

# DEPRESSION IN ROMANIA, HOSPITALIZATIONS IN THE LAST DECADE

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## INTRODUCTION

Depression is the most common mental illness, according to the WHO. 5% of adults suffer from depression worldwide, being the main cause of disability, with an important contribution to the overall burden of the disease globally. [1] The prevalence of the disease in the general population is 3.8%, with 280 million people affected, especially adults (5%) and the elderly over 60 (5.7%), in 2022 figures reported by the WHO were 322 million [2]. Women are twice as likely to be affected as men, and in young people, about 20% of them have experienced at least one depressive episode before becoming adults [2]. Especially when it comes to recurring episodes, moderate to severe, they can be serious health problems, influencing major professional activity, but also social life, and in severe cases, can lead to suicide, statistics indicate that around 700,000 people commit suicide annually, making it the fourth leading cause of death in the world in the 15-29 age group. Although it belongs to the category of diseases for which there are effective treatments, approx. 75% of those affected by depression in low and middle-income countries do not receive treatment [1], and those who are not treated are 20% more likely to commit suicide and develop comorbidities, such as the risk of coronary heart disease - 64% [2]. In the case of women, they are more affected by the disease, about 80% of mothers are affected by postnatal depression, but depression can also affect women with certain comorbidities, such as polycystic ovary syndrome (20%) or those suffering from anorexia (50%). [2] Certain age groups are also more prone, about 7.5% of women aged 55-74, compared to 5.5% of men of the same age, and in the case of adolescents, for example, girls under 18 are affected by 20% compared to only 6.8% of American boys.

According to official data, the prevalence of depression remains relatively constant from 1990 3.6%, until 2019 3.59%, with small variations, the highest value being recorded in 2005 3.73%, and the lowest in 2010 and 2011, 3.55% [3]. In Europe, around 40 million people (4.3%) are affected by depression, 3 out of 4 not receiving treatment. European statistics estimate an economic loss of around € 70 billion a year [4]. In the European Union in 2019, 7.2% of the population had this chronic condition, increasing by 0.3% compared to 2014 [5]. Among the countries with the highest prevalence rate is Portugal (12.2%), Sweden, Germany and Croatia. Romania (1%) is one of the countries with the lowest prevalence, along with Bulgaria

*According to the WHO, depression is the most common mental illness, with adults and the elderly, but also a significant number of adolescents or young people being affected worldwide, the disease being a major cause of disability, with a significant contribution to the overall burden of the disease at global level. Although Romania has low incidence and prevalence compared to other European countries, the upward trend over time must be taken into account, as well as the negative impact with serious future health implications and the increased risk of death by suicide or associated comorbidities that induces the need for sustained interventions aimed at minimizing the burden of disease on both the patient and the health system, and timely therapeutic interventions can effectively reduce costs for patients and society.*

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and Malta. Identically, on the continental level, but also in Romania, women have a higher rate than men. [5] In the European region, it is estimated that neuropsychiatric disorders (depression being the most common) account for 19.5% of the disease burden, and in the European Union, 26% and 40% of years of disability [6]. In the European Union, the cost of mood and anxiety disorders is approx. 170 billion euros a year [6]. In the case of Romania, the prevalence of depression is about 1%, with an incidence of 1018 new cases per 100,000 inhabitants annually [7]. Adults and the elderly are particularly affected, with a sharp increase in the number of new cases in recent years compared to a decade ago. For example, in 2020, there were 426.2 new cases per 100,000 men and 596.56 in the 75-79 age group, the highest incidence in the elderly category [8]. The number of new cases of illness and the incidence (rates per 100,000 inhabitants) due to a depressive episode in 2019 and 2020 was 464.92, respectively 450.25% 000 inhabitants, compared to 323.84% 000 inhabitants in year 2011, constantly growing until now [8]. In 2020, the incidence in Romania was 234.43 new cases / 100,000 inhabitants, being double for women 308.23 compared to men 157.45. By counties, the leading place is held by Hunedoara county with 623.72 new cases / 100,000 inhabitants, followed by Maramureş 611.52 new cases / 100,000 inhabitants, by sex, in the case of women the order is maintained (849.15 new cases / 100,000 inhabitants in Hunedoara compared to 797.20 in Maramureş), and in men the order is reversed (419.10 new cases / 100,000 inhabitants in Maramureş versus 389.78 in Hunedoara). Constanţa is the county with the lowest incidence in the country of 4.03 new cases / 100,000 inhabitants [8]. In terms of prevalence, in Romania it was 3.51% in 2019, compared to 3.41% in 2010, the values remaining between these limits, with a prevalence of 4.44% in women and 2.5% for men in 2019 and 4.65% for the elderly population. (Source: <https://vizhub.healthdata.org/gbd-compare/>) [8] If we refer to the years of life lost due to disability in 2019 in Romania, the value was 1.39%, compared to 1.36% in 2010, men less affected 0.81% compared to women 2, 07% [8].

Given the increasing incidence of this condition each year, as well as the negative impact, especially in cases that are not treated properly, with serious future health implications and an increased risk of death from suicide or



associated comorbidities, more attention is needed from the medical sector, as well as from the public health authorities, to reduce the burden on both the patient and the health system as much as possible, and timely therapeutic interventions can effectively reduce costs for patient and society. A regular monitoring of the situation regarding especially the recurrent, severe cases that have undergone hospitalizations is a necessity, therefore the National School of Public Health, Management and Professional Development in Health, Bucharest (NSPHMPDH) has conducted a study on the situation of episodes of hospitalization for these patients in the period 2008-2020, a study whose results will be presented below.

## OBJECTIV

Identifying at national, regional and local level the geographical distribution of hospitalization episodes in the case of patients with depression, as well as the temporal evolution of their number in 2008-2020.

## METHODOLOGY

The study conducted by NSPHMPDH was a descriptive, retrospective one, which used data from the National DRG Database, data reported in a continuous hospitalization regime by Romanian hospitals under a contractual relationship with the National Health Insurance House. In accordance with the provisions of the Order. no. 1782/576/2006 on the registration and statistical reporting of patients receiving medical services in the inpatient and day hospital setting, with subsequent additions and modifications, NSPHMPDH collects and processes the minimum set of patient-level data for the cases treated in the continuous and day hospitalization. The study used data reported in 2008-2020, following the analysis of data on hospitalization episodes in the case of patients with depression in Romania, in the aforementioned hospitals (hospitalizations in continuous hospitalization). The data were selected using the ICD-10-AM classification, the records were extracted and analyzed from the observation sheets which most frequently had as main diagnosis one of the codes: F33-Recurrent depressive disorder, includes- recurrent episodes of depressive reaction, psychogenic depression, reactionary depression; seasonal depressive disorder and excludes recurrent short-term depressive episodes (F38.1). F33.0- Recurrent depressive disorder, mild current episode, F33.1-Recurrent depressive disorder, moderate current episode, F33.2-Recurrent depressive disorder, severe current episode without psychotic symptoms, F33.3-Recurrent depressive disorder, severe current episode with psychotic symptoms, F33.4 -Recurrent depressive disorder, currently in remission, F33.8-Other recurrent depressive disorder and F33.9-Recurrent depressive disorder, unspecified. 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 NSPHMPDH, and the identification of persons for the purpose of analysis is based on encrypted personal identification code. The age of the patients was calculated in years of age, as the difference between the date of hospitalization and the date of birth. The data were processed using SQL Server Manage-

ment Studio Express 2005 software, and further processing and analysis was performed using SPSS and Excel. The analysis was performed according to a number of demographic and socioeconomic variables, such as the patient's gender, age, area of residence, length of hospital stay, discharge status, etc., information included in the minimum set of data reported in the DRG system by hospitals. The interpretation and presentation were done in the form of tables and graphs.

## RESULTS

Data extracted from the national DRG were analyzed in relation to a number of demographic variables and socioeconomic characteristics (sex, age, area of residence, length of hospital stay, in-hospital mortality rate, state of discharge) following the geographical distribution and temporal evolution of episodes of hospitalization of patients diagnosed with depression, hospitalized in our country between 2008-2020.

### 1. Total number of hospitalization episodes for patients with depression, registered in Romania, in the period 2008-2020

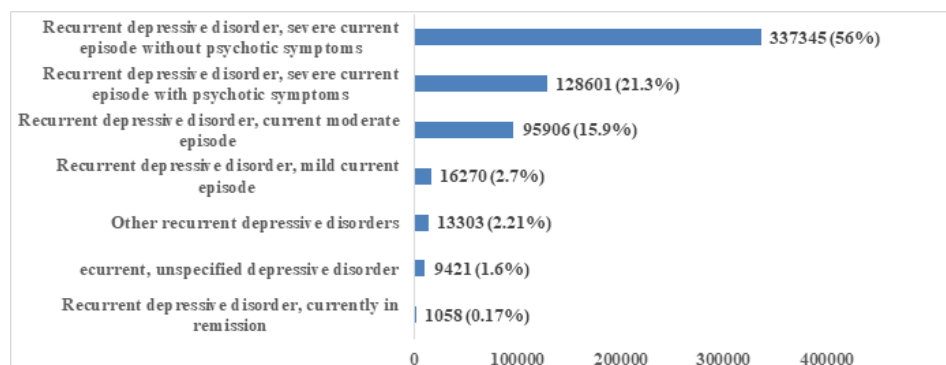
The total number of continuous hospitalization episodes for patients with depression registered in Romania between 2008-2020 was 601,904 episodes. From the point of view of the main diagnosis at discharge, most hospitalization episodes were diagnosed with recurrent depressive disorder, severe current episode without psychotic symptoms (56% of the total) and recurrent depressive disorder, severe current episode with psychotic symptoms (21, 3%) -graph no 1. The current hospitalization episodes classified as moderate represented 16% of the national total.

### 2. The temporal evolution regarding the hospitalization episodes of patients with depression, in Romania, in the period 2008-2020

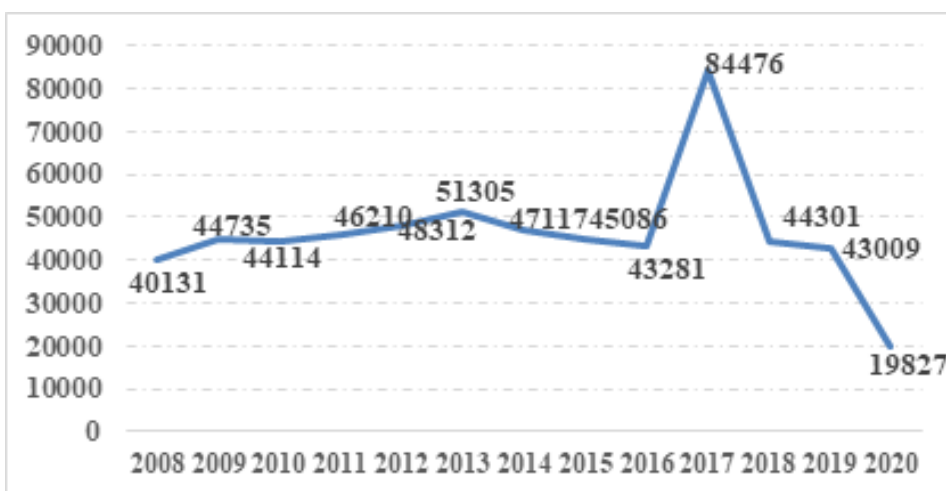
The temporal evolution of the hospitalization episodes of the patients with depression in the studied time period can be observed in graph no.2. It is found that the situation of hospitalizations is relatively constant, slightly increasing, there are small variations from one year to another, being recorded two peaks - in 2013 and in 2017, while the minimum was observed in 2020, the situation in this year being influenced by the epidemiological situation at national level. Related to the two peaks, it is observed that if in 2013 the increase was 1.3 times compared to the number of episodes recorded in the initial year, in 2017, the increase was double.

Compared to 2008, the increase observed in 2019 (previously to the pandemic situation) was relatively small. In terms of the type of diagnosis, the largest increases in 2019 compared to 2008 were recorded in the case of episodes with diagnosis Recurrent depressive disorder, current moderate episode (55%), Recurrent depressive disorder, unspecified (45%) and Other recurrent depressive disorders (29%) - graph no. 3.

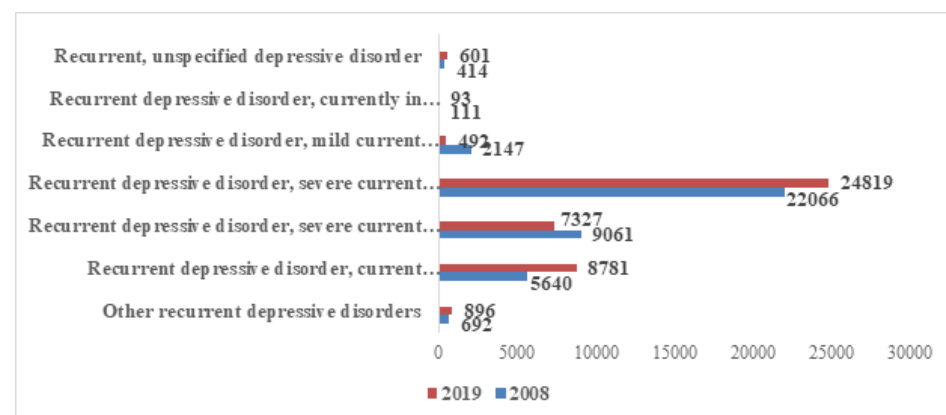
Graph no. 1. Total number of episodes reported in continuous hospitalization and type of main diagnosis, in patients with depression, recorded in 2008-2020, at national level



Graph no. 2. Evolution of total number of episodes reported in continuous hospitalization, in patients with depression, registered in 2008-2020, at national level



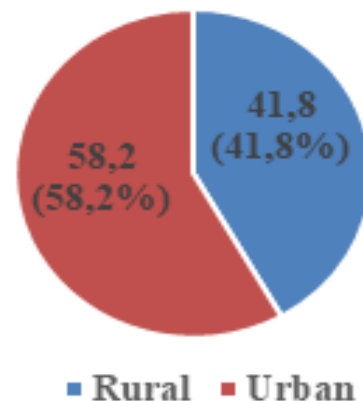
Graph no. 3. The difference registered by the number of hospitalization episodes due to depression, in 2019 compared to 2008, depending on the main diagnosis



### 3. Distribution of hospitalization episodes of patients with depression, at regional and local level, in the period 2008-2020

Regarding patient's residence, it is found that most hospitalization episodes were registered in the case of patients from urban areas (58.2%) - chart no. 4.

Graph no.4 Distribution of hospitalization episodes for patients with depression, depending on the patient's place of residence, in Romania, during 2008-2020



At regional level, the most hospitalization episodes for patients with depression were registered in South (20.2 %), Bucharest-Ilfov region (16.9% of the national total) and North East region (15.6%). The West and South-East regions with approximately 8% had the fewest hospitalizations - graph no.5

In relation to number of inhabitants, the descending order of the regions that recorded episodes of hospitalization for patients with depression was: South region (427.54 episodes/10,000 inhabitants), Bucharest Ilfov region (384.35 episodes/10,000 inhabitants), North East (238.9 episodes/10,000 inhabitants), Center (233.4 episodes/10,000 inhabitants), Southwest region (232.67 episodes/10,000 inhabitants), Southeast region (224.17 episodes/10,000 inhabitants), West (223.41 episodes/10,000 inhabitants) and the North West region (195.82 episodes/10,000 inhabitants) - graph no.6.

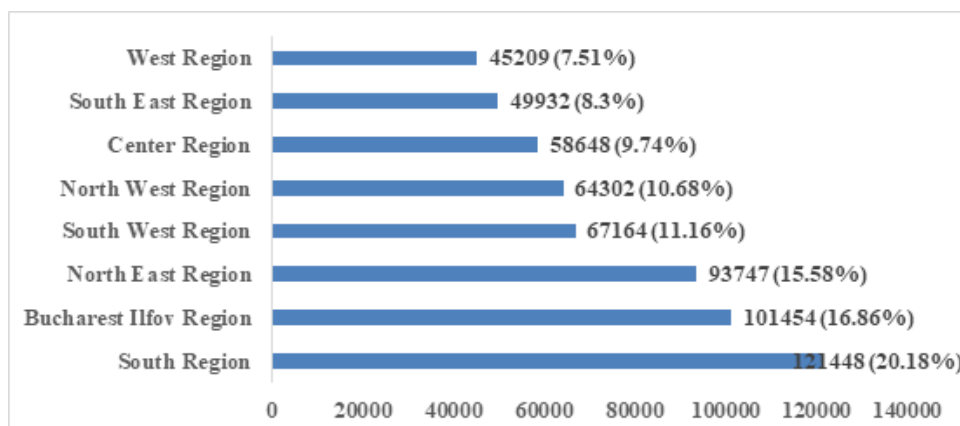
At local level, most hospitalization episodes were registered between 2008-2020 in Bucharest (14% of national total), 1.8 times more episodes than next placed, Prahova county - graph no.7. The fewest hospitalizations were registered in the counties of Covasna, Sălaj and Constanța

(2500-2600 episodes).

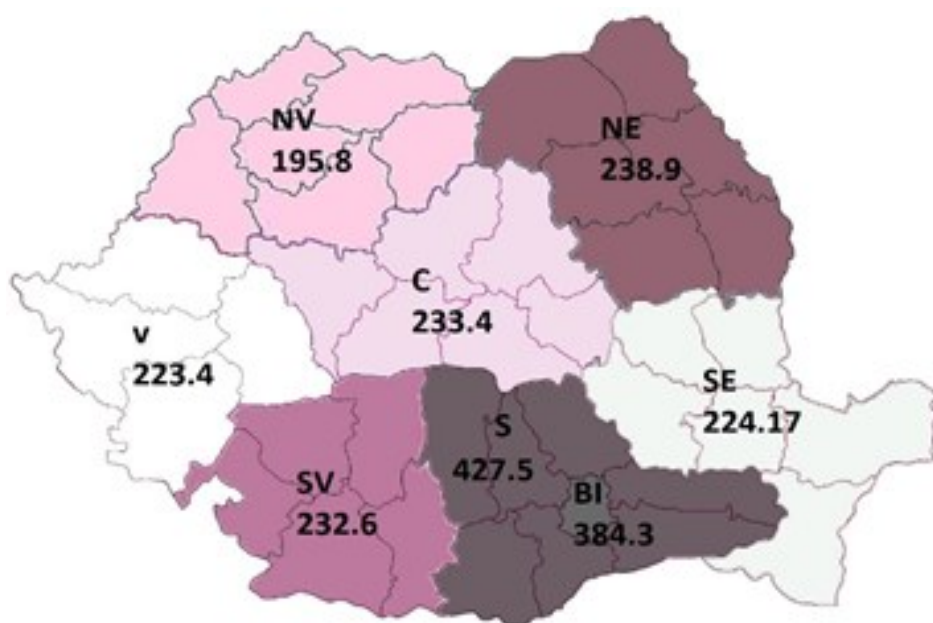
Compared to the population of each county, a change in the ranking can be seen from graph no.8, on the first places being Prahova 572.22 episodes/10,000 inhabitants, Hunedoara (467.33 episodes/10,000 inhabitants) and Giurgiu (458.47 episodes/10,000 inhabitants), and on the



**Graph no. 5. Distribution of hospitalization episodes for patients with depression, at regional level in Romania, in the period 2008-2020**



**Graph no. 6. Distribution of hospitalization episodes for patients with depression, according to population number, at regional level, in Romania, between 2008-2020**



last, counties of Constanța and Arad, with extremely few episodes compared to the leading counties.

**4. Distribution of hospitalization episodes in patients with depression, by patient sex**

Of the total number of hospitalizations with the main diagnosis of depression recorded during the study period, approximately three quarters belonged to women, approximately 71% - graph no.9.

As a time evolution, there is an increase over time in the number of hospitalization episodes throughout the study period, for both sexes, except for the last year, 2020, but the increases were small, peaks being recorded only in the 2 years previously mentioned, 2013 and 2017. In the case of women, the increase in 2019 compared to the initial year was lower (2.6%) compared to the increase in hospitalizations for men, where the percentage was 20% - graph no. 10.

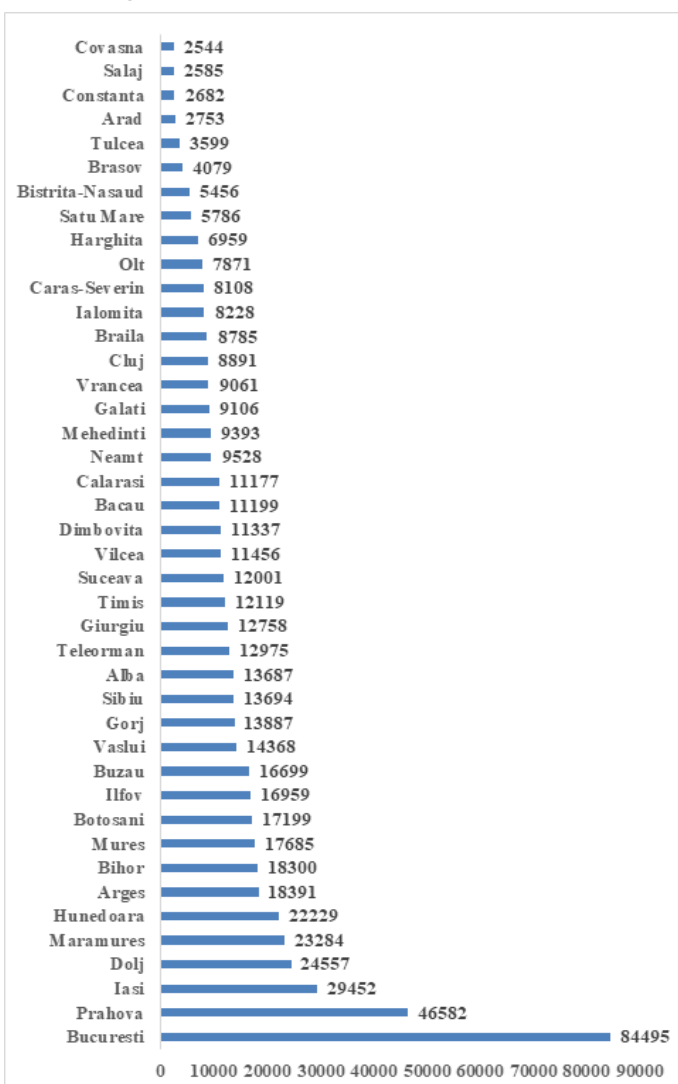
Depending on the diagnosis at discharge, the number of hospitalization episodes in women was about 2.5 times higher than in the case of men for all diagnostic classifications - graph no. 11.

**5. Distribution of hospitalization episodes in patients with depression, according to patients age**

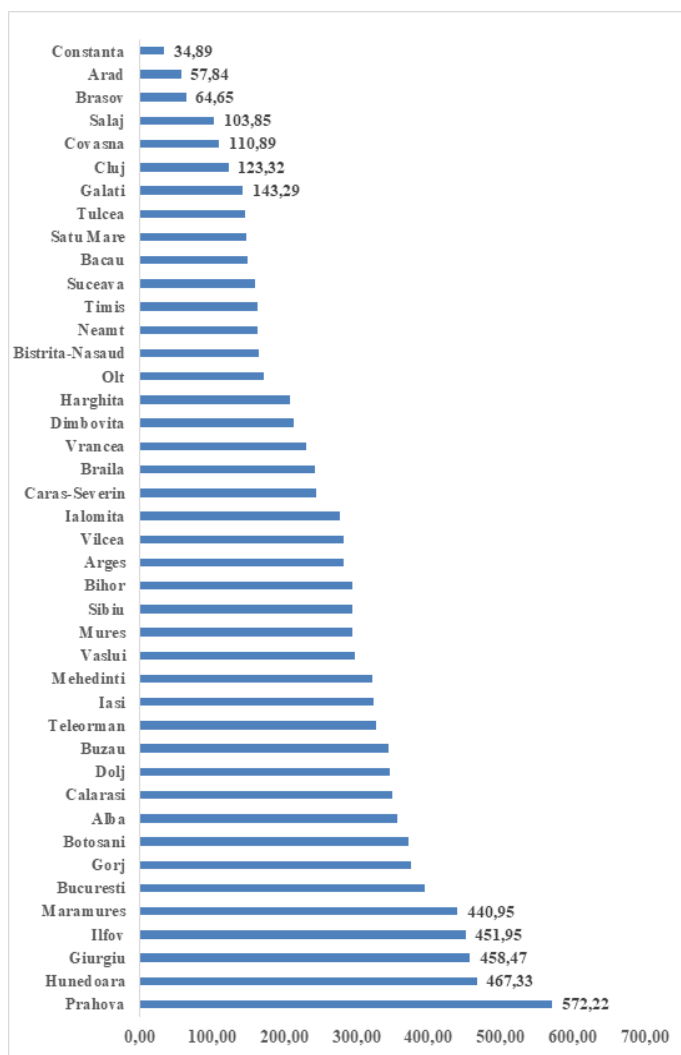
The analysis of data by age groups shows that for the entire study period, over 93% of hospitalization episodes were recorded in adults (age group 41-65 years) and the elderly (over 65 years). The other age categories, respectively the young adult (21-40 years old), the adolescents (15-20 years old) and the children (under 14 years old) being poorly represented - graph no.12. In the group of children, the most affected ages are those over 12 years old, in the category of adolescents, most hospitalizations were suffered by those between 16-18 years old, the category of young adult is dominated by hospitalizations of those over 28 years old, age 40 years predominating with 13% of the total category. Among the adults, the hospitalizations of those aged between 51-58 years predominate, most of them being registered in adults aged 55 years, and the elderly between 66 and 70 years old are the ones who registered the most hospitalizations in that period.

Depending on the main diagnosis at discharge, by age groups it is found that in the category of children, most often they were diagnosed with recurrent depressive disorder, unspecified or recurrent depressive disorder, a mild current episode. In the category of adolescents, the most common diagnosis was recurrent depressive disorder, severe current episode without psychotic symptoms, recurrent depressive disorder, moderate current episode or recurrent depressive disorder, severe current episode with psychotic symptoms. Young adults have been hospitalized mainly for recurrent depressive disorder, severe current episode without psychotic symptoms, recurrent depressive disorder, current severe episode with psychotic symptoms or recurrent depressive disorder, moderate current episode. In the case of adults, hospitalizations were most often diagnosed with recurrent depressive disorder, severe current episode with or without psychotic symptoms, and the elderly with recurrent depressive disorder, severe current episode without psychotic symptoms or recurrent depressive disorder, moderate current episode. From the point of view of the evolution of the number of hospitalization episodes, it was generally slightly oscillating, except

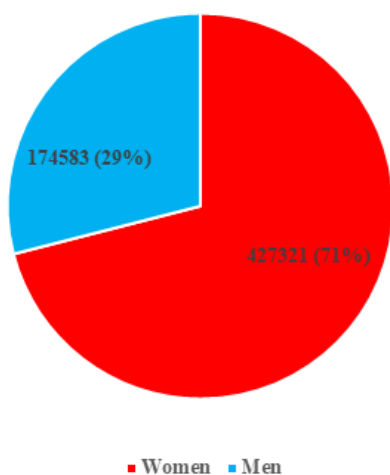
Graph no. 7. Distribution of hospitalization episodes for patients with depression, at local / county level, in Romania, during 2008-2020



Graph no. 8. Distribution of hospitalization episodes for patients with depression, at local / county level, depending on population number of each county, during 2008-2020



Graph no. 9. Total number of episodes reported in continuous hospitalization, in patients with depression, according to patient's sex, 2008-2020, at national level

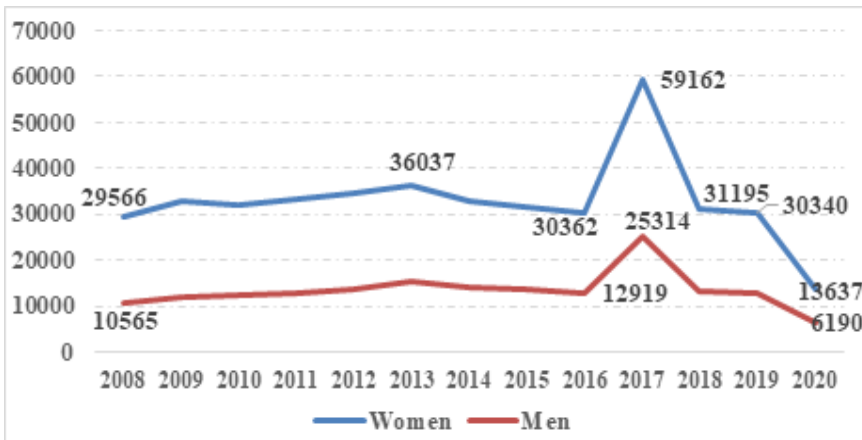


for 2017, when compared to the initial year 2008 there is an increase of 4 times in the case of the elderly and 2 times in the case of adults and young adults. - graph no.13.

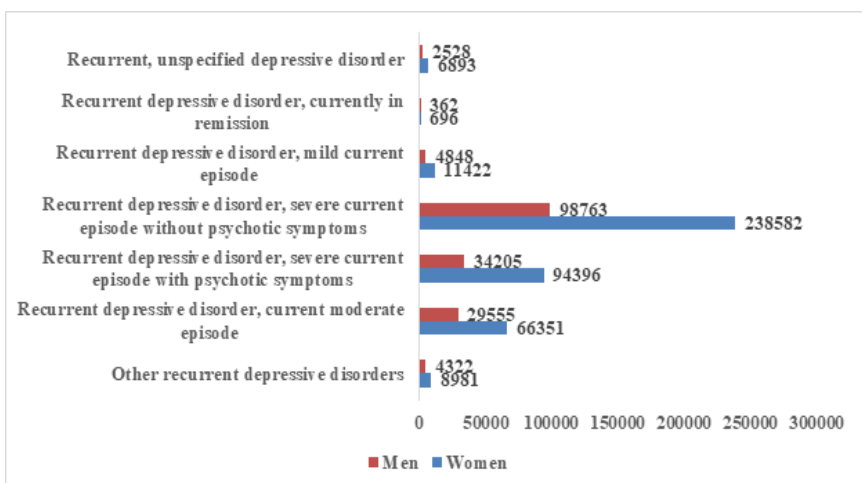
## 6. Distribution of hospitalization episodes for patients with depression, based on average length of hospital stay

The average duration of hospitalization for patients with depression in continuous hospitalization was 11 days in the period 2008-2020, varying throughout the study period, the maximum value being observed in the initial years 2008 and 2009 (13, 4 days, respectively 13.1 days), constantly decreasing to the lowest value of 9.2 days in 2019. As a type of pathology, the severe forms register the highest values of length of hospital stay, the patients with main diagnosis as Recurrent depressive disorder, current severe episode with psychotic symptoms and Recurrent depressive disorder, current severe episode without psychotic symptoms with values of 11.8 and 11.2 days, respectively, while for the diagnosis of

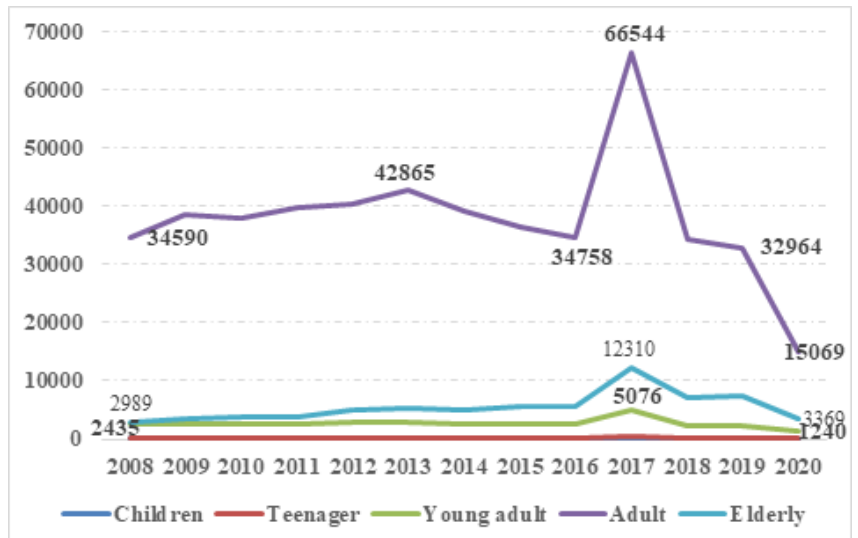
Graph no. 10. Evolution of episodes number reported in continuous hospitalization, in patients with depression, depending on patient sex, during 2008-2020, at national level



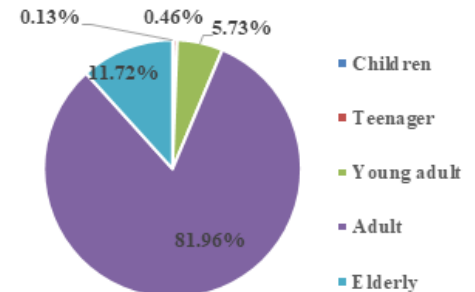
Graph no. 11. Number of hospitalization episodes according to patient sex and diagnosis at discharge, during 2008-2020, at national level



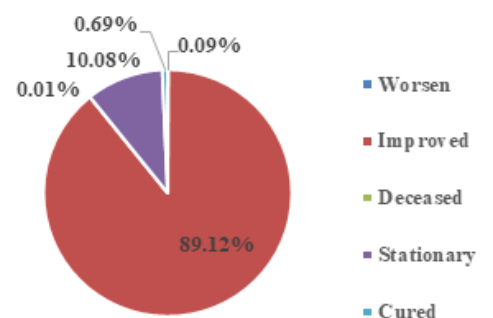
Graph no. 13. Evolution of episodes number reported in continuous hospitalization, in patients with depression, depending on patient's age, during 2008-2020



Graph no. 12 Number of episodes reported in continuous hospitalization, in patients with depression, depending on patient's age, during 2008-2020, at national level



Graph no. 14 Number of hospitalization episodes for patients with depression, depending on state of discharge, in Romania, during 2008-2020



recurrent, unspecified depressive disorder, the lowest value was recorded (7.52 days) in the specified period. Almost half of the patients remained hospitalized between 8 and 14 days, 31% a week and 16% between 2 and 3 weeks.

**7. Distribution of hospitalization episodes in patients with depression, depending on the patient's discharge status and in-hospital mortality rate**

Depending on the patient's state of discharge, the analysis of the data indicates that of the total number of episodes reported in continuous hospitalization in patients with depression, 99% were discharged improved or stationary - graph no 14, were considered cured under a percentage, and very few cases have worsened or died.

The calculated in-hospital mortality rate was 0.015% for the entire study period, with values ranging from 0.005% in 2017 to 0.042 in 2009. Most of the deceased were diagnosed at discharge with Recurrent depressive disorder, a severe current episode with symptoms psychotic (41%) or Recurrent depressive

disorder, severe current episode without psychotic symptoms (28%), the number of cases in terms of gender of the patient being almost equal (47 men compared to 43 women), and in terms of age, most of the deceased (47) were elderly, but also adults (38) as well as a number of 5 episodes of hospitalization resulting in death in the group of young people.

## CONCLUSIONS

Following the analysis for the period 2008-2020 regarding the situation of hospitalization episodes, in the continuous hospitalization regime due to depression in Romania, the following conclusions can be drawn:

- there are 601904 episodes of hospitalization, on average almost 50,000 hospitalizations per year, the vast majority of patients being hospitalized for severe current episodes with or without psychotic symptoms (more than half of hospitalizations)
- the evolution of hospitalizations is relatively constant, slightly increasing, with small variations from one year to another, except in 2017 when they doubled, while the minimum was observed in 2020, probably influenced by the epidemiological situation in national level
- The highest increases (around 50%) observed in 2019 compared to 2008 were recorded in patients with a primary diagnosis at discharge Recurrent depressive disorder, current moderate episode and Recurrent depressive disorder, unspecified
- Most patients hospitalized with such a diagnosis come from urban areas
- As a spatial distribution, the most frequent hospitalizations were registered in the regions of the South (one fifth), Bucharest-Ilfov and North East, compared to the lowest in West and South East regions, as the most affected counties were the municipality of Bucharest with 1, 8 times more episodes than the next Prahova, and the least affected Covasna, Sălaj and Constanța
- In relation to the number of inhabitants, the order of the above leading regions is maintained, South, Bucharest Ilfov and North East, and in the case of counties on the first places appear Prahova, Hunedoara and Giurgiu, on the last appearing Constanța and Arad, with very few episodes compared to the leading counties
- About three-quarters of hospitalizations due to depression belonged to women, but an increase in the number of hospitalizations over the study period was observed for both sexes, except for the last year, 2020. The increase in hospitalizations for men was about one-fifth, compared to the minimum observed in women
- Throughout the study period, the vast majority of hospitalization episodes were recorded in adults (age group 41-65 years) and the elderly (over 65 years). In the group of children the most affected ages are those over 12 years old, in the category of adolescents, most hospitalizations were suffered by those between 16-18 years old, the category of young adult is dominated by hospitalizations of those over 28

years old, age 40 years predominating in the total category. Among the adults, hospitalizations of those aged between 51-58 predominate, most of them being registered in adults aged 55 years, and the elderly between 66 and 70 years old are the ones who registered the most hospitalizations. Children most commonly diagnosed with recurrent depressive disorder, unspecified or recurrent depressive disorder, mild current episode, adolescents with Recurrent depressive disorder, severe current episode without psychotic symptoms, recurrent depressive disorder, moderate current episode or recurrent depressive disorder, severe current episode with psychotic symptoms, young adults have been hospitalized especially for recurrent depressive disorder, severe current episode with or without psychotic symptoms or recurrent depressive disorder, moderate current episode. Adults are most often hospitalized for Recurrent Depressive Disorder, Severe Current Episode with or Without Psychotic Symptoms, and in elderly Recurrent Depressive Disorder, Severe Current Episode Without Psychotic Symptoms, or Recurrent Depressive Disorder, Current Episode moderate.

- The number of hospitalizations was generally slightly fluctuating, with the exception of 2017, when compared to the initial year 2008 there is an increase of 4 times in case of the elderly and 2 times in the case of adults and young adults.
- The average duration of hospitalization for patients with depression in continuous hospitalization was in the period 2008-2020 of 11 days, with variations between 13.4 days (2008) and 9.2 days (2019). Severe forms have the highest values of length of hospital stay, patients with recurrent depressive disorder, current severe episode with psychotic symptoms and recurrent depressive disorder, current severe episode without psychotic symptoms recording higher values, the vast majority of patients remained in hospital until 2 weeks
- 99% of patients were discharged improved or stationary, very few cases (less than one percent) worsened or died
- The calculated in-hospital mortality rate was 0.015%, ranging from 0.005% (2017) to 0.042 (2009). Most of the deceased had recurrent depressive disorder, current severe episode with psychotic symptoms or recurrent depressive disorder, current severe episode without psychotic symptoms, the number of cases in terms of gender of the patient being almost equal (47 men compared to 43 women), and in terms of age, most of the deceased were elderly or adults.

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