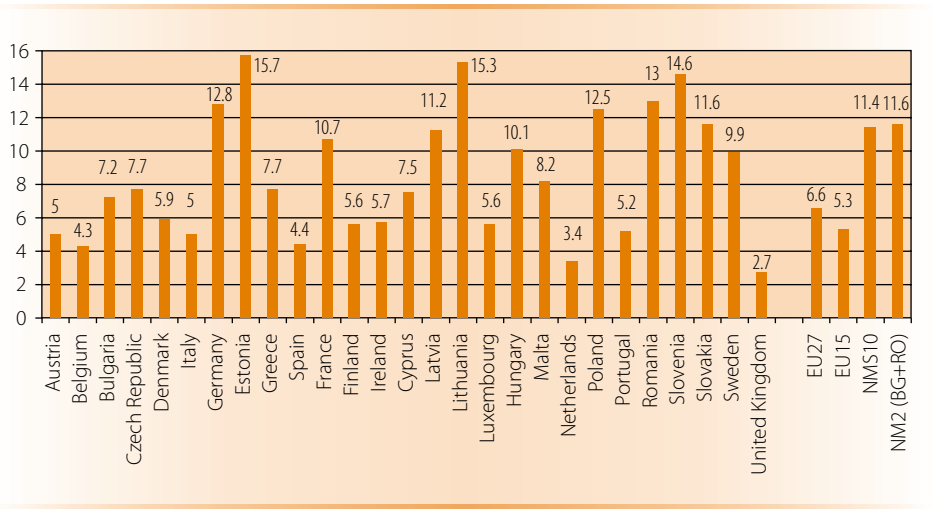
Contact dermatitis affected 5 778 persons in 2005 (EODS, 2005). The total number of cases of skin disease increased by 8 % between 2001 and 2005, from 5 438 cases to 5 873. Contact dermatitis had the highest incidence rate (5.5) The number of recorded occupational skin cancer cases has increased from seven in 2001 to 18 in 2005.

Table 1: Number of skin diseases and incidence rate (per 100 000 workers), non-fatal, EODS data, Eurostat, 2001–05

Disease	2001			2002			2003			2004			2005		
	Number	% of occupational diseases	Incidence rate	Number	% of occupational diseases	Incidence rate	Number	% of occupational diseases	Incidence rate	Number	% of occupational diseases	Incidence rate	Number	% of occupational diseases	Incidence rate
Contact dermatitis	5,316	10.9	5.2	7,692	10.9	7.4	8,038	10.4	7.7	6,220	7.8	5.9	5,778	6.9	5.5
Contact urticaria	120	0.25	0.1	156	0.22	0.1	194	0.3	0.2	119	0.2	0.1	95	0.11	0.1
Acne				4											
Total no, of skin diseases	5,438	11.2	5.3	7,852	11.1	7.5	8,232	10.7	7.9	6,339	8.0	6	5,873	7.1	5.6
Skin cancer	7	0.01		20	0.03		19	0.02		13	0.02		18	0.02	0
Total no. of occupational diseases	48,492	100	47.1	70,508	100	67.6	76,745	100	73.5	79,124	100	74.9	83,159	100	78.8

([5]) For the 2001 data, 12 Member States (Belgium, Denmark, Ireland, Spain, Italy, Luxembourg, the Netherlands, France, Austria, Portugal, Finland, Sweden and the United Kingdom) were included. From 2002 onwards the data are available for the same countries, except Ireland. In 2004, the new Member States were included.

Figure 2: Skin problems, by MS and EU-27, EU-15, NMS10 AND NM2. In percentage share, 2005. EWCS 2005



Age

In 2005, all workers older than 25 years old have reported skin diseases more often than in 2000

No detailed selection by age was available from the EODS data. Nevertheless, the ESWC (European Survey on Working Conditions, 1995–2000) data show that younger workers (15–44 years old) have a slightly higher risk of being affected by skin diseases than workers over 45. In 2000 the youngest workers reported fewer skin diseases than in 1995, but all other age groups — except the over 55s — recorded an increase.

For the 2005 survey the age categories were different from those in previous surveys. The results indicate, however, that 5.7 % of young workers — under 25 — have reported skin problems. It is less by 1.6 % than workers 25–39 years old (7.3 %), and 1 % less often that those 40–54 years old (6.7 %). Even though the oldest group of workers — older than 55 — reported skin diseases more often (4.9 %) than in 2000, their level of risk was the lowest. In 2005, all age groups except the youngest reported skin problems more often than in 2000.

Table 2: Skin problems by age, European Survey on Working Conditions, 1995/2000 (in Web information: Skin problems — Europe, TCRO P06-01 OSH in figures)

Age	2000				1995			
	Weighted sample size	Sample size	Frequency	Percent	Weighted sample size	Sample size	Frequency	Percent
15-24	20,570,492	1,909	1,386,884	6.7	24,996,039	2,502	1,624,434	6.5
25-34	44,860,537	4,384	2,838,382	6.3	58,736,508	5,839	3,759,520	6.4
35-44	41,302,032	4,364	2,392,609	5.8	57,426,023	6,269	3,661,150	6.4
45-54	32,579,780	3,526	1,474,571	4.5	50,010,131	4,940	2,755,048	5.5
>=55	15,687,328	1,803	617,676	3.9	23,831,212	2,153	931,141	3.9

Gender

Men and women were equally affected by skin problems in 1995. From 1995 to 2005 the percentage of men with skin problems increased, while the percentage of affected women initially decreased slightly. It later returned to the 1995 level, however.

Table 3: Percentage of workers with skin problems by gender, European Working Conditions Survey, 1995/2000/2005 (in Web information: Skin problems — Europe, TCRO P06-01 OSH in figures)

	Men	Women
1995	5.7	5.5
2000	6.3	5.3
2005	7.4	5.5

Economic sector

The mining and quarrying sector shows the highest incidence rate of skin diseases (31.5), followed by manufacturing (10.4) and construction (9.1). 34 % of all cases of skin diseases were registered in manufacturing, followed by construction (14 %) and health and social work (9.5 %).

Table 4: Number of skin diseases by sector, EODS data, Eurostat, 2005

Sector	All skin diseases	
	Number	Incidence rate
Agriculture, hunting and forestry	168	4.1
Fishing	6	7.1
Mining and quarrying	55	31.5
Manufacturing	2,006	10.4
Electricity, gas and water supply	7	0.9
Construction	834	9.1
Wholesale and retail trade; repair of motor vehicles, motorcycles and personal and household goods	447	2.6
Hotels and restaurants	305	5.9
Transport, storage and communication	71	1.1
Financial intermediation	10	0.3
Real estate, renting and business activities	391	3
Public administration and defence; compulsory social security	247	3.5
Education	32	0.5
Health and social work	558	5.1
Other community, social, personal service activities	503	9.5
Activities of households	4	0.3
Unknown NACE branch	223	
All NACE branches – Total	5,873	5.3

With relatively small number of cases, the incidence rate of skin diseases is highest in the mining sector. The manufacturing sector, with the largest number of cases, has the second highest incidence rate

Occupation (6)

The occupational group of crafts and related trades workers shows the highest prevalence of skin diseases (33.2 %). They are followed by the elementary occupations (7) (22.1 %), service workers, shop and market sales workers (17.8 %) and plant and machine operators and assemblers (14.4 %). Crafts and related trades workers also show the highest incidence rate (16), followed by elementary occupations (13) and plant and machine operators and assemblers (10.1).

Table 5: Number of skin diseases by occupational group, EODS data, Eurostat, 2005

Occupational group	All skin diseases		
	Number	%	Incidence rate
Legislators, senior officials and managers	20	0.3	0.2
Professionals[1]	228	3.9	1.7
Technicians and associate professionals	254	4.3	1.6
Clerks	76	1.3	0.6
Service workers and shop and market sales workers	1,047	17.8	7.8
Skilled agricultural and fishery workers	155	2.6	6.9
Craft and related trades workers	1,947	33.2	16.1
Plant and machine operators and assemblers	845	14.4	10.1
Elementary occupations	1.3	22.1	13
Unknown			
All NACE branches – Total	5,873	100	6

1.4.2.2. Significance of occupational skin diseases in the EU

Skin diseases are second most frequent occupational disease

In many developed countries, including the countries of the EU, occupational skin diseases are second in the ranking of occupational diseases, following musculoskeletal disorders (MSDs). At the European level skin diseases represent between 10 % and 40 % of recognised occupational diseases [5] [9].The high incidence is particularly due to the tens of thousands of chemical products in use. These are responsible for 80 % to 90 % of skin diseases [8], but biological and physical agents must also be included as causative factors. The most frequent lesions are irritant- or even corrosive- induced contact dermatitis followed by allergic contact dermatitis.

The three broad groups of occupational skin diseases are:

(1) irritations (including chemical burns, urticarias, etc.); these comprise about 80 % of skin diseases;

(2) allergies — their incidence rate is constantly increasing; allergies comprise more than 10 % of skin diseases;

(3) others (including skin cancers) — less than 10 % of skin diseases.

(6) According to the ISCO-88: International Standard Classification of Occupation (see http://www.ilo.org/public/english/bureau/stat/isco).

(7) Elementary occupations include street vendors and related workers, domestic and related helpers, cleaners and launderers, building caretakers, window and related cleaners, among other categories.

Together, irritations and allergies, which include contact dermatitis and eczemas, now represent over 90 % of occupational skin diseases. In 80 % of cases, skin diseases affect the hands, the principal 'tool' of workers [5] [34].

1.4.3. Underestimation, importance and problems posed

The number and extent of skin disorders are often underestimated, for several reasons (Chapters 2 to 7). Their importance lies not only in the frequency of their occurrence, but also in their effect on the occupational prospects of sufferers. Occupational skin diseases pose numerous problems for affected workers, in some cases forcing them to change occupation at times when unemployment is a real problem, and when maintaining high employment rate is a European priority. Because of this, there is a need for a better understanding not only of the causes and mechanisms of these skin disorders, but also of the necessity to prevent them. The problem is made more complex by the lack of indices for dermal exposures or 'skin OELs' (occupational exposure limits) along the lines of the inhalation OELs that set maximum exposure limits for inhaled substances.

The EU has established lists of indicative European OELs (IOELs) for the Member States. Like the national OEL lists, these include the indication D ('dermis' or 'dermal') or Sk (skin) for percutaneous toxic agents (EU: e.g. Directive 2006/15/EC, second IOEL list following Directive 98/24/EC 'Chemical agents').

It must also be remembered that because of the presence of numerous xenobiotic agents (not naturally present in the body) in the working environment, a damaged skin is more vulnerable to external aggression. Dermal exposure to toxic substances is therefore more likely to cause a general disorder of the organism under certain conditions (see Chapter 1.3.) [36]. In this case biological monitoring or 'biomonitoring' (of urine, blood, expired air, etc.) would be helpful, but it is rarely conducted and very few valid biological exposure indices (BEIs) are available.

The prevalence and gravity of skin diseases vary considerably according to the country, sector of activity, occupation, company and workstation. A selection of the major sectors and jobs with an inherent risk of developing skin diseases can be found in the table in Appendix 1.

Furthermore, occupational dermatology is continually developing, not only because of progress in medical and technological research, but also because of the large number of new chemical products constantly appearing on the market [5] [36] [56] [73].

Because of these factors, any accurate statistical snapshot of skin diseases would not only be extremely difficult to obtain — it would also quickly become obsolete.

It is almost impossible to collect accurate, specific statistical information on the prevalence, distribution, assessment, compensation and prevention systems for all types of skin exposure [33].

The continuous increase in the frequency and gravity of observed skin diseases (in particular irritations, skin cancers and above all allergies of chemical origin) is, however, a general trend found in all studies. It is an additional reason to pursue these studies in depth and focus the necessary attention on them. One welcome development in this regard is the reawakening of interest in occupational lesions and diseases, which are often difficult to diagnose (Chapter 5). Skin diseases may be disabling and are usually complicated to cure while the patient is still working. It might be difficult or drastic to expect the patient to stop working, particularly if they could not go back to work at a later date. Work-related skin diseases usually go on for a long time: on average between five and 10 years [64].

2.

LEVEL OF RECOGNITION OF OCCUPATIONAL (SKIN) DISEASES IN THE EU

2.1. International level

The ILO Convention No 121 provides a list of occupational diseases appended to the ILO Code of Practice — Recording and notification of occupational accidents and diseases. Among diseases caused by biological, physical and chemical agents, specific skin diseases are listed [52].

The ILO continues to work on updating the list of occupational diseases, to make it more relevant to the modern workplace environment. The new list of occupational diseases — Recommendation 194 — was proposed in 2002 (http://www.ilo.org/ilolex/cgi-lex/convde.pl?R194). The discussions on the content of the list are continuing. http://www.ilo.org/public/english/protection/safework/health/expmtg05/english/index.htm

Other ILO conventions also are applicable to workplace skin exposures and occupational skin diseases: (http://www.ilo.org/ilolex/english/subjlst.htm)
Convention 155 provides for the adoption of coherent national occupational safety and health policies, as well as action to be taken by governments and within enterprises to promote occupational safety and health and to improve working conditions. Attached to it Protocol (155/2002) proposes the establishment and application of procedures for the notification of occupational accidents and diseases, by employers and, when appropriate, insurance institutions and others directly concerned, and the production of annual statistics on occupational accidents and diseases on the national level.
Convention 161 — with regard to occupational health services, provides for the establishment of enterprise-level occupational health services which are entrusted with essentially preventive functions and which are responsible for advising the employer, the workers and their representatives in the enterprise on maintaining a safe and healthy working environment.

2.2. European level

The European Commission has issued the European schedule of occupational diseases (Commission Recommendation 2003/670/EC of 19 September 2003 concerning the European schedule of occupational diseases, European Commission, 2003) which lists diseases that have been scientifically recognised as occupational in origin, and are thus liable to compensation. Preventive measures must be applied in the case of such diseases to reduce their prevalence. The disease statistics of the various Member States are collated annually and released in the form of the European Occupational Diseases Statistics (EODS). The methodology of the statistical compilation so far has been adopted by 'gentlemen's agreement' among the EU Member States and Candidate Countries within the framework of the EODS working group of Eurostat [27].

European Member States themselves determine the criteria for recognising occupational diseases and are free to implement more comprehensive national laws and regulations than those stipulated by the EU.

The Commission has also issued an additional list of diseases (Annex II to the European schedule) suspected of being occupational in origin that should be subject to notification and may be considered for inclusion in Annex I to the European schedule at a later stage [28].

The development of the European schedule of occupational diseases has three main objectives:

— to improve the knowledge of the subject at EU level by collecting and comparing information;

— to encourage Member States to formulate quantified objectives aimed at reducing the number of diseases;

— to help affected workers to prove the link between their occupational activities and their disease more easily so that they can apply for compensation.

The new Community strategy for safety and health at work for 2007–2012 also identifies the ongoing, sustainable and uniform reduction of occupational diseases as its prime objective.

2.3. National level

Occupational diseases resulting from physical, chemical or biological factors associated with a patient's job are recognised in all EU Member States. The reporting of any occupational disease is obligatory. Skin diseases are included in the national lists of occupational diseases. No specific (additional) schemes or systems exist for the recognition of skin diseases.

The criteria for recognition of occupational diseases vary between Member States

In most countries the official recognition of occupational (skin) diseases is based on the recognition of a so-called 'professional risk' and the application of three key criteria:

- there has to be a causal relationship between the disease and exposure to a harmful situation or agent;
- this exposure is linked to the workplace; and
- the disease occurs among the groups of people concerned with a frequency that exceeds the average morbidity of the rest of the population.

Besides this, the recognition of the individual cases can be based on a (national) list of occupational diseases that in turn is based on the European list of occupational diseases ([8]). The national list can differ from the European list in content and approach. National lists are sometimes more comprehensive than the European list (e.g. those of Finland and Germany), and may also include specific diseases particularly relevant to the country concerned. The main aim of the list is to facilitate the notification of cases

([8]) This is not the case in France and Sweden. See relevant sections in Appendix 2, available at: http://osha.europa.eu/publications/reports/TE7007049ENC/view

and the compensation of those affected. Lists are adapted according to new scientific insights and expertise.

Recognition of occupational diseases can therefore be done in various ways: through the use of a general definition; the use of lists of occupational conditions and diseases; and the application of a combination of definitions and lists (mixed system).

Some countries started to recognise occupational diseases in the early 20th century. Since 1937 the German list of occupational diseases, an attachment of the Berufskrankheitenverordnung (German ordinance on occupational diseases), has included severe or recurrent skin conditions that force the affected individual to refrain from all activities that led or could lead to the development, aggravation, or recurrence of the condition.

In view of the prevalence of skin diseases throughout the European Union, skin diseases and their prevention are recognised as an important issue.

2.3.1. Examples of recognition in some European countries

Information about the recognition of occupational diseases is only available for some of the countries of the European Union. Comparing the systems is difficult, because it is unclear whether all the relevant elements of the occupational diseases recognition systems were included in the answers to the questionnaire (see Appendix 2, available at: http://osha.europa.eu/publications/reports/TE7007049ENC/view).

2.3.1.1. Recognition

It is evident that the number of nationally registered occupational skin diseases depends heavily on the standards/criteria used to recognise occupational diseases.

France

In France the recognition is based on 98 official tables describing the symptoms or lesions, the occupational activities that could possibly have caused the condition, and time after the exposure to the risk when the condition was first recognised. A complementary system exists, taking into account occupational diseases that do not correspond with one or more of the criteria in the classification tables or are not represented in the list of diseases. Only harm caused by professional activities can be taken into account [23]. In France, once the disease is on the official list of skin diseases and the conditions that are required by this official list have been met, the disease is recognised as an occupational disease.

Luxembourg

Luxembourg has an official list, but if a worker can prove that a disease that does not appear on the official list is work-related, the illness will be recognised as an occupational disease.

Belgium

In Belgium there are four possibilities for recognition:

— the disease is listed in the European or Belgian lists;

— according to the occupational physician the disease is caused by the patient's job;

— the patient is predisposed to an occupational disease;

— the patient proves a direct causal relationship between the disease and the exposure to the occupational risk (this is known as the open system, or *système hors liste*).

The Netherlands

In the Netherlands the European list is used as a reference, but the concept of 'professional risk' does not apply. The list is used for identification purposes and for preventive action. This means there is a social and scientific recognition of these occupational diseases but no legal recognition of specific occupational diseases. The affected person is compensated by the social security system. If the patient believes the employer has not done everything in his power to prevent the disease, he/she can ask the union (FNV Bondgenoten) to start court proceedings. Guidelines for the notification of occupational diseases are developed by the National Centre for Occupational Diseases.

United Kingdom

In the United Kingdom, the recognition of occupational diseases is based on an official list. A registered medical practitioner has to prepare a written statement, and this is forwarded by the patient to the relevant enforcing authority. The recognition of skin disease in the United Kingdom may be influenced by civil litigation [42].

Sweden

In Sweden, any illness can be considered occupational as long as it is determined to be related to work [8].

It is the patient, however, who has to prove the link between the occupational exposure and the ill health. This not the case in France, Italy and part of Belgium, for example, where the presumption of accountability is in favour of the patient.

This provision has led to a fall in occupational cases in Sweden since 1993 [23].

Czech Republic

In the Czech Republic the diagnosis must also correspond to the Czech list of occupational diseases, which is similar to the European list of occupational diseases. The exposure, sufficient to cause certain occupational disease, must be confirmed by regional industrial hygienists responsible for health and safety assessment of the workplace.

According to the same authors [62], patients suffering from occupational diseases in the Czech Republic are given generous financial compensation, which provides considerable motivation for them to apply for the recognition of diseases as occupational.

Slovenia

In Slovenia organisational shortcomings have been reported that might hinder a proper reporting of occupational diseases to the relevant authorities. This has held back the systematic verification, recognition and registration of occupational diseases in the country.

2.3.1.2. Investigation of the reported disease

Germany

German institutions for statutory accident insurance and prevention for the industrial sector (the Berufsgenossenschaften) keep records not only of the cases of reported and

recognised occupational skin diseases, but also of cases of skin diseases that were not recognised as occupational because the required legal conditions were not fulfilled. The agents that may affect skin, and their relation to the skin diseases are also examined.

In order for the disease to be recognised as occupational in origin, a thorough investigation is carried out. This involves tracing the medical history of the patient as well as carrying out a thorough assessment of the workplace. This assessment can lead to a longer investigation.

Denmark and Luxembourg follow the same system as Germany.

2.3.2. Under-reporting and differences between data

Most countries publish a report on occupational diseases, including skin diseases, every year. The statistics separate out reported, recognised and reimbursed occupational diseases in the country concerned.

Under-reporting of occurrence of skin diseases is a recognised fact, with multiple causes

Belgium registers the number of declarations as well as the number of cases where compensation was awarded. The latter figure gives a more accurate picture of the number of actual occupational diseases that are recognised (12 % of the occupational diseases were skin diseases, 10 % of the claims for skin diseases were accepted as occupational in origin).

In the **Netherlands** there is a discrepancy between the number of cases reported by dermatologists and by occupational physicians. Dermatologists report more cases than occupational physicians. This can be explained by the fact that most people with dermatoses go directly to the skin diseases specialist. There is also a gap between the types of reported cases: dermatologists deal most frequently with eczema and skin blastoma (8 %), but these conditions are rarely mentioned by occupational physicians because they manifest themselves when the affected workers have retired.

Other countries (such as Germany, Belgium, Denmark, Spain and Italy) are also subject to the under-reporting of occupational (skin) diseases.

According to a study by Eurogip in 2001, there are many reasons for this under-reporting [8] [23] [24]:

- employees do not always provide enough information;
- in some countries employees are not sufficiently aware of their exposure to the risk and are unfamiliar with the provisions of insurance systems (Belgium, Germany, Greece, France, Spain);
- lack of knowledge and training on the part of general practitioners which prevents them from recognising or seeking occupational causes for ill health. This was reported by Belgium, Denmark, Germany, Greece, Spain, France, Italy, Luxembourg, the Netherlands, and Austria. A generalist physician might not be informed about the patient's working situation and conditions, or about the effect of specific working conditions on the skin of their patient;
- employees' fear of losing their job;
- a shortage of occupational physicians.

Eurostat [33] has identified several factors that determine whether or not a case is notified as an occupational disease: the motivation of the patient, the physician, and the employer to report the case, and the motivation of social security authorities and other relevant agencies to handle such cases under the normal social security coverage or to classify them as occupational.

3.

METHODS OF COLLECTING DATA ON PREVALENCE/RISK OF SKIN DISEASES

3.1. Reporting the disease

Although some differences exist in the way occupational diseases are reported and followed up, in general they are reported by occupational physicians. In some cases the disease can also be reported by the affected person or by the health insurance fund (e.g. Belgium, Germany).

It is the physician who is responsible for the declaration in Denmark, Germany, Luxembourg, Austria, Poland and Finland. In Belgium, Spain, France, Portugal and Sweden the affected worker is obliged to report the disease. The employer is responsible for the notification in Italy. In Belgium and France two different procedures exist: one for the declaration or notification of the disease, and the other one for compensation purposes [8] [24].

Cases of work-related diseases are usually reported by occupational physicians

In Austria, suspected cases of occupational diseases have to be reported by a doctor to the AUVA (Allgemeine Unfallversicherungsanstalt; Austrian social insurance for occupational risks). In practice this does not happen often. Instead, patients are usually sent to a dermatologist for diagnosis.

Belgian occupational physicians are obliged to report (skin) diseases that are included in the Belgian list of occupational diseases or when they identify a link between the disease and the occupation (see possibilities for recognition in Belgium above). The cases are reported to the Fund for Occupational Diseases ('Fonds des maladies professionnelles').

Danish doctors are obliged to report suspected and confirmed cases of occupational diseases. The figures for cases of occupational diseases are compiled according to the year in which they were reported.

As a result of the cooperation between dermatologists and the Berufsgenossenschaften (statutory accident insurers) a special agreement has been reached in Germany that precedes the official recognition procedure. Every physician is obliged to send a patient to a dermatologist, if an occupational skin disease is suspected. As soon as the suspicion is confirmed, the dermatologist has to inform the competent statutory accident insurer by means of a standardised form [74].

In Greece it is also the occupational physician who reports the disease, but in this case to the labour inspectorate.

The Netherlands requires the reporting not only of cases where there is a clear link between disease and cause, but also of multi-causal diseases.

3.2. Methods of collecting data on skin diseases

3.2.1. Aims of data collection

The primary goals of data collection in the context of occupational diseases are to identify and track the main problems, detect new diseases and risk factors, gain insight in the causes and prevention of occupational diseases, predict and study trends, and to take precautions accordingly. (This is the case in the Czech Republic, Greece, the Netherlands, and the United Kingdom.) The data also serve as a basis for further analysis and scientific research, professional education and international comparison (Czech Republic). In some cases, such as France, the statistics are used primarily to assess the number of compensated patients of occupational diseases. In Finland, the main object of registration is the notification of new occupational diseases.

3.2.2. European data on occupational (skin) diseases

The national data are transferred to Eurostat's European Occupational Diseases Statistics (EODS) and later sent on to the WHO and ILO. These statistics are based on case-by-case data for occupational diseases recognised by the national authorities. The EODS Phase 1 specifications cover 68 disease items ([9]), in a compulsory way (included in all national data collections). In addition 41 items are included in an optional way (these include some infectious diseases that may occur in the occupational setting, but are not usually specifically mentioned in the national lists of occupational diseases, as well as some relatively rare occupational diseases). The specifications are meant to include only diseases which are covered by most, if not all, national recognition schemes. The data collected include information on age, gender, diagnosis, occupation, sector of economic activity, severity and causative agent. For incidence rate of occupational diseases the data are available for all old EU Member States combined (EU-15) for the 1995 pilot data and for 12 Member States combined (Belgium, Denmark, Ireland, Spain, Italy, Luxembourg, the Netherlands, Austria, Portugal, Finland, Sweden and the United Kingdom) for the 2001 data. From 2002 onwards the data are available for the same countries, except Ireland. The EODS methodology is being implemented in the new Member States and in the candidate countries, with first data covering the reference year 2004 [33] ([10]).

Eurostat´s European Occupational Diseases Statistics collects information on occupational diseases from the Member States

3.2.3. National data on occupational (skin) diseases

Data on occupational diseases are collected mainly via reports from doctors (for example occupational physicians, general practitioners or dermatologists). These are forwarded to the insurance company if appropriate, the local or national authorities (for example, the labour inspectorate, health officials of the ministry of labour), the health and safety offices, and the national institutes responsible for the monitoring and prevention of occupational diseases. In some countries (e.g. Greece) there is no permanent collection of data on occupational diseases.

Most EU countries have national surveillance schemes for the reporting and registration of occupational diseases.

([9]) By disease items or entities is meant the types of disease eg. urticaria, contact dermatitis.

([10]) More details can be found in the methodology papers in http://circa.europa.eu/Public/irc/dsis/hasaw/library: European Occupational Diseases Statistics (EODS).

National registries of occupational disease notifications

Austria: Hauptverband der Sozialversicherung.

Belgium: Fonds des maladies professionnelles, a parastatal institution that is also responsible for compensation.

Czech Republic: National Registry of Occupational Diseases (NRNP). Information from NRNP serves as a basis for the analysis of problems in the field of health protection at work, for scientific research, professional education and international comparison.

Denmark: Register for Occupational Diseases (Registret for arbejdsbetingede lidelser). The register is a division of the National Working Environment Service, which is a public organisation under the Ministry of Labour.

Estonia: National Register of Occupational Diseases (National Labour Inspectorate).

Finland: Finnish Register of Occupational Diseases (FROD). Data are collected from two sources: new cases reported to the insurance companies, and cases reported by occupational physicians to the provincial labour protection authority.

Germany: The Berufsgenossenschaften (statutory accident insurers) keep statistics on reported, recognised and reimbursed occupational diseases.

Ireland: Data on occupational diseases are based on records of the National Authority for Occupational Safety and Health. This authority is notified of prescribed occupational diseases by the Department of Social Welfare [30].

Italy: Information is provided by INAIL (l'Instituto Nazionale per le Assicurazioni contro gli Infortuni sul Lavoro) to the Servizio Sanitario Nazionale (national healthcare service), scientific commission for revision of occupational diseases.

Lithuania: National Register of Occupational Diseases.

Luxembourg: The physician sends the notification to the insurance company.

Netherlands: National Centre for Occupational Diseases (NCVB). Sources are twofold: occupational physicians report directly to the NCVB, and data are also collected through dermatological measuring stations by the Occupational Dermatoses Surveillance project, in collaboration with the NCVB.

Poland: Central Register of Occupational Diseases compiled at the Nofer Institute of Occupational Medicine in Łódź and by the National Sanitary Inspector.

Portugal: Data are obtained via reports of occupational diseases and resulting permanent disabilities. The data are collected through the form entitled *Participação obrigatória do diagnóstico presuntivo de doença profissional*. Details on occupational diseases are the responsibility of the Statistics Department of the Social Security Financial Management Institute [30].

Slovakia: Skin diseases are registered at the National Centre of Health Information: see http://www.nczisk.sk

United Kingdom: The Occupational Disease Intelligence Network (ODIN) has two parts: EPIDERM (a scheme for surveillance of occupational skin diseases by dermatologists) and OPRA (Occupational Physicians Reporting Activity: a scheme for all types of work-related diseases). Presently operating surveillance scheme is the Health and Occupation Reporting Network (THOR).

In Greece, statistical reporting of injuries or diseases caused by dangerous substances is not undertaken on a permanent basis. Statistics published by the Ministry of Labour are based on occupational accidents reported to the local inspectorates of work, under various decrees regarding health and safety at work. The purpose of the official occupational disease report is both prevention and research.

No systematic and defined methods of verification, recognition and registration of occupational diseases exist in Slovenia either. Some data about occupational skin diseases are available at the Clinic of Dermatology, but only for those patients who were tested there.

3.2.4. Specific data collection for the surveillance of skin diseases

Only two countries, the Netherlands and France, mentioned specific systems and data gathering for the surveillance of skin diseases.

The Dutch Occupational Dermatoses Surveillance project (ADS) is a joint surveillance initiative by the Centre of Occupational Diseases and the Dutch Knowledge Centre of Occupational Dermatoses (NECOD). The centre is part of the Academic Hospital of Groningen and the Free University Medical Centre (Vrije Universiteit medisch centrum — VUmc), and the project covers almost the entire country. New cases are reported via a special skin diseases annotation card, which provides data on the occupational groups that have a high risk of developing a skin disease.

Unofficial statistics — France

An epidemiological survey of occupational dermatitis was carried out by four hospitals in the Île-de-France region: Cochin, Créteil, Fernand Widal and Garches. Each of these hospitals has a specialist consultant in occupational dermatology. The data on new cases were gathered between 2001 and 2005 and then analysed. In this study on 1 829 patients, 53.4 % were women; the main industries concerned were healthcare, cleaning, construction and public work and hairdressing. The main products responsible for occupational allergic dermatitis were: resins, disinfectants, household products, hairdressing products, nickel and latex.

4.

LEVEL OF RECOGNITION OF RISKS RELATED TO DERMAL EXPOSURE

4.1. European legislation on cutaneous risks

The European legislation provides the framework for recognition of occupational dermal exposure to dangerous agents.

European legislation applicable to risk of dermal exposure

Directive 2006/121/EC of the European Parliament and of the Council of 18 December 2006 amending Council Directive 67/548/EEC on the approximation of laws, regulations and administrative provisions relating to the classification, packaging and labelling of dangerous substances in order to adapt it to Regulation (EC) No 1907/2006 concerning the registration, evaluation, authorisation and restriction of chemicals (REACH).

Directive 2006/25/EC of the European Parliament and of the Council of 5 April 2006 related to the minimum health and safety regulations concerning exposure of workers to risks due to physical agents (artificial optical radiation) (19th specific directive within the meaning of Article 16(1), of Directive 89/391/EEC). 'This directive relates to the risks which involve, for the health and the safety of the workers, harmful effects on the eyes and the skin of the exposure to artificial optical radiations.'

Commission Directive 2006/15/EC of 7 February 2006 drawing up a second list of indicative limit values of occupational exposure (IOELs) pursuant to Council Directive 98/24/EC and amending Directives 91/322/EEC and 2000/39/EC. 'It is also advisable to establish short-term exposure limit values for certain substances in order to take into account the effects related to a short-term exposure. For certain substances, it is also necessary to consider the possibility of penetration through the skin, in order to guarantee the best possible level of protection.'

Commission Directive 2006/8/EC of 23 January 2006 amending, for purposes of their adaptation to technical progress, Annexes II, III and V to Directive 1999/45/EC of the European Parliament and of the Council relating to the approximation of the legislation, regulations and administrative provisions of the Member States relating to the classification, packaging and labelling of dangerous preparations.

Council Directive 2005/25/EC of 14 March 2005 amending Annex VI to Directive 91/414/EEC as regards plant protection products containing micro-organisms.

Directive 2003/53/EC of the European Parliament and of the Council of 18 June 2003 relating to restrictions on the marketing and use of nonylphenol, nonylphenol-ethoxylate and cement (26th amendment of Council Directive 76/769/EEC).

Commission Directive 2001/59/EC of 6 August 2001 adapting to technical progress for the 28th time Council Directive 67/548/EEC on the approximation of the laws, regulations and administrative provisions relating to the classification, packaging and labelling of dangerous substances.

Directive 2000/54/EC of the European Parliament and of the Council of 18 September 2000 on the protection of workers from risks related to exposure to

biological agents at work (seventh individual directive within the meaning of Article 16(1) of Directive 89/391/EEC). Extract Article 8: 'place at the disposal of workers water and sanitary rooms suitable and adequate, which may contain eye drops and/or disinfectants for the skin.'

Directive 1999/45/EC of the European Parliament and of the Council of 31 May 1999 concerning the approximation of the laws, regulations and administrative provisions of the Member States relating to the classification, packaging and labelling of dangerous preparations.

Council Directive 98/24/EC of 7 April 1998 on the protection of the health and safety of workers from risks related to chemical agents at work (14th individual directive within the meaning of Article 16(1) of Directive 89/391/EEC).

Council Directive 96/29/Euratom of 13 May 1996 laying down basic safety standards for the protection of the health of workers and the general public against the dangers arising from ionising radiation.

Council Directive 89/656/EEC of 30 November 1989, concerning the minimum safety and health requirement for the use by workers of personal protective equipment (PPE) at the workplace (third individual directive within the meaning of Article 16(1) of Directive 89/391/EEC.

4.2. Level of recognition of risks of dermal exposure

The EU countries recognise the risks of dermal exposure leading to skin diseases. Since the latest 'Status of communication of health and safety legislation' [28], all 25 countries have transposed into national law the basic EU directives regarding chemical, biological and physical exposure. Most countries report that they adhere to the relevant legislation (health surveillance, avoidance and reduction of risks, limiting exposure values).

Both the national and European lists of skin diseases also list the categories of harmful substances that can lead to occupational skin diseases. They are also integrated in the European and national legislation concerning the risk assessment and prevention of exposure to harmful biological, chemical and physical risks.

But in order to fully recognise the risks of dermal exposure, more information is needed about the extent of the hazards and workers' exposure. The prevalence of occupational skin diseases throughout the EU indicates that exposure assessment is particularly important.

As mentioned above, in comparison with exposure to dangerous substances through inhalation, there are no occupational exposure levels (OELs) for dermal exposure to dangerous substances, because of the difficulty of quantifying dermal exposure.

There are few, if any, direct data on dermal exposure. Data on the effects of repeated exposure, occupational exposure to diluted preparations and exposure to multiple

chemical and/or physical factors are particularly scarce. The Organisation's for Economic Cooperation and Development (OECD) guidelines on skin irritation, skin sensitisation and corrosivity of substances can be used to derive a system of classification and labelling, but they give little information about the health effects of exposure under the conditions specific to the workplace.

It is very difficult to identify and evaluate risks of dermal exposure to harmful substances

The lack of clear and detailed information on acceptable levels of exposure (exposed body parts, quantity of substance) makes it very difficult to recognise and identify the risks of dermal exposure to harmful substances. This prevent employers from providing a realistic risk assessment and adopting the appropriate control measures.

The European RISKOFDERM project was designed to overcome this problem. The project has gathered a large number of new measurements on dermal exposure to industrial chemicals in various work situations, together with information on possible determinants of exposure. Many countries have indicated that they use this software program to carry out risk assessment of dermal exposure (see Chapter 5.8. and Appendix 2, available at: http://osha.europa.eu/publications/reports/TE7007049ENC/view).

The European Committee for Standardisation has published a technical specification (CEN/TS 15279) 'Workplace exposure — measurement of dermal exposure — principles and methods' [29]. This document sets out principles and describes methods of measuring dermal exposure in the workplace. It gives guidance on the approaches that are commonly used to measure dermal exposure, describes the limitations and advantages of these methods, and explains how they might be used in specific circumstances and for specific compounds.

5.

DIAGNOSIS, MEASUREMENT AND RISK ASSESSMENT OF SKIN DISEASES AND DERMAL EXPOSURE

A number of questions must be asked when investigating the case of a worker with a skin disorder.

- How should the problem be approached?
- How can the maximum amount of information be gathered?
- How can the aetiology (causes) be identified?
- How can one distinguish between personal and occupational exposure factors?
- How can the preventive measures in force be improved?
- How should the permanent after-effects and functional limitations be assessed?

The problems related to multiple definitions of occupational skin diseases and health, their legal and financial implications require strict attention to be paid to the national recognition criteria and recognised risk factors (Chapters 2 to 4).

Precise, early diagnosis is very important for success of both treatment and controlling risk

A precise and early diagnosis is important if treatment and prevention are to be effective and if the patient's professional career and employment are to continue (see Chapter 1.4.3.).

Three criteria are necessary for the diagnosis of occupational skin diseases:

1. the first symptoms must appear after assignment to a workstation which is known to involve a dermatological risk factor (even if no dermatological problem has been reported there before);
2. clinical signs must subside when the worker is withdrawn from the exposure (typically the weekend) and get worse or recur on return to work (typically on Monday);
3. a known aetiological (causative) agent must be present in the workplace [36] (Appendix 1).

Diagnosis is based on the link between the medical observations and those made in the work environment. This can be done through allergology and skin tests, particularly with the standard European battery and supplementary specific batteries (cosmetics, dyes, antiseptics, solvents, rubber products) [68], as appropriate for the workplace concerned.

Therapeutic care is based on avoidance of the causal agent (prevention at the source) and various other preventive measures (see Chapter 6 and Appendix 1) via a participative approach.

Moreover, in the more difficult cases, specialist consultants (dermatologist and occupational diseases specialist) can suggest ways in which the employee can prevent the disease, and also advise on compensation available (Chapters 2 to 4). Some countries mentioned this explicitly (5.12.: Czech Republic, Slovenia; details in respective sections of the Appendix 2, available at: http://osha.europa.eu/publications/reports/TE7007049ENC/view).

Several methods of skin-specific risk assessment are used in the EU and described in this chapter.

5.1. Anamnesis and examination of history

The anamnesis (medical history of the affected worker) must include data on several aspects of the disease, including the occurrence and development of the lesions, the worker's personal and family medical history, his/her occupation and leisure activities. The anamnesis is extremely important for a full understanding of the causes and the natural progress of the disease and the influence of occupational activities on the possible occurrence or aggravation of the symptoms.

The following essential elements must be part of any history taking:

- information about the worker: history of skin problems, progress;
- relationship with work: present or previous tasks carried out, duration of exposure, chemical and biological products handled, physical agents, skin protection, sick or other leave;
- colleagues' skin problems, explanations given by the worker;
- leisure activities/pastimes: sources of contact outside the workplace with irritants or allergens: hobbies, clothing, cosmetics, medications, chemical products, metals (Cr, Ni, etc.).

This information is usually gathered by occupational physicians, in collaboration with occupational hygienists, safety technicians and others involved in risk assessment. Some countries explicitly mentioned this (See 5.12.: Czech Republic, Slovenia; details can be found in Appendix 2, available at: http://osha.europa.eu/publications/reports/TE7007049ENC/view) [36] [40] [56].

5.2. Clinical examination of the skin and additional tests

The examining clinician needs to determine (without deciding about its irritant or allergic nature) whether the worker's condition is contact dermatitis or another form of eczema not directly linked to an external cause. In many cases, it is possible to answer this question by comparing the anamnesis with a detailed clinical examination of the rash. Eczemas of the hand pose a lot of difficult questions for a differential diagnosis (see Chapter 5.3.).

The affected skin must therefore be examined with great attention to detail. The examination must include a detailed description of the morphology of the lesions (primary and secondary, colour, distribution, outlines) and indicate their exact site. It must also compare symmetrical organs and emphasise observations made at other sites that might facilitate a diagnosis. The examination of the area of skin affected must be complemented by a complete examination of the entire skin [5] [35] [36] [39] [40] [56] ([11]).

([11]) See Chapters 5.8. 'Riskofderm', 5.9. 'NOSQ-2002', 5.12 'Selection of national methods' and Appendix 2 for examples of practical implementation of these guidelines in the EU.

5.3. Dermatologic diagnosis and differential diagnosis

5.3.1. Contact dermatitis caused by allergy or irritation

Occupational skin disorders, in particular inflammations, affect the hands in 80 % of cases.

The most frequent diagnosis — occurring in more than 90 % of occupational skin diseases — is that of an irritant or allergic contact dermatitis.

80% of the inflammatory occupational skin diseases affect the hands

Whether it is due to an irritation (80 % of cases) or an allergy (20 % of cases), the clinical appearance is often the same. There may be areas covered with vesiculopapules or erythematous or lichenified patches. In all cases it is important to know and to look for the criteria that will distinguish between irritation and allergy: the circumstances of occurrence, objective and subjective symptoms, limits of the lesions, distance rashes, histopathology and patch tests.

Essentially, an irritation dermatitis is the result of a non-immunological reaction due to the handling, usually repeated, of irritant chemical agents. The principal elements pointing to this diagnosis are:

- the early appearance of lesions after contact with the irritant;
- a similar disorder in work colleagues;
- a rash that is mainly squamous, hyperkeratotic and/or fissural;
- immediate and complete recovery on withdrawal from exposure to the irritant;
- clear limiting of the lesions to the product application site; and
- a negative allergology check-up.

Allergic contact eczema is due to the direct contact of the skin with a substance triggering a cell-mediated delayed hypersensitivity reaction. The disorder is individual: not all exposed workers are affected. Very small quantities of the product are sufficient to provoke new lesions, but these lesions are usually limited to the contact site and disappear after the contact is terminated. They appear quickly after consecutive exposures and test positive in some patch tests and other allergological tests (Chapter 5.6.).

Other clinical forms

Occupational dermatology can also include and mimic clinical symptoms of general dermatology (including multiforme erythema, lichen, urticaria, purpura, lymphoma and acne). Only the most frequent forms are described here [5] [31] [35] [36] [39] [40] [56].

For detailed examples, classified by sector/occupation, see Appendix 1.

5.3.2. Airborne contact eczemas

By definition, airborne dermatoses include all skin disorders related to external agents (physical, chemical, biological) transported in the surrounding air. They occupy a particularly important place in occupational dermatology. They are grouped into two large categories:

- airborne 'contact' dermatoses directly related to skin contact with agents in the environment conveyed by the air;
- airborne dermatoses caused by the inhalation of chemical products.

Some dermatoses are the result of both airborne contact and inhalation of a substance (such as glass fibres and pesticides) [5] [31] [35] [36] [39] [40] [56]. An important example is an airborne dermatitis caused by glass fibres (eventually ensimated, or resin covered) from composite materials. For other examples, classified by sector/occupation, see Appendix 1.

5.3.3. Phototoxic and photoallergic contact dermatitis

- Phototoxic contact dermatitis is a photochemical reaction caused by contact between certain chemical substances and skin in situations where the skin is exposed to solar or artificial light (i.e. a sufficient dose of radiation of an appropriate wavelength) and there is a large enough quantity of the chemical substance to have a phototoxic potential. Examples of such phototoxic substances are: polycyclic aromatic hydrocarbons (PAHs) in tars and bitumens used by roofers, tetracyclines, and pesticides such as parathion and glyphosate used by farmers and gardeners.
- Contact photoallergies, unlike phototoxic reactions, are photoimmunological reactions. As in allergic contact eczemas, they involve cell-mediated immunity mechanisms. The chemical substances responsible are photoallergens (e.g. chlorothalonil, used by carpenters).

Several other examples are detailed in the Appendix 1.

5.3.4. Contact dermatitis of the erythema multiforme type

Erythema multiforme is a dermatosis in which the basic lesion is the most characteristic: it is a papule which looks like a rosette (red ring). Contact with degreasing agents such as tri-chlorethylene can cause this type of lesion.

For other sectors/occupations with related causative agents, see the table in Appendix 1.

5.3.5. Lichenoid contact dermatitis of occupational origin

These dermatoses are found primarily in jobs that involve the handling of photographic development products. In all cases the disorder improves gradually when contact with the agent responsible is discontinued. It heals with or without change of colour of the skin, which, if occurring, can remain for several months. The diagnosis is based on the clinical examination, histopathology and patch test for the suspected allergen [5] [31] [35] [36] [39] [40] [56].

5.3.6. Urticarias and contact dermatitis due to proteins, fatal anaphylactic shock

Contact urticarias are seen usually within 30 minutes of contact between disorder-free skin and substances which are rapidly absorbed through the epidermis. The numerous causes include physical agents (such as pressure or cold affecting bricklayers and roofers). The cutaneous reactions can sometimes become generalised, cover the entire skin and be accompanied by generalised symptoms. Three pathogenic entities are described.

— **Non-immunological contact urticarias** are caused by primary urticants (including DMF –dimethylformamide–, formaldehyde, turpentine, alkaline or ammonium persulfates (APS) used by hairdressers). For details sorted by sector and occupation, see the table in Appendix 1.

— **Immunological contact urticarias** with the risk of fatal anaphylactic shock. The classical criteria are: medical history (previous contacts without symptoms); intensity of the reaction increasing following subsequent exposures; the relatively low number of subjects affected among the population exposed. It can provoke serious general symptoms including anaphylactic shock. The prevalence of immunological contact urticaria appears to be greater in atopic patients.

The substances responsible are many and varied (they include foods, animal products, wood, preservative agents and antiseptics, medicines, metals and textiles). Specific examples, sorted by sector and occupation, can be found in the table in Appendix 1.

Latex gloves are currently responsible for a great many cases, for example in the healthcare and hairdressing sectors (see Sections 3 and 4 of the table in Appendix 1). The confirmation of contact urticaria caused by latex involves a series of delicate tests that must be carefully carried out in order to track down all cases while not exposing the subjects to the risk of generalised urticarial reaction or of fatal anaphylactic shock. It is strongly recommended that this test should only be carried out in hospital, with all the indispensable emergency therapeutic means at hand (including injection of adrenaline/corticosteroids, and respiratory therapy).

The antigens are water-soluble protein macromolecules contained in natural rubber obtained from the Para rubber tree (latex). Atopy is a predisposing factor. Major complications such as distant reactions with general symptoms are not rare: rhinitis, conjunctivitis, angioneurotic oedema (Quincke's oedema), dyspnoea, asphyxia and even death.

In addition, surgical gloves are often powdered inside with maize starch, which on its own can cause immunological contact urticaria, or irritation [43] [53].

— **Contact dermatitis caused by animal or vegetal proteins or toxins.** This may be described as eczema of the hands and is exacerbated immediately (within 30 minutes) when sufferers handle proteins, particularly food proteins (vegetal or animal). The severity of the complaints can vary from intense pruritus, erythema and urticarial reactions to dyshidrosis vesicles on the lateral sides of the fingers, and even anaphylactic shock, asphyxia and death. Several occupations are particularly at risk: for example, cooks and fishmongers (for animal proteins) and

horticulturists, gardeners and foresters (for toxins from the bites of hymenoptera — wasps, bees, hornets). (See table in Appendix 1, Section 1 Food; Section 7 Animals and plants) [35] [38] [39].

5.3.7. Acneiform rashes of occupational origin

Comedos become inflamed and infected, clinically mimicking common acne (blackheads).

— Oil acne (Oil folliculitis or Blum's follicular elaiokoniosis) results from the exposure of workers to industrial oils, particularly of mechanics to mineral oils used as cutting, greasing or cooling agents.

— Chlorine acne (chloracne) is the cutaneous marker of exposure to various chlorinated phenol agents or their decomposition products such as dioxins or furanes. Contamination may be caused by exposure in the workplace (for example during the production of aromatic chlorinated pesticides) or in agriculture (use of these pesticides) [38]. The clinical symptomatology of chlorine acne only occurs some weeks after the initial contact with the product responsible. It is essentially characterised by the presence of very many non-inflammatory comedos [5] [31] [35] [36] [39] [40] [56].

5.3.8. Skin cancers

There is a very long latency period between exposure to a carcinogenic factor and development of a skin cancer

The relationship of occupational exposures to sometimes fatal malignant melanomas is still the subject of controversy.

Cutaneous carcinomas are by far the most frequent malignant tumours. Their occurrence seems to be increasing everywhere, including in Europe.

Occupational and non-occupational carcinomas do not differ clinically, apart from the specific cause and effect reaction. The long latent period (sometimes more than 20 years) between exposure to the risk and the appearance of the tumour is an almost typical feature.

Among the occupational aetiologies, three categories may be distinguished:

- **post-traumatic carcinomas:** wounds (e.g. cuts among mechanics, etc.), thermal burns (heat, among welders.), or chemical burns (among cleaners);
- **carcinomas caused by radiation,** whether ionising or not: solar radiation and artificial UV rays (precancerous lesions, e.g. in welding or solar keratosis); X-rays (precancerous lesions, e.g. radiodermatitis in the healthcare sector); infra-red rays (precancerous lesions);
- **carcinomas caused by exposure to various chemical agents:** arsenic, PAH (among painters, roofers and tilers), aromatic amines, halogenated derivatives, phenols, α-halo-ethers, β-propiolactone, certain metals (for example Cr VI from cement, Co, Sn, Ni, Se, Zn, Be) [5] [15] [36] [46] [47] [56] [61] [66] [75]; EU Directive 2004/37/EC 'Carcinogenic or mutagenic agents'. See also the table in Appendix 1 for specific examples, classified by sector and occupation.

5.4. Further research to find the irritant or allergen

Identifying the irritant or allergen often requires a complex investigation. When the employee is first examined it is usually impossible to bring together all the elements that will determine a cause and effect relationship.

Information included in Material Safety Data Sheet facilitates making diagnosis of occupational skin disease

Most companies can now give their workers, on request, the official Material Safety Data Sheet (MSDS), which has 16 sections providing information about the materials handled at work (EU Directives 91/155/EEC, 92/32/EEC, 2001/58/EC are applicable to MSDSs). The correct and complete MSDS also makes it possible to identify, at least on the qualitative level, the irritation/sensitisation potential of certain chemical substances. The role of the occupational health physician is to provide information to the dermatologist about the products thought to be responsible. Even if the clinical manifestation of the skin pathology may, in itself, suggest the possibility of an allergic contact eczema, the MSDS must guide the decision about whether or not to carry out an allergy test and/or a chemical analysis of the products.

If the composition of implicated substances remains unknown or not fully known (this is particularly likely in the case of commercial products and complex mixtures), the products must be analysed in specialised laboratory. In certain cases, a spot test (a qualitative colorimetric analysis) will be sufficient. In other cases, it will be necessary to carry out chromatographic separation and identification by spectroscopy [36] [56].

5.5. Inspections of workplaces

Workplace inspections allow essential observation of the tasks carried out and identification of the possible (causative) agents (chemical, biological and physical). They facilitate understanding of the genesis of an occupational dermatosis, provide better knowledge of the operating procedures and can assist in the design of better prevention and protection measures (Chapter 6). In all cases, account must be taken of all risk factors that may be present in the working environment: products used, working and exposure conditions, including any protective measures taken, equipment, sanitary installations and so forth [36].

5.6. Patch tests and similar allergological tests

The purpose of patch tests and similar tests is to identify the substances to which the subject has become sensitised/allergic. While such tests are easy to carry out, their interpretation is a delicate matter and should always be conducted by an experienced dermatologist. Many series of allergens are available commercially. The European standard battery, consisting of some 20 tests, makes it possible to identify the substances responsible for 80 % of cases of allergic contact dermatitis. But workers are often exposed to contact with sensitising products that are not in the standard battery. It is therefore necessary to select the series of specific allergens that are relevant to the work of the person concerned (series are available for occupations — such as hairdressers and photographers, and for products — such as glues and plastic materials, dyes, pesticides, antiseptics and preserving agents). The workers must also be tested with the products they work with, buffered and diluted at non-irritant concentrations in appropriate vehicles. These techniques are highly developed and delicate. They are a matter for dermatology teams specialised in dermato-allergology.

Patch test should be conducted with products that workers are exposed to

In all cases where a positive allergic skin reaction is observed, care must be taken to check against the MSDS that the results concur with an exposure at work, for the relevance of the test. The observation of an allergy to the glyceryl monothioglycolate (GMTG) contained in acid perm solutions used by hairdressers is a good example of this practice [31] [35] [63] [68].

Finally, biochemical examinations of blood, urine and tissues (skin, hair, nails) can also provide crucial information about exposure [5].

5.7. Skin toxicology tests and alternatives

Different tests may be carried out to study:

— the toxicity of a product for the skin;

— the LD_{50} by the dermal route;

— percutaneous absorption.

This mostly involves experiments on laboratory animals. The new European regulations make it obligatory to minimise tests on animals as far as possible by recourse to alternative methods (see Chapter 5.7.4.).

5.7.1. Toxicity for the skin

These trials may include various tests on laboratory animals (guinea-pigs, mice, rabbits) depending on the skin pathology being studied [73].

5.7.2. LD_{50} by the dermal route

This acute toxicity test — supplying the dose lethal for 50 % of laboratory animals — is used when human dermal exposure to the product being tested (in particular industrial chemicals) is probable. It is carried out on rats, rabbits or guinea-pigs. It involves application of the product to the animal's skin for 24 hours [73].

5.7.3. Percutaneous absorption

This test determines the proportion of the tested substance crossing the skin barrier and entering the blood circulation, by assays in the liquids, tissues and excreta of the organism (*in vivo* test) or in the receiving solution (*ex vivo* or *in vitro* tests). Both the original product and any metabolites must be considered.

The assays may be made:

— *in vivo*, on human volunteers or animals;

— *ex vivo* on the excised skin of the animal;

— *in vitro* by means of artificial membranes or fibroblast cultures and human keratinocytes.

In principle, these tests require only one application; the substance to be tested may or may not be radiolabelled [73].

5.7.4. Alternative *in vitro* methods for testing skin toxicity

- The new OECD directives take into account recent developments in *in vitro* tests. The new European REACH regulation [18] makes it obligatory to minimise experiments on laboratory animals (Chapter 5.7.1.–3.) by recourse to these alternative methods. The following tests have been validated:

— the transcutaneous electric resistance (TER) test;

— a human cutaneous model test, for routine examination of the corrosiveness of a substance;

— a phototoxicity test;

— a test capable of detecting quantitative differences in cutaneous sensitisation potential, with development by means of cell assays (http://www.oecd.org/document).

- A European project entitled EDETOX ('European project assessment and prediction of the dermal absorption of toxic chemical compounds', http://ec.europa.eu/research/environment/pdf/env_health_projects/chemicals/c-edetox.pdf) has highlighted considerable inter-laboratory variations with regard to *in vitro* cutaneous tests. Research should in particular make it possible to define a protocol for the percutaneous transfer of hygroscopic liquids (such as DMF).

RISKOFDERM 5.8.

RISKOFDERM (Risk assessment of occupational dermal exposure to chemicals), a large European research project coordinated by the Dutch Institute TNO, collected a large amount of qualitative and quantitative information about the conditions under which dermal exposure occurs. The programme involved 15 institutes in 10 Member States (Germany, Spain, France, Italy, the Netherlands, Austria, Portugal, Finland, Sweden and the United Kingdom).

The RISKOFDERM model defines determinants such as 'task carried out by the worker' or 'exposure control measures', and it provides dermal exposure values that are particularly useful for SMEs. The dermal exposure information has been classified and included in a 'toolkit' which is being developed [25] [72]

RISKOFDERM consisted of four parts:

(1) a qualitative overview of tasks, processes and the determinants of dermal exposure;
(2) a quantitative overview of detailed data concerning dermal exposure and determinants in most economic activities and processes;
(3) the development of a predictive model of dermal exposure including all the pertinent variables;
(4) the development of a 'toolbox' for the evaluation and management of dermal exposure risks and control measures in the field.

A number of reports have been published to present the results of the project.

The observations confirm the weaknesses of current risk perception and the necessity to develop and implement preventive measures (see Chapter 6, and the examples in the tables in Appendix 1) [57].

An interesting British study followed a 'generic approach' based on measurements in terms of 'product' or 'formulation', rather than of the particular substance as a component. It showed the importance of, among other things, contact with dirty clothing (contaminated by metals and oils, for example) [72].

NORDIC OCCUPATIONAL SKIN QUESTIONNAIRE NOSQ-2002 5.9.

A group of Nordic countries (Denmark, Finland, Sweden and Iceland) has drawn up a remarkable specialised questionnaire to record and assess skin diseases and dermal exposure of the hands and forearm. Such a precise standardised questionnaire is of benefit in both research and development of prevention methods. It facilitates the provision of comparative information about skin diseases of the hands in different populations. The group has drafted a short, easy-to-use version for detection and control, and a long, in-depth version to identify skin diseases of the hands and to assess risk factors both in the workplace and in the general population [34].

5.10. New European allergen analysis EN standards

As we have seen (Chapters 1.2.2., 1.4.2., 5.3.1., 5.3.3., 5.3.6.), allergies constitute an increasing health problem, both public and occupational, in Europe. To tackle this problem, common assessment methods are necessary at the European level. A new technical committee has therefore been set up within the CEN (Comité Européen de Normalisation): the CEN/TC 347 'Allergen analysis methods', with the objective of drawing up standardised analysis methods applicable to the known chemical allergens. The committee was set up following preliminary work by a CEN working group devoted to the development of standards enabling 56 allergens to be assayed in different materials or substrates: metals, plastics and rubbers, preserving agents and dyes, perfumes and rosins. Following the first meeting of TC 347 in October 2005, three areas of investigation were highlighted: metals (revision of the standard EN 1811 concerning the reference assay method for the release of nickel by products in direct and prolonged contact with the skin), plastics and rubbers, perfumes and rosins. They represent a programme of 10 analysis methods covering some 30 substances.

Food allergens are also the subject of European normative work, managed by the CEN/TC 275/WG 12 'Analysis of food products — general methods', and revolving around five topics: general demands, immunological methods, molecular biology methods, reference materials and chromatographic methods. The drafting of two framework standards on immunological methods and molecular biology was officially included in the work programme in December 2005. These proceedings support Directive 2003/89/EC, amending Directive 2000/13/EC, which fully came into force at the end of 2005, with regard to indicating the ingredients present in foodstuffs. It makes it obligatory to label 12 allergens (cereals containing gluten and products based on cereals, crustaceans and products based on crustaceans, eggs, soya, peanuts etc.) [7]. http://www.cen.eu/cenorm/homepage.htm.

5.11. Advanced studies in the European chemical industry: Ecetoc

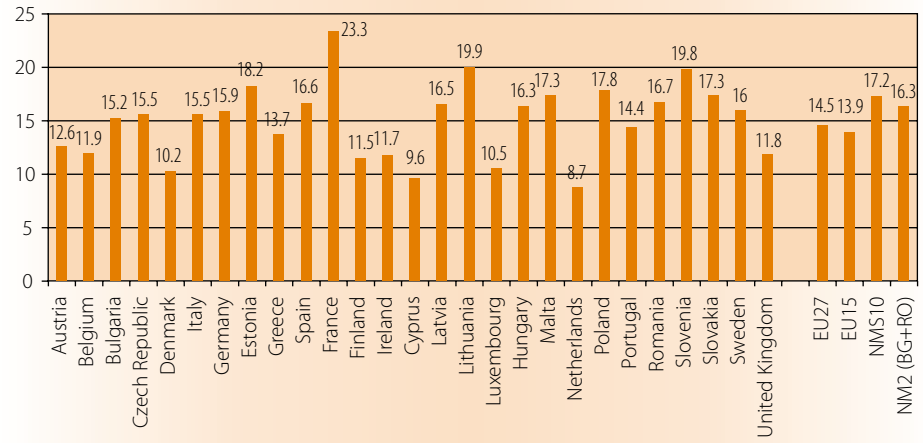
Through the European Centre for Ecotoxicology and Toxicology of Chemicals (ECETOC), Europe's chemical industry has been publishing detailed toxicological studies since 1978. Some of them directly concern skin diseases and dermal exposure e.g. Skin sensitisation testing (3.1990, 1991, 12.1999, 9.2000, 2001); Skin irritation (7.1990); Skin absorption (8.1993); Skin and respiratory sensitisers: Reference chemical data bank (1999), Contact sensitisation, new perspectives and recommendations (2001, 4.2003, 7.2003); Examination of a proposed skin notation strategy (9.1998), etc. [22] http://www.ecetoc.org

Selection of national methods of assessing/measuring risks of skin diseases and dermal exposure (Details: Appendix 2, available at: http://osha.europa.eu/publications/reports/TE7007049ENC/view)

5.12.

Clear statistics on the number of exposed workers are scarce. Data on the exposure of workers are mostly collected through questionnaires and surveys. Widespread surveys are conducted in the United Kingdom, France, Germany and the Nordic countries. The results of the survey conducted by Eurofound also provide some information about perceived exposure at the national level.

Figure 3: Exposure at work: handling or being in contact with chemical products or substances (at least 25 % of the time), by MS and EU-27, EU-15, NMS10 and NM2. In percentage share, 2005. EWCS 2005.



Belgium: GERDA — Guide for European standard patch tests battery

GERDA ([12]) (Groupe d'études et de recherches en dermato-allergologie) has published an introductory guide for a standard European patch test battery and its complements. For sources and use of allergens, see [68] and [41].
GERDA: http://www.gerda-assoc.com

Slovenia: risk assessment is usually done by occupational physicians.

The risk of dermal exposure is assessed during the general risk assessment. This is usually the task of the occupational physician, in collaboration with hygienists and/or safety technicians. None of the regulatory methods of risk assessment (PHA, MOSAR, FTA, Delphi, FMEA) includes specific methods to assess the risk of dermal exposure. In Slovenia, there is no systematic recording of risk related to occupational dermal exposures or any other kind of exposure at the state level.

([12]) De Craecker, W., 'Maçonner sans chrome', *PreventActua*, Prevent, Brussels, 2003.

Finland: register on employees exposed to carcinogens (ASA)

Workers exposed to carcinogens — including those affecting skin — have been registered annually since 1979. Employers send their lists of exposed workers to labour protection district offices every year. The countrywide information is collected by FIOH, which publishes the relevant statistics annually. This enables the health and safety authorities to focus their inspection and advisory tasks — including assessing/measuring risks of dermal exposure and developing skin diseases — appropriately.

Finland: FINJEM

The Finnish Job-Exposure Matrix (FINJEM) is a database that summarises data from several other FIOH databases and supplements them with information on the labour force and professional expertise.

FINJEM is used for hazards surveillance; it provides an overview of national exposure trends and makes it easier to identify occupations with high or multiple exposures. It includes definitions, inferences, exposure data, and references. The system takes into account workforce data, and it provides information on the numbers of exposed workers in Finland by agent, occupation, and level of exposure. FINJEM covers major physical, chemical, microbiological, ergonomic and psychosocial factors. Exposure is described by the prevalence of exposure and the level of exposure among the exposed, both estimated mainly on continuous scales. In addition, the user may also define the final criteria of exposure, and thereby influence the magnitude of misclassification [54].

France: SUMER

The SUMER survey (Surveillance médicale des expositions et des risques — Medical surveillance of exposures and risks), is led by the Direction des relations du travail (medical inspectorate) and DARES (Direction de l'animation de la recherche, des études et des statistiques), and aims to provide regular information about the exposure of employees to the main occupational risk factors in France. This includes physical risks as well as chemical, biological and organisational risks.

A second objective is to define and prioritise preventive actions on a national level.

The strength of this survey lies in the fact that, on the one hand, it is based on the expertise of the occupational physician who can administer a sometimes very technical questionnaire and, on the other hand, on the extensive number of participating employees, which permits the quantification of exposures to rather unusual risks. The survey was carried out for the first time in 1987 and the second time in 1994. The last survey dates from 2002/03. This registration system is thus regularly updated. In total 1 800 occupational physicians (more than 20 % of the occupational physicians in France) have conducted interviews with more than 50 000 employees. The previous week's exposures to chemical products, biological agents and other factors are registered. The weakness of the survey is that exposures related to single or irregular activities are underestimated, because these activities are less likely to occur during the short survey period. The survey is of particular interest because it details the characteristics of the exposure. This is important because there are many studies on the hazards of dangerous substances, but few linking the risk of exposure to the dangers of the products.

The SUMER survey takes into consideration the intensity (related to the dose, thus to the quantity and concentration of the product) and the incidence of exposure (recurrence and duration). Furthermore, the survey also determines criteria for distinguishing the different degrees of exposure and awards an 'exposure score', to specify the results of the survey as precisely as possible. SUMER also confirms that personal protective equipment (PPE) is still more readily available than collective protective equipment. PPE provides cutaneous protection and is intended more for immediate risks (irritation, burns, urticaria, allergies) than for delayed risks (percutaneous intoxication, carcinogenic, mutagenic or reprotoxic effect (CMR)). For a complete overview of the project see

http://www.travail-solidarite.gouv.fr/result_recherche.php3?recherche=SUMER&x=7&y=6

For a summary, see [58] [69] [70].

Germany: documentation on occupational diseases (BK-DOK) of the Berufsgenossenschaften

A compilation of statistical data is published regularly in English (HVBG 2004). It provides information on the number of companies, person-hours worked and persons insured. A list of all occupational diseases is included, as well as: the number of notifications of a suspected occupational disease, the recognised cases, new pensions, and a summary of all cases on which a decision was taken in the year under review. Finally, data on the number of pensions, and the expenditure of the statutory accident insurers, including that for accident prevention, curative treatment and pensions, are provided. A special evaluation focused on occupational skin diseases was published recently in German [44] [45].

ODIN

In Germany, occupational contact with carcinogenic substances is regulated by very strict legislation. Medical preventive care continues after employment involving contact with carcinogenic substances has ceased, since there is often a long delay before occupationally induced tumours develop. The German Service for the Organisation of Post-exposure Medical Examinations (ODIN) was established by the statutory German accident insurance institutions (Berufsgenossenschaften) to ensure that early detection examinations continue to be performed after the employee retires. Thus, the success of cancer treatment is enhanced by the detection of malignancy in its early stages. The registration by ODIN of data concerning exposure to hazardous substances also has the function of preserving evidence required for possible compensation claims by victims of occupational illnesses. In the longer term, ODIN data may help explain the relationship between exposure to hazardous substances and the incidence of cancer, including skin cancers.

Poland: STER computer system

To help companies in assessing occupational risk, the Central Institute for Labour Protection-National Research Institute (CIOP-PIB) has developed a supporting tool: a computer system for hazard registration and occupational risk assessment, STER. The system helps to:

— collect and analyse information about the workplace that is necessary to identify hazards;

— assess risk connected with those hazards. The user of the system receives a proposal of risk assessment for all agents in frequent use in the workplace, such as harmful chemical substances. On the basis of the measurement data, the programme makes it possible to develop a so-called 'agent measurement card' which is then stored in its database;

— identify actions that should be taken as a result of risk assessment. The system contains a database of Polish regulations and it automatically selects from that database admissible values for the indicated agents. For chemicals, the Sk (Skin) notation, for substances that are absorbed through the skin, is used as a warning sign only, indicating that certain chemicals might penetrate the human skin with the potential for systematic toxicity. To estimate risk, a three-level scale has been adopted: low, medium or high. The system makes it possible to print a document registering all data relevant to the workstation in question. It includes information used for conducting a risk assessment, together with results of the assessment and recommendations made regarding preventive actions (marked up to give the date when the recommendations were implemented, along with the person responsible). The document itself is called an 'Occupational safety and health (OSH) workstation card'. It is also possible to print other documents required by statutory organisations.

Slovakia: ASTR

In Slovakia, workers whose skin is exposed to dangerous substances have been registered in ASTR (Automatic system of classification of risks) since 1996 (http://www.uvzsr.sk)

United Kingdom: EASE (Estimation and Assessment of Substance Exposure) was developed by the United Kingdom Health and Safety Executive (HSE). The EASE model is a general model to predict workplace exposure to a wide range of substances hazardous to health.

The HSE's National Exposure Database (NEDB) was used as the principal data source. It describes the development of the output ranges of exposures provided within the model. Users of the model have identified a number of problems and limitations with it, but nonetheless the EASE model is widely used in risk assessments for new and existing chemicals by companies all over Europe, North America, Australia and Asia.

United Kingdom: workplace health and safety survey programme

Respondents were asked whether in the last 12 months they had come into regular contact at work with specific chemicals that could cause skin problems e.g. cutting oils or coolants, soaps or cleansers, solvents, or any other substances known to cause skin problems (see questionnaire available on the Internet for more details). Responses indicated that in the previous 12 months almost all workers came into regular contact with substances that are known to cause skin problems. Two-thirds had received some training or information on whether handling such substances could cause skin problems and/or how to protect themselves from any harmful effects of the substances. An estimated 87 % were

very or fairly confident that this would help prevent them from developing a skin problem.

The level of concern among those exposed to this risk was relatively low at 12 % (representing 6 % of the working population). Some 29 % thought the risk could realistically be reduced, and a clear majority (13 % versus 3.7 %) of those reporting that there had been some change in the level of risk over the last 12 months, thought that the risk had reduced in this time rather than increased. See results at HSE: http://www.hse.gov.uk/ [43]

6.

METHODS OF PREVENTING, ELIMINATING OR MINIMISING THE RISK OF DERMAL EXPOSURE

Skin diseases can, to a large extent, be prevented by the combined application of technical, organisational and medical measures designed to eliminate or minimise the exposure of skin to risk factors.

In the light of the constraints that currently prevent all of these measures being put into place, it would be interesting to know what results would be achieved if they were in fact followed scrupulously. In a recent study, Géraut and Tripodi investigated cases where preventive regulations and prescriptions were fully complied with. They found that globally, for all occupations, there were 80 % positive results over six months and 72 % over three years [37] [40]. They particularly emphasised collective prevention and individual hygiene validated by the worker himself or herself.

In this context it is important to mention the initiatives and official publications at European level of the two principal bodies concerned with occupational safety and health:

1. the European Agency for Safety and Heath at Work in Bilbao (EU–OSHA) — especially in relation to the European Week campaign on dangerous substances (http://ew2003.osha.europa.eu/);
2. the European Foundation for the Improvement of Living and Working Conditions (Eurofound) in Dublin (http://www.eurofound.europa.eu/).

Very specific preventive measures are given at the end of the table in Appendix 1 for various occupations, lesions and causative agents.

6.1. General or collective prevention

Collective protective methods have the highest priority in preventing exposure to skin risks factors

General or collective prevention must be applied as a matter of priority, whether a hazard affects all or part of the company concerned (EU: OSH directives). There must be a sense of responsibility about identifying the risks involved at each workstation, and about informing and training the workers and making them actively aware of physical, biological and chemical risks.

Various measures aimed at eliminating or at least reducing contact with irritant or allergenic and/or carcinogenic products can be employed. Specific examples can be found in Appendix 1.

6.1.1. Removal of allergens/carcinogens/corrosives and related measures at source (avoidance)

- **The removal** of allergens/carcinogens: where possible, an allergen/carcinogen should be removed entirely from a product and replaced by a non- or less- toxic substance (for example the removal of yellow sodium dichromate from French 'Javelle water').
- **The replacement** of very dangerous products: the substitution of very allergenic products by other, less harmful ones (for example the replacement of turpentine by white spirit, of disinfecting formaldehyde by ethyl alcohol, isopropanol or ether), and

of corrosive/very irritant products by those that are less so (for example the replacement of a strong acid by acetic or citric acid) in general constitutes an effective measure [11] [15].

- **The transforming, neutralising, reducing or entrapping** of allergens/carcinogens: cement, for example, is allergenic (and carcinogenic) because of the hexavalent chromium Cr VI salts present in fairly large quantities. The addition of ferrous sulphate to the cement before the mixing stages makes it possible to transform the Cr VI into non-allergenic (and non-carcinogenic) Cr III and so to reduce the Cr VI content to a level below 2 ppm (EU: 'Cement directive') ([13]) [13] [14]. The removal of aromatic hydrocarbons from petroleum derivatives (such as motor fuels and solvents) greatly reduces their carcinogenic PAH content and potential (EU: Directive 2004/37/EC 'Carcinogenic or mutagenic agents') [15].
- **The avoidance of contact** with the allergens, carcinogens/mutagens and caustics/irritants through technical innovations: in hairdressing, for example, the plastic sheathing of nickel-plated scissor handles makes it possible to reduce allergies to nickel. Covers, screens, flexible tubing and other equipment makes it possible to avoid splashing while transferring liquids [56] [36].

6.1.2. Automation

The automation of certain continuous operations involving a direct risk of skin contact with irritant or allergenic products considerably reduces the risk of dermatoses (such operations include photography and the manufacture of antibiotics and biocides). Special vigilance must be maintained, however, with regard to discontinuous operations involving high exposure and therefore high risk (for example: maintenance, repairs, cleaning, opening or closing of packages, boiling, pulverising, evaporating, (un)loading) [10].

6.1.3. Use of allergens, carcinogens and/or corrosive agents in closed or isolated systems for continuous operations

In theory this prevents any contact on the part of the workers. In practice, vigilance must be maintained, because the presence of a closed system leads to a lack of awareness of the risk and a slackening of the safety reflexes. This might increase the possible risks in the event of a problem (such as a breakdown or the emission of a dangerous product) [17].

6.1.4. General ventilation and localised extraction

These measures enable working environments to be maintained in acceptable conditions (compliance with occupational exposure limit values — OELs — where these exist). Adequate localised extraction (appropriate design, direction of the airflow) makes it possible to entrap all dangerous products at the source of production and to discharge them, after suitable filtration, outside the working environments. This is particularly important for airborne dermatoses: including wood (especially hardwoods and exotic woods), glass fibre composites and corrosive aerosols (see Chapters 5.3.1. and especially 5.3.2.).

([13]) EU Directive 2003/53/EC.

6.1.5. General cleanliness at and of the workplace

This is another effective method of combating skin diseases. On building sites, even the smallest ones, workers should always have access to clean water points, with suitable cleansing agents and clean towels. Proper washing off (See 6.2.5.(d) and Appendix 1 sections 2.1.(1) and (3) for bricklayers and tilers; 2.4.(1) and (2) for painters) of splashes of irritant/corrosive or allergenic products (cements, paints, solvents, glues) must be done immediately. The general housekeeping of workstations is also of paramount importance to reduce exposure not only of workers using potentially hazardous substances, but also others working nearby.

6.1.6. Measures aimed at a better knowledge of the products handled

In addition to measures aimed at reducing exposure, action must be taken to improve knowledge of products handled in the workplace, including those not officially classed as dangerous (see Chapter 4.1.), and to ensure that workers are better informed about risks and trained in use of methods to control them. This is one of the objectives of the Franco-Belgian group GERDA ([14]) and of information programmes conducted by the British Health and Safety Executive (HSE). Obtaining and interpreting correct and complete MSDSs is also crucial (see Chapter 5.4.). In practice however, given their complexity, these documents should be converted into one-page short safety instruction sheets, displayed in the workplace in the form of posters (min. A3, laminated), containing an optimum number of colour pictograms, which will be comprehensible and easy to apply in the field by everyone ([15]) [12] [15] [16].

6.1.7. Basic organisational measures

The organisation of work can be changed, for example by altering and rotating workstations, reducing dangerous operations, particularly discontinuous ones, and reducing the presence of non-essential personnel in proximity of permanent or temporary sources of risk. Attention should be given to the operating procedures and tools used. Very often skin lesions are the result of handling errors or the use of non-compliant tools. Assessment of the workstation and a search for consensual or participatory solutions, involving workers, management, experts and executives, could resolve this problem.

([14]) Groupe d'études et de recherches en dermato-allergologie — Dermato-Allergology Study and Research Group: http://www.gerda-assoc.com

([15]) De Craecker, W, 'White spirit, Ammonia', *PreventMemo*, 2003–04; EU: Directive 92/58/EEC 'Provision of safety signs'.

6.1.8. Examination of the workplace by a dermatologist and other specialists

When a complex skin problem occurs in a company, the occupational physician may consider it advisable to refer the problem to a dermatologist and to other specialists. A shared inspection (carried out by a dermatologist, an occupational physician, a hygienist, a local OSH staff) will enable the cumulative knowledge of all these specialists to be tapped, leading to rapid identification of the problem and making it possible to employ the most effective and efficient control methods.

6.2. Personal protection

Personal protection arrangements are less effective than collective measures: the cooperation of the workers is the deciding factor in implementing them. In practice, they often represent the only course open in the area of prevention and they must be accorded great importance in the prevention of skin diseases. Practical examples of such arrangements are to be found in Appendix 1.

Workers' cooperation is necessary to ensure effectiveness of personal protective equipment

6.2.1. Strategic programme for personal protective measures in three stages

Apart from obvious and legally prescribed general hygiene, such as prohibiting eating, drinking or smoking in the workplace, the strategic programme for personal protection consists of three stages.

Before and during work.

- First stage: use of individual means of protection: protective clothing (with particular attention to gloves), creams and/or protective gels.

After work.

- Second stage: adequate cleaning of the skin, in particular the hands, before any break, thus repeatedly during the day.
- Third stage: skin care: the use of 'remedial', emollient, moisturising and/or anti-inflammatory creams or ointments.

6.2.2. Wearing of suitable protective clothing

Protective clothing in the form of jackets, trousers, aprons, helmets, facial shields, respirators, gloves and other items are supplied by specialist shops and must comply with safety standards — including the European Norms ([16]) [7] — for each workstation. They must also have the following qualities: be of general-purpose, comfortable, of a good appearance, heavy-duty, acceptable to the employees, not

([16]) http://www.cen.eu/cenorm/homepage.htm

burdensome and not cause unwanted side-effects. The suitability of a type of clothing to the employee and their workstation is of the utmost importance. As the aim is to avoid the onset of skin diseases, it must not cause either irritation or contact allergies. It must also not create other risks. The user must comply scrupulously with the manufacturer's instructions for use.

6.2.3. Wearing of safety shoes and boots

The wearing of safety shoes and boots is highly advisable, even obligatory, in certain occupations. However, their use can bring about unwanted side-effects:

- Their occlusion effect can accentuate the clinical symptomatology of plantar hyperhidrosis, or excessive sweating, with dermatomycosis. An exemption from the obligation of wearing safety shoes, with a temporary change in workstation, may therefore become necessary.
- The shoes can also contain allergens (additives in the rubber, glues) which can be dissolved by sweat and cause allergic reactions.

6.2.4. Wearing of protective gloves

The correct wearing of suitable gloves is of paramount importance in the prevention of skin diseases. The nature of the gloves, their thickness and general form must be suitable for the task and the hazardous material in question, and must meet the protection requirements of each workstation. However, vigilance is necessary: no material can withstand an agent indefinitely. Varying sizes of workers' hands have to be taken into consideration. Extra lengths (cuffs) will protect the wrists.

(a) Gloves made of polymeric materials

Hundreds of different types of gloves in polymeric materials are available from manufacturers. According to their use and thickness, they are divided into four categories.

Category I: single-use gloves (thickness 0.07–0.25 mm)

Category II: household gloves (thickness 0.20–0.40 mm)

Category III: industrial gloves, frequently with inner lining (0.36–0.85 mm)

Category IV: job-fitted gloves (heat, cold) with additional covering and/or greater length.

The different categories of gloves have specific properties depending on the materials used to make them, and how thick they are. They also have different levels of relative permeability, depending on the nature and the concentration of the chemical products they are designed to protect against.

In order to select the correct gloves, reference can be made to pre-selection grids of the 'impermeability profile' type provided by the manufacturer, and to documents and studies of permeability carried out in specialised centres. All of this must, however, be supplemented by field studies carried out in the company itself, at the relevant

workstation. The ideal is always to test small numbers of pre-selected gloves in real working conditions before ordering the total number required.

Certain gloves in polymeric materials have specific properties:

- **Latex gloves (natural rubber)**

They are used in many economic sectors (food production, healthcare etc.), whether sterilised or not, because of their technical qualities (the user retains their dexterity). In industry their use is limited by their permeability to a large number of chemical substances.

Allergies to latex gloves, found mostly in the hospital sector (see Chapter 5.3.6.), have made it necessary to provide latex-free substitutes:

— synthetic rubber gloves, or preferably plastic gloves;

— a very fine, impermeable glove made of a plastic material under the no-powder latex glove [41].

- **Synthetic rubber gloves: nitrile, butyl, neoprene, styrene-butadiene, etc.**

Because of their additives these gloves can cause allergies, but less frequently than latex gloves. Gloves made of styrene-butadiene are considered 'hypoallergenic'. However, synthetic rubber presents problems of occlusion, hyperhidrosis (excessive sweating), maceration and irritations.

- **Plastic gloves (PVC, PVA, PE, multilayered, Viton, etc.)**

In general these offer a better chemical resistance than the gloves described above; they are rarely involved in the development of allergies and are therefore considered 'hypoallergenic'.

(b) Leather gloves

These provide good mechanical protection. They can, however, cause various pathologies, including allergy to chromium (if they are tanned with chrome), microtraumas (if their flexibility is impaired by moisture or solvents), allergic or irritation dermatoses (if chemical products pass through them or because of the residual presence of products used to maintain the leather). In certain cases, therefore, they are only suitable for work in a dry environment.

(c) Textile gloves

Made of cotton and other textiles, these are used on their own for certain types of work, but may also serve as internal lining for other types of gloves, particularly rubber gloves. Theoretically they have no side-effects. If they are washed, they must be rinsed extremely thoroughly before being re-used, to avoid all risk of irritation caused by detergents or other substances used in the washing.

(d) Metal mesh gloves

These gloves protect from the risk of injury by sharp objects (knives, fish bones, bone fragments, etc.) in meat, poultry and fish processing units or abattoirs.

To avoid the risks of nickel (Ni) allergy, aluminium (Al) mesh gloves can be used (guaranteed nickel-free), or gloves made from a wire net in Kevlar-sheathed stainless steel.

6.2.5. Protection creams and gels (so-called 'barriers'), maintenance creams

(a) General points

Due to the influence of occupational physicians and hygienists in particular, protective creams and dermatological preparations are increasingly used to protect against irritant skin diseases. Protecting the epidermis from limited or repeated moderately aggressive mechanical and/or physico-chemical contacts has become a necessity when it is not possible to wear gloves and/or when it is essential to retain a high level of dexterity.

Protective creams do not provide the same level of chemical and mechanical resistance as gloves. They do, however, have an undeniable effect in the prevention of certain irritant, contact dermatoses, for, when used properly, they can:

— limit the risk of transcutaneous transfer of certain high-molecular-weight molecules (resins for example);
— reduce the defatting of the epidermis (caused, for example, by the action of solvents or detergents);
— reduce skin abrasion due to repeated mechanical contact (among bricklayers, tilers and roofers, for example);
— maintain a satisfactory level of epidermal hydration;
— facilitate the cleaning of the skin after each work session;
— be used on the various healthy areas of the body (hands, wrists, forearms, face), with the exception of mucous membranes and damaged areas of the skin.

Protective creams can be beneficial to skin. However, they do not offer full protection

The limitations of this kind of protection must, however, be taken into account:

— the skin is rarely completely protected (spaces between the fingers and underneath the nails are difficult to reach);
— the skin is not protected against allergens, toxic, corrosive or septic substances, hard abrasive particles (steel particles, metal shavings, glass powder, sand, glass fibres, etc.);
— in particular, the skin is not protected against the percutaneous absorption of some industrial solvents (see Chapters 1.3. and 5.7.3.). Some studies show converse effects [55];
— the skin cannot be protected in a durable way (two to four hours at most, where the skin has neither been washed or wiped, nor brought into repeated contact with rough objects).

(b) Different types of protective creams

There are no absolute rules, and therefore no particular classification, regarding the galenical form of protective creams. Leaving aside the fact that 'cream' necessarily means 'a water-soluble (lipophobic) or hydrophobic (lipophilic) protective emulsion', the general term of 'protective cream' can also be used to designate ointments, pastes, foams and gels (popular because they are not greasy to the touch).

(c) Quality criteria

When selecting creams with a view to ordering, the following characteristics should be taken into account (see (f), below): microbiological and physico-chemical stability, efficacy, organoleptic and touch characteristics, pH (6 to 8 in general) and viscosity.

(d) Correct methods of use

A protective cream should be applied before work only to healthy, uninjured, clean and dry skin, paying particular attention to areas which are difficult to get at (spaces between the fingers, joints, edges of the nails, etc.). It is recommended that the application is repeated about every two to four hours. An emollient maintenance cream is applied after each working day, to restore and restructure the epidermis.

For cleaning the hands and forearms, suitable specialised formulations should be used (greases, moisturisers, conditioners, 5<pH<9): excessively abrasive soaps (rather use borax or pumice stone), excessively alkaline soaps or detergents (pH>9), irritant solvents, degreasing agents or toxic percutaneous substances (benzene in super-grade gasoline found in garages, workshops etc.), should not be used.

(e) Contra-indications of protective creams

Protective creams should not be used:

— whenever the wearing of gloves is absolutely obligatory;
— where there are skin lesions, whether of mechanical, infectious or allergic origin;
— under latex gloves if the cream contains hydrocarbons (Vaseline, paraffin. etc.) that are not compatible with the latex proteins (this can lead to the formation of microperforations);
— on dirty hands;
— for certain sensitive tasks, such as painting and varnishing.

(f) Toxicity of protective creams

Protective creams for occupational use are cosmetic products. Maximum safety is therefore expected. In particular, they should not contain either irritants or allergens (including lanolin, parabens and perfumes). However, many exogenic factors can increase the toxicity of the creams, however slightly. These factors include excessively long duration of skin contact, non-compliance with recommendations for use and/or storing, exceeding the expiry date, and simultaneous use with another cream [36] [56] [35] [21] [48] [49]. http://www.inrs.fr
http://www.hse.gov.uk/pubns

6.3. Selection of National Methods of preventing, eliminating, minimising risk of skin diseases and dermal exposure (Details: Appendix 2, available at: http://osha.europa.eu/publications/reports/TE7007049ENC/view)

Austria: information package for high risk groups

Prevention measures include contacting high-risk groups and providing them with information packs. Hairdressers, masons, cleaning and care and nursing staff are among the groups targeted. These campaigns are held in appropriate settings such as vocational schools, guilds, trade fairs and building yards, as well as at company premises. They were initiated by AUVA (Sozial Unfallversicherung — the national accident insurance company).

Belgium: brochures, tables, campaigns

DETIC [20] (http://www.detic.be), the Belgo-Luxembourg association of producers and traders of soaps, cosmetics, detergents, cleaning products, adhesives, etc. and IVP, the Belgian association of producers and distributors of paints, varnishes, inks, etc. [51] (http://www.ivp-coatings.be) publish specific safety brochures, leaflets and guidelines for producers as well as consumers, particularly with a view to preventing skin diseases and dermal exposure.

Czech Republic: various preventive actions

- Sanitary supervision in workplaces
- Health examination of workers at the beginning of employment
- Collaboration between dermatologists, occupational hygiene specialists and safety technicians to optimise the effectiveness and use of:
  — technological processes,
  — protective instruments,
  — protective creams.

Finland: register of employees exposed to carcinogens (ASA)

In Finland, legislation stipulates that workers exposed to carcinogens, including those affecting skin, be registered annually. The Finnish ASA Register, established in 1979, is based on ILO Convention 139 and the associated Recommendation 147. The basic objective of ASA is to help prevent occupational cancer — including cutaneous cancers — in Finland. ASA aims mainly at enforcing the implementation of preventive measures by safety and health personnel at workplaces, but it also helps the labour safety authorities to focus their inspection and advisory tasks appropriately.

The specific preventive objectives of the ASA are:
— to stimulate preventive measures, such as the substitution of carcinogens, improvement of local ventilation, and personal protection of the skin;
— to inform about cancer risks and effective preventive measures.

France: *Fiches d'allergologie-dermatologie professionnelle DMT*

The INRS coordinates and publishes in the series *Documents pour le médecin du travail* an important collection of *Fiches d'allergologie-dermatologie professionnelle* (Occupational allergology and dermatology cards). Every card has the following headings: definition, composition and utilisation, irritants and allergens, epidemiology, diagnosis in the workplace and in a specialised environment, technical and medical prevention, rehabilitation, bibliography [47].

http://www.dmt-prevention.fr, search for *'Dermatologie'*

Germany: sectoral information and training programmes, substitution, technical rules

Intensive health and safety measures, including information and training programmes, have led to a decrease in the number of notifications and recognitions of occupational skin diseases in Germany (from 24 056 suspected cases in 1992, to 16 165 in 2004) [4]. The success is especially evident in the hairdressing and healthcare sectors. The allergen glycerylmonothioglycolate (GMTG) (used in acid permanent waves) was substituted with less toxic substance. In the healthcare sector, latex gloves were replaced by non-latex gloves or non-powdered latex gloves. The number of skin diseases due to these allergens decreased notably. All in all, awareness in relation to occupational skin diseases, their causes and consequences has risen both at employee and at employer level. These awareness-raising campaigns have been supported by information provision and training [67] [71]. The effect of certain measures — such as the reduction of chromate in concrete, the provision of additional information in safety sheets for skin protection, and renewed investigations of the efficiency of skin protection — are only visible in the long term.

The content of different technical rules could also be useful to other countries. The rule on wet work in particular has attracted attention throughout Europe. This process could be carried forward by the diffusion of the TRGS 401 *'Gefährdung durch Hautkontakt'* (risks due to skin contact) [4].

In 2007, the German Berufsgenossenschaften (institutions for statutory accident insurance and prevention for trade and industry) launched a two-year-long nationwide preventive skin campaign. It is aimed at the maintenance of a healthy skin status to prevent skin diseases in both occupational and private settings. More than 100 sub-campaigns aimed at specific target groups have been planned, including TV and radio campaigns. These activities are geared towards awareness-raising, the improvement and appropriate implementation of hazard analyses at the workplace, optimised provision and usage of protective gloves and skin care products in affected enterprises, as well as increasing participation in training activities.

Luxembourg: campaigns, publications

The Resource Centre for Environmental Technologies (part of the Ministry of Environment) has published a guide on the use of water-based lacquers.

The Netherlands

- **Arbocovenanten**

The Netherlands combines the general occupational health and safety legislation with a sectoral approach. 'Safety and health covenants' are agreements between

employers' organisations, trade unions and the government. They are aimed at improving working conditions, curbing sick leave and reducing the number of cases of occupational disability. Covenants have been concluded on a sector-by-sector basis since 1999. Different branch covenants concern the prevention of skin diseases in particular. These include the hairdressing branch, construction, laundry (protocol on biological agents), metalworking, cleaning, and hospital work. The essential aim is to reduce hand dermatitis by 50 %, through a reduction/elimination of allergens.

Examples of effective measures are: the reduction of dangerous substances and allergens by making an inventory of the hospitals with a high exposure to allergens and dangerous substances; listing skin-related problems and prevention priorities; awareness-raising regarding the risks and control measures, the implementation of control measures, the follow-up and evaluation of the measures; cost-benefit analysis; and, above all, the introduction of latex-free gloves.

- **The VASt programme**

This is a specific covenant on dangerous substances, by which the industry and users work together to voluntarily reinforce the working conditions policy on hazardous substances in the Netherlands. Through the VASt programme, the Dutch Ministry of Social Affairs and Employment (SZW) encourages and supports industry in gaining better control over exposure to dangerous substances. To achieve this, the Ministry has set aside approximately EUR 10 million for the period 2003–07, provided, however, that the business community accepts its own share of responsibility and actively implements the VASt programme [59].
SZW: http://arboconvenanten.szw.nl

United Kingdom: HSE actions on SD/DE

HSE has implemented a number of actions and is developing new ones: information, training, study, research and publications (including leaflets, cards and brochures) — some of which are specifically about skin diseases and dermal exposures in the various economic sectors [43].

http://www.hse.gov.uk/skin
http://www.hse.gov.uk/latex
http://www.hse.gov.uk/pubns

7.

CONCLUSIONS, CHALLENGES, PROSPECTS AND RECOMMENDATIONS

7.1. General conclusions

Skin diseases are one of the most important occupational health problems in the European Union

Skin diseases are a major problem in the European countries. They are on the list of the most important emerging risks related to the use of and exposure to chemicals, but they can also be caused by exposure to biological and physical risk factors. In many European countries, they are the second most prevalent occupational disease, after musculoskeletal disorders (MSDs). Skin diseases represent 10 % to 40 % of recognised occupational diseases in the EU. The most recurrent lesions are irritant- ,or even corrosive-induced contact dermatitis followed by allergic contact dermatitis.

Recognition of skin diseases

Recognition of occupational diseases in the European countries varies between the use of a general definition (mostly based on the so-called 'professional risk'), the use of lists or tables of occupational conditions and diseases, and a combination of definitions and lists/tables (mixed system).

Incidence and collection of data

The primary goals of data collection in the various EU countries are:

- to monitor occupational diseases in order to identify and keep track of the main pressure points;
- to detect the appearance of new risk factors and diseases;
- to gain insight in the causes and prevention of occupational diseases;
- to predict and study trends, sectors, etc., and to take precautions accordingly.

The data also serve as a basis for further analysis and scientific research, professional education and international comparison.

Data are collected through the declarations of occupational diseases that are sent to the insurance company (if applicable), the local or national authorities or health and safety offices, and national institutes responsible for the monitoring and prevention of occupational diseases. Some countries also have additional systems for the surveillance of occupational skin diseases.

Collecting accurate, specific statistical information on the prevalence, distribution, assessment, compensation and prevention systems for all skin exposure in the EU is almost impossible. The lack of a precise internationally accepted definition of occupational skin diseases in addition to differences between national registration systems also impedes the collection of high-quality epidemiological data. The regular increase in the frequency and gravity of observed skin diseases (in particular irritations, skin cancers and above all allergies of chemical origin) is a trend found in all studies.

National surveillance schemes for the reporting and registration of occupational diseases exist in most countries. There is often an acknowledged underestimation of the number and seriousness of the disorders. There are many reasons for this: the lack of a clear-cut definition; not getting the information from the employee because they may not be sufficiently aware of the exposure to the risk and the insurance system; a lack of knowledge and training on the part of general practitioners; employees' fear of losing their job when they report a disease; and a lack of occupational physicians.

All this indicates a need for a better understanding of the causes, mechanisms and exposures leading to skin diseases and an improvement in the recording and interpretation of the data in order to effectively prevent them, but also some changes to the insurance systems and improved training of doctors and workers.

Moreover, the number of registered diseases is also very dependent upon the standards/criteria used to recognise occupational diseases. The criteria of recognition vary from one country to another. In some cases it is the patient himself who has to prove the link between work and the disease or it is the patient's employer that has to pay compensation or medical costs if the disease is reported as an occupational disease; this may also lead to under-reporting.

Lack of standard values for dermal exposure

The EU countries recognise the risks of dermal exposure leading to skin diseases. Most countries report that they adhere to the applicable legislation (relating to health surveillance, avoiding and reduction of risks, action and limit exposure values). However, in order for the risks of dermal exposure to be fully appreciated, information about the extent of the hazards and level of workers' exposure is needed. Due to methodological problems, there is a lack of indices for dermal exposures or 'skin OELs' similar to the inhalation OELs (occupational exposure limits) for the control and monitoring of exposure. Consequently very little direct data on dermal exposure exist. This is especially true for data on the effects of repeated exposure; the effects of occupational exposure to diluted preparations; and exposure to multiple chemical and/or physical factors. The prevalence of occupational skin diseases in the EU shows that exposure assessment is necessary.

Risk assessment and prevention

Many different methods have been developed to assess and control the risk of dermal exposure more effectively, but there are still many challenges to be met.

7.2. Challenges, recommendations and prospects

The prevention of skin diseases includes the maintenance of the natural protective function of skin, as well as the identification and evaluation of exposure to harmful agents.

Until now relatively little effort has been made to differentiate between the nature of dermal exposure found respectively in continuous and discontinuous activities in industry.

Many risk control measures in the past were developed as a reaction to the appearance of a problem rather than from a proactive approach; this means that corrective action was usually only taken after an incident or accident.

Not all EU countries indicate that the assessment and prevention of skin diseases is a priority, although skin diseases rank highly in the incidence lists. A need for effective evaluation and registration standards is evident.

There is a clear, urgent and general need for a unifying framework of recognition and registration criteria for occupational diseases in a European context. Equally urgent is the need for validation and improvement of models for assessment of skin exposure of workers, considering the impact of skin diseases on absenteeism, but also on professional prospects of affected workers. The mapping of exposure to dangerous substances, including skin exposure, has been identified as one of the elements of the general workplace exposure assessment [26].

Furthermore, much work needs to be done to raise the awareness of employees and to keep physicians up to date with the current developments in the field.

An example of new European policy: cosmetic products

Regardless of a long list of needs in relation to administrative measures to be developed and research into skin diseases and occupational dermal exposure, some progress is being made to reduce dermal exposure. The Commission has drawn up guidelines in collaboration with Member States and stakeholders to give the public (and therefore also workers) better access to relevant information in relation to cosmetics that may have undesirable effects and can, for example, cause allergic reactions. These guidelines were published on 28 August 2006 ([17]).

1. Better access to information on undesirable effects related to the product

An 'undesirable effect' is an adverse effect on human health that occurs from the normal or reasonably foreseeable use of a cosmetic product. Undesirable effects do not include, for example, those resulting from abuse or misuse of the product and those related to associated items, such as the packaging. Examples of undesirable effects are: irritant and allergic effects, cosmetic acne, phototoxic effects, photosensitivity, and anaphylactic shock.

The cosmetic manufacturer or the person responsible for placing an imported cosmetic product on the market must provide appropriate information on the frequency and nature of undesirable effects linked to the product. All undesirable effects reported to the companies have to be included in this information. The companies can also publish a value for the number of undesirable effects per 1 000 000 units of the product placed on the market.

2. Information on quantitative composition of the products

The list of ingredients is given on cosmetic products in descending order of weight at the time they are added. On request, the quantitative information on those substances that are classified as 'dangerous' under the provisions of Directive 67/548/EEC must be disclosed.

The guidelines were drawn up by a working group set up by the Commission that included representatives of Member States and stakeholders.

This is a very good example of guidelines for reducing dermal exposure and skin diseases due to the extensive use of products not only by consumers, but also by workers in the cosmetology and hairdressing sectors. Hairdressers, beauticians, manicurists and chiropodists, among others, must use these products every day. They are among the occupations most exposed to occupational dermatitis (see References and Appendix 1, Sector 4. Hairdressing and cosmetology).

([17]) http://ec.europa.eu/enterprise/cosmetics/html/cosm_guidance_docs.htm
European Directory for public access: http://www.european-cosmetics.info

Other sectors with high levels of dermal exposure and skin diseases caused by chemicals could conclude a similar agreement in order to prevent these diseases: some relevant sectors are cleaning, food, drink, cooking, catering, construction (including painting), healthcare, plastics and metal production, occupations in contact with animals and plants, and printing (See Appendix 1).

The cosmetic industry approach could be adopted as a model for other agents and sectors/occupations, to help to solve one of the most important — but underestimated — OSH problems: skin diseases. The cosmetic initiative is a fairly recent one and as yet there are no data confirming its effectiveness. However, provision and use of information — as outlined in the policy — would be a first step in achieving the behavioural change needed to bring about lasting success, resulting in reduction of prevalence of occupational skin diseases.

8.
GLOSSARY

Term	
a	
acneiform	Resembling acne
aetiology	A branch of knowledge concerned with the causes of particular phenomena, in medical science — with the causes and origins of diseases
adrenaline	A hormone produced by the adrenal medulla in mammals. It can be produced synthetically for medical purposes. It is secreted in response to low blood glucose, exercise and stress
allergology	The branch of medicine devoted to the study of allergy, its etiology, diagnosis, and treatment
anamnesis	A medical or psychiatric patient history, as opposed to catamnesis (follow up)
anaphylactic shock	A serious, often life-threatening allergic reaction that is characterised by low blood pressure, shock (poor tissue perfusion) and difficulty breathing
antimitotic medications	A drug for inhibiting or preventing mitosis. Many anti-tumour drugs are antimitotic
articulations	joints
assays	The determination of the amount of a particular constituent of a mixture or of the biological or pharmacological potency of a drug
b	
Blum's follicular elaiokoniosis	Oil acne
c	
carcinogenic	Producing carcinoma
carcinoma	A malignant new growth that arises from epithelium. Carcinomas tend to infiltrate into adjacent tissue and spread (metastasize) to distant organs, for example: to bone, liver, lung or the brain
cell-mediated	Immune response that involves T lymphocytes and not the production of antibodies
chloracne	An occupational acne-like eruption due to prolonged contact with certain chlorinated compounds
chromatographic separation	A chromatographic technique that utilises the ability of biological molecules to bind to certain substances specifically
CNS-depressant drugs	Medication that diminishes the function or activity of central nervous system (CNS)
colorimetric analysis	Analytical method, use of change of colour of substances to find the densities and/or concentrations of the other solutions
conjunctivitis	Inflammation of the conjunctiva, generally consisting of conjunctival redness associated with a discharge
corticosteroids	A group of synthetic hormones including prednisone, prednisolone, methylprednisolone and dexamethasone used in the treatment of some leukaemias and also to suppress graft rejection and graft-versus-host disease following bone marrow transplant. Side-effects include an increased risk of infection
cutaneous	Pertaining to the skin
cutaneous carcinomas	A malignant new growth that arises from epithelium of skin
d	
defatting	Removal of fatty layer
dermatitis	Inflammation of the skin

Term	
dermatomycosis	A superficial infection of the skin by fungi
dyshidrosis	A vesicular or vesicopustular eruption of multiple causes that occurs primarily on the volar surfaces of the hands and feet; the lesions spread peripherally but have a tendency to central clearing
dyspnoea	Shortness of breath, difficult or laboured breathing
e	
eczema	A pruritic papulovesicular dermatitis occurring as a reaction to many endogenous and exogenous agents
epidemiological	Relating to or involving epidemiology: the study of the distribution and determinants of health-related states and events in populations and the control of health problems, the study of epidemic disease
epithelioma, malignant	A neoplasm of epithelial origin, ranging from benign (adenoma and papilloma) to malignant (carcinoma)
erythema	A name applied to redness of the skin produced by congestion of the capillaries, which may result from a variety of causes, the aetiology or a specific type of lesion often being indicated by a modifying term
erythema multiforme	Skin disorder resulting from an allergic reaction
erythematous	Relating to, or causing, erythema
ex vivo	Outside the living body
f	
fibroblasts	Resident cell of connective tissue, that secretes fibrillar procollagen, fibronectin and collagenase
fibroplast	Cell producing fibrous tissue
fissural	Relating to a fissure: any cleft or groove, normal or otherwise
g	
galenical	Usually relating to Galen (Greek physician and medical scientist in Rome) or his medical principles or method
h	
histiocytes	Long living resident macrophage found within tissues
histopathology	Science concerned with the study of microscopic changes in diseased tissues
hyperhidrosis	Excessive perspiration
hyperkeratosis	Hypertrophy of the corneous layer of the skin
hypersensitivity	A state of altered reactivity in which the body reacts with an exaggerated immune response to a foreign substance
i	
intertrigo	A superficial dermatitis occurring on apposed skin surfaces, such as the axillae, creases of the neck, groin, between the toes, with obesity being a predisposing factor, caused by moisture, friction, warmth and sweat retention and characterised by erythema, maceration, burning, itching and sometimes erosions, fissures and exudations and secondary infections
in vitro	Within a glass, observable in a test tube, in an artificial environment
in vivo	Within the living body.

Term	
j	
k	
keratin	A protein that is a primary constituent of hair, nails and skin
keratinocytes	Epidermal cells which synthesise keratin and undergo characteristic changes as they move upward from the basal layers of the epidermis to the cornified (horny) layer of the skin.
l	
langerhans cells	Recirculating, dendritic, antigen-presenting cells found principally in the stratum spinosum of the epidermis
leukaemia	An acute or chronic disease that involves the blood forming organs, which is characterised by an abnormal increase in the number of leucocytes in the tissues of the body with or without a corresponding increase of those in the circulating blood
lesion	Any pathological or traumatic discontinuity of tissue or loss of function of a part
lichenification	Hypertrophy of the epidermis, resulting in thickening of the skin with exaggeration of the normal skin markings, giving the skin a leathery barklike appearance, which is caused by prolonged rubbing or scratching
lipophilic	Having an affinity for fat, pertaining to or characterised by lipophilia
lipophobic	Not soluble in lipids (fats)
lymphoma	Malignant tumour of lymphoblasts derived from B lymphocytes. most commonly affects children in tropical Africa: both Epstein Barr virus and immunosuppression due to malarial infection are involved
m	
maceration	The softening of a tissue by soaking, especially in acids, until the connective tissue fibres are so dissolved that the tissue components can be teased apart
macrophages	Round, granular, mononuclear phagocytes found in the alveoli of the lungs
mast cells	Resident cells of connective tissue that contain histamine and heparan sulphate
melanocytes	Special cells in the skin and the eye that synthesise melanin pigments
melanoma, malignant	A malignant tumour which arises from the pigment producing cells (melanosomes) of the deeper layers of the skin (or the eye). Melanoma is the leading cause of death attributable to skin lesions
morphology	A study of the configuration or the structure of animals and plants
musculoskeletal	Relating to muscles and to the skeleton, as, for example, the musculoskeletal system
n	
necrosis	The sum of the morphological changes indicative of cell death, it may affect groups of cells or part of a structure or an organ
o	
organoleptic	Making an impression upon an organ; said of the effect or impression produced by any substance on the organs of touch, taste, or smell, and also on the organism as a whole
p	
papule	A small circumscribed, superficial, solid elevation of the skin
patch tests	Skin tests in which the sensitiser is applied to a patch of cotton cloth or gauze held in place for approximately 48-72 hours. It is used for the elicitation of a contact hypersensitivity reaction

Term	
percutaneous	Performed through the skin, injection of radiopaque material in radiological examination or the removal of tissue for biopsy accomplished by a needle
percutaneous intoxication	Poisoning, the state of being poisoned, occurring through exposure through the skin
photoallergies	Sensitisation of the skin to light, usually due to the action of certain drugs, plants, or other substances; may occur shortly after administration of the drug (phototoxic sensitivity), or may occur only after a latent period of from days to months (photoallergic sensitivity, or photoallergy)
photoimmunological reaction	Immunological reaction induced by light
phototoxicity	Severely exaggerated reaction to sunlight caused by a new chemical in the skin
plantar hyperhidrosis	Excessive perspiration of or pertaining to the sole of the foot
pruritus	Itching, an unpleasant cutaneous sensation that provokes the desire to rub or scratch the skin to obtain relief
purpura	A small haemorrhage (up to about 1 cm in diameter) in the skin or mucous membrane, which may be caused by various factors, including blood disorders, vascular abnormalities and trauma
q	
Quincke's oedema	A vascular reaction, representing localised oedema characterised by development of giant wheals
r	
radiodermatitis	A cutaneous inflammatory reaction occurring as a result of exposure to ionising radiation
Raynaud's disease	Paroxysmal spasm of the arteries causing pallor (blanching) of the fingers and toes
reprotoxic	Toxic for reproduction
rhinitis	Inflammation of the mucous membrane of the nose
s	
sebaceous glands	Numerous glands in the dermis that usually open into the hair follicles and secrete an oily semifluid sebum
spectroscopy	Spectroscopy is the science of measuring the emission and absorption of different wavelengths (spectra) of visible and non-visible light, this can be done via a spectroscope
squamous	Scaly or platelike
sweat retention syndrome	A condition seen in conjunction with heat stress, in which the sweat ducts are closed, producing inability to sweat and heat retention that may lead to heat exhaustion with weakness, dyspnea, tachycardia, elevation of body temperature, and collapse
symptomatology	Branch of medicine with describes symptoms, the systematic discussion of symptoms
t	
thrombosis	The formation, development or presence of a thrombus
transcutaneous, transdermal	Entering through the dermis or skin, as in administration of a drug applied to the skin in ointment or patch form
Transcutaneous Electric Resistance (TER) test	Test of electrical resistance of the skin, used for assessment of skin corosivity of substances

Term	
u	
urticants	Producing a wheal or other similar itching agent
urticaria	A transient condition of the skin, usually caused by an allergic reaction, characterised by pale or reddened irregular, elevated patches and severe itching, hives
v	
vesiculopapules	Combination of vesicles (closed membrane shell) and papules (small circumscribed, superficial, solid elevation of the skin), or of papules becoming increasingly swollen with sufficient collection of fluid to form vesicles
z	
zoonotic	Relating to a zoonosis: transmission of a disease from an animal or nonhuman species to humans
y	
x	
xenobiotic	A completely synthetic chemical compound which does not naturally occur on earth and thus believed to be resistant to environmental degradation

Source of the definitions: Online Medical Dictionary. http://cancerweb.ncl.ac.uk/omd/

9.

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10.

LIST OF EU LEGISLATION MENTIONED

- Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the registration, evaluation, authorisation and restriction of chemicals (REACH), establishing a European Chemicals Agency, amending Directive 1999/45/EC and repealing Council Regulation (EEC) No 793/93 and Commission Regulation (EC) No 1488/94 as well as Council Directive 76/769/EEC and Directives 91/155/EEC,93/67/EEC, 93/105/EC and 2000/21/EC
  http://eur-lex.europa.eu/LexUriServ/site/en/oj/2006/l_396/l_39620061230en00010849.pdf
- Commission Regulation 2006/341/EC adopting the specifications of the 2007 ad hoc module on accidents at work and work-related health problems provided for by Council Regulation (EC) No 577/98 and amending Regulation (EC) No 384/2005
  http://eur-lex.europa.eu/LexUriServ/site/en/oj/2006/l_055/l_05520060225en00090013.pdf
- Directive 2006/121/EC of the European Parliament and of the Council of 18 December 2006 amending Council Directive 67/548/EEC on the approximation of laws, regulations and administrative provisions relating to the classification, packaging and labelling of dangerous substances in order to adapt it to Regulation (EC) No 1907/2006 concerning the registration, evaluation, authorisation and restriction of chemicals (REACH) and establishing a European Chemicals Agency
  http://eur-lex.europa.eu/LexUriServ/site/en/oj/2006/l_396/l_39620061230en08500856.pdf
- Directive 2006/25/EC of the European Parliament and of the Council on the minimum health and safety requirements regarding the exposure of workers to risks arising from physical agents (artificial optical radiation) (19th individual Directive within the meaning of Article 16(1) of Directive 89/391/EEC)
  http://eur-lex.europa.eu/LexUriServ/site/en/oj/2006/l_114/l_11420060427en00380059.pdf
- Commission Directive 2006/15/EC establishing a second list of indicative occupational exposure limit values in implementation of Council Directive 98/24/EC and amending Directives 91/322/EEC and 2000/39/EC
  http://eur-lex.europa.eu/LexUriServ/site/en/oj/2006/l_038/l_03820060209en00360039.pdf
- Commission Directive 2006/8/EC amending, for the purposes of their adaptation to technical progress, Annexes II,II and V to Directive 1999/45/EC of the European Parliament and the Council concerning the approximation of the laws, regulations and administrative provisions of the Member States relating to the classification, packaging and labelling of dangerous preparations
  http://eur-lex.europa.eu/LexUriServ/site/en/oj/2006/l_019/l_01920060124en00120019.pdf
- Commission Directive 2005/53/EC amending Council Directive 91/414/EEC to include chlorothalonil, chlorotoluron, cypermethrin, daminozide and thiophanate-methyl as active substances
  http://eur-lex.europa.eu/Notice.do?val=409314:cs&lang=en&list=409314:cs,&pos=1&page=1&nbl=1&pgs=10&hwords=2005/53/EC~&checktexte=checkbox&visu=#texte
- Commission Directive 2005/34/EC amending Council Directive 91/414/EEC to include etoxazole and tepraloxydim as active substances
  http://eur-lex.europa.eu/LexUriServ/site/en/oj/2005/l_125/l_12520050518en00050007.pdf
- Directive 2004/37/EC of the European Parliament and of the Council on the protection of workers from the risks related to exposure to carcinogenes or mutagenes at work

(Sixth individual directive within the meaning of Article 16(1) of Directive 89/391/EEC)
http://eur-lex.europa.eu/LexUriServ/site/en/oj/2004/l_229/l_22920040629en00230034.pdf

- Directive 2003/89/EC of the European Parliament and of the Council amending Directive 2000/13/EC as regards indication of the ingredients present in foodstuffs
  http://eur-lex.europa.eu/LexUriServ/site/en/oj/2003/l_308/l_30820031125en00150018.pdf
- Commission Recommendation 2003/670/EC concerning the European schedule of occupational diseases
  http://eur-lex.europa.eu/Notice.do?val=286286:cs&lang=en&list=286286:cs,284653:cs,&pos=1&page=1&nbl=2&pgs=10&hwords=&checktexte=checkbox&visu=#texte
- Council Regulation (EC) No 670/2003 laying down specific measures concerning the market in ethyl alcohol of agricultural origin
  http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:32003R0670:EN:HTML
- Directive 2003/53/EC of the European Parliament and of the Council amending for the 26th time Council Directive 76/769/EEC relating to restrictions on the marketing and use of certain dangerous substances and preparations (nonylphenol, nonylphenol ethoxylate and cement)
  http://eur-lex.europa.eu/pri/en/oj/dat/2003/l_178/l_17820030717en00240027.pdf
- Commission Directive 2001/59/EC adapting to technical progress for the 28th time Council Directive 67/548/EEC on the approximation of the laws, regulations and administrative provisions relating to the classification, packaging and labelling of dangerous substances
  http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:32001L0059:EN:HTML
- Commission Directive 2001/58/EC amending for the second time Directive 91/155/EEC defining and laying down the detailed arrangements for the system of specific information relating to dangerous preparations in implementation of Article 14 of European Parliament and Council Directive 1999/45/EC and relating to dangerous substances in implementation of Article 27 of Council Directive 67/548/EEC (safety data sheets)
  http://eur-lex.europa.eu/LexUriServ/site/en/oj/2001/l_212/l_21220010807en00240033.pdf
- Directive 2000/54/EC of the European Parliament and of the Council of 18 on the protection of workers from risks related to exposure to biological agents at work (seventh individual directive within the meaning of Article 16(1) of Directive 89/391/EEC)
  http://eur-lex.europa.eu/LexUriServ/site/en/oj/2000/l_262/l_26220001017en00210045.pdf
- Directive 1999/45/EC of the European Parliament and of the Council concerning the approximation of the laws, regulations and administrative provisions of the Member States relating to the classification, packaging and labelling of dangerous preparations
  http://eur-lex.europa.eu/LexUriServ/site/en/oj/1999/l_200/l_20019990730en00010068.pdf
- Council Directive 98/24/ECon the protection of the health and safety of workers from the risks related to chemical agents at work (14th individual Directive within the meaning of Article 16(1) of Directive 89/391/EEC)
  http://eur-lex.europa.eu/LexUriServ/site/en/oj/1998/l_131/l_13119980505en00110023.pdf

- Council Directive 96/29/Euratom laying down basic safety standards for the protection of the health of workers and the general public against the dangers arising from ionizing radiation
  http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:31996L0029:EN:HTML
- Directive 96/58/EC of the European Parliament and of the Council amending Directive 89/686/EEC on the approximation of the laws of the Member States relating to personal protective equipment
  http://eur-lex.europa.eu/Notice.do?val=344405:cs&lang=en&list=344405:cs,&pos=1&page=1&nbl=1&pgs=10&hwords=96/58/EC~&checktexte=checkbox&visu=#texte
- Council Directive 92/58/EC on the minimum requirements for the provision of safety and/or health signs at work (ninth individual directive within the meaning of Article 16(1) of Directive 89/391/EEC)
  http://eur-lex.europa.eu/smartapi/cgi/sga_doc?smartapi!celexapi!prod!CELEXnumdoc&lg=en&numdoc=31992L0058&model=guichett
- Commission Directive 93/112/EC of 10 December 1993 amending Commission Directive 91/155/EEC defining and laying down detailed arrangements for the system of specific information relating to dangerous preparations in implementation of Article 10 of Council Directive 88/379/EEC
  http://eur-lex.europa.eu/Notice.do?val=294622:cs&lang=en&list=260540:cs,294622:cs,&pos=2&page=1&nbl=2&pgs=10&hwords=91/155/EEC~&checktexte=checkbox&visu=#texte
- Council Directive 92/32/EC amending for the seventh time Directive 67/548/EEC on the approximation of the laws, regulations and administrative provisions relating to the classification, packaging and labelling of dangerous substances
  http://eur-lex.europa.eu/smartapi/cgi/sga_doc?smartapi!celexapi!prod!CELEXnumdoc&model=guicheti&numdoc=31992L0032&lg=en
- Council Directive 91/414/EEC concerning the placing of plant protection products on the market
  http://eur-lex.europa.eu/LexUriServ/site/en/consleg/1991/L/01991L0414-20051201-en.pdf
- Commission Directive 91/155/EEC defining and laying down the detailed arrangements for the system of specific information relating to dangerous preparations in implementation of Article 10 of Directive 88/379/EEC
  http://eur-lex.europa.eu/smartapi/cgi/sga_doc?smartapi!celexapi!prod!CELEXnumdoc&lg=en&numdoc=31991L0155&model=guichett
- Council Directive 89/656/EC on the minimum health and safety requirements for the use by workers of personal protective equipment at the workplace (third individual directive within the meaning of Article 16(1) of Directive 89/391/EEC)
  http://osha.europa.eu/data/legislation/4
- Council Directive 89/391/EC on the introduction of measures to encourage improvements in the safety and health of workers at work
  http://osha.europa.eu/data/legislation/1
- Council Directive 67/548/EEC on the approximation of laws, regulations and administrative provisions relating to the classification, packaging and labelling of dangerous substances
  http://eur-lex.europa.eu/Notice.do?val=9088:cs&lang=en&list=72847:cs,72809:cs,45241:cs,9088:cs,&pos=4&page=6&nbl=54&pgs=10&hwords=67/548/EEC~&checktexte=checkbox&visu=#texte

APPENDIX 1.

EXAMPLES OF OCCUPATIONS AT RISK OF DEVELOPING OCCUPATIONAL SKIN DISEASES AND AGENTS INVOLVED

CLASSIFICATION BY ACTIVITY SECTOR/OCCUPATION

N.B. Other sectors (such as printing, chemical and pharmaceutical industries) use the same agents and face the same risks.

Sector —activity— occupations: examples	Lesions observed (dermatoses)	Agents involved (chemical, physical, biological): examples	Aggravating factors	Complications	Prevention
1. CLEANING/FOOD/ HOTELS/ RESTAURANTS/ CATERING 1.1. Cleaners, domestic help 1.2. Food handlers, butchers, delicatessen dealers, bakers, pastry makers, grocers, cheese-makers and cheesemongers, fishmongers. 1.3. Brewers, wine growers, wine merchants. 1.4. Cooks, restaurateurs, waitpersons, hotel-keepers, café-owners.	(1) Chemical burns	– Acids (phosphoric, hydrochloric, acetic, citric, vinegar) – Bases/alkalis (sodium hydroxide, potassium hydroxide, ammonium hydroxide, concentrated Javelle water)	– Atomisation HP washer – Reaction releasing Cl_2	– Post-traumatic arcinoma – Poisoning – Death	– PVC, butyl, neoprene, gauntlet ested gloves
	(2) Abrasion dermatitis 'housewives' dermatitis	– Exposure to chemical products and repeated physical micro trauma (abrasion) – Cereal beards	– Metallic sponge ('pumice stone')		– Gloves (1) – Moisturising, softening creams
	(3) Irritation dermatitis 'housewives' dermatitis	– Solvents (acetone), wet work – Diluted Javelle water, vinegar – Soaps, detergents – Hydrogen peroxide – Juices (fish, meat, fruit, vegetable: citric acid)			– Butyl, PVC tested gloves – Moisturizing creams, softeners
	(4) Trophic disorders of the nails	– Repeated contact with solvents		– Mycotic grafts	– See 3
	(5) Allergic contact eczemas	– Nickel of utensils, coins, mesh gloves, chromium, cobalt impurities in detergents, gloves – Seafood products – Fruit (limonene) – Animal and vegetable proteins – Enzymes (detergents, flour) – Vegetables (lactones sesquiterpenic agents), aromatics, spices, condiments – α-amylase, rye, flour – Antioxidants, preservatives: sorbic acid, gallates, Kathon CG with isothiazolinones – Antiseptics and disinfectants (formaldehyde, glutaraldehyde, glyoxal, Javelle water with yellow sodium dichromate, quaternary ammoniums and other allergenic biocides) – Gloves and other rubber articles (see 3.3 and 3.4) – Floor polishes, waxes, (turpentine: Δ-3 carene, Δ-limonene) – Silver cleaners, brass cleaners (thiourea) – Bleaching agents: persulfates, peroxides		– Urticaria, anaphylactic shock, asphyxia – Death – Ungual dystrophy	– Utensils, tested gloves, detergents without nickel, chromium, cobalt – Patch test – Avoidance of contact – Tested gloves (1) – Non-allergenic biocide (ethanol, isopropanol, colourless Javelle water without dichromate) – PVC, PVA, Viton tested gauntlet gloves, – Substitution with white spirit
	(6) Contact urticarias	– Cleaning solvents with DCM (dichloromethane or methylene chloride) – Urticating plants (nettles: histamine, acetylcholine) – Marine products, enzymes, proteins (meat)			– PVA, Viton gauntlet gloves, tested, – Protection, contact avoidance

Sector —activity— occupations: examples	Lesions observed (dermatoses)	Agents involved (chemical, physical, biological): examples	Aggravating factors	Complications	Prevention
2. CONSTRUCTION 2.1. Bricklayers, tilers, carpenters, concreters.	(1) Chemical burns ('cement burns')	– Cement, particularly rapid-hardening or quick-setting cement, very alkaline (pH = 13-14) – Lime	– Bad professional work practices (bare hands, knees exposed to fresh cement)	– Ulcerations (hands, knees, face, feet, nasal septum)	– Cement at pH < 12 – Hygiene, clean gauntlet tested gloves, boots
	(2) Abrasive and irritation dermatitis	– Cement (very dust producing: airborne) – Handling traumas, heat, cold – Washing hands with detergents, washing powders or soaps with abrasives, alkalis (pH>10)		– Burns – see (1) – Impetigo, infection	– Non-allergenic protective clothing – Emollient, moisturizing cream – Soaps without abrasives, 4<pH<10
	(3) Allergic contact eczemas: 'cement disease'	– Chromium, cobalt, nickel of cements, chromium of leather gloves (Chromium is a principal allergen in males) – Epoxy resins of very permeable cements – Fluids and oils in formwork an dismantling – Rubber gloves and boots (natural, latex)		– Palmoplantar dyshidrosis – Rubber allergy	– Cement with low chromium, cobalt, nickel, epoxy content (see 5.2) – Tested, clean gauntlet gloves and boots from PVC, PVA
	(4) Airborne glass fibre dermatitis	– Glass fibres (reinforced, composite plastics), possibly ensimated (resin covered)	– See 5.1	– See 5.1	– See 5.1
	(5) Skin infections – dermatomycoses or intertrigo of the toes ('athlete's foot') – pyodermatitis by irritation or allergic infection	– Infectious, mycotic or bacterial agents – Hyperhidrosis or excessive sweating with synthetic or rubber glued boots and shoes	– Collective showers	– Proliferation of microbes, removal of the horny layer, pains, inflammation, extensive redness	– Stitched leather shoes – Activated carbon soles – Strict individual hygiene
	(6) Neoplastic lesions: pitch keratosis, malignant epithelioma, carcinomas, melanoma: skin tumours	– Hexavalent chromium VI – Solar UV – Tars, pitches, bitumens, asphalt, roof felt and derivatives, creosote (wood-tar) : PAH	– Working in the sun	– Phototoxicity – Cancer – Death	– Cement with a low Chromium VI: < 2 ppm content (EU), with ferrous sulphate – Tested gloves, clothing, sun screen (cream)
	(7) Venous insufficiency in the lower limbs and trophic problems of the legs	– Standing for prolonged periods	– Bad living and health conditions	– Eczematiform dermatitis – Skin ulcers on the legs	– Adequate breaks and sufficient movement
	(8) Chafing, frostbite	– Cold	Prolonged standing position	– Urticaria – Gangrene	– Protection of extremities – Adequate breaks, sufficient movement

Sector —activity— occupations: examples	Lesions observed (dermatoses)	Agents involved (chemical, physical, biological): examples	Aggravating factors	Complications	Prevention
2.2. Quarry workers, miners	(1) Systemic scleroderma and Raynaud's syndrome ('white finger' or 'dead finger')	– Silica powder – Handling of vibrating machines			– Silica entrapping – Less vibrating machines
	(2) Allergic contact eczemas	– Rubber boots (cf. 3.3 and 3.4) – Cements (cf. 2.1)	– Sweating (uric acid)		– See 3.3 and 3.4 – See 2.1
2.3. Carpenters, cabinetmakers	(1) Allergic eczemas	– Plastic glues (epoxides, neoprene, urea-formaldehyde, phenol-formaldehyde) – Varnish (acrylates, plasticisers) – Exotic woods, fir, pine (terpenes) – Colophony – Turpentine (Δ-3carene, Δ-limonene) – Preservatives: ▪ dichromates ▪ pesticides: captafol, TCPN, creosote, creolin, chlorothalonil,	– Polishing, aerosol – Working in the sun – UV	– See 5.2 – Ungual dystrophy – Erythema multiforme – Contact photoallergy	– Skin protection, hygiene – Local extraction covering the saw – Substitution with white spirit – Ad hoc tested PPE, particularly gloves, facial shield – Clothing, sun screen (cream)
	(2) Airborne dermatoses from glass fibres	– Glass fibres (reinforced, composite plastics), possibly ensimated (resin-covered)	– See 5.1	– See 5.1	– See 5.1
	(3) Raynaud's syndrome ('white finger' or 'dead finger')	– Vibrating wood machines		– Particularly affects index and middle finger	– Less vibrating machines – Ad hoc tested PPE
	(4) Hypothenar hammer syndrome	Use of the heel of the hand in repeated percussion on a hard surface		– Thrombosis, Raynaud's syndrome (3), necrosis of the extremities (arteriography)	– Appropriate tools – (Sledge)hammer
2.4. Painters	(1) Irritation dermatitis	– Paint removers ▪ DCM ▪ detergents ▪ washing powders ▪ acids ▪ alkalis (bases) – Solvents and thinners – Additives	– Complexity of compositions of paints, varnishes, glues		– Water-based paints – Extraction ventilation – Suitable tested gauntlet gloves – Facial shield, respirator – Proper cleaning up of splashes
	(2) Allergic contact eczemas or urticarias (airborne or otherwise)	– Plastic resins: glues and varnishes, paints among others with epoxy resin bases (DGEBA), acrylics, PUR (TDI, MDI, IPDI) – Pigments and dyes: ▪ Chromium (zinc chromate rust-inhibiting paints) ▪ Cobalt (salts: blue paints) ▪ Nickel (metallic paints) ▪ Mercury (red protective paint) ▪ PPD (paraphenylenediamine: azo dyes)	- Gun spraying	– See 5.2	– Paints without allergens (chromium, cobalt, nickel, mercury, PPD, formaldehyde, turpentine) – Return to using the paint brush or roller, if possible

Sector —activity— occupations: examples	Lesions observed (dermatoses)	Agents involved (chemical, physical, biological): examples	Aggravating factors	Complications	Prevention
2.4. Painters		– Additives: biocides, preservatives, antiseptics ▪ Kathon-MW, TCPN ▪ thiurames ▪ diamines ▪ Peru balsam ▪ Rosin (pine tar) ▪ formaldehyde – 'Natural' solvents ▪ turpentine (Δ-3 carene, Δ-limonene)		– Ungual dystrophy	– Extraction ventilation – Suitable tested gauntlet gloves – Facial shield, respirator – Proper cleaning up of splashes – Substitution with white spirit
	(3) Traumatic tattooing	– Subcutaneous injection of paint under high pressure (gun spraying)		– Secondary ischemia, amputation of affected finger	– Safety instructions – See 1
	(4) Skin cancers	– Tar and coal-tar pitch: PAH – Bitumen, asphalt and petroleum products: PAH – Creosote or wood tar: PAH – Solar UV	– Working in the sun (phototoxicity)	– Melanoma – Death	– Gauntlet tested gloves and other protective, non- sensitizing clothing, sun screen cream
3. HEALTH CARE 3.1. Nurses. 3.2. Nursing assistants, hospital service agents, ambulance attendants, physiotherapists. 3.3. Doctors, anaesthetists, surgeons, assistants. 3.4. Dentists, denturists, dental technicians, orthodontists. 3.5. Veterinary surgeons (see also 7.7).	(1) Irritation dermatitis (associated with skin sensitization)	– Soaps, detergents, antiseptics and disinfectants – Wet work	– (Too) frequent washing	– Allergy	– Emollient and moisturising creams – Suitable gauntlet-tested protective gloves in nitrile, neoprene, styrene-butadiene (lined where necessary)
	(2) Skin burns	– Ethylene oxide (gas for sterilising for example surgical clothing) – Mercury		– Malignant epithelioma or skin cancer	– Protection, entrapping, screen, suitable tested PPE
	(3) Allergies a) contact urticaria (immediate hypersensitivity) b) contact eczema (delayed hypersensitivity)	– Vegetable proteins powdered latex (Para rubber tree: natural rubber) – Propanidid (Epontol): general anaesthetic – Procaine: local anaesthetic – Mercury of amalgams and disinfectants – (Meth)acrylates – Impressions – Rosin (red-brown glue with a pine-tar base: colophony for adhesive tape) – Antiseptics (formaldehyde, glutaraldehyde, glyoxal, quaternary ammoniums, Javelle water with dichromate, Kathon CG with isothiazolinones) – Nickel tools – Excipients (lanolin, propyleneglycol) – Preservatives (parabens) – Antioxidants	- Stress	– Conjunctivitis, rhinitis – Quincke's oedema (angio-oedema) – Asphyxia, anaphylactic shock – Death	– 'Latex free': replace latex with non-powdered, low-allergen latex, tested PVC, nitrile, neoprene, styrene-butadiene, (lined where necessary) – Replacing rosin by non-allergenic white glue – Replacing allergenic antiseptics by non- allergenic biocides (ethanol, isopropanol, Javelle water without yellow dichromate),

Sector —activity— occupations: examples	Lesions observed (dermatoses)	Agents involved (chemical, physical, biological): examples	Aggravating factors	Complications	Prevention
		– Perfumes – Anti-inflammatories (piperazine) – Antibiotics and sulphonamides – Benzodiazepines – Neuroleptic phenothiazines – Antimitotics (anticancer agents) – Fixatives (Chromium, glutaraldehyde) – Epoxy resins – Dyes (Sudan III, IV) – Plant extracts – Peru balsam – Radiology (hydroquinone, pyrocatechol, Kathon CG)			without atomisation, with trapping and ventilation – Autoclavable equipment – Tools without nickel – Replacing cosmetics by hypoallergenic agents without perfume or allergenic preservatives
	4) Allergies to the constituents of synthetic and natural rubber (allergic contact eczemas)	– Gloves – Rubber vulcanisation accelerators and antioxidants: ▪ thiurames ▪ carbamates ▪ mercaptobenzothiazole (MBT) and derivatives ▪ IPPD (Isopropylparaphenylene diamine)	– Stress		– Plastic tested gauntlet gloves (PVC, PVA, Viton, polyethylene), lined where necessary
	5) Skin infections	– Bacterial agents (pyoderma) – Cutaneous herpes – Mycotic agents (onychoses) – Scabies (epidemic of Norwegian scabies): acarids, (house) mites, fleas	– Excretions, blood, saliva, soiled linen	– Soaps, antiseptics used too much may cause irritation dermatitis	– See 7.a
	6) Radiodermatitis and radiocancers of the skin	Ionising radiations (X-ray)	– Reduction of fractures under screen – Interventional radiology – Keep shielded	– Necrotic ulceration – Death	– Radiation protection
4. HAIRDRESSING, COSMETOLOGY **4.1. Hairdressers.** **4.2. Assistants.** **4.3. Beauticians.** **4.4. Manicurists, foot care specialists are examples of the occupations most exposed to risk of developing occupational dermatitis**	1) Irritation dermatitis	– Soaps, detergents, wet work – Perms (base: ammonium thioglycolate and acid) – Bleach (hydrogen peroxide) – Irritant shampoos – Creams (perfumes, excipients, preservatives)	– Rubbing – Intensive practice – Intensive practice	– Chemical burn if dose is incorrect – Chemical burn	– Ad hoc gauntlet tested gloves – Emollient and moisturising cream
	2) Hairdressers' skin allergies	– PPD (paraphenylenediamine), for example in temporary tattooing with black henna, modified vegetable dye – PTD (paratoluylenediamine) – Resorcinol, pyrogallol – Basic Blue 99 – Hydroquinone – Aminophenols – Nickel (metal instruments) (= principal allergen in the female) – Rubber additives (see 3.4) – Alkaline persulphates and ammonium persulphate (APS): bleaches – Acid perms (glyceryl monothioglycolate GMTG, cysteamine hydrochloride)	– Rapid development of products, fashion, novelties	– Localised oedema – Contact urticaria – Asthma, asphyxia – Anaphylactic shock – Death	– Avoidance of direct skin contact – Suitable gauntlet tested gloves – Instruments sheathed or nickel-free

Sector —activity— occupations: examples	Lesions observed (dermatoses)	Agents involved (chemical, physical, biological): examples	Aggravating factors	Complications	Prevention
		– Shampoos: ▪ formaldehyde ▪ Kathon CG with isothiazolinones ▪ quaternary ammoniums ▪ trichlorocarbanolide ▪ phenoxyethanol: Euxyl K400 ▪ cocamidopropylbetain CAPB, amido-amine (surfactants) ▪ alkylglucosides ▪ perfumes: aldehyde, alcohol, terpene ▪ parabens: acid esters ▪ coconut oil, lanoline – Nail varnish (formaldehyde and derivatives) – Resins (epoxides, (meth)acrylates, cyanoacrylates: Loctites TM) – Peru balsam – Latex gloves (Para rubber tree vegetable proteins), particularly powdered – Depilatory waxes with very allergenic modified rosin (brown-pink pine tar)	– Hair straightening	– Ungual dystrophy – Blocking of the fingers – Ungual dystrophy – Conjunctivitis, rhinitis – Quincke's oedema – Anaphylactic shock – Asphyxia – Death	– Avoidance of contact – Avoidance of perfumes – 'Latex free': gauntlet tested gloves in PVC, PVA, Viton – Depilation without rosin wax
5. PLASTIC MATERIALS 5.1. Plastic manufacturers, plastic-processes operators. 5.2. Applicators of glues and adhesives.	1) Airborne dermatitis from glass fibres	– Glass fibres (reinforced, composite plastics)	– Fibres ensimated or covered with allergenic resins – Cutting of glass-fibre lattices	– Allergies to ensimating resins	– Local covering extractors – Ample clothing but well-fitting at the neck, wrists and ankles – Hygiene: shower, emollient and moisturising cream
	2) Contact dermatitis ▪ irritations ▪ caustic dermatitis ▪ abrasion dermatitis ▪ allergic contact eczemas ▪ airborne dermatitis	– Resins ▪ (meth)acrylates ▪ cyanoacrylates (Loctites TM) ▪ epoxides (DGEBA) and hardeners ▪ PUR (MDI, TDI, IPDI) composites (fibreglass) see 2.4. Painters (dyes, pigments, additives, solvents)		– Epidemic allergy to epoxy resins (after limited contact, 50% or more of workers are sensitised) – Blocking of the fingers – Ungual dystrophy	– High molecular weight epoxy resins, polyesters – Suitable tested gauntlet gloves – Facial shield
6. METAL, ELECTRO-MECANICAL ENGINEERING 6.1. Metalworkers, steelworkers, rolling mill operators, smelting workers. 6.2. Solderers, brazers, welders, oxycutters.	1) Physical traumas ▪ hyperkeratoses ▪ haematomas ▪ excoriations ▪ calluses ▪ cuts	Physical agents (repeated action of the hands)	– Antiquated equipment	– Thromboses – Necroses – Infection – Post-traumatic carcinoma	– Suitable tools and protective equipment
	2) Reactions with metal foreign bodies	Nails, filings		– Infection	– Safety instructions – See 4

Sector —activity— occupations: examples	Lesions observed (dermatoses)	Agents involved (chemical, physical, biological): examples	Aggravating factors	Complications	Prevention
6.3. Machinists, (garage) mechanics, coachbuilders. **6.4. Surface treaters, cadmium-platers, chromium-platers, nickel-platers.** **6.5. Electrical-appliance repairers, electricians, electronics workers.** **6.6. Silversmiths, goldsmiths, jewellers.**	3) Traumatic 'tattoos'	Spraying of products (oils etc) under pressure: subcutaneous injection		– Secondary ischaemia, amputation of finger affected	– See 2.4.3
	4) Irritation dermatitis, or even alkali burns	– Motorfuels – Abrasives – Battery electrolytes (sulphuric acid) – Glues with cyanoacrylates – Degreasing agents (TRI, gasoline, bases) – Dewaxing agents – Protection removers (alkalis: pH>12) – Window-cleaning products (ammonia: pH>10) – Cleaning products for bumpers, doorsills, doorways (hydrocarbons) – Cleaning products for aluminium wheel rims: interior ▪ aluminium hydrogen fluoride ▪ sulphuric acid ▪ phosphoric acid ▪ sodium hydroxide	– Use or formation of hydrofluoric acid (HF)	– Leukaemia (benzene of super-grade gasolines used to clean hands) – Death – Blocking of fingers to be given emergency treatment – Erythema multiforme – Burning through to the bone, to be given emergency treatment with calcium gluconate	– Avoidance of all contact – Extraction ventilation – Use of suitable tested gauntlet gloves, specific skin cleaners – Avoidance of all contact – Specific tested gauntlet gloves – Facial shield
	5) Airborne dermatoses from oxides of slag, RCF	– Sharp particles of various metallic oxides, constituting the pulverulent slag added to steel in continuous smelting – Various fibres, particularly RCF, insulating materials replacing asbestos in ovens		Inhalation, resulting in lung disorders (cancers by exposure to RCF?)	– Extraction ventilation – Ample clothing but well-fitting at the neck, wrists and ankles, facial shield, respirator – Hygiene: shower, emollient and moisturising cream
	6) Allergic, contact dermatitis	– Rubbers: additives ▪ mercaptobenzothiazole MBT ▪ carbamates ▪ thiurames ▪ IPPD, CPPD – Motor fuels ▪ dyes (red or blue furfural) ▪ antiseptics – Oils and greases ▪ p-t-butylcatechol ▪ diphenylamine			– Gauntlet tested gloves and protective PVC, PVA, Viton, clothing – Facial shield – Hygiene

Sector —activity— occupations: examples	Lesions observed (dermatoses)	Agents involved (chemical, physical, biological): examples	Aggravating factors	Complications	Prevention
		– Cutting fluids ▪ metal traces ▪ anticorrosives (ethylenediamine, MBT) ▪ biocides (Kathon CG) ▪ dispersants (rosin) ▪ stabilisers (Epoxide) ▪ perfumes ▪ turpentine (Δ-3 carene, Δ-limonene) ▪ Peru balsam – Tin soldering ▪ rosin (fluxing, remover) ▪ hydrazine ▪ aminoethylethanolamine – Anticorrosives and antifreezes ▪ chromium derivatives ▪ mercaptobenzothiazole (MBT) ▪ benzotriazoles – Metals ▪ Cobalt (special metals, rubber, paints) ▪ Nickel (metals, soldering fumes) ▪ Chromium (metals, paints, fumes) – Glues and resins ▪ (cyano)acrylates (Loctites TM) ▪ epoxides and hardeners ▪ PUR, acrylics, polyesters – Diesel cleaners ▪ Chromium (sodium chromates) – External cleaners ▪ Frothing agents (ethylenediamine) ▪ Metallic impurities of detergents (Chromium, Cobalt, Nickel) – Antiseptics or motor-oil preservatives		– Phototoxicity – Blocking of fingers – For epoxydes see 5.2	– Substitution with white spirit
	7) Oil acne or blackheads: follicular elaiokoniosis (acne originating from hair follicles/ sebaceous glands)	Mineral oils	Contamination of oils by chlorinated derivatives	Chloracne (see 7.d)	– Soluble oils (oil-in water emulsion) without allergenic additive – Daily shower – New overalls – Plastic-covered trousers
	8) Skin cancers: malignant epitheliomas	– Lubricating and cutting oils (aromatic amines) – Chromium VI, arsenic, PAH – UV (welding, oxygen cutting)		Death	– Avoidance of Cr VI, As, and PAH – Specific tested PPE – UV protection: welder's helmet, appropriate gloves, closed collars of the shirt/overalls
7. SECTORS INVOLVING CONTACT WITH ANIMALS and PLANTS 7.1. Animal breeders. 7.2. Beekeepers. 7.3. Farmers. 7.4. Butchers, sausage makers.	a) Zoonotic diseases transmitted to man				
	1) Viral infections ▪ Plantar, butcher warts ▪ Contagious ecthyma ▪ Cowpox	Papillomavirus Parapoxvirus Cowpoxvirus			Hygiene

Sector —activity— occupations: examples	Lesions observed (dermatoses)	Agents involved (chemical, physical, biological): examples	Aggravating factors	Complications	Prevention
7.5. Abattoir employees, meat salvagers. 7.6. Fishermen. 7.7. Veterinary surgeons. 7.8. Various other occupations having contact with animals (e.g. dog groomers). 7.9. Miscellaneous occupations having contact with plants: compost producers, dockers, florists, foresters, forestry producers, fruit growers, gardeners, horticulturists, market gardeners, wine producers.	2) Mycotic infections ▪ Ringworm Onychomycosis: mycosis of the nails ▪ Sycosis and suppurating tinea kerion: infection of hair ▪ Interdigital candidiases	Fungi, yeasts Trichophyton Epidermophyton Dermatophytes *Candida* (yeast)			– Hygiene – Complete agent-specific treatment
	3) Microbial infections ▪ (Sub)cutaneous tuberculosis ▪ Cutaneous brucellosis ('veterinary eczema') ▪ Dermatitis from swine erysipelas ▪ Pasteurellosis ▪ Granulomas ▪ Anthrax or malignant oedema of the face ▪ Cat-scratch disease ▪ (Purulent) pyodermatitis *Erythema chronicum migrans*,, Lyme disease	Bovine tubercle bacilli *Brucella* antigen Swine erysipelas bacilli *Pasteurella multocida* *Mycobacterium marinum* *Bacillus anthracis*, Blackleg (anthrax) *Bartonella henselae* Pyrogenic germs *Borrelia burgdoferi* bacteria inoculated through the bite of an infected tick	Contact with runts or genital areas of infected animals – Bites – Exotic drink, swimming pool, aquarium – Animals, hides or animal feed contaminated with spores	– Injuries – Suppuration – Polyarthritis, Neurological and/or cardiac disorders	– Covering clothing, total elimination of the ticks, antibiotics in the case of erythema (red ring)
	4) Parasitosis: mange, scabies or itch	Animal parasites (*Sarcoptes scabei:* mites, acarids, fleas and worms)			– Hygiene, skin protection
	b) Irritation dermatitis, chemical burn or urticaria	– Soaps, detergents, wet work – Disinfectants – Fertilisers, pesticides – Thorns, cereal beards, wood – Calcium oxalate (crystals, raphides or microscopic airborne needles) – Flowers : nettles (histamine, acetylcholine), Western buttercups – Processionary caterpillars from oak, pine (in the spring) – Sea products: jellyfish, coral		– Urticaria with intense pruritis	– Avoidance of contact – Suitable tested gauntlet gloves – Suitable cream – Thick gloves – Well fitted protection – Facial shield
	c) Allergic contact eczemas	– Wood protection pesticides (chromium, cobalt, nickel, mercury), fungicides, acaricides insecticides, herbicides, nematocides			– Biological struggle: coccinella against plant louse

Sector —activity— occupations: examples	Lesions observed (dermatoses)	Agents involved (chemical, physical, biological): examples	Aggravating factors	Complications	Prevention
		– Plants (sesquiterpenic lactones, primin, allicin, tulipalin A, catechol, vanillin) – Weeds (idem) – Oakmoss resin *(Frullania)* – Spices, aromatic plants, condiments – Flowers: arnica, camomile, primroses, chrysanthemums, daisies – Insect bites/stings (hymenoptera)	– Anaphylactic shock – Asphyxia – Death		– Use of tested pesticides without allergens – Specific tested PPE, avoidance of contact – Labelling – designated storage space
		– Pine tar – Turpentine (Δ-3 carene, Δ-limonene) – Pink-brown rosin (pine tar) – Nickel of metallic mesh gloves			– Substitution with white spirit – Non-allergenic glue – Mesh gloves without nickel (aluminium, stainless steel with Kevlar)
		– Synthetic and natural rubber of gloves or boots: ▪ mercaptobenzothiazole MBT ▪ carbamates ▪ thiurames ▪ IPPD, CPPD – Antiseptics: see 3.3) – Vermifuges (piperazine) – Preservatives (chromium, kathon CG, bronopol) – Antioxidants – Antibiotics and sulphonamides (veterinary medicines, feed additives for animals) – Anaesthetics ▪ general: propanidid (Epontol) ▪ local: procaine – Agricultural fuel dye (Sudan IV)			– Tested PVC, PVA, Viton gauntlet gloves – Facial shield
	d) Acne, among other forms - chlorine acne or chloracne	– Aromatic (phenolic) chlorinated pesticides – Methyl bromide – Steroid hormones		– Liver disorders	– See b) and c)
	e) Phototoxic reaction	– Parsley family : celery, fennel, dill (psoralens), glyphosate, sesquiterpenic lactones	Work in the sun		– Gauntlet tested gloves – Sun screen
	f) Skin cancers	– Arsenic or chromium-based insecticides, – Solar UV			– Tested insecticides without Arsenic, Chromium VI – Clothing, glasses, sun screen (cream)

2

GLOSSARY of terms used in the appendix 1

Term	
a	
angio-oedema	An acute or recurring attack of transient oedema suddenly appearing in areas of the skin or mucous membranes, often associated with, urticaria, erythema, and purpura
anthrax	An infectious bacterial zoonotic disease usually acquired by humans by contact with infected animals or their discharges (agricultural anthrax) or with contaminated animal products (industrial anthrax). Anthrax is classified by primary routes of inoculation as: cutaneous, gastrointestinal and inhalational
b	
bacillus anthracis	A species of bacteria that causes anthrax in humans and animals
barcoptes scabei	Mite causing scabies
bartonella henselae	A species of gram-negative bacteria that is the aetiologic agent of bacillary angiomatosis, can also be a cause of cat scratch disease in immunocompetent patients
blackleg	A disease among calves and sheep, characterised by a settling of gelatinous matter in the legs, and sometimes in the neck
borrelia burgdorferi	The causative agent of Lyme disease
bovine tubercle bacilli	Mycobacterium bovis - a variety of bacteria causing tuberculosis in cattle
brucella	A genus of gram-negative, aerobic bacteria that causes brucellosis
c	
candida	A genus of fungus
contagious ecthyma	A specific disease of sheep and goats, caused by the orf virus. This virus is transmissible to man and characterised by vesiculation and ulceration of the infected site
cowpox	A mild, eruptive skin disease of milk cows caused by cowpox virus, with lesions occurring principally on the udder and teats. Human infection may occur while milking an infected animal
cowpoxvirus	A species of orthopoxvirus that is the aetiologic agent of cowpox
cutaneous brucellosis	Infection caused by bacteria of the genus Brucella. Human infection results from occupational exposure to infected animals or by ingestion of infected milk, milk products or animal tissue
d	
dermatophytes	A fungus parasitic upon the skin
e	
eczematiform dermatitis	Inflammation of the skin resembling eczema in appearance
elaiokoniosis	Oil acne
epidermophyton	A fungal genus which grows in the epidermis and is the cause of tinea - ringworm
erythema chronicum migrans	The classic initial rash of Lyme disease, resulting from a tick bite: the local skin develops an expanding ring of unraised redness. There may be an outer ring of brighter redness and a central area of clearing
f	
g	
granuloma	Chronic inflammatory lesion characterised by large numbers of cells of various types (macrophages, lymphocytes, fibroblasts, giant cells), some degrading and some repairing the tissues

Term	
h	
housewives' dermatitis	Skin inflammation commonly related to housekeeping work
hypothenar hammer syndrome	Condition of the hand in which the blood flow to the fingers is reduced. Hypothenar refers to the group of muscles that control the movement of the little finger
i	
impetigo	A contagious pyoderma caused by direct inoculation of group A streptococci or Staphylococcus aureus into superficial cutaneous abrasions or compromised skin
interdigital candidiases	Usually a superficial infection of the moist cutaneous areas of the body and is generally caused by Candida albicans, involving the skin between fingers or toes
intertrigo	A superficial dermatitis occurring on apposed skin surfaces, such as the axillae, creases of the neck, groin, between the toes, with obesity being a predisposing factor, caused by moisture, friction, warmth and sweat retention and characterised by erythema, maceration, burning, itching and sometimes erosions, fissures and exudations and secondary infections
j	
k	
l	
lyme disease	A bacterial disease caused by the micro-organism (spirochete) Borrelia burgdorferi. This bacterium was discovered in 1982, although the clinical disease was first described in 1977. Infection occurs after the bite of an infected tick. The incubation period is approximately 14 days
m	
malignant oedema	An acute toxaemia caused by the bacterium Clostridium septicum and characterised by edematous swellings around the entry wound, anorexia, high fever, and death
mange	The scab or itch in cattle or dogs
mycobacterium marinum	A moderate-growing, photochromogenic species found in aquariums, diseased fish, and swimming pools. It is the cause of cutaneous lesions and granulomas (swimming pool granuloma) in humans
mycosis	Any disease caused by a fungus
mycotic grafts	Spread of the disease caused by fungus to areas previously free from infection
n	
necrotic ulceration	The formation or development of an ulcer with morphological changes indicative of necrosis - cell death
neoplastic lesions	Pertaining to or like a neoplasm (new and abnormal growth of tissue, which may be benign or cancerous) with new and abnormal growth, pertaining to neoplasia with the formation of a neoplasm
o	
oedema	The presence of abnormally large amounts of fluid in the intercellular tissue spaces of the body, usually applied to demonstrable accumulation of excessive fluid in the subcutaneous tissues
p	
palmoplantar dyshidrosis	A vesicular or vesicopustular eruption of multiple causes that occurs primarily on the volar surfaces of the hands and feet; the lesions spread peripherally but have a tendency to central clearing. Affecting palms of hands and soles of feet

Term	
papillomavirus	A genus of viruses (family Papovaviridae) containing DNA and including the papilloma and warts viruses of man and other animals, some of which are associated with inductions of carcinoma
parapoxvirus	A genus of the family poxviridae, which infect ungulates and may infect humans
parasitosis	Infestation or infection with parasites
pasteurella multocida	A species of gram-negative bacteria, normally found in the flora of the mouth and respiratory tract of animals and birds. In humans, disease usually arises from a wound infection following a bite or scratch from domesticated animals
pasteurellosis	Infection with bacteria of the genus Pasteurella
pitch keratosis	A skin lesion that is abnormally sensitive to the effects of ultraviolet light
polyarthritis	An inflammation of several joints together
purulent	Consisting of or containing pus, associated with the formation of or caused by pus
pyodermatitis	Any purulent (consisting of or containing pus) skin disease
pyrogenic	Fever inducing
q	
r	
ringworm onychomycosis	A fungal infection that involves the fingernails. Nails generally split, flake and grow too thick., caused by a fungal skin infection sometimes referred to as ringworm
s	
scabies	A contagious dermatitis of humans and various wild and domestic animals caused by the itch mite, characterised by a papular eruption over tiny, raised sinuous burrows (cuniculi) produced by digging into the upper layer of the epidermis by the egg laying female mite
secondary ischemia	A low oxygen state usually due to obstruction of the arterial blood supply or inadequate blood flow leading to hypoxia in the tissue
suppuration	The formation of pus, the act of becoming converted into and discharging pus
suppurating tinea kerion	Forming pus inflammatory fungal infection of the scalp and beard, marked by pustules and a boggy infiltration of the surrounding parts
swine erysipelas	An acute and chronic contagious disease of young pigs caused by erysipelothrix insidiosa
sycosis	A pustular eruption upon the scalp, or the beared part of the face, whether due to ringworm, acne, or impetigo
systemic scleroderma	Hardening of skin
t	
traumatic tattooing	Imbedding in the superficial layer of the skin of pigments, small particles of foreign substances, as a result of an accident, usually involving high pressure
trichophyton	A fungal genus of the class hyphomycetes. Various species attack the skin, nails, and hair
trophic disorders	Abnormalities of the skin, hair, nails, subcutaneous tissues and bone, caused by peripheral nerve lesions
u	
ungual dystrophy	A disorder arising from defective or faulty nutrition, especially the muscular dystrophies, relating to a nail or the nails
w	

Term
y
z
x

Source of the definitions: Online Medical Dictionary. http://cancerweb.ncl.ac.uk/omd/

APPENDIX 2.

POLICY AND PRACTICE OVERVIEW ON SKIN DISEASES AND DERMAL EXPOSURE IN THE EUROPEAN UNION

As a part of the project, a template has been developed to collect the information in relation to national policies and practices that are relevant to occupational dermal exposure and skin diseases. The members of the project team (names provided in the main report) have contacted national Focal Points, relevant ministries and research institutes in all Member States, asking for the questionnaire to be filled out. The national reports have been supplemented with the information available on the Internet.

The information obtained from these sources has been collated by the authors of the report. In the process of consultation, the information has been validated by the Focal Points — all relevant comments have been included in this Appendix.

Statistical information has been provided in the original questionnaires, however some data collected for the parallel project 'OSH in figures' have also been included.

TABLE OF CONTENTS OF APPENDIX 2

1. Collected data regarding Austria

1. Legislation (international, EU, national-regional-local, governmental written policy/charter)

Regulations concerning occupational skin diseases are based on the Health and Safety at Work Act (ArbeitnehmerInnenschutzgesetz) which is the national transposition of the European Council Directive 89/391/EEC. It contains a section on dangerous substances (paragraphs 40 to 48) and personal protective equipment (paragraphs 69 and 70). More detailed are the Regulation on occupational exposure limit values (Grenzwerteverordnung — 2006) and the Regulation on biological agents (Verordnung biologische Arbeitsstoffe).

The Regulation on occupational exposure limit values lists approximately 800 substances, displaying occupational exposure limit values and providing information whether a substance is carcinogenic, sensitising for the skin, photosensitising or skin resorptive.

The regulation on biological agents is the national transposition of the European Council Directive 90/679/EEC on the protection of workers from risks related to exposure to biological agents at work.

The main legislation in Austria applicable to occupational diseases is the General Social Security Law ('Allgemeines Sozialversicherungsgesetz' — ASVG), introduced in 1956. The following parts in this law are relevant for occupational diseases.

- Annex 1 ('Anlage 1') contains the list for occupational diseases, including skin diseases numbers 17 and 19. Compensation will be paid after confirmation.
- § 177 says that an occupational disease can only be confirmed if the referring employee had to quit his/her work because of the causative factor.
- § 363 says that, in the case of a suspected occupational disease, the doctor must report the case to the referring accident insurer.

2. Collective practices (guidelines, recommendations, actions/initiatives/programmes/solutions, agreements between social partners, and sectors)

Austrian Social Insurance for Occupational Risks ('Allgemeine Unfallversicherungsanstalt' — AUVA) is in charge of collecting and reporting cases, expert opinions, compensation, exposure assessment and statistics.

Each suspected case of occupational disease must be reported by an Austrian doctor to the AUVA: in practice this does not often happen; usually patients are sent to a dermatologist for clarification.

3. Main risks (chemical, biological, physical) and related sectors, activities and jobs

The main risks are listed in the AUVA report 'Hautschutz' (skin protection); it includes risks known from the literature, such as solvents, humidity, extreme ph-values, radiation, mechanical components and any combination of these risks [1].

4. Levels of recognition of occupational skin diseases and dermal exposure

Skin diseases are officially recognised as occupational diseases. In 2005, 224 cases of occupational skin diseases were confirmed, out of a total of 1 249 occupational diseases (17.9 %).

The referring data were higher in previous years: in 2002, 374 cases of occupational skin diseases were confirmed among a total of 1 402 occupational diseases (26.7 %). It can be concluded that the proportion of occupational skin diseases decreased dramatically from 26.7 % in 2002 to 17.9 % in 2005.

Sources: AUVA. *Auszug aus der Statistik* 2005 [3], AUVA. *Auszug aus der Statistik* 2002 [4].

Skin diseases are included in the Austrian list of occupational diseases [5]:

No 17: Skin cancer or changes of the skin with potential cancer caused by soot, raw paraffin, dark oils, tar, anthracene, pitch, mineral oil, bitumen and similar substances ('*Hautkrebs oder zur Krebsbildung neigende Hautveränderungen durch Ruß, Rohparaffin, Dunkelöle, Teer, Anthrazen, Pech, Mineralöle, Erdpech und ähnliche Stoffe*').

No 19: Skin diseases — this section applies to occupational diseases, if they force the employee to quit their job. This qualification is not necessary if the skin disease is a manifestation of general disease caused by one or more substances out of the listed substances harmful for humans ('*Hauterkrankungen*. (*Hauterkrankungen gelten nur dann als Berufskrankheiten, wenn und solange sie zur Aufgabe schädigender Tätigkeiten zwingen. Die Bedingung der Aufgabe schädigender Tätigkeiten ist nicht erforderlich, wenn die Hautkrankheit eine Erscheinungsform einer Allgemeinerkrankung ist, die durch Aufnahme einer oder mehrerer der in der Liste angeführten schädigenden Stoffe in den Körper verursacht wurde*')).

The reporting of skin disease is standardised using different forms for companies, doctors, employees but it is assumed that many cases are unreported [6]. The form relating to chemicals inducing skin cancer can be found in attachment AUVA_Hautkrebs_0295.pdf ('*Hautkrebs verursachende Stoffe*').

5. Methods

5.1 Methods of preventing (eliminating/minimising/controlling) the risk of dermal exposure

Risk assessment and prevention measures follow a points system that combine the risk level for the workplace (1–110 points) and the risk level for the hazardous substance (0->32). This risk matrix defines five risk classes, along with the relevant measures for protection and prevention. For more details see AUVA Evaluierungsheft E 4 [7].

Recommendations for standard prevention measures are given in the AUVA-report Hautschutz [1] and in the booklet 'Protective gloves' ('*Schutzhandschuhe*') [2].

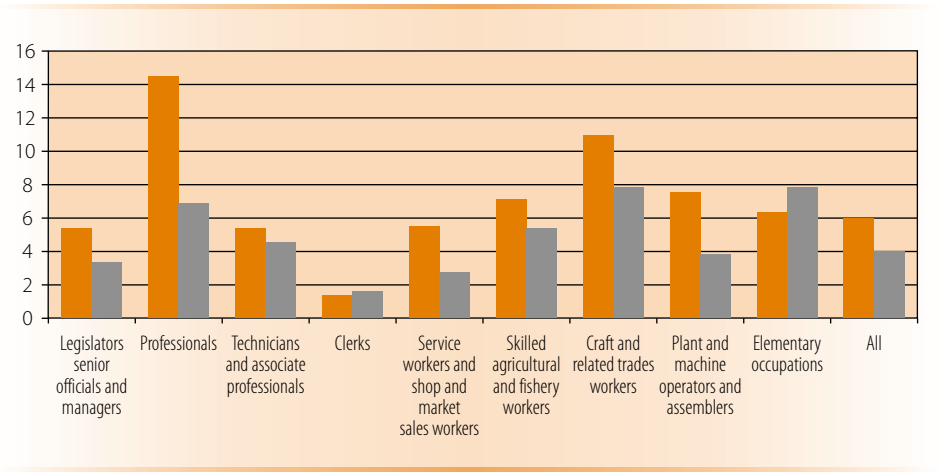
Doctors recommend or initiate preventive measures; these are implemented within the framework of the recognition procedure in cooperation with local experts, under the supervision of the AUVA. Prevention measures follow a ranking system: first substitution, then technical measures, organisation of workflow and personal protective measures.

The AUVA took part in the EU project Riskofderm — 'Risk assessment for occupational dermal exposure to chemicals', coordinated by TNO (Netherlands). In this project an

international group of experts representing 15 institutions from 10 countries collected information and monitoring data in relation to dermal exposure. They developed a validated predictive dermal exposure model and a practical dermal exposure risk management toolkit for use in the workplace. Different reports, called Deliverables [8] [9] [10] and papers were published [11] [12] [13] [14].

The toolkit was tested by different groups. Its questions appeared diffult to understand so recommendations were made to make the toolkit more user-friendly.

Figure 1: Effect on health: skin problems by occupation, percentage of affected workers, European Survey of Working Conditions, 1995/2000



6. Are skin problems considered a high priority risk?

Occupational skin diseases are considered a high priority risk because they are the second most common form of occupational disease in Austria. Although the incidence has fallen as a result of prevention strategies, there is still room for further improvement and branch-specific campaigns are planned to address this.

7. Perspectives and challenges for the future

Prevention measures planned for the near future will focus on contacting high risk groups to deliver to them information packages; for example, hairdressers and masons were contacted in 2006 and cleaning and care and nursing staff are being contacted in 2007. The campaigns for hairdressers ('*Hautnah an der Schönheit*' — 'The beauty of your skin: your business card') and for masons ('Your body is your capital') were presented in appropriate settings like vocational schools, guilds, fairs, building yards, firms and small enterprises.

8. Other main references

[1] AUVA, Report No. 43, *Hautschutz, Prävention berufbedingter Hauterkrankungen* http://www.auva.at/mediaDB/103303.PDF

[2] AUVA M705, *Schutzhandschuhe, Sicherheit kompakt*, 2005. http://www.auva.at/mediaDB/111370.PDF

[3] AUVA, *Auszug aus der Statistik*, 2005. http://www.auva.at/mediaDB/111401.PDF

[4] AUVA, *Auszug aus der Statistik, 2002*. http://www.auva.at/mediaDB/49153.PDF

[5] Skin diseases recognised in Austria can be found at http://www.auva.at/mediaDB/48479.PDF

[6] http://www.auva.at/esvapps/page/page.jsp?p_pageid=120&p_menuid=58954&p_id=3

[7] *Evaluierungsheft E 4, Gefahren ermitteln und beseitigen: Chemische Arbeitsstoffe, Sicherheitsinformation der Allgemeinen Unfallversicherungsanstalt* — AUVA http://www.auva.at/mediaDB/118581.PDF

[8] Riskofderm Deliverable 47, *Results of an expert review, revision and validation of workplace exposure for a dermal risk assessment and management toolkit*, 2003.

[9] Riskofderm Deliverable 48, *Toolkit for dermal risk assessment and management', Final paper version of toolkit*, 2003.

[10] Riskofderm Deliverable 49, *Instruction manual for computer version of toolkit for dermal risk assessment and management*, 2003.

[11] Rajan-Sithamparanadarajah, R., Roff, M., Delgado, P., et al, 'Patterns of dermal exposure to hazardous substances in European Union workplaces', *Annals of occupational hygiene*, Vol. 48, No 3, 2004, pp. 285–297.

[12] Roff, M., Bagon, D. A., Chambers, H., Dilworth, E. M., Warren, N., 'Dermal exposure to dry powder spray paints using PXRF and the method of Dirichlet tessellations', *Annals of occupational hygiene*, Vol. 48, No 3, 2004, pp. 257–265.

[13] Hughson, G. W., Aitken, R. J., 'Determination of dermal exposures during mixing, spraying and wiping activities', *Annals of occupational hygiene*, Vol. 48, No 3, 2004, pp. 245–255

[14] Oppl, R., Kalberlah, F., Evans, P. G., Van-Hemmen, J. J., 'Toolkit for dermal risk assessment and management: an overview', *Annals of occupational hygiene*, Vol. 47, No 8, 2003, pp. 629–640.

2. Collected data regarding Belgium

1. Legislation (international, EU, national-regional-local, governmental written policy/charter)

- CIM-10 International Statistic classification of diseases — 10th revision — OMS
- European directives and recommendations: are all transposed into Belgian legislation
- http://www.fmp.fgov.be: Législation/lists (Belgian, European and OMS); (De Craecker: Dossier No 5, Annexes I et II, 2004); (De Craecker: PreventActua, 2004–06).

2. Collective practices (guidelines, recommendations, actions/initiatives/programmes/solutions, agreements between social partners, and sectors)

- http://www.detic.be: new European regulation in relation to detergents, cosmetics: allergens (brochures, information sheets)
- http://www.ivp-coatings.be: new European regulation applicable to paint, varnishes, ink (idem DETIC)
- http://www.fmp.fgov.be: Reports

3. Main risks (chemical, biological, physical) and related sectors, activities and jobs

- See the table in Appendix 1 for selected sectors and professions, and possible forms of dermal protection.
- All sectors and professions consult with each other regularly and are important in Belgium (De Craecker, *Dossier* Nº 5, 'Agents cancérogènes', and *Dossier* Nº 9, 'Agents chimiques', 2004).

4. Levels of recognition of occupational skin diseases and dermal exposure

- http://www.fmp.fgov.be: Annual reports 2005
- Synthesis: de Craecker, *Statistiques accidents du travail et maladies professionnelles* 2004–05', éd. Prevent, 2006
- 'Maladies professionnelles: les tendances 2005 en Belgique (Dermatoses: 4e dans le Top 10)', *PreventActua*, 2006

5. Methods of preventing (eliminating/minimising/controlling) the risk of dermal exposure

- Introduction/General issues/forms: http://www.fmp.fgov.be

- Medical information and Chapter 5 can be found at: http://www.fmp.fgov.be
- Guide to European standard battery cutaneous tests
- Cf. Chapter 5: all these methods are applied in Belgium
- Cf. Chapter 6 and the table in Appendix 1: idem; De Craecker, 'Recherche de produits de substitution (Méthodologie générale)', *Travail & Bien-Être*, March 1998 http://www.gerda-assoc.com

Table 1: Number of accepted cases skin problems in the closed system, 1990–04, Occupational Diseases Fund

Occupation	Number	% of total skin problems
Legislators, senior officials and managers	2	0.05
Professionals	581	14.64
Technicians and associate professionals	153	3.86
Clerks	82	2.07
Service workers, shop — market sales workers	867	21.85
Skilled agricultural and fishery workers	18	0.45
Craft and related trade workers	811	20.44
Plant and machine operators and assemblers	292	7.36
Elementary occupations	1,136	28.63
Unknown	26	0.66
Total	3,968	100

6. Are skin problems a high priority?

Cf. Chapter 1 and http://www.fmp.fgov.be → 'Généralités'

7. Main results

Reduction in classic recognised skin diseases since 1998 (because of prevention, modernisation and politics of FMP).

8. Perspectives and challenges for the future

Increase of allergies and cutaneous cancer have been observed, although their true occurrence is underestimated. Recommended solution: a practical overview for critical professions (as per table in Appendix 1).

9. References

http://www.fmp.fgov.be → Links, http://www.prevent.be

Collected data regarding Cyprus 3.

1. Legislation (international, EU, national-regional-local, governmental written policy/charter)

1.1. Skin diseases

Regional

Accidents and Occupational Diseases (Notification) Law of 1953

Dermal exposure
European

- Council Directive 89/656/EEC of 30 November 1989 on the minimum health and safety requirements for the use by workers of personal protective equipment at the workplace.
- Directive 2004/37/EC of the European Parliament and of the Council of 29 April 2004 on the protection of workers from the risks related to exposure to carcinogens or mutagens at work.
- Directive 2000/54/EC of the European Parliament and of the Council of 18 September 2000 on the protection of workers from risks related to exposure to biological agents at work.
- Commission Directive 91/322/EEC of 29 May 1991 on establishing indicative limit values by implementing Council Directive 80/1107/EEC on the protection of workers from the risks related to exposure to chemical, physical and biological agents at work.
- Council Directive 98/24/EC of 7 April 1998 on the protection of the health and safety of workers from the risks related to chemical agents at work.
- Council Directive 67/548/EEC of 27 June 1967 on the approximation of laws, regulations and administrative provisions relating to the classification, packaging and labelling of dangerous substances and amendments.
- Council Directive 76/769/EEC of 27 July 1976 on the approximation of the laws, regulations and administrative provisions of the Member States relating to restrictions on the marketing and use of certain dangerous substances and preparations.
- Directive 1999/45/EC of the European Parliament and of the Council of 31 May 1999 concerning the approximation of the laws, regulations and administrative provisions of the Member States relating to the classification, packaging and labelling of dangerous preparations and amendments.
- The Safety and Health at Work (Biological agents) Regulations of 2001 (P.I. 144/2001).
- The Safety and Health at Work (Carcinogenic and mutagenic agents) Regulations (Amendment) of 2004 (P.I. 493/2004).
- The Safety and Health at Work (Chemical agents) Regulations of 2001 (P.I. 268/2001).
- The Minimum Requirements for Safety and Health (Use of personal protective equipment at work) Regulations of 2001 (P.I. 470/2001).

- The Dangerous Substances (Classification, packaging and labelling of dangerous substances and preparations) Regulations of 2002 (P.I. 292/2002), (P.I. 536/2004), (P.I. 301/2005).

2. Collective practices (guidelines, recommendations, actions/initiatives/ programmes/solutions, agreements between social partners, and sectors)

1. Control of dangerous chemical substances (in Greek) http://www.mlsi.gov.cy/dli
2. Health and safety guide for chemical laboratories (in Greek) http://www.mlsi.gov.cy/dli
3. Chemical substances in the working environment. Health hazards and measures for protection (in Greek) http://www.mlsi.gov.cy/dli
4. Personal protective equipment (in Greek) http://www.mlsi.gov.cy/dli
5. European Foundation survey on working and living conditions in candidate countries http://www.eurofound.europa.eu/publications/htmlfiles/ef0306.htm

4. Collected data regarding the Czech Republic

1. Legislation (international, EU, national-regional-local, governmental written policy/charter)

1.1. Skin diseases

General information

Czech Labour Code Section 133c (6): the employer shall keep records of all employees suffering from an occupational disease that originated at the employer's workplaces and shall ensure that working conditions that give rise to the danger of occupational diseases or have caused an occupational disease are limited.

Source: http://cz.osha.europa.eu/legislation/files/labour_code.pdf (Czech Labour Code.pdf)

The main legislative Acts concerning occupational diseases and occupational skin diseases in particular are the Government Order No 290/1995 Coll. — which established the list of occupational diseases — and the Decree No 342/1997 Coll. as amended by Decree 38/2005 Coll., which outlines the procedures for recognising occupational diseases and lists the departments for occupational diseases that are authorised to recognise these diseases.

The other important legislative Acts are Government Order of the No 178/2001 Coll. — which outlines the conditions of the protection of the health of workers at work, as amended — and Decree No 432/2003 Coll. of the Ministry of Health of the Czech Republic, which sets out the way in which categories of work are classified, the limit values of indicators of biological exposure tests, the conditions for taking biological samples for biological exposure tests and the requirements for notification for work with asbestos and biological agents.

Source: Ministry of health of the Czech Republic, Department of Public Health Protection (e-mail)

1.2. Labour legislation

A list of all important laws and regulations and their amended versions is published at www.mpsv.cz in the 'práce a platy' (employment and wages) section.

Source: http://www.mpsv.cz/en/1609

All Member States' homepages available through the Agency for Safety and Health at Work portal have sections dedicated to legislation. Some of these give direct access to national legislation texts in the area of health and safety at work. However, these are generally only available in the national language.

Source: http://cz.osha.europa.eu

Source: Ministry of Health of the Czech Republic, Department of Public Health Protection (e-mail)

2. Collective practices (guidelines, recommendations, actions/initiatives/programmes/solutions, agreements between social partners, and sectors)

Mission, major tasks and other tasks of the National Institute of Public Health

- Process data on population health relevant to prevention of the emergence and spread of infectious diseases, occupational health risks and other occupational health damage, human exposure to occupational and environmental pollutants and the epidemiology of drug addiction, with the aim of obtaining background information for national policymaking and the monitoring of long-term trends in the incidence of infectious and other diseases of high prevalence
- Participate in law-making and harmonisation with EU legislation

Source: http://www.szu.cz/English/niph1/statutes.htm

3. Main risks (chemical, biological, physical) and related sectors, activities and jobs

Common contact sensitisers in the Czech Republic: patch test results in 12 058 patients with suspected contact dermatitis [2]

Background: over a period of five years (1997–2001), 12 058 patients (7 642 female and 4 416 male) had skin patch tests.

Results: occupational contact dermatitis was diagnosed in 2 335 patients (19.4 %); most of these were construction workers and metal workers (55.2 %) who showed relevant sensitisation to metals and thiuram mix. Hospital workers (18.6 %) and hairdressers followed next: hospital workers were most frequently sensitised to thiuram mix present in rubber gloves.

4. Levels of recognition of occupational skin diseases and dermal exposure

Data on occupational diseases

Only specialised centres of occupational diseases, authorised by the Ministry of Health, are entitled to recognise diseases that appear in the List of Occupational Diseases and meet the prescribed medical and exposure criteria. The centres are legally obliged to report all cases of occupational diseases to the National Registry of Occupational Diseases, which is a part of the National Health Information System. The Registry was founded in 1991 and is run at the Centre for Occupational Health of the National Institute of Public Health in Prague. Its operation is based on Act No 156/2004 Dig., which established 13 national health registries, and on the Decree of the Ministry of Health No 552/2004 Dig., which regulates the collection of data into the National Health Information System. Approximately 20 pieces of information for each case of an occupational disease are stored in the registry. Currently, it contains data on approximately 40 000 cases of occupational diseases.

Occupational skin diseases are included in Chapter IV of the list of occupational diseases and are further divided into 20 categories according to ethiology. Between 1991 and

2006, approximately 7 400 cases of occupational skin diseases were reported in the Registry.

The Registry is not freely accesible online; however, detailed aggregated data are published annually both on the Internet and in scienfitic journals.

Source: http://www.szu.cz/chpnp/pages_en/NZP/NZP_en.htm

'Occupational diseases in the Czech Republic' List

Statistics concerning occupational skin diseases caused by physical, chemical or biological factors, have been collected from 1991–2006. In 2004, the main occupational skin diseases were:

1. skin diseases caused by plastics (62 cases),
2. skin diseases caused by mineral products (43 cases),
3. skin diseases caused by rubber or rubber industry chemicals (42 cases),
4. skin diseases caused by other organic chemicals (27 cases),
5. skin diseases caused by chromium or its compound (21 cases),
6. skin diseases caused by cleansing products (16 cases).

The full list of occupational skin diseases caused by physical, chemical or biological factors is available from: http://www.szu.cz/chpnp/pages_en/NZP/NZP_en.htm

5. Methods of preventing (eliminating/minimising/controlling) the risk of dermal exposure

Table 2: Occupational skin diseases in the Czech Republic from 1996–2005, Czech National Registry of Occupational Diseases

Year	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	Total
Total skin diseases	490	452	360	417	363	400	346	323	272	249	3,672
Total occupational diseases	2,543	2,376	2,111	1,886	1,751	1,677	1,600	1,558	1,387	1,400	18,289
Proportion of skin diseases)	19.30%	19.00%	17.10%	22.10%	20.70%	23.90%	21.60%	20.70%	19.60%	17.80%	20.10%

Table 3: Occupational skin diseases in the Czech Republic from 1996–2005 by sectors of economic activity and gender, Czech National Registry of Occupational Diseases

NACE	Gender	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	Total
A-B	Females	30	17	15	25	12	10	10	8	11	8	146
	Males	6	6	1	6	2		3	1	2		27
	Total	36	23	16	31	14	10	13	9	13	8	173
C-D	Females	150	142	127	129	112	129	115	103	84	97	1,188
	Males	149	158	121	152	137	164	137	139	100	96	1,353
	Total	299	300	248	281	249	293	252	242	184	193	2,541
E	Females					1				1		2
	Males	3	1	2		1	1	1	1	1		11
	Total	3	1	2		2	1	1	1	2		13

NACE	Gender	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	Total
F	Females		4		1					2		7
	Males	23	19	13	23	23	17	15	11	8	10	162
	Total	23	23	13	24	23	17	15	11	10	10	169
G	Females	1	6	2	6	4	2		3	1	1	26
	Males	5	1		5	2	1	1		3	2	20
	Total	6	7	2	11	6	3	1	3	4	3	46
H	Females	2	4		2	2	1		1	2	1	15
	Males	2					1	1			1	5
	Total	4	4		2	2	2	1	1	2	2	20
I	Females	2	2	1	1		1	1	1	1		10
	Males	5	5	3	5	2	2	3	3		2	30
	Total	7	7	4	6	2	3	4	4	1	2	40
K	Females	6	1	1			3	2	2	1	2	18
	Males	3			1	1				2	1	8
	Total	9	1	1	1	1	3	2	2	3	3	26
L	Females	1	8	1	1	1	1	1				14
	Males	11	3	2	1	3	8	1	1	1		31
	Total	12	11	3	2	4	9	2	1	1		45
M-N	Females	77	59	49	40	44	48	45	39	43	20	464
	Males	4	6	6	1	3	4	1	1	2	2	30
	Total	81	65	55	41	47	52	46	40	45	22	494
O	Females	8	7	16	14	13	4	8	6	3	6	85
	Males	2	3		4		3	1	3	4		20
	Total	10	10	16	18	13	7	9	9	7	6	105
Total		**490**	**452**	**360**	**417**	**363**	**400**	**346**	**323**	**272**	**249**	**3,672**

A–B: agriculture, hunting, forestry and fishing
C–D: mining and manufacturing
E: electricity, gas and water
F: construction
G: wholesale and retail, repairs
H: hotels and restaurants
I: transport and communication
J: financial intermediation
K: real estate, business activity
L: public administration and defence
M–N: education and health
O: other services

Article (case study)

A case of contact hypersensitivity to platinum salts [1].

6. References

[1] Dastychová E., Semrádovà V., 'A case of contact hypersensitivity to platinum salts', *Contact dermatitis*, No 43, 2000, p. 226.

[2] Machovcova A., Dastychova E., Kostalova D., Vojtechovska A., Reslova J., Smejkalova D., Vaneckova J., Vocilkova A., 'Common contact sentisisers in the Czech Republic: Patch test results in 12 058 patients with suspected contact dermatitis', *Contact dermatitis*, No 53, 2005, pp. 162–166.

[3] 'Occupational diseases in the Czech Republic' List: http://www.szu.cz/chpnp/pages_en/NZP/NZP_en.htm

5. Collected data regarding Denmark

1. Legislation (international, EU, national-regional-local, governmental written policy/charter)

The Working Environment Act

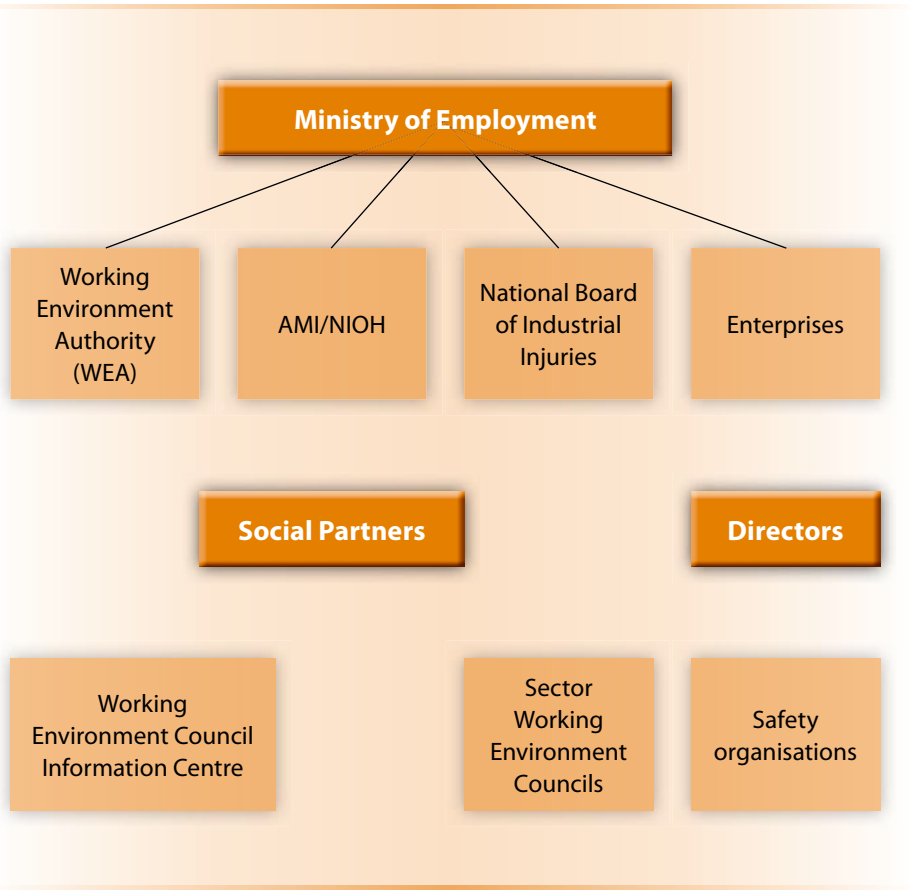
National Board of Industrial Injuries (Arbejdsskadestyrelsen)

Administrative Order No 850 of 12 September 2005, on the list of occupational diseases reported on or after 1 January 2005.

National Board of Industrial Injuries (Arbejdsskadestyrelsen)
Act on protection against the consequences of industrial injuries

Compilation of the 'Act on protection against the consequences of industrial injuries', cf. Consolidated Act No 943 of October 16, 2000, with amendments resulting from Section 4 of Act No 1329 of December 20, 2000, Section 1 of Act No 488 of June 7, 2001, Section 4 of Act No 503 of June 7, 2001, and Section 14 of Act No 428 of 6 June 2002. The text takes effect only on 1 July 2002, in respect of Section 33 and Section 42(1).

Figure 2: Infrastructure of occupational health and safety research, service, information, and training in Denmark



1.1. Occupational health services (OHS)

Clinics of occupational medicine

In 2003 the Government presented its proposal for a new working environment reform: 'A good working environment for employees and enterprises'. A new Working Environment Act was enacted on 1 January 2005. The reform implies major changes to improve the working environment. All enterprises are to be screened by the Working Environment Authority during the next seven years. The new act focuses on the efforts at the work-floor of individual enterprises and introduces working environment 'smileys'. The reform also implies that the existing OHS obligation (in which all enterprises of specific types must have access to an Occupational Health Service) has become redundant and that all enterprises not in control of their working environment must use authorised advisors. The existing OHS centres can apply for authorisation to become such advisor.

Source: International Evaluation of the National Institute of Occupational Health, Denmark (AMI), Self-evaluation report, General part, March, 2005.

2. Levels of recognition of occupational skin diseases and dermal exposure

Table 4: List of occupational diseases after 1 January 2005

Item	Disease	Exposure
Group A: Head		
A.1.	Noise-induced loss of hearing *(DLA professionalis)*	Severe noise for several years
A.2.	Cataract	Radiant energy
A.3.1.	Sugar and flour caries, in particular at the facial (front) surface of the teeth	At least five years of teeth exposure in the sugar and flour industry within a total period of seven years
A.3.2.	Third or fourth degree attrition of several permanent teeth at the masticating surface of the teeth and/or the incisal edge of the front teeth (abrasion)	Not less than five years of tooth exposure in production work with abrasives in the air within a period of seven years
	Other diseases of head and brain: *Groups I, J and K*	
Group B: Back and neck/shoulder		
B.1.	Chronic low-back disease with pain *(lumbago/sciatica, lumbar prolapsed disc, degenerative low-back disease)*	(a) Back-loading lifting work involving lifting/upward pulling of heavy objects and many tonnes of lifting per day for a considerable number of years (b) Back-loading lifting work with generally occurring, extremely heavy and awkward single lifts and several tonnes of lifting per day for a considerable number of years (c) Back-loading care work with many daily handlings of adults or older handicapped children for a considerable number of years

Item	Disease	Exposure
		(d) Back-loading, daily exposure to whole-body vibrations from heavily vibrating vehicles for a considerable number of years
B.2.	Chronic neck and shoulder pain *(cervicobrachial syndrome)*	Quick and monotonously repeated precision work with static load on the neck/shoulder region for a considerable number of years
Group C: Arm and shoulder		
C.1.	*Tendovaginitis* (inflamation of the synovial sheath) and inflamantory degeneration of tendon or tissue surrounding the tendon *(tendinitis and peritendinitis)*	Strenuous and repetitive work movements in combination with the assessment of the working posture of the hand in connection with the load
C.2.	Carpal tunnel syndrome	(a) Work with heavily vibrating handtools for a considerable amount of time (b) A combination of quickly repeated, strenuous and/or awkward, wrist-loading work movements for a considerable amount of time (c) Work with objects leading to direct and persistent pressure on the median nerve of the carpal tunnel for a considerable amount of time (d) As a complication to tendovaginitis on the flexion side of the wrist qualifying for recognition on the basis of this list
C.3.	Diseases of bones, joints, vessels, or nerves *(vibration-induced white finger, neuropathy)* *(Carpal tunnel syndrome: C.2.)*	Work with heavily vibrating handtools
C.4.1.	Tennis elbow *(epicondylitis lateralis)*	(a) Strenuous and repetitive work movements (b) Strenuous work movements in awkward positions (c) Strenuous static work
C.4.2.	Golfer's elbow *(epicondylitis medialis)*	
C.5.1.	Degeneration in the rotator tendons of the shoulder joint (rotator cuff syndrome) and/or the biceps tendon *(tendinitis caput longum musculus bicipitis brachii)*	(a) Repetitive and strenuous shoulder movements, in combination with an assessment of the position of the arm in connection with the load (b) Static lifting of upper arm to about 60 degrees or more
C.5.2.	Shoulder tendinitis *(tendinitis musculi articulatio humeri)* *Other diseases of the arm: Group I*	
Group D: Legs		
D.1.	Degenerative arthritis of the knee joint *(arthrosis genus)*	Kneeling and/or squatting work for many years
D.2.	Inflammatory degeneration of knee bursa *(bursitis)* *(Bursitis in other places: J.1)*	Persistent, external pressure for days or longer
D.3.	Meniscus disease of knee joint *(laesio meniscus genus)*	Work in a squatting position under cramped conditions for days or longer
Group E: Lungs and respiratory tracts		
E.1.	Silicosis	Silica *(for instance: in connection with sand blasting, iron founding, and stone cutting)*
E.2.	Lung fibrosis	Other silicium compounds

Item	Disease	Exposure
E.3.1.	Lung asbestosis	Asbestos
E.3.2.	Widespread formation of connective tissue in pulmonary pleura with affected lung function	*(for instance: work with insulation materials of asbestos, asbestos cement, brake linings)*
E.3.3.	Pleural plaques without lung Asbestosis	
E.4.	Lung diseases *(bronchopulmonary diseases)*	Dust or vapours from aluminium or aluminium compounds or dust from hard metals
E.5.1.	Asthma *(allergic and non-allergic)*	Dust or vapours from: (a) plants or plant products (b) animals or animal products (c) enzymes, dyes, persulphate salts, synthetic resin or medicaments and precursors thereof (d) isocyanates and certain anhydrides in epoxy resins
E.5.2.	Allergic inflammation of nasal mucous membrane *(rhinitis allergica)*	
E.5.3	Allergic, inflammatory degeneration of the mucous membranes of the eye *(conjunctivitis allergica)*	
E.6.	Lung disease caused by organic material *(allergic alveolitis, humidifier fever, and byssinosis; farmer's lung, mushroom worker's lung, and bird breeder's lung)*	Organic material *(for instance: fungal spores or animal protein)*
E.7.	Chronic bronchitis	Unspecified dust after massive exposure for many years *(for instance: from insulating materials, grain and feedstuffs, woodworking, or fumes from welding and desurfacing)*
	Other diseases of lungs, respiratory tracts, and organs: Groups I, J and K	
Group F: Mental illness		
F.1.	Posttraumatic stress disorder	Traumatic events or situations of short or longer duration that are of an exceptionally ominous or catastrophic nature
Group G: Skin		
G.1.	Allergic eczema	Allergens *(for instance: preservatives, rubber additives, latex or foods)*
G.2.	Other irritative skin diseases *(for instance toxic eczema)*	One or more irritants or physical factors
	Other skin diseases: Groups I and K	
Group H: Infectious and parasitic diseases		
H.1.	Infectious and parasitic diseases from animals or animal material *(for instance: tetanus, ornithosis, undulant fever, anthrax, Weil's disease, tuberculous infection from animals)*	Animals, animal material or other relevant source of infection *(for instance: work in refuse disposal systems and sewerage systems)*
H.2.	Infectious diseases from humans *(for instance hepatitis, staphylolocci, tuberculosis, AIDS)*	Blood, tissue, tissue fluids, or other biological material from persons with the same type of infection
H.3.	Tropical diseases *(for instance: malaria, amoebiasis, trypanosomiasis, dengue fever, pappataci fever, Malta fever, relapsing fever, yellow fever, plague, leish maniosis, framboesia, leprosy, spotted fever, and other fever diseases caused by rickettsia)*	Transfer of disease (infection)

Item	Disease	Exposure
Group I: Diseases from chemical substances		
I.1.1. I.1.2.	Neuritis Hobnail liver	Arsenic and some arsenic compounds *(for instance: in the chemical and metallurgic industries, the pharmaceutical industry and in the manufacture of acids and wood preservation chemicals)*
I.2.	Beryllium lung disease	Beryllium and some beryllium compounds *(for instance: in porcelain and ceramic manufacturing and electronic and nuclear (atomic) industries)*
I.3.1.	Toxic brain damage/dementia *(severe carbon monoxide poisoning with unconsciousness, toxic encephalopathy)*	Carbon monoxide, phosgene, hydrocyanic acid, cyan salts, cyanic compounds, and cyanates Carbon monoxide
I.3.2.	Inflammation of the liver *(hepatitis toxica)*	Acrylonitrile
I.3.3.	Bronchial asthma and obstructive lung disease with impaired lung function	Isocyanates *(for instance: in rooms where incomplete combustion occurs, oxidation of chloric degreasing agents in the metal industry, galvanisation, steel tempering, and work with gold and silver)*
I.4.	Kidney injury *(cadmium poisoning)*	Cadmium and some cadmium compounds *(for instance: in the galvanisation and dye industries)*
I.5.1.	Allergic eczema	Chromium and some chromium compounds *(for instance: in the metal and dye industries, in connection with cement work and use of chrome-tanned products)*
I.5.2.	Bronchial asthma	
I.5.3.	Inflammation of mucous membranes of eyes and upper respiratory tracts	
I.5.4.	Perforation of nasal septums	
I.6.1.	Toxic brain damage/dementia *(toxic encephalopathy)*	Mercury and some mercury compounds *(for instance: in the electro-chemical and electro-mechanical industries, laboratory work and the manufacture of measuring instruments)*
I.6.2.	Kidney injury *(nephrotic syndrome)*	
I.7.	Manganism *(manganese-induced parkinsonism)*	Manganese and some manganese compounds following severe exposure *(for instance: the manufacture of dry cells and dyes and paints)*
I.8.	Lung injury	Nitric acid, nitric oxides, ammonia and ammonia compounds following severe exposure *(for instance: the manufacture of fertilisers, explosives, dyes and paints; in connection with metal etching, pickling, use of nitric acid, combustion of nitrogenous products (fertilisers) and in cooling systems)*
I.9.	Allergic eczema	Nickel following substantial exposure for many years
I.10.1. I.10.2.	Bronchial asthma, hard metal lung	Cobalt *(for instance: manufacture of special steel, coins and trinkets)*

Item	Disease	Exposure
I.11.1. I.11.2.	Polyneuropathy Pulmonary edema with lung injury	Phosphorus and some phosphorus compounds *(for instance: manufacture of insecticides)*
I.12.1.	Toxic brain damage/dementia *(toxic encephalopathy)*	Lead *(for instance: in the accumulator, detergent and plastic industries)*
I.12.2.	Neuritis *(peripheral polyneuropathy)*	
I.12.3.	Kidney injury *(chronic interstitial nphritis)*	
I.13.1.	Toxic brain damage/dementia *(toxic encephalopathy)*	Hydrogen sulphide following severe exposure
I.13.2.	Lung injury	Sulphur dioxide or sulphuric acid following severe exposure *(for instance: in the manufacture of sulphuric acid and in the paper, accumulator, soap and artificial silk industries)*
I.14.	Thallium poisoning *(hair loss, neuritis, and visual disorders)*	Thallium and thallium compounds *(for instance: in the manufacture of fireworks and rat poison)*
I.15.	Chronic bronchitis and pneumonia	Vanadium and vanadium compounds *(for instance: in the manufacture of special steel, dyes, and paints)*
I.16.1.	Fluorosis (bone disease)	Fluorine and fluorine compounds following severe exposure
I.16.2.	Lung injury	Chlorine, bromine and iodine and their inorganic compounds, as well as fluorine and fluorine compounds, following severe exposure *(for instance: industrial bleaching agents)* Hydrocarbons and hydrocarbon derivatives: *(for instance: chemical products containing organic solvents, such as dyes, paints, detergents, raw materials from the chemical industry and the plastics industry)*
I.17.1.	Toxic brain damage/dementia *(toxic encephalopathy)*	Organic solvents
I.17.2.	Kidney injury *(glomerulonephrotis)*	Organic solvents
I.17.3.	Inflammation of the liver *(hepatitis toxica)*	Chlorinated solvents
I.17.4.	Anaemia *(aplastic anaemia)*	Benzene
I.17.5.	Neuritis *(peripheral polyneuropathy)*	Hexane and mtylbutylketone
I.18.	Inflammation of the liver *(hepatitis toxica)*	Organic nitrogen compounds: Dimethyl formamide *(for instance: chemical products containing amines or nitroamines in the food, dye and explosives industries)*
	Other diseases caused by chemical substances: Group E, G and K	

Item	Disease	Exposure
Group J: Oher diseases		
J.1.	Inflamatory degeneration of bursae other than in the knee *(bursitis)* *(Bursistis of knee: D.2.)*	Persistent, external pressure for days or longer
J.2.	Neurological paralyses	Eternal pressure
J.3.	Diseases caused by work in compressed air	Work in compressed air
Group K: Cancer diseases		
K.1.1.	Leukaemia	**Substances:** (a) benzene (b) ethylene oxide (c) 1,3-Butadiene **Processes:** (d) rubber industry (e) petroleum refining (f) boot and shoe manufacture and repair
K.1.2.	Myeloid leukemia	Ionising radiation (e.g. x-rays and gamma radiation)
K.1.3.	Lymph and blood producing organs	1,3-Butadiene
K.1.4.	Non-Hodgkin lymphoma	(a) 2,3,7,8-Tetrachlorodibenzo-para-dioxin *(dioxin)* (b) tetrachlorethylene (c) trichlorethylene
Digestive organs:		
K.2.1.	Peritoneum *(mesothelioma)*	(a) asbestos (b) erionite (c) talc containing asbestiform fibres
K.2.2.	Liver and biliary ducts	(a) aflatoxins (b) polychlorinated biphenyls (c) trichlorethylene
K.2.3.	Liver	(a) hepatitis B-virus (b) hepatitis C-virus (c) vinyl chloride
K.2.4.	Liver (angiosarcoma)	Vinyl chloride
K.2.5.	Stomach	Inorganic lead compounds
K.2.6.	Nasal pharynx	Formaldehyde
Skin:		
K.3.	Skin	**Substances:** (a) arsenic and arsenic compounds (b) anthracene (c) creosote compounds (d) mineral oil, untreated and mildly treated (e) crude paraffin (f) shale oil or lubricants extracted from shale

Item	Disease	Exposure
		(g) solar radiation (h) soot (i) coal tar and coal tar pitch **Processes:** (j) coke production (k) coal gasification (l) petroleum refining
Respiratory tract:		
K.4.1.	Lung	**Substances:** (a) 2,3,7,8-Tetrachlorodibenzo-para-dioxin *(dioxin)* (b) alpha-chlorinated toluenes and benzoylchlorid (combined) (c) arsenic and arsenic compounds (d) asbestos (e) beryllium and beryllium compounds (f) bis(chloromethyl)ether and chloromethyl methyl ether (technical grade) *(oat cell)* (g) cadmium and cadmium compounds (h) insecticides (non-arsenical) (i) chromium compounds (j) crystalline quartz (k) nickel compounds, including combinations of nickel oxides and nickel sulphides in the nickel refinery industry (l) particles of metallic cobalt containing wolfram carbide (tungsten) (m) passive smoking (n) radon and radon daughters (o) mustard gas (sulphuric mustard) (p) soot (q) coal tar and coal tar pitch (r) strong inorganic acid mists containing sulphuric acid (s) talc containing asbestiform fibres (t) diesel exhaust fumes **Processes:** (u) aluminium production (v) iron and metal founding (w) coke production (x) coal gasification (y) painter (occupational exposure as a) (z) mining of iron core (jernglans) with radon exposure (aa) production of art glass, glass containers, and pressed ware
K.4.2.	Pulmonary pleura (mesothelioma)	(a) asbestos (b) erionite (c) talc containing asbestiform fibres
K.4.3.	Nasal cavity and sinuses	**Substances:** (a) formaldehyde (b) chromium compounds (c) nickel compounds, including combinations of nickel oxides and sulphides in the nickel refinery industry (d) wood dust

Item	Disease	Exposure
		Processes: (e) manufacture of isopropanol in strong acid process (f) furniture and cabinet making (g) boot and shoe manufacture and repair
K.4.4.	Mucous membranes of sinuses and processus mastoideus *(epitelial tumours)*	Radium-226
K.4.5.	Larynx	**Substances:** (a) asbestos (b) mustard gas (sulphuric mustard) (c) strong inorganic acid mists containing sulphuric acid **Processes:** (d) isopropanol, manufacture in strong acid process
Urinary tract:		
K.5.1.	Kidney	Coke production
K.5.2.	Urinary bladder	**Substances:** (a) 2-Naphthylamine (b) 4-Aminobiphenyl (c) 4-Chloro-*ortho*-toluidine and its strong (hydrochloride) salts (d) 4,4'-Methylene bis chloroaniline (MOCA) (e) arsenic and arsenic compounds (f) benzidine and benzidine-based dyes (g) ortho-toluidine (h) coal tar and coal tar pitch (i) diesel exhaust fumes **Processes:** (j) aluminium production (k) auramine production (l) hairdresser work (m) coal gasification (n) rubber industry (o) painter (occupational exposure as a) (p) magenta manufacture (fuchsine) (q) boot and shoe manufacture and repair
Other organs or types of cancer:		
K.6.1.	Connective tissue	2,3,7,8-Tetrachlorodibenzo-para-dioxin *(dioxin)*
K.6.2.	Breast	Ionising radiation (e.g. x-rays and gamma radiation)
K.6.3.	Bone *(sarcoma)*	Radium-226 and Radium-228
K.6.4.	Cancer without specification *(all types of cancer not included under other items)*	2,3,7,8-Tetrachlorodibenzo-*para*-dioxin *(dioxin)*
K.6.5.	Thyroid gland	Ionising radiation (e.g. x-rays and gamma radiation)
Group L: Congenital injuries		
	Congenital disease/injury	**Documented infection/exposure in mother during pregnancy**
	Effects of infections:	

Item	Disease	Exposure
L.1.1.	Congenital cytomegalovirus infection	Cytomegalovirus
L.1.2.	Neonatal hepatitis B-virus infection causing persistent carrier state	Hepatitis B-virus
L.1.3.	Neonatal herpes	Herpes simplex-virus
L.1.4.	Congenital or neonatal HIV infection	Human immuno deficiency virus (HIV)
L.1.5.	Inflammation of the brain	Listeria
L.1.6.	Congenital infection	Parvovirus B-19
L.1.7.	Congenital rubella syndrome	Congenital rubella syndrome (German measles virus)
L.1.8.	Microcephalia, hydrocephalus, retinitis, inflammation of the liver	Toxoplasmosis (rabbit fever)
L.1.9.	Congenital varicella syndrome or neonatal varicella	Varicella zoster virus (chicken pox virus)
	Effects of chemical substances:	
L.2.1.	Microcephalia, mental retardation	Methylmercury
L.2.2.	Inflammation of the brain, retarded development	Lead
L.2.3.	Low weight at birth, skin changes	PCB
	Effects of other harmful exposures:	
L.3.1.	Microcephalia, malignant diseases	Radiation (radioactivity)
L.3.2.	Premature birth and associated complications	Extreme physical work load
	Effects of physical traumas:	
L.4.	Premature birth and associated complications	Accidents and violence

Prior to 1 January 2005, the list of occupational diseases included:

1. occupational diseases caused by chemical agents (Category A)
2. occupational diseases of the skin caused by substances or agents which do not come under other headings (Category B)
3. occupational diseases caused by the inhalation of substances or agents which do not come under other headings (Category C)
4. infectious or parasitic occupational diseases (Category D)
5. occupational diseases caused by physical agents (Category E);
6. initial stages of malignant aliments caused by organic compounds (Category F)
7. dental or periodontal diseases (Category G).

Source: National Board of Industrial Injuries, Guide to work-related contact eczemas, the List of Occupational Diseases Group A, items 5 and 9, Group B, items 2 and 3.

Occupational diseases reported to WEA

Doctors and dentists are obliged to report suspected and confirmed cases of occupational diseases. The figures for cases of occupational diseases are compiled according to the year in which they were reported.

The number of cases of occupational diseases reported in 2003 was 11 413; this is somewhat lower than the level of the previous five years: the figure fell from 14 456 in 1998 to 11 413 in 2003.

Table 5: Reported occupational diseases 1998–2003, by category of main diagnosis and year

Main diagnosis	Registration year						
	1998	1999	2000	2001	2002	2003	Total
Infectious diseases	181	167	181	188	163	115	995
Cancer and pre-cancerous conditions	204	194	207	177	183	238	1,203
Blood and metabolic disorders	6	4	3	3	2	3	21
Mental disordes	679	745	870	1,213	1,423	1,551	6,481
CNS dysfunction*	95	77	61	88	51	35	407
Other nervous system disordes	130	88	98	26	20	21	383
Hearing impairment	2,025	1,724	1,447	1,578	1,606	1,308	9,688
Other sensory organ disorders	312	288	474	343	392	308	2,117
Circulatory disorders	154	153	149	153	182	166	957
Non-allergic respiratory disorders	485	378	412	354	259	231	2,119
Allergic respiratory disorders	378	326	338	298	263	243	1,846
Disorders of the gigestive system	79	47	76	72	56	47	377
Skin diseases	**1,561**	**1,371**	**1,366**	**1,545**	**1,418**	**1,268**	**8,529**
Muskuloskeletal disorders	7,800	6,765	6,851	7,340	6,309	5,511	40,576
Genito-urinary disorders	5	3	7	7	8	5	35
Disorders of the pregnancy and childbirth	–	3	8	6	2	7	26
Inadequately definied conditions	113	73	99	104	96	108	593
Suddenly occuring injury (non-accidents)	249	229	209	95	133	176	1,091
Total	**14,456**	**12,635**	**12,856**	**13,590**	**12,566**	**11,341**	**77,444**

Source: The Danish Working Environment Authority.

(*) CNS dysfunction includes various forms of impairment of the central nervous system.

The incidence of reported occupational diseases fell considerably during the period 1998–2003. However, there is a considerable uncertainty in relation to incidence rates of occupational diseases

Source: http://www.at.dk

3. Perspectives and challenges for the future

The Working Environment Authority, the National Board of Industrial Injuries and AMI are preparing a report entitled, 'Working environment in the future — evidence-based background for decisionmaking concerning the working environmental problems that should be the focus of the forthcoming working environment action programme until 2010'. The report identifies potential focal points both from a risk factor view point as well as from a health consequence view point. The potential focal points include:

- defined from a risk factor view point: skin damaging exposure;
- from a health consequence view point: skin problems.

6. Collected data regarding Estonia

1. Legislation (International, EU, national-regional-local, governmental written policy/charter)

Occupational Health and Safety Act, passed on 16 June 1999 (RT1 I 1999, 60, 616), entered into force on 26 July 1999, amended by the following Acts:

- 29 January 2003, entered into force 1 July 2003 — RT I 2003, 20, 120,
- 19 June 2002, entered into force 1 September 2002 — RT I 2002, 63, 387,
- 15 May 2002, entered into force 1 January 2003 — RT I 2002, 47, 297,
- 24 January 2001, entered into force 1 January 2002 — RT I 2001, 17, 78,
- 14 June 2000, entered into force 21 July 2000 — RT I 2000, 55, 362.

Several laws and regulations have been adopted since the Estonian Parliament adopted the Act on Occupational Health and Safety in June 1999. Most of these are meant to promote implementation of the Act on Occupational Health and Safety, and the relevant directives of the European Commission. Another important piece of OH&S-related legislation is the Act on Compulsory Insurance of Occupational Accidence and Diseases.

The rate of occupational diseases was 0.3 per 1 000 workers in 1996; this level is about 20 times lower than that of the Nordic countries. Musculoskeletal disorders are the most common, followed by vibration diseases, hearing damage and erysipelas in meat processing. Evidence of increasing psychological violence on the part of managers and stress among workers has also been reported. Hazardous substances, like asbestos, are still in use but only single cases of asbestosis have been diagnosed. The socio-economic situation has led to the spread of infectious diseases, such as tuberculosis, which has also been registered among medical personnel.

2. Levels of recognition of occupational skin diseases and dermal exposure

Table 6: Reported occupational diseases in Estonia, 1990–2000

Main diagnosis	Year						
	1990	1992	1994	1996	1998	1999	2000
Physical factors							
Hearing damage	16	21	12	17	109	154	137
Vibration disease	16	15	42	49	37	59	60
Other (eye diseases, radiation disease)	1			1			
Musculoskeletal disease	1	16	28	53	76	115	128
Bronchopulmonary	20	10	6	17	3	10	5
Pneumoconioses	1	1	2	*	2	2	1
Allergies	14	6	2	*	*	*	*
Diseases caused by dust	5	3	2	*	*	*	*

Main diagnosis	Year						
	1990	1992	1994	1996	1998	1999	2000
Skin diseases	**11**	**8**	**5**	**6**	**2**	**2**	**3**
Poisoning	12	16	22	3	21	8	5
Biological factors							
Erysipelas	48	17	11	26	15	0	8
Leptospirosis, Tuberculosis				2	4	6	2
Total	135	105	126	174	269	359	355

(*) Data not available

Source: The FinEst bridge — Finnish-Estonian collaboration in occupational health (Twinning project), Finnish Institute of Occupational Health, Helsinki 2002.

In 2000 a new system of determining the degree of disability and incapacity for work has been adopted in Estonia. Until 2000, disability assessment committees determined incapacity for work in three categories of disability. These three categories (First group, Second group and Third group of disability) formed grounds for receiving disability pension.

Since 2000, medical assessment committees determine incapacity for work in percentage terms (i.e. 10, 20, 30 and up to 100) and disability in three degrees of severity (profound, severe or moderate). The percentage of the incapacity for work determines if the patient will receive disability pension, while the degree of severity of a disability is the ground for receiving social benefits for disabled persons.

Because of differences between the old and new systems, there is separate data on persons declared disabled according to the categories of disability used from 1985–99 and those persons whose incapacity for work (in percentage terms) has been recognised since 2000. However, the data are still partly comparable: 100 % incapacity for work corresponds to the first disability category; 80–90 % incapacity for work corresponds to the second disability category, and 40–70 % incapacity for work corresponds to the third degree disability. The pension for incapacity for work is not granted if the incapacity for work is less than 40 %.

Source: http://pub.stat.ee

Figure 3: Occupational skin diseases — male, grouped by age

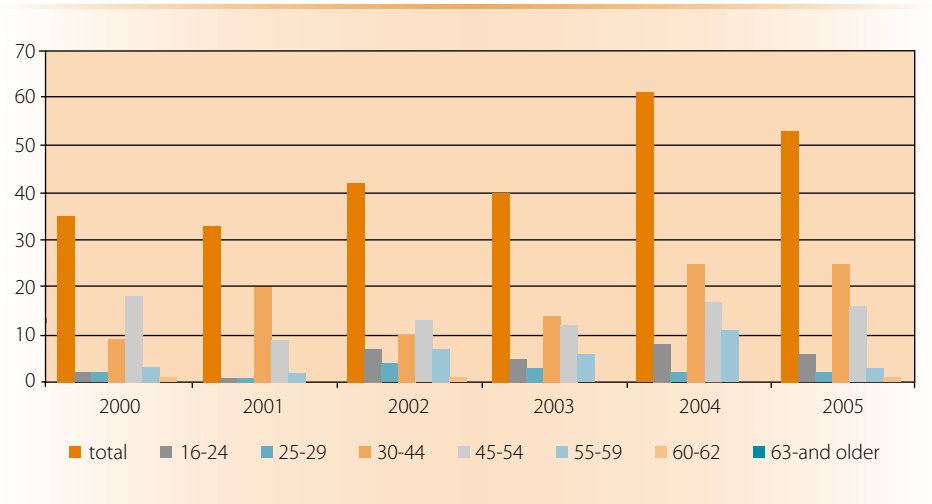


Figure 4: Occupational skin diseases — female, grouped by age

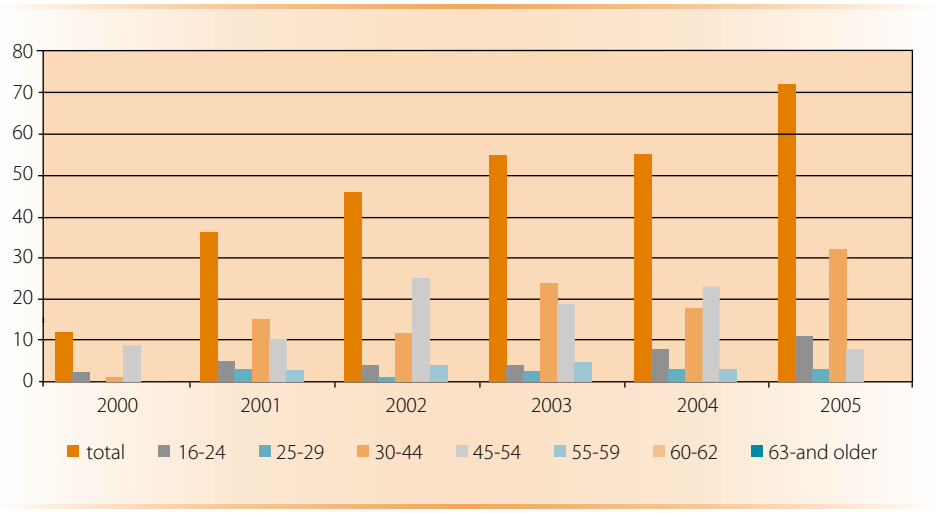


Table 7: Number of diseases by sex and age group

Females	Age groups total	16–24	25–29	30–44	45–54	55–59	60–62	63 and older
2000	12	2	0	1	9	0	0	0
2001	36	5	3	15	10	3	0	0
2002	46	4	1	12	25	4	0	0
2003	55	4	3	24	19	5	0	0
2004	55	8	3	18	23	3	0	0
2005	72	11	3	18	32	8	0	0

Males	Age groups total	16–24	25–29	30–44	45–54	55–59	60–62	63 and older
2000	35	2	2	9	18	3	1	0
2001	33	1	1	20	9	2	0	0
2002	42	7	4	10	13	7	1	0
2003	40	5	3	14	12	6	0	0
2004	61	8	0	25	17	11	0	0
2005	53	6	2	25	16	3	1	0

Table 8: Total of occupational diseases and skin diseases

	2000	2001	2002	2003	2004	2005
Diseases total	45,433	57,281	19,899	17,237	18,045	17,505
Diseases of the skin and subcutaneous tissue	99	77	38	44	32	45

Collected data regarding Finland

7.

1. Legislation (international, EU, national-regional-local, governmental written policy/charter)

All daughter directives of the framework directive have been implemented in Finland.

- The new Occupational Safety and Health Act (738/2002) has been in force since the beginning of 2003. It incorporates the basic idea of safety and health management: the key principle for implementing the employers' obligations in relation to safety and health. The Act requires systematic and continuous monitoring of the working conditions, identification and assessment, as well as elimination of hazards and risk factors.
- The Act and Decree on Occupational Diseases (1343/1988 and 1347/1988) address the compensation for occupational diseases (including occupational skin diseases) caused by chemical, biological or physical factors.
- The Act on Supervision of Labour Protection (44/2006) requests that the labour inspectorate is notified of any occupational diseases (including skin diseases).
- The Decision of Ministry of Social Affairs and Health on Occupational Limit Values (109/2005) identifies chemicals with marked skin absorption.

- Primary Health Care Act 66/1972
- Occupational Health Care Act since 1979
- New Act 1383/2001 since 1 January 2002
- Occupational Safety Act 299/1958
- Sickness Insurance Act 364/1963
- Act on Health Care Professionals 559/1994
- Act on the Supervision of Occupational Safety and Health and Appeal in Occupational Safety and Health Matters (131/1973)
- Act on Occupational Diseases and Accidents at Work
- Act on the Supervision of the Labour Protection Act
- Act on Occupational Diseases (1343/88)
- Ordinance on Occupational Diseases (1347/88): the list of the physical, chemical, and biological factors that can lead to occupational disease when exposed during work
- Statute on Certain Injuries Compensable as Occupational Accidents (852/48).

The main objectives of OHS as stated in the Occupational Health Care Act (1383/2001) are:

– the prevention of work-related illnesses and accidents;

– the health and safety of the work and the working environment;

– the health, working capacity and functional capacity of employees at the different stages of their working careers;

– the functioning of the work community.

Lower level regulation

- Government Decree (No 1484) on the principles of good occupational healthcare practice, the content of occupational healthcare and the qualifications of professionals and experts.
- Government Decree (No 1485) on medical examinations in work that presents a special risk of illness.
- Decision of Ministry of Labour on factors that cause a risk of cancer (838/1993).
- Other legislation with implications to OHS.
- Ratified ILO Conventions:
  - Finland has been a member of ILO since 1920. Altogether 95 Conventions have been ratified (79 in force);
  - ILO Convention No 155 on Occupational Safety and Health was ratified in 1985;
  - ILO Convention No 161 on Occupational Health Services was ratified in 1987.

http://www.balticseaosh.net/finland/System_of.shtml

Legislation is applicable to all employees, farmers, some students and trainees. Self-employed persons may join voluntarily.

2. Collective practices (guidelines, recommendations, actions/initiatives/ programmes/solutions, agreements between social partners, and sectors)

Health and safety is under the direction of the Ministry of Social Affairs and Health. The Department for Occupational Safety and Health is concerned with all aspects of OHS including monitoring, research and legislation. The Occupational Safety and Health Inspectorates of Finland, supervised by the Ministry of Social Affairs and Health, are the enforcing authorities for occupational safety and health.

Occupational Exposure Limits — Finland has its own system of OELs.

- Binding Limit Values (MAC or Sitovat raja-arvot) are published as ordinances of the Council of the State under the Occupational Safety and Health Act 738/2002.
- Concentrations known to be harmful (Haitalliseksi tunnetut pitoisuudet — HTP) are published as ordinances of the Ministry of Social Affairs and Health under the Council of State decree on chemical agents at workplace 715/2001.
- The lists are regularly updated (last time in 2005). They currently contain:
  - 18 MAC entries, including two additional entries for lead in blood;
  - about 500 main HTP entries.

The values are expressed either in ml/m^3 (ppm) or in mg/m^3 at 20 °C and 101.3 kPa. A skin notation is given for substances that can be also absorbed via the skin.

Definitions against which exposure is assessed — an HTP is defined as a time-weighted average over a reference period of eight hours. Short-term values are defined for a period of 15 minutes.

- There is no specific regulation on certain sectors or working conditions.
- Various kinds of medical and vocational rehabilitation are provided free of charge by the accident insurance institution. The costs of rehabilitation are paid in full. During rehabilitation the insured person also receives the full cash benefits.

3. Main risks (chemical, biological, physical) and related sectors, activities and jobs

Of the occupational diseases reported in Finland in 2002, 20 % were skin diseases. Of these, 330 were allergic contact dermatitis, 313 were irritant contact dermatitis, and 115 were protein contact dermatitis. There were also 95 cases of other skin diseases (41 unspecified cases of contact dermatitis, four paronychias, one oil acne, 29 other skin diseases including chemical burns, and 21 skin diseases for which the specific diagnosis was not reported). Women accounted for 60 % of the skin diseases and were also more exposed to their most common causes; these include cleansing agents (CR), animal derived substances, food and rubber allergens (such as latex (BR) or wet work).

In 2002, the main causes for allergic skin diseases were exposure to nickel, cobalt or rubber chemicals and polymers. The main causes of irritant skin diseases in 2002 were cleaning agents, wet work and oils/lubricants, while the main causes for protein contact dermatitis or urticaria were animal epithelia, fur, grain or flour dust and latex proteins. Finally, in 2002, the main occupational skin infection was scabies.

Sectors with the highest incidence rates were:

- food, beverage and tobacco manufacturing;
- agriculture and forestry (exposure to animal derived substances, flour, grain, fodder dust, cleansing products, dermatophytes, rubber gloves, wet and dirty working conditions);
- furniture manufacture.

In 2002, occupational skin diseases were mostly caused by chemical factors; around 15 % were caused by biological factors, while only very few were caused by physical factors.

Main causes

The most common cause of skin diseases are itch mites that cause skin infections; however, cleansing agents were another common cause, responsible for 6 % of all skin diseases. Rubber gloves were behind most of the allergic contact dermatitis caused by exposure to rubber chemicals.

Epoxy resins and epoxy paints and glues, acrylates and metacrylates were the most common types of plastic chemicals responsible for skin diseases.

Animal-related skin diseases were mostly caused by cow epithelium. The most common causes of protein contact dermatitis or contact urticaria were cow-induced dermatoses (48 cases), flours, grains and fodders (33 cases) and NRL-indiced dermatoses (11 cases). The main irritant substances causing contact dermatitis were organic solvents, detergents, oils, cutter fluid, food products and chemicals in plastic.

Source: http://www.ttl.fi/search/MsmGo.exe?grab_id=504&page_id=13179392&query=skin&hiword=SKINS+skin+

4. Levels of recognition of occupational skin diseases and dermal exposure

Skin diseases are considered to be occupational diseases if they are caused at work by chemical, physical or biological risk factors. The decree on occupational diseases includes a list of agents known to cause occupational diseases but other cases can also qualify for compensation if a causal relationship between the disease and chemical, biological or physical exposure at work can be proven.

Finland has a list of generally recognised occupational diseases. Part of the list is classified according to the European recommendation (3297/2003/EC) but it also includes diseases that are not on the EU list of possible occupational diseases.

Among listed agents causing skin diseases are ionising radiation, infrared radiation, ultraviolet radiation, arsenic, beryllium, mercury, cobalt, chromium, nickel, zinc chloride, halogens, sulphuric acid, nitric acid and ammonia, alkali, hydrocarbons and their derivatives, nitroglycerin, aldehydes, organic acids, phenol, antibiotics, plastics, organic dusts, thiurams, dyes, fungi causing dermatic mycosis or ringworm, and bacteria causing erysipeloid.

5. Methods

5.1. Methods of collecting data on the occurrence and prevalence of skin diseases

The **Finnish Register of Occupational Diseases** (FROD) was established in 1964 at the Finnish Institute of Occupational Health (FIOH). Its status as a research register was consolidated by law in 1993. The information is collected from two different sources:

1. notifications of new cases reported to the insurance companies as an occupational disease are sent to the Register;
2. occupational physicians are also obliged to report cases of occupational diseases or work-related illnesses to the provincial labour protection authority, which sends the report to FIOH.

The information from the two sources is cross-referenced so that each case is only registered once.

The register contains information on the person affected (such as name, gender, age and occupational title), information on the employer (name, industry and location), a description of the disease (diagnosis and date), information on the causes (exposure and exposure time), and on the severity of the illness and any compensation paid.

Until 2002, statistics on occupational diseases were collected by the Finnish Institute of Occupational Health. The registration system is under reorganisation; as a result, data is only available until 2002.

5.2. Methods of assessing the risks of dermal exposure

Assessing the risk of occupational dermal exposure is the responsibility of the employer's general and specific risk assessment procedures, which are required by several EU directives and corresponding national legislation.

Additionally, in Finland the Occupational Healthcare Act requests healthcare providers at workplaces to identify all types of occupational risks (including dermal exposures) and to propose ways in which to combat these risks as well as to plan health surveillance and any first aid needed for dermal exposures that have been identified.

5.3. Methods of measuring the risks of dermal exposure

This is partly carried out by biological monitoring of workers, which is a reasonably common procedure in Finland. It addresses both airborne material and skin absorption of chemicals.

Register of employees exposed to carcinogens (ASA)

In Finland, the legislation requires the annual registration of any workers exposed to carcinogens. The Finnish ASA Register was established in 1979 and is based on ILO Convention 139 and the adjoining Recommendation 147. Employers send their lists of exposed workers and relevant carcinogens every year to Labour Protection District offices. This information is collected by FIOH, which publishes the relevant statistics each year. The basic objective of the ASA Register is to be an effective instrument in the prevention of occupational cancer in Finland. It is aimed primarily at enforcing the implementation of preventive measures through the actions of health and safety personnel at workplaces. However, it also enables the labour safety authorities to focus their inspection and advisory tasks appropriately.

The specific objectives of the ASA are:

- to increase identification of carcinogens and evaluation of exposure at workplaces;
- to stimulate preventive measures, such as the substitution of carcinogens, improvements to local ventilation and personal protection of the skin;
- to inform about cancer risks and effective preventative measures;
- to direct labour safety inspection activities concerning the use of carcinogens at workplaces;
- to form a database for future epidemiological research on cancer risks among exposed workers.

Occupational cancer register

Hospitals, practising physicians and pathological and haematological laboratories are required to report all cases of cancer that come to their attention to the Finnish Cancer Registry. In addition, all death certificates in which cancer is mentioned are transferred from the files of Statistics Finland to the Cancer Registry each year.

The aim of the occupational cancer register is to provide accurate, systematic, population-based, nationwide information of absolute and relative cancer risks related to occupational exposures. The goal is to identify patterns of exposure and develop tools to analyse and interpret the relationships between work-related factors and cancer. The Cancer Registry is more than 99 % complete and very accurate.

Source: http://www.cancerregistry.fi

Finnish job-exposure matrix — FINJEM

FINJEM is a database which summarises data from several other FIOH databases and supplements them with information on the labour force and professional judgments.

FINJEM is used for hazard surveillance; it provides an overview of national exposure trends and helps to identify occupations with high or multiple exposures. It was designed to contain definitions, inferences, exposure data and references. It includes workforce data and provides information on the numbers of exposed workers in Finland by agent, occupation and level of exposure. FINJEM covers exposures to major physical, chemical, microbiological, ergonomic and psychosocial factors. Exposure is described by both the prevalence and level of exposure among the exposed, both estimated mainly on continuous scales. The user may also define the final criteria of exposure, and thereby influence the magnitude of misclassification.

FINJEM was designed in the early 1990s to summarise data and expert judgments on occupational exposure to major physical, chemical, ergonomic, and psychosocial

agents/factors (N=74) in Finland since 1945. Exposure is quantified by the proportion of exposed (P) and the mean level of exposure among the exposed (L) by occupation (N=311) and period (N=6 in 2005, update every three years). The algorithms of FINJEM also calculate the numbers of exposed workers (Nexp) by classified level of exposure (<10 %, 10–50 %, >50 % of the Finnish occupational exposure limit, calculation based on the log-normal assumption of exposure levels) for chemical agents and crude exposure estimates by industrial class (N=223, estimates based on the distribution of occupations by industry).'

(Kauppinen T., 'Experiences on the use of Finnish job-exposure matrix', http://www.saioh.org/ioha2005/Proceedings/Abstracts/Posters/AbstractPoster2.pdf).

Register of occupational hygiene measurements ([1])

FIOH measures the levels of chemical, physical and microbiological agents at the workplace. Only the chemical measurements are included in the database. Some of these measurements were published in 34 reports that covered the major chemical exposures (the Sutkea project). The database allows the production of crude statistics for surveillance (identification of high exposures and temporal trends) and administrative issues (status of and trends in measurements).

CAREX (International information system on occupational exposure)

CAREX is an international information system concerning occupational exposure to known and suspected carcinogens. The CAREX (CARcinogen EXposure) database, constructed with support from the 'Europe against cancer' programme of the European Union, provides selected exposure data and documented estimates of the number of exposed workers by country, carcinogen and industry. CAREX includes data on 139 agents evaluated by the International Agency for Research on Cancer (all agents in Groups 1 and 2A and selected agents in Group 2B), displayed across the 55 industrial classes of the United Nations system (ISIC Revision 2). The 1990–93 occupational exposure to these carcinogens was estimated for the 15 countries of the EU in two phases.

First, estimates were generated automatically by the CAREX system on the basis of national workforce data and estimated exposure prevalence from two reference countries (the United States and Finland) with the most comprehensive data available. These estimates were then adjusted for the economic structure (workforce distribution) of each country individually but do not take into account country-specific exposure patterns which may deviate from those of the reference countries. For selected countries, these estimates were then refined by national experts in view of the perceived similarities or dissimilarities to the exposure patterns in their own countries. The assessment procedure included several main phases which are described in more detail in the following sections:

- definition of agents and occupational exposure
- definition of industries and collection of labour force data
- collection of exposure measurement data and descriptive exposure data
- generation of default estimates of exposures by the CAREX system
- generation of final estimates of exposures by national experts
- estimation of multiple exposures.

(Kauppinen, T., et al., 1998)

5.4. Methods of preventing (eliminating/minimising/controlling) the risk of dermal exposure

Preventing risk of occupational dermal exposure is partially accomplished by:

- following the relevant legislation and advice on MSDSs;
- occupational healthcare input;
- providing information and written material from FIOH targeting specific dermal exposure risks, e.g. booklets on safe handling of acrylates and epoxy compounds;
- providing users with information about latex allergen content of various natural rubber protective gloves;
- restricting the active chromium content of cement by obliging manufacturers to add ferrosulphate.

For safe handling of acrylates in dentistry, 'non-touch' techniques are made available following improvements in dental acrylate product packaging. Workplaces using hydrogen fluoride must have antidotes available to minimise the risk of skin absorption in case of accidental splashes; water must be easily accessible at every workplace handling acids and alkali to minimise local effects on skin in case of accidental splashes.

Table 9: Prevalence of rash by occupation (ISCO) and year, Work and health survey.

Occupation	Year	N*	Rash, on the arms	Rash, elsewhere
1. Legislators, senior officials and managers	1997	163	9.20	8.0
	2000	138	10.10	8.7
	2003	237	6.80	6.8
	2006	241	7.00	10.4
2. Professionals	1997	374	10.20	11.0
	2000	336	8.00	10.7
	2003	438	9.60	10.7
	2006	434	11.80	12.0
3. Technicians and associate professionals	1997	329	9.70	6.1
	2000	317	11.40	10.1
	2003	451	10.20	9.5
	2006	349	8.00	7.2
4. Clerks	1997	202	8.90	8.4
	2000	192	9.90	13.5
	2003	168	9.50	7.1
	2006	141	6.40	9.9
5. Service workers and shop and market sales workers	1997	289	9.70	8.6
	2000	278	13.30	10.8
	2003	333	12.30	7.5
	2006	326	16.60	11.0

Occupation	Year	N*	Rash, on the arms	Rash, elsewhere
6. Skilled agricultural and fishery workers	1997	133	12.80	5.3
	2000	85	5.90	7.1
	2003	101	5.00	6.9
	2006	99	9.10	7.1
7. Craft and related trades workers	1997	249	11.60	9.2
	2000	255	10.60	8.6
	2003	253	11.50	10.7
	2006	293	11.60	8.9
8. Plant and machine operators and assemblers	1997	183	11.50	14.8
	2000	213	8.90	7.0
	2003	181	8.30	7.2
	2006	179	6.70	10.1
9. Elementary occupations	1997	168	10.10	6.6
	2000	153	14.40	6.5
	2003	146	15.80	10.3
	2006	143	11.90	6.3
10. Armed forces	1997	12	8.30	0.0
	2000	13	0.00	0.0
	2003	8	0.00	0.0
	2006	6	0.00	16.7

(*) N = number of respondents

NB: Persons under 25 or over 64 years of age were not sampled. The respondents were not always asked whether their rash was work-related

6. Are skin problems considered as a high priority risk?

It has been realised that as levels of airborne contaminants fall, partly because of more stringent exposure limit values, the share of diseases caused by skin absorption will increase, adding in the future to the importance of prevention of dermal exposure.

7. Main results and success factors

There has been a marked reduction in skin disease caused by natural rubber latex proteins. It can be attributed to making available extensive information on how to minimise exposure to latex proteins, including data on measurements of the allergen contents of various brands of natural rubber gloves, avoiding powdered gloves and replacing natural rubber gloves with synthetic rubber or plastics gloves whenever possible. Over the years, there has also been a reduction in occurrence of chromium eczema, partially because of the requirement to add ferrosulphate to cement. However, new cases of chromium eczema may still be caused, for example, by handling of leather.

8. References

Occupational diseases in Finland in 2002, 'New cases of occupational diseases reported to the Finnish register of Occupational Diseases', Finnish Institute of Occupational Health, Helsinki 2004.

Kauppinen, T., 'Finnish Occupational Exposure Databases', *Applied Occupational and Environmental Hygiene*, Vol. 16(2), Finnish Institute of Occupational Health, 2001, pp. 154–158.

Kauppinen, T., et al., 'Occupational exposure to carcinogens in the European Union in 1990–93', Finnish Institute of Occupational Health, Helsinki, 1998. http://www.ttl.fi/NR/rdonlyres/4444380F-B1FB-4D01-A974-0B6A9E663CFA/0/1_description_and_summary_of_results.pdf

8. Collected data regarding France

1. Legislation (international, EU, national-regional-local, governmental written policy/charter)

There is no specific law concerning skin prevention of exposure but the issue is mentioned in different regulations. The following list contains some examples.

Labour Code

Article R231-51 (prevention of chemical risk)

This text concerns the general prevention of chemical risk and concerns 'hazardous substances', 'preparations' or 'intermediary products'. It mentions three categories of skin-related hazards:

- **corrosive:** substances and preparations which can destroy living tissue upon contact;
- **irritating:** non-corrosive substances and preparations which can cause inflammation of the skin through direct, prolonged or repeated, contact with the skin or the mucous membranes;
- **sensitising:** substances and preparations which can cause hypersensitivity following inhalation or cutaneous absorption; consecutive exposure to the substance or the preparation of which can then produce characteristic harmful effects.

Decrees by ministers in charge of work, industry, environment, health, consumption and agriculture determine:

- a harmonised classification relating to substances that are the object of EU classification, in the categories presented above;
- methods and criteria of classification in these categories of other substances and preparations;
- an identifying symbol and the indication of the hazard for each category as well as the standard risk and safety phrases.

Article R231-58-7 (chemical risk)

Workplace use of cement or preparations containing cement is prohibited if they contain, when hydrated, more than 0.0002 % of soluble hexavalent chromium (chromium VI) of the total dry weight of cement. This does not apply to the use of cement and preparations containing cement in closed and completely automated systems in which they are treated exclusively by machines and where there is no contact with the skin.

Article R231-62-3 (biological risk)

For all activities in which pathogenic biological agents are used, the head of establishment must supply the workers with adapted sanitary facilities, an eyewash and disinfectants for the skin and, if necessary, eye lotions prescribed by the occupational physician.

Article R231-76 (ionising radiations)

I. The sum of the effective doses received by external and internal exposure should not exceed 20 mSv over any consecutive 12 months.

II. The limits of equivalent doses for different exposed parts of the body are as follows.

- Exposure to the hands, forearms, feet and ankles over any consecutive 12 month period should not exceed 500 mSv.
- Any exposure to the skin over any consecutive 12 month period should not exceed 500 mSv — this limit applies to the average dose to any surface of 1 cm^2, whatever the exposed surface.
- Any exposure to lens over any 12 month consecutive period should not exceed 150 mSv.

Article R231-77 (ionising radiations)

III. People aged between 16 and 18 who are authorised to carry out work that exposes them to ionising radiations must not receive an effective dose greater than six mSv during any consecutive 12 month period, or an equivalent dose greater than:

- 150 mSv for the hands, the forearms, the feet and the ankles;
- 150 mSv for the skin: this limit applies to the average amount to any surface of 1cm^2, whatever the exposed surface;
- 50 mSv for the lens.

Recommendations

- R410 Biological risks in healthcare services: applies to the prevention of infectious risks for healthcare workers, especially needle stick injuries and the possibility of exposure to AIDS.
- R409 Evaluation of the chemical risk.
- R394 Health risks caused by exposure to chemicals in the pastes, papers and paperboards industries.
- R391 Prevention of health risks related to the manufacture and use of glycol ethers.
- R382 Risks arising from exposure to dangerous chemicals in rubber industries.

Circulars

- Memorandum DGFAR/SDTE N° 2005-5014 of 4 April 2005: priority control topics for 2005 health and safety at work (*Official Bulletin of the Ministry of Agriculture*, No 14, April 2005).
- Circular No 89-6 of 27 February 1989 relating to warnings to distributors of cream barriers and to the instructions that users of these products must follow
- Circular DGS/SD5C/DHOS/E2/DRT/CT1/CT2 No 2004/382 of 30 July 2004 relating to the precautions to be observed by anatomo-pathology and cytology sevices, in autopsy rooms, morgues, and 'NCTA' specialised biology laboratories regarding the risk of transmitting conventional transmissible agents (CTA) and non-conventional agents (NCTA) (not published in the Official Journal).
- Memorandum DGFAR/SDTE N°2004/5018 of 7 June 2004 implementing the priority action set by the memorandum DGFAR/SDTE No 2004-5008 of 9 March 2004 which concerned preventing occupational hazards related to plant-care products (*Official Bulletin of Ministry of Agriculture*, No 24, June 2004).

- Circular DHOS/E 2/DGS/SD 5 C No 2003-591 of 17 December 2003 relating to the methods of manual disinfection of non-autoclavable endoscopes in healthcare services (Bomast, 1 January 2004).
- Circular No 01 DRT of 22 January 2001 relating to the 2001 coordinated action plan of workplace inspections to prevent occupational hazards.
- Circular DGS/VS 2/DH/DRT No 99-680 of 8 December 1999: recommendations to be implemented in the case of any transmission of HBV and HCV by blood or body fluids (*Official Bulletin of Social Affairs*, No 99/51 of 8 January 2000).
- Circular CNAMTS DRP No 36/98 — ENSM No 53/98 of 30 November 1998: recommendations regarding the implementation of anti-retroviral treatment after occupational accidental exposure to HIV, HBV or HCV.
- Circular DGS/DH No 98-249 of 20 April 1998: preventing the transmission of infectious agents, transmitted by blood or body fluids, during any time of care within healthcare establishments (modified by note of information DGS/VS 2/DH No 99-279 of 12 May 1999 (BOMES No 99/21, June 1999)).
- Note of information DGS/DH/DRT No 81 of 25 September 1995 relating to preventive measures taken to avoid the transmission of the HIV virus to healthcare workers and the action to be taken in case of accidental exposure to blood or another body fluids (not published in the *Official Journal*).
- Circular DRT No 94-14 of 22 November 1994 relating to the packaging and labelling of chemical substances and preparations and to safety data sheets (SDS) (BO min. wk. No 95/1 of 20 January 1995).

Other texts

- Order of 9 November 2004, modifying the decree of 5 January 1993, which specifies how to draft and send safety data sheets. This text transposes Commission Directive 2001/58/EC from 27 July 2001 (Official Journal of 18 November 2004).
- Modified decree of 30 June 2004 establishing the list of the occupational indicative exposure limit values to apply the Article R. 232-5-5 of the Labour Code (Official Journal of 11 July 2004).
- Order of 12 February 2004 relating to the diagnosis reference levels in radiology and nuclear medicine (Official Journal of 16 March 2004).
- Order of 7 August 1997 (modified) relating to the limitations of marketing and use of certain products containing dangerous substances (Official Journal of 17 August 1997).
- Order of 20 April 1994 (modified) relating to the declaration, classification, the packaging and the labelling of substances (Official Journal of 8 May 1994).
- Decree No 92-1074 of 2 October 1992 relating to the marketing, use and elimination of certain substances and dangerous preparations (Official Journal of 4 October 1992).

2. Levels of recognition of occupational skin diseases and dermal exposure

In France occupational diseases are presented in 98 official tables that describe their symptoms and causes. Many tables relate to occupational skin diseases and the most recent statistics (for 2002 and 2003) are listed in the Excel file 'Skin statistics'. The results

of two social security systems are presented: the general system which includes approximately 15 million workers and the agricultural system.

As can be seen, the causal agents are very diverse and include chemicals, radiation and biological agents, as well as diseases, such as allergies and skin cancer.

It is generally considered that the number of declared occupational diseases is underestimated.

SF unofficial statistics

The epidemiological survey of occupational dermatitis was organised in four hospitals in the Île-de-France: Cochin, Créteil, Fernand Widal and Garches. Each of these hospitals has a specialist occupational dermatology consultant. New cases reported between 2001 and 2005 were collected and analysed. Of the 1 829 patients studied, 53.4 % were women. The main industries concerned were healthcare, cleaning, construction and public work, and hairdressing. The main products responsible for occupational allergic dermatitis were resins, disinfectants, household products and hairdressing cosmetics, as well as nickel and latex.

Table 10: Occupational skin diseases in the agricultural social security system

Table		2002	2003
4	Pustular dermatitis caused by bacillus anthracis	0	0
5 bis	Erythema chronicum migrans caused by borellia burgdoferi	0	0
	Acrodermatitis chronica atrophicans caused by borellia burgdoferi	0	0
6	Skin allergy caused by brucella	1	0
9	Chronic lesions of the skin or mucous membranes caused by carbon tetrachloride	0	0
	Irritant dermatitis caused by arsenic and arsenical mineral compounds	1	0
	Melanoderma caused by arsenic or arsenical mineral compounds	0	0
	Palm and sole dyskeratosis caused by arsenic or arsenical mineral compounds	0	0
	Bowen's disease caused by arsenic or arsenical mineral compounds	0	0
	Skin epithelioma caused by arsenic or arsenical mineral compounds	0	0
12	Eczema-like dermatitis confirmed by epicutaneous test caused by mercury or its compounds	0	0
13	Irritant dermatitis caused by nitro- or chlorophenol derivatives	0	0
14	Ulcerative lesion of the skin and pyoderma caused by cement	0	2
	Eczema-like dermatitis confirmed by epicutaneous test caused by cement	1	1
15	Skin mycosis, no other specification	1	0
	Mycosis on hairless skin	3	0
	Mycosis on skin of scalp	0	0
	Mycosis on toes	0	0

Table		2002	2003
	Onycomycosis of the fingers	0	1
	Onychomycosis of the toes	1	0
16	Skin tuberculosis	0	0
	Skin lesions caused by mycobacterium marinum and fortuitum	1	0
20	Acute radiation dermatitis	0	0
	Chronic radiation dermatitis	0	0
21	Acute irritant dermal and epidermal skin disease caused by halogenated aliphatic hydrocarbons	0	0
	Chronic irritant dermal and epidermal skin disease caused by halogenated aliphatic hydrocarbons	0	0
25	Multiple papulo-pustular lesions caused by mineral or synthetic oil or grease	0	0
	Irritant dermatitis caused by mineral or synthetic oil or grease	0	2
	Eczema-like dermatitis confirmed by epicutaneous test caused by mineral or synthetic oil or grease	0	0
	Skin granuloma with giant-cell reaction caused by mineral or synthetic oil or grease	0	0
25 bis	Epithelioma of the skin caused by some oil compounds	0	0
26	Eczema-like dermatitis confirmed by epicutaneous test caused by chlorpromazine	0	0
28	Ulcerative skin lesions caused by formaldehyde	0	0
	Eczema-like dermatitis confirmed by epicutaneous test caused by formaldehyde	0	0
34	Ulcerative lesions of the nose caused by chromic acid, alkaline chromates or bichromates, zinc chromate or chromic sulfide	0	0
	Eczema-like dermatitis confirmed by epicutaneous test caused by chromic acid, alkaline chromates or bichromates, zinc chromate or chromic sulfide	0	0
35	Eczema-like dermatitis caused by coal tar pitch, coal tar, coal-derived oil and soot	0	0
	Phototoxic dermatitis caused by coal tar pitch, coal tar, coal-derived oil and soot	0	0
35 bis	Skin epithelioma caused by coal tar pitch, coal tar, coal-derived oil and soot	0	0
36	Eczema-like dermatitis confirmed by epicutaneous test caused by wood dusts	1	2
44	Allergic skin dermatitis caused by chemicals and confirmed by test	14	2
	Eczema-like dermatitis confirmed by epicutaneous test	40	36
	Contact urticaria caused by chemicals and confirmed by test	4	6
48	Dermatitis caused by organic solvants	0	0
	Eczema-like dermatitis confirmed by epicutaneous test caused by organic solvants	0	0

Table		2002	2003
51	Swine erysipelas (skin lesions)	1	4
	Swine erysipelas (skin lesion associated with other symptoms)	1	0
	Chronical swine erysipelas	0	0

Table 11: Occupational skin diseases in the general social security system

Table		2002	2003
Table N° 2	Eczema-like dermatitis confirmed by epicutaneous test caused by mercury or its compounds	0	0
Table N° 3	Dermatitis caused by tetrachloroethane	0	0
Table N° 5	Acute dermatitis caused by phosphorous or phosphorous sesquisulfide	0	0
	Chronic or eczema-like dermatitis caused by contact with phosphorous sesquisulfide	0	0
Table N° 6	Acute radiation dermatitis	0	0
	Chronic radiation dermatitis	1	1
Table N° 8	Ulcerative lesion of the skin and pyoderma caused by cement	0	0
	Eczema-like dermatitis confirmed by epicutaneous test caused by cement	95	148
	Ulcerative lesion of the skin and dermatitis caused by cement	149	58
Table N° 9	Porphyria cutanea tarda caused by hexachlorobenzene	0	0
	Acne caused by halogenated aromatic hydrocarbons	0	0
Table N° 10	Ulcerative lesions of the nose caused by chromic acid, alkaline chromates or bichromates, zinc chromate or chromic sulfide	10	7
	Eczema-like dermatitis confirmed by epicutaneous test caused by chromic acid, alkaline chromates or bichromates, zinc chromate or chromic sulfide	12	23
	Ulcerative lesions of the skin caused by chromic acid, alkaline chromates or bichromates, zinc chromate or chromic sulfide	31	7
	Mutiple health effects of which dermatitis	0	1
Table N° 11	Irritant dermatitis caused by carbon tetrachloride	0	
Table N° 12	Acute irritant dermal and epidermal skin disease caused by halogenated aliphatic hydrocarbons	2	6
	Chronic irritant dermal and epidermal skin disease caused by halogenated aliphatic hydrocarbons	1	1
Table N° 13	Chronic irritant or eczema-like dermatitis caused by nitro- or chloronitro- aromatic hydrocarbons	0	0
Table N° 14	Irritant dermatitis caused by nitro- or chlorophenol derivatives	1	1
Table N° 15	Irritant dermatitis caused by aromatic amines	7	5

Table		2002	2003
Table N° 15 bis	Eczema-like dermatitis confirmed by epicutaneous test caused by aromatic amines	36	32
Table N° 16	Eczema-like dermatitis caused by coal tar pitch, coal tar, coal-derived oil and soot	0	1
	Phototoxic dermatitis caused by coal tar pitch, coal tar, coal-derived oil and soot	0	0
Table N° 16 bis	Skin epithelioma caused by coal tar pitch, coal tar, coal-derived oil and soot	3	5
Table N° 18	Pustular dermatitis caused by Bacillus Anthracis	0	0
Table N° 19	Erythema chronicum migrans caused by Borellia burgdoferi	6	2
	Acrodermatitis chronica atrophicans caused by Borellia burgdoferi	0	0
Table N° 20	Irritant dermatitis caused by arsenic and arsenical mineral compounds	0	0
	Melanoderma caused by arsenic or arsenical mineral compounds	0	0
	Palm and sole dyskeratosis caused by arsenic or arsenical mineral compounds	0	0
	Skin epithelioma caused by arsenic or arsenical mineral compounds	0	0
	Bowen's disease caused by arsenic or arsenical mineral compounds	0	0
Table N° 24	Skin allergy caused by Brucella	0	0
Table N° 25	Scleroderma caused by silica	10	9
Table N° 31	Eczema-like dermatitis confirmed by epicutaneous test caused by aminoglycosides (steptomycine, neomycine)	0	0
Table N° 32	Dermatitis caused by fluorine or fluorhydric acid	0	0
	Chemical burns caused by fluorine or fluorhydric acid	1	1
Table N° 33	Dermatitis caused by beryllium or beryllium compounds	0	0
Table N° 36	Eczema-like dermatitis confirmed by epicutaneous test caused by mineral or synthetic oil or grease	114	110
	Irritant dermatitis caused by mineral or synthetic oil or grease	7	19
	Multiple papulo-pustular lesions caused by mineral or synthetic oil or grease	7	4
	Skin granuloma with giant-cell reaction caused by mineral or synthetic oil or grease	0	1
Table N° 36 bis	Epithelioma of the skin caused by some oil compounds	1	3
Table N° 37	Eczema-like dermatitis confirmed by epicutaneous test caused by nickel or nickel oxides	55	38
Table N° 38	Eczema-like dermatitis confirmed by epicutaneous test caused by chlorpromazine	0	0
Table N° 40	Skin tuberculosis	4	0

Table		2002	2003
	Ulcerative skin infections caused by M. Tuberculosis	1	0
Table N° 41	Eczema-like dermatitis confirmed by epicutaneous test caused by beta lactams or cephalosporin	0	1
Table N° 43	Eczema-like dermatitis confirmed by epicutaneous test caused by formaldehyde	12	12
	Ulcerative skin lesions caused by formaldehyde	0	1
Table N° 46	Mycosis on hairless skin	5	6
	Mycosis on skin of scalp	1	1
	Mycosis on toes	1	2
	Mycosis (multiple localisations)	1	0
Table N° 47	Eczema-like dermatitis confirmed by epicutaneous test caused by wood dusts	16	9
Table N° 49	Eczema-like dermatitis confirmed by epicutaneous test caused by aliphatic, alicyclic amines or ethanolamines	11	11
Table N° 50	Eczema-like dermatitis confirmed by epicutaneous test caused by phenyhydrazine	0	0
Table N° 51	Eczema-like dermatitis confirmed by epicutaneous test caused by epoxy resins	89	69
Table N° 62	Eczema-like dermatitis confirmed by epicutaneous test caused by isocyanates	12	12
Table N° 63	Eczema-like dermatitis confirmed by epicutaneous test caused by enzymes	2	0
	Skin ulceration caused by enzymes	0	0
Table N° 65	Allergic eczema-like dermatitis caused by different chemical substances, plants or substances of vegetal origin	530	566
Table N° 70	Eczema-like dermatitis confirmed by epicutaneous test caused by cobalt or cobalt compounds	0	0
Table N° 73	Eczema-like dermatitis caused by antimony or antimony compounds	0	2
Table N° 74	Eczema-like dermatitis confirmed by epicutaneous test caused by furfural or furfurilic alcohol	0	0
Table N° 75	Skin burns or irritations caused by selenium or selenium mineral compounds	0	0
Table N° 76	Infectious felon	6	4
	Pseudomonas Aeruginosa infection (skin localisation)	1	2
	Erysipelas	0	1
	Gonococcal keratosis	0	0
	Skin lesion caused by treponema	0	0
	Zoster	1	0
	Scabies	51	90
Table N° 77	Onycomycosis of the fingers	0	9

Table		2002	2003
	Onycomycosis of the toes	0	0
Table N° 78	Skin ulcerations caused by sodium chloride (mines)	0	0
Table N° 82	Eczema-like dermatitis confirmed by epicutaneous test caused by methyl methacrylate	9	8
Table N° 84	Eczema-like dermatitis confirmed by epicutaneous test caused by organic solvants	53	46
	Dermatitis caused by organic solvants	28	22
Table N° 88	Swine erysipelas (skin lesions)	12	9
	Swine erysipelas (skin lesion associated with other symptoms)	0	2
	Chronical swine erysipelas	0	0
Table N° 95	Eczema-like dermatitis confirmed by epicutaneous test caused by latex proteins	39	32
	Urticaria caused by latex proteins	23	16
	Giant urticaria caused by latex proteins	5	7

Other data: studies

INRS carries out number of studies in the field of occupational safety and health. Some of them concern skin protection or absorption of occupational chemicals through the skin. Some examples of the most recent studies are listed below with the title of the study, the laboratory in charge of it at the INRS Centre in Lorraine, the name of the author(s) and a summary.

Using three-dimensional solubility parameters to define a predictive tool for choosing polymer materials to ensure cutaneous protection of the hands

Study managed by the 'Process engineering' division: author: Chollot, A.

The aim of this study is to design a way to pre-select appropriate materials that will ensure adequate cutaneous protection of the hands. This should then be assessed on the basis of real tests. Preferably, it will be conducted in partnership with another Research Institute. Experimental data should be compiled that allow the calculation of the Hansen three-dimensional solubility parameters of the polymers used for protective gloves: after the calculation model has been validated, this data will allow the centre of the solubility sphere of the polymer under question to be defined.

Use of the data collected (after the calculation software has been defined and validated) and development of a predictive tool should allow the rapid exclusion of unsuitable materials and the choice of polymers with an 'acceptable' resistance.

Study of the resistance of protective gloves against chemical substances, particularly glycol ethers — Second part

Study managed by the 'Process engineering' division: author: Chollot, A.

This study is a continuation of the study A.7/1.035 and aims to conduct tests to measure the permeance of personal protective gloves against certain glycol ethers: DPGME, EGPhE, 2PGME, 2PG1BE, EGBEA and DEGBEA. The test rig developed during the preceding study will be used, but an analytical development phase will be necessary (liquid collector medium). This study will complete the determination of the permeance of gloves in relation to the chemical family of glycol ethers.

Study of the percutaneous penetration of bisphenol-A *in vivo* and *ex vivo* in rats

Study managed by the 'Pollutants and health' division: authors: Marquet, F., Payan J. P.

Bisphenol-A is an industrial and environmental contaminant included in the third list of priority substances (European Chemicals Bureau, 1997). About 700 000 tons are used each year in Europe. The two main uses of bisphenol-A are the synthesis of polycarbonates and of epoxy resins. Several thousand workers are potentially exposed by way of inhalation and/or the skin when handling this product. Bisphenol-A is a cutaneous sensitiser and can cause allergies when PVC gloves containing it are worn. The substance is classified as a category 3 in regard to its fertility toxicity among laboratory animals. When administered orally, bisphenol-A is intensely and rapidly absorbed. The major part is excreted in the faeces in an unchanged form, and to a lesser degree in the urine in glucuroconjugated form. Although the skin is the second route of occupational exposure after inhalation, only one study (results not published) has been carried out ex vivo with dermatomed human skin. About 10 % of the dose deposited (5 and 50 mg/cm3) may have been absorbed. However, a considerable fraction of the dose was present at dermis level, suggesting a skin reservoir effect.

This study is intended to determine, for bisphenol-A:

- the intensity of absorption flux *in vivo* and *ex vivo* in rats;
- any percutaneous metabolism;
- any skin reservoir effect.

The results will allow a better estimation of the risk linked to exposure via the skin. They will be forwarded for publication in an international journal.

Percutaneous microdialysis: percutaneous transfer of 2-butoxyethanol, pyrene and di-n-butylphthalate *in vivo* in rats

Study managed by the 'Pollutants and health' division: author: Marquet, F.

The potential of substances to penetrate the body via the skin is often poorly understood as data are very difficult or even impossible to obtain *in vivo* in humans. The data available at the present time have been obtained either by *in vitro* or *ex vivo* methods in humans, or *in vivo* and *ex vivo* in animals. A technique adapted from neurophysiology has been gaining ground for some 10 years in the study of percutaneous transfer, namely percutaneous microdialysis. The advantages of this technique are that it is not greatly invasive, it allows an estimation of the intensity of cutaneous metabolism, and it reduces the number of animals used.

The present study is intended to acquire and employ this technique in the laboratory. Experiments will be undertaken *in vivo* in rats using three substances for which we have the results obtained by other techniques: 2-butoxyethanol, pyrene and di-n-butylphthalate. The protocol used will be modelled on that used by a team from the University of Erlangen-Nürnberg to study two of these molecules (2-butoxyethanol and pyrene) among volunteers. Microdialysis should also yield more information concerning the dermal metabolism of the products tested.

The results of this study will be put forward for publication in an international review covering percutaneous passage and metabolism.

Study of the percutaneous penetration of naphthalene *in vivo* and *ex vivo* in rats

Study managed by the 'Pollutants and health' division: authors: Beydon, D., Payan, J. P.

Naphthalene is a solid industrial and environmental contaminant that can be sublimated. It is included in the first list of priority substances (European Chemicals Bureau, 1997). About 140 000 tons are used each year in Europe. Naphthalene is used to synthesise

phthalic anhydride and in the manufacture of colorants, paints and mothballs. Workers can be exposed by inhalation and via the skin. Naphthalene is carcinogenous in rats (category 3 of the European classification) and causes haemolytic anemias in humans and laboratory animals. Naphthalene is absorbed intensely when administered by ingestion and is excreted in the urine primarily in the form of metabolites. Although the skin is the second route of occupational exposure after inhalation, data on the skin transit of this compound are limited. This study is intended to determine:

- the intensity of absorption flux *in vivo* and *ex vivo* in rats;
- any percutaneous metabolism;
- any skin reservoir effect.

The result will allow a better estimation of the risk linked to exposure to the substance via the skin. They will be forwarded for publication in an international journal.

Methodological study to verify the integrity and viability of *in vitro* skin samples

Study managed by the 'Pollutants and health' division: authors: Payan, J. P., Beydon D.

Within the context of the European project 'Assessment and prediction of the dermal absorption of toxic chemical compounds' (Edetox), considerable inter-laboratory variation has been observed in the *in vitro* dermal absorption flux for three reference molecules (caffeine, testosterone, benzoic acid), with these variations primarily linked to the nature of the skin samples used. To limit this skin sampling problem, it has been decided to check systematically the integrity and the viability of skin samples during *in vitro* percutaneous absorption flux studies.

The aim of this study is to compare the different methods intended to verify the integrity and viability of skin samples. The methods most suited to our operating modes will be validated and then used routinely during *in vitro* percutaneous absorption flux studies.

In vitro percutaneous passage of dimethylformamide: iInfluence of the hygroscopic property of the molecule

Study managed by the 'Pollutants and health' division: authors: Payan, J. P., Beydon D.

Numerous industrial toxic substances penetrate into the body mainly via the skin. Determination of the absorption flux can be influenced by factors intrinsic (solubility in water and/or lipids, molecular weight or volatility) or extrinsic (ambient humidity, temperature, occlusion, quantity deposited or solvent used for depositing a solid) to the product studied. Knowledge of the influence of these factors on the percutaneous transfer of toxic substances allows for a better estimation of the risk linked to this exposure path. The two main parameters characterising the intensity of the percutaneous absorption of a compound are: the absorption flux obtained at equilibrium, and the time taken to reach this state. These parameters are determined after dermal application of a quantity termed 'infinite' of the compound. However, it has recently been demonstrated that after dermal deposit of very large amounts of N-methylpyrrolidone, no balanced state of absorption flux was reached with rat skin *in vitro*. In addition, the maximum absorption flux was greatly underestimated for the 'infinite' doses normally used in the literature. These results were put down to the ability of the molecules to absorb water (hygroscopic property) (Study B.5/1.025: *in vitro* percutaneous transfer of N-methylpyrrolidone). Dimethylformamide (DMF) is a hygroscopic liquid with physico-chemical properties close to N-methylpyrrolidone. It is used as an industrial solvent in the production of fibres and pharmaceuticals. The dermal absorption flux in humans is considerable (10 mg/cm^2/h). During a previous study (B.3/1.035: Percutaneous absorption of industrial toxic substances: methodological study), no state of *in vitro* absorption flux equilibrium was observed for a high dose of

DMF. Moreover, the aim of this study is to determine whether the hygroscopic property of this compound can influence its rate of percutaneous transfer.

This study will be carried out *in vitro* with the skin of Sprague-Dawley rats.

If the hypothesis is confirmed, the results will be put forward for publication in a scientific journal. They should allow the definition of a protocol for the percutaneous transfer of hygroscopic liquids.

Documents pour le Médecin de Travail is a journal published by INRS (National Research and Safety Institute) since 1973. It seeks to give occupational physicians the technical, legal and medical information that can help them to perform their task.

In the course of time, the journal's content has expanded and developed in line with changes in European health and safety principles, focusing in particular on risk assessment and prevention. At the same time, the editorial team has tried to keep up with current concerns of occupational physicians, even anticipating them by publishing reports on emerging risks. Last but not least, by publishing field reports (most often led by groups of occupational physicians or multidisciplinary groups in SMEs), INRS has sought to foster knowledge-sharing.

One of its sections is dedicated to occupational skin diseases, the 'Occupational allergo-dermatology sheets' deal with main hazards of occupational skin diseases and their prevention. Thirty six documents have been published since 1980. The titles of the latest sheets are:
Occupational dermatitis to plants
Occupational dermatitis to detergents
Occupational dermatitis to dyes
Occupational dermatitis in food industry and food processing
Photo-sensitisation, skin cancers and occupational exposure to ultraviolet radiations.

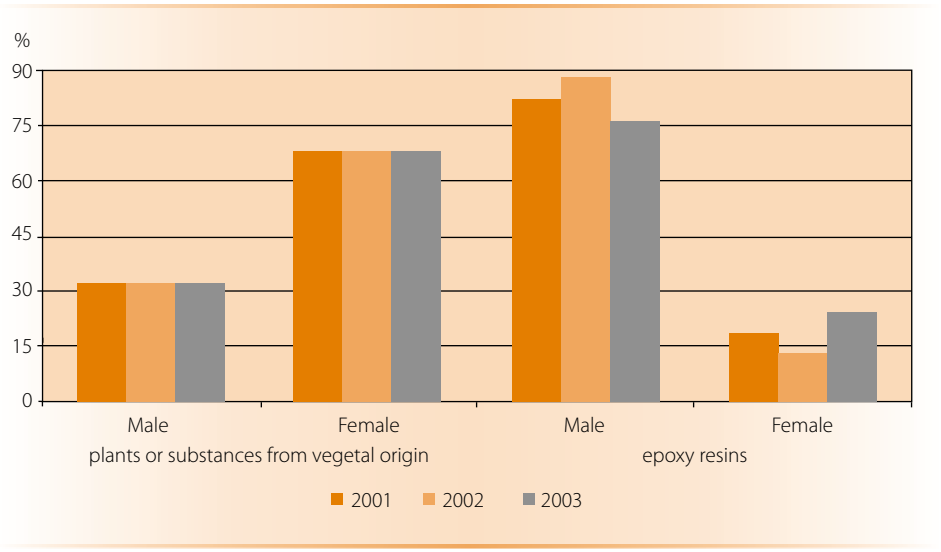
Other contacts

GERDA is an association of dermatologists and occupational physicians. It produces training and information on skin diseases (general and occupational). Its website address is: http://www.gerda-assoc.com

Table 12: Allergic eczema-like dermatitis caused by different chemical substances, plants or substances from vegetal origin, number of recognised cases

By occupation	2001	%T	2002	%T	2003	%T
Managers	1	0	0	0	0	0
Professionals	3	1	3	1	3	1
Technicians and associate professionals	8	3	6	2	17	5
Clerks	3	1	3	1	5	1
Service workers, shop and market sales workers	145	48	168	46	149	41
Agricultural workers	1	0	2	1	1	0
Craft and related trades workers	56	18	80	22	74	20
Plant and machine operators and assemblers	23	8	31	8	36	10
Elementary occupations	64	21	72	20	79	22
Total	304	100	365	100	364	100

Figure 5: Allergic eczema-like dermatitis caused by different chemical substances, plants or substances from vegetal origin and by epoxy resins — Percentage of recognised cases



Source: National statistics of occupational accidents and diseases and commuting accidents

9. Collected data regarding Germany

1. Legislation (international, EU, national-regional-local, governmental written policy/charter)

The European Directive 98/24/EC and further European OSH directives relating to dangerous substances were implemented in German law through the Verordnung zum Schutz vor Gefahrstoffen (GefStoffV). According to this regulation, dangerous substances are substances and preparations (*Zubereitungen*) that may also have an impact on the skin (i.e. are corrosive, irritating, sensitising, toxic substances that are absorbed via the skin, or have damaging effect for the skin through chronic exposure — aqueous solutions or fibreglass). The dermal exposure is evaluated separately in the risk assessment according to provisions of §7 GefStoff V. Appropriate protection measures are chosen after the risk assessment. The GefStoffV (dated 23 December 2005) regulates occupational-medical health examinations for wet work (defined as exposure to risk for more than four hours per day) and exposure to uncured epoxy resins. Every employee must be advised of the hazards.

The Arbeitsschutzgesetz — transposition of EU Directive 90/679/EEC, as well as BioStoffV (Verordnung über Sicherheit und Gesundheit bei Tätigkeiten mit biologischen Arbeitsstoffen) deal with the risks resulting from the effects of biological substances on the skin. In case of exposure, occupational medical advice is required.

The PSA-Benutzerverordnung is the national transposition of the European Framework Directive 89/391/EEC and EU Directive 89/656/EEC (personal protective equipment). European norms (e.g. DIN EN 374, DIN EN 455) are taken into account with regard to the choice and the assessment of protective gloves.

A system of technical rules specifies the GefStoffV and the BioStoffV. Different TRGS (Technische Regel für gefährliche Stoffe) relate to different topics: TRGS 401 — dermal exposure (including the former TRGS 150 — skin-absorbable substances and the TRGS 531 — wet work) and TRGS 540 — sensitising substances. The TRGS 530 is specifically occupation-related (hairdressers) with information on skin diseases and skin protection. The TRGS 613 specifies the reduction of chromate in cement (according to Directive 76/769/EEC). The TRGS 220 (safety data sheets) states the demand to provide further information on appropriate safety gloves (if dermal exposure is possible).

Within the BioStoffV, different technical rules for biological substances (TRBA) relate to dermal exposure to infections and skin protection in different industries (like waste industry, healthcare or laboratories).

The German Berufskrankheitenverordnung (BKV) regulates occupational diseases. Annex I of this regulation lists diseases caused by the resorption of dangerous substances in Part I (diseases caused by chemical impacts). Part III (Nos 3101, 3102, 3104) covers infectious diseases (transmission human to human, animal to human, tropical diseases), while Part V of the Annex lists important skin diseases (severe or repeated diseases which lead to a change of job, BK-No 5101). Skin cancer due to the exposure to ionising radiation is included in Part II, BK-No 2402.

2. Collective practices (guidelines, recommendations, actions/initiatives/programmes/solutions, agreements between social partners, and sectors)

The German statutory accident insurer (Berufsgenossenschaften) is responsible for compensation as well as playing a role in preventing occupational accidents and diseases. The Berufsgenossenschaften developed a comprehensive body of rules relating to the prevention of skin diseases and skin protection (partly industry-related).

In 2003, a working group of the Berufsgenossenschaften developed recommendations for the occupational disease No 5101 (Blome et al, 2003).

Since 1972 the Berufsgenossenschaften has supported the identification of occupational skin diseases through early identification of work-related skin diseases (so-called *Hautarztverfahren*). Every physician who diagnoses a work-related skin disease must send the patient to a dermatologist. If the dermatologist confirms the suspicion, he must send a report to the Berufsgenossenschaften. Ongoing improvements to this system allow for early intervention, better secondary prevention and more effective adaptation by the accident insurances (John, 2003).

Furthermore, specialists have developed guidelines for the diagnosis, and the expertise in the occupational skin protection.

3. Main risks (chemical, biological, physical) and related sectors, activities and jobs

Chemical risk factors

The occupations most at risk are:

- hairdressers (allergens in chemical products for hairdressers, irritants in washing agents and wet work);
- healthcare (wet work, use of protective gloves, allergens in disinfectants, medications and fragrances);
- the construction sector (chromate, cobalt, epoxy resins and rubber);
- metal workers (allergens and irritants in coolants, metals);
- the cleaning sector (wet work, allergens in disinfectants and cleaning agents, protective gloves);
- food sector (allergens in food, wet work).

(Plinske et al, 2006).

TRGS 540 contains a comprehensive list of allergens.

Biological risk factors

The BioStoffV applies to biological risk factors — micro-organisms or viruses that cause infections, allergies or have toxic effects. Infectious diseases of the skin can be transmitted from animals to human beings (e.g. mycoses like trichphytosis or microsporum infection, erysipelas and other diseases) and occur in professions related to agriculture, veterinary medicine or slaughtering. The person-to-person transmission occurs in healthcare, geriatric care or childcare (e.g. mycoses, impetigo, scabies or herpes).

Biological materials/agents according to the dangerous substances ordinance are plant or animal components which cause allergies (e.g. Sesqiterpenlactone in composite plants, allergens in wood, proteins in natural latex, proteins in animal hairs and body fluids of animals). The TRGS 540 and TRGS 907 provide information on these aspects.

Physical risk factors

These risk factors represent only a small part in the German occupational diseases statistics.

Dermatitis caused by glass fibres occurs in the construction industry and in conjunction with handling of epoxy resins.

Skin cancer due to ionising radiation (only individual cases) is considered to be an occupational disease (BK 2402). Non-ionising radiation (mostly UV radiation) in combination with soot, tar or pitch could also have an effect on skin (BK 5102). Up to now skin cancer due to UV light has not been recognised as an occupational disease in BKV and is accepted only in particular cases.

Cold, heat, pressure and friction sometimes lead to skin alteration. These factors are not apprehended statistically. Vibration tools can induce sklerodermal efects (BK 2104). Chlore acne (e.g. by dioxines) is a specific effect (BK 1310 or BK 1311) whereas oil acne is a general occupational disease (BK 5101 — if the employee has to resign his/her job) (Zober, 1994).

4. Levels of recognition of occupational skin diseases and dermal exposure

The German list of occupational diseases is an attachment of the Berufskrankheitenverordnung (BKV) of 31 October 1997. New scientific expertise and knowledge has made an extension possible. The BKV of 1929 already contained skin diseases due to galvanisation, exposure to exotic wood and skin cancer caused by exposure to soot, tar or paraffin. Since 1937, the BKV has contained skin diseases as severe and repeated recividous occupational skin diseases can lead to patients being forced to leave their job. This case/definition points out that other conditions have to be considered in the context of occupational diseases, and not only the occupational disease itself. The Bundesanstalt für Arbeitsschutz und Arbeitsmedizin (BAuA) publishes a report on occupational diseases every year (BMAS/BAuA, 2006). The Berufsgenossenschaften (statutory accident insurer) maintains statistics on reported, recognised and compensated occupational diseases. They also have information about occupational skin diseases which are not recognised because they do not meet the legal conditions. The agents and their impacts on skin diseases are analysed, but the relevance of the causative factors cannot always be analysed (www.hvbg.de/ziguv).

The 'Informationsverbund Dermatologische Kliniken' (IVDK) of the University of Göttingen analyses the results of patch tests taken in dermal clinics and publishes articles on that topic (Uter et al., 1998). The relevance of the results is not always clear or certain and it is difficult to draw conclusions in relation to the diffusion of allergens at the work. Branch-related analysis is carried out and the IVDK recommends profession-related tests (www.ivdk.gwdg.de).

5. Methods of collecting data on the occurrence and prevalence of skin diseases

There is no data collection available for the distribution of allergens at the workplaces. The Berufsgenossenschaften carry out analysis exposure in particular cases but the relevance of patch tests and the analysis of exposure in individual cases is often difficult to assess and may be incomplete.

The BAuA has published reports about databases (regarding the regional register of North-Bavaria and the data of the IVDK), and on the relationship between sentisitation and work-related and individual factors (Dickel et al., 2001, Uter, 2002).

The Berufsgenossenschaften has established information and training programmes for employees with skin problems (especially for hairdressers, healthcare workers, bakers and confectioners, and metal workers). The persons concerned are trained in the handling of substances and their impact on the skin, the use of skin protection as well as the risks at the workplace (Schwanitz, 1996).

Different authors have drafted an overview on the improvement of knowledge about occupational exposition on allergens (Diepgen, et al., 2005).

Different methods can be used for the assessment of the impact of allergens:

(a) estimations based on animal experiments (e.g. local lymph node assay, LLNA) (Akkan et al., 2004);

(b) grouping based on observations (human-beings, animal experiments) (Schlede et al., 2003).

Table 13: Percentage of skin irritation, itching during/after work — by occupation

Skin irritation, itching during/ after work? Occupations in	1998/99	2005/06
Agriculture	4.5	12.2
Production, miners, mineral miners	5.6	13.4
Construction	5.6	12.8
Technical occupation	2.6	5.2
Traders	1.4	4.1
Transport	2.1	7.0
Administration, in offices	1.4	4.4
Services	3.4	9.9
Others		3.5
Total	3.3	8.2

Source: BIBB/IAB surveys 1998/99 and 2005/06.

6. Are skin problems considered as a high priority risk?

Since the 1980s, the number of notifications of skin diseases has been increasing continuously (1992: 24 056 suspected cases). Skin diseases and noise trauma were the most frequent work-related diseases. This, in conjunction with the high costs for

rehabilitation and compensation in relation to skin diseases, has ensured that tackling these diseases has become a high priority.

Changing jobs often means social and financial problems for the persons concerned. Therefore, the prevention of skin diseases is of major impotrance for the Federal Ministry of Labour and Social Affairs (BMAS), the Hauptverband der Berufsgenossenschaften (HVBG), the different branch-related organisations (Berufsgenossenschaften) and the organisation responsible for health insurances. In 2007, the HVBG, the BUK (Bundesunfallkassen) the AOK (Allgemeine Ortskrankenkassen) and the Betrieblichen Krankenkassen (BBK) launched the national campaign 'Healthy skin' ('*Gesunde Haut*', see www.hvbg.de).

In the last few years, the number of notifications has notisably decreased.

7. Main results and success factors

Intensive measures, including information and training programmes have led to a decrease in the number of notifications and recognitions of occupational skin diseases (1992: 24 056 cases; 2004: 16 165 cases) (BMAS/BAuA, 2006).

The success is especially noticeable in the hairdressing and healthcare sectors. The allergen used in acid permanent waves (*Glycerylmonothioglykolat*) was substituted and, in healthcare, latex gloves were substituted with non-latex gloves or non-powdered latex gloves. As a result, the number of skin diseases due to these allergens has decreased significantly.

The awareness of occupational skin diseases, their causes and consequences has increased among both employees and employers, following information and training (Schwanitz, 1996, Uter, 1999).

Success due to the reduction of chromate in concrete, additional information on skin protection in safety sheets, investigations into skin protection efficiency (e.g. guidelines for skin protection and prevention guidelines provided by the Berufsgenossenschaften) or optimised healthcare procedures is only visible on a long term basis.

Transferring the content of different technical rules could also be useful for other countries, especially the rule on wet work, which has attracted attention throughout Europe. This process could be carried forward by the diffusion of the TRGS 401 '*Gefährdung durch Hautkontakt*' (risks due to skin contact).

Training and intervention programmes like those of the Berufsgenossenschaften or the results of research projects (Universities of Osnabrück, Heidelberg and Jena) could also be used as a best practice example (Schwanitz, 1996, Weishhaar, 2005).

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- Laws and regulation in relation to biological substances:
  http://www.baua.de/de/Themen-von-A-Z/Biologische-Arbeitsstoffe/Biologische-Arbeitsstoffe.html__nnn=true
- Occupational diseases law:
  http://www.baua.de/nn_5846/de/Themen-von-A-Z/Berufskrankheiten/Rechtsgrundlagen/BKV__content.html__nnn=true
- Medical guidelines:
  http://www.leitlinien.de/

10. Collected data regarding Greece

1. Legislation (iternational, EU, national-regional-local, governmental written policy/charter)

1.1. Skin diseases

The Article 40 of the Social Insurance Institute's Regulation about the recognised occupational diseases is in effect. This regulation is applicable to a large part of the private sector of the economy (IKA — http://www.ika.gr/en/home.cfm).

According to Article 40, recognised occupational skin diseases include:

1. skin ulceration and eczema (-like) dermatitis caused by the effect of chromic acid, chromic and bi-chromic alkaloids
2. skin diseases caused by exposure to anhydrides of sulfite and sulfuric acid
3. dermatitis caused by chloroethylene
4. skin diseases, melanodermia, hyperkeratosis of hands and soles, hair loss and ablation, alteration of nails caused by exposure to arsenic
5. dermatitis from exposure to nitro-, amine- and chloro-products of benzol and homologous compounds
6. skin irritation caused by carbon tetrachloride
7. subcutaneous cellulites or bursitis of the wrist, knee or elbow joint caused by pressure and friction
8. chronic radiation dermatitis caused by exposure in ionised radiation
9. primary and secondary dermatitis
10. primary epithelioma of the skin.

However, a generalised insurance legislation for those who are insured with another fund, such as Agriculture, Fishery or Public Service does not exist.

Source: Athena Linos (Department of Hygiene and Epidemiology, Medical School, University of Athens, e-mail).

The Social Insurance Institute (IKA) is the largest social security organisation. It covers almost all employees in the private sector in Greece — 5 530 000 workers and employees — and provides retirement benefits for 830 000 pensioners. This means that the relevant statistical data collected through the years provides a reliable picture of the couses of accidents at work, in respect to the development of workforce.

Source: http://gr.osha.europa.eu/statistics (IKA.pdf)

Today, the Greek labour legislation comprises more than 100 occupational safety and health statutes, including laws, decrees and decisions, which are binding in nature. The regulations apply to both organisational and technical measures. They can be divided into:

(a) general statutes that apply to all enterprises of the public or private sector, regardless of the economic activity and of the number of employees; and

(b) specific statutes that focus on specific occupational safety and health aspects.

Source: http://gr.osha.europa.eu/legislation/index.stm#1

Greek legislation on health and safety at work: http://gr.osha.eu.int/legislation/legislation_table.htm (this table lists all legislation relevant to health and safety, but does not provide any indication as to which sections apply to dermal exposure or occupational skin diseases)

1.2. Dermal exposure

Implemented EU directives

Council Directive 89/391/EEC — on the introduction of measures to encourage improvements in the safety and health of workers at work.

Council Directive 91/383/EEC — supplementing the measures to encourage improvements in the safety and health at work of workers with a fixed- duration employment relationship or a temporary employment relationship.

Council Directive 89/654/EEC — concerning the minimum safety and health requirements for the workplace (first individual directive within the meaning of Article 16(1) of Directive 89/391/EEC.

National legislation concerning workers' health protection and prevention of occupational diseases in general

National Law 1568/85: health and safety of workers

Article 10: surveillance of workers' health.

Article 26: preventive measures for the personnel exposed to dangerous agents at work.

Article 27: medical inspection for personnel exposed to dangerous agents at work.

Presidential Decree 17/96: introduction of measures to encourage improvements for the safety and health of workers.

Article 4: protective and preventive services.

Article 8: written occupational risk evaluation.

2. Collective practices (guidelines, recommendations, actions/initiatives/programmes/solutions, agreements between social partners, and sectors)

Collective practices by the following institutions:

- **Hellenic Institute for Occupational Health and Safety** — a non-profit organisation, founded by and representing the country's most significant social organisations: the Association of the Greek Industries, S.E.V. and the Hellenic Trade Unions Confederation (GE.S.E.E.).

  Web: http://www.elinyae.gr/el/index.jsp (GR)/http://www.elinyae.gr/en/index.jsp (EN).

- External Protective and Preventive Services (according to the Presidential Decree 17/96).

  Web: http://gr.osha.europa.eu/systems.

- Internal Protective and Preventive Services (within enterprises and organisations, according to Presidential Decree 17/96).

3. Levels of recognition of occupational skin diseases and dermal exposure

In Greece, statistical reporting of injuries or diseases due to dangerous substances is not undertaken on a permanent basis, but there have been a few systematic surveys that show the extent and level of exposure. While there is a wide range of potential risks because of the sheer variety of dangerous substances and industrial processes, the main problems relate to the nature of the activity and the size of the enterprise.

Source: http://osha.europa.eu/publications/magazine/6 (Reppas 2003.pdf).

The main national statistics relating to employment and occupational ill-health are as follows: of the economically active population, 3 900 000 (19.8 %) are employed in the primary sector, 22.5 % work in the secondary sector and 57.7 % work in the tertiary sectors, mostly in small- and medium-sized enterprises (SMEs). Dangerous occurrences are not recorded.

Cases of occupational diseases are diagnosed sporadically, but no cumulative data is compiled; essentially, only data regarding occupational disorders of the lung (and occasionally of the skin) is sought and confirmed. Since 1979, a list exists of 52 diseases that attracted compensation. Many doctors frequently underestimate the importance of occupational history when diagnosing health disorders, no cause-specific analysis of early retirement due to occupational or non-occupational grounds is made. Mortality is not analysed by occupation.

Source: http://joh.med.uoeh-u.ac.jp/pdf/E43/E43_3_09.pdf (Bazas 2001.pdf).

Statistics published by the Ministry of Labour are based on occupational accidents reported to the local inspectorates of work under different decrees regarding health and safety at work. The purpose of the official occupational-disease report is both prevention and research.

Source: http://www.occuphealth.fi/NR/rdonlyres/C90B553E-82C7-482B-AD65-04C577490DC3/0/GR002.pdf (Haste II.pdf).

Officially recognised skin diseases and statistics data available from the Social Insurance Institute

According to Article 40 of the 'Disease Regulation' of the Social Insurance Institute, *Government Gazette Issue*, No Φ.E.K. A'/12Φ/1979, Group IV: occupational skin diseases.

Articles:

Primary care and pattern of skin diseases in a Mediterranean island (not work-related)

Background: in those parts of Greece where primary healthcare services are not fully developed, patients with simple or minor conditions must go to hospitals to be treated. We analysed the data of patients with cutaneous disorders attending the tertiary referral hospital on the island of Crete, in order to identify the most common conditions that patients complain of and to define the areas of dermatology where the education of general practitioners must focus.

Methods: all patients attending the dermatology ambulatory office in the emergency department of the University General Hospital of Heraklion from January 2003 to December 2003 were included in this retrospective analysis. The medical records of the patients (history, physical examination and laboratory investigations) were analysed to

ascertain the diagnosis and the management of cases. All patients were evaluated by qualified dermatologists.

Results: a total of 3 715 patients attended the dermatology clinic. Most patients were young adults aged between 21 and 40 years (38.4 %), and the male to female ratio was 1 to 1.2. Allergic skin diseases, mostly dermatitis and urticaria (35.7 %) were the most common reason for attendance, followed by infectious diseases (26.1 %) and insect bites (10.2 %). Inflammatory and auto-immune disorders accounted for 7.9 % of the cases. Pruritus of unknown origin was diagnosed in 6.3 % of patients. Skin tumours were detected in 2.7 % of patients. The management of the vast majority of cases (85.0 %) consisted of advice with or without a prescription, while only 4.8 % of patients required admission.

Conclusion: allergic and infectious skin diseases were the most common cutaneous diseases in patients attending this tertiary university hospital, while the management of most patients did not require specialised care. On the basis of the present data, the training of primary healthcare providers in dermatology should emphasize these common conditions, with the aim of improving primary care and alleviating the burden on hospital care.

Figures and tables.

Age distribution of all patients who attended the dermatology ambulatory office in a year.

Monthly distribution of all patients who attended the dermatology ambulatory office in relation to gender.

Seasonal relative frequency of the most common skin disorders.

Distribution of cases in relation to the type of skin disorder, are available at the web page.

Source: http://www.biomedcentral.com/content/pdf/1471-2296-7-6.pdf (Symvoulakis 2006.pdf).

5. Methods

5.1. Methods of collecting data on the occurrence and prevalence of skin diseases

Notification of occupational diseases to the Labour Inspectorate: according to National Law 1568/85 Article 10 paragraph 4, the occupational physician reports occupational diseases or work-related diseases to the Labour Inspectorate.

5.2. Methods of assessing the risks of dermal exposure

External protective and preventive services.

Internal Protective and Preventive Services (in enterprises and organisations).

The positive results of patch test for thimerosal in Greece [1]

Background: 895 patients (366 male, 524 female) with suspected contact dermatitis were patch-tested with the European standard series, plus thimerosal 0.1 % pet., and ammoniated mercury 1 % pet., between November 1997 and May 1999.

Results: 68 of the 890 patients tested (7.6 %) reacted to thimerosal.

Discussion: thimerosal is one of the commonest contact allergens in Greece, as well as in other countries.

Trends in the results of patch testing to standard allergens over the period 1984–95 [2]

Background: from 1984 to 1995, 4567 patients (2 208 male, 2 359 female) with suspected contact dermatitis had patch tests done with the European standard series.

Results: the three most common allergens in males were metals (chromate, cobalt, nickel), thiuram mix and fragrance compounds (fragrance mix, balsam of Peru) and, in females, metals, fragrance compounds and PPD.

Trends: over 12 years there has been an increase in positive patch tests to nickel and PPD PTBPF resin (only females), an increase in sensitivity to colophony and carba mix (only males) and an increase in positive reactions to balsam of Peru, fragrance mix and formaldehyde (both male and female). However, sensitivity to benzocaine and primin has become less prevalent.

Trends in allergic contact dermatitis and preventive measures among cement workers (1985–99) [3]

Background: the objective of this study was to determine the frequency of allergic contact dermatitis among patients working with cement, to identify the most common allergens involved and to examine the preventive measures that such workers used during the period 1985–99. Patch tests were carried out on 904 cement workers with a history of eczema during that period, using the European standard series.

Results: potassium dichromate was the commonest allergen identified (84 % of positive patients). Cobalt chloride (38 %) and thiuram mix (37 %), coexisting with chromate allergy, were the next most common allergens. Chronic dermatitis was localised mainly on the hands and occasionally on the feet in 77 % of cement workers, while in 23 % the rash was widespread. There has also been a statistically significant improvement in the uptake of preventive measures among cement workers in the construction industry between the periods 1985–87 and 1997–99.

Table 14: Recorded cases of allergic contact dermatitis by occupation

Occupation	Year		
	2003	2004	2005
Unknown	1	1	–
Technicians and associate professionals	–	0	0
Service workers and shop and market sales workers	0	–	–
Craft and related trades workers	3	4	5
Plant and machine operators and assemblers	1	0	0
Elementary occupations	7	4	6
Total	12	9	11

Source: I.K.A. (2003–05).

6. References

Main references

Ministry of Employment and Social Protection
General Directorate of Working Conditions and Health
Internet: http://www.ypakp.gr
E-mail: grhsa@otenet.gr

Labour Inspectorate
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Social Insurance Institute (IKA)
Internet: http://www.ika.gr (GR)
http://www.ika.gr/en/home.cfm (EN)

Hellenic Institute for Occupational Health and Safety (Elinyae)
Internet: http://www.elinyae.gr/el/index.jsp (GR)
http://www.elinyae.gr/en/index.jsp (EN)

'Andreas Syggros' General Hospital for Skin Diseases
Internet: http://www.syggros-hosp.gr
E-mail: hsyggrou@otenet.gr

Other

[1] Katsarou, A., Lambrinopoulou, K., Armenaka, M., 'The positivity of thimerosal in Greece', *Contact dermatitis*, No 41, 1999, pp. 291–292.

[2] Katsarou, A., Kalogeromitros, D., Armenaka, M., Koufou, V., Davou, E., Koumantaki, E., 'Trends in the results of patch testing to statndard allergens over the period 1984–95', *Contact dermatitis*, No 37, 1997, pp. 245–246.

[3] Katsarou-Katsari, A., Bankovska, E., Lambrinopoulou, K., Davou, E., Bolbasis, A., Papakonstantinou, A., 'Trends in allergic contact dermatitis and preventive measures among cement workers (1985–99)', *Contact dermatitis*, No 48, 2003, pp. 174–175.

11. Collected data regarding Ireland

In Ireland, if a patient is out of work because of a skin disease, he/she is usually entitled to claim from the Department of Social and Family Affairs. The following benefits are available under the Occupational Injuries Scheme:

- Occupational injury benefit
- Disability benefit
- Unemployment supplements.

A weekly payment is made if the patient is unfit for work because of a work-related accident or disease. If still out of work after six months, the worker normally goes on to a sickness benefit and then an invalidity benefit. He/she can also claim a disablement benefit.

If notified, the dermatologist is required to appear in court. If a worker must handle or be in contact with irritating chemicals, the employer is required to provide gloves, aprons and adequate washing facilities. Employers must also warn their workers of the risks and precautions both verbally and in writing.

For the main conditions for benefit, including skin-related diseases, see [1].

The Health and Safety Authority is the national body in Ireland responsible for ensuring health and safety at work. It is a State-sponsored body, operating under the Safety, Health and Welfare at Work Act, 2005 [2] and it reports to the Minister for Enterprise, Trade and Employment.

For more details on legislation pertaining to chemicals, see [3].

Further information on skin diseases can maybe found in [4] (electronic version not available).

Other main references

[1] Prescribed occupational diseases under the Occupational Injuries Scheme, Department of Social and Family Affairs, 2005. http://www.welfare.ie/publications/sw33.pdf

[2] Safety, Health and Welfare at Work Act 2005. http://www.oireachtas.ie/documents/bills28/acts/2005/a1005.pdf

[3] Chemicals legislation — An overview. http://publications.hsa.ie/index.asp?locID=7&docID=-1

[4] Occupational diseases in 15 European countries, Data 1990–2000, *New developments 1999–2002*, Eurogip 2002.

12. Collected data regarding Italy

1. Legislation (international, EU, national-regional-local, governmental written policy/charter)

1.1. Skin diseases

International

C 42 Workmen's Compensation Occupational Diseases Convention
http://www.ilo.org/ilolex/cgi-lex/convde.pl?C042

EU

- Council Directive 98/24/EC of 7 April 1998 on the protection of the health and safety of workers from the risks related to chemical agents at work.
- Commission Directive 2000/39/EC of 8 June 2000, establishing a first list of indicative occupational exposure limit values in implementation of Council Directive 98/24/EC.
- Directive 2004/37/EC of the European Parliament and of the Council of 29 April 2004 on the protection of workers from the risks related to exposure to carcinogens or mutagens at work. http://eur-lex.europa.eu/LexUriServ/site/en/oj/2004/l_229/l_2292 0040629en00230034.pdf

National and regional

- D.Lgs. n 277 of 15 August 1991. Transposition of Directives No 80/1107/EEC, No 82/605/EEC, No 83/477/EEC, No 86/188/EEC and No 88/642/EEC, on the protection of workers against the risks resulting from exposures to chemical, physical and biological agents at work.
- DPR No 336 13 April 1994 Bylaw adopting the new tables of occupational diseases in the industry and agriculture.

http://www.ilo.org/public/spanish/protection/safework/cis/legosh/index.htm
http://www.ispesl.it/legisla/navig.asp?sx=argomenti.htm&dx=welcome.htm

Dermal exposure

EU

- Council Directive 67/548/EEC of 27 June 1967 on the approximation of laws, regulations and administrative provisions relating to the classification, packaging and labelling of dangerous substances.
- Council Directive 89/656/EEC of 30 November 1989 on the minimum health and safety requirements for the use by workers of personal protective equipment at the workplace.
- Commission Directive 91/322/EEC of 29 May 1991 on establishing indicative limit values by implementing Council Directive 80/1107/EEC on the protection of workers from the risks related to exposure to chemical, physical and biological agents at work.

- Council Directive 91/414/EEC of 15 July 1991 concerning the placing of plant protection products on the market.
- Directive 98/8/EC of the European Parliament and of the Council of 16 February 1998 concerning the placing of biocidal products on the market.
- Council Directive 98/24/EC of 7 April 1998 on the protection of the health and safety of workers from the risks related to chemical agents at work.
- Directive 1999/45/EC of the European Parliament and of the Council of 31 May 1999 concerning the approximation of the laws, regulations and administrative provisions of the Member States relating to the classification, packaging and labelling of dangerous preparations.
- Commission Directive 2000/39/EC, of 8 June 2000, establishing a first list of indicative occupational exposure limit values in implementation of Council Directive 98/24/EC.
- Directive 2004/37/EC of the European Parliament and of the Council of 29 April 2004 on the protection of workers from the risks related to exposure to carcinogens or mutagens at work.

National-regional-local

- D.P.R. No 303 of 19 March 1956: general measures for hygiene at work.
- D.Lgs. No 277 of 15 August 1991: transposition of Directives Nos 80/1107/EEC, 82/605/EEC, 83/477/EEC, 86/188/EEC and 88/642/EEC on the protection of workers against the risks resulting from exposures to chemical, physical and biological agents at work.
- D.Lgs. No 626 of 19 September 1994: transposition of Directives Nos 89/391/EEC, 89/654/EEC, 89/655/EEC, 89/656/EEC, 90/269/EEC, 90/270/EEC, 90/394/EEC, 90/679/EEC, 93/88/EEC, 95/63/EC, 97/42/EC, 98/24/EC and 99/38/EC concerning improvements in the safety and health of workers at work.
- D.Lgs. No 194 of 17 March 1995: transposition of Directive 91/414/EEC concerning the placing of plant protection products on the market.
- D.Lgs. No 52 of 3 February 1997: transposition of Directive 92/32/EEC relating to the classification, packaging and labelling of dangerous substances.
- D.Lgs. No 25 of 2 February 2002: transposition of Directive 98/24/EC on the protection of the health and safety of workers from the risks related to chemical agents at work.
- D. Lgs. No 65 of 14 March 2003: transposition of Directives 1999/45/EC and 2001/60/EC on classification, packaging and labelling of dangerous preparations.
- D. M. 26 February 2004 establishing of a first list of indicative limit values for occupational exposure to chemical.

2. Collective practices (guidelines, recommendations, actions/initiatives/programmes/solutions, agreements between social partners, and sectors)

Skin diseases

- INAIL has adopted '*Linee Guida per un Sistema di Gestione della Salute e Sicureza sul Lavoro (SGSL)*' (Guidelines for occupational health and safety. managment)(http://www.inail.it/prevenzionerischio/gestionesic/politica.htm).

- INAIL-instruzzione operative, Prot.n.7876/bis *'Criteri da seguire per l'ascertamento della origine professionale della malattie denunziate'* (Criteria guide for the ascertainment of the occupational origin of the reported diseases) (http://www.sicurweb.it/).
- The adopted Italian technical perspective in relation to skin diseases is close to that of the HSE (http://www.sicurweb.it/professional/news/dettaglio.asp?id=5669&cerca=malattie%20della%20pelle; http://www.hse.gov.uk/skin/index.htm).
- *'Protocolo d'intesa tra I presidenti delle Regioni, INAIL e ISPESL': Programma di Collaborazione (2002–07, e rinnovato tacitamente) (Sviluppo di un sistema informativo integrato nazionale; dati degli infortuni e malattie professionali).* (Protocol on a collaborative agreement between regions, INAIL and ISPESL: A cooperation programme (for 2002–07 and onwards) (Creation of an integrative national information system; accident and occupational diseases data)) (http://www.ispesl.it/infortuni/protocollointesa.htm).

Dermal exposure

- Guide for the application of D. Lgs 626/94 (Ispesl) http://www.ispesl.it/linee_guida/generali/linee_su_626/index.htm
  - Document No 12 (Personal protective equipment)
  - Document No 15 (Carcinogenic agents)
  - Document No 16 (Biologic agents protection).
- Guide for collective protection associated with exposure to biological agents during sterilization operations in the health sector (Ispesl), Article 6.3.4 http://www.ispesl.it/linee_guida/fattore_di_rischio/LGAgeBiolSter.asp
- Guide for the safety and hygiene for post workers (Ispesl), Article 3.2 http://www.ispesl.it/linee_guida/comparto_o_settore/prontosoccorso.pdf
- Safety appendix regarding agriculture http://it.osha.europa.eu/research/news/nuove_tecnologie/indexagriculture.htm

3. Main risks (chemical and biological) and related sectors, activities and jobs

Chemical risks

Main sectors involved (in decreasing order):

- healthcare
- construction
- services
- machine and equipment production industry
- metal production industry
- non-metal mineral industry
- rubber and plastic materials
- food process
- textile
- clothing industry
- wood
- leather industry
- family services.

Biological risks

- Agriculture, livestock farming and fishery (agricultural harvest, animals, fish and the handling, manipulation or stocking of their produce).
- Food industry (handling of slaughtered animals, their parts and products, contact with animals' body fluids and biological products).
- Healthcare and laboratories (contact with patients or contaminated objects or handling of samples).
- Waste, water waste and sewage management (waste collection, separation and treatment, direct contact with sewage, cleaning operations).

4. Levels of recognition of occupational skin diseases and dermal exposure

Skin diseases

Skin diseases that are fully recognised as work related diseases: as tabulated (also as non-tabulated diseases, whenever a cause–effect relationship between agents and occupation can be established). www.ispesl.it/infmp/mp93.htm

Code and recognised causative agents of skin diseases are as follow:

Code	Description
In industry	
4201	skin diseases caused by tar, pitch (and similar) and their mixtures or formulations
4202	skin diseases caused by paraffins, mineral oils (and similar) and their mixtures or formulations
4203	skin diseases caused by natural, artificial or synthetic resins, elastomers, (and similar) and their mixtures or formulations
4204	skin diseases caused by linseed oil, turpentine, their distillates and residua, lacquers, varnish, enamels and paints
4205	skin diseases caused by cement or lime
4206	skin diseases caused by caustic alkalis, sodium hypochlorite, ammonium persulphate and tannic acid
4207	skin diseases caused by detergent agents
4208	skin diseases caused by shells, corals and pearls
4209	skin diseases caused by antibiotics, antimicrobials and sulphonamides
4210	skin diseases caused by wood and other agents of plant origin
4299	skin diseases by agents not considered elsewhere and related to occupational environment (referring to old classification)
9900	non-tabulated diseases or contracted in non-tabulated occupations
In agriculture	
2301	skin diseases caused by mineral oil
9900	Non-tabulated diseases or contracted in non-tabulated occupations
9999	Non-tabulated diseases or contracted in non-tabulated occupations (with reference to old classification)

Statistics

Available data for Industry and Services, from 2000 to 2004, are presented on Table 15 (skin diseases and total occupational diseases).

Table 15: Industry and services (2000–04)

	2000	2001	2002	2003
Skin Diseases	1,050	1,024	830	675
Total occupational diseases	25,703	28,087	26,425	24,712

In the agricultural sector, the figures of the reported contact dermatitis, from 2000 to 2004, were as follows: 14, 13, 15, 12, 12 respectively

(http://www.inail.it/statistiche/andamento/testoandamento_2004.htm).

The most recent sector and job breakdown statistics available are for 2002. Main sectors are estimated from figures for Lombardy and Tuscany (these two regions are assumed by Ispesl as being representative of the whole country).

In 2002 in Lombardy skin diseases accounted for 6 % of the occupational diseases in 2002 (c.f. 5.3 % in 2001). In the ame year, in Tuscany skin diseases represented 6.3 % of the occupational diseases in 2002 (c.f. 6.9 % in 2001).

Main sectors involved

Lombardy: healthcare (21 % of all cases)
construction (11 %)

Tuscany: construction (15 %)
services (17 %).

Occupations at risk:

Lombardy: paramedics (14 %)
craftsmen (12 %)
workers in the extraction industry (12 %)
machinery workers (10 %)

Tuscany: workers in food processing, wood, textiles, confectionery and leather (26 %)
workers in family services (15 %)
workers in the extraction industry (15 %).

http://www.ispesl.it/rapporto2004/htm/t21_2002_03.html

5. Methods

5.1. Methods of collecting data on the occurrence and prevalence of skin diseases

- Reporting of any disease is compulsory under Italian law.
- Analysis of the information is provided by INAIL to Servizio Sanitario Nationale (National Healthcare Service) in accordance with DPCM 91/86.
- A scientific commission revises the list of occupational diseases.

http://www.ispesl.it/rapporto2004/htm/t21_2002_03.html

5.2. Methods of assessing the risks of dermal exposure

Occupational Dermal Exposure Assessment: proposal for a check-list: http://gimle.fsm.it/25/3a/02.pdf

5.3. Methods of measuring the risks of dermal exposure

- OECD, 1997: guidance document for the conduct of studies of occupational exposure to pesticides during agricultural application: http://www.olis.oecd.org/olis/1997doc.nsf/LinkTo/ocde-gd(97)148
- English model for plant protection products: http://www.pesticides.gov.uk/uploadedfiles/Web_Assets/PSD/UK_POEM1.xls
- German model for plant protection products: http://www.pesticides.gov.uk/uploadedfiles/Web_Assets/PSD/German_Model_PSD1.xls

6. Are skin problems considered as a high priority risk?

It is considered a high priority: skin diseases is the second most commonly reported group of occupational diseases after hearing loss in the representative regions of Lombardy and Tuscany. Skin diseases account for roughly 50 % of the reported diseases among young workers in Tuscany and the incidence of skin diseases is approximately three times greater among women than men (in specific age frames).

http://www.ispesl.it/rapporto2004/htm/t21_2002_03.html

7. Success factors

Success: a significant decrease was noted in reported skin diseases (as a percentage of the total occupational diseases) over the period 2000–04, as it can be seen in Table 16.

Table 16: Rates of occupational skin diseases (as a percentage of the total occupational diseases)

	2000	2001	2002	2003	2004
%	4.1	3.6	3.1	2.7	2.1

Success factors

- Improvement of reporting and recording systems.
- The collaborative programme between INAIL and ISPESL.

8. Perspectives and challenges for the future

- High rates of under-reporting of occupational diseases (roughly 45 %, depending on the specific region, despite improvements).
- The impact of skin diseases among migrant workers, especially extra-communitarian workers.
- Illegal migrant workers who face job-market pressure.
- Women at work are more exposed due to lack of prevention and/or protection skills, and employment in the jobs with the highest risk levels.

9. References

INAIL (l'Istituto Nazionale per le Assicurazioni contro gli infortuni sul lavoro) and ISPESL (l'Istituto Superiore per la Prevenzione e la Sicurezza del Lavoro).

13. Collected data regarding Lithuania

1. Legislation (international, EU, national-regional-local, governmental written policy/charter)

The State Register of Occupational Diseases was established in 1994 and all new cases of occupational diseases must be notified and registered under the following laws.

- Notification and recording of occupational diseases, Republic of Lithuania, Žin., 2001, 21-591.
- State Register of Occupational diseases. Republic of Lithuania, Žin., 2001, 106-3817.
- Republic of Lithuania Law on Social Insurance of Occupational Accidents and Occupational Diseases, 23 December 1999, No VIII — 1509, Vilnius.
- In November 2002, an amendment of the Law on Labour Protection (Law on safety and health at work) came into force. It was prepared drawing on the lessons learned from the evaluation of the practical implementation of the current law on labour protection and seeks to reconcile the existing articles of law with the respective articles of European Union law.
- Republic of Lithuania Provisional Law on Damage Compensation for Accidents at Work or in Occupational Disease Cases, 1 July 1997, No VIII — 366, Vilnius.

2. Levels of recognition of occupational skin diseases and dermal exposure

During 1995–2001, there were 4 034 registered cases of occupational diseases; 3 439 among men (85 %) and 604 (15 %) among women.

Table 17: Number of cases of occupational diseases

	Occupational diseases — number of cases			%	
Year	Total	Males	Females	Males	Females
1995	370	269	101	72.7	27.3
1996	606	510	96	84.2	15.8
1997	701	616	85	87.9	12.1
1998	618	510	108	82.5	17.5
1999	606	530	76	87.5	12.5
2000	572	503	69	88.0	12.0
2001	570	501	69	87.9	12.1
2002	–	–	–	–	–
2003	808	706	102	87.4	12.6

Trends show that, from 1995 to 1997, the number of newly diagnosed occupational diseases increased significantly, then fell slightly before stabilising in 2001. In 2003, an increase was recorded.

From 1995–2001 the largest proportion of occupational diseases was registered among workers in agriculture and forestry (1 918 cases), then in the manufacturing industry (862 cases) and construction (763 cases).

Table 18: Incidence rates of occupational diseases, per sector, per 10 000 workers

Sector	Incidence rates per 10 000 workers
Agriculture, hunting and forestry	7.9
Fishing	8.0
Mining and quarrying	15.5
Electricity, gas and water supply	2.4
Construction	9.9
Retail trade	0.2
Hotels and restaurants	0.3
Transport, storage and communication	2.4
Financial intermediation	0.2
Private household with employed persons	1.5
Public administration and defence; compulsory social security	0.4
Education	0.2
Health and social work	0.2
Other public, social and service activities	1.1

The most prevalent types of diseases (registering more than 100 cases) were:

- vibration diseases
- diseases of the ear
- diseases of the musculo-skeletal system and connective tissue
- diseases of the respiratory system
- diseases of the nervous system.

The main causes of occupational diseases were related to exposures to physical hazards, mostly noise and vibrations (about 83 % of all cases recorded). Strain caused by heavy workloads or a forced working posture were major factors in occupational diseases of nervous system (57.3 % of all cases) and diseases of musculoskeletal system (45.1 %). Dusts (from metal or wood) and chemical agents (toxic, allergic substances) were the main causes of occupational diseases of respiratory system (74.3 % and 24.5 % accordingly).

In the first half of 2002, 221 individuals reported 338 cases of work-related injuries and illness. No information on the amount of illnesses was found.

In the period under consideration, work-related injuries and illness were reported by 73 agricultural workers (33 %), 52 construction workers (23.5 %), 13 workers in land transportation (5.9 %), 12 workers in textile industry (5.4 %) and nine workers in the food and beverages industry (4.1 %).

The most common cases are vibratory illness (134 workers — 61 %), tissue- and muscle-related illness (43 workers — 19.5 %) and noise-related hearing problems (25 workers — 11.3 %).

In most cases, work-related injuries and illness is caused by physical factors (188 workers — 85.1 %), such as vibration (162 workers — 86.2 %), noise level (25 workers — 13.3 %) and other physical factors (one worker — 0.5 %). Work-related stress is another more frequent cause (22 workers — 10 %). In particular, uncomfortable working position caused work-related injuries to 10 workers, while the lifting and carrying of heavy loads caused injuries to five workers.

Harmful physical factors were very common causes of injuries in the following industrial jobs: the operation of agricultural and forestry machinery and equipment (82 workers — 37.1 %), driving heavy trucks and trailers (42 workers — 19 %), the operation of excavation and related machinery (29 workers — 13.1 %) and the operation of cranes and lifting equipment (seven workers — 3.2 %).

Males are more likely to sustain work-related injuries than females. During the first half of 2002, 189 males (85.5 %) and 32 females (14.5 %) reported work-related injuries. Males are more likely to incur vibratory injuries (132 males and only two females) and tissue- and muscles-related injuries (33 males and 10 females). However, females are more likely to suffer from nervous system- and respiratory system-related illness (nine females and three males).

The length of working experience in a harmful working environment clearly influences work-related injuries and illness. Work-related injuries and illnesses have been confirmed in 103 (46.6 %) workers with 30 to 39 years of work experience, 56 (25.3 %) workers with 40 to 49 years of work experience and 50 (22.6 %) workers with 20 to 29 years of work experience.

The age of workers incurring work-related injuries is distributed as follows:

- 50 to 59 years old — 100 workers (45.2 %),
- 60 years old and over — 74 workers (33.5 %),
- 40 to 49 years old — 41 workers (18.6 %),
- 30 to 39 years old — 6 workers (2.7 %).

In 2003, 808 cases of occupational diseases were recorded in the State Register of Occupational Diseases. These were contracted by 483 people: 87.4 % among men and and 12.6 % among women.

From 1997–2001 the number of cases of occupational diseases fell from 701 to 570, while in 2002 and 2003 it went up, reaching 808 cases in 2003. There were a similar number of cases registered in 2002 and 2003 although more women were diagnosed with occupational diseases in 2003, compared with 2002. In 2003, as in 1998–2002, the majority of registered occupational diseases comprised:

- cases of vibration disease (34.6 %),
- cases of ear disease (41.3 %).

Almost the same number of occupational diseases was registered in Lithuania in 2003, compared with 2002. As in previous years, the largest number of recorded cases of occupational diseases comprised vibration disease and ear diseases. The percentage share of the cases of vibration diseases in the total number has consistently fallen since 2001; in 2003 it was at its lowest level in the period since 1998.

3. Collective practices (guidelines, recommendations, actions/initiatives/programmes/solutions, agreements between social partners, and sectors)

A new version of the Law on Social Insurance of Occupational Accidents and Occupational Diseases was passed at the end of 2003. This establishes that individuals benefiting from social insurance for occupational accidents and occupational diseases will receive insurance benefits regardless of the fact that their occupational disease was recognised after dismissal from work. Moreover, an accident will also be recognised as an insurance event in cases where an employee, having been dismissed from his job, was looking for a new job after working hours and received remuneration for that period.

Since December 2003, the Ministry of Social Security and Labour has participated in the activities of the Mutual Information System on Social Protection in the Member States of the European Union (MISSOC). This system provides key data on social protection within the Member States and in the European Economic Area. MISSOC comparative tables consist of 12 parts:

I. financing
II. healthcare
III. sickness and cash benefits
IV. maternity
V. invalidity
VI. old age
VII. survivors
VIII. employment injuries and occupational diseases
IX. family benefits
X. unemployment;
XI. guaranteeing sufficient resources
XII. long-term care.

Sources of information:
http://www.balticseaosh.net/participants.shtml
http://www.socmin.lt
http://www.stat.gov.lt/lt/

14. Collected data regarding Luxembourg

1. Legislation (international, EU, national-regional-local, governmental written policy/charter)

- Règlement grand-ducal du 17 août 1998 complétant et modifiant la liste des maladies professionnelles figurant en annexe de l'arrête grand-ducal du 30 juillet 1928 concernant l'extension de l'assurance obligatoire contre les accidents aux maladies professionnelles.
- The list of European occupational diseases (19 September 2003).
- Directive 89/391/EEC on the introduction of measures to encourage improvements in the safety and health of workers at work: transposed to the national legislation on 17 June 1994.
- Code des assurances sociales — Art. 94 et prescriptions de prévention de l'AAA.

The list of occupational diseases was developed in 1965 and completed in 1998. Every three years the Commission revises the list and proposes to adapt or complete it if needed. Article 94 of the 'Code des assurances sociales' specifies that if a worker can prove that a disease that does not appear on the official list is work related then it will be recognised as work related.

2. Collective practices (guidelines, recommendations, actions/initiatives/programmes/solutions, agreements between social partners, and sectors)

- Practical guide: risk inventory brochure plus forms to guide companies through their obligations.
- In the technical lyceum of Ettelbruck Hairdressers' Department there are training sessions on allergies organised by the Ministry of Health and the Department of Occupational Health.
- The occupational health service for hospitals: SIST-EHL organises awareness-raising campaigns on latex.

3. Main risks (chemical, biological, physical) and related sectors, activities and jobs

Different industries: construction, hairdressers and beauty salons.

Concerned workers: the statistics cover 100 000 workers in Luxembourg: 33 500 employees of 190 companies face chemical risks.

Exposure to UV radiation: in 62 companies with 15 984 employees 4 021 workers are at risk.

4. Levels of recognition of occupational skin diseases and dermal exposure

Skin diseases are recognised as occupational disease (Art. 94 du code des assurances sociales) as long as they are on the national list. However, patients can apply to have diseases that are not on the list recognised as occupational diseases. The costs of the occupational disease are paid by the AAA (insurance) which depends on the Ministry of Social Security. If the disease is not an occupational disease, compensation comes partly from the Caisse de maladie. Indviduals can also take out private insurance.

Statistics from AAA — no specific info on skin diseases.

5. Methods

5.1. Methods of collecting data on the occurrence and prevalence of skin diseases

- Through declarations of occupational diseases.
- Via an inventory of work places at risk.
- Through the annual report of the activities of the company's prevention service.
- Via the Caisse de maladie, which collects cases other than occupational diseases.
- Via the declaration of an occupational disease: the doctor (either a specialist, occupational physician, or generalist) identifies the disease and fills out the AAA form to declare the disease (www.AAA.lu). The AAA sends it to the employer for a patronal declaration: if this is in doubt, a workplace analysis will follow. In case of doubt, the medical examiner (médecin de contrôle) carries out allergy tests and the committee of the AAA insurance company decides whether the disease should be recognised as occupational or not.

5.2. Methods of preventing (eliminating/minimising/controlling) the risk of dermal exposure

- Prevention rules and checks.
- Actions and campaigns by different organisations.
- Fédération pour les solvants: guide for the use of water bases lacquers http://www.crte.lu/mmp/online/website/content/clean/guidelines/file_32/crte_cpp03.pdf
- Brochure on the effects of the sun developed by the social medical establishment (i.e. not specifically related to work but aimed at the wider public). http://www.gouvernement.lu/salle_presse/actualite/2006/05/09bartolomeo/final_soleil-FR.pdf

6. Are skin problems considered as a high priority risk?

No, because of the low amount of cases in Luxembourg.

7. Main results and success factors

Too early to know.

8. Perspectives and challenges for the future

New version of the practical guide will contain an inventory of workplaces at risk.

9. References

- www.aaa.lu
- www.ms.etat.lu
- www.sti.lu
- www.stm.lu
- AAA: Association d'Assurance contre les Accidents.
- DSAT: Division de la Santé au travail/Ministère de la santé.

15. Collected data regarding the Netherlands

1. Legislation (international, EU, national-regional-local, governmental written policy/charter)

The European directives relating to dangerous substances were implemented in the working conditions decree. Further (technical) guidelines from the labour inspection are set out in the corresponding 'beleidsregels' (legislative rules). They provide a best practice guideline on how best to apply the legislation. Any employer that does not follow them must prove that it can provide the same level of protection to its workers.

The Working Conditions Act of 1999 (Wet van 18 maart 1999, houdende bepalingen ter verbetering van de arbeidsomstandigheden — Arbeidsomstandighedenwet 1998) provides the legislative framework for occupational health and safety. It determines that employers must ensure safe work for their employees and instruct them properly about the risks and what preventive measures to take.

It also determines that if an employee is found to be suffering from an occupational illness, the occupational health and safety service will notify this to the relevant institution designated by the Minister (Article 9).

Working conditions decree (Chapter 4. Hazardous substances and biological agents) determines that the exposure of employees to dangerous substances should be assessed by the employer. Consequently the level of exposure should be measured by the employer. The Dutch system provides regular occupational health examinations (PAGO) to examine and safeguard a worker's health to prevent ill health or detect it at an early stage. The used methods are laboratory tests, physical examinations, validated questionnaires and interviews.

Exposure to risk factors is examined through risk analysis and description of the workload per task and workplace. Law requires the provision of such examination; workers' participation is voluntary.

The employer determines the rules and procedures for the handling of dangerous substances, cleaning of the workplace and personal hygiene. The employer also provides personal protective equipment where necessary.

http://www.rug.nl/Bureau/expertisecentra/amd/producten/bedrijfsgezondheid/pago
http://www.arbo.nl/legislation/index2.stm#arboregeling

2. Collective practices (guidelines, recommendations, actions/initiatives/programmes/solutions, agreements between social partners, and sectors)

- NECOD — the Dutch knowledge centre of occupational skin diseases evaluates and provides consultancy services to patients before referring them to medical experts. This consultancy is important to develop guidance and reintegration methods. NECOD also develops protocols and guidance and conducts work place analysis. http://www.necod.nl/

- The hairdressers' association and the centre for skin and work ('Centrum voor Huid en Arbeid') work together to help workers with occupational skin diseases.

Arboconvenanten

The Netherlands combine the general occupational health and safety legislation with a sectoral approach. Safety and health covenants are agreements between employers' organisations, trade unions and the government. They are aimed at improving working conditions, curbing sick-leave and reducing the number of cases of occupational disability. Covenants have been concluded on a sector-by-sector basis since 1999.

Nine sectoral covenants specifically take up the prevention of skin diseases; for example, the hairdresser's branch is aiming for a 50 % reduction of hand dermatitis by reducing or eliminating allergens.

The VASt programme

One specific covenant regarding dangerous substances sees industry and users working together to voluntarily reinforce the working conditions policy on hazardous substances. Through the VASt programme, the Dutch Ministry of Social Affairs and Employment (SZW) encourages and supports the industry in gaining better control over exposure to dangerous substances. To achieve this, the Ministry has set aside approximately EUR 10 million for the period 2003–07 provided that the business community accepts its own share of responsibility and actively implements the VASt programme.

3. Main risks (chemical, biological, physical) and related sectors, activities and jobs

Extent of the problem

In 2003, occupational medical officers reported 270 cases of skin diseases (4.5 % of the total number of reported occupational diseases). Eczema accounted for 90 % of the cases and almost 27 % of reported cases were in people under 30.

Either a pre-existing condition or relevant personal characteristics considered important to the development of the disease were present in 30 % of the cases of eczema (urticaria).

Most cases were reported in:

- industry (31 %)
- the construction sector (19.6 %)
- health services (19.3 %).

Table 19: The number of reported skin diseases by occupational physicians, distribution by diagnosis (2003)

Disease	2000	2001	2002	2003
6. Contact dermatitis	243	207	166	212
Atopic dermatitis	5	7	8	7
Other dermatitis	11	20	30	21
Contact urticaria	3	10	5	4

Disease	2000	2001	2002	2003
Skin blastoma	3	1	0	7
Skin infections	6	13	7	10
Other skin diseases	17	12	19	9
7. Total	288	270	235	270

Spreeuwers, D. et al., *Signaleringsrapport beroepsziekten '04, Nederlands Centrum voor Beroepsziekten*, Amsterdam, 2004, http://www.beroepsziekten.nl/datafiles/SR04perpaginadef.pdf

The most important causes of dermatitis are wet work, combined with detergents (21 %), metal working fluids (8 %), latex (5 %), cement and chromium (5 %), and hairdresser products (5 %). Other causes are rubber chemicals and epoxy bonds.

Table 20: Diagnosis of the diseases in 2001, 2002 and 2003 reported by the dermatologists under the framework of the ADS project

Diagnosis	Number of reported cases in 2001 (% of total)	Number of reported cases in 2002 (% of total)	Number of reported cases in 2003 (% of total)
6. Contact dermatitis	882 (77.9)	764 (79.9)	673 (81.1)
Skin blastoma	150 (13.2)	77 (8.0)	83 (10.0)
Other skin diseases	40 (3.5)	49 (5.1)	33 (4.0)
Contact urticaria	34 (3.0)	25 (2.6)	11 (1.3)
Mechanical trauma	12 (1.1)	24 (2.5)	11 (1.3)
Skin infections	8 (0.7)	19 (1.9)	12 (1.4)
Nail diseases	3 (0.3)	6 (0.6)	3 (0.4)
Infection of hair follicles	3 (0.3)	4 (0.4)	4 (0.5)
Total	1,132	956	830

Spreeuwers, D. et al., *Signaleringsrapport beroepsziekten 2004, Nederlands Centrum voor Beroepsziekten*, Amsterdam, 2004, http://www.beroepsziekten.nl/datafiles/SR04perpaginadef.pdf

Table 21: Top 10 occupations with the most reported cases of contact dermatitis in 2001, 2002, 2003 and 2004 under the framework of the ADS project

Occupation	2001	2002	2003	2004
1 Hairdresser	94 (1)	79 (1)	59 (1)	63 (1)
2 Motor mechanic	36 (5)	46 (3/4)	36 (3)	48 (2)
3 Nurse	62 (2)	48 (2)	38 (2)	35 (3)
4 Metalworker	43 (4)	28 (6)	30 (7)	32 (4)
5 Cleaner	59 (3)	46(3/4)	34 (4)	30 (5)
6 Sales assistant	31 (7)	18 (7)	33 (5)	25 (6)

Occupation	2001	2002	2003	2004
7 Worker in horeca	32 (6)	29 (5)	31 (6)	18 (7)
8 Nursing (not specified)	9 (8)	2 (10)	4 (10)	18 (8)
9 Painter	8 (9)	8 (9)	10 (9)	14 (9)
10 Operator industry	7 (10)	13 (8)	18 (8)	12 (10)

Spreeuwers, D. et al., *Signaleringsrapport beroepsziekten 2005, Nederlands Centrum voor Beroepsziekten*, Amsterdam, 2005,
http://www.beroepsziekten.nl/datafiles/NCvBSR05def.pdf

4. Levels of recognition of occupational skin diseases and dermal exposure

The Registratierichtlijnen (registration criteria) of the Dutch Centre of Occupational Diseases give a clear description of the registration criteria of diseases that appear on the European list.

Criteria exist for specific skin diseases: contact dermatitis; skin diseases caused by charcoal and vitiligo (which are not on the European list); and depigmentation of the skin caused by certain chemical substances (group of phenols and catechols).

The European list is used as a reference, but in the Netherlands the concept of professional risk does not apply. The list is used for identification purposes and for preventive actions. This means that these occupational diseases are recognised socially and scientifically, but not legally (except for mesothelioma, all cases of which are regulated collectively).

http://www.beroepsziekten.nl/datafiles/NCvBSR05def.pdf

European guidelines (Information notices on occupational diseases) are translated by the Centre for Occupational Diseases (Nederlands Centrum voor Beroepsziekten (NCvB)) to register occupational diseases. The prevention offices (arbodiensten) must report occupational diseases to the centre. They report not just diseases with a clear causal link to work, but also multi-causal diseases. The registration is used to gain insight in the causes and prevention of occupational diseases, and to predict and study trends and sectors.

Reporting can be done on the website www.beroepsziekten.nl via a standardised form (registratieformulier) or via the prevention office system (arbodienst).

Identification and prevention currently appear to be a greater priority than legal recognition of diseases.

If a worker believes that his employer has not done everything possible to prevent his disease, or if he suffers income loss, he can ask the union (FNV Bondgenoten) to start court proceedings to establish liability. The union supports the worker, who must prove that he is suffering permanent damage which has negatively affected his income. If he has been given another job, or task, he cannot ask for indemnity because there is no loss of earnings. Every case has to be evaluated on its own merits.

5. Methods

5.1. Methods of collecting data on the occurrence and prevalence of skin diseases

National Centre for Occupational Diseases (NCvB)

The NCvB has drawn up a number of registration guidelines for the notification of occupational diseases. A Steering Committee on Guidelines was established in 2003. The committee revises the existing guidelines and sets up new registration guidelines.

As a number of occupational diseases were added to the European list of occupational diseases in 2003; these will determine which of these disorders require new registration guidelines.

Medical officers from the prevention offices (arbodiensten) are required to report occupational diseases to the National Centre for Occupational Diseases. Additional information is provided by the Occupational Dermatoses Surveillance project (ADS) through dermatological measuring stations, in collaboration with the Dutch Centre of Occupational Diseases (NCVB).

The ADS project is a joint surveillance initiative between the Centre of Occupational Diseases and the Dutch Knowledge Centre of Occupational Dermatoses (NECOD). The centre is part of the Academic Hospital of Groningen and the Free University medical Centre (Vrije Universiteit medisch centrum — VUmc) The project has almost nationwide coverage. New cases are reported via a special skin diseases annotation card. This leads to information on the occupational groups that carry a high risk of developing a skin disease.

There is a difference between the cases reported by dermatologists and those reported by occupational physicians. Dermatologists report more cases, probably because most people with skin diseases are not absent from work. There is also a gap between the types of reported cases; dermatologists deal most frequently with eczema and skin blastoma (8 %). However, occupational physicians do not mention it because it manifests itself when patients have already left working life.
http://www.necod.nl/

5.2. Methods of preventing (eliminating/minimising/controlling) the risk of dermal exposure

Arboconvenant

An action plan has been developed to reduce exposure to allergens by:

- working with suppliers and producers in relation to the ingredients and packaging of hair cosmetics and the improvement of product information and user instructions;
- providing information to interns about the relation between allergenic substances and any pre-existing personal history of dermatitis;
- introducing working methods that reduce the allergenic strain;
- providing guidelines to hairdressers about the provision of a room or place that can exclusively be used for chemical products;
- developing and providing screening instruments to diagnose allergic symptoms;
- establishing an intervention and expert centre;
- developing a central database with product information;

- translating the latest scientific insights into legislation about how to use certain substances and packages.

http://arboconvenanten.szw.nl/

Hospitals:

There has been a reduction in dangerous substances and allergens by carrying out inventories of hospitals with a high exposure to allergens and dangerous substances and by the implementation of new measures, including a skin protection programme, cost-benefit analyses and the use of latex-free gloves.

Other sectors: construction, laundry (including a protocol on biological agents), the metalworking sector, furniture and cleaning. Every sector has its own website dedicated to the covenant and the action plan (http://www.arbo.nl/systems/strategies/covenants/).

6. Main results

The number of reported cases of contact dermatitis in the Netherlands has fallen, partly because of the high priority given to it by the main risk sectors, such as hairdressing, healthcare and metalworking, and the progress made to introduce latex-free gloves.

The incidence of wet work as most frequent cause of contact dermatitis has also declined. Since 2003, the irritating factors are better registered.

7. Reference

Spreeuwers, D. et al., *Signaleringsrapport beroepsziekten 2005, Nederlands Centrum voor Beroepsziekten*, Amsterdam, 2005,
http://www.beroepsziekten.nl/datafiles/NCvBSR05def.pdf

16. Collected data regarding Poland

1. Legislation (international, EU, national-regional-local, governmental written policy/charter)

ILO

The ILO Convention No 161 on Occupational Health Services, the WHO Global Strategy for Occupational Health for All, and EU Council Directive 89/391/EEC.

Commission Recommendation 2003/670/EC of 19 September 2003 concerning the European schedule of occupational diseases, OJ L 238, 25 September 2003, p. 28.

http://eur-lex.europa.eu/

Polish Labour Code (Official Journal No 21, item 94, with amendments, 1998). www.sejm.gov.pl

The Labour Code concerns employees working on different kind of employment contracts, but does not apply to self-employed workers or individual farmers.

Chapter VII, Art. 235 § 1, 2, 3, 4, Art. 236.

The employer is obliged to approach the State Sanitary Inspection and the National Labour Inspectorate in every case of recognised or suspected occupational disease. The same applies to the diagnosing physician. The employer must:

- together with the State Sanitary Inspection, establish the cause of the occupational disease, its nature and extent;
- immediately eliminate the agents responsible for the occupational disease and apply necessary preventive means;
- ensure that the doctor's recommendations are carried out;
- keep a list of occupational diseases;
- analyse the causes of occupational diseases and apply the necessary prevention.

Art. 237 § 1 www.sejm.gov.pl

The Council of Ministers is obliged to establish a list of occupational diseases, along with detailed principles governing the suspicion, recognition and statement of occupational diseases and the relevant organisations in this area.

Art. 237 § 4

The Minister for Health is obliged to establish a method of documenting occupational diseases and their effects, a model of registering occupational diseases and the diagnostic principles by which they should be recognised.

Occupational Health Services Act of 27 June 1997 (Official Journal, No 96, item 593, 1997,consolidated: Official Journal, No 125, item 1317, 2004).

Act of 30 October 2002 on social insurance in respect of accidents at work and occupational diseases (Official Journal, No 199, item 1674 with further amendments, 2002).

Act of 20 December 1990 on social insurance of farmers (uniform text: Official Journal No 7, item 25 with further amendments, 1998).

Regulations

Regulation of the Minister for Health and Social Welfare of 30 May 1996 on medical examinations of workers, regarding preventive healthcare and medical statements issued for reasons given in the Labour Code (Official Journal, No 69, item 332, 1996; Official Journal, No 60, item 375, 1997; Official Journal, No 159, item 1057, 1998, Official Journal, No 37, item 451, 2001).

Regulation of the Council of Ministers of 30 July 2002 on the occupational diseases index, relating to specific procedures concerning the reporting of doubts, and the identification and recognition of occupational diseases and subjects that are appropriate for these cases (Official Journal, No 132, item 1115, 2002).

Regulation of the Minister for Health of 1 August 2002 on documentation of occupational diseases and the effects of these diseases (Official Journal, No 132, item 1121, 2002).

Regulation of the Council of Ministers of 10 September 1996 on a list of the types of work that are particularly strenuous or harmful for women's health (Official Journal, No 114, item 545, 1996; Official Journal, No 127, item 1092, 2002).

Regulation of the Council of Ministers of 24 August 2004 on the list of jobs prohibited for young workers and the circumstances in which they might be employed in some of these jobs (Official Journal, No 200, item 2047, 2004).

The occupational health services system in Poland

- Occupational medicine — predominantly preventive services
- Occupational hygiene — sanitary inspection
- Occupational safety and health in businesses and labour inspection.

The main objectives of OHS

- Preventive activities of occupational physicians and other personnel (diminishing the harmful effects of work on employers health)
- Fulfilling the requirements of the Labour Code (mainly via labour inspections)
- Fulfilling the hygienic conditions (via sanitary inspections)
- Diagnosing and statement of occupational diseases (OM and sanitary inspections).

The most important legal bases of OHS

- The Labour Code
- The Occupational Health Service Act
- The Health Insurance Act
- Another 150 legal regulations
- ILO Conventions 155 and 161 are not ratified, but their requirements have been met.

The structure of OHS

- Primary units — authorised doctors
- Voievodeship occupational healthcare centres
- Institutes of occupational medicine
- State Sanitary Inspection
- State Labour Inspection
- The Central Institute for Labour Protection.

The main methods for quality improvement in OHS

- Supervision and control of primary units by voievodship occupational healthcare centres
- QA in some laboratories according to ISO or GLP
- Occupational hygiene laboratories authorised by sanitary inspections.

The main financial resources for OHS

- Employers cover the costs of hygiene checks and preventive examinations.
- The State covers VOHC costs (supervision, education, diagnosing occupational diseases).
- The costs of sanitary and labour inspections are covered by the State.
- Health insurance covers the costs of curative activities.

The education and training required for occupational physician

- An authorised doctor is either a specialist in occupational medicine (four years' experience) or, until 1998, had at least six years' experience in industrial medicine.
- Out of 8 000 authorised doctors, 45.5 % are specialists, 35 % have six years' experience and 14 % are General Practitioners.

2. Collective practices (guidelines, recommendations, actions/initiatives/ programmes/solutions, agreements between social partners, and sectors)

I grade

- Suspicion, report — physician, dentist, veterinary, employer, employee
- Recognition, diagnosis — physicians who provide primary healthcare services, wards and surgeries of occupational medicine, medical academies surgeries and clinics, surgeries and wards of contagious and invasive diseases
- State, administration decision — State Sanitary Inspection.

II grade

- Recognition, diagnosis — physician specialised in occupational health or industrial medicine, research institutions, universities and other organisations and institutions whose activities are directed towards occupational health protection and research institutions, universities and other organisations that cover contagious and invasive diseases
- State, administration decision — Voivodeship State Sanitary Inspection.

After an occupational disease has been clinically diagnosed by these institutions, the medical opinion is sent to the State Sanitary Inspection, which has the legal competence to pronounce occupational diseases. The Nofer Institute of Occupational Medicine in Łódź (Św. Teresy 8, 91-348 Łódź) keeps a register of occupational diseases in Poland.

There are now 26 diseases on the register, among them occupational dermatoses.

Occupational diseases

1. Acute and chronic intoxications with chemical substances and their sequelae

2. Metallic fever
3. Pneumoconioses
4. Diseases of pleura or pericardium induced by asbestos dust
5. Chronic obstructive bronchitis which causes airflow limitation
6. Bronchial asthma
7. Extrinsic allergic alveolitis
8. Acute general allergic reactions
9. Byssinosis
10. Berylliosis
11. Lung diseases induced by hard metals dust
12. Allergic rhinitis
13. Oedematous laryngitis induced by allergy
14. Nasal septum perforation induced by substances of irritating and corrosive action
15. Chronic diseases of vocal organ related to excessive vocal effort
16. Diseases caused by ionising radiation
17. Malignant neoplasms induced by human carcinogens present in work environment
18. Skin diseases:
    - allergic contact dermatitis,
    - irritant contact dermatitis,
    - oil acne, chloroacne, coal tar acne of diffuse nature,
    - candida infections: hand intertrigo, nail dystrophy with paronychia due to working conditions,
    - dermatophyte infections due to contact with biological material from animals,
    - contact urticaria,
    - melanodermitis toxica,
    - contact lichen planus caused by photographic chemicals,
    - occupational photodermatoses,
    - change in skin colour due to chemical occupational exposure or incrustation of skin with foreign body particles.
19. Chronic diseases of locomotor system related to the way the job is performed
20. Chronic diseases of peripheral nervous system related to the way the job is performed
21. Bilateral permanent noise-induced hearing loss of cochlear type
22. Vibration syndrome
23. Diseases induced by work in increased atmospheric pressure
24. Diseases induced by high or low temperature of environment
25. Diseases of visual system induced by physical, chemical or biological agents
26. Infectious and parasitic diseases or their sequels.

There are no laws applicable specifically to dermal exposure, except for the regulation of the Minister for Health (dated 20 April 2005) regarding carcinogenic or mutagenic substances, preparations and agents or processes in the working environment (Official Journal No 280, item 2771, 2004), in which the employee should inform the national sanitary inspector about skin contact with carcinogenic or mutagenic, chemical or biological, agents in the working environment.

3. Main risks (chemical, biological, physical) and related sectors, activities and jobs

The main responsibility of the interdepartmental commission for the maximum admissible concentrations and intensities for agents harmful to health in the working environment in Poland is to consider, evaluate and adopt exposure limits for chemical and physical agents in the working environment. It then submits them to the Minister

for Labour and Social Policy, who is responsible for introducing those values into legislation. The Commission's publication, *Hazardous agents in the working environment — limit values, 2005*, contains notations to help industry, hygienists and occupational inspectors. The Sk notation — substances absorbed through the skin — was originally to be used as a warning sign only, indicating that a certain chemical might penetrate the human skin with the potential for systematic toxicity. The basis of notation are:

- The Ministry of Health's Regulation of 28 September 2005 regarding the classification and labelling of the list of dangerous substances (Official Journal, No 201, item 1674, 2005);
- The LD50s value from acute animal toxicity data < 1000 mg/kg:
  - where repeated dermal application studies have shown significant systemic effects,
  - the chemical and physical data (solubility, octanol-water partition coefficients, molecular weight) according to the methods of Fiserova-Bergerova et al. (Fiserova-Bergerova V., Thomas P.J., Droz P.O., Dermal absorption potential of industrial chemicals: criteria for skin notation. *Am. J. Ind. Med.*, 17, 1990, pp. 617–635).

The symbol Sk attached to the name of a chemical on the maximum admissible concentration (MAC) list indicates that, in order to assess the exposure quantitatively, air sampling alone is not sufficient and must be accompanied by determination of the potential dermal absorption. (Czerczak, S., Kupczewska, M., Assignment of skin notation for maximum allowable concentration (MAC) list in Poland, *Appl. Occup. Environ. Med.*, No 55, 2002, pp. 795–804).

Of the 479 chemicals on the list, 172 (35 %) have skin notations. The methods of biological monitoring for some of the chemicals with skin notation are published in the same book of the Commission. To assess the risk of dermal exposure, biological monitoring is very helpful (for example, for organic solvents), but biological monitoring is not obligatory in Poland (with the exception of lead). (Nielsen, J.B., Grandjean, Ph., Criteria for skin notation in different countries, *Am. J. Ind. Med.*, no 45, 2004, pp. 275–280).

4. Levels of recognition of occupational skin diseases and dermal exposure

Database — Central Register of Occupational Diseases

The database of occupational diseases has been compiled at the Nofer Institute of Occupational Medicine in Łódź, Poland, since 1971. In 1999 it was transformed into the Central Register of Occupational Diseases, on which any new case of medically certified occupational disease from all-Poland's territory is reported on a special form. The form contains detailed data including diagnosis, job description, causal agent, exposure level and duration, patient's name, date of birth, home address, name of enterprise with its code number and postal address, industrial branch, name of health service unit that diagnosed the disease, and date of issue of medical certification.

Based on the analysis of database records, a bulletin on occupational diseases in Poland is published annually, with bilingual Polish-English headings to tables. Summarised data and charts are available at http://www.imp.lodz.pl

Since 2003, the Central Register of Occupational Diseases has been participating in the Eurostat's European Occupational Diseases Statistics (EODS) programme.

In 2005 dermatoses constituted 5.0 % of all occupational diseases (163 cases of 3 249 total cases). The rate per 100 000 paid employees was 1.7.

In 2004 dermatoses constituted 4.8 % of all occupational diseases (181 cases of 3 790 total cases). The rate per 100 000 paid employees was 2.0; the rate per 100 000 employed persons was 1.2

Table 22: Skin diseases in Poland in 2004

Skin diseases	Number of cases			%		
	Total	Males	Females	Total	Males	Females
Total	181	77	104	100.0	100.0	100.0
Allergic contact dermatitis	160	70	90	88.4	90.9	86.5
Irritant contact dermatitis	10	5	6	5.6	6.5	4.8
Oil acne, chloroacne, coal tar acne of diffuse nature	–	–	–	–	–	–
Candida infections: hand intertrigo, nail dystrophy with paronychia due to working conditions	3	–	3	1.7	–	2.9
Dermatophyte infections due to contact with biological material from animals	1	1	–	0.5	1.3	–
Contact urticaria	6	–	6	3.3	–	5.8
Melanodermitis toxica	–	–	–	–	–	–
Contact lichen planus caused by photographic chemicals	–	–	–	–	–	–
Occupational photodermatoses	1	1	–	0.5	1.3	–
Change in skin colour due to chemical occupational exposure or incrustation of skin with foreign body particles	–	–	–	–	–	–

Table 23: Skin diseases in Poland in 2004 by NACE sectors and gender

Sector	Number of cases		
	Total	Males	Females
Total	181	77	104
A. Agriculture, hunting and forestry	19	11	8
B. Fishing	–	–	–
C. Mining and quarrying	8	8	–
D. Manufacturing	52	23	29
E. Electricity, gas and water supply	–	–	–
F. Construction	18	17	1
G. Trade and repair	7	5	2
H. Hotels and restaurants	1	1	–
I. Transport, storage and communication	7	6	1

Sector	Number of cases		
	Total	Males	Females
J. Financial intermediation	–	–	–
K. Real estate, renting and business activities	6	2	4
L. Public administration and defence; compulsory social security	–	–	–
M. Education	3	2	1
N. Health and social work	43	1	42
O. Other community, social and personal service activities	17	1	16

In 2004 the health and social work services had the highest number of recorded skin diseases:

- healthcare: 43
- hospital activities: 31
- medical practice activities: 3
- dental practice activities: 6
- other human health activities: 3
- veterinary activities: 0
- social work activities: 0.

Table 24: Skin diseases in Poland in 2004 by age

		Age groups				
	Total	<29	30–39	40–49	50–59	60
Skin diseases	181	26	30	69	56	–

Table 25: Skin diseases in Poland in 2004 by duration of exposure to harmful agent

		Duration of exposure								
	Total	One shift	1–12 months	1–4 years	5–9 years	10–14 years	15–19 years	20– years	Not specified	Not relevant
Skin diseases	181	–	–	4	28	27	31	13	73	5

In 2003 dermatoses constituted 4.9 % of all occupational diseases (214 cases of 4 365 total cases). The rate per 100 000 paid employees was 2.3; the rate per 100 000 employed persons was 1.4.

Table 26: Number of skin diseases in 2003 by type and gender

Skin diseases	Number of cases			%		
	Total	Males	Females	Total	Males	Females
Total	214	93	121	100.0	100.0	100.0
Allergic contact dermatitis	190	85	105	88.8	91.4	86.8
Irritant contact dermatitis	6	2	4	2.8	2.2	3.3
Oil acne, chloroacne, coal tar acne of diffuse nature	–	–	–	–	–	–
Candida infections: hand intertrigo, nail dystrophy with paronychia due to working conditions	2	1	1	0.9	1.0	0.8
Dermatophyte infections due to contact with biological material from animals	3	1	2	1.4	1.0	1.7
Contact urticaria	11	2	9	5.2	2.2	7.4
Melanodermitis toxica	2	2	–	0.9	2.2	–
Contact lichen planus caused by photographic chemicals	–	–	–	–	–	–
Occupational photodermatoses	–	–	–	–	–	–
Change in skin colour due to chemical occupational exposure or incrustation of skin with foreign body particles	–	–	–	–	–	–

Table 27: Skin diseases in Poland in 2003 by NACE sectors and gender

Sector	Number of cases		
	Total	Males	Females
Total	214	93	121
A. Agriculture, hunting and forestry	17	6	11
B. Fishing	–	–	–
C. Mining and quarrying	6	6	–
D. Manufacturing	66	34	32
E. Electricity, gas and water supply	1	1	–
F. Construction	23	23	–
G. Trade and repair	13	6	7
H. Hotels and restaurants	4	3	1
I. Transport, storage and communication	7	3	4
J. Financial intermediation	1	–	1
K. Real estate, renting and business activities	9	3	6
L. Public administration and defence; compulsory social security	2	–	2

Sector	Number of cases		
	Total	Males	Females
M. Education	2	–	2
N. Health and social work	50	6	44
O. Other community, social and personal service activities	10	–	10
Plants outside of Poland	–	–	–
No type of economic activity n.a.	3	2	1

In 2003 health and social work services reported 50 cases of skin diseases:

- healthcare: 47 cases
- hospitals activities: 32
- medical practice activities: 6
- dental practice activities: 0
- other human health activities: 9
- veterinary activities: 1
- social work activities: 2.

Table 28: Skin diseases in Poland in 2003 by age

		Age groups				
	Total	<29	30–39	40–49	50–59	60
Skin diseases	214	22	34	84	70	4

Table 29: Skin diseases in Poland in 2003 by duration of exposure to harmful agent

		Duration of exposure						
	Total	1–12 months	1–4 years	5–9 years	10–14 years	15–19 years	20– years	Not specified
Skin diseases	214	3	30	38	32	28	70	13

In 2002 dermatoses constituted 6.5 % of all occupational diseases (320 cases of 4 915 total cases). The rate per 100 000 paid employees was 3.5; the rate per 100 000 employed persons was 2.2.

In 2001 dermatoses constituted 6.2 % of all occupational diseases (375 cases of 6 007 total cases). The rate per 100 000 paid employees was 3.9; the rate per 100 000 employed persons was 2.5.

Table 30: Skin diseases in Poland in 2001 by gender

Skin diseases	Number of cases		%	
	Total	Males	Females	Of all diseases
Total	375	185	190	6.2

Table 31: Skin diseases in Poland in 2001 by NACE sectors

Sector	Number of cases Total
Total	375
A. Agriculture, hunting and forestry	27
B. Fishing	–
C. Mining and quarrying	17
D. Manufacturing	141
E. Electricity, gas and water supply	2
F. Construction	48
G. Trade and repair	9
H. Hotels and restaurants	5
I. Transport, storage and communication	10
J. Financial intermediation	–
K. Real estate, renting and business activities	8
L. Public administration and defence; compulsory social security	2
M. Education	4
N. Health and social work	80
O. Other community, social and personal service activities	20
Plants outside of Poland	–
No type of economic activity n.a.	2

In 2001 in health and social work services there were 80 cases of skin diseases:

- healthcare: 74 cases
- hospitals activities: 45
- medical practice activities: 11
- dental practice activities: 7
- other human health activities: 11
- veterinary activities: 2
- social work activities: 4.

Table 32: Skin diseases in Poland in 2001 by age

		Age groups				
	Total	<29	30–39	40–49	50–59	60
Skin diseases	375	29	89	149	96	12

Table 33: Skin diseases in Poland in 2001 by duration of exposure to harmful agent

	Total	Duration of exposure							
		One shift	1–12 months	1–4 years	5–9 years	10–14 years	15–19 years	20– years	Not specified
Skin diseases	375	1	11	44	44	57	33	134	51

In 2000 dermatoses constituted 6.9 % of all occupational diseases (504 cases of 7 339 total cases). The rate per 100 000 paid employees was 5.1; the rate per 100 000 employed persons was 3.2.

In 1999 dermatoses constituted 7 % of all occupational diseases (697 cases of 9 982 total cases). The rate per 100 000 paid employees was 6.8; the rate per 100 000 employed persons was 4.4.

Table 34: Skin diseases in Poland in 1999 by gender

Skin diseases	Number of cases			%		
	Total	Males	Females	Of all diseases	Males	Females
Total	697	304	393	7.0	5.7	8.4

Among the 697 cases, 615 were allergic eczema, more often in females than males. The number of cases of this disease fell by approximately 69 cases compared to the previous year.

Table 35: Skin diseases in Poland in 1999 by NACE sectors

Sector	Number of cases Total
Total	697
A. Agriculture, hunting and forestry	42
B. Fishing	–
C. Mining and quarrying	25
D. Manufacturing	232
E. Electricity, gas and water supply	10
F. Construction	94
G. Trade and repair	19
H. Hotels and restaurants	4
I. Transport, storage and communication	5
J. Financial intermediation	1
K. Real estate, renting and business activities	11
L. Public administration and defence; compulsory social security	15
M. Education	15
N. Health and social work	200

Sector	Number of cases Total
O. Other community, social and personal service activities	18
Plants outside of Poland	–
No type of economic activity n.a.	6

In 1999 there were 200 cases of skin diseases in health and social work:

- healthcare: 190 cases
- hospitals activities: 127
- medical practice activities: 26
- dental practice activities: 13
- other human health activities: 24
- veterinary activities: 2
- social work activities: 8.

Table 36: Skin diseases in Poland in 1999 by age

		Age groups				
	Total	<29	30–39	40–49	50–59	60
Skin diseases	697	58	154	288	165	32

Table 37: Skin diseases in Poland in 1999 by duration of exposure to harmful agent

		Duration of exposure						
	Total	1–12 months	1–4 years	5–9 years	10–14 years	15–19 years	20– years	Not specified
Skin diseases	697	8	57	84	101	92	266	89

In 1998 dermatoses constituted 6.3 % of all occupational diseases (766 cases of 12 017 total cases). The rate per 100 000 paid employees was 7.5; the rate per 100 000 employed persons was 4.8.

In 1997 dermatoses constituted 5.8 % of all occupational diseases (674 cases of 11 685 total cases). The rate per 100 000 paid employees was 6.7; rate the rate per 100 000 employed persons was 4.4.

Table 38: Skin diseases in 1997 by gender

Skin diseases	Number of cases			%		
	Total	Males	Females	Of all diseases	Males	Females
Total	674	309	365	5.8	4.7	7.2

Table 39: Skin diseases in Poland in 1997 by NACE sectors

Sector	Number of cases Total
Total	674
A. Agriculture, hunting and forestry	40
B. Fishing	–
C. Mining and quarrying	37
D. Manufacturing	267
E. Electricity, gas and water supply	2
F. Construction	68
G. Trade and repair	22
H. Hotels and restaurants	4
I. Transport, storage and communication	14
J. Financial intermediation	–
K. Real estate, renting and business activities	14
L. Public administration and defence; compulsory social security	5
M. Education	12
N. Health and social work	153
O. Other community, social and personal service activities	31
Plants outside of Poland	–
No type of economic activity n.a.	5

In 1997 here were 153 cases of skin diseases in health and social work:

- healthcare: 147 cases
- hospitals activities: 88
- medical practice activities: 15
- dental practice activities: 11
- other human health activities: 33
- veterinary activities: 3
- social work activities: 3.

Table 40: Skin diseases in Poland in 1997 by age

		Age groups				
	Total	–29	30–39	40–49	50–59	60
Skin diseases	674	44	152	290	156	32

Table 41: Skin diseases in Poland in 1997 by duration of exposure to harmful agent

	Total	Duration of exposure								
		One shift	1–12 months	1–4 years	5–9 years	10–14 years	15––19 years	20– years	Not specified	Not relevant
Skin diseases	647	5	5	56	61	44	33	146	20	304

In 1996 dermatoses constituted 6.1 % of all occupational diseases (696 cases of 11 318 total cases). The rate per 100 000 paid employees was 7.1; the rate per 100 000 employed persons was 4.6.

In 1995 dermatoses constituted 6.2 % of all occupational diseases (698 cases of 11 320 total cases). The rate per 100 000 paid employees was 7.2; the rate per 100 000 employed persons was 4.7.

Social Insurance Company (Zakład Ubezpieczeń Społecznych, ZUS)

Agricultural Social Insurance Company (Kasa Rolniczego Ubezpieczenia Społecznego, KRUS) — covers occupational diseases of agricultural workers (www.krus.gov.pl)

The basic law defining farmers' social insurance obligations and entitlements to benefits is included in the Act of 20 December 1990 on farmers' social insurance (full text: Official Journal No 7, item 25 with later amendments, 1998).

Beside this law, farmers receive their entitlements and benefits according to the following Acts:

- the Act of 13 October 1998 on social insurance system (Official Journal No 137, item 887 with later amendments);
- the Act of 28 November 1994 on family benefits (Official Journal No 228, item 2255 with later amendments);
- the Act of 26 April 2001 on structural pensions (Official Journal No 52, item 539 with later amendments, 2001);
- the Act of 23 January 2003 on general health insurance (Official Journal No 45, item 391 with later amendments, 2003).

The basic legal Acts of the European Community are:

- Council Regulation (EEC) No 1408/71 of 14 June 1971 on the application of social security schemes to employed persons, to self-employed persons and to members of their families moving within the Community;
- Council Regulation (EEC) No 574/72 of 21 March 1972 laying down the procedure for implementing Regulation (EEC) No 1408/71 on the application of social security schemes to employed persons, to self-employed persons and to members of their families moving within the Community.

The Agricultural Social Insurance Fund (KRUS) was established to fully cover farmers' social insurance. It was intended to create an independent, specialised organisation in Poland which, as a real manager of farmers' social insurance, could take over and ensure efficient execution of all tasks related to the insurance, which had been introduced earlier. It is also responsible for taking on any relevant roles that may emerge. KRUS is managed by the President who is appointed and dismissed by the Prime Minister on application of the Minister for Social Policy, in agreement with the Council of Farmers' Social Insurance.

The law offers two forms of social insurance cover for farmers. For an interested person satisfying the necessary conditions, insurance cover can either be legally required or

voluntary. Farmers' social insurance requires quarterly contributions, regardless of whether the cover is obligatory or voluntary). Farm owners who engage in agricultural activity for themselves must also fulfil this obligation. The following persons are legally required to be covered by the farmers' social insurance:

1. a farmer who conducts agricultural activity on his own account as the owner (independent or dependent) of a farm situated in the Republic of Poland and possessing more than one hectare of arable land or engages in a special type of agricultural production, according to the interpretation of tax regulations;
2. a farmer's spouse who works constantly on the farm, in special forms of agricultural production or keeps a house that is directly connected with a farm;
3. a member of the household, i.e. a person close to a farmer who:
   - is at least 16 years old,
   - remains a farmer in the common household or lives on the farm or in the neighbourhood,
   - works constantly on the farm and is not employed by a farmer as a worker, if they are not covered by other social insurance and do not have the right to old age pension or disability pension from the farmers' social insurance or other social insurance.

The exception to this rule are those who conduct agricultural activity or work on the farm and at the same time conduct non-agricultural economic activity or cooperate in such activity. According to the Law of 1 January 1997, these persons may choose their own insurance cover.

Table 42: List of occupational diseases of agricultural workers who had insurance in 1995–2004

	Occupational diseases								
	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total	80	82	139	141	142	116	113	135	104
Allergic dermatitis	8	11	13	22	20	32	14	24	11
Candida infections: hand	1	0	0	1	0	0	0	0	0
Dermatophyte infections	0	0	2	2	1	0	0	0	0
Potodermatoses	0	0	0	0	0	0	0	0	1

5. Methods

5.1. Methods of collecting data on the occurrence and prevalence of skin diseases

Occupational skin diseases are reported on a special form that contains detailed data including diagnosis, job description, causal agent of the disease, exposure level and duration, patient's name, date of birth, home address, name of enterprise with its code number and postal address, industrial branch, name of health service unit that diagnosed the disease, and date of issue of medical certification. The examples of forms (*wzory formularzy*) are in the Regulation of the Minister for Health of 1 August 2002 on documentation of occupational diseases and the effects of these diseases (Official Journal, No 132, item 1121, 2002). Exposure levels are not required for biological and allergic agents; instead, the type of agent, the kind of contact and its duration must be given (Regulation of the Council of Ministers of 30 July 2002 on occupational

diseases index, specific procedures concerning reporting doubts, identification and recognition of occupational diseases and subjects that are appropriate for these cases (Official Journal, No 132, item 1115, 2002)). This information should be sent to the Nofer Institute of Occupational Medicine in Łódź and to the National Sanitary Inspector. The same system works for farmers, but they must send the information to the National Sanitary Inspector and to KRUS.

The Central Statistical Office also collects the information of occupational diseases in form Z-10 'Work conditions'.

5.2. Methods of assessing the risks of dermal exposure

To help enterprises to assess occupational risk, the Central Institute for Labour Protection-National Research Institute (CIOP-PIB) has developed STER, a computerised system for hazard registration and occupational risk assessment. The system has several functions.

- It collects and analyses information about the workplace that is required to identify hazards. This includes the name (code) and location of the workstation and the number of people working at that workstation, a description of the technological process and materials being used, a description of machines and other technical devices being used at the workplace, as well as the basic instrumentation and equipment which are essential for occupational safety and comfort. It also logs a description of basic activities and the time of their performance (the so-called time keeping), and any identified risks (with possible illustration).
- It assesses any risk connected with those hazards. The system suggests a risk assessment for the most commonly found agents at workplaces, such as noise, mechanical vibrations, radiation, microclimate, harmful chemical substances and also mechanical agents causing accidents. For each of the identified and listed agents, the system asks for the results of the measured exposure parameters; after loading them it makes calculations necessary to compare the results of the measurements with the admissible values set by law, standards or other requirements. The data then enable the programme to develop a so-called 'agent measurement card' stored in its database.
- It identifies and properly documents actions that should be taken as a result of the risk assessment.

The system contains a database of Polish regulations, from which it automatically selects admissible values for the indicated agents. The Sk notation — substances absorbed through the skin — is only used as a warning sign to indicate that a certain chemical might penetrate the human skin and could cause systemic toxicity.

A three-level scale is used to estimate and compare risk, which defines a risk as low, medium or high. For chemical agents (except carcinogenic ones), risk is assessed as low if the worker's exposure does not exceed 0.5 MAC, as medium if it is higher than 0.5 MAC but does not exceed the legal value, and as high if the health standards are not met. A risk connected with the presence of a carcinogenic agent in workplace air has two-level scale: it is assessed as medium if the worker's exposure does not exceed 0.1 MAC, and as high if it is higher than 0.1 MAC.

High risk always signifies a lack of compliance with the requirements; a medium risk means it is necessary to take reasonable action to protect employees more effectively. If a risk is defined as low, the protection measures in place are considered satisfactory.

The system makes it possible to print a document registering all data regarding the analysed workstation. These data, together with the results of the assessment and

recommendations concerning preventive actions with the indication of the date of their realisation and the name of the person responsible, are necessary for risk assessment as well. The document is called an Occupational Safety and Health (OSH) Workstation Card. It is also possible to print other documents required by supervising and controlling institutions.

5.3. Methods of measuring the risks of dermal exposure

Poland has no method of measuring the risks of dermal exposure.

5.4. Methods of preventing (eliminating/minimising/controlling) the risk of dermal exposure

Personal protective equipment and biological monitoring.

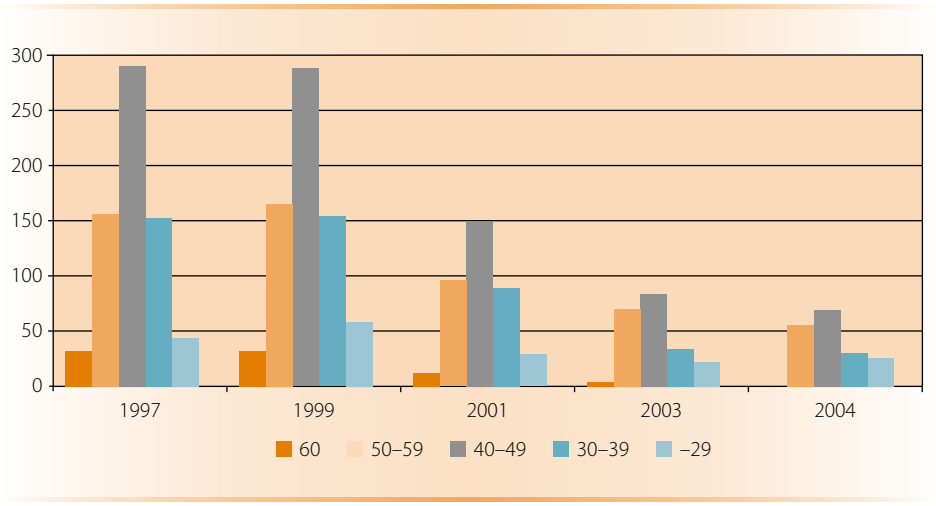
6. Are skin diseases and dermal exposure considered as a high priority risk?

In Poland skin diseases and dermal exposure are not a high priority risk. Nevertheles, a significant reduction in occurrence of skin diseases has been noted since 1997.

7. Main results and success factors

The number of occupational skin diseases has fallen. This is not due to any prevention or elimination, but rather is a result of falling employment and a rise of a proportion of SMEs in which exposure is either not controlled or exists at a very low level.

Figure 6: Changes in occurence of occupational skin diseases between 1997 and 2004, by age



8. Perspectives and challenges for the future

There are four priorities:

- strengthening basic occupational health
- rural health and agriculture
- integrated workplace health management
- the changing world of work, including ageing workers.

Main references: websites and links to the information described.

17. Collected data regarding Portugal

1. Legislation (international, EU, national-regional-local, governmental written policy/charter)

Skin diseases

- 2003/670/EC Comission Recommendation concerning the European list of occupational diseases.
- 76/768/EEC Cosmetics Directive.
- Regulatory Decree 6/2001 approving the schedule of occupational diseases and the corresponding codifying index [2001, CIS 01-942].
- Decree-law No 248/99 — Proceeds to the global reformulation and improvement of legislation concerning occupational diseases in line with the new legal framework introduced by law No 100/97 of 13 September and in the development of the framework adopted by Law No 28/84, of 14 August [1999, CIS 01-311].
- Decree-law No 341/93 of 30 September on the approval of the national table of disability due to occupational accidents and diseases [1993, CIS 97-5].
- Order No 33/93 of 15 October on the organisation and operation of the National Commission for the revision of the list of occupational diseases [1993, CIS 97-4].
- List of substances, agents and industrial processes that present occupationally exposed workers with a real or potential carcinogenic risk [1985, CIS 87-735]
- List of occupational diseases (Portuguese Decree No 12/80) [1981, CIS 84-820].
- Codified index of occupational diseases [1980, CIS 84-1066].

Dermal exposure

- Council Directive 98/24/EC of 7 April 1998 on the protection of the health and safety of workers from the risks related to chemical agents at work.
- Commission Directive 91/322/EEC of 29 May 1991 on establishing indicative limit values by implementing Council Directive 80/1107/EEC on the protection of workers from the risks related to exposure to chemical, physical and biological agents at work.
- Commission Directive 2000/39/EC, of 8 June 2000, establishing a first list of indicative occupational exposure limit values in implementation of Council Directive 98/24/EC.
- Council Directive 67/548/EEC of 27 June 1967 on the approximation of laws, regulations and administrative provisions relating to the classification, packaging and labelling of dangerous substances.
- Directive 1999/45/EC of the European Parliament and of the Council of 31 May 1999, concerning the approximation of the laws, regulations and administrative provisions of the Member States relating to the classification, packaging and labelling of dangerous preparations.
- Council Directive 91/414/EC of 15 July 1991, concerning the placing of plant protection products on the market.
- Directive 98/8/EC of the European Parliament and of the Council of 16 February 1998, concerning the placing of biocidal products on the market.

- Directive 2004/37/EC of the European Parliament and of the Council of 29 April 2004 on the protection of workers from the risks related to exposure to carcinogens or mutagens at work.
- Council Directive 89/656/EEC of 30 November 1989 on the minimum health and safety requirements for the use by workers of personal protective equipment at the workplace.
- Decree-law No 290/2001, transposing into national law Council Directive 98/24/EC on chemical safety, and Commission Directives 91/322/EEC and 2000/39/EC on chemical exposure limits [2001, CIS 01-1296].
- Decree-law No 82/95, transposing into internal legislation European Community Directives concerning the approximation of laws, regulations and administrative provisions relating to the classification, packaging and labelling of dangerous substances [1995, CIS 96-1934].
- Decree No 275/91, regulating particular measures of prevention and of the protection of the health of workers against the risks of exposure to certain chemical substances [1991, CIS 93-717].
- Decree of 24 August 1988, establishing standards for the classification, labelling and packaging of pesticides and pesticide additives [1988, CIS 91-18].
- Decree-law No 84/97, transposing into national legislation Council Directives 90/679/EEC and 93/88/EEC, and Commission Directive 95/30/EC concerning the protection of workers from risks related to exposure to biological agents in the workplace [1997, CIS 98-410].
- Decree-law No 301/2000, concerning the protection of workers from risks related to exposure in the workplace [1997, CIS 98-410] carcinogens or mutagens at work in the workplace.
- Decree-law 28/93, transposining the Council Directive 89/656/EEC on the minimum health and safety requirements for the use by workers of personal protective equipment at the workplace.

2. Collective practices (guidelines, recommendations, actions/initiatives/programmes/solutions, agreements between social partners, and sectors)

GPEDC Grupo Portugues de Estudo das Dermites de Contacto.

Guidelines

Safety and Health at work IDICT (Instituto de Desenvolvimento e Inspecção das Condições de Trabalho).
http://www.ishst.pt/IDICT_C00.aspx?cat=Cat_Apresentacao_Institucional&lang=

Actions, initiatives

RISKOFDERM project 'Risk assessment of occupational dermal exposure to chemicals' (Project QLKA4-CT-1999-01107 funded by the European Commission). Links:
http://annhyg.oxfordjournals.org/content/vol47/issue8/ and
http://annhyg.oxfordjournals.org/content/vol48/issue3/

SUI project 'Safe Use Initiative':
http://www.ecpa.eu/website/page.asp?cust=3&lang=en&mi=4&si=15&dt=2

3. Main risks (chemical, biological, physical) and related sectors, activities and jobs

The main sectors affected by dermal exposure are the following:

- agricultural industry (mixing/diluting, loading and spraying pesticides)
- chemical industry (handling, loading, mixing/diluting chemical substances, maintenance and servicing)
- electrical/electronic engineering industry (immersing of objects, electroplating)
- leather processing industry
- polymers industry
- metallurgy
- pulp, paper, and board industry
- textile processing industry
- paints, lacquers, and varnishes industry
- fishing (catching fish, classification and selection, processing)
- agriculture (harvesting, harvest handling, storage)
- livestock farming (parturition assistance, milking, shearing, fodder handling)
- healthcare (patient handling, contaminated biological samples handling)
- laboratories (contaminated samples handling, contaminated objects handling)
- food industry (slaughterhouses, direct contact with dead animals, their biological fluids and biological origin products such as milk or excrements)
- waste and sewage treatment companies (cleaning operations, wastes collection and transfer).

Source: RISKOFDERM project. Links: http://annhyg.oxfordjournals.org/content/vol47/issue8/ and http://annhyg.oxfordjournals.org/content/vol48/issue3/

4. Levels of recognition of occupational skin diseases and dermal exposure

- Decree-law No 362/93 on statistics and occupation, *Diário da República*, No 242, 15 October 1993, pp. 5,802-5,804.
- Healh Ministry.

http://www.portaldasaude.pt/portal/conteudos/informacoes+uteis/saude+no+trabalho/doencasprofissionais.htm
http://www.seg.pt/

Table 43: Cases of skin diseases without and with incapacity

Skin diseases without incapacity	2003	2004	2005
Contact dermatitis	5	3	11
Traumatic dermatitis	**4**	**0**	**0**
Total of work diseases	823	1,165	2,110
Skin diseases with incapacity	**2003**	**2004**	**2005**
Contact dermatitis	58	81	98
Traumatic dermatitis	**22**	**16**	**0**
Eczematous dermatitis (dermatitis eczematiformes)	4	0	0
Total of work diseases	**1,142**	**2,023**	**1,416**

Table 44: Total number of cases of skin diseases in 2002–06

	2002	2003	2004	2005	2006
Total of work diseases related to the skin	135	132	128	132	109

Source: http://www.seg.pt/

5. Methods

5.1. Methods of collecting data on the occurrence and prevalence of skin diseases

Participao Obligatoria de Doenca Profesional
http://www.min-saude.pt/portal/conteudos/informacoes+uteis/saude+no+trabalho/doencasprofissionais.htm

5.2. Methods of assessing the risks of dermal exposure

Toolkit for assessment and management of risks from occupational dermal exposure to hazardous substances, from RISKOFDERM project.
http://annhyg.oxfordjournals.org/cgi/content/full/47/8/629

5.3. Methods of measuring the risks of dermal exposure

- OECD, Guidance document for the conduct of studies of occupational exposure to pesticides during agricultural application, 1997 (http://www.olis.oecd.org/olis/1997doc.nsf/LinkTo/ocde-gd(97)148)
- Models from RISKOFDERM project, Workpart 3: http://annhyg.oxfordjournals.org/content/vol47/issue8/
- EASE model: http://www.hse.gov.uk/research/rrhtm/rr136.htm

5.4. Methods of preventing (eliminating/minimising/controlling) the risk of dermal exposure

Toolkit for assessment and management of risks from occupational dermal exposure to hazardous substances, from RISKOFDERM project.
http://annhyg.oxfordjournals.org/cgi/content/full/47/8/629

Collected data regarding Slovakia 18.

1. Legislation (international, EU, national-regional-local, governmental written policy/charter)

Skin diseases

Act No 461/2003 Coll. laws on social insurance, outlining two categories of occupational skin diseases:

1. skin cancers,
2. skin disease except skin cancers and transmitted skin diseases.

Dermal exposure

- Council Directive 89/391/EEC on the introduction of measures to encourage improvements in the safety and health of workers at work (implemented into Act No 124/2006 Coll. of Laws on safety and health protection at work).
- Directive 2004/40/EC of the European Parliament and of the Council of 29 April 2004 on the minimum health and safety requirements regarding the exposure of workers to the risks arising from physical agents (electromagnetic fields).
- Council Directive 90/394/EEC of 28 June 1990 on the protection of workers from the risks related to exposure to carcinogens at work.
- Council Directive 97/42/EC of 27 June 1997, amending for the first time Directive 90/394/EEC on the protection of workers from the risks related to exposure to carcinogens at work.
- Council Directive 99/38/EC of 29 April 1999, amending for the second time Directive 90/394/EEC on the protection of workers from the risks related to exposure to carcinogens at work and extending it to mutagens.
- Directive 2000/54/EC of the European Parliament and of Council of 18 September 2000 on the protection of workers from risks related to exposure to biological agents at work.
- Council Directive 98/24/EC of 7 April 1998 on the protection of the health and safety of workers from the risks related to chemical agents at work.
- Commission Directive 2000/39/EC of 8 June 2000, establishing a first list of indicative occupational exposure limit values in implementation of Council Directive 98/24/EC on the protection of the health and safety of workers from the risks related to chemical agents at work.
- Commission Directive 91/322/EEC of 29 May 1991 on establishing indicative limit values by implementing Council Directive 80/1107/EEC on the protection of workers from the risks related exposure to chemical, physical and biological agents at work.

LSDE Specific: national-regional-local

General obligations for employers to reduce a risk from occupational environment factors are laid in:

- Act No 124/2006 Coll. of Laws on safety and health protection at work;
- Act No 126/2006 of the Coll. of Laws on public health;

- GWPDE: Governmental Written Policy/Charter;
- Governmental Order of the Slovak Republic No 338/2006 of the Coll. of laws on the protection of workers to the risks arising from exposure to biological factors at work;
- Governmental Order of the Slovak Republic No 355/2006 of the Coll. of laws on the protection of workers to the risks arising from exposure to chemical factors at work;
- Governmental Order of the Slovak Republic No 356/2006 of the Coll. of laws on the protection of workers to the risks arising from exposure to carcinogenic and mutagenic factors at work;
- Governmental Order of the Slovak Republic No 329/2006 of the Coll. of laws on the minimum health and safety requirements for protection of workers to the risks arising from electromagnetic fields;
- Governmental Order of the Slovak Republic No 351/2006 of the Coll. of laws on details on protection of health from the effects arising from optical radiation (UV, infrared and laser);
- Governmental Order of the Slovak Republic No 247/2006 of the Coll. of laws on details about protection of health from the adverse effects arising from heat and cold at work;
- Governmental Order of the Slovak Republic No 357/2006 of the Coll. of laws on details about factors of work and work environment and about risk categorisation.

All published in the Collection of Laws of the Slovak Republic.

Instructions of Ministry of Health of the Slovak Republic No 2 from 12 November 1990, on practising preventive examinations of workers at increased risk of occupational diseases, industrial poisoning or other health injuries (published in official reports of the Ministry of Health of the Slovak Republic No 2/1991).

2. Main risks (chemical, biological, physical) and related sectors, activities and jobs

- Leather and leather products — tanners, shoemakers
- Chemical industry — chemical processers
- Machinery — galvanisation, painters
- Construction — asphalter
- BR: biological risks/sectors, activities and jobs. Exposure to biological factors is registrated and assessed only as a general exposure to certain factor — it is not registrated from an aspect of target organs or local effects
- PR: physical risks (excl.UV)/sectors, activities and jobs. Exposure to physical factors is registered and assessed only as a general exposure to certain factors; it is not registrated in any aspect of target organs or local effects.

3. Levels of recognition of skin diseases and dermal exposure as occupational

Skin disease can be officially recognised as an occupational or work-related disease if a relationship between adequate occupational exposure and clinical findings is confirmed.

Workers exposed to occupational factors (physical, chemical or biological) greater than permitted limits (whether action or limit exposure values) are supposed to be at risk. They are registered as workers at risk and their employer must provide them adequate health surveillance.

Skin diseases are registered in the National Centre of Health informations — http://www.nczisk.sk

Workers with dermal exposure are registered in ASTR (Automatic System of Classification of Risks): the data have been collected and archived in the Public Health Authority of the Slovak Republic since 1996 — http://www.uvzsr.sk

4. Methods

4.1. Methods of collecting data on the occurrence and prevalence of skin diseases

Data relating to workers with occupational skin diseases or who are at risk of occupational skin diseases are registered at Clinic of Occupational Medicine and Toxicology and annual summary is sent to National Centre of Health Informations.

4.2. Methods of assessing the risks of dermal exposure

Risk assessment is made in compliance with above mentioned EU directives.

4.3. Methods of measuring the risks of dermal exposure

There is no specific method.

4.4. Methods of preventing (eliminating/minimising/controlling) the risk of dermal exposure

There is no specific method of preventing risk of dermal exposure, but employers must adhere to the legislation (action and limit exposure values, avoiding or reducing risks, and health surveillance).

5. Are skin problems considered as a high priority risk?

In the Slovak Republic, skin diseases are the fourth most frequent occupational disease.

6. Main results and success factors

The number of occupational skin diseases have been falling since 1997 and during last few years has stayed at almost unchanged level (approximately 50 cases each year).

Rate of occupational dermal exposure is difficult to assess because the Slovak Republic only measures occupational exposure to chemical factors that produces dermatological effects. Exposure to other factors (physical, biological) is registered and assessed only as a general exposure to certain factors and not with respect to target organs or local effects.

Employers and workers are informed in compliance with EU directives and national legislation.

7. Perspectives and challenges for the future

The main objectives of the policy about occupational skin diseases and dermal exposure are to reduce the number of exposed workers and reducing the level of exposure.

19. Collected data regarding Slovenia

1. Legislation (international, EU, national-regional-local, governmental written policy/charter)

- Occupational health and safety law (Official Gazette, RS 56/99, 64/01* — framework law, accepted by Slovenian parliament, 1999).
- Pension and disability law (Official Gazette, RS 12/92, 5/94, 106/99, 26/03, 104/05*, signed by the Minister for Labour).
- Regulation of preventive medical check ups (Official Gazette, RS 87/02, signed by the Minister for Health).
- Regulation of safety statement with risk assessment (Official Gazette, RS 30/00, signed by the Minister for Labour).
- Regulation of the list of occupational diseases (Official Gazette, RS 85/03, signed by the Minister for Labour). In this regulation occupational skin diseases are listed under II/1. Occupational diseases are listed by affected organ or system. Skin diseases, caused by substances and agents not included are considered under other headings:
  - under number 43: skin diseases and skin cancers caused by soot, tar, bitumen, pitch, anthracene or compounds thereof, mineral and other oils, crude paraffin, carbazole or compounds thereof, by products of the distillation of coal;
  - under number 44: occupational skin damage caused by scientifically recognised allergy provoking or irritative substances not included under other headings;
  - under number 45: occupational vitiligo; this regulation follows Commission Recommendation of 22 May 1990 (90/326/EEC).

2. Collective practices (guidelines, recommendations, actions/initiatives/programmes/solutions, agreements between social partners, and sectors)

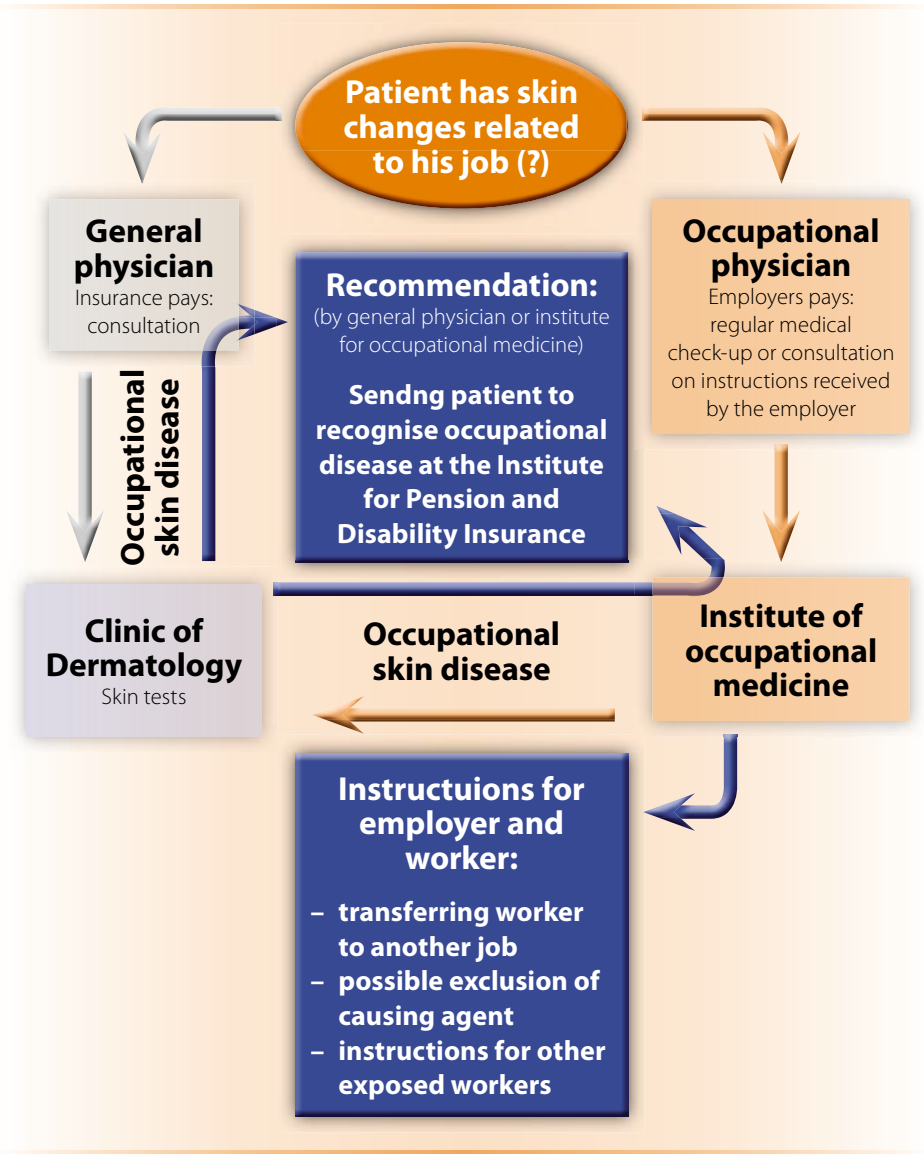
There are no effective 'sub-legal' practices concerning dermal risks in Slovenia.

3. Levels of recognition of occupational skin diseases and dermal exposure

- The Ministry of Health asked the Clinical Institute of Occupational, Traffic and Sports Medicine to prepare criteria for recognising occupational diseases. Criteria are already prepared and will be published in spring 2006.
- A laboratory for occupational skin diseases is a part of the Clinic of Dermatology. Patients are directed there from a general physician or from the Institute of Occupational Medicine. Occupational skin diseases diagnosed by the Clinic of Dermatology are not registered. Once diagnosed with an occupational disease, only a few patients decide to ask the Institute for Pension and Disability Insurance for partial disability and recognition of occupational disease (Figure 7), mainly because they are afraid to lose their job or are not aware of this option.

- The Clinic of Dermatology has its own evidence of occupational skin diseases which shows 2.4 cases of occupational skin disease per 100 000 workers each year.
- Exposure is included within the verification of occupational skin diseases.

Figure 7: Pathway of the recognition of occupational diseases



4. Main risks (chemical, biological, physical) and related sectors, activities and jobs

There is no official collection or recording of data concerning any occupational risk.

Table 45: Specific criteria for verification of occupational skin diseases

Consecutive number	OCCUPATIONAL DISEASE / CRITERIA VERIFICATION	Occupational skin diseases and skin cancers caused by soot, tar, bitumen, resins, anthracene or its compounds, mineral and other oils, crude paraffin, carbazole or its compounds, by-products in coal destilation				Occupational skin diseases caused by other scientifically proved allergens, primarily poisonous and irritating substances that are not listed elsewhere				Occupational vitiligo
		Acne	Irritative contact dermatitis	Skin cancer		Irritative contact dermatitis	Allergic contact dermatitis	Urticaria, angioedema	Photoallergic dermatitis	
				Planocellular	Basal cell					
1.0.	Causal relationtionship between the exposure to an occupational risk factor and the reactivity of a worker									
1.1.	History: work (targeted), personal, family	+	+	+	+	+	+	+	+	+
1.2.	Clinical picture of skin disease	+	+	+	+	+	+	+	+	+
1.3.	Positive patch test for occupational allergens						+			
1.4.	Positive patch phototest								+	
1.5.	Positive prick test							+		
1.6.	Positive histopathological result			+	+					
1.7.	Other targeted examinations and tests used to prove occupational skin disease (dermatologist, in vitro tests, provocation test in the workplace)	+	+	+	+	+	+	+	+	+
1.8.	Epidemiological research that proves greater frequency of occupational skin diseases									
2.0.	WORKPLACE Risk assessment	+	+	+	+	+	+	+	+	+
2.1.	The lowest intensity of exposure	acute repetitive or chronic	acute repetitive or chronic	repetitive long-lasting		acute repetitive and long-lasting	no connection dose and effect	no connection dose and effect	no connection dose and effect	long-lasting +
2.2.	The shortest duration of exposure	Some weeks to some months depending on the intensity of exposure +	Acute: some minutes to some hours or chronic within 7 days +	6 months +	6 months +	Acute: some minutes to some hours or chronic within 7 days +	10-15 days after first contact with allergens	Possible after one contact with allergen	10-15 days if accompanied by UV radiation	Some days to some months +
2.3.	Latent period	6 months	During exposure or within 48 hours +	5-20 years +		During exposure or within 48 hours +	Some days +	Some days +	Some days +	2 years +
2.4.	Induction period									

Source: Institute of Public Health of the Republic of Slovenia.

5. Methods

Slovenia has no systematic way of verifying, recognising or registering occupational diseases. This is because of two main reasons.

- If a worker with a suspected occupational skin disease is sent to the occupational physician, the employer must pay for the check-up and, if the diagnosis is that of a recognised occupational disease, the compensation as well. This presents an obstacle preventing employers from informing occupational physicians.
- Occupational doctors in Slovenia are contracted directly by the employers and are therefore financially dependent on them. As a result, they are often reluctant to confirm diagnosis of occupational diseases. If a diagnosis is made, a new one can be established by contracting another occupational doctor, replacing the previous doctor and diagnosis.

As a result there are only a few occupational skin diseases in Slovenia that are recognised by the Institute for Pension and Disability Insurance. Some data about occupational skin diseases are available at the Clinic of Dermatology but only regarding patients tested there.

Methods of assessing and measuring risk of dermal exposure

- Each employer has to conduct a risk assessment for each job. This is usually carried out by safety engineers and occupational physicians who produce a document (safety statement) that must list the occupational dermal exposures and measures taken to reduce risk.
- The risk of dermal exposure is assessed during the risk assessment, usually by occupational physicians, participating in the assessment. There are different methods used for risk assessment. Some of them are listed in paragraph nine of the Regulation of Safety Statement (PHA, MOSAR, FTA, Delphi, FMEA). None of them includes specific methods to assess the risk of dermal exposure.
- There is no systematic recording of risk related to occupational dermal exposures or any other kind of exposure at the State level.

Methods of preventing risk of occupational dermal exposure

The safety statement must list what measures must be taken against any risk of dermal exposure and a timetable according to which time these measures must be in place. Labour inspections should control this.

According to the Institute of Occupational, Traffic and Sports Medicine, there is no systematic way of applying and controlling measures against risk of dermal exposure in Slovenia. It is possible that some companies apply these measures.

Table 46: First five most frequent skin diseases diagnoses for attendances of employees in outpatient health care services by ICD-10 Chapters, 2001-2004.

	No./1000 2001	No./1000 2002	No./1000 2003	No./1000 2004
Other dermatitis (inflammation of skin)	13.5	13.4	12.4	12.9
Urticaria (nettle-rash)	11.9	11.8	10.7	10.5
Unspecific contact dermatitis (dermatitis simplex)	9.9	9.4	8.8	9.4
Skin abscess	9.2	8.8	8.5	8.1
Allergic contact dermatitis (eczema vulgare)	8.6	8.6	8.1	7.4
Other	59.1	61.3	52.9	53.8

Source: Institute of Public Health of the Republic of Slovenia.

6. Are skin problems considered as a high priority risk?

Dermal exposure and occupational skin diseases are not considered as high priority risks. The Institute of Occupational, Traffic and Sports Medicine mentioned that currently there are no principal topics concerning occupational safety and health at all (like, for example, the use of asbestos in the past).

7. Main results and success factors

As there are no specific measures regarding dermal risks, this question is not applicable.

8. Perspectives and challenges for the future

In order to improve the situation, the Clinical Institute of Occupational, Traffic and Sports Medicine has decided to organise a continuous campaign for workers and employers ('Fit for work') to raise awareness about the importance of workers' health in the production process. So far, six modules have been prepared:

data analysis in companies and priorities

1. ergonomics at workplace
2. ecology chemistry
3. accidents at work
4. work organisation
5. stress at work and drugs.

Collected data regarding Spain 20.

1. Legislation (international, EU, national-regional-local, governmental written policy/charter)

Skin diseases: international

ILO-C42 Workmen's Compensation (Occupational Diseases) Convention (Revised), 1934
http://www.ilo.org/ilolex/english/convdisp1.htm

Skin diseases: EU

- Council Directive 76/768/EEC of 27 July 1976 on the approximation of the laws of the Member States relating to cosmetic products.
- Directive 94/27/EC of the European Parliament and of the Council of 30 June 1994, amending for the 12th time Directive 76/769/EEC the approximation of the laws, regulations and administrative provisions of the Member States relating to restrictions on the marketing and use of certain dangerous substances and preparations.
- Council Decision 1999/126/EC of 22 December 1998 on the Community statistical programme 1998 to 2002.
- Commission Recommendation 2003/670/EC of 19 September 2003, concerning the European schedule of occupational diseases.

Skin diseases: national

- Act-R.D. 1/1994 of 20 June 1994 for the approval of the rewritten text of the Social Security General Act.
- Order of 22 January 1973 on occupational health diseases report.
- Ruling 6 March 1973 on the official occupational disease report form.
- R.D. 1995/1978 of 12 May for the approval of the table of occupational diseases within the system of Social Security.

Governmental written policy

Explanatory notes helping diagnose occupational diseases, Ministry of Health (Spanish translation, 1999)
http://www.msc.es/ciudadanos/saludAmbLaboral/docs/NotasAyudaDiagEnfProf.pdf

Dermal exposure

- Council Directive 67/548/EEC of 27 June 1967 on the approximation of laws, regulations and administrative provisions relating to the classification, packaging and labelling of dangerous substances.
- Council Directive 89/656/EEC of 30 November 1989 on the minimum health and safety requirements for the use by workers of personal protective equipment at the workplace.
- Commission Directive 91/322/EEC of 29 May 1991 on establishing indicative limit values by implementing Council Directive 80/1107/EEC on the protection of workers from the risks related to exposure to chemical, physical and biological agents at work.

- Council Directive 91/414/EC of 15 July 1991, concerning the placing of plant protection products on the market.
- Directive 98/8/EC of the European Parliament and of the Council of 16 February 1998, concerning the placing of biocidal products on the market.
- Council Directive 98/24/EC of 7 April 1998 on the protection of the health and safety of workers from the risks related to chemical agents at work.
- Directive 1999/45/EC of the European Parliament and of the Council of 31 May 1999, concerning the approximation of the laws, regulations and administrative provisions of the Member States relating to the classification, packaging and labelling of dangerous preparations.
- Commission Directive 2000/39/EC, of 8 June 2000, establishing a first list of indicative occupational exposure limit values in implementation of Council Directive 98/24/EC.
- Directive 2000/54/EC of the European Parliament and of the Council of 18 September on the protection of workers from the risks related to exposure to biological agents at work.
- Directive 2004/37/EC of the European Parliament and of the Council of 29 April 2004 on the protection of workers from the risks related to exposure to carcinogens or mutagens at work.
- Directive 2006/25/EC of the European Parliament and of the Council of 5 April 2006 on the minimum health and safety requirements regarding the exposure of workers to risks arising from physical agents (artificial optical radiation).
- R.D. 1407/1992 of 20 November 1992, setting out legal condictions for facilitating the sale and free movement of personal protective equipment.
- R.D. 2163/1994 of 4 November 1994 on the regulation of the European harmonised system for placing on the market and using plant protection products.
- R.D. 363/1995 of 10 March 1995 on the regulation of provisions relating to notification of new substances and classification, labelling and packaging of dangerous substances.
- R.D. 1561/1995 of 21 September 1995 on special working days.
- R.D. 665/1997 of 12 May 1997 on the protection of workers from the risks related to exposure to carcinogens at work.
- R.D. 486/1997, of 14 April 1997, establishing minimum provisions for health and safety in workplaces.
- R.D. 773/1997 of 30 May 1997 on the minimum health and safety requirements for the use by workers of personal protective equipment at the workplace.
- R.D. 374/2001 of 6 April 2001 on the protection of the health and safety of workers from the risks related to Chemical agents at work.
- R.D. 1054/2002 of 11 October 2002, on the regulation of the assessment process for registration, approval and placing of biocides on the market.
- R.D. 255/2003 of 28 February 2003 on the regulation of provisions relating to the classification, packaging and labelling of dangerous preparations.

2. Collective practices (guidelines, recommendations, actions/initiatives/ programmes/solutions, agreements between social partners, and sectors)

Skin diseases

Guidelines

- Protocols for specific medical surveillance:
  - occupational dermatosis
  - biological agents
  - cytostatic agents
  - ethylene oxide
  - vinyl chloride monomer
  - pesticides
  - ionising radiations.

http://www.msc.es/ciudadanos/saludAmbLaboral/saludLaboral/vigiTrabajadores/protocolos.htm

- White Paper on health surveillance for occupational risk prevention

http://www.msc.es/ciudadanos/saludAmbLaboral/saludLaboral/vigiTrabajadores/home.htm

Recommendations

Updating the agreement on the basic criteria about the resources' organisation for the medical activity of the prevention services.
http://www.msc.es/ciudadanos/saludAmbLaboral/docs/criteriosBasicos.pdf

Actions, initiatives

- Information system on occupational health (SISAL), http://www.msc.es/ciudadanos/saludAmbLaboral/saludLaboral/sisal.htm
- European network of occupational health, http://es.osha.europa.eu/

Agreements

- Work Health Observatory http://www.istas.net/webistas/abreenlace.asp?idenlace=1979

Non-governmental written policy

- Spanish Academy of Dermatology:
  - Spanish Group of Research on Contact Dermatitis
  - Spanish Group of Photobiology (http://www.aedv.es/red.asp)
- Association of work accidents and occupational diseases insurance organisations of the Social Security (AMAT) http://www.amat.es
- Spanish Society of Medicine and Safety at Work http://www.semst.org/actualidad/actualidad.html
- Trade Union Institute for Work, Environment and Health http://www.istas.ccoo.es

Dermal exposure

Guidelines

- Technical guide for the evaluation and prevention of risks related to chemical agents present in places of work (http://www.mtas.es/insht/en/practice/g_AQ_en.htm).
- Technical guide for the evaluation and prevention of risks associated with exposure to biological agents (http://www.mtas.es/insht/en/practice/g_biolog_en.htm).
- Technical guide for the use by workers of personal protective equipment at the workplace (http://www.mtas.es/insht/en/practice/g_epi_en.htm).
- Technical guide for the evaluation and prevention of risks related to carcinogens or mutagens present in places of work (http://www.mtas.es/insht/practice/g_cancer.htm).
- Occupational exposure limits for chemical agents, 2006 (http://www.mtas.es/insht/en/practice/vlas_en.htm).
- Guidelines on limits of exposure to broad-band incoherent optical radiation (0.38 to 3µm). *Health Physics*, No 73 (3), 1997, pp. 539–554 (http://www.icnirp.org/documents/broadband.pdf)
- Technical guide for the evaluation and prevention of risks associated with the use of workplaces (http://www.mtas.es/insht/en/practice/g_lugares_en.htm).
- Technical guide for the evaluation and prevention of hazards in construction sites: (http://www.mtas.es/insht/en/practice/g_obras_en.htm).

Recommendations

- Erga FP: http://www.mtas.es/insht/erga_fp/ergafp.htm
  - N 24: storing and mixing pesticides,
  - N 25: applying and wasting pesticides.
- Erga news — practice notes: http://www.mtas.es/insht/erga_not/erga_not.htm
  - N 71: biological risk prevention in slaughterhouses,
  - N 77: skin care in the workplace,
  - N 80: workers dermal exposure to chemicals.
- Preventive action guides: http://www.mtas.es/insht/practice/guias.htm
  - greenhouses,
  - florist's shops,
  - tinned food industry.
- Poster: protection clothes against pesticides: http://www.mtas.es/insht/information/carteles/car_064.htm
- Safety handbook for researchers in biotechnology laboratories: www.juntadeandalucia.es/empleo/anexos/23_1_1.pdf
- Fact sheets: http://www.mtas.es/insht/information/lib_tot.htm#dd
  - optical radiation risk from luminance sources,
  - occupational exposure to optical radiation.
- Technical prevention notes (TPN): http://www.mtas.es/insht/ntp/index.htm
  - TPN 326: heat radiation in fires of liquids and gases,
  - TPN 462: cold stress: occupational exposures evaluation,
  - TPN 526: first aid: burns,
  - TPN 545: biological risk prevention in the laboratory: work with parasites,
  - TPN 571: biological exposure: personal protective equipment,
  - TPN 585: biological risk prevention in the laboratory: work with bacterium,

- TPN 608: biological agents: developing a sampling plan,
- TPN 609: biological agents: bioaerosols samplers (I),
- TPN 610: biological agents: bioaerosols samplers (II),
- TPN 611: biological agents: sample analysis,
- TPN 625: biological hazards in maritime fishery,
- TPN 654: new laser classification (UNE EN 60825-1/A2: 2002),
- TPN 697: dermal exposure to chemicals,
- TPN 700: infection control precautions in healthcare settings,
- TPN 711: work risks in waste management and treatment companies: sorting plants of packages (II).

Actions

- INSHT projects:
  - risk assessment of occupational dermal exposure to chemicals http://www.mtas.es/insht/research/p_nal.htm
  - assessment of new plant protection products for its authorisation and placing on the market http://www.mtas.es/insht/research/p_nal.htm#sevilla
  - risk assessment of exposure to plant protection products http://www.mtas.es/insht/research/p_nal.htm#sevilla
- RISKOFDERM project 'Risk assessment of occupational dermal exposure to chemicals' (Project QLKA4-CT-1999-01107 funded by the European Commission). Links: http://annhyg.oxfordjournals.org/content/vol47/issue8/ and http://annhyg.oxfordjournals.org/content/vol48/issue3/
- SUI project 'Safe use initiative' http://www.ecpa.be/files/ecpa/documentslive/23/14871_SUI_EN_v31.pdf

Non governmental written policy

- Professional Association for Plant Protection: http://www.aepla.es
- Other Spanish associations, for example:
  - association of personal protection equipment manufactures: http://www.asepal.es/
  - association to prevention occupational accidents: http://www.apa.es/

3. Main risks (chemical, biological, physical) and related sectors, activities and jobs

Chemical

The main sectors affected by dermal exposure are the following:

- agricultural industry (mixing/diluting, loading and spraying pesticides)
- chemical industry (handling, loading, mixing/diluting chemical substances, maintenance and servicing)
- electrical/electronic engineering industry (immersing of objects, electroplating);
- leather processing industry
- polymers industry
- metallurgy
- pulp, paper, and board industry
- textile processing industry
- paints, lacquers, and varnishes industry.

(*Source*: RISKOFDERM project): Links: http://annhyg.oxfordjournals.org/content/vol47/issue8/ and http://annhyg.oxfordjournals.org/content/vol48/issue3/)

Biological

- Fishing (catching fish, classification and selection, processing)
- Agriculture (harvesting, harvest handling, storage)
- Livestock farming (parturition assistance, milking, shearing, fodder handling)
- Healthcare (patients handling, handling of contaminated biological samples)
- Laboratories (contaminated samples handling, contaminated objects handling)
- Food industry (slaughterhouses, direct contact with dead animals, their biological fluids and Biological origin products as milk and excrement)
- Waste and sewage treatment companies (cleaning operations, wastes collection and transfer).

4. Levels of recognition of occupational skin diseases and dermal exposure

Although occupational dermal exposure risks are recognised, there is no record.
Statistics: http://www.mtas.es/estadisticas/index.htm

5. Methods

5.1. Methods of assessing the risks of dermal exposure

- Toolkit for assessment and management of risks from occupational dermal exposure to hazardous substances, from RISKOFDERM project: http://annhyg.oxfordjournals.org/cgi/content/full/47/8/629
- Poster: methodology to assess occupational exposure to optical radiations introduced in the International NIR Workshop & Symposium (Seville 2004) Organised by: Icnirp (International Commission on Non-Ionising Radiation Protection)

Evalfrio: Computer application for thermal risk and discomfort assessment in cold workplaces http://www.mtas.es/insht/information/aip/aip_023.htm

5.2. Methods of measuring the risks of dermal exposure

- OECD, 1997: guidance document for the conduct of studies of occupational exposure to pesticides during agricultural application: http://www.olis.oecd.org/olis/1997doc.nsf/LinkTo/ocde-gd(97)148
- Models from RISKOFDERM project, workpart three: http://annhyg.oxfordjournals.org/content/vol47/issue8/
- EASE model: http://www.hse.gov.uk/research/rrhtm/rr136.htm
- EUROPOEM model for plant protection products: http://europoem.csl.gov.uk/
- English model for plant protection products: http://www.pesticides.gov.uk/uploadedfiles/Web_Assets/PSD/UK_POEM1.xls
- German model for plant protection products: http://www.pesticides.gov.uk/uploadedfiles/Web_Assets/PSD/German_Model_PSD1.xls

5.3. Methods of preventing (eliminating/minimising/controlling) the risk of dermal exposure

Toolkit for assessment and management of risks from occupational dermal exposure to hazardous substances, from RISKOFDERM project: http://annhyg.oxfordjournals.org/cgi/content/full/47/8/629.

Table 47: Cases and percentage of workers with skin problems by occupation, 2000–04 Estadísticas de enfermedades profesionales 2000–04. MTAS Spain

Occupation	2001	%	2002	%	2003	%	2004	%
Technicians	45	12	38	8.74	44	10.4	32	6.74
Assistant technicians	23	6.42	22	4.95	32	5.89	38	6.75
Clerks	11	2.63	22	4.14	23	3.95	24	3.68
Service workers	222	12.36	222	10.06	254	9.51	254	8.43
Qualified workers	881	8.43	903	7.72	918	7.35	830	6.41
Operators	212	7.36	161	5.6	173	6.2	200	5.95
No qualified workers	687	10.48	599	8.76	634	8.61	626	8.12
DA	3	33.33	2	28.57	1	50	0	0
Total	2,084	9.12	1,969	7.86	2,079	7.74	2,004	6.98

6. Are skin problems considered as a high priority risk?

'Plan for the improvement of occupational health and safety and reduction of occupational accidents'.

http://www.tt.mtas.es/periodico/Laboral/200504/LAB20050422_3.htm

Occupational illnesses hardly show in the statistical systems because of the difficulties of registering them. This plan considers it a priority to gain a better understanding of the true scale of occupational illnesses, agents, process and occupational situations in order to find effective measures to control and reduce them.

7. Main results and success factors

There has been an increase in the recording of occupational illnesses, partially because of an improvement in their detection and notification, which has begun to shed light on the importance of the damage to health that they can cause.

8. Perspectives and challenges for the future

Among other policies, the 'Occupational Health and Safety Spanish Strategy, 2005–08' agrees to finish the new list of occupational illnesses and to renew the procedures for declaring, notifying and recording systems of occupational illnesses.

21. Collected data regarding Sweden

1. Legislation (international, EU, national-regional-local, governmental written policy/charter)

Government offices: Ministry of Industry, Employment and Communications, Sweden

Government measures for health at work.

In its Budget Bill for 2002, the Government presented a comprehensive action programme for better health in working life. The intention is to combine ongoing as well as new initiatives in a cohesive action plan that will serve to promote better health in working life.

Work Environment Act

The purpose of this act is to prevent illness and accidents in the course of employment and to otherwise achieve a sound work environment.

2. Collective practices (guidelines, recommendations, actions/initiatives/programmes/solutions, agreements between social partners, and sectors)

Sweden is in the frontline concerning research and legislation for prevention of disease caused by hazardous skin exposure.

Swedish Work Environment Authority

The Swedish Work Environment Authority is the administrative authority for questions relating to the working environment. It endeavours to reduce the risks of ill-health and accidents at work and to improve the working environment with a holistic perspective. It acts to realise the public policy objective of a good and developmental working environment for all.

Swedish council for working life and social research

The Council's support for research takes various forms. The main one is grants for projects. Proposals are submitted by researchers and their scientific merit and societal relevance are assessed through a peer review process. To stimulate research within specific areas, the Council may award longer period grants to research programmes at academic departments of excellence. The Council also creates research positions at Swedish universities and provides grants for visiting researchers as well as scholarships for post-doc studies abroad.

The research funded by the Council covers the following areas:

- chemical and physical hazards at work including electromagnetic fields,
- disability.

Working life and environmental exposures and clinical sensitivity

The general aim of their research group is occupational and environmental health for all. It focuses on exposure-related clinical effects, the effect of differences in sensitivity and their consequences for sustainable occupational and environmental health.

The idea is that problems arise from imbalance between working life demands and individual resources. In order to reach our goal of sustainable occupational and environmental health for all, it performs exposure assessment for relevant agents including allergens, irritants, particles, and different physical exposures.

The goals are to understand causes for differences in exposures, limit important exposure, provide relevant information regarding risk work tasks related to sensitivity, and to enable early detection of results, including perceived health effects.

Karolinska Institutet

Based at the Department of Public Health Sciences, the Institue conducts research, teaching and consultancies based on the public health concept and also occupational medicine. The research focuses on health problems in the population and their alleviation via community-based prevention and the development of appropriate healthcare systems.

Epidemiologists and social scientists work along with researchers with medical and nursing backgrounds. Planning and evaluation of health services and understanding of health behaviour are common perspectives in the projects.

Occupational and Environmental Dermatology, Research Group in Stockholm

- The organisation

The application and communication of scientific knowledge are performed in close cooperation between the Occupational and Environmental Dermatology Research Group, Karolinska Institutet and the Department of Occupational and Environmental Health, the Stockholm Centre for Public Health and Stockholm County Council. The majority of senior researchers of the research group are employed by the Stockholm County Council and one is employed by the National Institute for Working Life (NIWL).

- Research programme

The overall aim is primary and secondary prevention of occupational and environmental skin disease. The research is mainly applied science focusing on major health problems. The work is multidisciplinary, with close cooperation between dermatologists, immunologists, epidemiologists, toxicologists, chemists and technicians. Much of the research is performed in collaboration with other groups in Sweden and internationally. The main research areas are the following.

Skin exposure assessment

The research area receiving the greatest increase in effort relates to assessing skin exposure that can cause local skin effects. The research groups are applying existing methods and developing new ones. Skin exposure to pesticides in developing countries, and to acrylates in dental work, is studied by fluorescent tracer technique and other methods. A tape stripping technique was developed for assessment of skin and surface contamination with acrylates. Together with other methods, this is now used in studies of skin exposure to hair dyes in hairdressers. Skin exposure to metals is

studied by acid wipe sampling, a technique developed by the group. A unique exposure chamber has been constructed and is used for studies on skin and lung exposure to airborne particles.

Contact dermatitis and contact urticaria

This is clinical research involving patients and studying major skin allergens and irritants such as nickel, chromate, cobalt, preservatives, acrylates, natural rubber latex and surfactants. The work includes identification of new allergens. Besides epidemiology, the research group is using clinical, experimental, immunological and chemical methods. The research group is also engaged in European standardisation on nickel, protective gloves, and skin exposure.

Epidemiology

The research group is focusing on the development of methods for analytical epidemiology, suitable for studies in occupational dermatology; epidemiologic monitoring and studies on the occurrence of hand eczema, contact allergy and atopic dermatitis in the general population and in risk occupations, i.e. dentists, dental technicians, hairdressers, mechanics and bakers. Health-related quality-of-life studies are ongoing.

Skin structure and function

Studies of the skin barrier functions and the pathogenetic mechanisms in irritant and allergic contact reactions are carried out. Microscopy, immunology and non-invasive bio-engineering techniques are applied.

Scientific publications and grants

More than 140 referred publications were published in scientific journals from 1997–2005. Major research funding comes from the Swedish Council for Working Life and Social Research (FAS), the Swedish Foundation for Healthcare Sciences (Vårdal), and Stockholm County Council (SLL).

The second international conference 'Occupational and environmental exposures of skin to chemicals' (OEESC-2005) was arranged by the activities of the reseach group, in cooperation with NIOSH, USA.

Scientific papers

- Aragón, A., Blanco, L. E., Funez, A., Ruepert, C., Lidén, C., Nise, G., Wesseling, C., 'Assessment of dermal pesticide exposure with fluorescent tracer: a modification of a visual scoring system for developing countries', *Ann Occup Hyg*, No 50, 2006, pp. 75–83.
- Lidén, C., Carter, S., 'Nickel release from coins', *Contact Dermatitis*, No 44, 2001, pp. 160–165.
- Lind, M-L., Boman, A., Sollenberg, J., Johnsson, S., Hagelthorn, G., Meding, B., 'Occupational dermal exposure to permanent hair dyes among hairdressers', *Ann Occup Hyg*, No 49, 2005, pp. 473–480.
- Meding, B., Järvholm, B., 'Hand eczema in Swedish adults — changes in prevalence between 1983 and 1996', *J Invest Dermatol*, No 119, 2002, pp. 719–723.
- Nyrén, M., Lindberg, M., Stenberg, B., Svensson, M., Svensson, Å., Meding, B., 'Influence of childhood atopic dermatitis on future worklife', *Scand J Work Environ Health*, No 31, 2005, pp. 474–478.

2.1. Examples of the application or communication of scientific knowledge

Prevention of work-related asthma and dermatitis

The research group has for many years actively communicated scientific knowledge and clinical experience concerning work-related dermatitis, high-risk occupations, risk factors and preventive measures. The group produced videos and fact sheets on occupational guidance for prevention of asthma and dermatitis, on hand eczema, the use of protective gloves, and latex allergy. By cooperating with experts on work-related asthma, the research group has broadened the communication to include asthma.

Website

The website www.jobbafrisk.se (healthy work) is a further development of the efforts to communicate scientific knowledge to the broader community. It was first published in 2004 in a nationwide campaign. In 2005, the website had 3 000 unique visitors per month and is continuously updated with information on more occupations. In 2006, we received economic support by the Stockholm County Council to develop it further in order to reach broader target groups than at present.

Some of the most important players in the fields of employment, education and allergy, such as the Swedish Employment Service, the Swedish National Agency for School Improvement, and the Swedish Asthma and Allergy Association, have published links to www.jobbafrisk.se.

Education

The knowledge on work-related dermatitis and prevention is communicated in several education programmes arranged by the Karolinska Institutet and NIWL, in which we participate as teachers and in some cases hold responsibility for the training programme.

Examples: the Karolinska Institutet: study programme in medicine; postgraduate course and education for occupational health professionals on asthma, allergy and eczema in working life; postgraduate course in environmental research, and in skin allergy and inflammation; study programme in toxicology; NIWL: training programmes for occupational health professionals.

2.2. OEESC-2005 — international conference on prevention

The Second International Conference on Occupational and Environmental Exposures of Skin to Chemicals (OEESC-2005) was held in Stockholm from 12–15 June 2005. The conference was organised by the National Institute for Occupational Safety and Health, USA (NIOSH), the Karolinska Institutet and Stockholm County Council. The first conference in the series was held near Washington, DC in 2002; the third conference was held in Colorado in 2007.

The purpose of these conferences is to bring people from around the world and from many disciplines in public health research and practice to focus on prevention of harmful skin exposures to chemicals. The programme in Stockholm 2005 included short courses, plenary talks, vendor seminars, workshops and posters.

Some of the issues that attracted the most attention in the conference and the media were the possibilities and needs for prevention of contact dermatitis, and particularly the harmful effects of wet work; pesticide use and risks in developing countries; and latex allergy.

2.3. Legislation and European standardisation for prevention

Members of the research group are engaged as experts — by national and international authorities and organisations — on issues regarding skin sensitisation, hazardous substances, occupational limits and legislation. The focus of our participation in such work is the protection of the health of workers and consumers, by limiting hazardous skin exposure and preventing contact dermatitis.

Regulations concerning dangerous substances, chemical products and cosmetic products are decided by the EU, not at the national level. The work has had significant impact on some of the EU regulations and on European standardisation (CEN), and on their implementation in Sweden and by the Stockholm County Council.

Swedish national authorities

The members of the research group are engaged as experts on skin exposure, sensitisation, percutaneous absorption, dermatitis and prevention by national authorities and committees.

- Swedish Chemicals Inspectorate
- Swedish Medical Product Agency
- Swedish Work Health Authority
- Swedish Criteria Group on Occupational Limits
- National Swedish Council of Toxicology
- Stockholm County Council.

They give expert support to the County Council in the procurement of protective gloves for medical use, hygiene products, detergents and other chemical products, for minimising the risk of allergies and to protect employees and patients.

3. Main risks (chemical, biological, physical) and related sectors, activities and jobs

Wet work and skin exposure to solvents, cement and pesticides are some of the primary causes of skin disease. It is also important to know how new chemical substances and products may affect health, and how to prevent disease.

4. Levels of recognition of occupational skin diseases and dermal exposure

Skin diseases at the workplace are officially recognised as occupational diseases.

Work injury insurance system

People injured in an accident at work, or on the way to or from work, can obtain compensation from the work injury insurance scheme. The insurance also applies to occupational illness, e.g. skin complaints following contact with certain substances. The employer must notify the social insurance office.

The Work Injury Information System (ISA) contains information about reported work accidents and work-related illnesses among all employees in Sweden. This register is based on reports made of work injuries to the Social Insurance Office under the Work Injury Insurance Act (LAF). ISA contains data on occupational accidents and work-related diseases reported under the Work Injury Insurance Act. The purpose of ISA is to provide basic information required for preventive measures in working life.

5. Methods

5.1. Methods of collecting data on the occurrence and prevalence of skin diseases

There are no methods for systematic data collection on the occurrence of skin diseases caused by occupational exposures or other reasons. If a doctor recognises a case as work-related, he/she can refer the patient to a dermatologic clinic that specialises in occupational skin diseases (mainly at university hospitals). The research is conducted by university clinics. Their research can give some idea of the magnitude of the problem. The ISA system is based on reports of symptoms made by workers themselves and is not based on clinical diagnoses.

5.2. Methods of assessing and measuring the risks of dermal exposure

The projects mentioned below, and other scientific projects within the universities, can contribute to the discovery and quantification of both new and known risks. The Swedish Authority for Work Environment is pursuing a project aiming at a better disclosure of occupational skin diseases by work environment inspectors.

5.3. Methods of preventing (eliminating/minimising/controlling) the risk of dermal exposure

The provisions on chemical work environment hazards (AFS 2000:4) deal with all aspects on protection from chemical substance exposure, including risks for skin damages. The main principle is to exchange a substance for one less hazardous; the second step is to encapsulate the process; then to enhance ventilation; and, finally, to use personal protection equipment.

Research and activities

Projects sponsored by the Swedish Council for working life and social research about dermal exposure and occupational skin diseases.

- Grant No 2001-0222: predictive allergy- and toxicity-testing and improved diagnosis and therapy of allergic contact dermatitis.
- Grant No 2001-0337: quantitative studies of dermal absorption of compounds present in the occupational environment.
- Grant No 2001-2399: dermal exposure in hairdressers and possibilities for prevention.
- Grant No 2001-2564: variability in dermal exposure.
- Grant No 2001-2811: quantitative dermal uptake studies of workplace chemicals.
- Grant No 2001-2888: skin exposure assessment — methods for dose, uptake and local effects. Development of knowledge for the prevention of occupational skin disease.
- Grant No 2003-0043: rubber chemicals: skin contacts, penetration and risk evaluation.
- Grant No 2004-1899: skin exposure assessment — methods for dose, uptake and local effects. Development of knowledge for the prevention of occupational skin disease.
- Grant No 2005-0373: rubber products: skin exposure, penetration and metabolism.
- Grant No 2005-0373: dermal exposure and skin adduct of MDI (methylene diphenyl diisocyanate).

6. Are skin problems considered as a high priority risk?

Occupational skin damages are not a priority this year or next.

7. Main results and success factors

Examples of methods of assessing and measuring risk of dermal exposure.

A method for assessing occupational dermal exposure to permanent hair dyes was developed

The performance characteristics of hand wash sampling with bag rinsing were studied for five hair dye compounds. The sampling efficiency after five minutes' residence time was between 70 and 90 % for the dye components in the hair dye products. The sampling efficiency was adequate for measurements of dermal exposure to permanent hair dyes (Lind, M.-L. et al., *Ann. Hyg.*, No 48 (6), 2004, pp. 533–539).

Occupational dermal exposure to permanent hair dyes among hairdressers

The hairdressers' skin is exposed to allergenic compounds during hair dyeing. Hand rinse samples were collected from each hand before the start of hair dyeing, after application of the dye and after cutting the newly-dyed hair. Exposure occurs from dye application, from cutting newly-dyed hair and from background exposure. The exposure loadings are in the level, where there is a risk of sensitisation and/or elicitation of contact allergy (i.e. for PPD 22-939 nmol per hand).

The glove use observed in this study was often improper, and was insufficient to prevent exposure (Lind, M.-L. et al., *Ann. Hyg.*, No 49 (6), 1 August 2005, pp. 473–480).

Measurement of dermal exposure to epoxy components

A majority of epoxies are based on diglycidyl ether of bisphenol A (DGEBA). For the assessment of dermal exposure to DGEBA, field sampling was performed on workers applying seamless floors. The sampling was performed either with patches attached to the skin during a work shift or as tape stripping after a work shift. These sampling methods are to be more thoroughly studied at the laboratory and during field sampling in different occupational environments. The measurements give information on current exposure levels but are also intended to be a basis for recommendations on sampling strategy in different workplaces (Lindahl, R. et. al., *Proceedings of the international conference on occupational and environmental exposures of skin to chemicals).*

Large organic aerosols in a human exposure chamber: applications in occupational dermatology and lung medicine (L. Lundgren, Karolinska Institute): http://diss.kib.ki.se/2006/91-7140-731-6/

Occupational dermal exposure to permanent hair dyes among hairdresser (M.-L. Lind, National Institute for Working Life): http://annhyg.oxfordjournals.org/cgi/content/abstract/49/6/473

Dermal uptake studies of workplace chemicals (M. Rauma, Karolinska Institute) http://ki.se/ki/jsp/polopoly.jsp?d=2650&a=6279&l=en

Other references

[1] www.eurekalert.org/pub

[2] The Swedish Work Environment Authority, Publication Services, Box 1300, SE–171 25 Solna, Tel. (46-8) 730 97 00 or Fax (46-8) 735 85 55, E-mail: publikationsservice@av.se

22. Collected data regarding the United Kingdom

1. Legislation (International, EU, national-regional-local, governmental written policy/charter)

Under the Health and Safety at Work Act 1974 and the Management of Health and Safety at Work Regulations 1999 (http://www.opsi.gov.uk/si/si1999/19993242.htm), employers have a legal duty to protect the health and safety of their employees and anyone else affected by their work activities.

Chemicals are subject to the Control of Substances Hazardous to Health Regulations 2002 (http://www.opsi.gov.uk/si/si2002/20022677.htm). These implement the health requirements of an EC directive, known as the chemical agents directive (Directive 98/24/EC, http://europa.eu.int/eur-lex/pri/en/oj/dat/1998/l_131/l_13119980505en00110023.pdf), which establishes minimum requirements for the protection of workers' health and safety from the presence or use of hazardous chemical agents.
Source: http://www.hse.gov.uk/skin/law.htm

2. Collective practices (guidelines, recommendations, actions/initiatives/programmes/solutions, agreements between social partners, and sectors)

- The Health & Safety Executive (HSE) provides information on skin diseases, especially on:
  - (contact) dermatitis (http://www.hse.gov.uk/skin/diseases/dermatitis.htm),
  - contact urticaria (http://www.hse.gov.uk/skin/diseases/urticaria.htm),
  - acne (http://www.hse.gov.uk/skin/diseases/acne.htm),
  - pigmentary disorders (http://www.hse.gov.uk/skin/diseases/pigment.htm),
  - skin cancer (http://www.hse.gov.uk/skin/diseases/cancer.htm).

Source: http://www.hse.gov.uk/skin/diseases/index.htm

- The website 'http://www.hse.gov.uk/skin/index.htm' links to different topics in relation to occupational skin diseases (e.g. topics like contact with chemicals, the 'skin at work' action plan).
- HSE also provides guidelines like 'Preventing dermatitis at work — advice for employers and employees' (http://www.hse.gov.uk/pubns/indg233.pdf) or the 'Medical aspects of occupational skin disease' (http://www.hse.gov.uk/pubns/ms24.pdf).

Further information like posters or further reading is also available.
Source: http://www.hse.gov.uk/skin/information.htm

- The 'Skin at work action plan' is a suitable step-by-step action plan to prevent work-related dermatitis. It contains information on measurements, personal protective equipment as well as information on teaching and training of the staff.

Source: http://www.hse.gov.uk/skin/actionplan.htm

- A case study on fabric coating (problem-solution-benefits — legislative requirements) is described on the HSE website.

Source: http://www.hse.gov.uk/skin/casestudies/fabric.htm

- The guideline 'Selecting protective gloves for work with chemicals' recommends how to select suitable protective gloves (http://www.hse.gov.uk/pubns/indg330.pdf).
- The correct removal of single use and reusable gloves as well as possibilities for skin care is also described on the HSE website (http://www.hse.gov.uk/skin/information.htm).

3. Main risks (chemical, biological, physical) and related sectors, activities and jobs

Occupations affected by contact dermatitis (mostly industries and business sectors):

- agriculture/horticulture
- catering and food processing
- chemicals
- cleaning
- construction
- engineering
- hairdressing/beauty care
- healthcare
- offshore work
- printing
- rubber.

These are the industry sectors with the highest risk of work-related dermatitis, but dermatitis can affect people working in all sectors.
Source: http://www.hse.gov.uk/skin/diseases/dermatitis.htm

Oil acne amongst oil workers is rare because there are fewer opportunities for prolonged contact with crude oil or the heavier oil fractions.
Source: http://www.hse.gov.uk/skin/diseases/acne.htm

According to the latest statistics on skin diseases in United Kingdom:

- in 2006/07 there were 29 000 people with 'skin problems' which they believed to be work-related (*Source*: Self-reported work-related illness survey);
- over 3 500 cases of occupational skin disease in 2006 were reported by dermatologists and occupational physicians reporting in the THOR (Epiderm and OPRA) network. Of these, 2 395 (68 %) were contact dermatitis and 760 (21 %) — most of the remainder — were skin cancers.

Statistical modelling by the University of Manchester showed statistically significant downward tends in the incidence of both contact dermatitis and all skin disease cases over the period 1996–2006 after taking account of certain factors which affect the annual estimates based on THOR.

During 2004–06, the most common agents cited by dermatologists and occupational physicians as causes of skin disease were 'soaps and cleaners', 'rubber chemicals and materials', 'wet work', and 'personal protective equipment (PPE)'.

The occupations with the highest estimated incidence rates in 2004–06 according to dermatologists reporting to Epiderm, were: 'floral arrangers and florists', 'hairdressers and barbers', 'rubber process operatives', 'glass and ceramics process operatives' and 'beauticians and related occupations'.

The industrial sector with the highest estimated incidence rates in 2004–06 according to dermatologists reporting to Epiderm, was 'other service activities'.

Source: http://www.hse.gov.uk/statistics/overpic.htm?ebul=stats/nov-07&cr=03

4. Levels of recognition of occupational skin diseases and dermal exposure

For figures on occupational contact dermatitis see http://www.hse.gov.uk/statistics/causdis/skin.htm

'Skin problems' data

2001/02: estimated prevalence: 38 000 (88 cases per 100 000 ever employed)
2003/04: estimated prevalence: 31 000 (71 cases per 100 000 ever employed)
2004/05: estimated prevalence: 29 000 (67 cases per 100 000 ever employed)
Source: http://www.hse.gov.uk/statistics/tables/swit3.htm

Further tables

Diagnostic categories per age group per sex:
http://www.hse.gov.uk/statistics/tables/thors01.htm

Diagnostic categories per year per sex:
http://www.hse.gov.uk/statistics/tables/thors02.htm

Estimated number cases per diagnostic category:
http://www.hse.gov.uk/statistics/tables/thors03.htm

Estimated number of cases and estimated rate per 100 000 workers per year, by occupation: http://www.hse.gov.uk/statistics/tables/thors04.htm

Estimated number of diagnoses in which particular casuative substances were identified: http://www.hse.gov.uk/statistics/tables/thors06.htm

Estimated number of cases and estimated rate per 100,000 workers per year, by industry: http://www.hse.gov.uk/statistics/tables/thors05.htm

For further statistics on the incidence of work-related disease see: Cherry 2002.pdf

5. Methods

National surveillance schemes for the reporting of occupational diseases have been active in the United Kingdom since 1989. Together these form the Occupational Disease Intelligence Network (ODIN), of which two component schemes — EPIDERM (a scheme for the surveillance of occupational skin diseases by dermatologists) and OPRA (Occupational Physicians Reporting Activity, a scheme for all types of work-related diseases) — contribute to the reporting of occupational skin diseases.
Source: Shum 2003.pdf

In 1998, the different schemes were brought together and run from the University of Manchester as part of the Occupational Disease Intelligence Network (ODIN). From April 2002 the network, still run from the University of Manchester, has been known as the 'Health and occupation reporting network' (THOR).
Source: http://www.hse.gov.uk/statistics/sources.htm

The following summary is available at
http://www.hse.gov.uk/statistics/causdis/skin.htm

'The 2004/05 'Self-reported work-related illness' survey estimated the prevalence of self-reported work-related skin disease in Great Britain as 29 000.

An estimated average of 3 500 new cases of work-related skin disease was diagnosed each year between 2002 and 2004 by specialist physicians (THOR): approximately 75 % of these were contact dermatitis.

The annual number of workers with occupational dermatitis assessed as having some degree of disablement under the industrial injuries scheme continued to fall from just over 400 in the early 1990s to 170 in 2003/2004.

Trends in the incidence of occupational dermatitis are difficult to assess from the available data sources. Looking at the THOR data it can be seen that, after fluctuating between 3 000 and 4 000 cases per year between 1996 and 2000, the number of dermatitis cases in the Epiderm and OPRA surveillance schemes has now been below 3 000 for the last four years. This, therefore, seems to represent a genuine downward trend. However, there can be several reasons that may explain an apparent change in the number of reported cases from one year to the next. As a result such data should be interpreted with caution. For example, participation by specialist doctors in the schemes is voluntary, and they may leave the scheme or be less inclined to report as time goes on.

The occupations estimated to be at highest risk in 2002–04 according to dermatologists reporting to Epiderm, were floral arrangers and florists, beauticians and related occupations, and hairdressers and barbers.

The industries where workers were estimated to be at highest risk in 2002–04 according to dermatologists reporting to Epiderm, were other service activities, research and development, and manufacture of chemicals and chemical products.

During 2002–04, the most common agents cited by dermatologists and occupational physicians as causes of skin disease were rubber chemicals and materials, followed by soaps and cleaners, and wet work.'

The Health and Safety Laboratory (HSL) developed the fluorescence interaction video exposure system in order to measure skin contamination.
Source: http://www.hsl.gov.uk/capabilities/skin.htm

Workplace health and safety survey programme

'Respondents were asked whether, in the last 12 months, they had come into regular contact with specific chemicals in their job which could cause skin problems; e.g. cutting oils or coolants, soaps or cleaners, solvents, or any other substances known to cause skin problems (see questionnaire 4 for more details). Responses indicated that in the last 12 months, around half of all workers came into regular contact with substances that are known to cause skin problems. Two thirds had received some training or information on whether handling such substances could cause skin problems and/or how to protect themselves from any harmful effects of the substances. An estimated 87 % were very or fairly confident that this would help prevent them from developing a skin problem.

The level of concern among those exposed to this risk was relatively low at 12 % (representing 6 % of the working population). Some 29 % thought the risk could realistically be reduced, and a clear majority (13 % versus 3.7 %) of those reporting that there had been some change in the level of risk over the last 12 months, thought that the risk had reduced in this time rather than increased.'
Source: HSE 2005.pdf

Skin diseases in Gulf war veterans

'Background: Gulf war veterans report more symptomatic ill-health than other military controls and skin disease is one of the most frequent reasons for military personnel to seek medical care.

Results: the prevalences of skin disease in disabled Gulf, non-disabled Gulf and disabled non-Gulf veterans were 47.7 %, 36.7 %, and 42.8 % respectively. Seborrhoeic dermatitis was twice as common as expected in the Gulf veterans (both disabled and non-disabled).'
Source: Higgins 2002.pdf

The prevalence of occupational dermatitis in the United Kingdom printing industry

'Aims: to quantify occupational ill health resulting from dermatitis in the United Kingdom printing industry and to explore links with particular processes and activities. Results: a total of 490 respondents (41 %) self-reported a skin complaint at some time. The prevalence of skin complaints was highest in males (43 %) and those working in printing (49 %), in particular those who cleaned rollers and cylinders or who came into contact with substances containing isocyanates on a daily basis. The most commonly affected areas reported were the fingers and webs between the fingers. Of the 490 respondents, 26 % reported a current problem on the hand. Reported symptoms included itching (61 %), rash (58 %), and dry skin (56 %). Although certain printing industry substances were thought by respondents to aggravate their condition, constant washing and friction was most often cited. Reported use of protective equipment and cleansing products was generally high, particularly by printers. Clinical examination confirmed the high self-reported prevalence and also identified a substantial proportion of mild cases which were not reported. The overall prevalence of occupationally related skin complaints is estimated to be 40 %.'
Source: Livesley 2002.pdf

Dermal exposure to electroplating fluids and metalworking fluids in the United Kingdom

'Introduction: this paper describes two sets of workplace dermal exposure measurements that were carried out by the Health and Safety Laboratory (HSL) as part of the EU RISKOFDERM project (RISKOFDERM, 1999). The project was an opportunity to study dermal exposure in a generic manner, i.e.to measure in terms of a product or formulation, rather than to particular hazardous substance as an ingredient of concern in that product. This generic approach allows exposure to be inferred for a range of hazardous substances that might be encountered during similar tasks but using different products.

Conclusion: the presence of detectable quantities of other metals implies that there was contamination around the workplace and that the workers were being re-contaminated by their own dirty protective clothing. This shows that exposure can take place not just from the immersion activity, but also from incidental contact. All the pathways for dermal exposure must be taken into account in any risk assessment.'
Source: Roff 2004.pdf

Table 48: Contact dermatitis: estimated number of cases reported by dermatologists and occupational physicians to Epiderm/OPRA and estimated rates per 100 000 workers per year, by occupation 2003–05

Code	Occupational group	Dermatologists (Epiderm)		Occupational Physicians - (OPRA)	
		Annual average estimated cases	Rate per 100 000 workers per year	Annual average estimated cases	Rate per 100 000 workers per year
1	Legislators, senior officials and managers	17		1	
2	Professionals	70	2	22	1
3	Technicians and associate professionals	349	9	163	4
4	Administrative and secretarial	35	1	4	
5	Skilled trades	418	14	113	4
6	Personal service	285	14	50	2
7	Sales and customer service occupations	42	2	8	
8	Plant and machine operators and assemblers	231	11	246	12
9	Elementary Occupations	224	7	113	4
	All	1,687	6	720	3

6. Are skin problems considered as a high priority risk?

HSE has developed strategic programmes of support and intervention work to deliver public service targets for significant reductions in the incidence of occupational illnesses by 2010. Increasing awareness and knowledge of occupational health is an important activity underpinning these programmes.
Source: http://www.hsl.gov.uk/case-studies/profile_oh.htm

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European Agency for Safety and Health at Work

Occupational skin diseases and dermal exposure in the European Union (EU-25): policy and practice overview

Luxembourg: Office for Official Publications of the European Communities

2008 — 244 pp. — 21 x 29.7 cm

ISBN 978-92-9191-161-5

In order to improve the working environment, as regards the protection of the safety and health of workers as provided for in the Treaty and successive Community strategies and action programmes concerning health and safety at the workplace, the aim of the Agency shall be to provide the Community bodies, the Member States, the social partners and those involved in the field with the technical, scientific and economic information of use in the field of safety and health at work.

European Agency for Safety and Health at Work

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Publications Office
Publications.europa.eu

TE-70-07-049-EN-C

ISBN 978-92-9191-161-5