

Do hairdressers in Denmark have their hand eczema reported as an occupational disease? Results from a register-based questionnaire study

Susan H. Lysdal¹, Heidi Søstved¹ and Jeanne D. Johansen²

¹Department of Dermato-Allergology, Research Centre for Hairdressers and Beauticians, Copenhagen University Hospital Gentofte, DK-2900 Hellerup, Denmark and ²Department of Dermato-Allergology, National Allergy Research Centre, Copenhagen University Hospital Gentofte, DK-2900 Hellerup, Denmark

doi:10.1111/j.1600-0536.2011.01997.x

Summary

Background. Occupational hand eczema is common in hairdressers, owing to wet work and chemicals.

Objectives. To estimate whether hairdressers in Denmark have their hand eczema reported as an occupational disease and to clarify the reasons for not reporting.

Methods. A register-based study was performed, comprising trained hairdressers ($n = 7840$), using a self-administered postal questionnaire including questions on hand eczema and it being reported as an occupational disease. A response rate of 67.9% ($n = 5324$) was obtained.

Results. Overall, 2186 respondents ever had hand eczema; 71.3% were apprentices at the time of hand eczema onset. The majority (61.9%) had had hand eczema several times and 21.3% (almost) all of the time, but only 20.7% had reported their hand eczema as being occupational to the National Board of Industrial Injuries (Denmark). A positive association between severity of hand eczema and filing a report was found (odds ratio 19.2; 95% confidence interval 8.18–45.06). The main reasons for not reporting were 'I thought it would eventually get better' (40.4%) and 'My doctor didn't tell me it was possible to report it' (26.6%).

Conclusions. Hand eczema is considerably under-reported as an occupational disease; the perception of hand eczema among hairdressers and the lack of reporting from doctors are the main reasons for this.

Key words: hairdresser apprentices; hairdresser population; hairdressers; hand eczema; occupational contact dermatitis; occupational disease register; occupational hygiene; questionnaire study; register-based study; reporting occupational disease.

Eczema, and irritant eczema in particular, is the most commonly recognized occupational disease in Denmark (1–3). However, we are under the impression

that there is massive under-reporting to the authorities of hand eczema as an occupational disease (4–8), including among those affected by hairdressing (9). This may disguise the true costs of this occupational disease.

Hairdressing is one of the occupations in which occupational hand eczema (OHE) commonly occurs (1, 10), and in previous studies the reported prevalence of OHE in hairdressers (1, 9, 11, 12) and apprentice hairdressers (9, 13, 14) was between 35% and 49.4%. OHE has far-reaching consequences for the affected individual, and often leads to a change of career among hairdressers (12).

In Denmark, an occupational disease can be reported to the National Board of Industrial Injuries by either the patient, the patient's trade union, or the patient's

Correspondence: Susan H. Lysdal, Department of Dermato-Allergology, Research Centre for Hairdressers and Beauticians, Copenhagen University Hospital Gentofte, Niels Andersenvej 65, DK-2900 Hellerup, Denmark. Tel: +45 3977 7308; Fax: +45 3977 7118. E-mail: sushov04@geh.regionh.dk

Conflicts of interest: There are no conflicts of interest. *Funding:* Funding received from the Danish Hairdressers' and Beauticians' Union, the Danish Hairdresser Association, the Danish Working Environment Research Fund, and Aage Bang's Foundation.

Accepted for publication 19 August 2011

physician. Physicians are, however, obligated by law to report suspected occupational diseases to the board (15). Upon receiving the report, the board will decide whether the disease is likely to be of occupational origin and if financial compensation should be made. When it is suspected that a disease may be occupational, the deadline for reporting it is 1 year.

All employers in Denmark are obligated to insure their employees against occupational disease (15), and their insurance companies will pay the compensations decided by the National Board of Industrial Injuries (3). Persons who are self-employed have the opportunity to insure themselves against occupational diseases, but this is a voluntary scheme. The annual cost of this insurance is approximately €50 per person, but is dependent on the number of employees and the annual turnover of the business (3, 16). Roughly estimated, there are approximately 12 000 hairdressers working in Denmark (17), 5900 of whom are self-employed (18).

The purposes of this study were to estimate to what extent hand eczema among hairdressers is reported as an occupational disease to the National Board of Industrial Injuries, to assess whether significant under-reporting is taking place, and to clarify the reasons for not reporting hand eczema as an occupational disease among hairdressers.

Materials and Methods

Design

We conducted a register-based questionnaire study with a self-administered postal questionnaire among hairdressers in Denmark, in collaboration with the Danish Hairdressers' and Beauticians' Union and the Danish Hairdresser Association. The study was approved by the Danish Data Protection Agency. The part of the study concerning the prevalence of hand eczema and its career consequences has been published previously (12).

Registers

Information on current postal addresses was provided by the Central Person Registration Office. The Labour Market Supplementary Pension Scheme provided information on the annual affiliation to the hairdressing trade for every individual in the cohort.

Study population

The study population comprised all graduates from hairdressing vocational schools in Denmark between

Table 1. Characteristics of the 2186^a respondents with hand eczema

	Total (%)
Sex, n = 2186	
Men	58 (2.7)
Women	2128 (97.3)
Age (years), range 22–69, n = 2186	
Mean	36.3
Median	37
Mean age at hand eczema onset	21.5
Median age at hand eczema onset	20
Employment by onset of hand eczema, n = 2130	
Hair washing assistant	97 (4.7)
Hairdresser apprentice	1463 (71.3)
Hairdresser	493 (24.0)
Other	77 (3.6)
Severity of hand eczema (How frequently have you had hand eczema?), n = 2153	
Only once and for less than 2 weeks	191 (8.9)
Only once but for 2 weeks or more	170 (7.9)
Several times	1333 (61.9)
(Almost) all the time	459 (21.3)
Atopic dermatitis	833 (38.1)
Doctor consultations because of hand eczema, n = 2167	
Number of respondents who consulted a doctor	1084 (50.0)
Median number of consultations (range 1–500) ^b	3

The varying n-values in the subsamples are attributable to missing data for the individual items.

^aIn all, 2186 of 5324 respondents (42.1%) had ever had hand eczema, and they formed the basis of this study.

^bThe incoming questionnaires were all scanned. As the range of doctor consultations was very wide, all questionnaires with an answer that exceeded 100 doctor consultations because of hand eczema were manually checked. The verified values (2 × 200, 1 × 365, and 1 × 500) were allowed in the calculations, whereas the non-verified values were denoted 'missing'.

1985 and 2007 whose current postal addresses were available from the Civil Registration System (n = 7840). They received a postal questionnaire in May 2009 and, after two reminders, answers were obtained from 5324 persons (67.9%). In this study, only respondents who claimed to have had hand eczema were included, giving a sample of 2186 individuals aged between 22 and 69 years (Table 1). For the results regarding the reporting of hand eczema as an occupational disease, only respondents who themselves believed that their hand eczema was caused or worsened by their job were included (n = 1839).

Questionnaire

The respondents completed a questionnaire consisting of 147 questions concerning topics of both an occupational and a personal nature. Previously validated questions concerning hand eczema from the Nordic Occupational Skin Questionnaire (NOSQ-2002) were used (19). We

defined atopic dermatitis according to the UK Working Party's diagnostic criteria (20, 21).

All respondents who believed that their hand eczema was caused or worsened by their occupation were asked to state whether their hand eczema was reported as an occupational disease ('yes', 'no', or 'I don't know'). In the event that the respondent did not confirm that a report had been made, the respondent was asked to check off the reasons for not reporting (see Table 4 for the questions asked).

The questionnaire was pretested as a peer review among supervisors of the project, the two hairdressing unions, and experts in the fields of smoking and alcohol. The pilot test included 19 hairdressers, who received a postal questionnaire and were subsequently interviewed by telephone. The questionnaire was adjusted accordingly.

Non-respondents

Of those sent the questionnaire, 32.1% ($n = 2516$) did not return it; 8.8% of men ($n = 221$) and 91.2% of women ($n = 2295$). There were significantly more men in the group of non-respondents than in the group of respondents [$p < 0.0001$; odds ratio (OR) 2.16; 95% confidence interval (CI) 1.78–2.61]. The mean ages were 36.7 and 37 years for the non-respondents and the respondents, respectively. There was no significant mean age difference between the two groups ($p = 0.126$; 95% CI for the mean difference -0.62 to 0.505). The geographical distribution between the five regions in Denmark was similar among respondents and non-respondents. The only exception was that significantly more non-respondents than respondents lived in the Capital Region of Denmark ($p < 0.001$; OR 1.19; 95% CI 1.08–1.32).

According to data from the Labour Market Supplementary Pension Scheme, 1768 (73.2%) non-respondents no longer worked in the hairdressing trade.

Of the non-respondents' addresses, 7.1% ($n = 179$) were not valid according to the Danish Postal Service.

Statistics

All statistical analyses were carried out with PASW™ Statistics 18 (SPSS Inc., Chicago, IL, USA) for Windows™. A p -value of < 0.05 was considered to be significant.

A backward logistic regression model was performed among all hairdressers who had ever had hand eczema and who believed it to be caused or worsened by their job. In the model, 'Is your hand eczema reported as an occupational disease?' ('yes' versus 'no') was used as the dependent variable (respondents who answered 'I don't know' to

this question were excluded from the analysis). Sex ('men' versus 'women'), age when hand eczema first appeared (age in years), year in which hand eczema first occurred (exact year as claimed by the respondent), hand eczema severity ['only once and for less than 2 weeks' versus 'only once but for 2 weeks or more' versus 'several times' versus '(almost) all the time'], atopic dermatitis ('yes' versus 'no') and whether the respondent was self-employed ('yes' versus 'no') were included as the independent variables. An interaction variable between age when hand eczema first appeared and hand eczema severity was also included.

ORs with 95% CIs were calculated to describe the associations.

The χ^2 trend test (univariate analysis) was used to test for statistically significant differences across the categories of the variable 'number of doctor consultations because of hand eczema' ('one time' versus 'two times' versus 'three to four times' versus 'five to nine times' versus '10 times or more').

Results

Of the total number of respondents replying to the question about hand eczema ($n = 5187$), 42.9% (2128/4966) of the women had ever had hand eczema as compared with 26.2% (58/221) of the men. The uneven sex distribution among the respondents is attributable to the fact that the hairdressing trade is dominated by women. In all, 2186 hairdressers (42.1% of the respondents) had had hand eczema at some point in their lives, and they formed the basis of this study. The mean age of the respondents was 36.3 years (Table 1).

Hand eczema, history of atopic dermatitis, and doctor consultations

The mean age at hand eczema onset was 21.5 years (Table 1). The majority of the hairdressers (71.3%) were apprentices at the time of hand eczema onset, and nearly 1 in 4 hairdressers (24%) had finished their vocational training before developing hand eczema. Furthermore, 61.9% and 21.3% of the hairdressers had had hand eczema several times or (almost) all the time, respectively. Notably, 38.1% of the respondents had a history of atopic dermatitis.

Half of the hairdressers with hand eczema had consulted a doctor concerning their hand eczema since they started as apprentices.

Reporting of hand eczema as an occupational disease

Of the respondents, 84.9% (1839/2167) believed that their hand eczema was caused or worsened by their

Table 2. Backward logistic regression analysis with the outcome 'I reported my hand eczema as an occupational disease' and with different explanatory variables

Explanatory variables	Adjusted OR ^a	95% CI
Severity of hand eczema (how frequently have you had hand eczema?)		
Only once and for less than 2 weeks	1 (reference)	—
Only once but for 2 weeks or more	1.389	0.475–4.059
Several times	2.614	1.118–6.112
(Almost) all the time	19.201	8.183–45.055
Self-employed		
No	1 (reference)	—
Yes	0.714	0.521–0.978
Age at hand eczema onset	1.045	1.020–1.070

CI, confidence interval; OR, odds ratio.

Performed in 1839 hairdressers with hand eczema who believed it to be caused or worsened by their job. The model is adjusted for sex, year of hand eczema debut, and atopic dermatitis. An interaction variable between age at hand eczema debut and severity of hand eczema was included in the model but was insignificant. Significant associations are shown in bold.

^aMutually adjusted for sex, age at hand eczema onset, and atopic dermatitis. An interaction variable between age at hand eczema debut and severity of hand eczema was included in the model, but was insignificant.

occupation. However, only 20.7% (380/1836) of these reported their hand eczema as an occupational disease to the authorities. On comparison of the two subsets of the respondents who had had hand eczema either several times or (almost) all the time, 12.3% (138/1119) and 51% (221/433), respectively, reported their hand eczema as an occupational disease.

A logistic regression analysis with 'I reported my hand eczema as an occupational disease' as the outcome was carried out (Table 2). We found that reporting hand eczema as an occupational disease was positively associated with increased severity of hand eczema: thus, having had hand eczema several times (OR 2.61; 95% CI 1.12–6.11) and having hand eczema (almost) all the time (OR 19.20; 95% CI 8.18–45.06) were predictors for reporting hand eczema as an occupational disease as compared with only having had hand eczema once for <2 weeks. Being self-employed was negatively associated with reporting hand eczema as an occupational disease as compared with those respondents who worked as employees (Table 2). Finally, there was a positive correlation between age at hand eczema onset and reporting hand eczema as an occupational disease (OR 1.05; 95% CI 1.02–1.07). This means that, for every year that the hand eczema debut age increases, the respondent is 1.05 times

as likely to have reported it as an occupational disease to the National Board of Industrial Injuries. No association with sex, atopic dermatitis, year of hand eczema onset or the interaction variable between age at hand eczema onset and hand eczema severity was found.

In a separate univariate analysis, a positive association between the number of doctor consultations and reporting of hand eczema as an occupational disease was observed (χ^2 , $p < 0.0001$); thus, hand eczema was reported more frequently as an occupational disease among those respondents with three or more doctor consultations.

Reasons for not reporting hand eczema as an occupational disease

In descending order, the 'Hand eczema ever' column in Table 3 shows the reasons for not reporting hand eczema as an occupational disease, the primary reason being 'I thought it would eventually get better' (40.4%, multiple answers possible). Second, 26.6% claimed that their doctor had not informed them about the possibility of reporting hand eczema as an occupational disease. The majority of these respondents had, in fact, seen a doctor regarding their hand eczema (315/373, 84.5%).

Furthermore, 25% of the respondents did not think that they would gain anything from reporting their hand eczema as an occupational disease to the authorities, and 15.5% thought that the process of reporting was too difficult. The category 'other' was checked off by 23.5%, and, when looking at the written answers attached to this variable, the impression is that this group considers hand eczema to be 'a natural part of the hairdressing trade', 'a side effect of being a hairdresser', and something that 'all apprentices had', and thus never thought of reporting hand eczema as an occupational disease.

Approximately 5% did not report their hand eczema as an occupational disease because they were afraid to lose their job or because they thought that it would lead to problems with their employer.

Approximately 3% answered that they were self-employed and not insured as a reason for not reporting. In fact, 27.5% (594/2157) of the respondents in this study were self-employed, and only 12.5% (74/594) of them have reported their hand eczema as an occupational disease.

Respondents who had had hand eczema 'several times' (moderate hand eczema) were predominant (Table 3). Consequently, the answers given in this group are very similar to those given by the whole group. Of the respondents in this group, 46.4% had seen a doctor regarding their hand eczema. Table 3 also shows the reasons for not reporting hand eczema as an occupational disease in the

Table 3. Reasons for not reporting hand eczema as an occupational disease to the occupational registers among 1419 hairdressers who believed their hand eczema was caused or worsened by their job

	Hand eczema ever (n = 1419) (%)	Several times (n = 980) (%)	(Almost) all the time (n = 212) (%)
I thought it would eventually get better	573 (40.4)	417 (42.6)	76 (35.9)
My doctor didn't tell me it was possible to report it	377 (26.6)	256 (26.1)	87 (41.0)
I would probably not gain anything from it anyway	354 (25.0)	244 (24.9)	73 (34.4)
Other ^a	334 (23.5)	221 (22.6)	36 (17.0)
It seemed difficult	220 (15.5)	158 (16.1)	42 (19.8)
I didn't know that my hand eczema was occupational	176 (12.4)	117 (11.9)	28 (13.2)
I was worried it would lead to problems with my employer	81 (5.7)	55 (5.6)	23 (10.9)
I was afraid of losing my job	78 (5.5)	56 (5.7)	17 (8.0)
I am self-employed and not insured	41 (2.9)	20 (2.0)	14 (6.6)
I have always had eczema	30 (2.1)	16 (1.6)	12 (5.7)
My doctor didn't think that my hand eczema was occupational	16 (1.1)	9 (0.9)	5 (2.4)
It had gone over the time limit	15 (1.1)	10 (1.0)	3 (1.4)

Multiple answers were possible to the question 'Why hasn't your hand eczema been reported as an occupational disease?'

^a'Other' served as the last response category in the question asked (see Table 4). Respondents who checked off this category had the opportunity to add a written comment. The comments mainly expressed an attitude towards hand eczema as 'a natural part of the hairdressing trade, 'a side effect of being a hairdresser', and something that 'all apprentices had'.

subset of respondents who had had hand eczema '(almost) all the time' (severe hand eczema). Of the respondents in this group, 81.5% had seen a medical doctor regarding their hand eczema. The reasons for not reporting their hand eczema as an occupational disease do not differ greatly from those mentioned above, apart from 41% claiming that their doctor did not inform them about the possibility of reporting.

Discussion

Our study showed considerable under-reporting of hand eczema as an occupational disease to the National Board of Industrial Injuries for hairdressers in Denmark; only 20.7% of the hairdressers with self-reported OHE had a report filed. This was true for 12.3% of the hairdressers with moderate hand eczema and for 51% of the hairdressers with severe hand eczema.

OHE among hairdressers and other occupational groups is well described in the literature, and it seems that there is a general consensus that the true numbers of occupational skin diseases are considerably higher than reflected by national registers, owing to under-reporting (4–8, 22). However, very few studies have quantified this under-reporting. In 1988, Taylor estimated the true incidence of all occupational illnesses to be 10–50 times greater than reported (8). With regard to the hairdressing trade, Hansen et al. described a reporting rate as low as 11.6% among trained hairdressers with hand eczema (9).

The lack of literature in this area might be attributable to the fact that the legislation varies greatly between

countries (23), leading to major differences in the procedures for reporting an occupational disease. Despite these national differences, under-reporting is probably not only happening in Denmark but must be viewed as an international problem. This means that statistics from national registers of reported OHE show only a fraction of the true problem. As a consequence, the true impact of hand eczema as an occupational disease is grossly underestimated, and this reduces the incentive to take preventive action.

As this is a questionnaire study, a possible shortcoming might be that hand eczema is self-reported and therefore not clinically diagnosed. This may lead to recall bias. However, a recent validation study by Bregnhøj et al. showed a high degree of agreement between the clinical diagnosis and self-reported hand eczema in apprentice hairdressers (24), and other studies have shown that both hairdressers and other occupational groups are more likely to underestimate the occurrence of hand eczema than to overestimate it (25, 26).

Information on the reporting of hand eczema as an occupational disease to the authorities also relies on the answers provided by the respondents. However, we find these statements to be reliable. It is very time-consuming to file a report, so it is highly unlikely that this would have taken place without the patient's knowledge. Furthermore, in the question regarding the reasons for not reporting hand eczema as an occupational disease, multiple answers were possible. Thus, it was impossible to conclude what the primary reason for not reporting was, unless the respondent only had a single reason for not doing so.

Table 4. The four primary questions used for this study

53. Have you ever had hand eczema? Please check off one box only.
☐ Yes
☐ No ➡ please go to question 65
59. Do you think that your hand eczema is caused or worsened by your job? Please check off one box only.
☐ Yes
☐ No ➡ please go to question 63
☐ I don't know
61. Has your hand eczema been reported as an occupational disease? Please check off one box only.
☐ Yes ➡ please go to question 63
☐ No
☐ I don't know
62. Why hasn't your hand eczema been reported as an occupational disease?
 Please check off all statements that are true for you.
☐ My doctor didn't think that my hand eczema was occupational
☐ I didn't know that my hand eczema was occupational
☐ My doctor didn't tell me it was possible to report it
☐ I was worried it would lead to problems with my employer
☐ I was afraid of losing my job
☐ It seemed difficult
☐ It had gone over the time limit
☐ I would probably not gain anything from it anyway
☐ I have always had eczema
☐ I am self-employed and not insured
☐ I thought it would eventually get better
☐ Other: _____

In all, the postal questionnaire consisted of 147 questions, and was administered in May 2009 to 7840 trained hairdressers in Denmark. After two reminders, a response rate of 67.9% was obtained. Question number 53 is from the Nordic Occupational Skin Questionnaire 2002. The remaining three questions have been developed for this questionnaire. The questions have been translated into English for this publication.

The relatively high response rate of 67.9% makes it possible for us to assume that the results can be extrapolated to the entire population of trained hairdressers in Denmark, and perhaps even other occupational groups where hand eczema is prevalent. However, it is possible that we lost valuable information among the non-respondents: according to the data from the Labour Market Supplementary Pension Scheme, 73.2% of the non-respondents no longer worked in the hairdressing trade, and this could suggest selection bias, as it is possible that they would be more reluctant to answer a questionnaire regarding something that may no longer be of relevance to them.

This study illustrates the nature of the under-reporting of hand eczema: Denmark has a very well-developed reporting system, free of charge for all employees, and inexpensive for the employers. Nevertheless, only half of the hairdressers with severe hand eczema have filed a report.

We found that some of the main reasons for not reporting hand eczema as an occupational disease were 'I thought it would eventually get better' (Table 2) and that the hairdressers considered hand eczema to be a 'a natural part of the hairdressing trade'. These statements indicate that hairdressers do not think of hand eczema as an occupational disease worthy of being reported. In order to improve the reporting to the registers and the prevention of OHE, this attitude needs to be changed. This could be achieved by making information about the reporting of hand eczema as an occupational disease a mandatory part of the training in the vocational schools. Furthermore, the Research Centre for Hairdressers and Beauticians hopes to increase hairdressers' knowledge about this subject in the future by giving lectures to hairdressers and writing articles in the magazines published by the unions.

The statement 'My doctor didn't tell me it was possible to report it' scored very high and, interestingly, this was the main reason (41%) for not reporting in the group with severe hand eczema (Table 2). In addition, a positive association between the number of doctor consultations and reporting of hand eczema as an occupational disease was shown (χ^2 , $p < 0.0001$). This is problematic, because doctors in Denmark are obligated by law to report whenever the slightest suspicion of an occupational disease appears, that is, at the first visit. This rule creates a duality in the role of doctors: a doctor is considered to be the patient's advocate, but, at the same time, the requires them to report even if it is against the patient's wish.

Thus, more information for doctors, both general practitioners and dermatologists, about the importance of reporting hand eczema as an occupational disease is needed. The information could be provided through papers published in national medical journals. Also, the Danish National Board of Industrial Injuries could start an information campaign, stressing the importance of reporting hand eczema as an occupational disease and reminding medical doctors of their obligation to report.

In conclusion, we find that there is considerable under-reporting of hand eczema as an occupational disease in the hairdressing trade, owing to factors that are largely preventable. Further information and guidelines about how to handle hand eczema as an occupational disease should be provided to doctors, hairdressers, and other stakeholders in the hairdressing trade, and a change of attitude is needed among all parties.

Acknowledgements

Financial support from The Danish Working Environment Research Fund, Aage Bangs Foundation, The Danish Hairdressers' and Beauticians' Union, and The Danish Hairdresser Association is gratefully acknowledged.

References

- 1 Skoet R, Olsen J, Mathiesen B, Iversen L, Johansen J D, Agner T. A survey of occupational hand eczema in Denmark. *Contact Dermatitis* 2004; **51**: 159–166.
- 2 Halkier-Sørensen L. Occupational skin diseases: reliability and utility of the data in the various registers; the course from notification to compensation and the costs. A case study from Denmark. *Contact Dermatitis* 1998; **39**: 71–78.
- 3 The official website of the National Board of Industrial Injuries in Denmark. Arbejdsskadestatistik, 2010. Available at: http://ask.dk/Statistik/~/_/media/67D3EF05010145FAACBF3486458F39DC.ashx (last accessed 4 July 2011).
- 4 Chen Y, Turner S, McNamee R, Ramsay C N, Agius R M. The reported incidence of work-related ill-health in Scotland (2002–2003). *Occup Med (Lond)* 2005; **55**: 252–261.
- 5 Cherry N, Meyer J D, Adishes A, Brooke R, Owen-Smith V, Swales C, Beck M H. Surveillance of occupational skin disease: EPIDERM and OPRA. *Br J Dermatol* 2000; **142**: 1128–1134.
- 6 Dickel H, Kuss O, Blesius C R, Schmidt A, Diepgen T L. Occupational skin diseases in Northern Bavaria between 1990 and 1999: a population-based study. *Br J Dermatol* 2001; **145**: 453–462.
- 7 Diepgen T L. Occupational skin-disease data in Europe. *Int Arch Occup Environ Health* 2003; **76**: 331–338.
- 8 Taylor J S. Occupational disease statistics. In perspective. *Arch Dermatol* 1988; **124**: 1557–1558.
- 9 Hansen H S, Søstød H. Hand eczema in Copenhagen hairdressers – prevalence and under-reporting to occupational registers. *Contact Dermatitis* 2009; **61**: 361–363.
- 10 Lind M L, Albin M, Brisman J et al. Incidence of hand eczema in female Swedish hairdressers. *Occup Environ Med* 2007; **64**: 191–195.
- 11 Perkins J B, Farrow A. Prevalence of occupational hand dermatitis in UK hairdressers. *Int J Occup Environ Health* 2005; **11**: 289–293.
- 12 Lysdal S H, Søstød H, Andersen K E, Johansen J D. Hand eczema in hairdressers: a Danish register-based study of the prevalence of hand eczema and its career consequences. *Contact Dermatitis* 2011; doi:10.1111/j.1600-0536.2011.01935.x. [Epub ahead of print].
- 13 Nixon R, Roberts H, Frowen K, Sim M. Knowledge of skin hazards and the use of gloves by Australian hairdressing students and practising hairdressers. *Contact Dermatitis* 2006; **54**: 112–116.
- 14 Uter W, Pfahlerberg A, Gefeller O, Schwanitz H J. Prevalence and incidence of hand dermatitis in hairdressing apprentices: results of the POSH study. Prevention of occupational skin disease in hairdressers. *Int Arch Occup Environ Health* 1998; **71**: 487–492.
- 15 Beskæftigelsesministeriet (the Danish Ministry of Employment). Bekendtgørelse af lov om arbejdsskadesikring (Act on Workers' Compensation). LBK nr. 848, 2009.
- 16 The official website of the Labour Market Occupational Diseases Fund. Arbejdsmarkedets Erhvervssygdomssikring Selvstændige. Available at: <http://www.atp.dk/X5/wps/wcm/connect/atp/atp.dk/erhverv/sik/aes/selvstaendig/selvstaendige.htm> (last accessed 2011).
- 17 Monggaard P. President of the Danish hairdressers and beauticians union, 2008.
- 18 Petersen J. Director of the Danish hairdresser association, 2011.
- 19 Susitaival P, Flyvholm M A, Meding B, Kanerva L, Lindberg M, Svensson A, Olafsson J H. Nordic Occupational Skin Questionnaire (NOSQ-2002): a new tool for surveying occupational skin diseases and exposure. *Contact Dermatitis* 2003; **49**: 70–76.
- 20 Williams H C, Burney P G, Pembroke A C, Hay R J. The UK Working Party's Diagnostic Criteria for Atopic Dermatitis. III. Independent hospital validation. *Br J Dermatol* 1994; **131**: 406–416.
- 21 Williams H C, Burney P G, Pembroke A C, Hay R J. Validation of the UK diagnostic criteria for atopic dermatitis in a population setting. UK Diagnostic Criteria for Atopic Dermatitis Working Party. *Br J Dermatol* 1996; **135**: 12–17.
- 22 Diepgen T L, Schmidt A. Werden Inzidenz und Prävalenz berufsbedingter Hauterkrankungen unterschätzt? *Arbeitsmed Sozialmed Umweltmed* 2002; **37**: 477–480.
- 23 Frosch P J, Aberer W, Agner T et al. International comparison of legal aspects of worker's compensation for occupational contact dermatitis. In: *Contact Dermatitis*, 5th edition, Johansen J D, Frosch P J, Lepoittevin J-P (eds): Berlin, Heidelberg, Springer, 2011: pp. 1029–1051.
- 24 Bregnhøj A, Søstød H, Menné T, Johansen J D. Validation of self-reporting of hand eczema among Danish hairdressing apprentices. *Contact Dermatitis* 2011.
- 25 Leino T, Tammilehto L, Hytonen M, Sala E, Paakkulainen H, Kanerva L. Occupational skin and respiratory diseases among hairdressers. *Scand J Work Environ Health* 1998; **24**: 398–406.
- 26 Meding B, Barregård L. Validity of self-reports of hand eczema. *Contact Dermatitis* 2001; **45**: 99–103.