# Prevalence and Severity of Hand Eczema in the Dutch General Population: A Cross-sectional, Questionnaire Study within the Lifelines Cohort Study

Angelique N. VOORBERG#, Laura LOMAN# and Marie L. A. SCHUTTELAAR
*Department of Dermatology, University of Groningen, University Medical Center Groningen, Groningen, The Netherlands*
*#These authors share first authorship.*

**Data on chronic hand eczema and severity of hand eczema in the general population is scarce. In this cross-sectional study, a questionnaire was sent to 135,950 Lifelines Cohort Study participants, in order to investigate the prevalence and severity of hand eczema in the Dutch general population. In total, 57,798 subjects were included. The lifetime prevalence of hand eczema was 15.0% (95% confidence interval 14.7–15.3), the 1-year prevalence 7.3% (95% confidence interval 7.1–7.6), and the self-reported physician-diagnosed prevalence 6.1% (95% confidence interval 5.9–6.3). The 1-year prevalence of chronic hand eczema was 4.7% (95% confidence interval 4.5–4.9). The majority (56.9%) of the subjects with hand eczema had almost clear at worst ever and the prevalence of severe to very severe hand eczema at worst ever in the general population was 1.9% (95% confidence interval 1.8–2.1). Future epidemiological studies in the general population should include data about chronic hand eczema and severity of hand eczema, as this can provide perspective on the burden of hand eczema.**

*Key words:* chronic hand eczema; epidemiology; general population; hand eczema; prevalence; severity.

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*Corr:* Marie L. A. Schuttelaar, Department of Dermatology, University of Groningen, University Medical Center Groningen, PO Box 30 001 NL-9700 RB Groningen, The Netherlands. E-mail: m.l.a.schuttelaar@umcg.nl

## SIGNIFICANCE

Data on chronic hand eczema and severity of hand eczema in the general population is scarce. This cross-sectional, questionnaire-based study found a 1-year prevalence of chronic hand eczema of 4.7%, and a lifetime prevalence of severe to very severe hand eczema of 1.9% in the Dutch general population. Data about chronic hand eczema and severity of hand eczema provides perspective on the patient burden of hand eczema.

Hand eczema (HE) is the most common skin disease affecting the hands, and one of the most prevalent occupational skin diseases (1, 2). HE can cause a substantial reduction in quality of life and may also impact work, potentially leading to lost earnings and job loss (3–5). In a recently published systematic review, the pooled estimates for lifetime prevalence and 1-year prevalence of HE in the general population were 14.5% (95% confidence interval (95% CI) 12.6–16.5) and 9.1% (95% CI 8.4–9.8), respectively (6). Most of the HE prevalence studies in the general population have been conducted in Scandinavian countries (6–10). In the Netherlands, only 1 cross-sectional and 1 cohort study have been conducted, including 670 and 1,992 persons from the general population, respectively. In the cross-sectional study a 1-year prevalence of HE of 8.2% was found, and in the cohort study a prevalence of HE of 7.1% over the past 3 years was found (11, 12).

Although the prevalence of HE in the general population has been investigated extensively, data on the proportion of individuals with chronic HE in the general population have not been reported previously, and data on severity of HE in the general population are scarce.

Therefore, the aim of this large cross-sectional, questionnaire-based study was to investigate the prevalence of HE, chronic HE, and severity of HE in the general Dutch population.

## MATERIALS AND METHODS

### *Design, setting and participants*

This is a cross-sectional add-on study within the Lifelines Cohort Study (13). The Lifelines Cohort Study is a multi-disciplinary prospective population-based cohort study, examining the health and health-related behaviours of 169,729 persons living in the north of the Netherlands in a unique 3-generation design. It employs a broad range of investigative procedures in assessing the biomedical, socio-demographic, behavioural, physical and psychological factors that contribute to the health and disease of the general population, with a special focus on multi-morbidity and complex genetics. Data collection in the Lifelines Cohort Study was conducted according to the guidelines of the Declaration of Helsinki, and all procedures were approved by the Medical Ethics Committee (METc) of the University Medical Center Groningen (reference number: METc 2007/152, reference number current add-on study: METc 2019/571).

Baseline data for 167,729 participants were collected between 2006 and 2013 and follow-up visits are scheduled every 5 years for at least 30 years. For the current study, a self-administrable digital add-on questionnaire was developed, comprising questions regarding dermatological problems including, among others, HE and atopic dermatitis (AD). The questionnaire was sent out to all the participants aged 18 years or older of the Lifelines Cohort


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Study ($n$ = 135,950) between 6 February and 15 May 2020. A digital reminder was sent to non-responders within 10 weeks.

### *Participant characteristics and questionnaire*

Details of all the questions used in the current study, including relevant references, are shown in Appendix S1; Table SI[1]. The lifetime prevalence of HE was identified by the question "Have you ever (now or in the past) had hand eczema?" (based on the Nordic Occupational Skin Questionnaire (NOSQ-2002; Q.D1, adjusted)) (14). Only in case of an affirmative answer, subjects were asked to complete all other questions regarding HE. The 1-year prevalence of HE was identified by the question "Have you had hand eczema within the past 12 months?" (NOSQ 2002; Q.D1 adjusted) and the physician diagnosed prevalence of HE by the question: "Has a physician ever diagnosed hand eczema?". Questions about the prevalence, chronic HE, and severity of HE, were also included in the add-on questionnaire. The adapted photographic guide, containing 16 photographs distributed in 4 groups of severity of HE: almost clear, moderate, severe and very severe, was used to assess self-reported severity of HE (15, 16). Data on age, sex, asthma, allergic rhinitis, eczema, psoriasis and acne were extracted from the baseline assessment for both responders and non-responders.

### *Statistical analysis*

Data analysis was performed using the Statistical Products and Service Solutions package version 25.0 (SPSS 25.0, Chicago, IL, USA). Data were analysed with descriptive statistics. Normally distributed variables were presented as mean and standard deviation (SD), qualitative variables were presented as numbers and proportions (%), prevalence was presented as numbers and proportions with corresponding 95% CIs. All proportions were computed excluding missing answers. In addition to crude estimates, prevalence estimates were also standardized to the WHO European standard population to make a better comparison with other published estimates (17). Differences between responders and non-responders, and females and males were assessed using the independent Student's $t$-test for normally distributed continuous variables, and the $\chi^2$ test for categorical variables. A $p$-value of $<0.05$ was deemed statistically significant.

## RESULTS

### *Study population*

Of the 135,950 invited Lifelines Cohort Study participants, a total of 58,198 (42.8%) participants responded to the questionnaire. Of these responders, a total of 57,796 subjects responded to the question regarding lifetime prevalence of HE and were included in the present analysis. The mean ± SD age of the study population was 55.3 ± 12.6 years, and the majority were female (60.4%) (**Table I**). Compared with non-responders, responders were older (50.5 ± 12.3 vs 55.3 ± 12.6 years, respectively), more often female (57.2% vs 60.4%, respectively) and reported more eczema, psoriasis and less often severe acne (15.1% vs 15.7% for eczema, 2.6% vs 3.0% for psoriasis, and 2.9% vs 2.7% for severe acne, respectively) (Appendix S1; Table SII[1]).

### *Prevalence*

A lifetime prevalence of HE of 15.0% (95% CI 14.7–15.3) (Table I) was found. The 1-year prevalence of HE was 7.3% (95% CI 7.1–7.6), and the self-reported physician-diagnosed prevalence of HE was 6.1% (95% CI 5.9–6.3). The highest 1-year prevalence of 11.8% (95% CI 10.7–13.0) was found in subjects aged 25–34 years, and declined with age. Higher prevalence of HE in females compared with males was observed for all age categories. The age-standardized lifetime prevalence, 1-year prevalence and physician-diagnosed prevalence were 15.5% (95% CI 15.2–15.8), 8.7% (95% CI 8.5–9.0) and 5.8% (95% CI 5.7–6.0), respectively (Table I).

### *Chronic hand eczema*

According to the definition of chronic HE, having one episode for more than 3 months or 2 or more episodes of HE in one year, 63.9% of the subjects with HE in the past year had chronic HE (see **Table II**), resulting in a 1-year prevalence of chronic HE of 4.7% (95% CI 4.5–4.9) (Table I) (18).

### *Severity of hand eczema*

The majority (56.9%) of subjects with HE in lifetime reported almost clear HE at worst ever. The proportion of subjects with HE in lifetime with severe to very severe HE at worst ever was 12.9% (Table II). Among all subjects who responded to the question "Have you ever (now or in the past) had hand eczema?", the prevalence of severe to very severe HE at worst ever was 1.9% (95% CI 1.8–2.1) (Table I).

Subjects with HE in the past year were also asked to rate the severity of their HE at worst and on average during the past year. The majority (62.0%) reported almost clear HE at worst and the proportion of severe to very severe HE at worst in the past year was 7.6%. In addition, 75.1% reported an average severity of almost clear HE and 2.7% an average severity of severe to very severe HE.

When comparing the group of subjects with chronic HE to the group with HE, which was not chronic, the proportion of severe to very severe HE was higher among all 3 questions on severity (at worst ever 16.6% vs 6.1%, at worst during the past year 10.6% vs <2.7%, and on average during the past year 3.9% vs <1.3%) (Appendix S1; Table SIII[1]). The proportion having a physician diagnosis was higher among subjects with severe to very severe HE comparing subjects with moderate or almost clear HE (75.3%, 49.7%, and 28.8%, respectively). Of the subjects with severe to very severe HE at worst ever, 24.7% did not report a physician diagnosis (Appendix S1; Table SIV[1]).

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**Table I. Characteristics of the subjects who responded to the question regarding lifetime prevalence of hand eczema (HE), stratified by sex**

| | Total, *n* (%) (*n* = 57,796) | Male, *n* (%) (*n* = 22,861) | Female, *n* (%) (*n* = 34,935) | *p*-value |
|---|---|---|---|---|
| Age, years, mean ± SD | 55.3 ± 12.6 | 57.0 ± 12.6 | 54.3 ± 12.6 | **< 0.001** |
| Age range, *n*/*n* total (%) | | | | |
| 18–24 years | 634 (1.1) | 183 (0.8) | 451 (1.3) | |
| 25–34 years | 3,196 (5.5) | 801 (3.5) | 2,395 (6.9) | |
| 35–44 years | 7,151 (12.4) | 2,730 (11.9) | 4,421 (12.7) | **< 0.001** |
| 45–54 years | 14,704 (25.4) | 5,485 (24.0) | 9,219 (26.4) | |
| 55–64 years | 18,422 (31.9) | 7,231 (31.6) | 11,191 (32.0) | |
| ≥65 years | 13,689 (23.7) | 6,431 (28.1) | 7,258 (20.8) | |
| Male, *n* (%) | 22,861 (39.6) | 22,861 (100) | 0 (0) | – |
| Atopic dermatitis[a], *n* (%) | 5,237 (9.2) | 1,475 (6.5) | 3,762 (11.0) | **< 0.001** |
| Asthma, *n* (%) | 4,718 (8.2) | 1,793 (7.9) | 2,925 (8.4) | **< 0.001** |
| Allergic rhinitis, *n* (%) | 15,260 (27.1) | 5,701 (25.6) | 9,559 (28.1) | **< 0.001** |
| Prevalence HE, *n* (% [95% CI]) | | | | |
| Lifetime | 8,655 (15.0 [14.7–15.3]) | 2,449 (10.7 [10.3–11.1]) | 6,206 (17.8 [17.4–18.2]) | **< 0.001** |
| 1-year prevalence | 4,234 (7.3 [7.1–7.6]) | 1,246 (5.5 [5.2–5.8]) | 2,988 (8.6 [8.3–8.9]) | **< 0.001** |
| Physician diagnosed | 3,534 (6.1 [5.9–6.3]) | 897 (3.9 [3.7–4.2]) | 2,637 (7.6 [7.3–7.8]) | **< 0.001** |
| 1-year prevalence chronic HE[b] | 2,702 (4.7 [4.5–4.9]) | 792 (3.5 [3.2–3.7]) | 1,910 (5.5 [5.2–5.7]) | 0.78 |
| Age-standardized prevalence HE, *n* (% [95% CI])[c] | | | | |
| Lifetime | 8,976 (15.5 [15.2–15.8]) | 2,344 (11.2 [10.8–11.6]) | 6,632 (18.0 [17.6–18.3]) | **< 0.001** |
| 1-year prevalence | 5,051 (8.7 [8.5–9.0]) | 1,308 (6.2 [5.9–6.6]) | 3,743 (10.1 [9.8–10.4]) | **< 0.001** |
| Physician diagnosed | 3,381 (5.8 [5.7–6.0]) | 823 (3.9 [3.7–4.2]) | 2,557 (6.9 [6.7–7.2]) | **< 0.001** |
| 1-year prevalence chronic HE[b] | 3,236 (5.6 [5.4–5.8]) | 844 (4.0 [3.8–4.3]) | 2,391 (6.5 [6.2–6.7]) | 0.72 |
| HE persistence in the past year, *n* (%) | | | | |
| Only once (< 3 months) | 1,524 (2.6) | 453 (2.0) | 1,071 (3.1) | 0.78 |
| Only once (>3 months) | 307 (0.5) | 92 (0.4) | 215 (0.6) | 0.84 |
| More than once | 1,571 (2.7) | 429 (1.9) | 1,142 (3.3) | **0.02** |
| (Nearly) all the time | 824 (1.4) | 271 (1.2) | 553 (1.6) | **0.02** |
| Severity[d], *n* (%) | | | | |
| At worst (ever) | | | | |
| Almost clear | 4,897 (8.5) | 1,536 (6.7) | 3,361 (9.6) | **< 0.001** |
| Moderate | 2,597 (4.5) | 647 (2.8) | 1,950 (5.6) | **< 0.001** |
| Severe | 760 (1.3) | 178 (0.8) | 582 (1.7) | **0.002** |
| Very severe | 354 (0.6) | 74 (0.3) | 280 (0.8) | **0.002** |
| At worst (past year) | | | | |
| Almost clear | 2,622 (4.5) | 812 (3.6) | 1,810 (5.2) | **0.005** |
| Moderate | 1,286 (2.2) | 349 (1.5) | 937 (2.7) | **0.03** |
| Severe | 257 (0.4) | 71 (0.3) | 186 (0.5) | 0.5 |
| Very severe | 64 (0.1) | 12 (0.05) | 52 (0.1) | 0.06 |
| Average (past year) | | | | |
| Almost clear | 3,170 (5.5) | 970 (4.2) | 2,200 (6.3) | **0.006** |
| Moderate | 940 (1.6) | 248 (1.1) | 692 (2.0) | **0.018** |
| Severe | 95 (0.2) | 23 (0.1) | 72 (0.2) | 0.3 |
| Very severe | 18 (0.03) | < 10 (< 0.04) | 14 (0.04) | 0.5 |

All characteristics are self-reported. For hand eczema (HE) persistence, severity at worst (12 months), and severity on average (12 months) only patients are included who indicated to have had HE in the past 12 months. For data on missing values see Appendix SI[1].
[a]Self-reported physician diagnosed atopic dermatitis. [b]*p*-value based on proportion of subjects with chronic HE among subjects with HE in the past year. [c]Prevalence estimates were standardized to the WHO European standard population. [d]According to the modified photographic guide for self-assessment.
Numbers smaller than 10 are presented as < 10 to avoid possible identification of subjects.
*p*-values < 0.05 are shown in bold.
SD: standard deviation.

## DISCUSSION

In this cross-sectional questionnaire-based study within the Lifelines cohort, a lifetime prevalence of HE in the Dutch general population of 15.0% (95% CI 14.7–15.3), a 1-year prevalence of 7.3% (95% CI 7.1–7.6) and a self-reported physician-diagnosed prevalence of 6.1% (95% CI 5.9–6.3) were found. The age-standardized lifetime prevalence, 1-year prevalence and self-reported physician prevalence were 15.5% (95% CI 15.2–15.8), 8.7% (95% CI 8.5–9.0) and 5.8% (95% CI 5.7–6.0), respectively. The age-standardized prevalence estimates for HE in the current study were similar to the prevalence reported in a recent systematic review including 66 studies, mostly from Scandinavian countries, in which the pooled estimates for lifetime prevalence, 1-year prevalence and self-reported physician diagnosis of HE in the general population were 14.5% (95% CI 12.6–16.5), 9.1% (95% CI 8.4–9.8) and 5.2% (95% CI 1.1–11.8), respectively (19). The crude 1-year prevalence of HE in the current study was also similar to the 1-year prevalence reported in a previous cross-sectional study in the Netherlands in 1993 (7.3% vs 8.2%, respectively) (11). Higher prevalence of HE among females compared with males and a higher prevalence of AD among subjects with HE, as reported in previous studies (6), was also confirmed in the current study. Based on selective non-response bias, the prevalence found might be slightly over-estimated, since non-responders were more likely to be male and younger, and less likely to have eczema and psoriasis than responders. Although, absolute differences between responders and non-responders were small, and therefore the chance of a significant bias in our prevalence estimates is assumed to be small.

**Table II. Characteristics of the participants of the Lifelines Cohort Study with hand eczema (HE), stratified for HE prevalence and sex**

| | Lifetime prevalence HE | | | 1-year prevalence HE | | | Physician diagnosed prevalence HE | | |
|---|---|---|---|---|---|---|---|---|---|
| | Total (*n* = 8,655) | Male (*n* = 2,449) | Female (*n* = 6,206) | Total (*n* = 4,234) | Male (*n* = 1,246) | Female (*n* = 2,988) | Total (n=3,534) | Male (n=897) | Female (n=2,637) |
| Age, years, mean ± SD | 53.0 ± 11.8 | 54.2 ± 11.9 | 52.5 ± 11.8 | 50.8 ± 12.1 | 52.5 ± 11.8 | 50.0 ± 12.1 | 54.2 ± 11.6 | 55.8 ± 12.1 | 53.7±11.4 |
| Age range, *n*/ntotal (%)[a] | | | | | | | | | |
| 18–24 years | 80/634 (12.6) | 19/183 (10.4) | 61/451 (13.5) | 60/634 (9.5) | 16/183 (8.7) | 44/451 (9.8) | 26/634 4.1) | 9/183 (4.9) | 17/451 (3.8) |
| 25–34 years | 553/3,196 (17.3) | 96/801 (12.0) | 457/2,395 (19.1) | 378/3,196 (11.8) | 57/773 (7.4) | 321/2,307 (13.9) | 181/3,080 (5.9) | 24/773 (3.1) | 157/2,307 (6.8) |
| 35–44 years | 1,369/7,151 (19.1) | 412/2,730 (15.1) | 957/4,421 (21.6) | 821/7,151 (11.5) | 254/2,730 (9.3) | 567/4,421 (12.8) | 479/7151 (6.7) | 128/2,730 (4.7) | 351/4,421 (7.9) |
| 45–54 years | 2,492/14,704 (16.9) | 699/5,485 (12.7) | 1,793/9,219 (19.4) | 1,240/14,704 (8.4) | 356/5,485 (6.5) | 884/9,219 (9.6) | 999/14,704 (6.8) | 236/5,485 (4.3) | 763/9,219 (8.3) |
| 55–64 years | 2,792/18,422 (15.2) | 756/7,231 (10.5) | 2,036/11,191 (18.2) | 1,219/18,422 (6.6) | 369/7,231 (5.1) | 850/11,191 (7.6) | 1,219/18,422 (6.6) | 288/7,231 (4.0) | 931/11,191 (8.3) |
| ≥ 65 years | 1,369/13,689 (10.0) | 467/6,431 (7.3) | 902/7,258 (12.4) | 516/13,689 (3.8) | 194/6,431 (3.0) | 322/7,258 (4.4) | 630/13,689 (4.6) | 212/6,431 (3.3) | 418/7,258 (5.8) |
| Male | 2,449 (283) | 2,449 (100) | 0 (0) | 1,246 (29.4) | 1,228 (100) | 0 (0) | 897 (25.4) | 897 (100) | 0 (0) |
| Atopic dermatitis[b] | 2,461 (29.9) | 568 (24.2) | 1,893 (32.2) | 1,372 (34.0) | 312 (26.3) | 1,060 (37.2) | 1,485 (44.5) | 332 (38.5) | 1,153 (46.6) |
| Asthma | 1,079 (12.5) | 308 (12.6) | 771 (12.5) | 545 (12.9) | 139 (11.2) | 406 (13.5) | 499 (14.2) | 134 (15.0) | 365 (13.9) |
| Allergic rhinitis | 3,157 (37.2) | 880 (36.7) | 2,277 (37.4) | 1,582 (38.3) | 446 (36.6) | 1,136 (39.0) | 1,392 (40.2) | 338 (38.9) | 1,054 (40.6) |
| HE persistence in the past year | | | | | | | | | |
| Only once (<3 months) | – | – | – | 1,524 (36.1) | 453 (36.4) | 1,071 (35.9) | 388 (24.8) | 100 (24.8) | 288 (24.8) |
| Only once (>3 months) | | | | 307 (7.3) | 92 (7.4) | 215 (7.2) | 121 (7.1) | 40 (9.9) | 81 (7.0) |
| More than once | | | | 1,571 (37.2) | 429 (34.2) | 1,142 (38.3) | 578 (36.9) | 135 (33.5) | 443 (38.1) |
| (Nearly) all the time | | | | 824 (19.5) | 271 (21.8) | 553 (18.6) | 479 (30.6) | 128 (31.8) | 351 (30.2) |
| Severity[c] | | | | | | | | | |
| At worst (ever) | | | | | | | | | |
| Almost clear | 4,897 (56.9) | 1,536 (63.1) | 3,361 (54.4) | 2,487 (58.8) | 809 (65.0) | 1,678 (56.2) | 1,408 (39.9) | 419 (46.7) | 989 (37.5) |
| Moderate | 2,597 (30.2) | 647 (26.6) | 1,950 (31.6) | 1,200 (28.4) | 321 (25.8) | 879 (29.4) | 1,288 (36.5) | 306 (34.1) | 982 (37.3) |
| Severe | 760 (8.8) | 178 (7.3) | 582 (9.4) | 376 (8.9) | 83 (6.7) | 293 (9.8) | 553 (15.7) | 119 (13.3) | 434 (16.5) |
| Very severe | 354 (4.1) | 74 (3.0) | 280 (4.5) | 167 (3.9) | 31 (2.5) | 136 (4.6) | 282 (8.0) | 53 (5.9) | 229 (8.7) |
| At worst (past year) | – | – | – | | | | | | |
| Almost clear | | | | 2,622 (62.0) | 812 (65.3) | 1,810 (60.6) | 755 (48.1) | 206 (51.0) | 549 (47.1) |
| Moderate | | | | 1,286 (30.4) | 349 (28.1) | 937 (31.4) | 589 (37.5) | 142 (35.1) | 447 (38.4) |
| Severe | | | | 257 (6.1) | 71 (5.7) | 186 (6.2) | 181 (11.5) | 47 (11.6) | 134 (11.5) |
| Very severe | – | – | – | 64 (1.5) | 12 (1.0) | 52 (1.7) | 44 (2.8) | 9 (2.2) | 35 (3.0) |
| Average (past year) | | | | | | | | | |
| Almost clear | | | | 3,170 (75.1) | 970 (77.9) | 2,200 (73.9) | 996 (63.6) | 270 (66.8) | 726 (62.5) |
| Moderate | | | | 940 (22.3) | 248 (19.9) | 692 (23.2) | 482 (30.8) | 113 (28.0) | 369 (31.8) |
| Severe | | | | 95 (2.3) | 23 (1.8) | 72 (2.4) | 76 (4.9) | 19 (4.7) | 57 (4.9) |
| Very severe | | | | 18 (0.4) | <10 (<0.8) | 14 (0.5) | 12 (0.8) | <10 (<1.1) | 10 (0.9) |

All characteristics are self-reported. Proportions of hand eczema (HE) persistence, severity at worst (12 months), and severity on average (12 months) for physician-diagnosed HE are based on the subgroup participants with physician-diagnosed HE and HE in the previous 12 months (*n* = 1,540). For data on missing values see online Appendix SI[1].
[a]*n*/*n* total: number of cases divided by total number of cases in the representative age group. [b]self-reported physician diagnosed atopic dermatitis. [c]According to the modified photographic guide for self-assessment.
SD: standard deviation. Numbers smaller than 10 are presented as <10 to avoid possible identification of subjects.

Most previously published studies on the prevalence of HE in the general population did not focus on severity, while information on the severity of HE can provide perspective on the burden of HE. The majority (56.9%) of subjects with HE in the current study had almost clear HE at worst ever, indicating that the relatively high prevalence of HE in the general population can mostly be explained by the high proportion of patients with almost clear HE. The few studies that previously focused on severity used mostly different or non-validated severity outcome measurements, instead of the photographic guide for self-assessment used in the current study. One previous, questionnaire-based, study also used the photographic guide for self-assessment in the adult general population, in which the proportion of subjects who rated their HE in the past year as moderate to very severe was similar compared with the current study, namely 22.7% (20) vs 24.9% (2.7% severe to very severe HE plus 22.3% moderate HE), respectively. Among the HE severity self-assessment, using the photographic guide, the question regarding the average severity in the past year might be more prone to lower reliability than the questions regarding severity at worst (lifetime and past year). The high proportion of subjects with almost clear HE at worst ever, may also explain the substantial difference in the self-reported lifetime prevalence of HE and the physician-diagnosed prevalence of HE (15.0% vs 6.1%); patients with almost clear HE may not feel the need to seek medical assistance for their symptoms. However, almost a quarter (24.7%) of the subjects with severe to very severe HE at worst ever did not report a physician diagnosis. Other reasons explaining the difference between self-reported lifetime and physician diagnosed prevalence might be healthcare avoidance, recall bias or the healthcare professional not clearly communicating the diagnosis. In a previous questionnaire-based study, it was found that two-thirds of the patients with HE did not seek medical assistance for their symptoms, but the reasons, e.g. having almost clear HE, were not investigated (20).

A substantial proportion (12.9%) of the subjects with HE in their lifetime, had severe to very severe HE at worst ever, resulting in a prevalence of severe to very severe HE at worst ever in the general population of 1.9% (95% CI 1.8–2.1). In addition, 2.7% of the subjects with HE in the past year had severe to very severe HE on average. Furthermore, a substantial proportion of subjects with HE in the past year had chronic HE (63.8%), resulting in a 1-year prevalence of chronic HE of 4.7% (95% CI 4.5–4.9). The prevalence of chronic HE in the general population (duration of more than 3 months or at least 2 episodes within the past year) has not been studied previously (18). Subjects with chronic HE more often reported severe to very severe HE among all questions on severity compared with subjects with HE which was not chronic. Chronic HE, especially with increased severity, might lead to high healthcare costs, decreased quality of life and, sometimes, far-reaching occupational consequences. A systematic review, comparing the cost-of-illness of HE, showed that more severe and occupational HE, in particular, resulted in higher healthcare costs (21). In another cross-sectional questionnaire study about presenteeism in a Dutch HE population, presenteeism was common and more predominantly observed in patients with more severe HE (22). Furthermore, more severe HE is also associated with higher impairment in health-related quality of life, based on a cross-sectional study using the Quality Of Life in Hand Eczema Questionnaire (QOLHEQ) in 168 patients with vesicular HE (5). The high prevalence of chronic HE and the substantial prevalence of severe to very severe HE in the general population, together with the lack of systemic treatment options, as alitretinoin is currently the only licensed systemic treatment for severe HE, emphasize the need for further research focusing on new treatment options for chronic and severe HE.

One of the strengths of this study was the possibility to perform a non-responders analysis. A non-responder analysis was not possible in the majority of the previous cross-sectional studies investigating the prevalence of HE in the general population. As this study was performed within the Lifelines Cohort Study, information about sex, age and skin diseases were also available for the non-responders. Another strength is that this is the first study to provide insight into the proportion of chronic HE in the general population according to the official definition of chronic HE, and it provides insight into the severity of HE in the general population using a validated instrument. Other strengths are that the study has been performed outside of Scandinavia, in contrast to many of the previous studies on the prevalence of HE (19), the large sample size, and that the studied population covered a large part of the Netherlands.

In conclusion, the majority of subjects with HE in the past year had chronic HE, and severity among subjects with chronic HE was higher compared with subjects with HE that was not chronic. Furthermore, the majority of patients with HE in the general population have almost clear HE at worst; however, a substantial proportion also suffers from severe to very severe HE. Future epidemiological studies on HE in the general population should include data both on chronic HE and the severity of HE, as this can provide perspective on the burden of HE. In addition, when assessing severity of HE, the use of validated instruments would be recommended. Lastly, to study potential unmet medical needs for the patients with chronic and severe to very severe HE, future studies should focus on whether these patients have been sufficiently treated, as this might clarify which improvements are necessary in the treatment of chronic and severe HE.

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