

ESC HEART FAILURE

ESC Heart Failure 2020; 7: 131–138

Published online 9 January 2020 in Wiley Online Library (wileyonlinelibrary.com) DOI: 10.1002/ehf2.12535

ORIGINAL RESEARCH ARTICLE

The social return on investment of a new approach to heart failure in the Spanish National Health System

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Abstract

Aims We aim to agree on a set of proposals to improve the current management of heart failure (HF) within the Spanish National Health System (SNHS) and apply the social return on investment (SROI) method to measure the social impact that these proposals would generate.

Methods and results A multidisciplinary working team of 16 experts was set up, with representation from the main stakeholders regarding HF: medical specialists (cardiologists, internal medicine physicians, general practitioners, and geriatric physicians), nursing professionals, health management professionals, patients, and informal caregivers. This team established a set of proposals to improve the management of HF according to the main areas of HF care: emergency and hospitalization, primary care, cardiology, and internal medicine. A forecast-type SROI method, with a 1-year time frame, was applied to measure the social impact resulting from the implementation of these proposals. The required investment and social return were estimated and summarized into a ratio indicating how much social return could be generated for each euro invested. Intangible returns were included and quantified through financial proxies. The approach to improve the management of HF consisted of 28 proposals, including the implementation of a case management nurse network, standardization of operational protocols, psychological support, availability of echocardiography machines at emergency departments, stationary units and primary care, early specialist visits after hospital discharge, and cardiac rehabilitation units, among others. These proposals would benefit not only patients and their informal caregivers but also the SNHS. Regarding patients, proposals would increase their autonomy in everyday activities, decrease anxiety, increase psychological and physical well-being, improve pharmacological adherence and self-care, enhance understanding of the disease, delay disease progression, expedite medical assessment, and prevent the decrease in work productivity associated with HF management. Regarding informal caregivers, proposals would increase their quality of life; improve their social, economic, and emotional well-being; and reduce their care burden. The SNHS would benefit from shorter stays of HF patients at intensive care units and reduction of hospitalizations and admissions to emergency departments. The investment needed to implement these proposals would amount to €548m and yield a social return of €1932m, that is, €3.52 for each euro invested.

Conclusions The current management of HF could be improved by a set of proposals that resulted in an overall positive social return, varying between areas of analysis. This may guide the allocation of healthcare resources and improve the quality of life of patients with HF.

Keywords Heart failure; Disease management; Spanish National Health System; Social return on investment (SROI)

Received: 4 February 2019; Revised: 12 September 2019; Accepted: 17 September 2019

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Introduction

Heart failure (HF) is a clinical syndrome caused by structural and/or functional alterations of myocardium, which result in reduced cardiac output and/or raised intracardiac pressures at rest or during physical exertion.¹ While characterized by impaired systolic and/or diastolic ventricular function, its clinical manifestations are related to haemodynamic effects on other organs.² In Spain, HF prevalence is 4.7% for population ≥ 18 years old and 6.8% for population > 44 years old.³ This incidence has achieved a rate of 3.9/1000 inhabitants.⁴ In 2015, cardiovascular diseases were considered the second cause of death in Spain, with 22.3% of these deaths caused by HF, with an age-adjusted mortality rate of 16.8/100 000 inhabitants.⁵

This syndrome is associated with an unfavourable prognosis, given that 50% to 65% of patients with HF die within 5 years of diagnosis.^{6,7} Furthermore, the presence of comorbidities, such as arterial hypertension, diabetes mellitus, and hypercholesterolaemia, are considered detrimental factors for this syndrome.⁸ In addition, patients with HF usually require assistance in their everyday activities, as the disease significantly affects their work environment, as well as emotional, sexual, and social status. Similarly, informal caregivers also suffer from a negative impact primarily on emotional, physical, and economic levels. Thus, HF patients and their families experience a significant decline of physical and psychological health.^{9–13}

Consequently, the management of HF should be addressed in a holistic manner. Therefore, an improvement of the current approach is necessary to provide an answer to the unmet needs that benefit the Spanish National Health System (SNHS), patients with HF, and their informal caregivers. Correspondingly, a comprehensive evaluation of improvements is deemed necessary.

Accordingly, the social return on investment (SROI) method, developed in 1996 by the Roberts Enterprise Development Fund, may account for the social value of the holistic management of HF. The main motivation for developing the SROI framework was to measure returns that do not have a market value but possess an intrinsic value (e.g. emotional well-being of patients or doctor–patient relationship).¹⁴ The application of this method helped to improve the assessment of social value, as every intervention could create or destroy social and environmental values.¹⁵

In subsequent revisions of the original SROI method, new principles and processes normally used in evaluations of economic and financial return on investment were added to create a framework capable of capturing the total economic, social, and environmental impact of the interventions.¹⁶ This method has recently been used in the SNHS in the areas of dermatology, cardiology, and oncology,^{17–19} as well as for the management of viral infections, such as human immunodeficiency virus, childhood bronchial asthma, spinal cord

injuries,²⁰ arterial hypertension and obesity,²¹ and paediatric cancer²² in other countries. However, the SROI method has not been applied to the management of HF. Therefore, the objective of this study was twofold: first, to agree on a set of proposals that could potentially improve the current management of HF within the SNHS and, second, to apply the SROI method to measure the social impact that these proposals would generate, including the intangible aspects of the disease.

Methods

The six stages of the SROI analysis were used to achieve the goals of the present study: (i) to establish scope and identify stakeholders; (ii) to map outcomes; (iii) to evidence and give them a value; (iv) to establish the impact; (v) to calculate the SROI; and (vi) to report to the stakeholders, use the results, and embed the SROI process. The first four stages of the SROI analysis were based on the collection of relevant data from the following sources.

(a) Literature review

We reviewed scientific articles, official data, and, to a lesser extent, grey literature. This helped design a survey to collect relevant data from patients with HF and their informal caregivers. Moreover, the evidence was gathered to obtain necessary information for the SROI analysis.

(b) Surveys for patients with HF and their informal caregivers

A survey was administered from May to August 2016 among HF patients and their informal caregivers, of legal age and living in Spain, to analyse the impact of HF on each life domain. The patient survey, designed *ad hoc* for this study, contained a sub-questionnaire addressed to the patients' primary informal caregiver.

In addition, a five-level health-related quality of life (EQ-5D©) questionnaire was delivered to patients and caregivers; and a 12-item General Health Questionnaire, a screening tool for minor psychiatric disorders, was administered to HF patients. In brief, the EQ-5D© evaluates mobility, self-care, usual activities, pain/discomfort, and anxiety/depression on a scale ranging from 'no problems' to 'extreme problems'.

Two data collection methods were used to obtain a larger sample size: paper-based surveys and an online reproduction of the paper-based format. Owing to the difficulty of obtaining a random sample of HF population across the country, patients were mainly recruited through cardiovascular disease associations grouped in the CardioAlianza association, following the inclusion criteria designed by expert cardiologists and internal medicine physicians. HF patients ≥ 18 years

old, living in Spain, and who had at least one of the following symptoms in the past year, were included in the study population: shortness of breath during or after physical exercise, exertion, or while lying down; peripheral oedema and/or ascites; unexplained weight gain in the past week; feeling full or stomach bloating; nocturia; or fatigue. Overall, the study sample consisted of 558 patients with HF.

The exclusion criteria were underage subjects, patients living abroad, those who did not have any of the symptoms referred to in the inclusion criteria, or those with any limitation on responding to the questionnaire (no knowledge of Spanish, cognitive disability, etc.).

The calculated sample error (from HF prevalence in Spain²³ and population data²⁴) was 4.15% (level of confidence: 95%; distribution $p = q = 0.5$). This survey did not require the approval of an ethics committee yet conforms with the principles outlined in the Declaration of Helsinki.

(c) Expert consultation

A multidisciplinary working team (MWT) consisting of 16 experts was set up, with representation from the main stakeholders regarding HF: medical specialists (cardiologists, internal medicine physicians, general practitioners, and geriatric physicians), nursing and health management professionals, patients, and informal caregivers. Four of the 16 experts formed the Project Advisory Committee to establish the current approach to HF (starting point) and, together with the rest of the experts, agreed on a set of proposals aimed to improve the management of HF patients (first objective).

During an extensive meeting, the MWT was organized into the three subgroups from the perspectives of medicine, nursing, and patients. Each group discussed the most relevant proposals. Thereafter, these were shared with the rest of

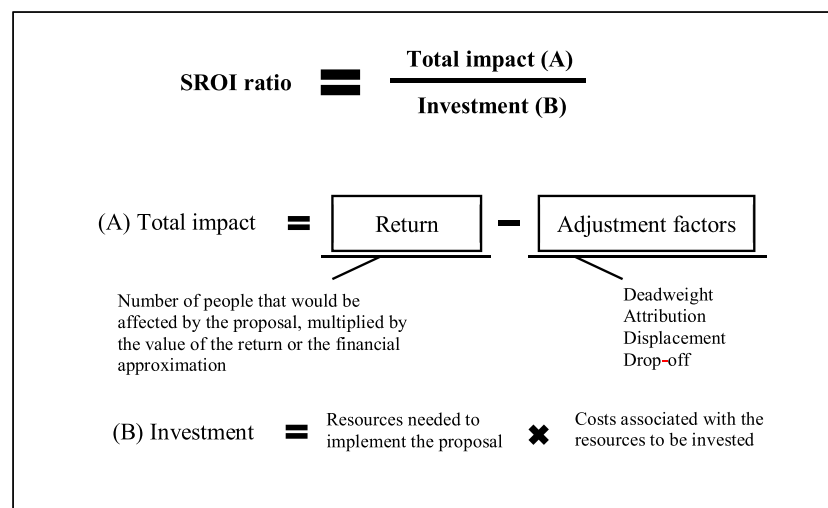
the groups via a spokesperson and discussed and categorized into four blocks that were previously established according to the main areas of HF management: emergency and hospitalization (EH), primary care (PC), cardiology (C), and internal medicine (IM).

Subsequently, the members of the MWT were asked to rate the proposals according to their importance on a scale, ranging from 0 ('not important') to 10 ('maximum importance'). Finally, the technical team, on the basis of the basic principle of economy of resource scarcity, decided to select 25% of the proposals with the highest average score in each area. A new general (G) area was introduced to address HF patients treated by different specialists.

Social return on investment analysis

To measure the social impact of selected proposals, a forecast-type SROI method, with a 1-year time frame, was applied. The analysis combined both qualitative and quantitative methodologies, as indicated by the SROI guide.²⁵ The investment was determined from the SNHS perspective, while the impact was determined from a social perspective. The relationship between investment and social return was presented by a ratio indicating how much social return could be generated for each euro invested (*Figure 1*). The SROI framework is based on seven principles: (i) involvement of stakeholders, (ii) understanding of changes, (iii) evaluation of significant factors, (iv) inclusion of material aspects, (v) assessment of changes associated with the activity independent of other factors, (vi) transparency, and (vii) verification of the result.²⁵ Initially, the costs associated with the activities and resources required for implementation of each proposal were identified, and the latter were multiplied by their unit

Figure 1 The association between investment, return, total impact, and SROI ratio. SROI, social return on investment.



prices. These resources, be they medical or non-medical, or material or human, they were quantified (in number and cost) from literature sources, official data, public prices of health services of the Spanish autonomous regions, and market prices. Following the current convention on SROI methodology, no financial value was given to the time spent on interventions by patients and caregivers (main beneficiaries).²⁵

To calculate returns, the potential consequences of each proposal from the clinical, welfare, economic, and social perspectives were identified. These returns, be they tangible or intangible, or positive or negative, were obtained from the MWT, literature review, official data, public prices of health services of the Spanish autonomous regions, and market prices. Finally, unit market prices and financial proxies (an approximate value when a return does not have a market price) were used to evaluate the tangible and intangible returns, respectively. The adjustment factors, including deadweight (percentage of return that would have been obtained without the proposal), attribution (percentage of the return resulting from activities independent from the proposal), displacement (percentage of the return that would have displaced another return), and drop-off (percentage of return deterioration over time) were deducted from the return (*Figure 1*). All calculations were based on the prevalence of HF in Spain.^{4,23,24} In addition, the analyses were carried out with a

conservative perspective, so that the highest costs were chosen among all the available ones, whereas for the returns, the lowest monetary impact was taken into account. Missing data points were added based on assumptions. Prices were updated to euros from 2015 according to the corresponding consumer price index.²⁶

Finally, a sensitivity analysis was performed by comparing three scenarios that considered the different ways of amortizing the equipment acquisition investment^{27,28}:

- (a) the worst scenario, considering the total costs of the equipment;
- (b) an intermediate scenario, considering the minimum amortization of the equipment; and
- (c) the best scenario, considering the maximum amortization of the equipment.

Results

The MWT agreed on a total of 28 proposals to improve the current approach to HF management within the SNHS (*Table 1*). Proposal 17 has been used as an example of how outcomes were mapped and evaluated, and impact established,

Table 1 The proposals to improve the current approach to heart failure in the Spanish National Health System

Areas of HF management	Proposals
General	<ol style="list-style-type: none"> 1. Optimization of the electronic medical record use 2. Enhancement of electronic prescription use 3. Implementation of a widespread hospital nurse case manager network 4. Realization of a widespread community nurse case manager network 5. Standardization of operational protocols between specialities attending the same patients 6. Application of a clinical pathway in each hospital 7. Psychological–emotional support of patients 8. Professional reorientation and insertion actions
Emergency and hospitalization	<ol style="list-style-type: none"> 9. Monograph for palliative care patient identification 10. Informative dissemination of the advance directives document 11. Profile definition of a patient with acute HF and initial comprehensive assessment 12. Availability of echocardiography division at hospital emergency departments 13. Awareness campaign for health professionals on the importance of good communication with patients at hospital discharge 14. Health education for patients and caregivers before hospital discharge 15. Telephone contact 48 hours after hospital discharge to home
Primary care	<ol style="list-style-type: none"> 16. Quick access to the echocardiography in the primary care upon initial evaluation 17. Health education for patients with HF 18. Home visit within 7 days from hospital discharge 19. Early visit to the corresponding specialist within 2 weeks from hospital discharge
Cardiology	<ol style="list-style-type: none"> 20. Implementation of cardiac rehabilitation units at reference hospitals 21. Nursing staff specialization at HF units 22. Approach for non-invasive mechanical ventilation in the emergency department, cardiology, and acute care units 23. Early visit to the specialist indicated within 2 weeks from hospital discharge 24. Quick access to a clinical cardiologist
Internal medicine	<ol style="list-style-type: none"> 25. Campaigns on the importance of good communication between healthcare professionals and patients followed at the IM department 26. Social resource streamlining 27. Implementation of an optimal palliative care ratio 28. Early visit to the specialist indicated within 2 weeks from hospital discharge

according to the stages of SROI analysis. The details on each proposal are presented in the Supporting Information.

Regarding the mapping of outcomes, Proposal 17 aimed to improve physical and mental well-being of patients, decrease hospital readmission, delay HF progression, increase labour productivity, and reduce informal care hours (Table 3S). This further implied an investment on three nursing appointments per year for each patient (Table 2S).

To monetize the reduction in hospital readmission, Proposal 17 used the number of readmissions due to HF, the percentage of reduction of readmissions due to pharmacological adherence training, and cost of hospitalization. On the other hand, to monetize the improvement of physical and mental well-being, the average annual costs on leisure, entertainment, and culture were used, which could be equivalent to achieving well-being of patients in an alternative way.

In Proposal 17, to establish return related to delaying HF progression includes an attribution correction of 50% (a conservative assumption), which means that half of the return may be due to other causes, so the amount of return is reduced to half (Table 5S).

Once the required total investment and the net social return were estimated, the SROI ratio was calculated (Figure 1). The investment for the first year would amount to €548.1m, while the expected social return would amount to €1931.7m. The main investment would be made in areas G (€232.2m) and PC (€180.0m), followed by areas C, IM, and EH (€86.3m, €39.6m, and €10.0m, respectively) (Table 2). In addition, more than half of the total social return would be obtained from area G (€1164.2m), followed by PC (€515.5m) and to a lesser extent from areas C, EH, and IM (€115.0m, €90.6m, and €46.4m, respectively) (Table 2). The detailed evaluation of both the investment and the expected social return for each proposal is presented in the tables of the Supporting Information.

Therefore, the SROI ratio would yield a return of €3.52 for each euro invested. The highest SROI ratios would be achieved in the areas of EH and G (€9.05 and €5.01, respectively). For the rest of areas of HF management, lower but positive values for SROI ratios would be achieved (€2.86 in PC, €1.33 in C, and €1.17 in IM). These ratios could potentially be higher according to the results of the sensitivity analysis (Table 3).

Table 2 Investment and social return by areas of analysis

Areas of HF management	Investment	Social return
General	€232.15	€1164.17
Emergency and hospitalization	€10.02	€90.63
Primary care	€180.01	€515.49
Cardiology	€86.29	€115.00
Internal medicine	€39.62	€46.40
Total	€548.08	€1931.71

Table 3 Social return on investment ratio and sensitivity analysis

Areas of HF management	Worst scenario (base case)	Intermediate scenario	Best scenario
General	€5.01	€5.01	€5.01
Emergency and hospitalization	€9.05	€16.50	€18.39
Primary care	€2.86	€3.80	€3.96
Cardiology	€1.33	€1.92	€1.99
Internal medicine	€1.17	€1.17	€1.17
Total SROI	€3.52	€4.09	€4.16

Note: The SROI ratio is the social return in euros for each euro invested.

SROI, social return on investment.

The obtained results were reported to the Project Advisory Committee for validation. Subsequently, they were disclosed in 2017 at the congresses of the Spanish Society of Cardiology,²⁹ the Spanish Society of Internal Medicine,³⁰ and the Spanish Association of Health Economics,³¹ as well as via media and social networks.

Discussion

To our knowledge, this is the first study in Spain that has quantified the social value generated by the implementation of a set of proposals to improve the current HF approach in the SNHS. Until now, the expenses related to the management of HF have only been studied in terms of tangible costs,^{11,13,32–34} without showing a complete overview of their impact on patients' lives, their informal caregivers, and the society. There is no exact method to capture the social value, but the traditional ones leave out of the analysis its total impact. The SROI method, unlike other economic evaluation methods, allows measuring a broader concept of value,^{35,36} as it quantifies the tangible and intangible social impact of an intervention, compares it to the investment needed, and gives an SROI ratio that expresses how much social return could be obtained for each euro invested. Furthermore, it includes internal adjustment mechanisms that provide a conservative perspective during the processes of calculation and analysis.

We have shown that the total investment for this approach to HF would imply a social return of €3.52 for each euro invested. Moreover, this amount could be greater because the base case analysis corresponds to the most unfavourable scenario of the sensitivity analysis, and it follows the principles on which the SROI method is based on, including a conservative character and trying not to overestimate the potential of the social return and not to underestimate the required expenses to achieve it. The involvement of stakeholders related to HF and the consensus of proposals may enable a response to the existing gaps in the current management of patients with HF.

The implementation of this new approach in the SNHS could substantially improve the quality of life of HF patients and their informal caregivers, as well as optimize the use of certain healthcare resources. This approach could prevent the decrease in labour productivity and contribute to the reduction of informal caregiving while minimizing unnecessary health expenses. The SROI ratio justifies addressing unmet needs of HF patients through interventions that provide positive results for all stakeholders.

This study has several limitations. A different configuration of MWT could have conducted a different set of proposals from the ones presented in this paper. Therefore, the SROI ratio would have been different. However, the proposals are in line with the latest consensus of scientific societies.³⁷ Furthermore, the New York Heart Association functional class of the study patients with HF was not taken into account, an important parameter that could have altered the results.

In conclusion, based on the SROI method, the implementation of proposals agreed upon to improve HF management would result in a social return of €3.52 for each euro invested. More specifically, the analysis of EH area of HF management yielded the highest SROI ratio, followed by G, PC, C, and IM areas, respectively.

The present study provides valuable information that could guide the allocation of healthcare resources with respect to HF management and improve the quality of life of patients with HF. Having proposals developed by stakeholders involved in the management of different pathologies, knowing their cost, and their social return are of great importance at a time when the general budgets for healthcare are declining, and when the timing of investment is essential.

Acknowledgements

The authors are grateful to patients with HF and their caregivers who participated in this study for their valuable time spent responding to the survey. All of them have significantly contributed to the improvement of knowledge about the impact of HF on the daily lives of patients.

We would also like to thank the patient associations involved in the data collection: Asociación de Cardiopatas y Anticoagulados de La Coruña, Corazones Atendidos,

Associació gironina de prevenció i ajuda a les malalties del cor Maçanet Cor, Associació de Malalts Cardíacs i Anticoagulats d'Ontinyent, Asociación Valenciana de Pacientes Anticoagulados de la Comunidad Valenciana, Corazones sin Fronteras, Canarias con Corazón, Federación Andaluza de Asociaciones de Enfermos del Corazón, Asociación Española de Portadores de Válvulas Cardíacas y Anticoagulados, Asociación de Enfermos y Trasplantados de Corazón y Pulmón de Euskadi, Asociación de Trasplantados de Corazón—Castilla y León, Asociación de Trasplantados de Corazón de Gibraltar, and Asociación de Pacientes Cardiacos y Anticoagulados Portuenses.

Finally, the authors are also thankful to the following people for their valuable contribution to the project: Mercè Faraudo, Myriam Moralejo Martín, María Pumares Álvarez, Concepción Sánchez Gallego, Marta Cruz Lázaro, María Aroca Moreno, Dr. Carlos Palanco Vázquez, Alberto San Martín Prado, María José Pirla Buxó, Núria Mesado Batalla, Ana García Otero, José Andrés Peña Álvarez, and Dr. Pablo Díez Villanueva.

Conflict of interest

M. M., M. J., Y. I., and A. G. are employees of the consultancy firm that received funds from Novartis Farmacéutica, S.A. to develop this study. E. C., M. S., and N. M. worked as experts for the consultancy firm. However, the participation of Novartis Farmacéutica, S.A. was limited to sponsoring the project.

Funding

This work was supported by Novartis Farmacéutica, S.A..

Supporting information

Additional supporting information may be found online in the Supporting Information section at the end of the article.

Data S1. Supporting Information

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