

# Multidisciplinary approach to psoriasis in the Spanish National Health System: A social return on investment study

Gregorio Carretero<sup>1</sup>, David Moreno<sup>2</sup>, Almudena González-Domínguez<sup>3</sup>, David Trigos<sup>4</sup>, Albert Ledesma<sup>5</sup>, Esther Sarquella<sup>5</sup>, María Merino<sup>3</sup>, Carles Blanch<sup>6</sup>; SROI-Psoriasis Group

<sup>1</sup>Dermatology and Venereology Spanish Academy, Madrid - Spain

<sup>2</sup>Department of Dermatology, Virgen Macarena Hospital, Seville - Spain

<sup>3</sup>Max Weber Institute, Madrid - Spain

<sup>4</sup>Acción Psoriasis, Psoriasis Patients and Relatives Association, Barcelona - Spain

<sup>5</sup>Generalitat de Catalunya, Barcelona - Spain

<sup>6</sup>Novartis Pharmaceuticals, Madrid - Spain

## ABSTRACT

**Introduction:** Psoriasis is a chronic disease in which patients feel stigmatization, social rejection, and suffer from low self-esteem. There are still unmet needs that make it necessary to define a new multidisciplinary approach to provide benefits not only to patients and their families but also to the Spanish National Health System (SNHS) and society. The aim was to define a new approach to better address the unmet needs of patients with psoriasis within the SNHS and to measure its impact from a social perspective, that is, in clinical, health care, economic, and social terms.

**Methods:** Multidisciplinary experts identified, agreed on, and selected several health care interventions that were feasible for implementation in the SNHS. This process was carried out in four different areas: diagnosis, mild psoriasis, moderate psoriasis, and severe psoriasis. To estimate investment and social return, the social return on investment (SROI) method was used.

**Results:** The new approach to psoriasis management in the SNHS comprised 18 proposals. The investment needed for the implementation of this new approach would amount to €222.77 million and its return to €1,123.11 million. This would yield a SROI ratio of €5.04 for every euro invested.

**Conclusion:** The new approach to psoriasis management would yield a positive social return. The results will allow optimal strategic planning adapted to each assistance situation, to achieve a comprehensive and multidisciplinary approach.

**Keywords:** Health care utilization, Health economics, Psoriasis, Resource optimization, Social impact, SROI

## Introduction

Psoriasis is an immune-mediated, chronic, and systemic inflammatory skin disease (1). As a systemic disease comprising multiple comorbidities, its burden extends beyond the skin (1,2). Similarly, the World Health Organization stated that

psoriasis is a chronic, noncommunicable, painful, disfiguring, and disabling disease that has no cure (3). Therefore, the extent of the effect of psoriasis should encompass the burden that it places on global health and include not only clinical aspects, but economic and social aspects as well (4). The mean annual cost per patient in Europe, including direct and indirect costs, varies between €1,340.25 and €8,253.74 (5).

The average worldwide prevalence of psoriasis was reported to be 3% and varied among countries from 0% to 11.8% (6). In Spain, the estimated prevalence of psoriasis was 2.3% in 2013, greater than the 1.4% prevalence reported in 1998 (7). This increase was attributed to a greater understanding of the disease and a better diagnosis (7). Moreover, among psoriasis patients in Spain, 70.5% have mild psoriasis, 19.1% moderate psoriasis, and 10.4% severe psoriasis (8). Patients may be considered to suffer severe psoriasis when a large body surface area is affected, when the effect is more

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### Corresponding author:

Almudena González-Domínguez

Calle Moreto, 17

5° Dcha. 28014

Madrid - Spain

almudena.gonzalez@weber.org.es

aggressive, or even when its location (face, flexural, genital, hands, etc.) inflicts major psychological and social damage or is unresponsive to topical treatment (9).

Furthermore, the pathogenetic complexity of the disease, along with associated comorbidities, has been shown to impact both physical and emotional aspects of patients' lives, comparable to, and sometimes greater than, other diseases (10,11). In fact, psoriasis has been shown to affect physical, emotional, sexual, occupational, economic, and social life domains of patients (9,12,13) and their close relatives (14). In addition, the visibility of the lesions further affects the psychosocial domain, with patients adopting a negative body image, feeling stigmatization, experiencing social rejection, suffering from low self-esteem, and having feelings of inferiority (10,15-17). Therefore, given the multidimensional impact of psoriasis on patients' lives, the improvement of the current multidisciplinary approach to the management of psoriasis that meets patients' needs, and appropriate assessment of its effects, is deemed necessary. A comprehensive approach should provide benefits not only to patients and their families but also to the Spanish National Health System (SNHS) and society as a whole.

Increased loss of public resources makes considering value-for-money of interventions necessary. Traditionally, cost-effectiveness, cost-utility, and cost-benefit analyses have been used to assess value-for-money of public health interventions. However, the social return on investment (SROI) method enables the measurement of broader socioeconomic outcomes, summarizing views of multiple stakeholders into a single monetary ratio expressing how much social return can be obtained for each euro invested. The SROI is currently one of the most comprehensive methodologies for calculating social return, given its combination of qualitative, quantitative, and financial approaches (18). Thus, the aim of the present study was to obtain a consensus on priority proposals to better address unmet needs related to the management of psoriasis within the SNHS and to measure their impact from a social perspective through the application of the SROI method.

## Materials and methods

In order to attain the aims of the present study, the six stages of the SROI analysis were used: (1) establishing scope and identifying stakeholders; (2) mapping outcomes; (3) evidencing outcomes and giving them a value; (4) establishing impact; (5) calculating the SROI; and (6) reporting, using, and embedding (18). To carry out the first four stages of the SROI analysis, relevant data were retrieved from the following sources: (a) narrative review of scientific literature, (b) survey of psoriasis patients, and (c) consultation with several groups of experts in psoriasis.

### Data sources

#### Literature review

The scientific literature was reviewed to collect information, which would help design the patient questionnaire and justify potential return on investment.

### Survey for psoriasis patients

Patients were recruited using nonprobability, convenience sampling among members of the main association of psoriasis patients in Spain (Acción Psoriasis). Recruitment (July through August 2015) was carried out through an advertisement on the association's website and through a direct e-mail campaign. The inclusion criteria were: (a) having a psoriasis diagnosis and (b) living in Spain. Exclusion criteria were: (a) patients not diagnosed with psoriasis and (b) patients with psoriasis living outside Spain. The diagnosis was self-reported through a question from the survey, which asked whether the patient had been diagnosed by a dermatologist.

A closed and structured web-based questionnaire, written in Spanish language, was self-administered. This questionnaire included questions regarding sociodemographic characteristics, type and location of psoriasis, the effect of psoriasis on various life domains (Tab. I), willingness to pay (WTP) for improving the affected life domains, and use of health resources associated to psoriasis in the past year.

The effect of psoriasis on each life domain was evaluated using two types of five-level Likert scales: one contained the response categories "nothing," "a little," "somewhat," "quite," and "a lot" and the other referred to the frequency in which patients continued to fulfill various activities of daily living ("much more than before," "more than before," "same as before," "less than before," "much less than before").

Regarding WTP, the survey included the following question: "How much would you be willing to pay to improve the following aspects of your life?" For the different life domains, available answers on WTP ranged from "under €500" to "over €3,000" at €500 intervals. The midpoint of each interval was used to calculate WTP. Moreover, for the open top range, the midpoint was assumed to be at €3,250. WTP was used as a proxy value in the SROI analysis. To calculate the SROI ratio, the only values of WTP considered

TABLE I - Life domains considered in the survey

Life domain	Items included
Self-care	Physical activity, personal care, etc.
Emotional	Irritability, insomnia, depression, anxiety, etc.
Social relationships	Family, friends, etc.
Family	Partner, offspring, etc.
Sexuality	Sexual relationships
Activities of daily living	Shopping, taking public transport, etc.
Leisure/culture	Going to cinemas, bars, beaches, traveling, etc.
Community	Associations, volunteering, etc.
Education	Bullying, group activities, etc.
Work	Discrimination at work, choice of profession, etc.

were those of patients negatively affected in each domain, adjusted through a weighing factor of 50% due to ignorance of other (nonpsoriasis) causes that may be influencing the WTP. Furthermore, WTP was estimated for each degree of psoriasis severity.

All scales in the questionnaire included “do not know,” “no reply,” and “not applicable” response options. Moreover, the questionnaire developed for the present study had been previously pilot tested in a subsample of the cohort. From a total of 1,042 completed questionnaires, only those with valid information on severity of psoriasis were used for the SROI analysis ( $n = 632$ ). The severity of illness was estimated from visits to the dermatologist, considering patients with mild psoriasis as those who only attended primary care visits, while patients with moderate–severe psoriasis were considered as those who visited the dermatologist in the last year. The sampling error obtained for this analysis (from the prevalence of psoriasis in Spain and Spanish population data) (7,19) was  $\pm 3.9\%$ , with a 95% confidence level and assuming a  $p=q=0.5$  distribution. This survey did not require approval by any ethics committee. Nevertheless, the present study conforms with the ethical principles of the Declaration of Helsinki.

#### *Expert consultation*

Several multidisciplinary committees were established for expert consultation (Supplementary material 1: the name and affiliations of the members of the Scientific Committee, Expert Committee, and the other collaborators):

- 1) The Scientific Committee provided advice on the most relevant aspects to be considered for a comprehensive approach (current and improved) to psoriasis management in Spain. This committee comprised the following perspectives: dermatology, health care decision-making, economy, and patient association.
- 2) The Expert Committee reached a consensus on the epidemiology of the disease and an improved approach to its management. This committee comprised the following perspectives: dermatology, psychology, specialized nursing, primary care medicine, hospital pharmacy, health care management, Spanish Society of Quality Assurance, and patients.
- 3) Other collaborators advised on the use of resources and provided information on the direct health care costs and the loss of labor productivity due to psoriasis.

Together, these experts proposed, identified, agreed, and selected the health interventions that were feasible for implementation in the SNHS and would improve the physical health and quality of life of patients with psoriasis. This process was carried out for each of the different follow-up areas of patients: diagnosis, mild psoriasis, moderate psoriasis, and severe psoriasis. Given the high number of proposals obtained, members from each committee were asked to individually rate each proposal according to its importance from 1 (“not important”) to 5 (“very important”). Thereafter, the 25% most voted proposals on each area were selected and similar proposals were grouped into one. Subsequently,

the committee members individually scored each proposal between 1 (“the patient will remain the same”) and 10 (“the patient will significantly improve”) to indicate its impact on the patient’s well-being. The average impact on patient’s well-being was used to weigh the impact of every proposal on social return.

#### ***The SROI analysis***

To measure the social impact of the selected proposals, a prospective SROI analysis from a conservative perspective, with a 1-year time frame, was applied (18). Thereafter, the SROI ratio was calculated by dividing the total social return that would be generated with the implementation of the improved approach to psoriasis management by the investment required to implement it.

The SROI method is based on seven principles: (1) involve stakeholders, (2) understand what changes, (3) value things that matter, (4) only include what is material, (5) do not overclaim, (6) be transparent, and (7) verify the result (18). These principles provide the methodology with a conservative point of view, as it tries not to overestimate the social return (by taking the least impact in monetary terms) while trying not to underestimate the necessary expenditure to obtain it (by taking the highest cost among all those available for investment). Furthermore, the SROI method includes different adjustment mechanisms that allow focusing on the social value created by the intervention itself, without attributing it to other factors.

In brief, investment and social return were estimated as follows. On the one hand, investment was calculated from the estimation of the health care resources needed (equipment, extra medical visits, working time of professionals, etc.) multiplied by their unit costs. On the other hand, estimates of social return were based on the scientific literature that demonstrated the effect of several interventions (e.g., variation of health states or consumption of health care resources) and, to a lesser extent, the opinion of participating experts.

Unit costs were used for tangible outcomes, while proxies (approximation of value where an exact measure is impossible to obtain), such as WTP, were used for intangible outcomes. Prices were updated to 2015 according to the Consumer Price Index (20). Regarding foreign prices, the cost was updated, according to the general Consumer Price Index for the country of origin, to the equivalent cost in Spain (21). The prevalence and incidence of psoriasis were taken into account when estimating investment and return (7,22).

Finally, an analysis of scenarios was carried out to provide a SROI ratio for best-case scenario, reference case scenario, and worst-case scenario. For this, we considered two variables: (1) WTP: raw figures for the best-case scenario, 50% weighing factor for the reference case scenario (as we might miss other causes for the affected areas), and subtraction of deadweight for the worst-case scenario; and (2) the amortization of investment on teledermatology and phototherapy equipment: 6 and 10 years for the best-case scenario, 4.5 and 7.5 years for the reference case scenario, and 3 and 6 years for the worst-case scenario, respectively.

**TABLE II - Proposals for an improved approach to psoriasis management**

<b>Proposals for diagnosis</b>	
1. Consensus document	– Development and implementation of a consensus document on clinical diagnosis and monitoring for primary care, and mailing of the consensus document through the usual channels between clinics
	– Informative leaflet for patients
	– Promoting patient participation in decision-making rather than a paternalistic attitude
2. Teledermatology implementation	
<b>Proposals for mild psoriasis</b>	
3. Interdisciplinary meetings, primary care doctors and nurses	
4. Nursing consultation (health education)	
<b>Proposals for moderate psoriasis</b>	
5. Multidisciplinary psoriasis units: individualized and comprehensive monitoring meeting with moderate psoriasis patients	
6. Initial visit with the multidisciplinary team	
7. Prompt multidisciplinary monitoring visit	
8. Information sessions and patient referral to the services they require (psychology and dietetics)	
9. Psychological care for patients with moderate psoriasis whose emotional domain is affected	
10. Training in nutrition and dietetics for patients with endocrine-metabolic problems	
11. Implementation of phototherapy equipment	
<b>Proposals for severe psoriasis</b>	
12. Multidisciplinary psoriasis units: individualized and comprehensive monitoring meeting with severe psoriasis patients	
13. Initial visit with the multidisciplinary team	
14. Prompt multidisciplinary monitoring visit	
15. Reference book for nurses specializing in severe psoriasis	
16. Information sessions and patient referral to the services they require (psychology and dietetics)	
17. Psychological care for patients with severe psoriasis whose emotional domain is affected	
18. Training in nutrition and dietetics for patients with endocrine-metabolic problems	

**Results**

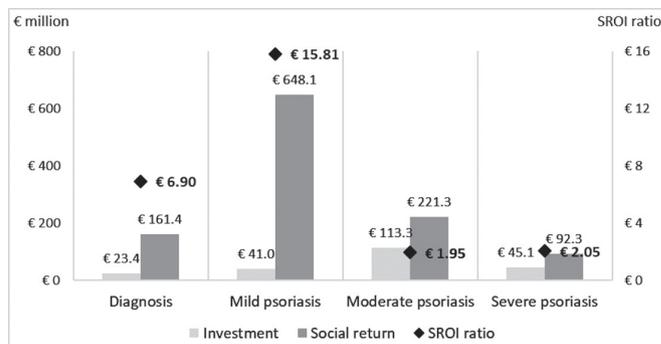
**The improved approach to psoriasis management**

The new approach to psoriasis management that was proposed by the experts comprised 18 proposals, distributed according to different areas: 2 for diagnosis, 2 for mild psoriasis, 7 for moderate psoriasis, and 7 for severe psoriasis (Tab. II). Detailed information on proposals and outcomes can be observed, respectively, in Supplementary material 2 (definitions of the new proposals in psoriasis management, the outcomes linked to proposals, and all the information on the economic valuation of inputs and outcomes) and 3 (detailed description of all outcomes).

Although most of the investment refers to resources within the SNHS, the expected benefits are for both the SNHS and patients. In relation to patients, proposals would increase adherence to treatment, empowerment with regard to decision-making, well-being, and labor productivity. Consequently, the use of direct and indirect health resources would decrease.

**The SROI ratio for the implementation of the new approach to psoriasis management**

The total investment required for the implementation of the new approach (€222.8 million) is lower than the expected social return (€1,123.1 million) (Fig. 1). Therefore,



**Fig. 1 - Social return on investment (SROI) ratio by diagnosis and severity of psoriasis**



implementing the proposals in the present study would yield a SROI ratio of €5.04 social benefit for each €1 invested. However, results differ depending on the severity of psoriasis. The highest ratio was reported for mild psoriasis (€15.82), while the lowest ratio was reported for moderate psoriasis (€1.95). In addition, proposals for diagnosis generated €6.90 of social benefit per €1 invested. Detailed information on the estimated investment and social return for each area of analysis is shown in Table III.

According to the present analysis, the greatest part of the total investment would focus on patients in poorer health conditions who would therefore require greater use of health care resources, with 50.9% of the total investment corresponding to moderate and severe psoriasis, and 18.4% to mild psoriasis. In addition, 10.5% of the total investment would correspond to the area of diagnosis. Conversely, the greatest part of the total return would come from patients with a better health status, with 57.7% of the total return corresponding to mild psoriasis and 27.9% to moderate and severe psoriasis. In addition, 14.4% of the total return would come from diagnosis.

The sensitivity analysis shows the robustness of the results and the conservative character of the reference case scenario. Worst-case scenario ratio (€4.78) is only 5.4% lower than the reference case scenario, while best-case scenario ratio (€7.42) is 47.2% higher than the reference case scenario. This means that the assumptions adopted in the reference case scenario are much closer to the worst-case scenario than to the best-case scenario. This further implies that the SROI ratio for the new approach to psoriasis may be higher than €5.04 (Tab. IV).

Supplementary material 4 contains detailed information on the economic valuation of inputs and outcomes of the new approach in psoriasis.

## Discussion and conclusions

To our knowledge, this is the first study to quantify the social benefit of an improved approach to psoriasis management in Spain using an economic analysis based on the SROI method. Previous studies have analyzed either disease burden or treatment costs (e.g., biological treatments) in moderate–severe psoriasis (23–25). However, these methods do not provide a comprehensive view of the impact psoriasis has on patients and society at large. Conversely, the SROI method takes into account intangible aspects (such as quality of life or emotional well-being) and allows all stakeholders (including patients) to participate in the analysis process.

One of the major contributions of the present study covers the detection and definition of a set of actions which, if implemented at the SNHS level, could substantially improve all areas of patients' lives while providing a positive social return for all other stakeholders. More specifically, the new priority approach would involve active and more meaningful nursing strategies aimed at increasing patient training and involvement, and an interdisciplinary cooperation between physicians that would further shape both diagnosis and treatment (7,26,27). That is, the coordination of different levels of care would improve disease diagnosis and hence prevent

**Table III** - Estimated investment and social return of proposals in each area of analysis

Proposals	Estimated investment (€)	Estimated social return (€)	SROI ratio
<b>Diagnosis</b>			
1	€1,129,860	€1,247,358	
2	€22,247,986	€2,780,533	
1+2	–	€157,335,169	
<b>Total</b>	<b>€23,377,846</b>	<b>€161,363,060</b>	<b>€6.90</b>
<b>Mild psoriasis</b>			
3	€5,760,018	€0	
4	€35,232,586	€648,101,302	
<b>Total</b>	<b>€40,992,604</b>	<b>€648,101,302</b>	<b>€15.81</b>
<b>Moderate psoriasis</b>			
5	€1,161,340	€0	
6	€15,974,824	€0	
7	€20,446,395	€84,437,706	
8	€2,568,905	€0	
9	€57,292,844	€78,909,609	
10	€9,876,996	€25,067,617	
11	€5,974,271	€4,513,020	
5+6+7+8+9+10+11	–	€28,413,011	
<b>Total</b>	<b>€113,295,575</b>	<b>€221,340,963</b>	<b>€1.95</b>
<b>Severe psoriasis</b>			
12	€580,670	€0	
13	€10,121,629	€0	
14	€9,704,743	€1,100,857	
15	€188,888	€0	
16	€902,847	€0	
14+16	–	€4,526,717	
17	€20,135,688	€61,214,909	
18	€3,471,291	€19,763,691	
12+13+14+15+16+17+18	–	€5,700,352	
<b>Total</b>	<b>€45,105,756</b>	<b>€92,306,526</b>	<b>€ 2.05</b>

SROI = social return on investment.

misguided or delayed treatments, which are common in current practice (28).

Additionally, the introduction of new technologies would optimize the current use of resources (29,30). Moreover, this

**Table IV** - Social return on investment ratio variation in sensitivity analysis

	Reference case scenario (€)	Worst-case scenario (€)	Best-case scenario (€)
Diagnosis	€6.90	€6.79	€6.96
Mild psoriasis	€15.81	€16.40	€23.74
Moderate psoriasis	€1.95	€1.57	€2.98
Severe psoriasis	€2.05	€1.25	€3.94
<b>Total SROI</b>	<b>€5.04</b>	<b>€4.78</b>	<b>€7.42</b>

SROI - social return on investment.

would allow implicating patients in monitoring, treatment, and joint decision-making, which would further optimize resources, enhance compliance, and improve emotional well-being (e.g., greater self-care, reduced outbreaks, delay in disease progression, and, consequently, improvement in leisure and sexual domains) (31,32). Finally, another important benefit of the suggested approach would be the prevention of decreased labor productivity, which would further reduce the economic burden caused by the disease (8,33).

Therefore, the proposals for an improved approach to psoriasis management would provide a much greater benefit relative to inversion, provided it has positive impact on clinical results, patient quality of life, and professional satisfaction. Accordingly, the overall investment in this new approach would render a considerable social return (€5.04 for every euro invested). Furthermore, provided that calculations of the SROI ratio are based on conservative assumptions that are very close to the worst-case scenario, the SROI in the new approach to psoriasis could be even greater. Nevertheless, the SROI ratio is much more than a number and supports the implementation of priority proposals that address unmet needs of patients with psoriasis, with positive effects for all stakeholders.

It should be noted that the positive return would be achieved not only globally, but that investment in any of the four areas studied would generate a positive social return. Moreover, the proposals addressed for mild psoriasis, which were only two, would yield the highest social return. These proposals refer to the implementation of periodic interdisciplinary meetings between doctors and nurses in primary care, and the implementation of health education for patients through consultations with primary care nurses. However, these data should be handled holistically, as it is jointly that proposals make up a better approach.

The present study has some limitations. First, a different group of experts might have chosen different priority interventions. Second, the impact of interventions was based on estimates. Third, survey respondents belonged to a patient association and were therefore more sensitive to the disease. Fourth, psoriasis patients were classified as mild and moderate/severe, depending on the specialties visited. Fifth, the WTP calculation method does not account for the socioeconomic status of patients and closed euro ranges might have biased the answers.

In conclusion, the present study describes a set of proposals conforming a comprehensive, multidisciplinary approach to the management of psoriasis in clinical, health care, economic, and social terms. This would allow optimal strategic planning adapted to the circumstances of each type of care. Moreover, this study shows that investing in strategic resources within the SNHS may further increase the well-being of society as a whole.

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## Disclosures

Authors' contribution: CB participated in the conception and design of the study. GC, DM, DT, AL, ES, and SG participated in the acquisition of data. AGD, MM, and CB participated in the analysis and interpretation of data. AGD and MM wrote the draft of the manuscript. All authors critically revised the manuscript for important intellectual content and approved the final version to be published.

Availability of data and materials: Data can be shared upon contact with the correspondence author.

Conflict of interest: CB is an employee of Novartis Pharmaceuticals. MM and AGD are employees of Max Weber Institute and received funds from Novartis Pharmaceuticals to develop this study. GC, DM, DT, AL, and ES worked as experts and received fees from Max Weber Institute. However, the participation of Novartis Pharmaceuticals was limited to sponsoring the project.

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