

Since this is a very extensive table, the format and content has not been edited by ActaDV.

**Table III. Characteristics of included studies**

| Author, year, and reference | Study Design, type of participants, studied occupation | Country, year of enrolment | Mean follow up     | Number of participants at enrolment or at follow-up | Reported risk factors for HE:<br>a) female<br>b) age<br>c) time in occupation until study enrolment<br>d) atopic dermatitis,<br>e) history of flexural eczema<br>f) contact allergy<br>g) current smoker<br>h) education<br>i) previous HE  | Method of HE diagnosis and definition of case   | Number of participants included in incidence calculation | IR in 100 person-years                           | OR of getting HE at study end with risk factor   | Drop-out, reason |
|-----------------------------|--|----------------------------|--------------------|---|---|---|--|--|--|------------------|
| Reich A, 2020 (23)          | Prospective metal worker apprentices                   | Germany, 2013–2014         | 2.75 years (2.5–3) | At enrolment 172                                    | a) female: 15, 8.7%<br>b) mean age 19.2 (SD 3.34)<br>c) participants spent 1 week in the occupation before enrolment<br>d) 2, 1.2% with atopy score $\geq 10$ , according to Erlange<br>e) history of flexural eczema 10, 6.5%<br>f) contact allergy: 2, 1.2%<br>g) tobacco smokers: 60, 35.5%. Daily cigarette consumption 13.58 mean (SD7.03)<br>h) education<br>-lower secondary school: 27, 16.0%<br>-intermediate secondary school: 111, 65.7%<br>-vocational baccalaureate diploma: 15, 8.9%<br>-A levels: 16, 9.5% | Questionnaire and dermatological examination at baseline and at 1,2 and 3 years. HE defined as presence of vesicles or erythema in combination with papules, scaling or fissures Incident case defined as HE developed after recruitment. | At 1 year: 149<br>At 3 years: 104                        | HE at 1 year: 7.4<br>HE at 3 years' period: 23.7 | At 1 year, 23, 13.4% of 172<br>At 3 years, 68, 39.5% of 172<br>Reasons; illness on the day of visit, changing school or career, varying lengths of vocational training programme. No drop-out because of skin changes. |                  |
| Reich A, 2020 (23)          | Prospective, office worker apprentices                 | Germany, 2013–2014         | 2.75 years (2.5–3) | At enrolment 118                                    | a) female: 17, 14.4%<br>b) mean age 20.6 (SD 3.1)<br>c) participants spent 1  | Questionnaire and dermatological examination at baseline and 1,2 and 3 years. HE  | At 1 year: 111<br>At 3 years: 71                         | HE at 1 year: 3.6<br>HE of 3 years' period:      | At 1 year, 7, 6.0% of 118<br>At 3 years, 47, 39.8% of 118  |                  |

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|                               |  |                        |                              |                  | week in the occupation before enrolment<br>d) Erlange atopy score $\geq 10$ : 3, 2.5%<br>e) history of flexural eczema 16, 18.8%<br>f) contact allergy 2, 1.2%<br>g) tobacco smokers: 34, 28.8%. Daily cigarette consumption 13.58 mean (SD7.03)<br>h) education<br>-lower secondary school: 1, 0.8%<br>-intermediate secondary school: 38, 32.2%<br>-vocational baccalaureate diploma: 29, 24.6%<br>-A levels: 50, 42.4% | defined as presence of vesicles or erythema in combination with papules, scaling or fissures Incident case defined as HE developed after recruitment.   | 12.2   | reasons were illness on the day of visit, changing school or career, varying lengths of vocational training programme. No drop-out because of skin changes. |
| Foss-Skiftesvik MH, 2017 (34) | Retrospective, hairdresser apprentices | Denmark, 2016          | 3 years                      | At follow-up 248 | a) female 239, 96.4<br>b) mean age 24 (SD 4.0)<br>c) 141, 56.8% active hairdressers, 188<br>d) atopic dermatitis: 90, 36.3%, according to working Party<br>g) current smokers: 89, 35.9%<br>h) education<br>-DISCED 20: 34, 13.7%<br>-DISCED 30: 212, 85.5%<br>-DISCED 50 and 60: 2, 0.8%   | questionnaire at baseline and at 3 years. HE was defined as affirmative answer to question "have you had HE since the last survey?". Incident case defined as participants who had never HE at baseline per person-year of observation. | Ay 3 years: 128<br>HE of 3 years' period: 6.80   | 256, 51% of 504 of target population did not complete follow-up questionnaire<br>174 had HE at baseline<br>25 had left hairdressing occupation at follow-up |
| Smit HA, 1993 (21)            | Retrospective, employed nurses         | Netherlands, 1987–1988 | 1.75 years (0.75–2.75 years) | At follow-up 371 | a) female 324, 86.3%<br>b) mean age 27.0 (SD 6.2)   | Questionnaire, HE was defined as recurrence or >3 weeks' duration of at least 2 of these criteria: a) red and swollen hands or fingers, b) red hands or fingers and fissures, c) vesicles on hands or fingers), d) scaling hands        | 298<br>HE for 1 year' period: 11.28<br>– at 0–3 moths 18.9<br>– at 4–6 moths 1.5<br>– at 7–12 moths 1.56<br>– at 13–18 moths | 57, 13% of 428 target population did not answer or complete questionnaire.  |

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|                    |  |                        |                              |                  |  | or fingers with fissures, e) itching hands or fingers with fissures. Incident cases are new cases of HE at occupation   |     | 1.1<br>– at >19 moths<br>1.32  |   |
| Smit HA, 1993 (21) | Retrospective, employed office workers | Netherlands, 1987–1988 | 1.75 years (0.75–2.75 years) | At follow-up 111 | a) female 77, 69%<br>b) mean age 30.8 (SD 8.1)   | Questionnaire, HE was defined as recurrence or >3 weeks' duration of at least 2 of these criteria: a) red and swollen hands or fingers, b) red hands or fingers and fissures, c) vesicles on hands or fingers), d) scaling hands or fingers with fissures, e) itching hands or fingers with fissures. Incident cases are new cases of HE at occupation  | 101 | HE for 1.75 period: 1.2  | 43, 28% of 154 did not answer or complete questionnaire.  |
| Smit HA, 1994 (24) | Prospective, hairdresser apprentices   | Netherlands, 1990–1991 | 0.75 year                    | At follow-up 74  | a) female 57, 51.4%<br>b) mean age 17.9 years (SD 1.6)<br>c) 10 months in training<br>f) contact allergy to 1 or more allergen 18, 23.9% | Dermatological examination and questionnaire. HE was defined as recurrence or >3 weeks' duration of at least 2 of these criteria: a) red and swollen hands or fingers, b) red hands or fingers and fissures, c) vesicles on hands or fingers), d) scaling hands or fingers with fissures, e) itching hands or fingers with fissures. Incident cases are new cases of HE at occupation. The combinations and person-time was calculated at every six weeks | 74  | HE for 0.75 year' period: 32.8<br>– at 0–13 weeks 33.5<br>– at 14–26 weeks<br>– at 27–39 weeks 14.6  | 3, 3.9% of 77 at baseline, 3 left school before the first follow-up measurement was made  |
| Smit HA, 1994 (24) | Prospective, nurse apprentices         | Netherlands, 1990–1991 | 1 year                       | At follow-up 111 | a) female 104, 93.7%<br>b) mean age 22.0 years (SD 2.5)<br>c) 3 years in training<br>f) contact allergy to 1 or more allergen 36, 32.5%  | Dermatological examination and questionnaire. HE was defined as recurrence or >3 weeks' duration of at least 2 of these criteria: a) red and swollen hands or fingers, b) red hands or fingers and fissures, c) vesicles on hands or fingers), d) scaling hands   | 111 | HE for 1 year' period: 14.5<br>– at practice 0–13 weeks 23.4;<br>20–32 weeks 22.4 and at 68–88 weeks 6.2 cases<br>– at classes 14–20 weeks | 15, 11.9% of 126 4 suffered from hand dermatitis at the start of the study 11 dropped out before the first follow-up measurement for reasons unrelated to hand dermatitis |

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|----------------------|--------------------------------------|--------------------|-----------------------|-------------------|---|--|-----|---|---|--|
|                      |                                      |                    |                       |                   |   | or fingers with fissures, e) itching hands or fingers with fissures. Incident cases are new cases of HE at occupation. The combinations and person-time was calculated at every six weeks  |     | 10.4; at 33–66 weeks<br>4.2   |   |  |
| John SM, 2000 (30)   | Prospective, hairdresser apprentices | Germany, 1992–1995 | 3 years               | At follow-up 66   | a) female 64, 97%<br>b) median age 17.1 years, range 16.4–18.3 years (25%–75% percentile)<br>c) participants were less than 7 weeks in traineeship<br>d) atopy score median 6, 1-0-9.5 (25%–75% percentile), according to Diepgen<br>e) history of flexural eczema 6, 9.1%<br>I) past HE 4, 6.1 | dermatological examination at baseline, 1 <sup>st</sup> , 2 <sup>nd</sup> and 3 <sup>rd</sup> year, HE was based on 11 morphologies and 6 sites/severity with 3 levels (no-mild-moderate/severe). HE defined as moderate/severe as (erythema, erosions, fissures, exudation...etc.) Incident case was first moderate HE at a person-time during observation time | 66  | HE for 3 years' period:21.1<br>HE at first year 31.7<br>HE at second and third year: 8.7  | Past HE OR 4.88 95% CI 0.52-56-65)<br>Previous flexural eczema 22.51 (95% CI 2.90–481.47) | 26, 28.3% of 92 at baseline<br>6 already had hand dermatitis on 1 <sup>st</sup> examination<br>20 dropped out or had started work longer than 48 days prior to investigation |
| Brisman J, 1998 (25) | Retrospective, graduated bakers      | Sweden, 1961-1989  | 17 years (3–31 years) | At follow-up 1644 | a) female 946, 42.5%<br>b) mean age for men 31 and for women 27<br>c) participants spent between 3–31 years in occupation<br>e) childhood eczema 477, 29%.  | Questionnaire, an affirmative answer to "do you have or have you had hand eczema?". If HE was reported before age 18 years or if the starting year of HE was unknown, the subject was excluded. Incident cases are new cases of HE per person-years under observation.   |     | HE for 3 years' period women 3.44 (vs men 1.67 family history of atopic dermatitis for women 7.57 (vs no 2.79) and for men 2.32 (vs no 1.64) previous childhood eczema for women 7.17 (vs no 2.90) and for men 4.71 (vs no 1.43) first year of employment for women 4.35 (vs ≥6 years 2.0) and for men 2.34 (vs ≥6 years 1.05). |   | 697, 23.8% of 2,923 at baseline<br>558 had never worked as bakers<br>24 did not report their work history  |
| Schmid K, 2005 (22)  | Prospective, nurse apprentices       | Germany, 2000–2001 | 3 years               | At follow-up 104  | a) female 89, 85.6%<br>b) mean age 20 years, range (17–41)<br>c) no previous exposure to irritants at practical training  | Dermatological examination at baseline and third year, questionnaire first and third year. HE defined as 1 of symptoms (redness or swollenness, redness and  | 104 | HE at 3 years' period: 10.3<br>HE at first year: 25.0<br>Severe HE at 3 years' period:3.85<br>Severe HE at first  |   | 44, 29.7% of 148<br>9 did not agree to participate<br>35 lost for unviability at the date of follow-up investigation, loss of interest or left school                        |

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|                          |                                       |                        |                             |                    |   | fissures, vesicles, scaling with fissures and itching with fissures). Severe HE required recurrence of symptoms or >3 weeks' duration. Incident case defined as new symptoms under apprenticeship  |                                 | year: 6.73   |  | None discontinued their training due to hand dermatitis.  |
| Visser MJ, 2014 (32)     | Prospective, nurse apprentices        | Netherlands, 2008–2011 | 3 years                     | At enrolment 721   | a) female 649, 90%<br>b) median age 18.3–20.9 years<br>c) at least 10 weeks in traineeship<br>d) life time atopic dermatitis 175, 24.3%<br>f) contact allergy 175, 24.3%<br>i) previous HE 115, 16% | daily card every 2–4 weeks. HE defined as the occurrence of 1 or more fissures and redness, fissures and itch, fissures and scales, vesicles, or papules, plus a duration of > 3 days or recurrence more than once. Incidence case defined as first episode of HE in a student without a eczema history up to inclusion. | At 1 year 533<br>At 3 years 445 | HE at first year was 25.0, whereas for those in practical work, 36.7<br>HE at the second and third year was 10.3, whereas for those in practical work, 13.7  | Hand washing $\geq 8$ times per shift OR 1.5 (95% CI 1.02–2.25)<br>Contact with soap or detergents, other than hand washing $\geq 4$ times per shift OR 1.5 (95% CI 0.97–2.30)<br>Contact with disinfectants, other than alcohol hand rubs $\geq 2$ times per shift OR 1.1 (0.69–1.79) | 188, 26.1% of 721, were lost to follow-up shortly after they had completed the inclusion questionnaire, or were excluded from the analysis for another reason, for example because they had not performed any traineeship or had missing information about exposure or HE symptoms during follow-up |
| Lind ML, 2007 (31)       | Retrospective, graduated hairdressers | Sweden, 1970–1995      | 13.5 years (1–26 years)     | At follow-up 3,665 | a) female 3,665, 100.0%<br>b) age median 29 years, range (19–50 years)<br>i) previous HE 660, 18.0%   | questionnaire at 1 to 26 years. HE was affirmative answer to the question "have you had HE". IR is the number of new cases per person-year observed in periods of working as hairdressers after graduation.  | 3,005                           | HE at mean follow-up 13.5 year 2.38<br>HE <25 years 3.71<br>HE 25–34 years 1.38<br>HE >34 years 0.66<br>HE for those with previous childhood eczema 4.39<br>HE for those without childhood eczema 2.13 |  | 3,538, 49.1% of 7,203 graduated hairdressers 3,142 of them did not return the questionnaire. Another 396 were excluded because they did not work as hairdressers  |
| Steengaard SS, 2016 (33) | Retrospective, graduated hairdressers | Denmark, 2008–2009     | 3.75 years (1.5 to 6 years) | At follow-up 72    | NR  | questionnaire at baseline, 1.5 and 1.5 to 6 years. HE was affirmative answer to the question "have you had HE at last 6 years?". Incident cases defined as new cases under training.   | 21                              | HE at mean follow-up 3.75 years 3.03   |  | 64, 47.1% of 136 at baseline  |
| Funke U,                 | Prospective, office                   | Germany,               | 3                           | At 3-years         | At 3-years follow-up  | dermatological   | 174                             | HE at 1 year 4.6   |  | 13, 7.0% of 187 at  |

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| 2001 (2)            | worker apprentices                    | 1990–1994          | years     | follow-up<br>174           | a) female 145, 83.3%  | examination at baseline, 1 and 3 years. HE was on hands and/ or forearms. Not included if dryness reported without any redness or scaling, dyshidrosis lamellose sica without hints of worsening and mycosis. Incident case was HE at apprenticeship dermatological |   | HE at 3 years' period 2.3   |   | baseline  |
| Funke U, 2001 (2)   | Prospective, cook apprentices         | Germany, 1990–1994 | 3 years   | At 3-years follow-up 13    | Not reported  | examination at baseline, 1 and 3 years. HE was on hands and/ or forearms. Not included if dryness reported without any redness or scaling, dyshidrosis lamellose sica without hints of worsening and mycosis. Incident case was HE at apprenticeship dermatological | 13  | HE of 3 years' period: 31.9   |   | Not reported  |
| Funke U, 2001 (2)   | Prospective, metal worker apprentices | Germany, 1990–1994 | 3 years   | At 3-years follow-up 1,110 | At follow-up a) female 118, 10.6%   | examination at baseline, 1 and 3 years. HE was on hands and/or forearms. Not included if dryness reported without any redness or scaling, dyshidrosis lamellose sica without hints of worsening and mycosis. Incident case was HE at apprenticeship dermatological  | 1110  | HE at 1 year 9.2<br>HE at 3 years period 5.1  |   | 95, 7.9% of 1,205 at baseline   |
| Berndt U, 2000 (29) | Prospective, metal worker apprentices | Switzerland, 1997  | 2.5 years | At enrolment 201           | At enrolment<br>a) female 0, 0%<br>b) age range 15–24 years<br>i) previous HE 0, 0% | examination at baseline and every 6 months. HE was occurrence of 1 or more following: erythema and scaling, papules, excoriations, vesicles or exudation. Incident case was HE for those without signs of HE at study start   | – at 0.5–year 201<br>– at 1-year months 198<br>– at 1.5-years 193<br>– at 2-years 193<br>– at 2.5-years 190 | HE at 2.5 years' period: 9.89<br>HE at different time points<br>– at 0.5-year 18.5<br>– at 1-year 5.1<br>– at 1.5-year 3.4, – at 2 years 1.3<br>– at 2.5-years 0.5. | At 0.5 year Flexural eczema in history (yes) OR 11.97 (95% CI 1.12–127.97)<br>Days of theoretical classes <= 1,5 h<br>OR 2.81 (95% CI 1.20–6.56)<br>Contact with solvents (h/day) OR 1.44 (95% CI | At 0.5 year 0, 0% of 201<br>at 1-year 3, 1.5% of 201<br>at 1.5-years 8, 4% of 201<br>at 2-years 8, 4% of 201<br>at 2.5-years 11, 5.5% of 201<br>1, 0.5 % of 201 gave up training due to severe HE<br>15, 7.5% % of 201 resigned from work for reasons unrelated to skin disease |

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| Uter W, 1998 and 1999 (26, 28) | Prospective, hairdresser apprentices   | Germany, 1992–1994 | 2.6 years | At follow-up 1,134 | <p>a) female 1073, 94.6%</p> <p>b) age groups<br/>         – &lt;16 years 335, 29.5%<br/>         – 17 years 392, 34.6%<br/>         – 18 years 197, 17.4%<br/>         – 19 years and older 208, 18.3%</p> <p>c) 2 months in training before the initial examination</p> <p>d) atopy score<br/>         – 0 to 3: 335, 29.5%<br/>         – &gt;3–5: 239, 21.1%<br/>         – &gt;5–7: 229, 20.2%<br/>         – &gt;7–9.5: 191, 16.8%<br/>         – 9.5 &gt;7: 141, 12.4%</p> <p>e) history of flexural eczema: 176, 7.5%</p> <p>i) previous HE 98, 8.6%</p> | questionnaire and dermatological examination at 1 and 2.6 years. HE was based on 11 morphologies and 6 site/severity with 3 levels (no-mild-moderate/severe). HE defined as at least moderate as (erythema, erosions, fissures, exudation...etc.) Incident case newly diagnosed HE in relation to person-time of individual at risk. Incident case was restricted to those who had been free of symptoms at the start of training and did not show skin changes on initial examination. | 1036 | HE at 3 years' period:15.2<br>Any skin changes at 3 years' period:34.3<br>HE at 3 years' period, without previous HE in their life time 15.1 | 0.99–2.08)  | 1,218, 51.8% of 2,352 at baseline information could be obtained from 449 51.4% of 2352. Of those 64.1% stated various "personal reasons" and 30.1% "skin problems". Dropout particularly affects participants with atopic skin sensitivity only if the "atopy score" is considered, and not for previous hand or flexural dermatitis. increased proportions of dropouts were noted in the older age group, in men and in participants of the 1st wave. |
| Uter W, 1998 (27)              | Prospective, office worker apprentices | Germany, 1993–1994 | 3 years   | At enrolment 111   | <p>a) female 85, 76.6%</p> <p>b) mean age 20.5 (SD4.6)</p> <p>c) 53, 47.3% at a 2-year programme and 58, 52.7% of 111 at a 3-year programme</p> <p>d)previous flexural eczema: 17, 15.3%.</p> <p>i) previous HE (dry/pompholyx type): 15, 13.5%</p>  | questionnaire and dermatological examination at 1 and 3 years. HE was based on 11 morphologies and 6 site/severity with 3 levels (no-mild-moderate/severe). HE defined as at least moderate as (erythema, erosions, fissures, exudation...etc.), whereas any "any skin changes" defined as mild Incident case newly diagnosed HE in relation to person-time of individual at risk. Incident case was restricted to those with no skin changes on initial examination.                   | 68   | HE at 3 years' period: 4.1<br>Any skin changes at 3 years' period: 18.4  | At 3 years 43, 38.7% of 111 Reasons were changed address, stopped training 1, 2.0% of 43 dropped-out because of claim HE due to secondary climatic changes and wet household work |  |