

Supplementary material

Definition of outcome variables: atopic dermatitis and patch test results

AD was defined according to The UK working Party Criteria.¹ To this end, a history of an itchy skin condition served as the major criterion while a history of onset under age of 2 years, a history of generally dry skin, a history of flexural involvement and a personal history of asthma or hay fever served as minor criteria. A history of AD was diagnosed by having the major criterion plus 3 or more of the minor criteria for increased specificity.² To have been patch tested was defined as an affirmative answer to the question “*have you ever been tested for allergy with a patch test applied to the back?*” (yes/no). It was possible for respondents to report the results of the patch test as (no allergy or allergy to hair dyes/perfumes/preservatives/nickel/other).

References

1. Williams HC, Burney PG, Pembroke AC, Hay RJ. The U.K. Working Party's Diagnostic Criteria for Atopic Dermatitis. III. Independent hospital validation. *Br J Dermatol*. 1994;131(3):406-416.
2. Thyssen JP, Andersen Y, Halling A-S, Williams HC, Egeberg A. Strengths and limitations of the United Kingdom Working Party criteria for atopic dermatitis in adults. *JEADV*. 2020;34:1764-1772. doi:10.1111/jdv.16364

Supplementary table 1. Kaplan-Meier survival analyses of Danish hairdressers graduating from 1985-2007. ATP pension scheme data was available for 91.2% (2385/2614) of the study population. (Sub)groups analyzed given as boldface subheadings. Note that total numbers may not add up to the actual total numbers in the stratum analyzed owing to missing values for the respective variable. NA, not applicable.

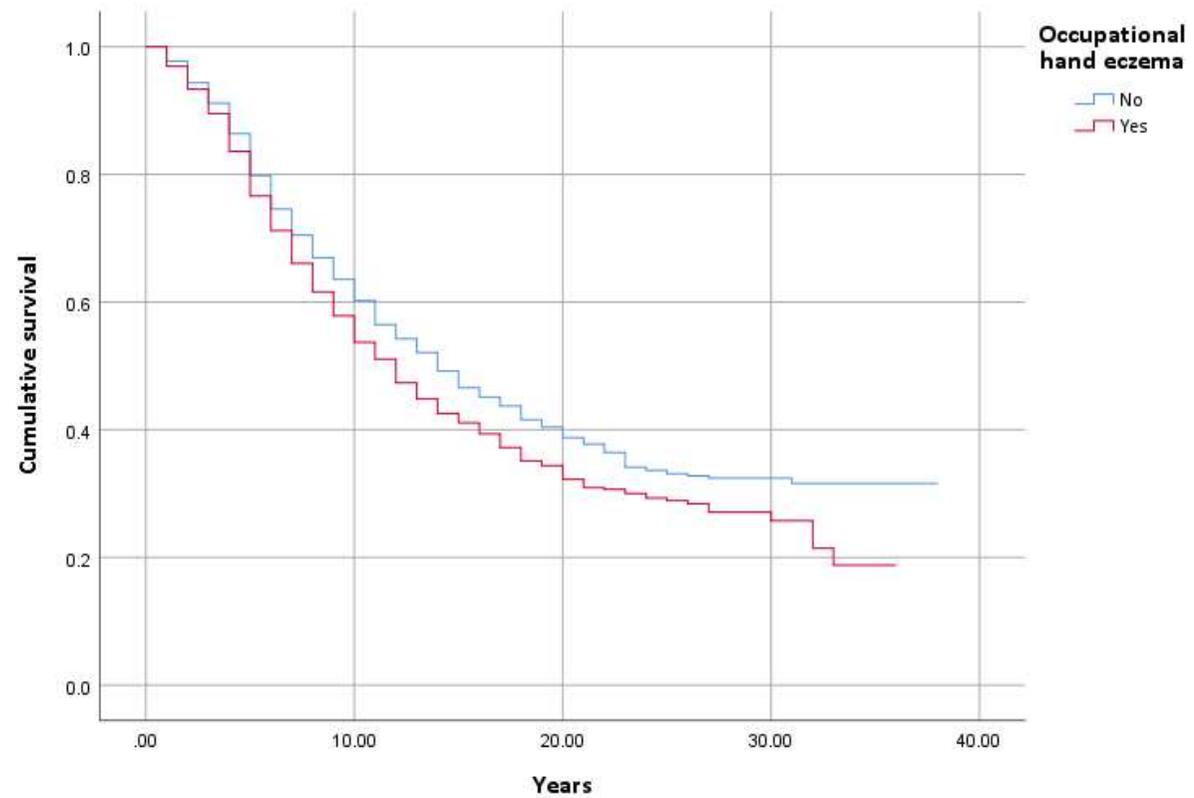
| | Ex-hairdressers in subgroup % | Median career length (years; 95%CI) | Log rank test |
|---|---|--|---|
| Total study population | 55.7 (1330/2385) | 13.0 (12.2-13.8) | NA |
| All ex-hairdressers | 100.0 (1330/1330) | 7.0 (6.6-7.4) | NA |
| Occupational hand eczema (all graduates) | | | |
| Hairdressers <i>without</i> occupational hand eczema | 52.5 (738/1405) | 14.0 (12.6-15.4) | P = 0.001 |
| Hairdressers <i>with</i> occupational hand eczema | 60.3 (590/978) | 12.0 (11.0-13.0) | |
| Frequency of hand eczema (all graduates) | | | |
| <i>Once</i> | 45.5 (76/167) | 20.0 (14.6-25.4) | P ≤ 0.001 For pairwise comparisons across all strata |
| <i>Several times</i> | 60.2 (348/578) | 12.0 (10.7-13.3) | |
| <i>Almost all the time</i> | 73.2 (164/224) | 7.0 (5.6-8.4) | |
| Occupational hand eczema (ex-hairdressers) | | | |
| Without OHE | 100.0 (738/738) | 7.0 (6.5-7.5) | P = 0.63 |
| With OHE | 100.0 (590/590) | 7.0 (6.5-7.5) | |
| Left the trade because of hand eczema (ex-hairdressers with OHE) | | | |
| No | 100.0 (267/267) | 8.0 (7.2-8.8) | P = 0.001 |
| Yes | 100.0 (283/283) | 6.0 (5.5-6.5) | |

Supplementary table 2. Characteristics of hairdressers by graduation year included in the survival analysis

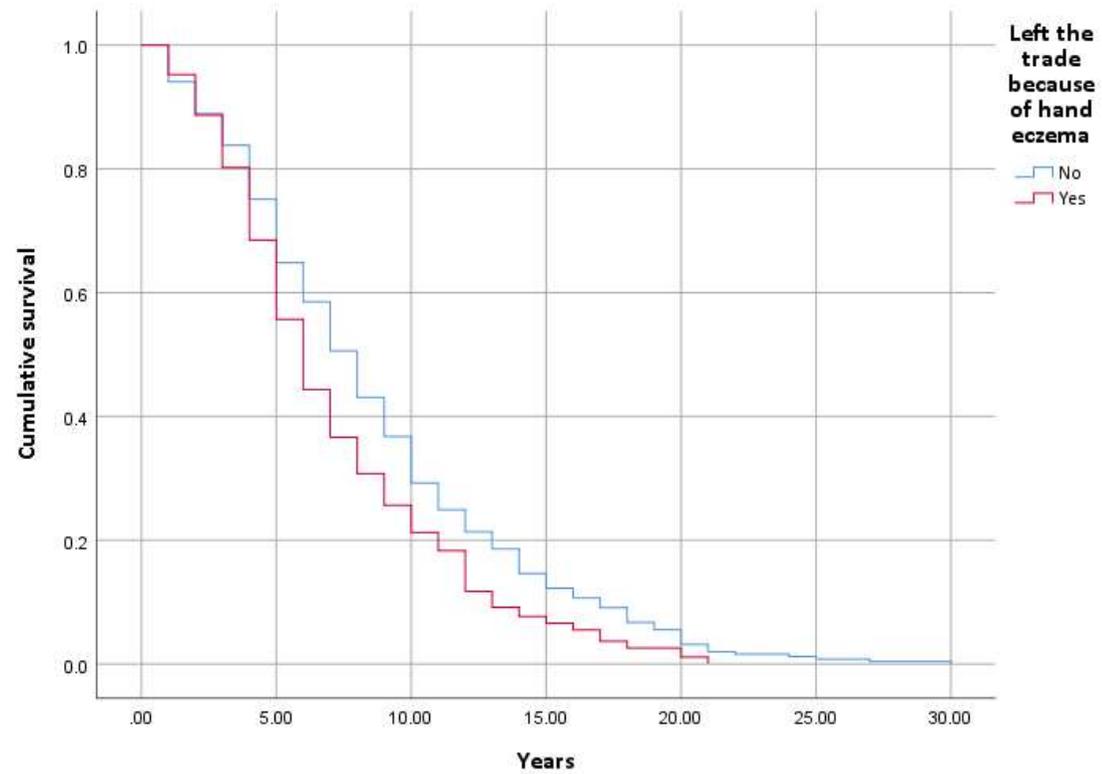
| Graduation year | 1985-1993 | 1994-2000 | 2001-2007 | 2001-2007 vs 1994-2000 | 1994-2007 vs 1985-1993 |
|---|------------------|------------------|------------------|-------------------------|--|
| Total % (<i>n</i> / <i>n</i> _{total}) | 58.6 (1531/2614) | 25.7 (673/2614) | 15.7 (410/2614) | | |
| Ex-hairdressers % (<i>n</i> _{cases} / <i>n</i> _{total}) | 58.4 (894/1531) | 55.4 (373/673) | 56.1 (230/408) | OR 1.0 (95%C 0.8-1.3) | OR 0.9 (95%CI 0.8-1.1) |
| Median survival (years; 95%CI) | 13.0 (11.8-14.2) | 14.0 (12.4-15.5) | 14.0 (12.0-16.0) | Log-rank test, P = 0.89 | Log-rank test, P = 0.08 |
| Age | | | | | |
| 31-40 | 0.0 (0/1531) | 5.3 (36/673) | 59.5 (244/410) | OR 0.0 (95%C 0.0-0.1) | NA |
| 41-50 | 33.3 (513/1531) | 88.1 (593/673) | 36.1 (148/410) | OR 13.1 (95%C 9.6-17.9) | OR 4.3 (95%CI 3.7-5.1) |
| 51-60 | 65.4 (1001/1531) | 5.3 (36/673) | 4.4 (18/410) | OR 1.2 (95%C 0.7-2.2) | OR <0.1 (95%CI <0.1- <0.1) |
| >60 | 1.1 (17/1531) | 1.2 (8/673) | 0.0 (0/410) | NA | OR 3.0 (95%CI 1.3-7.1) |
| History of atopic dermatitis | 19.5 (299/1531) | 23.2 (156/673) | 27.4 (112/409) | OR 0.8 (95%C 0.6-1.1) | OR 1.4 (95%CI 1.1-1.6) |
| Frequency of hand eczema | | | | | |
| Lifetime prevalence of OHE | 37.8 (578/1529) | 44.3 (298/673) | 46.8 (192/410) | OR 1.2 (95%C 0.9-1.7) | OR 1.4 (95%CI 1.2-1.6) |
| Once | 17.4 (99/570) | 14.9 (44/296) | 16.7 (32/192) | OR 1.1 (95%C 0.7-1.9) | OR 0.9 (95%CI 0.6-1.2) |
| Several times | 60.2 (343/570) | 59.1 (175/296) | 59.9 (115/192) | OR 1.0 (95%C 0.7-1.5) | OR 1.0 (95%CI 0.8-1.2) |
| Almost all the time | 22.5 (128/570) | 26.0 (77/296) | 23.4 (45/192) | OR 0.9 (95%C 0.6-1.3) | OR 1.2 (95%CI 0.9-1.5) |
| History of a positive patch test | 23.3 (360/1528) | 20.5 (138/673) | 20.0 (82/409) | OR 1.0 (95%C 0.8-1.4) | OR 0.8 (95%CI 0.7-1.0) |

| | | | | | |
|----------------------|---------------|--------------|--------------|------------------------|-------------------------------|
| Allergy to hair dyes | 4.3 (66/1528) | 5.9 (40/673) | 6.6 (27/409) | OR 0.9 (95%CI 0.5-1.5) | OR 1.5 (95%CI 1.0-2.1) |
|----------------------|---------------|--------------|--------------|------------------------|-------------------------------|

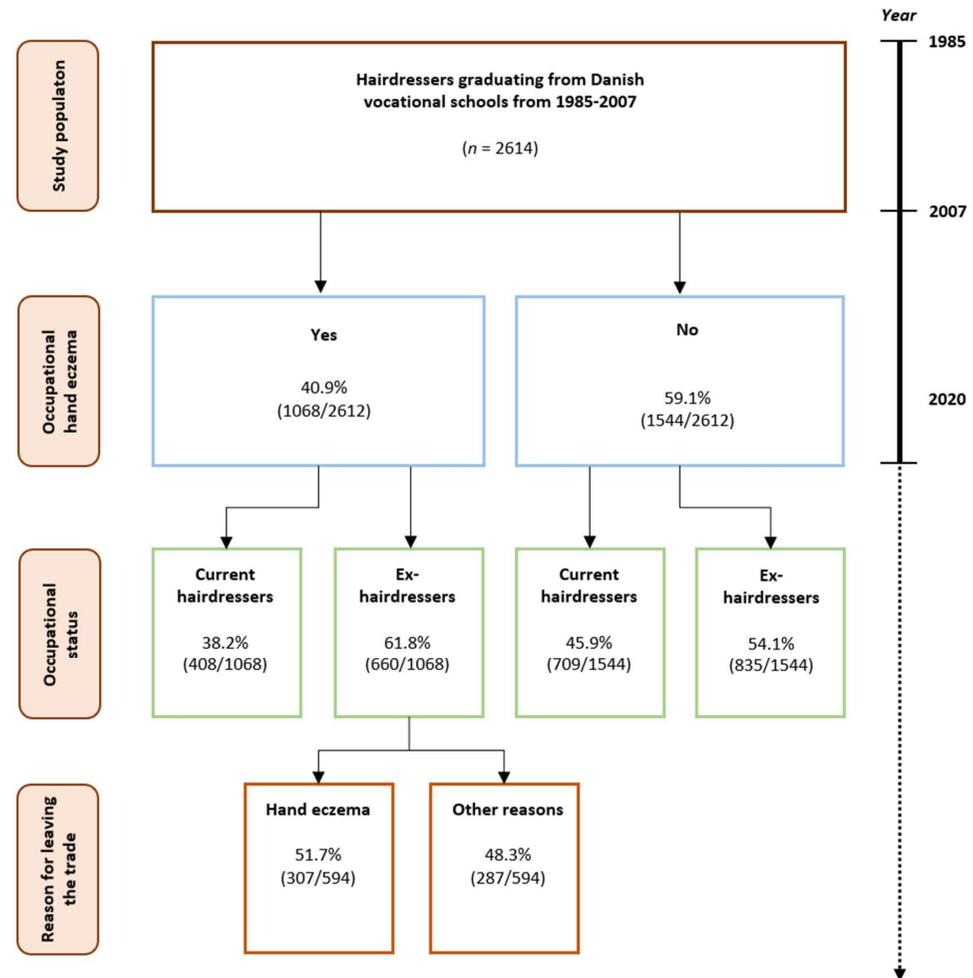
Supplementary figure 1. Kaplan-Meier Survival analysis. Career length in hairdressers with (n =978) and without occupational hand eczema (n =1405)



Supplementary figure 2. Kaplan-Meier survival analysis. Career duration in ex-hairdressers with occupational hand eczema, stating whether they left the trade because of hand eczema or not ($n=550$).



Supplementary figure 3. The proportion of the study population with occupational hand eczema (OHE) and the proportion that subsequently leaves the trade (in general) and because of OHE or other reasons. This is based on the total study population including those that were not included in the survival analysis due to lack of ATP data (229/2614).



Supplementary figure 4. Kaplan-Meier survival analysis of the time to onset of OHE from beginning apprenticeship. Analysis of hairdressers providing the year of onset of OHE (n = 393). Median time to onset of OHE is 2.0 (95%CI 1.7-2.3) years.

