PRS22

THE ECONOMIC BURDEN OF CHRONIC OBSTRUCTIVE PULMONARY DISEASE IN THE SPANISH REGION OF EXTREMADURA

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INTRODUCTION

The estimated prevalence of the Chronic Obstructive Pulmonary Disease (COPD) in Spain is 10.2% in population aged 40-80 years old.[1] More than 3 million people died worldwide in 2015 due to COPD.[2]

The main objective of this study was to estimate the **economic impact of COPD on society and the quality of life of patients in the Spanish region of Extremadura** in 2015. Extremadura is a region with a relatively old population and a low population density, which makes it an optimal place for the development of this study as a pilot experience for future analysis in other regions.

METHODS

Retrospective observational study in a **representative sample of COPD patients** (by healthcare area, gender and age group [<65 years old vs ≥65 years old]). Data collection was carried out between July and November 2015 in Extremadura.

Inclusion criteria were: patients aged 18 or over who had been diagnosed with COPD for at least the last 12 months, living in Extremadura. Patients participating in clinical trials or pregnant women were excluded.

Data on demographic characteristics were collected, as well as retrospective healthcare, non-healthcare resource utilization, and labour productivity losses for the last 12 months from **medical records and investigator-administered electronic questionnaires**. We used a **1-year prevalence approach** and a **bottom-up costing method** to estimate average annual costs per patient, using 2015 as the base year, from a societal perspective.[3] Costs only consider the resource consumption due to COPD.

Direct healthcare costs (DHC):

- The cost of medication related to respiratory disease was obtained from medical records.
- The costs of healthcare visits, tests, emergency services and home oxygen therapy were calculated by multiplying resource quantities by the average of official unit costs.[4]
- Hospitalization costs were obtained by their main Diagnosis-Related Group (DRG).[5]

Direct non-healthcare costs (DNHC):

- The costs of informal care, defined as the time used in performing tasks that help maintain or enhance the patient´s health, were calculated by the **proxy good method**.[6] This cost was considered equivalent to the minimum wage of a domestic employee who works for hours (because of non-specialized care), multiplied by the hours of informal care received.
- The costs of nursing homes, attendance to day care centres and professional caregiving, due to COPD, were calculated by multiplying resource quantities by their unit costs.

Indirect costs (IC):

- IC included labour productivity losses of the patient, i.e. the cost derived from absenteeism in employees, early retirement and unemployment when, according to the patient's perception, the situation was directly related to COPD. Losses were measured through the **human capital method**, that is, as the wage lost or not earned by the patient as a result of the illness, calculated by the imputation of the average wage that a person receives in a day.

Total costs are the sum of DHC, DNHC and IC. Results were analysed by COPD severity, gender and age group.

RESULTS

A total of **386 patients** with COPD were included in the study. **Table 1** shows patient characteristics.

Table 1. Patient characteristics (n=386)

Age (mean ± SD)	71.8 ± 10.3
Age (% 65 years old or over)	79.3
Gender (% male)	76.2
Smoking history (%)	
Current smoker	16.7
Past smoker	69.6
Never smoker	13.7
FEV1/FVC (mean ± SD)[a]	60.3 ± 18.7
FEV1% (mean ± SD)[b]	66.7 ± 22.3
COPD severity (%)	
GOLD I	10.9
GOLD II	20.5
GOLD III	9.1
GOLD IV	1.3
Unknown / Not available	58.3
Exacerbations in last year (% yes)[c]	36.7
Number of exacerbations in last year (mean ± SD)[c]	0.6 ± 1.2
Number of comorbidities (mean ± SD)	7.8 ± 4.7

SD=Standard deviation; a. number of valid cases 123; b. number of valid cases 140; c. number of valid cases 215.

The average annual cost for a COPD patient was €3,757.3 (95% confidence interval: €3,077 - €4,438). **Figure 1** shows the distribution of total annual costs by type of cost.

Medication is the largest DHC (€731.8), followed by hospitalization (€380.3) and use of home oxygen therapy (€186.5). **Informal care** represents 81.9% of DNHC (average annual cost of €1,178.8) (**Figure 2**).

Figure 1. Average Annual Costs per COPD Patient (€2015)

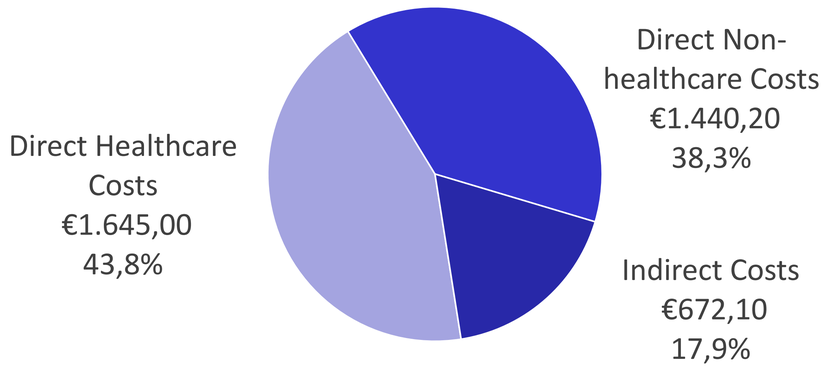
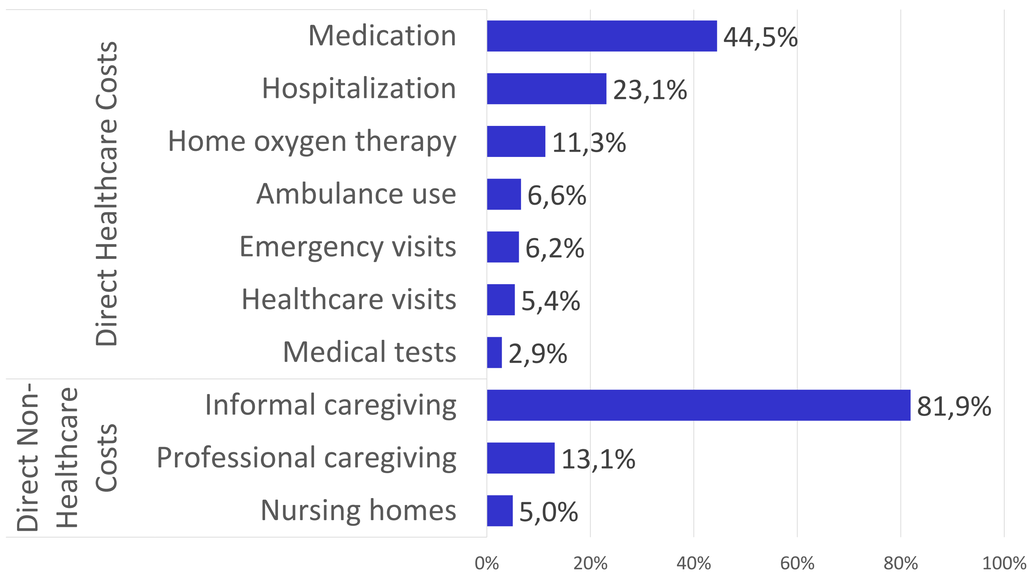


Figure 2. Distribution of Direct Healthcare and Non-Healthcare Costs



DHC and DNHC showed differences (p<0.05) by severity group and by age group: lower severity of COPD and lower age (<65 years old) are associated to lower costs, compared to higher severity of COPD and higher age (≥65 years old). **Age group showed differences (p<0.05) related to IC**, with higher costs in <65 years old group. Gender was not a significant variable in any type of cost.

Higher total costs were associated to higher severity of COPD and lower age, as patients under 65 have higher IC, which compensate their lower DHC and DNHC.

CONCLUSIONS

This is the first study that estimate, through a bottom-up approach in a representative sample of adult population, costs associated to COPD from a societal perspective.

COPD is a important burden for the healthcare system and for the whole society.

Related to the distribution of DHC, our results show a higher proportion of medication (44.5%) and a lower proportion of hospitalization (23.1%) than other studies (35%-40% and 40%-45% respectively).[8-11]

Results also show the **high labour incapacity related to COPD**, as IC represent 17.9% of total costs. Moreover, its high underdiagnosis could underestimate the socioeconomic impact of the disease. As advance stage of disease is associated to higher costs, preventive measures could substantially reduce both economic and social impact.

LIMITATIONS

The two main limitations of our study are: first, we haven't consider the intangible costs associated to COPD; second, we found a high rate of patients with unknown information about their COPD severity.

Acknowledgements

The authors are thankful to the patients who provided their time. We also thank all investigators involved in patient recruitment and data collection.

References

1. Miravitlles M, Soriano JB, García-Río F, et al. Prevalence of COPD in Spain: impact of undiagnosed COPD on quality of life and daily life activities. Thorax. 2009;64(10):863-868. doi:10.1136/thx.2009.115725.
2. WHO | The top 10 causes of death. WHO. http://www.who.int/mediacentre/factsheets/fs310/en/. Accessed September 21, 2017
3. Drummond M, O'Brien BJ, Stoddart G, Torrance G: Methods for the economic evaluation of health care programmes. Press OU, Ed., 1997
4. Official regional healthcare costs, 2015.
5. Ministerio de Sanidad, Servicios Sociales e Igualdad. Pesos de los GRDs del Sistema Nacional de Salud. 2014
6. Van den Berg B, Brouwer WB, Koopmanschap MA: Economic valuation of informal care. An overview of methods and applications. Eur J Health Econ. HEPAC : health economics in prevention and care 2004;5:36-45
7. Ministerio de Sanidad y Política Social. Estrategia en EPOC del Sistema Nacional de Salud. Sanidad; 2009. http://www.msc.es/organizacion/sns/planCalidadSNS/docs/EstrategiaEPOCSNS.pdf. Accessed August 29, 2016.
8. Masa JF, Sobradillo V, Villasante C, et al. Costes de la EPOC en España. Estimación a partir de un estudio epidemiológico poblacional. Arch Bronconeumol. 2004;40(2):72-79. doi:10.1016/S0300-2896(04)75476-9.
9. Miravitlles M, Murio C, Guerrero T, Gisbert R. Costs of chronic bronchitis and COPD: A 1-year follow-up study. Chest. 2003;123(3):784-791.
10. García Ruiz A, Fernández Leiva F, Crespo Martos F, Montesinos AC. Utilización de recursos y costes directos sanitarios de la EPOC en Atención Primaria de Salud (Estudio EPOC-AP). Rev Esp Econ Salud. 2003;2(3):176–181.
11. Izquierdo-Alonso DJL, Miguel-Díez J de. Economic Impact of Pulmonary Drugs on Direct Costs of Stable Chronic Obstructive Pulmonary Disease. COPD J Chronic Obstr Pulm Dis. 2004;1(2):215-223. doi:10.1081/COPD-120039809.

ISPOR 20th Annual European Congress, Glasgow, Scotland. 4-8 November 2017

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Supported by: Chiesi