

Productivity loss and indirect cost related to Atopic Dermatitis in Greece

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Background

Atopic Dermatitis (AD) is a chronic relapsing inflammatory skin disease [1]. AD is a global health issue with considerable negative impact on various aspects of life, since it seems to have a detrimental effect on patients' lives and their families throughout their lifespan [2]. In addition to the humanistic burden, AD seems to pose an economic burden due to productivity losses and indirect costs [2,3,4]. However, published data regarding financial burden of AD in adult population in Greece is limited.

Objective

The aim of this study was to investigate productivity loss and indirect cost related to AD in Greece.

Methods

Study Design

A non-interventional, cross-sectional, observational study was conducted in Greece during the period January to September 2023.

Participants

Adult members of the 'EPIDERMIA' patient association, who were diagnosed with AD, were eligible to participate regardless of current treatment or disease severity, provided they knew the Greek language and consent to participation.

Data collection

A structured questionnaire created in Google Form was used for data collection. Disease severity was assessed using the self-reported, repeatable Patient-Oriented Atopic Eczema Measure (POEM) measurement tool, available in Greek [5].

Work productivity loss was assessed by the Greek version of the valid Work Productivity and Activity Impairment Questionnaire (WPAI). It is a self-administered tool to measure work and activity reductions in 4 domains in the last 7 days :

- 1) absences or lost work time due to health problems,
- 2) attendance or percentage of reductions during work due to health,
- 3) total work reduction rate (including absences and attendance) and
- 4) percentage of reductions in activities due to health. In addition, time lost from work due to AD for the previous year was collected [6].

Cost estimation

All costs were expressed in Euros (€) and reflected in the year 2023. The total indirect cost resulted from the summation of absenteeism cost and presenteeism cost. For the estimation of absenteeism and presenteeism cost, data derived from the WPAI questionnaire were used.

Statistical analysis

For work productivity, linear regressions were fitted using the logarithm of overall work impairment as the dependent variable. To determine factors associated with cost, we applied GLM with gamma family and a log link function, which best fit the expenditure data according to the Box-Cox test and the modified Park test. Gamma coefficients generated by the regression model were exponentiated to retransform them into relative cost estimates. All tests were 2-sided, and the significance level was set at 5% for all analyses. The data management, cleaning and analysis was performed using STATA software (version 17.0, 2017, STATA Corp).

Results

Of 150 participants the median age was 37.6 years, 55.3% were female and 69% were currently employed. According to body mass index (BMI), no participants were classified as underweight, 41% were overweight and 12% obese. Regarding occupational status, most participants (77%) did not work in dermatitis-related occupations. Among those who worked in dermatitis-related occupations, most were laboratory or technical workers (21%). The 47% of participants were current smokers (Table 1).

The median (Q1 - Q3) age of study participants at diagnosis of AD was 10 (2 - 20) years. In total, 58% of the participants reported at least one comorbidity. The most common comorbidities were asthma (29%), rhinitis (28%), and food allergies (25%). Just over half of the sample (51%) had a family history of AD, rhinitis, or asthma. The median (Q1 - Q3) POEM score was 9 (6 - 13) points. Overall, 51% had moderate eczema, 12% had severe to very severe eczema (Table 2).

Work Impact and Productivity:

- Median working hours: 40 hours per week (Q1-Q3: 34.0–42.0).
- No absenteeism due to AD in the last week.
- Median impairment while working due to AD (presenteeism): 20% of actual working time (Q1-Q3: 10%–40%).
- Median overall work impairment (productivity loss) due to AD: 28% of total work time (Q1-Q3: 10%–43%) (Figure 1).

Factors Influencing Work Impairment:

- Work impairment increased with AD severity (multivariate analysis).
- Factors associated with greater work impairment included: Age of diagnosis, Presence of asthma, Higher AD severity levels.

Indirect Costs:

- Mean annual indirect cost per patient: 4,471 € (95% CI: 3,677 € to 5,425 €).
- Costs were primarily driven by presenteeism and rose with AD severity (p=0.049) (Figure 2).

Table 1 Socio-economic factors

Demographics – General profile	All (N=150)
Gender, n (%)	
Female	83 (55.3%)
Age, years	
Mean (SD)	37.6 (12.7)
BMI, n (%)	
Underweight	0 (0.0%)
Normal weight	70 (46.7%)
Overweight	62 (41.3%)
Obese	18 (12.0%)
Occupational status, n (%)	N=149
Freelancer/ self-employed	46 (30.9%)
Employee	59 (39.6%)
Unemployed	8 (5.4%)
Retired	7 (4.7%)
Student	25 (16.8%)
Household	4 (2.7%)
Other	0 (0.0%)
Occupation related to AD¹, n (%)	N=34
Hairdresser/Barber - Beautician	6 (17.6%)
Food Industry Worker	4 (11.8%)
Healthcare Professional - Dentist - Veterinarian	5 (14.7%)
Laboratory Worker - Laboratory Technician	7 (20.6%)
Farmer - Gardener - Florist	3 (8.8%)
Janitor - Cleaner	5 (14.7%)
Painter - Artist - Decorator	0 (0.0%)
Automotive Mechanic	2 (5.9%)
Construction Worker	2 (5.9%)
Smoking habits, n (%)	
Smoker	70 (46.7%)
Former smoker	24 (16.0%)
No smoker	56 (37.3%)

¹ if Occupational Status was "Freelancer/self-employed" or "Employee".

Conclusion

This study provides useful information regarding impact of AD on productivity as well as the indirect cost of AD in Greece, which might be useful when evaluating novel AD treatments.

Table 2 Medical profile and severity of atopic dermatitis

Medical profile	All (N=150)
Age at AD diagnosis, years	N=149
Median (Q1 – Q3)	10.0 (2.0 – 20.0)
Comorbidities, n (%)	N=150
Asthma	44 (29.3%)
Chronic obstruction pneumonopathy	0 (0.0%)
Food allergies	38 (25.3%)
Conjunctivitis	22 (14.7%)
Gastrointestinal problems	16 (10.7%)
Rhinitis	42 (28.0%)
Diabetes	6 (4.0%)
Hypertension	7 (4.7%)
Heart failure	0 (0.0%)
Other	0 (0.0%)
Family history of atopic dermatitis, rhinitis, or asthma	N=149
Yes	77 (51.7%)
No	72 (48.3%)
AD severity (POEM), n (%)	
Clear or almost clear	16 (10.7%)
Mild eczema	40 (26.7%)
Moderate eczema	76 (50.7%)
Severe eczema	15 (10.0%)
Very severe eczema	3 (2.0%)
POEM score	
Median (Q1 – Q3)	9.0 (6.0 – 13.0)

Abbreviations: N, n= number, SD= standard deviation, Q= quartiles, min=minimum, max=maximum
POEM: Patient Oriented Eczema Measure, AD= Atopic Dermatitis.
Time is summarized with median (Q1 – Q3).

Figure 1 Work productivity impairment based on WPAI questionnaire A) in overall population B) stratified by severity

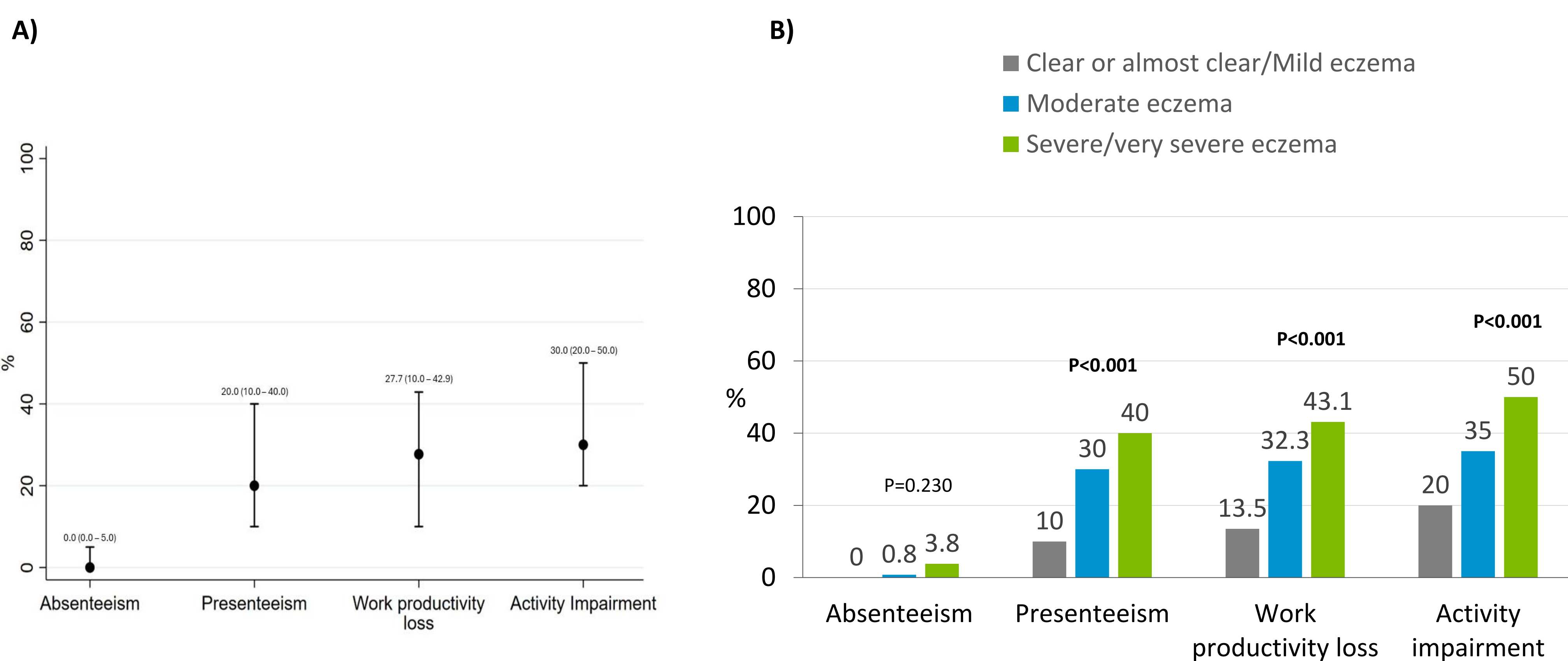
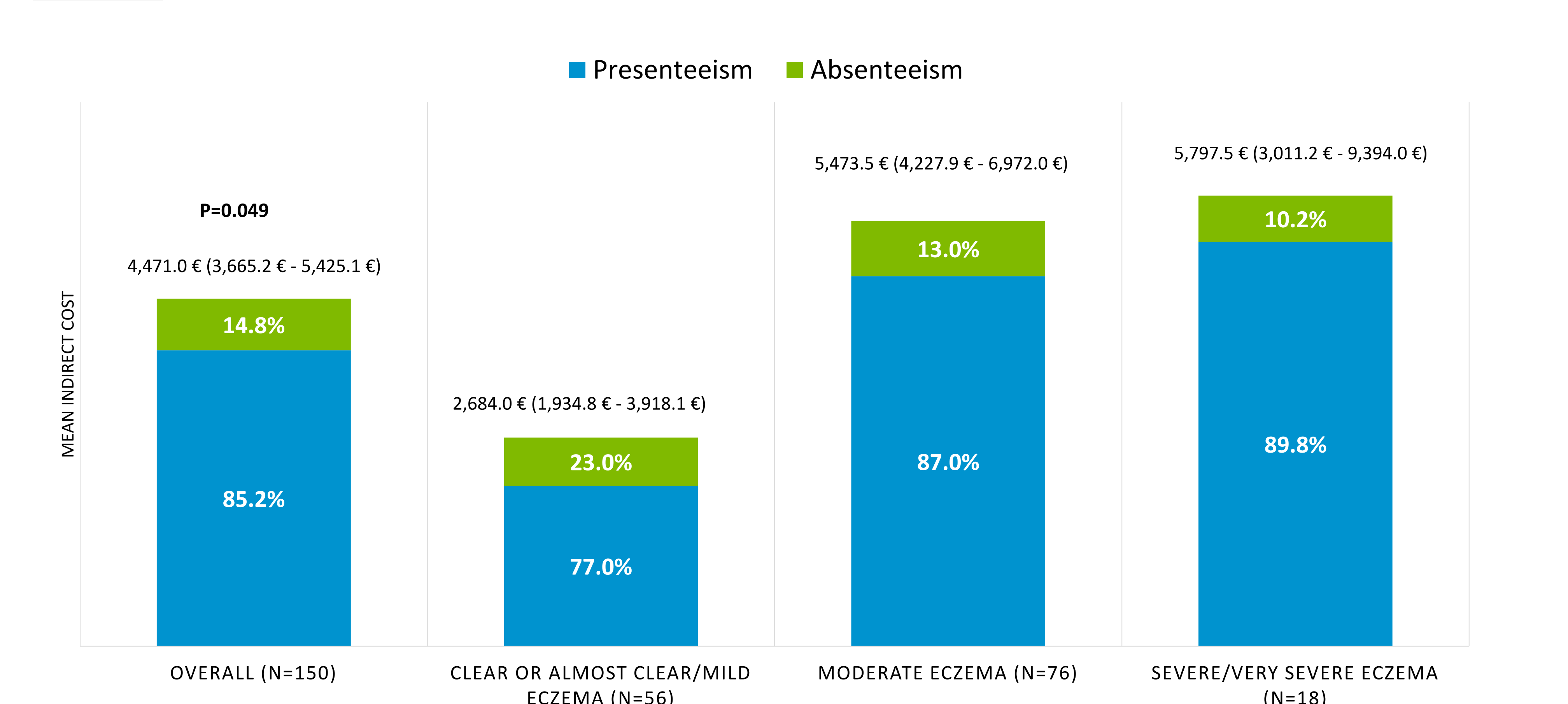


Figure 2 Indirect cost of AD during the last 12 months, overall and stratified by AD severity



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