

COST-OF-ILLNESS AND HEALTH-RELATED QUALITY OF LIFE OF GENERALIZED PUSTULAR PSORIASIS IN ITALY

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BACKGROUND

- **Generalized pustular psoriasis (GPP)** is a rare, chronic, inflammatory and potentially life-threatening disease, characterized by sudden relapsing or remittent episodes (flares) of widespread painful erythema with multiple sterile pustules [1].
- It is a **heterogeneous disease** with a **highly variable clinical course**: the extent and severity of symptoms vary both between patients and between flares experienced by an individual patient [2].
- GPP patients usually have an impaired **health-related quality of life (HRQoL)**, not only during flares but also in the quiescent phase [3].
- Although there has been an increasing attention towards the clinical and economic impact of the disease, the **literature** on both costs and quality of life of GPP is **scant**, as GPP has been considered for a long time a variant or subtype of plaque psoriasis (PsO), despite pathophysiological and other differences between GPP and PsO [4].

RESEARCH OBJECTIVES

- To estimate the **economic burden of GPP in Italy** from the societal perspective by conducting a **cost-of-illness (COI) analysis**.
- To provide estimates on the **HRQoL of GPP patients**.

METHODS

COI model

Perspective	Type of model	Costing approach
Society: it includes direct healthcare costs, direct non-healthcare costs and indirect costs	Probabilistic: to take into account the uncertainty surrounding parameters Prevalence-based: resource consumption and costs attributable to all GPP cases in a given year	Bottom-up: estimating costs by summing detailed individual-level expense data across all patients

Data sources

- **COI**: Published and grey literature, Delphi panel, expert opinion.
Socio-economic questionnaire to GPP patients (online questionnaire, designed for self-completion, developed on Qualtrics).
 - Main data: i) demographic and clinical data; ii) consumption of healthcare resources (e.g. visits), non-healthcare resources (e.g. transport to visits) and productivity losses; iii) data about patients' caregiver (e.g., time dedicated).
 - **HRQoL**: Socio-economic questionnaire to GPP patients.
 - Validated questionnaire for psoriasis (Psoriasis Disability Index - PDI)
- GPP patients (n=5) were identified and enrolled by UNIAMO Federazione Italiana Malattie Rare (the representative body of the rare disease community in Italy) and one clinical expert.

Data analysis

- Annual expenditure per patient and for all GPP cases were estimated through **deterministic analysis** (using mean values, base-case analysis) and **sensitivity analyses** (one-way deterministic and probabilistic).
- **Scenarios:** for some parameters subject to high uncertainty, we estimated costs based on both literature data/expert opinion (scenario 1) and questionnaire (scenario 2).
- All costs were reported in **2022 Euros**, and adjusted for inflation when needed.

RESULTS

Table 1 – Direct healthcare costs of GPP

	Scenario 1			Scenario 2		
	Mean annual cost per patient	Total annual cost	Incidence of cost category	Mean annual cost per patient	Total annual cost	Incidence of cost category
Treatment costs	€ 14,988	€ 1,768,587	93.6%	€ 14,988	€ 1,768,587	95.8%
Covered by NHS	€ 14,878	€ 1,755,607	92.9%	€ 14,878	€ 1,755,607	95.1%
OOP	€ 110	€ 12,980	0.7%	€ 110	€ 12,980	0.7%
Monitoring costs	€ 447	€ 52,746	2.8%	€ 478	€ 56,402	3.1%
Lab exams	€ 120	€ 14,160	0.7%	€ 120	€ 14,160	0.8%
Visits	€ 327	€ 38,586	2.0%	€ 358	€ 42,242	2.3%
Hospitalization costs	€ 586	€ 69,143	3.7%	€ 179	€ 21,146	1.1%
Formal care costs	€ 0	€ 0	0.0%	€ 0	€ 0	0.0%
Direct healthcare costs	€16,021	€1,890,476		€15,645	€1,846,134	

Note. i) Prevalent cases of GPP in Italy (mean value)=118. ii) Scenario 1 and 2 differentiate for the source of resource consumption for visits and ER accesses/hospitalizations (scenario 1: EuroGuiDerm Guideline and expert opinion for visits; literature and Delphi panel for ER accesses/hospitalizations; scenario 2: patient-reported data from socio-economic questionnaire).

Table 2 – Direct non-healthcare costs of GPP

	Scenario 1			Scenario 2		
	Mean annual cost per patient	Total annual cost	Incidence of cost category	Mean annual cost per patient	Total annual cost	Incidence of cost category
Transport costs	€ 49	€ 5,806	100.0%	€ 69	€ 8,128	100.0%
Hotel costs	€ 0	€ 0	0.0%	€ 0	€ 0	0.0%
Direct non-healthcare costs	€49	€5,806		€69	€8,128	

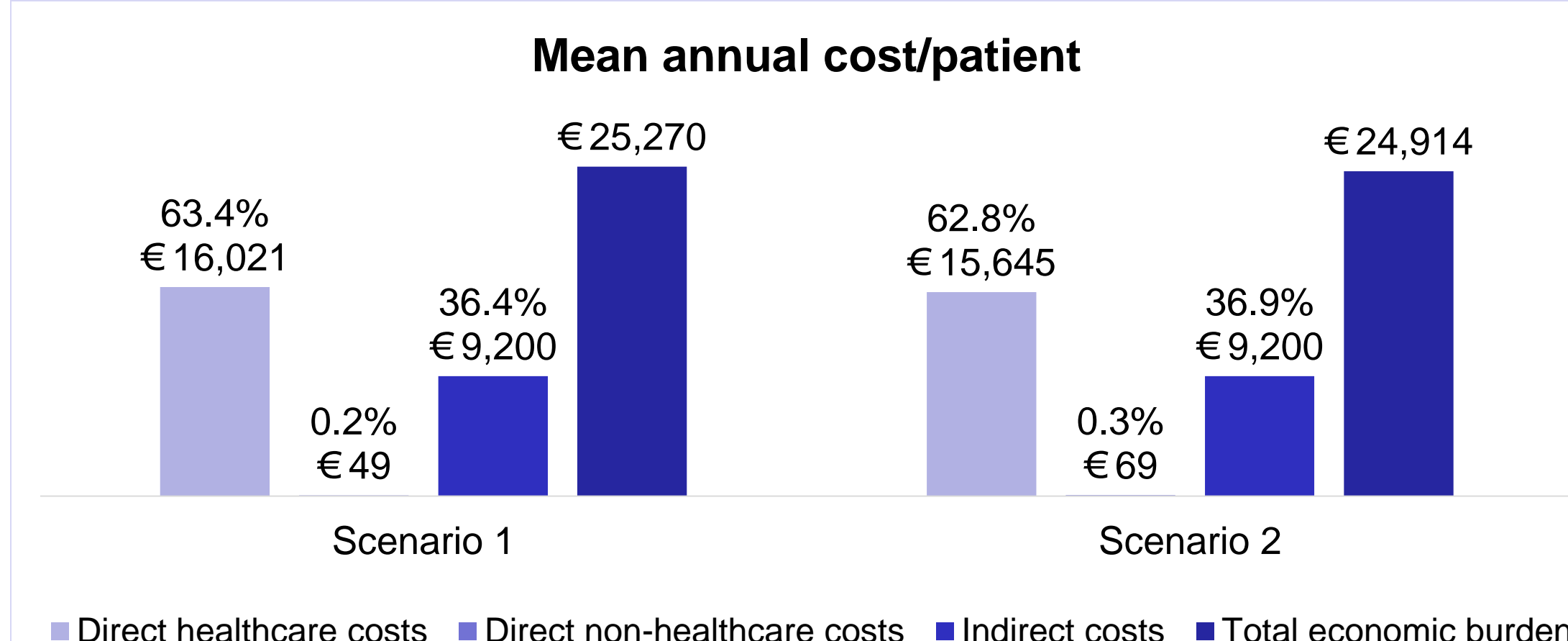
Note. i) Prevalent cases of GPP in Italy (mean value)=118. ii) Scenario 1 and 2 differentiate for the source of resource consumption for transport (scenario 1: literature - data on average travel time to healthcare facilities in Italy; scenario 2: patient-reported data from socio-economic questionnaire).

Table 3 – Indirect costs of GPP

	Mean annual cost per patient	Total annual cost	Incidence of cost category
Productivity losses	€ 5,528	€ 652,301	60.1%
Short-term absenteeism	€ 321	€ 37,854	3.5%
Long-term absenteeism	€ 245	€ 28,926	2.7%
Presenteeism	€ 2,988	€ 352,592	32.5%
Unpaid work	€ 1,974	€ 232,928	21.5%
Informal care costs	€ 3,672	€ 433,300	39.9%
Indirect costs	€9,200	€1,085,600	

Note. i) Prevalent cases of GPP in Italy (mean value)=118. ii) Resource consumption was estimated from socio-economic questionnaire.

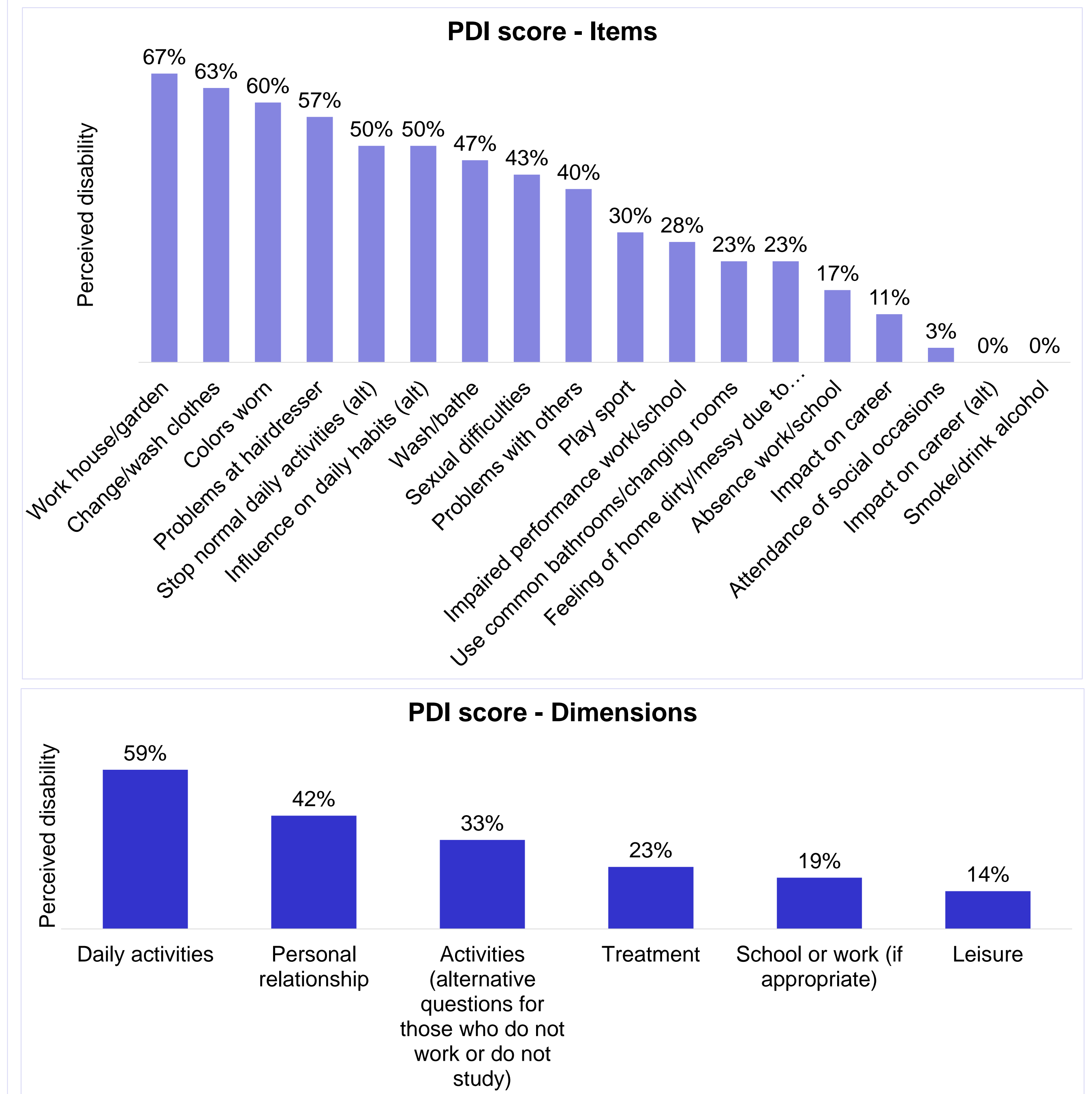
Figure 1 – Economic burden of GPP



- The **total annual economic burden** of GPP in Italy ranges from **€2.94 million** (scenario 2) to **€2.98 million** (scenario 1).
- In both scenarios, **indirect costs** account for **more than one third** of GPP economic burden.

Figure 2 and 3 – HRQoL of GPP patients

- The higher the score, the higher the perceived functional disability due to GPP



DISCUSSION

- This is the first study estimating the **economic burden of GPP** using a **societal perspective**.
- An Italian COI study on plaque psoriasis [5] showed that the annual cost per patient ranged from €5,226 to €11,434. These costs are far below our estimates for **GPP**, suggesting that this severe and very rare form of psoriasis **contributes considerably to the overall costs of psoriatic diseases**.
- Furthermore, our data showed that **GPP patients have an impaired HRQoL** due to the disease.
- **More specific management of GPP** and appropriate considerations regarding GPP **treatments approval and reimbursement** are of utmost importance in order to decrease the burden of the disease.

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