

University of Groningen

Prevalence of adult atopic dermatitis in the general population, with a focus on moderate-to-severe disease

Zhang, Junfen; Loman, Laura; Voorberg, Angelique Nadine; Schuttelaar, Marielouise

Published in:

Journal of the European Academy of Dermatology and Venereology

DOI:

[10.1111/jdv.17471](https://doi.org/10.1111/jdv.17471)

IMPORTANT NOTE: You are advised to consult the publisher's version (publisher's PDF) if you wish to cite from it. Please check the document version below.

Document Version

Publisher's PDF, also known as Version of record

Publication date:

2021

[Link to publication in University of Groningen/UMCG research database](#)

Citation for published version (APA):

Zhang, J., Loman, L., Voorberg, A. N., & Schuttelaar, M. (2021). Prevalence of adult atopic dermatitis in the general population, with a focus on moderate-to-severe disease: results from the Lifelines Cohort Study. *Journal of the European Academy of Dermatology and Venereology*, 35(11), e787-e790. <https://doi.org/10.1111/jdv.17471>

Copyright

Other than for strictly personal use, it is not permitted to download or to forward/distribute the text or part of it without the consent of the author(s) and/or copyright holder(s), unless the work is under an open content license (like Creative Commons).

The publication may also be distributed here under the terms of Article 25fa of the Dutch Copyright Act, indicated by the "Taverne" license. More information can be found on the University of Groningen website: <https://www.rug.nl/library/open-access/self-archiving-pure/taverne-amendment>.

Take-down policy

If you believe that this document breaches copyright please contact us providing details, and we will remove access to the work immediately and investigate your claim.

Downloaded from the University of Groningen/UMCG research database (Pure): <http://www.rug.nl/research/portal>. For technical reasons the number of authors shown on this cover page is limited to 10 maximum.

LETTER TO THE EDITOR

Prevalence of adult atopic dermatitis in the general population, with a focus on moderate-to-severe disease: results from the Lifelines Cohort Study

Dear Editor,

Previous epidemiologic studies on atopic dermatitis (AD) indicate a large variation (0.3%–17.6%) in the prevalence of adult AD, depending on differences in the methodology, AD definitions and study population.^{1,2} Here, we conducted a large cross-sectional study to firstly estimate the prevalence of adult AD in the Dutch general population, with a focus on moderate-to-severe AD.

This study was conducted within the Lifelines Cohort Study,³ a multi-disciplinary prospective population-based cohort study examining in a unique three-generation design the health and health-related behaviours of 169 729 persons living in the north of the Netherlands. All procedures were approved by the Medical Ethics Committee of University Medical Center Groningen (UMCG) (reference numbers METc 2007/152 and METc 2019/571). Data related to AD and hand eczema (HE) were collected by sending out a digital add-on questionnaire, to 135 950 adult participants, between February and May 2020. Other variables were extracted from baseline, collected between 2006 and 2013. Definitions of AD in lifetime were based on an adaptation of the United Kingdom Working Party (UKWP) criteria and a question regarding self-reported physician-diagnosed AD.^{2,4} In addition, point prevalence was determined as the proportion of the subjects with physician-diagnosed AD who had current eczema. Regarding disease severity, subjects with current eczema completed the Patient-Oriented Eczema Measure (POEM) and the Patient Global Assessment (PaGA) of disease severity.^{5,6} Both crude prevalence of AD and age-standardized prevalence estimates, based on the European standard population, were presented with 95% confidence intervals (CIs).⁷

A total of 57 643 subjects (42.4%) responded to the questions related to AD and were included in the analysis. The crude prevalence of UKWP criteria-diagnosed AD, physician-diagnosed AD and point prevalence was 5.9%, 9.3% and 3.3%, respectively, and the age-standardized prevalence was 8.3%, 10.7% and 4.2%, respectively. After pooling the categories into moderate and severe, according to the POEM, the crude point

prevalence of moderate-to-severe AD was 2.4%, and the age-standardized prevalence was 3.1% (Table 1). Of the subjects with current AD (physician-diagnosed AD plus current eczema), mild, moderate and severe AD based on the POEM represented a proportion of 29.4%, 53.8% and 16.9%, respectively, and the proportion was 58.2%, 36.1% and 5.7%, respectively, according to the PaGA (Table 2).

Our finding of the physician-diagnosed prevalence (9.3%) is consistent with the 8.5% reported by Barbarot *et al.*² in the European Union adult population. The UKWP criteria-diagnosed prevalence was lower than the physician-diagnosed prevalence in our analysis (5.9% vs. 9.3%), which is also reported by Thyssen *et al.*⁸ in Danish adults (2.3% vs. 4.8%). This is possibly due to the adapted UKWP criteria being stricter than the original version, which has been validated and commonly used for physician assessment.

Considering that AD, particularly moderate-to-severe AD, poses a substantial burden,⁹ the present study gives an insight into this more severe spectrum. Among the subjects with current AD, moderate-to-severe AD, based on the POEM and the PaGA, represented a large proportion of 70.7% and 41.8%, respectively. Barbarot *et al.*² provided a comparable proportion of 75% in the German population based on the POEM, and a proportion of 57% based on the PaGA. Furthermore, we found that 13.8% of the subjects with physician-diagnosed AD were treated with prednisolone, which provides information on the number of individuals who have experienced acute and/or severe exacerbations. Consistently, a German population-based study reported that systemic corticosteroids were administered to 10.2% of the adult patients.¹⁰ These Dutch and German data suggest that more effective treatment options are required for those with moderate-to-severe AD, such as biologics.

To summarize, our findings indicate a need for validated diagnostic criteria to identify adult AD in questionnaire settings and more cost-effective treatment options for those with moderate-to-severe AD.

Conflicts of interest

M.L.A. Schuttelaar received consultancy fees from Sanofi Genzyme and Regeneron Pharmaceuticals and is advisory board member for Sanofi, Regeneron, Pfizer, LEO Pharma, Lilly. No other conflicts are reported.

Funding sources

This study was financially supported by Novartis, but they had no role in the design or conduct of the study, the

Table 1 Characteristics of the subjects from the Lifelines cohort, who answered the questions related to atopic dermatitis (AD), stratified by sex

	N (%); Mean ± SD		
	Total (n = 57 643)	Male (n = 22 787)	Female (n = 34 856)
Age, years	55.3 ± 12.6	57.0 ± 12.5	54.3 ± 12.6
Age range			
20–29 y	1848 (3.2)	441 (1.9)	1407 (4.0)
30–39 y	5202 (9.0)	1763 (7.7)	3439 (9.9)
40–49 y	9594 (16.6)	3655 (16.0)	5939 (17.0)
50–59 y	20 071 (34.8)	7610 (33.4)	12 461 (35.7)
≥60 y	20 928 (36.3)	9318 (40.9)	11 610 (33.3)
Male	22 787 (39.5)	22 787 (100)	0 (0)
AD prevalence, n (% [95% CI])			
Crude prevalence			
UKWP criteria-diagnosed†	3345 (5.9 [5.7–6.1])	852 (3.8 [3.5–4.0])	2493 (7.2 [7.0–7.5])
Physician-diagnosed	5288 (9.3 [9.0–9.5])	1490 (6.6 [6.3–6.9])	3798 (11.0 [10.7–11.4])
Point prevalence	1888 (3.3 [3.2–3.5])	604 (2.7 [2.5–2.9])	1284 (3.7 [3.5–3.9])
Age-standardized prevalence			
UKWP criteria-diagnosed†	3380 (8.3 [8.0–8.6])	758 (5.2 [4.9–5.6])	2622 (10.1 [9.7–10.5])
Physician-diagnosed	4357 (10.7 [10.4–11.0])	1066 (7.3 [6.9–7.7])	3291 (12.6 [12.2–13.0])
Point prevalence	1693 (4.2 [4.0–4.4])	466 (3.2 [2.9–3.5])	1227 (4.7 [4.5–5.0])
Severity prevalence‡, n (% [95% CI])			
Crude severity prevalence			
Clear or almost clear	100 (0.2 [0.1–0.2])	46 (0.2 [0.1–0.3])	54 (0.2 [0.1–0.2])
Mild	451 (0.8 [0.7–0.9])	160 (0.7 [0.6–0.8])	291 (0.8 [0.7–0.9])
Moderate	1009 (1.8 [1.7–1.9])	302 (1.3 [1.2–1.5])	707 (2.0 [1.9–2.2])
Severe/very severe	317 (0.6 [0.5–0.6])	93 (0.4 [0.3–0.5])	224 (0.6 [0.6–0.7])
Age-standardized prevalence			
Clear or almost clear	70 (0.2 [0.2–0.3])	31 (0.2 [0.1–0.3])	39 (0.1 [0.1–0.1])
Mild	367 (0.9 [0.8–1.0])	99 (0.7 [0.6–0.9])	268 (1.0 [0.9–1.2])
Moderate	924 (2.3 [2.2–2.5])	250 (1.7 [1.5–1.9])	674 (2.6 [2.4–2.8])
Severe/very severe	327 (0.8 [0.7–0.9])	84 (0.6 [0.5–0.7])	243 (0.9 [0.8–1.0])
Comorbidities related to AD			
Asthma	4722 (8.2)	1788 (7.9)	2934 (8.4)
Allergic rhinitis	15 245 (27.1)	5679 (25.5)	9566 (28.1)
Hand eczema§	3502 (6.1)	894 (3.9)	2608 (7.5)

All characteristics are self-reported.





AD, atopic dermatitis; CI, confidence interval; n, number; SD, standard deviation; UKWP, United Kingdom Working Party; y, year. Missing values: sex, age: 0; UKWP criteria-diagnosed: 168 males, 406 females; physician-diagnosed: 149 males, 380 females; point prevalence: 132 males, 360 females; severity prevalence: 132 males, 365 females; asthma: 80 males, 117 females; allergic rhinitis: 550 males, 858 females hand eczema: 126 males, 270 females.

†The adapted UKWP criteria include having an itchy rash in lifetime, plus 3 or more of the following conditions: a history of general dry skin in the past year and/or an onset under the age of two and/or a history of skin creases involvement and/or a history of asthma or hay fever.

‡According to the Patient-Oriented Eczema Measure (POEM) among the subjects with physician-diagnosed atopic dermatitis.

§According to self-reported physician-diagnosed hand eczema.

interpretation of the data or the decision to submit the manuscript for publication. The Lifelines Biobank initiative has been made possible by subsidy from the Dutch Ministry of Health, Welfare and Sport, the Dutch Ministry of Economic Affairs, the University Medical Center Groningen (UMCG, the Netherlands), University Groningen and the Northern Provinces of the Netherlands. J.Z. is supported by the China Scholarship Council (CSC) Grant #201806200089.

J. Zhang,  L. Loman,  A.N. Voorberg, 
M.L.A. Schuttelaar* 

Department of Dermatology, University of Groningen, University Medical Center Groningen, Groningen, the Netherlands

*Correspondence: M.L.A. Schuttelaar. E-mail: m.l.a.schuttelaar@umcg.nl

References

- Harrop J, Chinn S, Verlato G *et al*. Eczema, atopy and allergen exposure in adults: a population-based study. *Clin Exp Allergy* 2007; **37**: 526–535.

Table 2 Characteristics of the subjects with atopic dermatitis (AD), stratified by AD definitions and sex

N (%); Mean \pm SD	UKWP criteria-diagnosed AD [†]			Physician-diagnosed AD			Point prevalence		
	Total (n = 3345)	Male (n = 852)	Female (n = 2493)	Total (n = 5288)	Male (n = 1490)	Female (n = 3798)	Total (n = 1888)	Male (n = 604)	Female (n = 1284)
Age, years	48.6 \pm 12.4	50.4 \pm 12.5	48.0 \pm 12.4	52.0 \pm 12.4	54.5 \pm 12.6	51.0 \pm 12.2	51.1 \pm 12.9	53.4 \pm 13.0	50.1 \pm 12.8
Age range [‡]									
20–29 y	251 (13.7)	42 (9.5)	209 (15.0)	242 (13.2)	37 (8.4)	205 (14.7)	113 (6.2)	20 (4.5)	93 (6.7)
30–39 y	609 (11.8)	141 (8.1)	468 (13.8)	690 (13.4)	166 (9.5)	524 (15.4)	280 (5.4)	77 (4.4)	203 (6.0)
40–49 y	779 (8.2)	197 (5.4)	582 (9.9)	1073 (11.3)	280 (7.7)	793 (13.5)	367 (3.9)	119 (3.3)	248 (4.2)
50–59 y	1115 (5.6)	290 (3.8)	825 (6.7)	1911 (9.6)	516 (6.8)	1395 (11.3)	655 (3.3)	197 (2.6)	458 (3.7)
≥ 60 y	591 (2.9)	182 (2.0)	409 (3.6)	1372 (6.6)	491 (5.3)	881 (7.7)	473 (2.3)	191 (2.1)	282 (2.5)
Disease severity									
POEM, mean score \pm SD	11.4 \pm 5.5	10.7 \pm 5.4	11.7 \pm 5.5	10.9 \pm 5.6	10.2 \pm 5.7	11.2 \pm 5.5	10.9 \pm 5.6	10.2 \pm 5.7	11.2 \pm 5.5
Clear or mild	300 (25.9)	95 (28.9)	205 (24.8)	551 (29.4)	206 (34.3)	345 (27.0)	551 (29.4)	206 (34.3)	345 (27.0)
Moderate	646 (55.8)	186 (56.5)	460 (55.6)	1009 (53.8)	302 (50.2)	707 (55.4)	1009 (53.8)	302 (50.2)	707 (55.4)
Severe or very severe	211 (18.2)	48 (14.6)	163 (19.7)	317 (16.9)	93 (15.5)	224 (17.6)	317 (16.9)	93 (15.5)	224 (17.6)
PaGA									
Mild	655 (56.6)	189 (57.3)	466 (56.3)	1098 (58.2)	367 (60.8)	731 (57.0)	1098 (58.2)	367 (60.8)	731 (57.0)
Moderate	440 (38.0)	119 (36.1)	321 (38.8)	680 (36.1)	200 (33.1)	480 (37.4)	680 (36.1)	200 (33.1)	480 (37.4)
Severe	63 (5.4)	22 (6.7)	41 (5.0)	108 (5.7)	37 (6.1)	71 (5.5)	108 (5.7)	37 (6.1)	71 (5.5)
Treatment									
Prednisolone	441 (14.7)	109 (14.7)	332 (14.8)	626 (13.8)	169 (13.9)	457 (13.7)	311 (19.4)	88 (18.0)	223 (20.1)
Comorbidities related to AD									
Asthma	977 (29.3)	279 (32.8)	698 (28.1)	985 (18.7)	285 (19.2)	700 (18.5)	379 (20.2)	124 (20.7)	255 (20.0)
Allergic rhinitis	2240 (69.0)	570 (68.8)	1670 (69.1)	2357 (45.7)	600 (41.3)	1757 (47.4)	867 (47.6)	244 (41.7)	623 (50.3)
Hand eczema [§]	743 (22.4)	142 (16.8)	601 (24.4)	1484 (28.4)	332 (22.6)	1152 (30.7)	601 (32.0)	148 (24.7)	453 (35.5)

All characteristics are self-reported.

AD, atopic dermatitis; n, number; PaGA, Patient Global Assessment; POEM, Patient-Oriented Eczema Measure; SD, standard deviation; UKWP, United Kingdom Working Party; y, year. Missing values: UKWP criteria-diagnosed AD: 20–29 y: 1 males, 11 females; 30–39 y: 13 males, 36 females; 40–49 y: 32 males, 69 females; 50–59 y: 56 males, 161 females; ≥ 60 y: 66 males, 129 females; POEM: 523 males, 1665 females; PaGA: 522 males, 1665 females; treatment: 109 males, 243 females; asthma: 2 males, 10 females; allergic rhinitis: 23 males, 75 females; hand eczema: 7 males, 25 females; Physician-diagnosed AD: 20–29 y: 1 males, 11 females; 30–39 y: 15 males, 38 females; 40–49 y: 30 males, 63 females; 50–59 y: 49 males, 153 females; ≥ 60 y: 54 males, 115 females; POEM: 889 males, 2522 females; PaGA: 886 males, 2516 females; treatment: 270 males, 468 females; asthma: 9 males, 19 females; allergic rhinitis: 38 males, 88 females; hand eczema: 18 males, 40 females; Point prevalence: 20–29 y: 1 males, 11 females; 30–39 y: 13 males, 36 females; 40–49 y: 28 males, 62 females; 50–59 y: 45 males, 148 females; ≥ 60 y: 45 males, 103 females; POEM: 3 males, 8 females; PaGA: 0 males, 2 females; treatment: 115 males, 173 females; asthma: 5 males, 8 females; allergic rhinitis: 19 males, 46 females; hand eczema: 4 males, 8 females.

[†]The adapted UKWP criteria included having an itchy rash in lifetime, plus 3 or more of the following conditions: a history of general dry skin in the past year and/or an onset under the age of two and/or a history of skin creases involvement and/or a history of asthma or hay fever.

[‡]n/total: number of cases divided by total number of cases in the representative age range.

[§]According to physician-diagnosed hand eczema.

- Barbarot S, Auzeire S, Gadkari A *et al.* Epidemiology of atopic dermatitis in adults: Results from an international survey. *Allergy* 2018; **73**: 1284–1293.
- Scholtens S, Smidt N, Swertz MA *et al.* Cohort Profile: LifeLines, a three-generation cohort study and biobank. *Int J Epidemiol* 2015; **44**: 1172–1180.
- Williams HC, Burney PG, Pembroke AC, Hay RJ, The UK Working Party's Diagnostic Criteria for Atopic Dermatitis. III. Independent hospital validation. *Br J Dermatol* 1994; **131**: 406–416.
- Charman CR, Venn AJ, Ravenscroft JC, Williams HC. Translating patient-oriented eczema measure (POEM) scores into clinical practice by suggesting severity strata derived using anchor-based methods. *Br J Dermatol* 2013; **169**: 1326–1332.
- Vakharia PP, Chopra R, Sacotte R *et al.* Validation of patient-reported global severity of atopic dermatitis in adults. *Allergy* 2018; **73**: 451–458.

- Ahmad OB, Boschi-Pinto C, Lopez AD, Murray CJ, Lozano R, Inoue M. Age Standardization of Rates: A New WHO Standard, Vol. 31, World Health Organization, Geneva, Switzerland, 2001.
- Andersen YMF, Egeberg A, Hamann CR *et al.* Poor agreement in questionnaire-based diagnostic criteria for adult atopic dermatitis is a challenge when examining cardiovascular comorbidity. *Allergy* 2018; **73**: 923–931.
- Silverberg JI. Public Health Burden and Epidemiology of Atopic Dermatitis. *Dermatol Clin* 2017; **35**: 283–289.
- Schmitt J, Schmitt NM, Kirch W, Meurer M. Outpatient care and medical treatment of children and adults with atopic eczema. *J Dtsch Dermatol Ges* 2009; **7**: 345–351.

DOI: 10.1111/jdv.17471