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Socio-Economic Costs of Affective Disorders in Romania

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Abstract

The Romanian healthcare system is financed through public and private resources, the main source of public income for healthcare being the healthcare social insurance contribution, and the healthcare expense has grown constantly in the last decades. The highest costs in the health care system are those with primary, secondary and tertiary health care, affective disorders being treated in all these levels. Depression, the most common major psychiatric disorder, has an important burden of disease, involving a wide spectrum of disabilities and huge social and economic costs. Bipolar disorder leads also to an important impact on quality of life and a considerable economic burden. Our research analyzed, on a period of three years, the economic impact represented by direct cost of affective disorders, and efficiency indicators of the Romanian health-care system in this field on a sample of 236 health care institutions. Both number of patients and hospitalization days for affective disorders were decreasing, but these diseases still cause significant human and long-term costs. The direct cost per patient exceeds the national average every year. These costs associated with affective disorders and their impact contribute to the estimation of the health determinants.

Keywords: *affective disorders, direct costs, burden of disease, social impact, healthcare system.*

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1. Introduction

Financing is paramount for healthcare systems. The Romanian healthcare system is financed through public and private resources, the majority being public resources, administered by the National Fund for Social Healthcare Insurance (NFSHI). Healthcare systems of the EU are also financed through public and private contributions. There are currently no healthcare systems that are exclusively financed through public or private means.

Thus, european healthcare systems are financed from various sources, combining state budget financing, from public and private social health insurance, copayment or direct payment of medical services by the patients. Although financing from public financial resources is an important financing source of the healthcare system, both in Romania, as well as in most European countries, the main source of public income for healthcare is the healthcare social insurance contribution (see Table 1).

Thus, similar to the majority of EU states, Romania functions based on a system of healthcare social insurance, with income coming from healthcare insurance shares collected in a unique fund.

Apart for contributions from healthcare social insurance, the incomes of the fund are comprised from grants from the state budget and from own incomes of the Ministry of Health. In average, the contribution shares for three years are approximately 80% from the income, and grants and own income, the rest of 20%. In most EU countries, the main financing source of public health expenses are healthcare social insurance and, of course, the contributions coming from the insurance, but in Romania the amount of contributions collected is insufficient to ensure the financing of medical services and medication. Considering the contribution shares, Romania is situated amongst the countries with the lowest taxes on healthin europe, with 10.7 %. By comparing, we are able to see that the Czech Republic has a contribution of 13.5% from the griss income, Slovakia, 12.9 % and Bulgaria 16 %.

Table no. 1 – The evolution of contributions made to the budget of the NFSHI between 2014 – 2016

Indicator/Year	2014	2015	2016
Amounts cashed by the budget of the NFSHI (thousands ron), out of which:	22.868.491	23.316.563	24.984.605
Insurance contributions (thousands ron)	17.465.592	19.435.294	21.293.841
Ratio of healthcare contributions within the NFSHI (%)	76,33	83,35	85,22

Through legal national implementations, EU countries, Romania included, have institutionalized the obligation of social healthcare contribution payment, so that these systems can achieve their main purpose – to ensure medical assistance for the population, including fopr the categories that are not able to contribute to the healthcare insurance funds. The share of social insurance contributions is significant and has grown in stages from 2014 to 2016, from 76.33% to 85.22%, aspect that was generated by the size of fiscal tax cashings in healthcare, and by national incomes. The current mechanisms that covering healthcare costs is founded on in EU countries, are based on social solidarity. According to this principle, all citizens have the right to healthcare, irrespective of their incomes. Financing medical asistance in Romania is mainly insured by the budget of the National Health Fund, together with amounts coming from the state budget, as well as own incomes from the Health Ministry. Related to the private ones, the majority of financial resources come from direct payment, copayment or services tariffs.

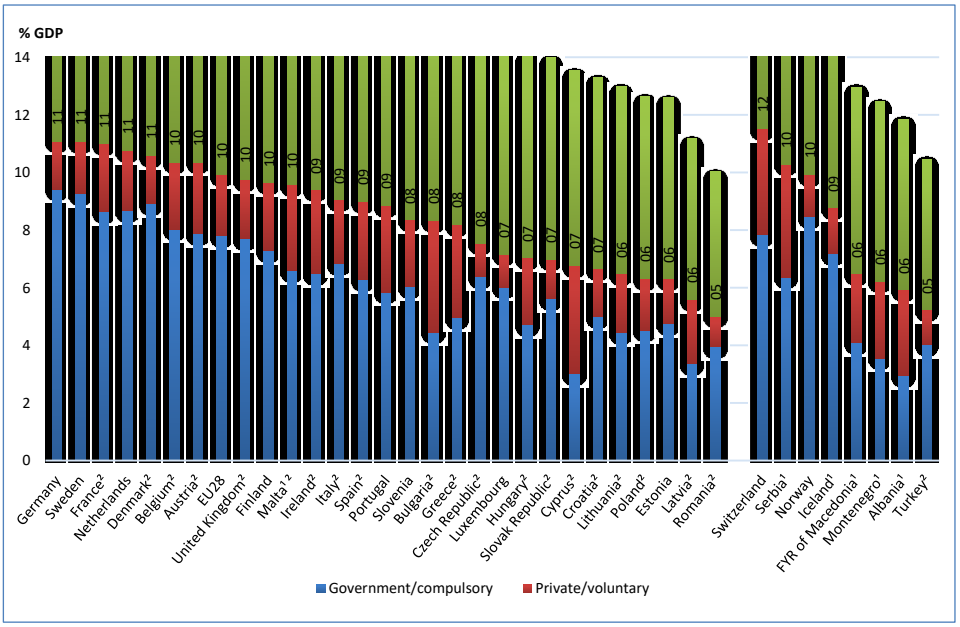
According to the Health at a Glance publication: Europe 2016, State of Health in the EU Cycle, in 2015, Romania spent 5.0 % from the GDP for health (see Figure no. 1), while the Total Health Expenditure (THE) as a percentage of GDP almost doubled between 2005 and 2010, from 5,5% to 5,7%, a steady decrease has been observed since then (see Table no. 2), placing Romania last among the EU countries in terms of health expenditure as a share of GDP, just below the average for EU Members. Health expenditure as a share of GDP in Romania was constantly lower that in the countries it was compared with: Bulgaria, the Czech Republic, Hungary, Poland and Slovak Republic (see Table no. 2).

Both the growth of expenses in healthcare and also the entire economy heavily influence the amount a country spends on healthcare in relation to all the other goods and services in the economy.

The EU assigned an average of 9,9% of its GDP to healthcare in 2015 (Figure no. 1). This percentage is more or less the same, if we look at the figures registered in both 2013 and 2014.

Among individual EU member states, Germany, Sweden and France each spent around 11% of GDP on healthcare, closely followed by the Netherlands and Denmark (at 10,8% and 10,6%, respectively). However, this share remains well below that of the United States, where health expenditure accounted for 16,9% of GDP in 2015, but is higher than the overall OECD average which stood at 9,0% [32]. Among EU countries, the share of health spending in GDP was lowest in Romania, Latvia, Estonia and Poland, ranging from 5.0% to 6.3%. In Europe, Switzerland allocated the biggest share in Europe, spending 11.5% of its GDP on health. At the

other end, Albania and Turkey were on a par with Romania and Latvia, allocating 5.2% and 5.9% of GDP, respectively.



1. Includes investments. 2. OECD estimate.
Source: OECD Health Statistics 2016; Eurostat Database; WHO, Global Health Expenditure Database. [36]

Figure no.1 - Health expenditure as a share of GDP, 2015 (or nearest year)

As seen in Table no. 2, the changes in the ratio of health spending to GDP are the result of the combined effect of growth in both GDP and health expenditure. Even taking into account the economic crisis, the annual average growth in health expenditure per capita (in real terms) in the European Union between 2005 and 2015 has been greater than the growth rate in GDP per capita. Therefore, with the exception of Croatia, Greece, Hungary, Latvia, Luxembourg, Romania and Portugal, the share of GDP allocated to health has increased in all other EU countries.

Between 2005 and 2015, with the exception of 2015, when Estonia and Cyprus, in 2006 and 2007, only Estonia, in Romania the share of GDP allocated to health was the lowest in the EU.

Table no. 2 - Health expenditure as a share of GDP, between 2005-2015

Percentage/Year

Country	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Austria	9,6	9,5	9,5	9,6	10,1	10,1	9,9	10,1	10,1	10,3	10,4
Belgium	9,0	8,9	9,0	9,4	10,1	9,9	10,1	10,2	10,4	10,4	10,4
Bulgaria	6,9	6,5	6,1	6,3	6,6	7,2	7,2	7,6	7,9	8,5	8,3
Croatia	6,9	7,0	7,4	7,7	8,2	8,2	7,6	7,6	7,3	6,7	6,6
Cyprus	5,4	5,5	5,4	6,1	6,5	6,4	6,6	6,6	6,9	6,8	6,8
Czech Republic	6,4	6,2	6,0	6,4	7,3	6,9	7,0	7,1	7,8	7,7	7,5
Denmark	9,1	9,2	9,3	9,5	10,7	10,4	10,2	10,3	10,3	10,6	10,6
Estonia	5,0	4,9	5,0	5,7	6,5	6,3	5,8	5,8	6,0	6,1	6,3
Finland	8,0	8,0	7,8	8,1	8,9	8,9	9,0	9,3	9,5	9,5	9,6
France	10,2	10,1	10,0	10,1	10,8	10,7	10,7	10,8	10,9	11,1	11,0
Germany	10,2	10,1	10,0	10,1	11,1	11,0	10,7	10,8	10,9	11,0	11,1
Greece	9,0	9,0	9,1	9,8	9,8	9,9	9,5	8,9	8,7	8,3	8,2
Hungary	8,0	7,8	7,3	7,1	7,3	7,6	7,6	7,5	7,3	7,2	7,0
Ireland	7,7	7,5	7,8	9,1	10,5	10,6	9,9	10,1	10,5	10,1	9,4
Italy	8,4	8,5	8,2	8,6	9,0	9,0	8,8	8,8	8,8	9,1	9,1
Latvia	5,9	5,7	5,8	5,6	6,2	6,2	5,6	5,4	5,4	5,5	5,6
Lithuania	5,6	5,8	5,8	6,3	7,4	6,8	6,5	6,3	6,1	6,2	6,5
Luxembourg	7,3	6,8	6,3	6,6	7,5	7,1	6,2	6,7	6,5	6,3	7,2
Malta	8,8	8,9	8,4	8,2	8,3	8,3	9,6	10,0	9,9	9,8	9,6
Netherlands	9,4	9,3	9,3	9,5	10,3	10,4	10,5	10,9	10,9	10,9	10,8
Poland	5,8	5,8	5,9	6,4	6,6	6,4	6,2	6,2	6,5	6,4	6,3
Portugal	9,4	9,1	9,1	9,4	9,9	9,8	9,5	9,3	9,1	9,0	8,9
Romania	5,5	5,0	5,1	5,2	5,5	5,7	5,4	5,4	5,2	5,1	5,0
Slovak Republic	6,6	6,9	7,2	7,0	8,0	7,8	7,4	7,7	7,6	7,0	7,0
Slovenia	8,0	7,8	7,5	7,8	8,6	8,6	8,5	8,7	8,8	8,5	8,4
Spain	7,7	7,8	7,8	8,3	9,0	9,0	9,1	9,1	9,0	9,1	9,0
Sweden	8,3	8,2	8,1	8,3	8,9	8,5	10,7	10,9	11,1	11,2	11,1
United Kingdom	7,4	7,5	7,6	7,9	8,7	8,5	8,4	8,5	9,9	9,9	9,8
EU28	**8,7**	**8,7**	**8,7**	**8,9**	**9,7**	**9,6**	**9,5**	**9,6**	**9,9**	**10,0**	**9,9**

Looking at the Romanian economy, the level of healthcare is a trustworthy indicator of the degree of development, in comparison to the more economically advanced countries that allocate important resources for financing healthcare, as a premise for a sustainable, long term development. The healthcare expense share from the GDP has grown constantly in the last decades; the total healthcare expense in 2014 and 2015 in Romania was approximately 5% of the GDP, ranking us last amongst the EU countries.

Public financial resources meant for financing the healthcare system represent 85% from total resources and are mainly ensured from theb FNUASS budget, completed with amounts from the state budget and from

the social health insurance budget, as well as from own incomes of the population.. Whereas private are concerned, the majority of financial resources come from direct payment, namely copayments or services' tarrifs.

Illnesses or medical problems due to work accidents or professional diseases are covered by the budget of state social healthcare insurance from the Risk Fund for Labor Accidents and Professional Ilnesses, managed by the National Pension and Other Social Insurance Rights House. Apart from the social healthcare insurance, the public health system benefits from incomes from the claw-back contribution and the excise taxes on alcohol and cigarettes ('the vice tax'). Except for special destination incomes, the healthcare system is also financed by state budget grants, coming from the general taxation.

Thus, public health expenditure is financed through the following income categories:

1. The National Health Fund (the main financing source is the contributions from employers and employees)
2. The Health Ministry – the main own income categories are the vice tax and the claw-back tax
3. The state budget – the Health Fund shortages are covered by allocations from the state budget, by way of transfers from the Health Ministry.
4. Local budgets.
5. Budgets of services' suppliers, from own incomes.
6. External loans.
7. Non-reimbursable external funds.
8. Donations, sponsorships.

Related to the GDP, Romania's healthcare expenditure is indeed low, but also Romanian public expenditure is amongst the lowest in Europe. Therefore, without any evolution or significant change of income and public expenditure in general, the growth of health care expenditure, in relation to the GDP, is limited.

The share of healthcare expense from the total of public expense has remained constant in the last years, as well as the share of the National Health Fund from total public expenditure. The percentages show, in fact, the resource level the public sector affords to spend for healthcare in the current budgetary fiscal context.

Health expenses, established through Law no.95/2006, related to the health reform, with further modifications and additions, and the frame agreement related to the conditions of giving medical assistance within the soicial health insurance system, presented below in table no. 3, suggests that sharing the health financing responsibility is common, most of the times

without a clear statement related to the percentages. These remain to be decided by the main credit release authorities, that decide on the spot and based on subjective motives.

Table no. 3 – Health expenditure structure, split per sources

No.	Expenditure types for medical services	Financing source			
		NFSHI	State budget (through Health Ministry)	Health Ministry (own incomes)	Local budgets
1	Primary medical assistance (family medicine)	*			
2	Medical services from specialty ambulatory (secondary medicine)	*			
3	Profilactic medical services in hospitals (tertiary medicine)	*			
4	Curative medical services (tertiary medicine)	*			
5	Paraclinical medical services (laboratory investigations, radiology)	*			
6	National health programs	*	*	*	
7	Emergency Unit and Emergency Unit Compartment, accredited from other hospitals		*	*	
8	Mobile emergency unit, resuscitation and extrication		*	*	*
9	On call rooms and EMU from other hospitals	*			
10	Ambulance county services	*	*		
11	School medical offices		*		*
12	Staff expenses for resident physicians		*		
13	Sports medicine offices, family planning, HIV/AIDS, TBC, LSM, dystrophy		*		
14	Medical research		*		
15	Health Ministry reserve and anti-epidemic county reserves			*	
16	Medication in ambulatory, with or without contribution, base don prescription, sanitary supplies, medical devices	*			
17	At home medical care	*			
18	Primary medicine infrastructure in the rural environment		*		
19	Investments, repairs and hospital reinforcements		*	*	**
20	Hospitals' equipment and facilities		*	*	**

** Expenditures coming from hospital investments, repairs and consilidations, as well as equipping hospitals with financing from local budgets is done with co-financing from the state budget

As a rule, the highest costs in the health care system are those with primary, secondary and tertiary health care, as well as those with medicines covered by the FNUASS. However, there are certain activities for which funding is provided from other sources than basic or from even more. The

highest share is spent on medical services in bedside units, which is around 40% (see Table no.4).

Table no. 4 – The evolution of payments to the NFSHI budget between 2014 - 2016[6]

Indicator/ Year	2014	2015	2016
Amounts paid from the NFSHI budget (thousands lei), out of which:	**21.487.323**	**22.013.317**	**24.458.528**
Value of expenditure from medical services in medical units with beds (thousands lei)	8.566.380	9.011.317	10.578.314
Share of payment for medical services in medical units with beds within the amounts cashed for the NFSHI budget (%)	39,86	40,93	43,25

2. Problem Statement

Depression is the most common major psychiatric disorder with high severity and recurrence, which causes an increase in the number of somatic comorbidities and correlates directly with the decrease in the level of global, physical and social functioning [46] as well as the level of quality of life of the patient and his family [51]. By its prevalence and incidence, at the moment it has been an estimate of more than 350 million people who have been affected globally. Depressive disorder has become a real public health issue in recent decades representing currently the main cause of disability expressed through lost years of life due to premature mortality (Years of Life Lost – YLL) [28].

The World Health Organization estimated in 1996 that depression ranks fourth in the world rankings of diseases generating disabilities [34], going beyond chronic medical conditions such as diabetes, arterial hypertension [19] or reumathoid arthritis [54]. It is estimated that in 2020 it will fade into the background, after cardiovascular disease, in this ranking based on measuring the burden of disease expressed through years of disability caused by disease (DALY - Disability-Adjusted Life Year [35].

Even if it is considered an important public health issue, epidemiological data on depressive disorder are extremely varied, this lack of uniformity being due to the lack of unitary diagnostic criteria. Studies based on the criteria of the statistical diagnostic manuals DSM-III, DSM-III-R, DSM-IV, diagnostic interview schedules (Diagnostic Interview Schedule)

[6] www.cnas.ro/page/bilanturi-contabile.html

[41] or CIDI (Composite International Diagnostic Interview) [3] in the 1980s, they achieved extremely varied results. Thus, the prevalence of depressive disorder was reported to be between 1.5% (Taiwan) and 19.0% (Lebanon) (median - 8.8%, median - 8.9%) for the entire lifetime, respectively 0.8% (Taiwan) and 5.8% (New Zealand) (mean - 3.4%, median - 3.0%) for the last 12 months of studies using the DSM-III diagnostic criteria [41, 3]. The results of the epidemiological research used in the DSM-IV criteria indicated a variation in lifetime prevalence of depression between 15.1% and 17.8%, respectively between 5.8% and 10.7% for the last 12 [46, 21, 8, 24, 14, 49].

The results of epidemiology studies based on the ICD-10 criteria, studies done in 60 countries, showed a prevalence of depressive disorder in the last 12 months of 3.2% for those who did not associate somatic comorbidities, while the presence of medical conditions associated with depression were noted at 9.3% to 23.0% of the assessed subjects [33]. The DEPRES study [26], conducted in six European countries on 78463 subjects, used the Mini-International Neuropsychiatric Interview (MINI) screening tool, the 6-month prevalence for major depression being estimated between 3.8% (Germany) and 9.9% (UK) with an average of 6.9%, highlighting the problem of underdiagnosis of the depressive disorder, with 43% of the patients being evaluated not previously diagnosed with depression.

Among the socio-demographic factors that influence the epidemiology of depressive disorder, female gender is an important factor of vulnerability, the prevalence of depression in women (12-20%) is double than that of men (5-12%), especially in the 50- 54 years [12, 23, 44], related to marital status, single or divorced individuals showing higher rates of depression than married [3, 52]. The age at which the onset of the depressive disorder happens is correlated with the socio-economic status of the affected individuals in the economically developed countries between the ages of 18-34 and 35-49 years, the risk of depression being greater than 3 to 5.5 times than those over the age of 65 [12].

The burden of depression may be expressed by residual symptoms, cognitive deficits, frequent recurrences, decreased quality of life, suicide, associated cardiovascular and cerebrovascular disease and worsening progression of depression or whose development is negatively influenced by depressive disorder, psychosocial inadaptability, economic loss, family and close family involvement.

Depression ranked fourth in the rankings of disability-generating pathologies in 1990 (3.7% of all lost years due to Disability Adjusted Life Years (DALYs) [35], respectively third in 2004 (4.3% of total DALYs), and

for the year 2030, the World Health Organization estimates that it will rank first, being the main disabling cause for women globally, of 13.4% of the years of disability Years Lived with Disability (YLD), the burden of disease being over 50% higher than for men (8.3% of YLD) [56]. In addition, epidemiological studies have demonstrated that maternal depression is an important factor affecting the normal development of children, and the burden of this disease affects not only present generations but also future generations [39].

The most important somatic comorbidities of depression are diabetes, especially type II, cardiovascular diseases (arterial hypertension, myocardial infarction, heart failure), stroke, cancer, chronic pain, viral hepatitis, obesity or neurodegenerative diseases.

The economic costs of depression have been estimated in the United States in 1980 at about $ 42 billion (at the value of the dollar in 2008) [48], in 1990 between $ 72 and $ 87 billion [16, 17], and for the year 2000 a total of $ 104 billion, of which 33 billion (31%) medical care, 6 billion (7%) suicide mortality and 65 million (62%) due to decreased productivity [15]. Standardized Mortality Ratio (SMR) by suicide to depression is 20.9 for men and 27.0 for women [37], hospitalized patients presenting a 20 times higher risk for suicide than the general population [11]. In terms of premature mortality, depressive disorder is responsible for worsening the prognosis of associated somatic diseases, particularly myocardial infarction [27] and stroke [18].

At family level, depression can lead to major dysfunctions, materialized by separation or divorce, which in turn lead to an increase in the severity of depressive symptomatology, especially in men [42], while for women the main problem is represented by depression during pregnancy with a prevalence of between 10% and 16% and consequences for both the woman and the fetus [29].

With a average age at onset of 18 years for Type I and 22 years for Type II [53], and a delay between the first manifestations and the initiation of treatment or even 5 to 10 year hospitalization [43], bipolar disorder leads to a particular impact on the condition of the person affected, both individually affecting the quality of life of the patient and his / her family, as well as socially, by the economic burden generated by the disease, direct consequences of absenteeism and job loss, antisocial behavior , stress and social networking difficulties [25, 31].

Type I bipolar disorder affects approximately 0.8% of the adult population, epidemiological data ranging from 0.4% to 1.6%, variations generated by ethnic and cultural diversity [52], while for type II bipolar disorder, at present, is discussed a 0.5% frequency of this diagnosis in the

adult population, in both cases discussing disease forms that meet the DSM-IV-TR diagnostic criteria and not bipolar disorder [5]. At European Union level, epidemiological research based on the DSM-III, DSM-III-R, DSM-IV and ICD-10 diagnostic criteria revealed a prevalence of type I bipolar disorder throughout the life span of 0.1-0.2% (Spain) [13] and 4.4% (Switzerland) [4], with an average of around 1.8% (The Netherlands) [10].

The prevalence of the same subtype I of the bipolar disorder for the last 12 months was estimated to be between 0.2% (Ireland) [45] and 1.1% (Netherlands) [9,10].

The same studies have shown a higher rate of diagnosis of bipolar disorders in the 18-34 age group, with a frequency in the 14-24 year age group of 2.3% for hypomania and 1.5% for the manic episode diagnosed according to the DSM criteria Early Developmental Stages of Psychopathology Study (EDP) [55]. Subsequent research mentions a cumulative incidence of 4.7% for hypomania, 2.6% for manic episodes up to 29 years of age, 14.8 years of onset for patients diagnosed with hypomania and 15.4% for those with manic episode [38].

As for the age of onset, the Epidemiological Catchment Area reported an average age of 21 years at the onset of bipolar disorder, but with a peak of first symptoms in the age range of 15-19 years, followed closely by 20-24 years [20], which confirms a delay of 5 to 10 years between the apparent onset of the disease and the first specialist consultation or admission to a psychiatric unit. The NEMESIS study [50] reveals an average age of the first 26.2 years-old hypomaniacal or manic episode, 40% of patients experiencing the first symptomatic manifestations between 18 and 24 years, similar data to those presented by a German epidemiological study, according to which 75% of the patients included in the research had the first symptoms before the age of 25 [21, 22, 45].

The occurrence of bipolar disorder at younger individuals than 15 years of age has been poorly studied due to the symptomatology that makes the differential diagnosis difficult, with attention deficit and hyperkinesia disorders, (Attention Deficit Hyperactivity Disorder – ADHD) [4], this dilemma will be clarified through group studies that aim to evolve patients with this symptomatology over a long period of observation. With regard to the onset of bipolar disorder over 60 years of age, literature data frequently mentions the organic causality of this disorder (stroke, lesions of the central cerebral system) at the expense of a positive heredocolateral history of the disease [1, 30].

The disabilities generated by bipolar disorder ranked seventh in the global disability condition list in 1990, with a 3% of the total YLD, while in

2000, the top ten disabled disabilities were maintained with a 2,5% of the total YLD [6].

As in the case of depression, economic costs are extremely important, with US $ 40 billion being calculated at the level of the year 1991 [59], while lifetime expenditure on bipolar care varied between $ 11,720 for a man with one maniacal episode and $ 624,785 for chronic patients, with $ 24 billion cumulated in 1998 [7]. Of the $ 45 billion reported in 1991, $ 7 billion was direct spending from medical services (excessive use of medical services - 49%, mental health services - 46%, treatment of alcohol and other psychogenic substances - 5 %), and judicial costs imposed by bipolar patients' antisocial behavior, $ 17 billion cost of productivity downsizing, $ 12 billion in care and institutionalization expenditure, and $ 8 billion in economic costs generated by premature mortality by suicide [59].

At family level, the bipolar disorder is also a major disruptive factor, with patients requiring daily monitoring and care, thus affecting daily activity and family life through stress and declining socio-economic status. Literature data highlights the existence of many dysfunctions at this level, with most bipolar patients experiencing divorce or serious couple problems [47]. Functional recovery of bipolar patients is difficult and long lasting, cognitive and functional deficits following episodes of illness leading to great difficulties in the process of patient reintegration [60], addiction and abusive consumption of alcohol (44%) or other psychoactive substances (56%) [40] complicating disease progression, increasing suicide risk and preventing recovery of this category of patients [2].

3. Research Questions/Aims of the research

Considering the complexity of the illness, as well as the specific functioning of the Romanian healthcare system, the research is aiming to analyse, on a period of three years, the economic impact represented by direct cost of affective disorders, the evolution of the number of admissions determined by these affective disorders, as well as efficiency indicators, the obtained economic data being a first step towards building fundamental premises for a future multi-disciplinary, systematic process that approaches this issue

4. Research Methods

The research was done on 236 health care institutions, of which monospecial hospitals (psychiatry), emergency hospitals, clinical hospitals,

institutes, university hospitals, municipal hospitals, city hospitals, communal hospitals, pediatric hospitals, military hospitals, hospitals or private clinics, health or medical centers that have psychiatric wards or departments

The costs imposed by admitted patient care have been cuantified on a three year period, for the medical units taken into consideration (January 1st, 2014 – December 31st, 2016), for the three following DRG diagnosis codes, specific to affective disorders, based on which patients where classified by medical units and reported to the National Health insurance House:

☞ U3041 - Major affective disorder aged> 69 or with (catastrophic or severe CC);

☞ U3042 - Major affective disorder age <70 without catastrophic or severe CC;

☞ U3050 - Other affective and somatoform disorders.

The sanitary units analyzed are financed for the hospital medical activity according to the Framework Contract and the related methodological norms based on the Diagnosis Related Groups (DRG) indicator. The Diagnosis Related Groups (DRG) is a diagnostic classification scheme for patients and is similar to the International Classification of Diseases (ICD), where diagnostics are classified In classes and subclasses, additionally, the DRG system uses an additional classification criteria, namely the cost of resources consumed for patient care, and patients can be classified simultaneously both after the pathology and after the cost of care, which ensures the possibility of associating the types of patients with the hospital cost incurred.

The data for each hospital for Hospital-specific relative-value (HSRV) have been taken over and processed from the National School of Public Health, Management and Professional Development, Bucharest (NSPHMPDB) website, and the values for Tariff of Average Case (TAC) from the Orders of the Ministry of Health and of the President of the National Health Insurance House, for the approval of the methodological norms for implementing the Framework Agreement regarding the conditions of granting medical assistance within the social health insurance system for 2013, 2014, 2015 si 2016, in Romania [57, 58].

5. Findings

Considering the allocation of medical units which offer medical services for affective disorders, a prevalence of individuals reporting the therapeutic intervention for the DRG group U3050 (see Table no. 5).

Table no. 5 – Distribution of sanitary units by diagnostic codes and years *

Type of sanitary unit	Diagnostic code / Year								
	U3041			U3042			U3050		
	2014	2015	2016	2014	2015	2016	2014	2015	2016
Psychiatric hospitals	31	31	31	32	32	32	29	29	29
County hospitals	38	38	38	39	39	39	40	40	40
Municipal hospitals	38	38	38	46	46	46	49	49	49
City hospitals	25	25	25	27	27	27	34	34	34
Communal hospitals	2	2	2	2	2	2	3	3	3
Pediatric hospitals	9	9	9	10	10	10	10	10	10
Military hospitals	14	14	14	17	17	17	17	17	17
University Hospitals / Clinics / Institutes	29	29	29	29	29	29	34	34	34
Private hospitals	12	12	12	14	14	14	14	14	14
Other hospitals	0	0	0	1	1	1	3	3	3
Health Centers	3	3	3	3	3	3	3	3	3
TOTAL	201	201	201	220	220	220	236	236	236

* The number of hospitals per diagnosis codes and years resulted from medical reports to the insurance house

During the research, the following indicators were calculated and analyzed:

a) Number of patients (chronic and acute) dispensed and treated for the period 2014 - 2016 for the diagnostic codes U 3041, U 3042, U 3050:

Table no. 6 – Total number of patients treated (chronic and acute) in 2014 – 2016

Type of sanitary unit	Diagnostic code / Year												
	U3041				U3042				U3050				
	2014	2015	2016	Total	2014	2015	2016	Total	2014	2015	2016	Total	Total
Hospitals of monospecialism (psychiatry)	10.627	10.310	11.094	32.031	26.317	22.536	20.492	69.345	2.548	1.820	1.539	5.907	107.283
Share (%)	49,8	46,9	48,3	48,3	40,6	37,4	36,6	38,3	32,4	29,6	29,4	30,7	40,3
County hospitals	4.631	4.876	4.801	14.308	17.125	14.795	14.205	46.125	1.377	1.245	951	3.573	64.006
Share (%)	21,7	22,2	20,9	21,6	26,5	24,6	25,4	25,5	17,5	20,3	18,2	18,6	24,0

Municipal hospitals	3.076	2.707	2.981	8.764	10.848	9.278	8.408	28.534	1.528	1.308	1.106	3.942	41.240
Share (%)	14,4	12,3	13,0	13,2	16,8	15,4	15,0	15,8	19,4	21,3	21,1	20,5	15,5
City hospitals	567	610	596	1.773	1.509	1.560	1.464	4.533	190	113	216	519	6.825
Share (%)	2,7	2,8	2,6	2,7	2,3	2,6	2,6	2,5	2,4	1,8	4,1	2,7	2,6
Communal hospitals	6	8	5	19	62	47	29	138	12	13	28	53	210
Share (%)	0,0	0,0	0,0	0,0	0,1	0,1	0,1	0,1	0,2	0,2	0,5	0,3	0,1
Pediatric hospitals	173	222	284	679	215	257	191	663	202	165	145	512	1.854
Share (%)	3,3	4,5	4,3	4,0	5,6	6,4	6,8	6,2	14,8	12,5	12,0	13,3	6,2
Military hospitals	695	991	980	2.666	3.595	3.840	3.803	11.238	1.164	771	626	2.561	16.465
Share (%)	3,3	4,5	4,3	4,0	5,6	6,4	6,8	6,2	14,8	12,5	12,0	13,3	6,2
University* Hospitals / Clinics / Institutes	1.332	1.962	1.946	5.240	4.329	7.041	6.572	17.942	747	677	578	2.002	25.184
Share (%)	6,2	8,9	8,5	7,9	6,7	11,7	11,7	9,9	9,5	11,0	11,0	10,4	9,5
Private hospitals	92	76	52	220	220	318	281	819	77	26	26	129	1.168
Share (%)	0,4	0,3	0,2	0,3	0,3	0,5	0,5	0,5	1,0	0,4	0,5	0,7	0,4
Hospitals of monospecialism (Other than psychiatry)	0	0	0	0	0	1	0	1	4	3	6	13	14
Share (%)	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,1	0,0	0,1	0,1	0,0
Health Centers	160	201	234	595	522	536	541	1.599	17	3	12	32	2.226
Share (%)	0,7	0,9	1,0	0,9	0,8	0,9	1,0	0,9	0,2	0,0	0,2	0,2	0,8
TOTAL	21.359	21.963	22.973	66.295	64.742	60.209	55.986	180.937	7.866	6.144	5.233	19.243	266.475

Table no. 7 – Total number of patients (acute) treated in 2014 – 2016

Type of sanitary unit	Diagnostic code / Year												
	U3041				**U3042**				**U3050**				
	2014	**2015**	**2016**	**Total**	**2014**	**2015**	**2016**	**Total**	**2014**	**2015**	**2016**	**Total**	**Total**
Hospitals of monospecialism	9.805	9.266	9.711	28.782	22.288	18.356	15.912	56.556	1.964	1.282	1.052	4.298	89.636
(psychiatry)	49,1	45,7	46,4	47,0	37,3	33,7	31,8	34,5	29,1	25,3	24,8	26,8	37,1
Share (%)	4.542	4.762	4.678	13.982	17.444	14.409	13.788	45.641	1.258	1.135	836	3.229	62.852
County hospitals	22,7	23,5	22,3	22,8	29,2	26,5	27,6	27,8	18,6	22,4	19,7	20,1	26,0
Share (%)	2.785	2.458	2.673	7.916	10.139	8.655	7.820	26.614	1.416	1.137	957	3.510	38.040
Municipal hospitals	13,9	12,1	12,8	12,9	17,0	15,9	15,6	16,2	21,0	22,5	22,6	21,9	15,8
Share (%)	536	590	577	1.703	1.398	1.467	1.400	4.265	165	96	191	452	6.420
City hospitals	2,7	2,9	2,8	2,8	2,3	2,7	2,8	2,6	2,4	1,9	4,5	2,8	2,7
Share (%)	0	0	0	0	0	0	0	0	1	0	2	3	3
Communal hospitals	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
Share (%)	173	222	284	679	215	257	191	663	202	165	145	512	1.854
Pediatric hospitals	3,5	4,9	4,7	4,3	6,2	7,0	7,5	6,9	16,8	14,2	13,2	15,0	6,8
Share (%)	693	990	978	2.661	3.700	3.802	3.759	11.261	1.134	719	559	2.412	16.334
Military hospitals	3,5	4,9	4,7	4,3	6,2	7,0	7,5	6,9	16,8	14,2	13,2	15,0	6,8
Share (%)	1.259	1.785	1.791	4.835	3.867	6.693	6.365	16.925	577	507	469	1.553	23.313
University* Hospitals /	6,3	8,8	8,6	7,9	6,5	12,3	12,7	10,3	8,5	10,0	11,1	9,7	9,7

Clinics / Institutes													
Share (%)	21	22	20	63	132	218	213	563	20	18	19	57	683
Private hospitals	0,1	0,1	0,1	0,1	0,2	0,4	0,4	0,3	0,3	0,4	0,4	0,4	0,3
Share (%)	0	0	0	0	0	0	0	0	1	0	2	3	3
Hospitals of monospecialism	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
(Other than psychiatry)	160	201	234	595	522	536	540	1.598	16	2	11	29	2.222
Share (%)	0,8	1,0	1,1	1,0	0,9	1,0	1,1	1,0	0,2	0,0	0,3	0,2	0,9
Health Centers	19.974	20.296	20.946	61.216	59.705	54.393	49.988	164.086	6.754	5.061	4.243	16.058	241.360

b) Number of hospitalization days (chronic and acute) performed between 2014 and 2016 for diagnostic codes U 3041, U 3042, U 3050:

Table no. 8 - Total number of days of hospitalization (chronic and acute) in 2014 – 2016

Diagnostic codes	Number of days of hospitalization / Year			Total
	2014	2015	2016	
U 3041	256.793	276.812	279.090	812.695
U 3042	764.669	766.802	692.837	2.224.308
U 3050	80.153	64.111	60.288	204.552
Total	1.101.615	1.107.725	1.032.215	3.241.555

Table no. 9 - Total number of days of hospitalization (acute) in 2014 – 2016

Diagnostic codes	Number of days of hospitalization / Year			Total
	2014	2015	2016	
U 3041	256.793	276.812	279.090	812.695
U 3042	764.669	766.802	692.837	2.224.308
U 3050	80.153	64.111	60.288	204.552
Total	1.101.615	1.107.725	1.032.215	3.241.555

c) The financial value for acute patients carried out between 2014 and 2016 for diagnostic codes U 3041, U 3042, U 3050:

Financial value was calculated for acute patients on each hospital analyzed on the basis of the formula:

$$FVij = NDCapij \times HSRV\ ij \times TACij$$

where:

- i – year;
- j – hospital;
- FVij – Financial value, realized by each hospital;
- NDC - Number of Discharged Cases, realized by each hospital, based on number of beds;
- HSRV ij - Hospital-specific relative-value for each DRG is based on the sum of
- the adjusted average cost center relative weights for discharges assigned to that DRG;
- TAC - Tariff of Average Case, observant of the competence based hospital classification.

Table no. 10 – Financial Amount (Acute Patients) in 2014 – 2016

Diagnostic codes	Financial Amount (RON) / Year			Total
	2014	2015	2016	
U 3041	60.519.823	68.491.536	71.908.062	**200.919.420**
U 3042	115.755.860	120.856.462	113.338.847	**349.951.169**
U 3050	7.677.179	6.338.207	5.532.728	**19.548.113**
Total	**183.952.862**	**195.686.205**	**190.779.636**	**570.418.702**

d) Financial/acute patient costs incurred between 2014 and 2016 for diagnostic codes U 3041, U 3042, U 3050:

$$CFapi = FVi / NDCapi$$

where:

i – year;

CFapi – Financial cost, realized by year and acut patient;

FVi – Financial value, realized by year;

NDCapi - Number of Discharged Cases (acut patient), realized by year.

Table no. 11 – Financial / acute patient costs incurred in 2014 – 2016

Diagnostic codes	Financial costs / acute patient (lei) / Year			Total
	2014	2015	2016	
U 3041	3.030	3.375	3.433	3.282
U 3042	1.939	2.222	2.267	2.133
U 3050	1.137	1.252	1.304	1.217
Total	2.128	2.454	2.538	2.363

e)Financial costs / day hospitalization of patients in the period 2014 - 2016 for diagnostic codes U 3041, U 3042, U 3050:

Financial costs / day acute patient hospitalization were calculated as follows:

CFdi = Vfi/ Ndapi

where:

i – year;

CFdi – Financial cost, realized by year and day;

FVi – Financial value, realized by year;

Ndapi - Number of hospitalization days by acut patient, realized by year.

Table no. 12 – Financial costs / day of hospitalization realized in 2014-2016

Diagnostic codes	Financial costs/day hospitalization (lei)/ Year			Total
	2014	2015	2016	
U 3041	451	437	406	431
U 3042	151	158	164	157
U 3050	96	99	92	96
Total	167	177	185	176

6. Discussions

Following the results of the study, it can be seen that the number of patients hospitalized in Romanian hospitals with affective disorders was decreasing, with over 13% of cases discharged in 2016 compared to 2014, consequently decreased by over 6% and hospitalization days, with the impact of the financing of the specific medical activity and the quality of the medical services, affective disorders representing an important percentage within the Mental illness, with over 40% (see Table 13).

Table no. 13 – Total number of patients (acute) treated nationwide / psychiatric specialty / affective disorder in the period 2014-2016

	Number of patients (acute)	Year 2014	2015	2016	Total
1	Patients at national level	3.880.680	3.782.831	3.693.699	11.357.210
2	Patients from psychiatry specialty	209.619	198.578	173.066	581.263
3	Share 2/1 (%)	***5,40***	***5,25***	***4,69***	***5,12***
4	Patients with affective disorders	86.433	79.750	75.177	241.360
5	Share 4/1(%)	***1,58***	***4,34***	***0,43***	***2,13***
6	Share 4/2(%)	***41,23***	***40,16***	***43,44***	***41,52***

The distribution of beds by specialties according to the data presented by the National Institute of Statistics places the number of psychiatric beds in hospitals, health centers and state and private medical centers on the first place, with a percentage of over 12%, representing an important share in the total number of beds in Romania, because the psychiatric specialty has the hospitalization duration on the sections/ compartments valid for all the largest hospitals in Romania.

Table no. 14 – Total number of beds nationwide and psychiatry specialty in 2014-2016

	Number of beds	Year 2014	2015	2016
1	Total per country	130.963	132.149	132.277
2	Total in the psychiatric hospital	16.503	16.505	16.435
3	Share 2/1 (%)	12,60	12,49	12,42

Affective disorders cause significant human and long-term costs. The economic impact of the illness is a burden on both the state budget, healthcare providers and patients and their families. These costs can be estimated within direct, indirect or intangible costs. In the study, only direct cost per patient of the disease - the cost of the resources used to treat it in the hospital by dividing the annual value in the number of patients treated in the hospital - and the average annual cost calculated for the period 2014 - 2016 exceeds the national average every year (see Table 15).

Table no. 15 – Average cost per patient / year treated nationwide and affective disorder in 2014 - 2016

Indicators	Year	Total

		2014	2015	2016	
1	**Patients at nation level**	3.880.680	3.782.831	3.693.699	11.357.210
2	**Value achieved at national level**	6.947.618.460	7.400.667.462	6.947.618.460	21.295.904.382
3	**Average cost per patient / year at national level**	***1.790,31***	***1.956,38***	***1.880,94***	***1.875,10***
4	**Patients with affective disorders**	86.433	79.750	75.177	241.360
5	**Value for patients with affective disorders**	183.952.862	195.686.205	190.779.636	570.418.702
6	**Average cost per patient / year for patients with affective disorders**	***2.128,27***	***2.453,75***	***2.537,74***	***2.363,35***

7. Conclusions

Disease cost analysis is not a classical economic assessment because it does not measure the benefits of consumed resources but is a database for such an analysis. Its value is in measuring the economic burden and identifying how it is distributed between the health system and the patient, family and society as a whole.

Compared to the economic activity of a commercial company, where the main economic objective is to maximize profit, in the economic activity in the medical field, the capacity is to use the resources optimally and to maximize the results, the qualitative criterion must be superior to the Price, taking into account the aspect of equity and using concepts such as: cost, efficiency, effectiveness, utility, quality.

However, the economic approach to the health sector must take into account the criteria for selecting health options: health gains (reduction of mortality and morbidity), acceptability, efficiency, effectiveness, performance of services, quality of service.

Knowing the costs associated with affective disorders and their impact contribute to the estimation of the health determinants which they are influencing. Knowing the costs and how to allocate the necessary resources will lead to a reduction in the effect of emotional bouts on the sick and their families, the care system and society in general. The quantification of direct (medical and non-medical) costs, as well as the indirect costs generated by the decrease in productivity, contributes to the sketching of an overall picture of the impact of affective disorders.

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