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Budget Impact Analysis of a Possible Extension of Public Funding for the Treatment of Disease-Related Malnutrition in Spain

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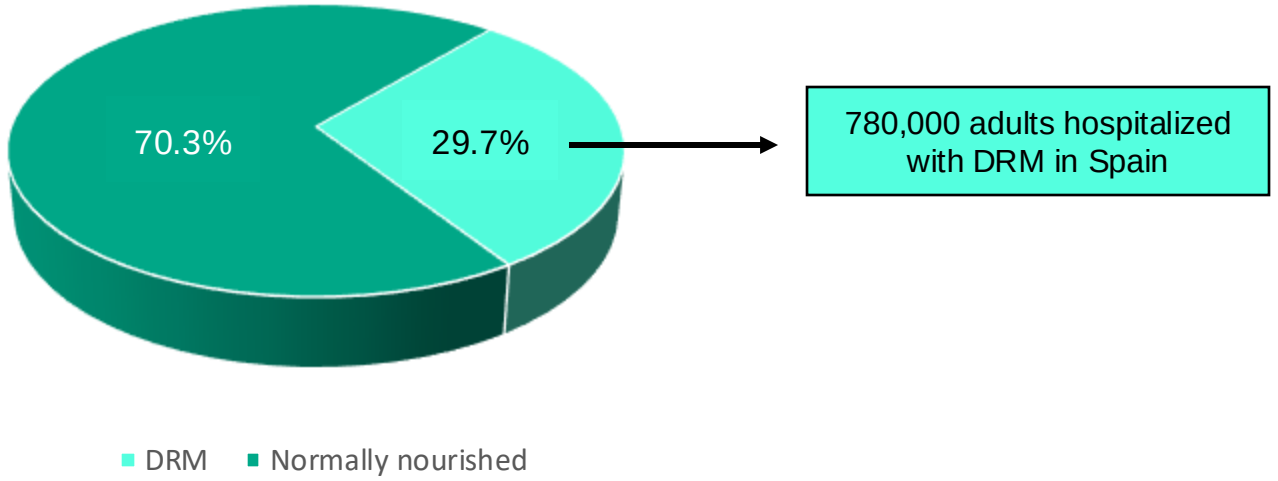
Introduction and Objectives

Introduction and Objectives

Disease-Related Malnutrition (DRM) is a complex syndrome that results from inadequate intake of nutrients that do not meet the patient's physiological requirements and from the systemic inflammatory response associated with a pathological state.



Consequences: Impact on QoL, higher in-hospital mortality, prolongation of ALOS compared to normally nourished patients, higher rate of early readmissions.

Despite the evidence on the positive impact of nutritional treatment on patients with DRM the establishment of Home Enteral Nutrition (HEN) in Spain is limited by an outdated regulatory framework.

The aim of this research is to estimate the economic burden that an update of the regulatory framework on the financing of HEN after hospital discharge would entail on the National Health System.

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Methods

Methods I

Experts from scientific societies related to nutrition proposed expanding the list of diseases in which Home Enteral Nutrition is financed once the patient is discharged with severe DRM after hospitalization.

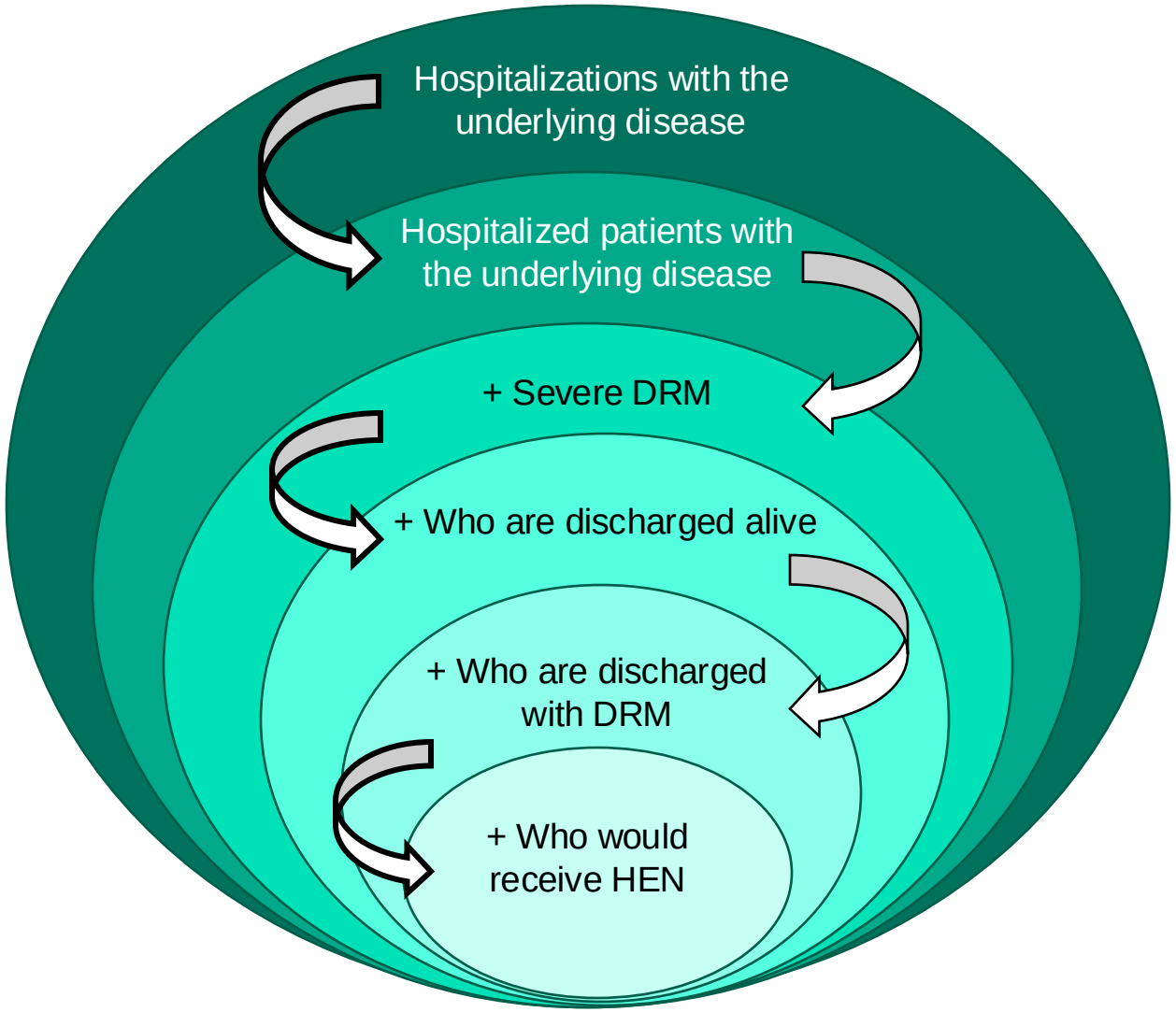
- Severe COPD (FEV1 < 50% of the theoretical value).
- NYHA Class III-IV Heart Failure.
- Child-Pugh C Chronic Liver Disease.
- Stage IV Chronic Kidney Disease.
- Stage III-IV pressure ulcers.

We compared the cost currently generated by patients who are discharged with severe DRM and the cost that those same patients would incur if HEN were funded.

Perspective of analysis: National Health System.

Time horizon: one year.

Methods II – Target population
Conceptual model for the calculation



The target population was estimated from a systematic review of the literature, limited to studies on the Spanish population.

It was complemented by a search in official sources for some variables: population, hospitalizations, in-hospital mortality.

The information gaps were addressed through a Delphi panel with a group of professionals directly linked to the care of patients with DRM.

Two rounds of the Delphi panel were held, after which a level of agreement of more than 75% was reached on all questions.

Methods III – Costs

The cost of HEN and cost of hospitalizations (number of hospitalizations, rehospitalizations and ALOS) were included in the calculation of the net cost per patient.

The dose of HEN (Oral Nutritional Supplementation: 400 mL/day) and the mean duration of nutritional treatment (12 weeks) were defined based on expert opinion.

The cost of nutritional treatment per patient was estimated from the weighted calculation of expenditure in ONS in hospitalized patients in the last 12 months.

Methods IV - Assumptions

The following variables are the same for all patients:

- Prevalence of Severe DRM: 12.5% (unless the SeDREno study has described a different prevalence for any of the diseases included in this BIA).
- Average number of hospitalizations/person: 1.3
- ALOS: 6.9 days.
- Mortality rate during hospitalization: 7.66%
- Percentage of patients discharged with DRM: 71.8%
- Daily dose and duration of nutritional treatment at home.

- All patients are hospitalized at least 1 time a year.

Results

1. Target population

Severe COPD + Severe DRM

COPD hospitalizations (≥ 15 years old)		60,609
COPD patients who are hospitalized	1.3 episodes per patient	46,623
COPD patients who are hospitalized with Severe DRM	12.5%	5,828
Severe COPD patients who are hospitalized with Severe DRM	75.5%*	4,400
Severe COPD patients who are hospitalized with Severe DRM who are Discharged Alive	92.34% of hospital discharges	4,063
Severe COPD patients who are hospitalized with Severe DRM who are Discharge con Severe DRM	71.8%	**2,918**
Severe COPD patients who are hospitalized with Severe DRM who are Discharge con Severe DRM who would receive HEN at discharge	35.5%*	**1,036**

*Mean of the interval with the highest level of agreement in the Delphi panel.

Target population

	HEN candidates	Patients who would access to HEN*
Severe COPD	2,918	1,036
NYHA Class III-IV Heart Failure	3,081	1,094
Child-Pugh C Chronic Liver Disease	1,180	419
Stage IV Chronic Kidney Disease	6,074	2,107
Stage III-IV pressure ulcers	4,157	1,476
TOTAL	**17,410**	**6,132**

*35.5% of HEN candidates according to the opinion of the experts who participated in the Delphi panel.

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Results

2. Costs

ONS cost

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Type of ONS	Expenditure	Liters	Liters per patient (12 weeks)	Patients treated (1 year)	Market share (according to pacients)
DIABETICS	47,102,776.29 €	1,795,723	33.6	53,444	16.56%
ENERGETICS	22,496,904.65 €	1,448,140		43,099	13.36%
SPECIAL	14,226,372.22 €	686,696		20,437	6.33%
THICKENED	16,571,185.41 €	661,272		19,681	6.10%
THICKENER	15,271,728.61 €	398,544		11,861	3.68%
STANDARD	1,926,610.79 €	193,089		5,747	1.78%
PEPTIDE	18,443,856.09 €	484,267		14,413	4.47%
PROTEIN	94,203,900.63 €	4,819,423		143,435	44.46%
RENAL	9,291,902.20 €	353,903		10,533	3.26%
TOTAL	**239,535,236.89 €**	**10,841,056**		**322,650**	**100%**

400 mL/day
for 12 weeks

ONS cost

Type of ONS	Expenditure	Liters	Liters per patient (12 weeks)	Patients treated (1 year)	Market share (according to pacients)	Price per liter
DIABETICS	47,102,776.29 €	1,795,723		53,444	16.56%	26.23 €
ENERGETICS	22,496,904.65 €	1,448,140		43,099	13.36%	15.54 €
SPECIAL	14,226,372.22 €	686,696		20,437	6.33%	20.72 €
THICKENED	16,571,185.41 €	661,272		19,681	6.10%	25.06 €
THICKENER	15,271,728.61 €	398,544		11,861	3.68%	38.32 €
STANDARD	1,926,610.79 €	193,089	33.6	5,747	1.78%	9.98 €
PEPTIDE	18,443,856.09 €	484,267		14,413	4.47%	38.09 €
PROTEIN	94,203,900.63 €	4,819,423		143,435	44.46%	19.55 €
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ONS cost

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Type of ONS	Expenditure	Liters	Liters per patient (12 weeks)	Patients treated (1 year)	Market share (according to pacients)	Price per liter	Price per liter (weighted)
DIABETICS	47,102,776.29 €	1,795,723	33.6	53,444	16.56%	26.23 €	4.34 €
ENERGETICS	22,496,904.65 €	1,448,140		43,099	13.36%	15.54 €	2.08 €
SPECIAL	14,226,372.22 €	686,696		20,437	6.33%	20.72 €	1.31 €
THICKENED	16,571,185.41 €	661,272		19,681	6.10%	25.06 €	1.53 €
THICKENER	15,271,728.61 €	398,544		11,861	3.68%	38.32 €	1.41 €
STANDARD	1,926,610.79 €	193,089		5,747	1.78%	9.98 €	0.18 €
PEPTIDE	18,443,856.09 €	484,267		14,413	4.47%	38.09 €	1.70 €
PROTEIN	94,203,900.63 €	4,819,423		143,435	44.46%	19.55 €	8.69 €
RENAL	9,291,902.20 €	353,903		10,533	3.26%	26.26 €	0.86 €
TOTAL	**239,535,236.89 €**	**10,841,056**		**322,650**	**100%**		**22.10 €**

ONS cost

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Type of ONS	Expenditure	Liters	Liters per patient (12 weeks)	Patients treated (1 year)	Market share (according to pacients)	Price per liter	Price per liter (weighted)	Price per treatment (weighted)
DIABETICS	47,102,776.29 €	1,795,723		53,444	16.56%	26.23 €	4.34 €	
ENERGETICS	22,496,904.65 €	1,448,140		43,099	13.36%	15.54 €	2.08 €	
SPECIAL	14,226,372.22 €	686,696		20,437	6.33%	20.72 €	1.31 €	
THICKENED	16,571,185.41 €	661,272		19,681	6.10%	25.06 €	1.53 €	
THICKENER	15,271,728.61 €	398,544		11,861	3.68%	38.32 €	1.41 €	
STANDARD	1,926,610.79 €	193,089	33.6	5,747	1.78%	9.98 €	0.18 €	**742,40 €**
PEPTIDE	18,443,856.09 €	484,267		14,413	4.47%	38.09 €	1.70 €	
PROTEIN	94,203,900.63 €	4,819,423		143,435	44.46%	19.55 €	8.69 €	
RENAL	9,291,902.20 €	353,903		10,533	3.26%	26.26 €	0.86 €	
TOTAL	**239,535,236.89 €**	**10,841,056**		**322,650**	**100%**		**22.10 €**	

Hospitalization costs

- Cost of each hospitalization: 6,262.17 € (calculation made from the cost of hospitalization per day, 907.56 €, and ALOS of 6.9 days).
- Cost of hospitalizations/year per patient: 8,140.82 € (1.3 hospitalizations/year per patient).
- Patients with DRM who receive HEN at hospital discharge have 27.5% fewer hospitalizations than those who did not receive nutritional treatment at home.
- Normally nourished patients have a mean length of stay 26.1% shorter than malnourished patients.

Results

3. Budget Impact

Budget Impact per patient
Based-Case

	Current Scenario (without HEN)	New Scenario (with HEN)
Cost of nutritional treatment	0.00 €	742.40 €
Number of hospitalizations/year	1.38*	1
ALOS	6.9	5.1
Cost per day of hospitalization	907.56 €	907.56 €
Cost of hospitalization episode	6,262,17 €	4,628.56 €
Cost of hospitalizations/year per patient	8,641.79 €	4,628.56 €
Total cost (based-case)	**8,641.79 €**	**5,370.96 €**
Budget Impact per patient	**-3,270.83 €**	

* In the "Current Scenario", 1.38 discharges per person are considered, since it is considered that all patients are hospitalized at least 1 time in the year. This shows a 27.5% reduction in hospitalizations in the "New Scenario".

Budget impact
Target population

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	Current Scenario (without HEN)	New Scenario (with HEN)
Target population	**17,410**	
Cost of nutritional treatment with HEN (per patient)	0.00 €	742.40 €
Cost of nutritional treatment with HEN (target population)	**0.00 €**	**12,925,184 €**
Cost of hospitalizations/year (per patient)	8,641.79 €	4,628.56 €
Cost of hospitalizations/year (target population)	**150,453,563.90 €**	**80,583,229.60 €**
Total cost (target population)	**150,453,563.90 €**	**93,508,413.60 €**
Budget Impact (target population)	**-56,945,150,30 €**	

If HEN were financed in the target population that is discharged with DRM after hospitalization, an additional expense in the treatment of DRM of almost €13 million would be generated, but **this would result in savings of approximately €57 million for the NHS** due to the reduction in hospitalizations and ALOS.
If the dissemination rate were 35.5%, the savings would be at least 20 million euros.

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Discussion

Discussion

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Disease-Related Malnutrition (DRM) is a clinical condition that not only affects the quality of life of those who suffer from it, but also has a negative impact on the evolution of the underlying diseases associated with malnutrition.

Despite the evidence on the positive impact of nutritional treatment on patients with DRM and the reduction in the use of health resources, the current regulatory framework does not allow the full benefits of nutritional treatment to be taken advantage of and generates inequities depending on the underlying disease of each person.

Although the universe of DRM is not limited to the field of hospitalization or to patients who are discharged with DRM from hospitals, we have based the Budget Impact Analysis on this group of patients due to the inequities that arise from the obsolescence of the regulatory framework for nutritional treatment at home.

One of the main uncertainties generated by the expansion of the list of diseases in which the HEN is financed is the budgetary impact that it could have on the NHS. The present work shows that **the incremental cost that HEN financing could generate in the proposed diseases is significantly lower than the savings that could be generated** in these same patients due to the reduction in the number of hospitalizations and in the ALOS. In relative terms, financing HEN in this group of patients would generate savings three and a half times higher than the cost of nutritional treatment.

However, it is desirable that a HEN financing model be defined based on the diagnosis of DRM and that access to nutritional treatment is not conditioned by the disease associated with malnutrition.

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