

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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- ▶ Materials and methods
- ▶ Materials and Methods - Calculations
- ▶ Results - Indirect costs
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- ▶ Discussion

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)
- ▶ Study period: 2014-2015
- ▶ 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

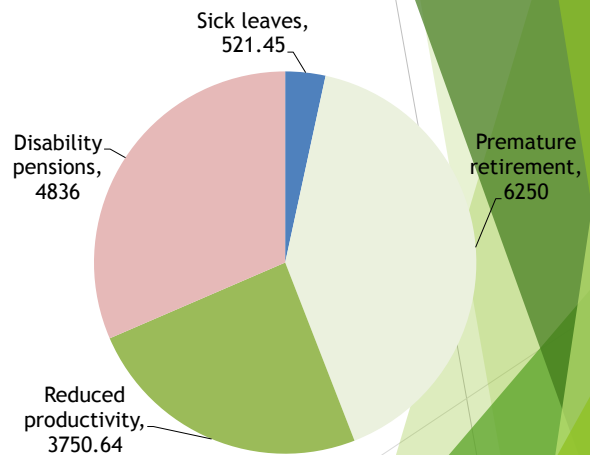
Materials and Methods - Calculations

- ▶ 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
- ▶ $DALY = YLL + YLD$, where
 - ▶ *Years of life lost (YLL)* = 0 since none of the observed patients suffered a fatal event
 - ▶ *Years of life in disability (YLD)* = $DW \times I_{(c \text{ and } a)} \times L$, where the Disability Weights used were obtained from a Dutch study by Haagsma et al.¹
 - ▶ DALY results were multiplied by GDP/capita to obtain a monetized value of the severity

Haagsma JA, de Noordhout CM, Poliner S, et al. Assessing disability weights based on the responses of 30,660 people from four European countries. *Population Health Metrics*. 2015 [cited 2017 March 03];13:10. DOI: 10.1186/s12963-015-0042-4

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).



Distribution of indirect costs in Euro

Results - Disability Adjusted Life Years

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

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

1. Haagsma JA, de Noordhout CM, Poliner S, et al. Assessing disability weights based on the responses of 30,660 people from four European countries. *Population Health Metrics*. 2015 [cited 2017 March 03];13:10. DOI: 10.1186/s12963-015-0042-4

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!

Thank you for your attention! Any questions?

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