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RESEARCH

DESCRIPTIVE STUDY ON THE SITUATION OF HOSPITALIZATION EPISODES DUE TO CHRONIC OBSTRUCTIVE PULMONARY DISEASE IN ROMANIA, IN THE LAST DECADE

Marius CIUTAN[1], *MD, Primary Care Physician in Public Health and Management*

Carmen SASU[1], *MD, Primary Care Physician in Public Health and Management*

Cristina Alexandra STOINA[2]

[1]*National Institute for Health Services Management*
[2]*University of Medicine and Pharmacy "Carol Davila" Bucharest*

Globally, Chronic Obstructive Pulmonary Disease is the third leading cause of death and the seventh leading cause of disability, particularly affecting people in economically less developed countries, but trends in morbidity are increasing everywhere, thus requiring more effective measures to maintain optimal public health and reduce costs for administered treatments.

Keywords: Chronic Obstructive Pulmonary Disease, hospitalization episodes, Romania

INTRODUCTION

Worldwide, Chronic Obstructive Pulmonary Disease is the third leading cause of mortality, causing 3.23 million deaths in 2019, with almost 90% of deaths occurring in people under 70 occurring in less economically developed countries. In terms of burden disease, COPD is the seventh leading cause of disability globally, approximately 74.4 million DALYs [1], [3]. According to studies conducted by the Global Burden of Disease, the age-standardized prevalence of COPD globally is estimated at 2-5% over the years, 328 million people in 2010 (a prevalence of 4.77%). 299 million in 2017 (3.9%) and 212 million (2.7%) in 2019. There are differences between the different reported values given the differences between the case definitions used. Recent studies that used the case definition of the Global Initiative for Chronic Obstructive Lung Disease (GOLD) estimate the prevalence between 9-12%, 300-400 million persons in the period 2018-2019 [2]. In 2020, worldwide the estimated prevalence was 10.6%, 480 million people, by 2050 an increase to 592 million is expected, an increase of 23.3% compared to 2020. While the prevalence among men is estimated to decrease from 13.4% in 2020 to 10.6% in 2050, for women an increase from 7.8% to 8.3% is estimated in the same time frame. As regional trends, if in 2020 the region with the highest prevalence was North America, it is estimated that in 2050 the highest prevalence will be recorded in sub-Saharan Africa, followed by East Asia and the Pacific and South Asia [2]. COPD is the most common chronic respiratory disease in terms of prevalence, and its incidence is increasing by 85.8% in 2019 compared to 1990, i.e. from 8.7 million new cases in 1990 to 16.2 million new cases in 2019 [4]. In Europe, an increase in COPD prevalence is estimated by 39.6%, from 36,580,965 people in 2020 to 49,453,852 in 2050 (European prevalence 9.3%) [5]. In terms of mortality, in 2019 the median value of the age-standardized mortality rate was 24/100,000, with the highest values for men in Spain, Hungary and Denmark, and for women in Denmark, Great Britain and Ireland. The most important reductions in the value of the age standardized rate in the period 2001-2019 were observed in men in Slovenia (-54.5%) and in women in Romania (-43.9%) [6]. As a burden of disease, the median value for DALYs was in 2019 in Europe 581/100,000 for men and 304/100,000 for women, from 2001 to 2019, 25 out of 28 countries recorded a decrease in the value of the indicator in men and 18 of 28 countries decrease in women. The burden of the disease remains high in EU states, although there has been a reduction in mortality attributable to COPD, and the prevalence of the disease remains a problem because although in most countries the prevalence is decreasing in men, it is increasing in women [6]. In Romania, in 2021, 2.3 million people suffered from respiratory diseases, registering 81,000 deaths as result of these conditions, 1.8 million DALYs, of which 849,850 patients with COPD, causing 6,865 deaths and 165,985 healthy life years lost to COPD [7].

Although efforts are being made to reduce the negative consequences and the impact of the disease on the population and society as a whole, according to experts' estimates, the trend in terms of COPD morbidity is an upward one, and the mortality and disability associated with this condition will not know a favorable evolution in the future either. That is why dynamic knowledge of the population's degree of affect, permanent monitoring of the evolution of the case history and the determining risk factors of the disease is a necessity, and the study/analysis of the frequency of hospitalization episodes, therefore of the serious case history, which requires hospital medical care, reflects best the extent of the phenomenon. NIHMS periodically performs analyzes on hospital morbidity and mortality, trying to outline the picture of the phenomenon at different points in time, so that it can conclude regarding the evolutionary trend of various chronic conditions, with an important impact on the health status of the population. The present study analyzes the evolution of COPD episodes requiring hospital admission over the last ten years, the results of which are presented below.

OBJECTIV

Identification at the national, regional and local level of the geographical distribution of

hospitalization episodes in the case of patients diagnosed with chronic obstructive pulmonary disease (COPD), as well as the temporal evolution of their number, in the period 2014-2023.

METHODOLOGY

A descriptive, retrospective study was carried out using data from the National DRG Database, the data being reported in the continuous hospitalization regime by Romanian hospitals in a contractual relationship with the National Health Insurance House. In accordance with the provisions of Order no. 1782/576/2006 regarding the registration and statistical reporting of patients who receive medical services under continuous hospitalization and day hospitalization, with subsequent additions and changes, National Institute of Health Management Services (NIHMS) collects and processes the minimum set of data at patient level for cases treated under continuous and day hospitalization. The study used data that were reported in the period 2014-2023, aiming at the analysis of data on hospitalization episodes in the case of patients with COPD in Romania, in the aforementioned hospitals (admissions under continuous hospitalization regime). Data were selected using the ICD-10-AM classification, records from the observation sheets were extracted and analyzed, which most frequently had as the main diagnosis one of the codes: J44-Other chronic obstructive pulmonary diseases, includes: chronic: bronchitis : asthmatic (obstructive), emphysematous with: airway obstruction, emphysema, obstructive: asthma, bronchitis, tracheobronchitis and excludes: asthma (J45), asthmatic bronchitis NOS (J45.9); bronchiectasis (J47); chronic: bronchitis: NOS (J42), simple and mucopurulent (J41), tracheitis (J42), tracheobronchitis (J42); emphysema (J43); diseases of the lung due to external agents (J60-J70); J44.0 Chronic obstructive pulmonary disease with acute lower respiratory tract infection, Excludes: influenza (J10-J11); J44.1 Chronic obstructive pulmonary disease with acute exacerbation, unspecified; J44.8 Other specified chronic obstructive pulmonary diseases Chronic bronchitis: asthmatic (obstructive) NOS, emphysematous NOS, obstructive NOS; J44.9 Chronic obstructive: airway disease NOS, pulmonary disease NOS. In accordance with the provisions of Law 190/2018 and Art. 13 of EU Regulation no. 679/2016, personal data are deleted at the time of transmission to NIHMS, and the identification of persons for the purpose of analysis is based on the encrypted personal numeric code. The age of the patients was calculated in completed years, as the difference between the date of admission and the date of birth. The data was processed using the software program SQL Server Management Studio Express 2005, the subsequent processing and analysis was carried out using the SPSS and Excel programs. The analysis was performed according to a series of demographic and socioeconomic variables, such as age, length of hospitalization, discharge status, etc., information included in the minimum data set reported in the DRG system by hospitals. The interpretation and presentation in the form of tables and graphs.

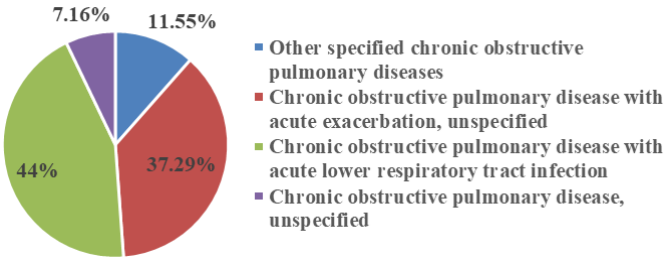
RESULTS

The data extracted from the national DRG database were processed, analyzed, and interpreted in relation to a series of demographic variables and socioeconomic characteristics (sex, age, place of residence, duration of hospitalization, in-hospital mortality rate, status at discharge) following the geographical distribution and evolution timeline of hospitalization episodes for patients with COPD, from hospitals in our country, in the period 2014-2023.

1. Total number of hospitalization episodes in patients with COPD, registered in Romania, in the period 2014-2023

The total number of continuous hospitalization episodes for patients with COPD registered in Romania, in the period 2014-2023, was 474,493 episodes, most of which were coded as Chronic Obstructive Pulmonary Disease with acute lower respiratory tract infection (44 %) or Chronic obstructive pulmonary disease with acute exacerbation, unspecified (37%) – graph no. 1.

Graph no. 1 Total number of episodes reported in continuous hospitalization according to the type of main diagnosis at discharge, in patients with COPD, recorded in the period 2014-2023, at the national level



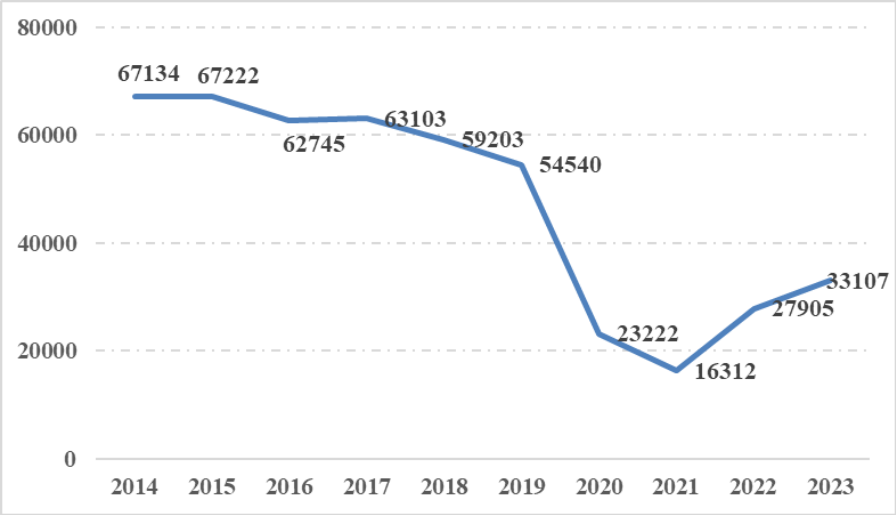
2. Temporal evolution in terms of hospitalization episodes of patients with COPD, in Romania, in the period 2014-2023

The temporal evolution of hospitalization episodes of COPD patients during this period can be seen in graph no. 2. The situation of hospitalizations was also downward in the period before the coronavirus pandemic, the number of hospitalizations decreased slightly, but in 2020 there was a reduction of almost 3 times compared to the initial year of the study period, the minimum being observed in the year 2021, with a level 4 times lower than in 2014. Starting from 2023, increasing values are recorded again, but at values 2 times lower compared to the pre-pandemic years.

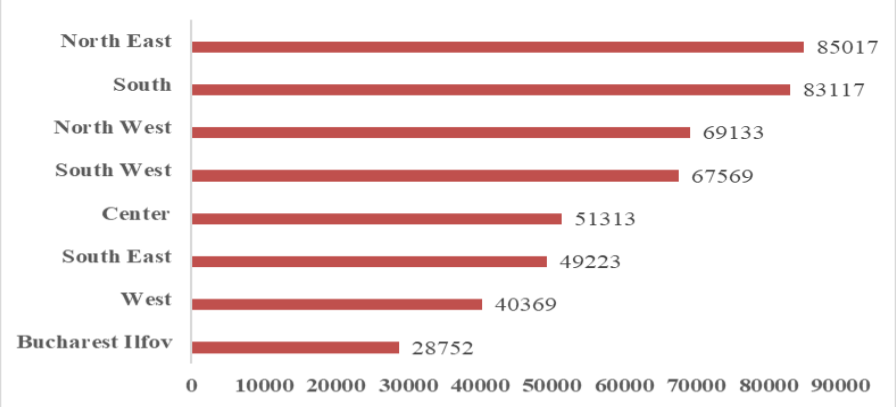
3. Distribution of hospitalization episodes of patients with COPD, depending on the discharge department

The most episodes of hospitalization for patients with COPD were recorded in the internal medicine (48% of the total) and pulmonology (46%) wards.

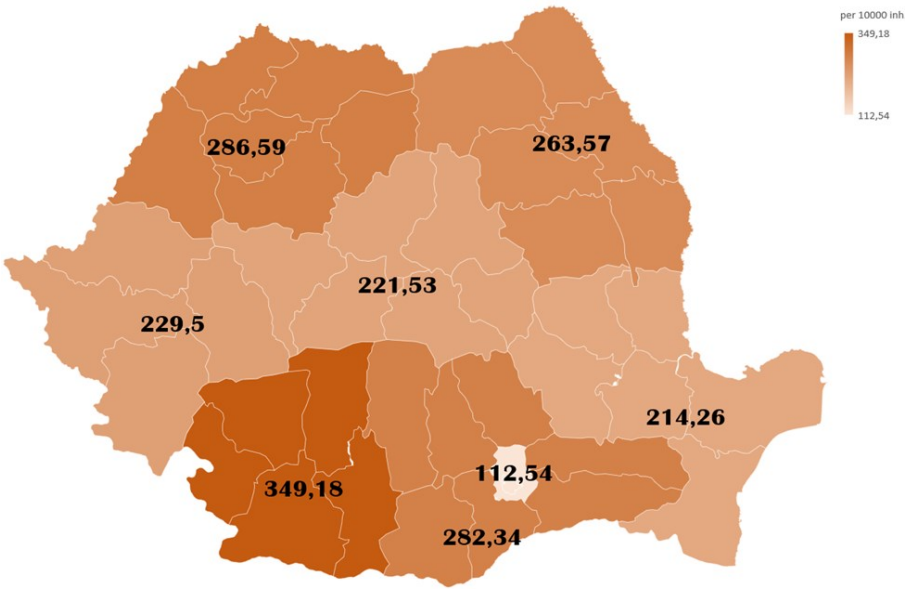
Graph no. 2. The evolution of the total number of episodes reported in continuous hospitalization, in patients with COPD, recorded in the period 2014-2023, at national level



Graph no. 3 Distribution of hospitalization episodes in patients with COPD, at the regional level in Romania, in the period 2014-2023



Graph no. 4 Distribution of hospitalization episodes in patients with COPD, by population (10-year average) at regional level, in Romania, between 2014 -2023



4. Distribution of hospitalization episodes in patients with COPD, at regional and local level, in the period 2014-2023

From the point of view of the residential environment where the patients with this diagnosis come from, it is noted that the most episodes of hospitalization were recorded in patients from the rural environment (59%). At the regional level, the most episodes of hospitalization for patients with COPD were registered during the study period in the North East and South regions, approx. 18%, but important percentages also appear in the North West and South West regions, approx. 14%. The West and Bucharest Ilfov regions, with approximately 8% and 6%, respectively, had the fewest hospitalizations - graph no. 3.

By number of inhabitants (the average population of the last 10 years in each region), the descending order of the regions that recorded episodes of hospitalization of patients with COPD was: South West region (349.18 episodes/10,000 inh), North West (286.59 episodes/10,000 inh), South (282.34 episodes/10,000 inh), North East (263.57 episodes/10,000 inh), West region (229.5 episodes/10,000 inh), Center region (221 .53 episodes/10,000 inh), South East (214.26 episodes/10,000 inh) and Bucharest Ilfov region (112.54 episodes/10,000 inh) - graph no. 4.

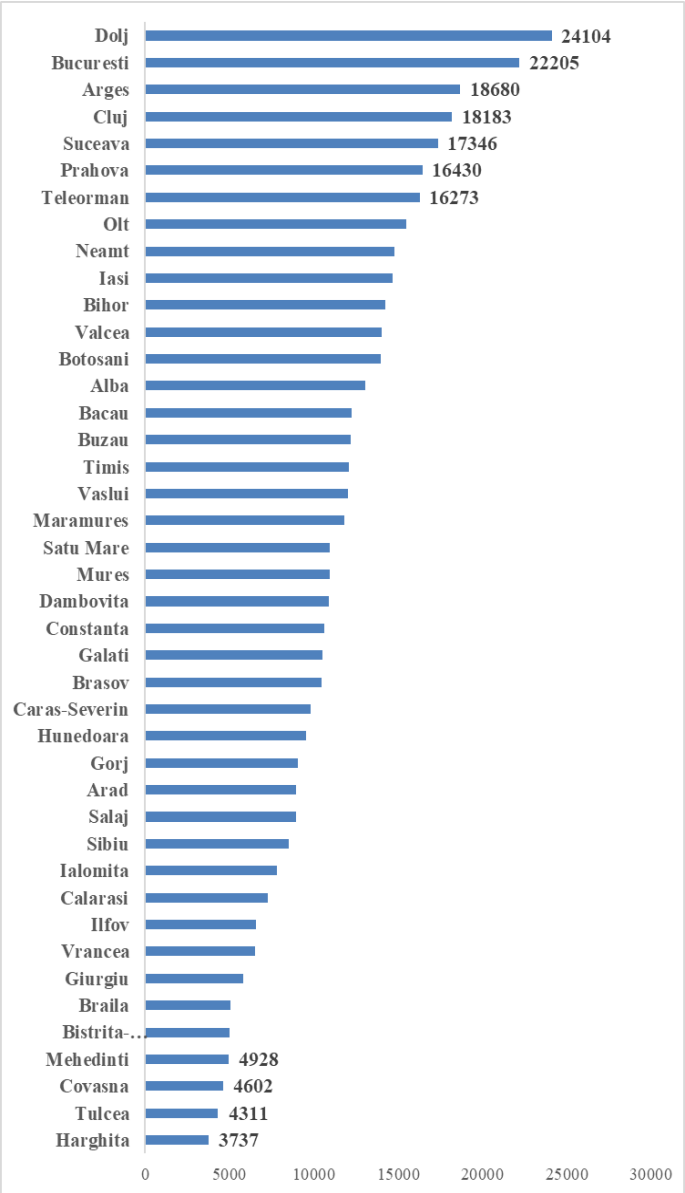
At the local level, the most episodes of hospitalization were registered between 2014-2023 in Dolj county, Bucharest municipality and Argeș, Cluj, Suceava counties. The last places are occupied by the counties of Harghita, Tulcea, Covasna and Mehedinți - graph no. 5.

Compared to the population of each county (calculated as the 10-year average), graph no. 6 shows a change in the ranking, with the counties of Teleorman (481.24 episodes/10,000 inh), Sălaj (419.65 episodes/10,000 inh) and Alba (397.28 episodes/10,000 inh) on the first places place and on the latter the municipality of Bucharest and the counties of Harghita, Ilfov and Constanța.

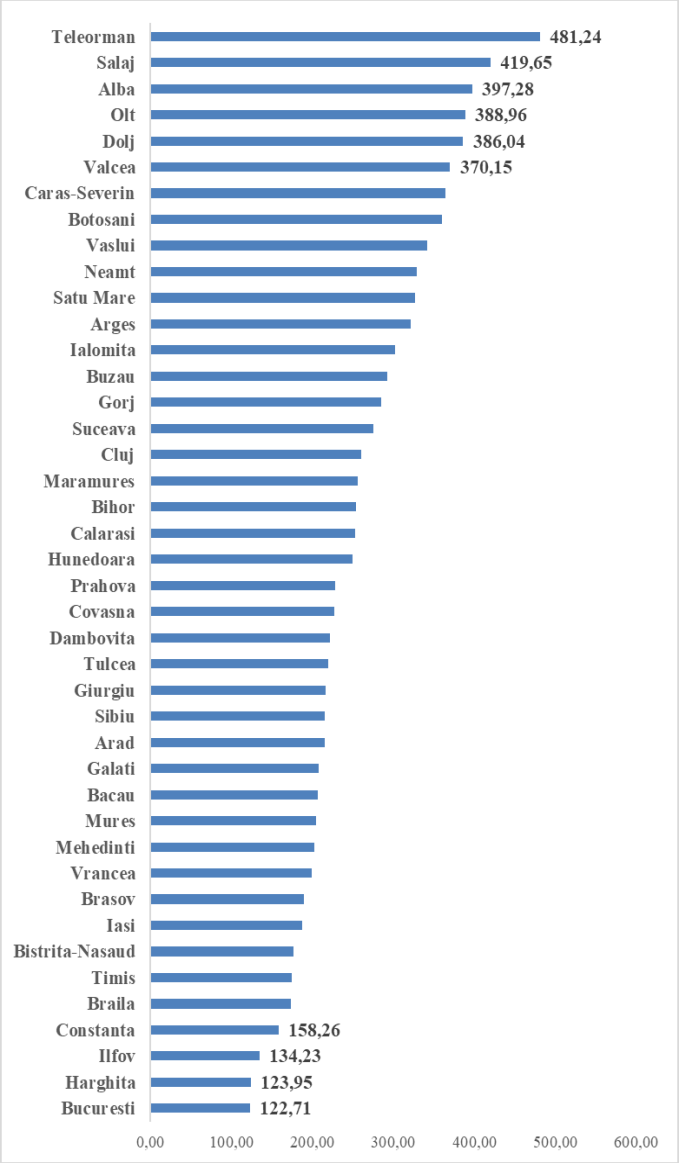
5. Distribution of hospitalization episodes in patients with COPD, according to the patient's sex

Of the total number of episodes of hospitalization with this type of main diagnosis at discharge, recorded during the study period, most belonged to men, approximately 66%, and the distribution

Graph no. 5. Distribution of hospitalization episodes in patients with COPD, at the local/county level, in Romania, in the period 2014-2023



Graph no. 6. Distribution of hospitalization episodes for patients with COPD, at local/county level, depending on the population (10-year average) of each county, in 2014-2023



of cases according to the type of diagnosis at discharge and gender can be seen in the graph no. 7.

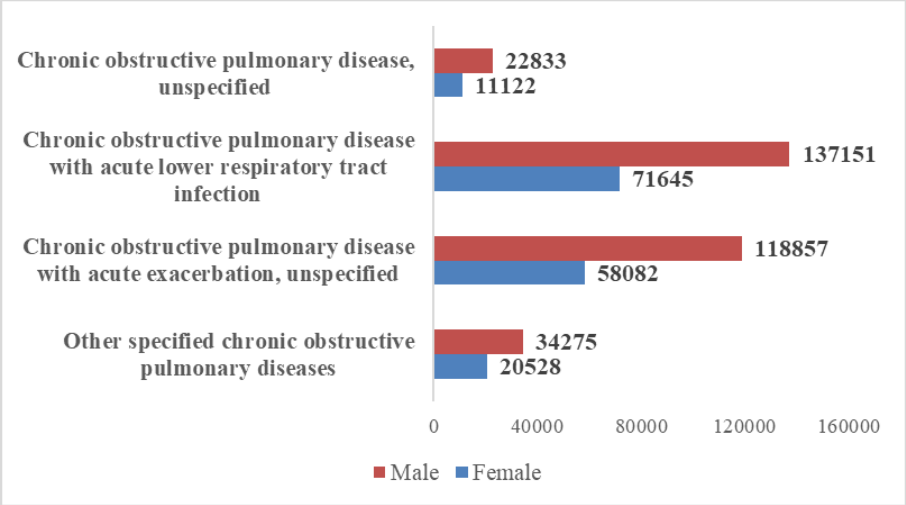
6. Distribution of hospitalization episodes in patients with COPD, by patient's age

The analysis of the data by age groups shows that for the entire study period, most episodes of hospitalization were recorded in the elderly (75% of the total), but an important percentage is also observed in adults between 40-59 years old (22%) – graph no. 8. The average age of those hospitalized during this period was 66.9 years, according to residence environments the ages have close averages (67.9 years in rural areas and 65.35 in urban areas), and by sex the average age was 66.54 years for men and 67.6 years for women. By type of diagnosis, the average age values were the lowest in patients diagnosed with Other specified chronic obstructive pulmonary diseases (62.4 years), and the highest in patients with Chronic obstructive pulmonary disease with acute lower respiratory tract infection (68.12 years).

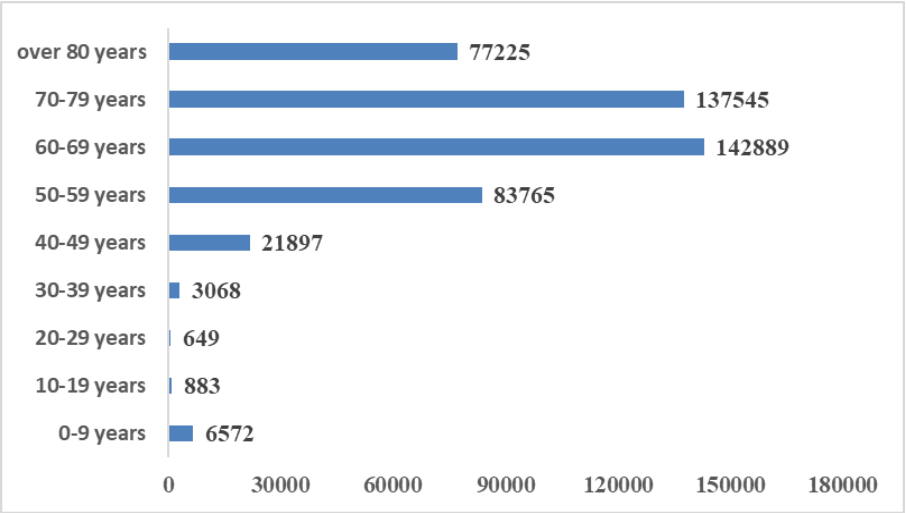
7. Distribution of episodes of hospitalization in patients with COPD, by average duration of hospitalization

The average duration of hospitalization in patients with COPD in continuous hospitalization was 7.73 days, varying throughout the study period, values above the average of the period being recorded between the years 2014 - 2017, the maximum value in 2014 (8.08 days). The lowest value is observed in the year 2023 – 7.02 days. The highest average values were recorded in patients discharged with the diagnosis of Chronic Obstructive Pulmonary

Graph no. 7. Total number of episodes reported in continuous hospitalization, in patients with COPD, depending on the gender of the patient and the type of diagnosis at discharge, during the period 2014-2023, at the national level



Graph no. 8. Number of reported episodes of continuous hospitalization in patients with COPD, by patient's age, in the period 2014-2023, at national level



Disease with acute lower respiratory tract infection (7.92 days) or Chronic Obstructive Pulmonary Disease with acute exacerbation, unspecified (7.77 days).

8. Distribution of hospitalization episodes in patients with COPD, by patient's discharge status and in-hospital mortality rate

Depending on the patient's condition at discharge, the data analysis indicates that of the total number of episodes reported in continuous hospitalization in patients with COPD, most of them were discharged in an improved condition (94.4% of the total). Very small percentages were discharged as inpatient or cured and a small share died (1.74%) - graph no. 9.

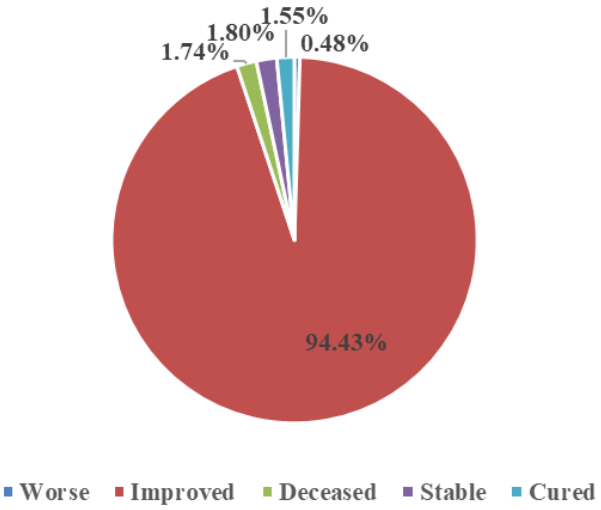
The calculated rate of in-hospital mortality was 1.74% during the entire study period, its values oscillating between 0.93% in 2014 and 4.07 in 2021. Most of the deceased were elderly (average age 71.8 years) diagnosed with Chronic Obstructive Pulmonary Disease with acute lower respiratory tract infection (46.2% of the total deceased) or Chronic Obstructive Pulmonary Disease with acute exacerbation, unspecified (36.2%).

CONCLUSIONS

Following the analysis of data from the period 2014-2023 regarding the hospitalization of patients with COPD, the following conclusions can be drawn:

- The total number of hospitalization episodes for patients diagnosed with COPD in the period 2014-2023 was 474,493 episodes;
- The temporal evolution of the number of episodes of hospitalization due to COPD is slightly downward in the period before the coronavirus pandemic, but during the pandemic a 3-4 times lower level of hospitalization due to this diagnosis is recorded;
- Most hospitalizations were recorded in internal medicine (48%) and pneumology departments (46% of the total);
- From the point of view of the main diagnosis at discharge, most episodes were registered for Chronic Obstructive Pulmonary Disease with acute lower respiratory tract infection (44%) or Chronic Obstructive Pulmonary Disease with acute exacerbation, unspecified in more than one third of admissions;
- More than half of those hospitalized come from rural areas;
- The analysis of the spatial distribution of hospitalizations by this type of diagnosis indicates a predominance in terms of the absolute frequency of cases in the North East and South regions, each around a fifth of the total, but high percentages are also observed in the North West and South West. In the case of the values related to the population of each region, the leaders are South West and North West region, then the South and North East regions follow;
- On a local level, the highest absolute frequencies of the number of hospitalizations were recorded in Dolj county, Bucharest municipality and Argeș, Cluj, Suceava counties, and compared to the population of each county separately, the first places were Teleorman, Sălaj and Alba;
- Most COPD hospitalizations belonged to men, with unspecified COPD registering the biggest difference between the sexes;

Graph no. 9. The number of hospitalization episodes in patients with COPD, depending on the discharge status, in Romania, 2014-2023



- From the point of view of the patients' age, three-quarters of the hospitalizations were registered in the case of the elderly over 60 years old, but a fifth also targeted adults over 40 years old, the average age of those hospitalized during this period was 66.9 years, in rural areas 67.9 years, in men 66.54 years. By type of diagnosis, the average age values were the lowest in patients diagnosed with Other specified chronic obstructive pulmonary diseases (62.4 years), and the highest in patients with Chronic obstructive pulmonary disease with acute lower respiratory tract infection (68.12 years);
- The average length of hospitalization for these patients was 7.73 days, with a maximum of 8.08 days in 2014, with variations above the average for the period between 2014-2017. The highest average values of duration of hospitalization were recorded in the case of patients discharged with the diagnosis of Chronic Obstructive Pulmonary Disease with acute lower respiratory tract infection (7.92 days) or Chronic Obstructive Pulmonary Disease with acute exacerbation, unspecified (7.77 days);
- Most of the patients were discharged in an improved condition (94.4% of the total), and very small percentages were discharged as stable or cured and a small proportion died (1.74%), the mortality rate hospitalizations oscillating between 0.93% in 2014 and 4.07 in 2021. Most of the deceased were elderly (average age 71.8 years) diagnosed with Chronic Obstructive Pulmonary Disease with acute lower respiratory tract infection (46.2% of total deceased) or Chronic obstructive pulmonary disease with acute exacerbation, unspecified (36.2%).

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