

# The Humanistic Burden and Productivity Lost From Atopic Dermatitis in Central and Eastern European Countries

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# INTRODUCTION

Atopic dermatitis (AD) presents a significant yet often overlooked burden due to its impact on quality of life and productivity. This study aims to quantify this hidden burden in adults and adolescents across Central and Eastern European (CEE) countries.

# **METHODS**

We studied 11 countries that are members of the European Union and are geographically located in CEE: Bulgaria, Croatia, Czechia, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia, and Slovenia. We used a bottom-up approach to estimate the hidden burden components (quality of life loss, productivity loss). Burden was calculated based on the following equation:

Burden component per country = burden per patient \* AD prevalence in the country

### Number of patients

We abstracted the number of AD patients (10 years or older) for each country from the Global Burden of Disease (GBD study).<sup>1</sup>

### **Humanistic burden**

The following equation was used to estimate the quality-adjusted life years (QALYs) lost from AD in each country:

 $\Sigma$  ((General population utility for age group x - Utility of AD population for age group x) \* Number of patients in age group x)

QALYs lost were translated into monetary losses based on the following equation:

Monetary value of QALYs lost = Annual QALYs lost \*local GDP per capita

### Indirect costs (productivity losses)

For each country, the value of productivity loss due to AD was estimated based on the following equation:

(Labour force participation rate \* (1 - Unemployment rate) \* Number of patients)) \* (Absenteeism + Presenteeism value) \* Average daily salary

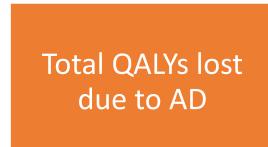
## Total hidden burden

Total hidden burden per country was calculated based on the following equation:

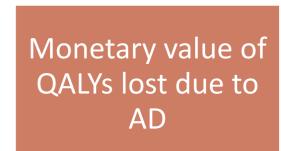
Total hidden burden = monetary value of QALYs lost + indirect costs (productivity lost)

## **RESULTS**

We present several metrics to show the burden of AD among adults and adolescents in CEE calculated for each country separately











Total hidden burden as a percent of GDP

# **Humanistic burden**

QALYs lost per population represent the total years lost due to ill health, disability, or early death from AD, with Poland facing the highest burden at 58,856 QALYs lost annually, while Latvia has the lowest at 1,832 QALYs. The annual weighted average utility loss per patient, reflecting the average reduction in quality of life for AD patients, remains relatively consistent across countries, ranging from 0.206 to 0.209, indicating a moderate but stable decrease in life quality for AD patients. The table below provides further details on the humanistic burden across countries.

Country	Total QALYS lost annually (per population)	Annual Weighted Average Utility Loss (per patient)	
Poland	58,856	0.208	
Hungary	22,656	0.206	
Romania	20,960	0.206	
Czechia	16,846	0.205	
Bulgaria	10,382	0.206	
Slovakia	8,922	0.209	
Croatia	6,680	0.207	
Estonia	5,210	0.207	
Lithuania	4,658	0.208	
Slovenia	3,363	0.207	
Latvia	1,832	0.207	

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### **Indirect costs**

Indirect costs of AD were reflected in productivity losses associated with the disease. These losses include both absenteeism and presenteeism among working-age individuals with AD. Poland experiences the highest total indirect costs (148.9 million EUR), while Latvia has the lowest (3.6 million EUR), with absenteeism and presenteeism contributing significantly across all countries.

#### Total hidden burden

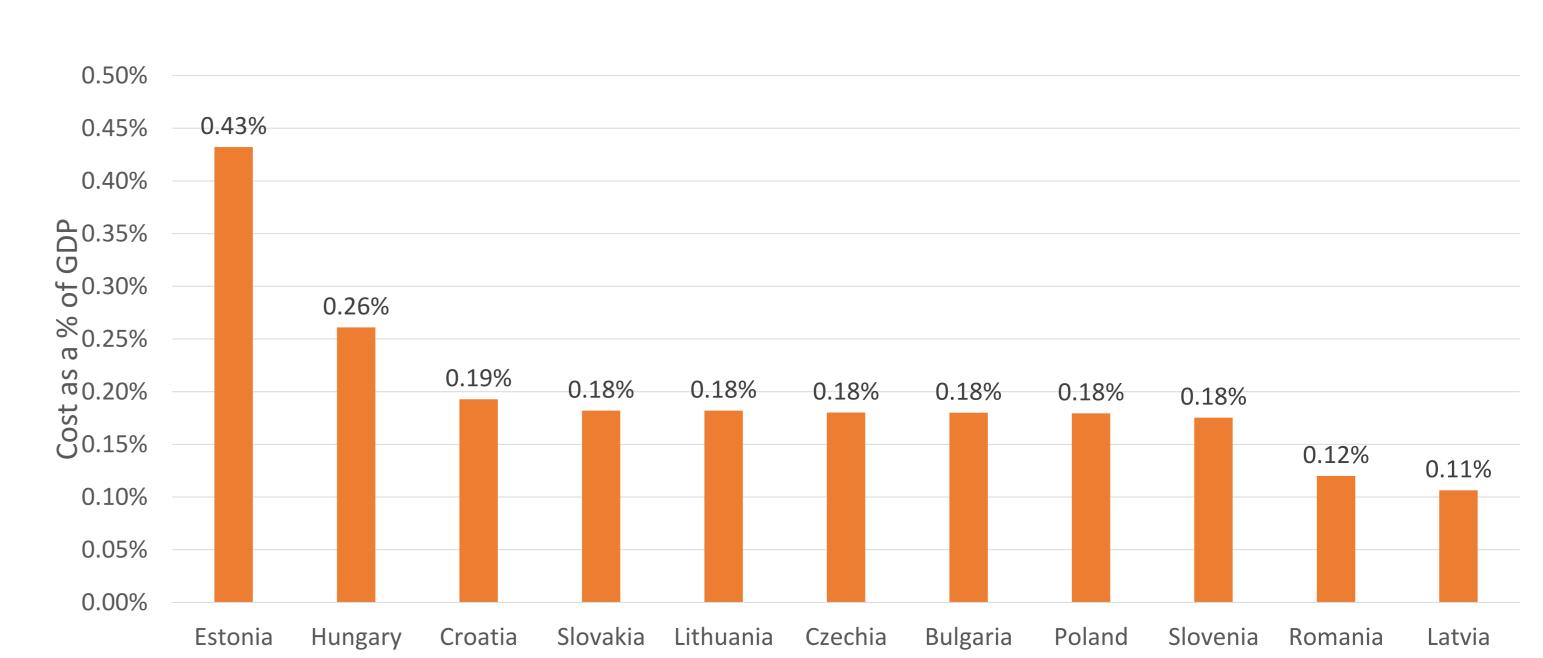
The hidden costs of AD revealed a substantial economic impact in each country, ranging from approximately 42 million EUR in Latvia to 1.2 billion EUR in Poland. The overall hidden cost of AD across the CEE region is estimated to be 3.36 billion EUR annually. The table below provides a breakdown of the total hidden costs.

Country	Monetary value of QALYs lost/EUR	Indirect costs/EUR	Total hidden costs/EUR
Poland	1,023,992,982	148,882,096	1,172,875,078
Hungary	397,238,250	45,918,259	443,156,509
Romania	316,320,614	26,996,486	343,317,100
Czechia	442,137,697	55,769,291	497,906,987
Bulgaria	135,779,348	16,418,378	152,197,725
Slovakia	180,108,395	19,443,010	199,551,404
Croatia	116,799,725	13,165,129	129,964,853
Estonia	140,182,768	16,187,585	156,370,353
Lithuania	109,810,527	11,726,846	121,537,373
Slovenia	94,072,208	9,385,902	103,458,110
Latvia	38,019,556	3,573,881	41,593,436

## Total hidden burden as a percent on the national GDP

Because different countries have different population sizes, and different GDPs, the absolute comparison of values is misleading. To enable a fair comparison across countries, we evaluated the total hidden costs of AD in each nation as a percentage of its local GDP. The total hidden costs of AD, expressed as a percentage of GDP, varied from 0.11% in Latvia to 0.43% in Estonia. The figure below illustrates the total hidden costs of AD as a percentage of national GDP for each country.

Total AD hidden cost as a % of GDP



# CONCLUSION

Our estimates account for notable variations in population size, prevalence rates, and economic strength across CEE countries. By adjusting the findings according to each country's specific GDP, we were able to gain a clearer understanding of the true hidden burden of AD. This data is intended to support decision-makers in prioritizing actions and making informed, evidence-based decisions.

# REFERENCES

1. Vos T, Lim SS, Abbafati C, et al. Global burden of 369 diseases and injuries in 204 countries and territories, 1990–2019: a systematic analysis for the Global Burden of Disease Study 2019. The Lancet 2020:396(10258):1204-1222. DOI: 10.1016/S0140-6736(20)30925-9