Social and economic burden of Chronic Obstructive Pulmonary Disease (COPD) - Bulgaria

Results with data obtained from an observational, ambispective, randomized trial with a representative patient cohort

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Overview

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Background information and importance of work

- Chronic Obstructive Pulmonary Disease (COPD) - “a common, preventable and treatable disease that is characterized by persistent respiratory symptoms and airflow limitation due to airway and/or alveolar abnormalities usually caused by significant exposure to noxious particles or gases” (GOLD)
  - In Europe the fifth leading cause of death with approx. 3 million deaths.
  - Expected to become the 2nd leading cause of death by 2030
  - Affects 30 million people over 45 years on the continent
  - Significantly more researched in Western than in Eastern Europe

- Goal of our study: To calculate the economic and social burden of COPD in Bulgaria based on presentism, absenteeism, premature retirement, and Disability Adjusted Life Years (DALY)

- To our knowledge it is the first study of this kind in Bulgaria.

Materials and methods

- Study cohort: 426 patients, assigned randomly (every 5th patient was asked to participate)
  - 30 patients with Mild (GOLD 1 - 7% of total study population)
  - 211 patients with Moderate (GOLD 2 and 3 - 50% of the study population)
  - 182 Patients with Severe (GOLD 4 - 43% of total study population)


- Inclusion Criteria
  - age > 40 years
  - -Confirmed COPD diagnosis by spirometer in the past year or more
  - -Active pharmacotherapy for the past year

- Data collected:
  - Days absent from work due to disease
  - Information on premature retirement due to disease
  - Reduced productivity due to disease
Materials and Methods - Calculations

- The following topics were investigated and calculated
- Indirect costs - using human capital approach
  - Lost productivity = Number of days out of work × (Yearly GDP per capita ÷ number of working days in one year)
  - Pension paid due to disability = minimal pension × 12 months × remaining years of life
    - life expectancy: 72y for men and 79y for women
  - Lifetime losses due to premature retirement
    - Lifetime losses for women = (61 - actual age of retirement) × yearly GDP per capita
    - Lifetime losses for men = (64 - actual age of retirement) × yearly GDP per capita
  - \( \text{DALY} = \text{YLL} + \text{YLD} \), where
    - Years of life lost (YLL) = 0 since none of the observed patients suffered a fatal event
    - Years of life in disability (YLD) = \( \text{DW} \times I_{(c \text{ and } a)} \times L \), where the Disability Weights used were obtained from a Dutch study by Haagsma et al.\(^1\)
    - DALY results were multiplied by GDP/capita to obtained a monetized value of the severity

Results - Indirect Costs

- 34.5% of patients were of active working age
- Men missed work more than women (77% vs 33%)
- Patients with moderate and severe stage were absent more frequently - average 521.45 € lost productivity per patient due to sick leave
- 65.5% were retirees - amounting to 4836 € paid in disability pensions
- 56 (13%) prematurely retired patients - average 6250 € in costs
- 66% of patients work with a disability - 3750.40 € per year due to reduced productivity
- COPD affected work productivity - 70% for severe vs 62% for moderate
- Average indirect costs per patient moderate vs severe was 24 000 € vs 36 000 €
- This was significant (\( p = 0.0425 \) for reduced productivity, \( p = 0.000051 \) for lost productivity and \( p = 0.04267 \) for premature retirement).

Results - Disability Adjusted Life Years

<table>
<thead>
<tr>
<th>Severity</th>
<th>Number of people</th>
<th>Disutility [1] (0.019 - 0.031)</th>
<th>Number of DALYs (38.657 - 63.072)</th>
<th>Average DALY per patient</th>
<th>Lost productivity per patient (€)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mild</td>
<td>30</td>
<td>0.025 (0.019-0.031)</td>
<td>18.56 (14.10-23.01)</td>
<td>0.619</td>
<td>3,596.52</td>
</tr>
<tr>
<td>Moderate</td>
<td>211</td>
<td>0.284 (0.242-0.329)</td>
<td>1,260.15 (1,073.19-1,459.82)</td>
<td>6.00</td>
<td>34,204.01</td>
</tr>
<tr>
<td>Severe</td>
<td>185</td>
<td>0.418 (0.367-0.464)</td>
<td>1,639.03 (1,439.05-1,819.40)</td>
<td>9.00</td>
<td>51,332.20</td>
</tr>
</tbody>
</table>

Evidently moderate and severe patients incur a large burden in terms of resources “lost.” As the disease progresses, the average number of years spent in disability rises dramatically.

Discussion

- Number of patients in moderate and severe stages suggest patients are diagnosed late.
- This increases indirect costs - Severe stages cause the biggest financial burden and the highest % disability.
- Disability pensions and Premature retirement account for the highest costs- 6250 € indirect costs and 4836 € in disability pensions and
- Moderate and severe stages cause patients to spend 6 and 9 years in disability vs only 0.61 for mild patients - evidence to support earlier diagnosis.
- Mild stage of the disease is more easily managed, it produces the fewest indirect costs and has a lower disability coefficient - Early diagnosis = happier life!

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Thank you for your attention! Any questions?

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