

## The Economic Costs Of Anxiety In Spain

OLIVA-MORENO, JUAN (\*), LÓPEZ-BASTIDA, JULIO (\*\*) Y MONTEJO, ANGEL LUIS (\*\*\*)  
(\* *Fundación de Estudios de Economía Aplicada (FEDEA) - Universidad de Castilla-La Mancha Área de Fundamentos del Análisis Económico*) (\*\*) *Servicio Canario de Salud. Unidad de Planificación y Evaluación* (\*\*\*) *Hospital Universitario de Salamanca. Facultad de Medicina. Universidad de Salamanca.* (\*) FEDEA. C/ Jorge Juan, 46. 28001 Madrid.

E-mail: [joliva@fedea.es](mailto:joliva@fedea.es)

### ABSTRACT

The main objective is the evaluation of the economic impact of anxiety-related direct and indirect costs in Spain for the year 2002. Direct medical costs (hospitalization costs, costs associated with outpatient consultations, and drugs) and indirect costs (premature death, temporary disability, and permanent disability) have been estimated based on prevalence costs, that is, the costs generated during the year 2002. Indirect costs have been calculated on the basis of the Human Capital Theory model. The annual total costs of anxiety in Spain were estimated at 789.4 million euros. Direct medical costs were estimated at 369 million euros and account for 46.7% of the total cost. Indirect costs were estimated at 420.4 million euros and represent 53.3% of the total cost. Direct medical costs associated with anxiety represent 1% of all National Health Care System expenditure for the year 2002 in Spain. Despite having applied a conservative approach, the high socioeconomic cost of anxiety offers us a better definition of the magnitude of the problem in order to establish priorities, as well as opening the way towards cost-effectiveness studies that will enable us to debate this issue with greater transparency.

*Keywords:* Anxiety. Cost of illness. Health Care costs. Indirect Costs. Mental Illness.

## Los Costes Económicos De Los Desórdenes De La Ansiedad En España

### RESUMEN

El objetivo de este trabajo es estimar el impacto económico de los desórdenes de la ansiedad en el año 2002. Para ello se estimarán tanto los costes sanitarios (hospitalizaciones, consultas a especialista, consultas a Atención Primaria y medicamentos) como las pérdidas de productividad laboral, empleando el método del capital humano, ocasionadas por mortalidad prematura, bajas permanentes y bajas temporales. Los costes estimados ascendieron a 789,4 millones de euros, de los cuales un 46,7% son imputables a costes sanitarios y el 53,3% restante a pérdidas de productividad laboral. Los costes sanitarios representan un 1% aproximadamente del gasto sanitario total del Sistema Nacional de Salud. Pese a aplicar métodos conservadores, se obtiene unas cifras muy elevadas de coste, lo cual ayuda a definir la dimensión del problema. El siguiente paso sería la evaluación de intervenciones sanitarias con una buena relación coste-efectividad y su aplicación en la población de riesgo.

*Palabras clave:* ansiedad. Coste de la enfermedad. Costes sanitarios. Costes indirectos. Enfermedades mentales

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## **1. INTRODUCTION**

Anxious symptomatology is present in a high percentage of the general population, comprising one of the leading health problems for which care is sought at Primary Care Centers (Servicio de Evaluación y Planificación del Servicio Canario de Salud, 1998 y 2004) and Mental Health Departments.

It is not easy to establish the true prevalence and incidence rates of mental illness because of the wide variability of study results due to the diagnostic criteria applied and study population selection criteria. The results of a World Health Survey of the World Health Organization (WHO) that polled more than 60,000 people from 14 countries, including Spain, in order to estimate the prevalence of anxiety reveal that in Spain, the prevalence rate is 5.9% (WHO World Mental Health Survey Consortium, 2004). However, these figures are likely to increase considerably if we take the various non-categorized forms of presentation into account (somatizations, nonspecific pain symptoms, and anxious personality traits). At any rate, all the evidence available indicates that anxiety is an illness that affects many people, has a great socioeconomic impact, and influences patients' quality of life.

Although it is true that resources should not be allocated on the basis of a specific disease, but rather according to where the greatest health benefits can be obtained as a result of a given intervention, cost studies can in many cases, offer the true dimension of a health problem, provide information that is valuable to society and decision-makers with respect to the relative and absolute importance of the illness in question and, hence, aid in establishing appropriate health care priorities and social resource allocation. The usefulness of a cost of illness study consists of indicating the economic impact of a disease particular, by establishing the burden to society associated with the mortality and morbidity of said illness, as well as the resources, whether they are health care resources or not, that are used to mitigate its effects and that can be put to alternative projects.

Despite the fact that at least 35% of people who frequently seek care in emergency room departments have a main diagnosis of anxiety (Santos Martín et al., 2000), scientific literature includes few studies that address the issue of anxiety-related costs in Spain. The objective of this study is to estimate direct medical costs and indirect costs related to anxiety in Spain during the year 2002.

## **2. METHODS AND DATA BASES**

### **2.1. Methodology for calculating costs**

A prevalence-based approach was used to estimate the cost of anxiety disorders. That means that the costs that can be attributed to the prevalence or existence of the

disease that were generated in the year 2002, including both direct medical costs and indirect costs. Direct medical costs correspond to the utilization of the health care system's resources, including costs for hospital care (psychiatric, general, and day hospitals and emergency room care), ambulatory care (outpatient and primary care consultations), and drugs. Indirect costs consist of the decrease or loss of productivity due to early death and occupational disability (temporary and permanent) attributable to anxiety. The human capital approach (Hodgson y Meiners, 1982; Max et al., 1990; Robinson, 1986) is used to calculate this item. This theory assumes that if a person leaves the labour market, his/ her employment production is lost until he/ she returns if the sick leave is temporary, or until the end of that person's working life, in the event that the sick leave is permanent. The marginal labour productivity is calculated by using gross wages (Becker, 1994; Grossman 1972 y 2000).

## 2.2. Direct medical costs

Direct medical costs have been estimated from the perspective of the National Health Care System. The information provided in the Conjunto Mínimo Básico de Datos Hospitalarios (CMBD) (Ministerio de Sanidad y Consumo, 2002) has been used to determine the volume of patient admissions in general hospitals (acute care) attributable to anxiety-related problems. The CMBD records data regarding the clinical history number, age, gender, dates of admission and discharge, and the circumstances surrounding hospitalizations, as well as the procedures performed using the coding system of the International Classification of Diseases (ICD-9-MC). It must be pointed out that this registry includes both the main diagnosis as well as secondary diagnoses related to each admission.

The method consists of identifying the total number of patients hospitalized during the year 2002 for each diagnostic code 300, 306, 308 and 313 of the International Classification of Disease (ICD-9) for anxiety and its subsequent transformation into the following Diagnostic Related Groups (DRG): 425 and 427.

Cost estimation for those patients in whom anxiety presents as a secondary diagnosis have been obtained from the Servicio Canario de la Salud (Canary Island Health Department) by calculating the differences between the mean length of hospital stays for patients with and for those without anxiety (Servicio de Evaluación y Planificación del Servicio Canario de Salud, 2004; Ministerio de Sanidad y Consumo, 2002).

The CMBD collects data from general hospitals (acute care). In order to determine the volume of anxiety-related admissions into in psychiatric hospitals (acute care and long-term hospitalization), as well as for the number of visits to the emergency room and to day hospitals, we have used data from the Estadística de Establecimientos Sanitarios con Régimen de Internado from the Instituto Nacional de Estadística [2001]. These data have been complemented with primary information from the Las Palmas de Gran Canaria catchment area of the Servicio Canario de la Salud [Programa

Insular de Rehabilitación Psicosocial, 2003], from a study conducted in the Servicio Catalán de Salud [Servicio Catalán de Salud, 2003], and from the Salamanca catchment area of the Servicio de Salud de Castilla y León (personal communication). The mean cost per emergency and day hospital visit have been obtained from the SOIKOS database (SOIKOS, 2001).

The volume of outpatient visits for specialized care (first and subsequent visits with the different professionals in the field of psychiatry, psychology and nursing) due to anxiety have been estimated on the basis of the data provided by the Servicio de Salud Mental de la Dirección General de Programas del Servicio Canario de Salud, information from the outpatient departments of mental health of the Canary Island hospitals and from data provided by the Estadística de Establecimientos Sanitarios con Régimen de Internado; these figures have then been extrapolated for all of Spain based on population. The mean cost for outpatient consultations (first and subsequent appointments with various professionals in the areas of psychiatry, psychology, and nursing) was obtained from the SOIKOS database.

The total number of visits made to healthcare centers in Primary Care for the care of patients with anxiety was obtained as the average of the figures given in several studies that have counted a total of 861,343 appointments per annum (Díaz Berenguer et al., 2004; Gisbert et al., 1999) In these studies, visits for which the main reason for consultation was anxiety accounted for 1.96% of Primary Health Care visits. Therefore, by applying the mean for these percentages of the total number of visits at the national level (a total of 217 million PC visits in Spain), we obtain the total number of visits to Primary Care in health care centers all over Spain that are imputable to anxiety. The cost of scheduled appointments with the family physician has been taken from the SOIKOS database.

The data regarding drug use by patients with anxiety has been obtained from data provided by the National Health Care System, the Direction General of Pharmacy (Dirección General de Farmacia, 2004). The main drug classes included for anxiety were the following: NO3 (antiepileptic drugs/ mood stabilizers), NO5A (neuroleptics), NO5C (hypnotics), NO5B (benzodiazepines), and NO6A (antidepressants). There are no studies in the literature that focus on assessing the percentages of each group of psychoactive drugs used in the treatment of anxiety. This information as it regards patients with anxiety has been obtained by consulting different data sources that have obtained data directly or indirectly from retrospective clinical history reviews or by extrapolating information regarding patterns of psychoactive drug use in Spain (A L Montejo et al, in press; Baca et al., 2004a y 2004b; Sociedad Española de Medicina Rural y Generalista (SEMERGEN), la Sociedad Española de Psiquiatría Biológica (SEPB) y la Sociedad Española de Psiquiatría (SEP), 2003).

### 2.3. Indirect costs (loss of labour productivity)

The concept of indirect cost is still under discussion in the field of economic evaluation. Two main questions – “what does indirect cost mean and “how should indirect cost be evaluated” – remain answered in various ways. A wider interpretation of indirect costs adds up the complete time loss due to illness (CCOHTA, 1997). However, the most common definition for indirect cost is restricted to the loss of labour productivity due to ill health.

The Human Capital (HC) approach has been the most commonly used method for measuring and evaluating productivity loss. This method assumes that when a worker leaves the labour market, his/her labour productivity is lost until the worker returns to work, in the case of temporary disability, or until the end of his/her working life, in the case of permanent disability. Wages provide a reasonable measure for assessing labour factor productivity. Despite the fact that this method has been the object of criticism (Mishan, 1971; Henriksson y Jonsson, 1998; Goeree et al., 1999), this approach is widely used because it is easy to calculate and for lacking of alternative methods<sup>1</sup>.

The wages was taken from the Encuesta de Estructura Salarial (INE, 2002a), which is given in gross figures, that is, including the base income and income supplements (personal supplements, for specific jobs, etc.), and before deducting taxes and Social Security contributions charged to the worker. Employment data were taken from the Encuesta de Población Activa (INE, 2002b).

Costs due to early mortality were estimated as the present monetary value of the flow of lost productivity along time lost as a result of the death. The HC approach states that if persons had not died prematurely they would have continued being productive for a certain number of years, until the age of retirement. These years were estimated as the difference between the legal age of retirement and the age of death. Annual wages lost due to early mortality were adjusted by employment rates by gender and age in every case of death. The adjustment is necessary because only

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<sup>1</sup> An alternative is the FC approach [Koopmanschap y van Ineveld, 1992; Koopmanschap et al.; 1995). The main idea is that workers with temporary disability can make up for lost work when they re turn to work; coworkers can re place them in urgent tasks, and non urgent tasks can be cancelled. In the case of permanent disability or early mortality the worker would be re placed by another person from the unemployed pool, filling the vacant position. In the FC model productivity loss due to temporary disability is lower than in the HC approach. In a long-term perspective, after an adjustment or “friction period,” production loss would be zero. This approach presumes that individual production lost by a sick worker is not comparable to production loss from a social point of view be cause an un used re source fills the gap (the replacement worker) (Oliva et al. 2005a).

a certain proportion of individuals of working age hold a paid job, and only in these cases should the loss of labour productivity be estimated. In order to calculate lost income (productivity, given our hypotheses), a 1% yearly increase of productivity is applied. A discount rate of 3% has been applied in order to update the figures obtained. All costs have been brought up to date for the year 2002. A detailed description of the method of estimation can be consulted in Oliva et al. (2004, 2005a, 2005b).

Temporary disability is represented by the productivity lost when individuals can not work for a limited period of time due to illness or disability. To ascertain these costs we used the number of working days lost for every employed individual.

Mortality data appear recorded in the Death Registry according to Estadística de defunciones según la Causa de Muerte (INE, 2001). The number of deaths due to anxiety disorders is very low, given that only the *basic cause of death* is recorded, that is to say, the disease or injury that put the chain of pathological events into motion that led directly to the death or the circumstances of the accident or violence that provoked the fatal injury. Anxiety is not generally listed as the basic cause of death except in very few cases.

Information about days of temporary disability (TD) was obtained from the data corresponding to patients with anxiety and who are on sick leave as a result in the entire Canary Island region (personal communication from Regional Authority). These data have been extrapolated for all of Spain, adjusting for the weight of the employed population in the Canary Islands versus the employed population for all of Spain (EPA, INE 2002b).

There is a lack of good quality data regarding individuals who incurred permanent disability. For these reason, we prefer do not estimate loss of labour productivity due to permanent disability. So, the estimation of indirect costs should be seen with caution and the values obtained can be interpreted as a conservative estimation.

### 3. RESULTS

#### 3.1. Direct medical costs

Anxiety accounted for a total of 7,276 admissions of individuals with a main diagnosis and 51,129 total stays in acute care medical facilities, with a mean hospital stay of 7 days. They also accounted for 134,905 of stays in patients with a secondary diagnosis of anxiety. Moreover, anxiety accounted for a total of 55,016 stays in psychiatric hospitals (acute care units). The number of emergency room cases amounted to 54,773. The estimated cost for hospital care, emergency room care, and day hospital visits was 58.9 million euros. Anxiety originated a total of 1,541,394 outpatient consultations in psychiatry, psychology, and nursing. The number of visits to Primary Care health care centers was calculated at 4,260,256. The estimated

cost of ambulatory consultations rose to 116.1 million euros. The drugs used to treat anxiety were distributed as follows: neuroleptics (7.7%), antidepressants (51.9%), hypnotics (4.7%), benzodiazepines (31.2%), and antiepileptics (4.5%). The total drug expenditure amounted to 194 million euros.

Direct medical costs for anxiety totaled 369 million euros; accounting for approximately 1% of public health care expenditure in Spain. The tremendous weight of drug costs is of particular interest and is the leading budget item included in direct medical costs (52.6%), followed by ambulatory costs (visits to outpatient and primary care) accounting for 31.5% of direct medical costs, and hospital costs, representing 15.9% of all health care costs.

**Table 1. Physical units, resource utilization, direct medical and non-medical (informal) costs, indirect and total costs associated with anxiety in Spain (2002)**

RESOURCE UTILIZATION	
Admissions in general hospitals (acute care)	7,276 admissions
Stays in general hospitals (acute care)	51,129 days
Mean stay in general hospitals (acute care)	7 days
Number of emergency room visits	54,773 cases
Outpatient consultations	1,541,394 consults
Primary care visits	4,260,256 consults

Source: Own elaboration

### 3.2. Indirect costs

A total of 25 deaths were due to anxiety, originating costs of 330,511 euros due to premature death. Costs due to medical leave (TD) incurred by patients with anxiety are calculated at 420.1 million euros, resulting in 8,452,464 workdays lost. All told, anxiety-related indirect costs amount to 420.44 millions of euros, with a special emphasis on temporary medical leaves (99.9% of indirect costs) (in absence of indirect costs due to permanent disability). There is virtually no cost associated with premature death, bearing in mind the scant number of deaths in Spain for which anxiety is coded as the main cause of death.

### 3.3. Total costs

The total costs of anxiety amounted to 1,326 million euros (see Table 2). The impact of indirect costs (72.2%) on total cost is particularly striking. Permanent disabilities account for 40.5% of the total cost, followed by temporary medical leave (31.7%). The third most important budget item is drugs, accounting for 14.6%, followed by ambulatory consultations (8.8% of the total cost), hospital care (4.4%), and, lastly, premature death, which was virtually zero.

**Table 2. Direct medical and non-medical (informal), indirect, and total costs associated with anxiety in Spain (2002)**

<b>DIRECT MEDICAL COSTS</b>		<b>% health care costs</b>	<b>% total cost</b>
a) Hospital care and	53,464,971	14.49%	6.77%
b) Emergencies	5,367,754	1.45%	0.68%
<b>Subtotal (hospital care)</b>			
Outpatient appointments:			
a) Outpatient consultations and	52,240,085	14.16%	6.62%
b) Primary care consultations	63,903,840	17.32%	8.09%
<b>Subtotal (outpatient consultations)</b>			
<b>Drugs</b>	194,021,087	52.58%	24.58%
<b>TOTAL DIRECT MEDICAL COSTS</b>	<b>368,997,737</b>	<b>100.00%</b>	<b>46.74%</b>
<b>INDIRECT COSTS</b>			
Premature death	330,511		0.04%
Temporary disability	420,113,593		53.22%
<b>TOTAL INDIRECT COSTS</b>	<b>420,444,104</b>		<b>53.26%</b>
<b>TOTAL COSTS</b>	<b>789,441,841</b>		<b>100.00%</b>

Monetary unit: euros (2002)

Source: Own elaboration

## 4. DISCUSSION

In recent decades, anxiety has become consolidated as an extraordinarily important social and health care issue, both in Spain and in the rest of the industrialized countries. It is very common (in terms of incidence and prevalence) and its consequences for society in terms of morbidity, economic and social costs, and quality of life justify the attention of health care authorities and society in general. This illness has an ever-growing impact on patients' social, family, and occupational environment, in terms of both direct and indirect costs.



The comparison of the results of our study with the outcomes of other studies on the cost of anxiety reveals that the distribution of direct, indirect, and total costs is similar to some of the studies recently published in the international literature. This is surprising if we take into account the fact that it is difficult to compare cost of illness studies when not all the studies use the same methodology. Furthermore, data availability varies from one country to another. This may be exceptionally important in making accurate calculations of the costs associated with extended lengths of stay, informal care (it was not possible to estimate informal care costs in our study), or indirect costs. For instance, we did not show estimation of indirect costs related to permanent disabilities. We estimated this item combining primary and secondary source of information (personal communication from Canary Island Health Authority and INSALUD). We considered that source of information are not so solid for including this estimation in the general corpus of the article. However, indirect costs due to permanent disabilities could be as high as loss of productivity due to temporary disability. In this sense, our results should be interpreted with a grain of salt and the estimation of indirect costs should be seen as a conservative estimation.

Moreover, in the valuation of health care resources, we must consider the fact that each country has different resources available, as well as health care systems that are structured differently, all of which conditions the intensity of health care and non-health care resource utilization in prevention, treatment, and patient care. Finally, we must address the problem of differences in the relative prices and total resources worldwide.

**Table 3. Total anxiety-related costs. Results from international studies**

Year of reference	Authors/year of publication	Health Care costs	Indirect Costs	Country
1990	Greenberg et al (1999)	33%	67%	USA
1990	DuPont et al (1996)	23%	77%	USA
1992	Salvador-Carulla* et al (1995)	31%	69%	Spain
1992	Salvador-Carulla ** et al (1995)	77%	23%	Spain
N/a	Souetre et al (1994)	67%	33%	France
2002	Jacobi et al	47%	53%	Germany

Source: Löthgren (2004) 1 and own elaboration

\* panic disorder (pre-diag)

\*\* panic disorder (post-diag)

We also should stress that the methodological discussion between Human Capital and Friction Cost (FC) is far to be solved in spite of FC does not have a foundation in economic theory (Liljas, 1998). Several studies following both HC and FC points of view have assessed the costs of migraine, mental illness, coronary diseases, cancer, and back and neck pain [see Oliva et al 2005a]. The main conclusion of these studies is that there are significant differences between estimation based on HC and based on FC. The differences are stronger when losses are related to mortality and permanent disability and smoother when temporary disability are considered (Oliva et al., 2005a).

In any case, there are still few economic studies addressing health and health care in Spain. This in no way contributes to developing the critical attitudes or maturity of the health care system stakeholders (politicians, managers, clinicians, citizens, and patients) that are needed when participating in priority decision-making in financing resources. A greater presence of economic studies in the area of health care should begin with cost of illness studies and then continue on to economic evaluation studies, so that cost-effective actions can be chosen that will decrease the degree of discretionary decisions in prioritizing health care program funding. For instance, a natural line to follow would be to study the costs associated with the use of different drugs on the basis of effectiveness, since some drugs may be more advantageous than others in saving direct and indirect costs, although studies of this type continue to be scarce (Wan et al., 2002).

The data available for cost estimates are limited, disperse, heterogeneous, and incomplete. These limitations are due to the deficient quality of the existing data and to information gaps. It has also been impossible to include other costs related to informal care, as well as intangibles, such as those that have to do with the lifestyle changes imposed by the treatment of illness, the chronic limitations of autonomy, impairment of patients' social and family life, etc., that influence health-related quality of life. The availability of this information would undoubtedly contribute to increasing the accuracy and the total amount of social and medical costs of patient care for individuals suffering from anxiety in Spain.

## **5. CONCLUSIONS**

The total costs of anxiety have been estimated at 789.4 million euros. Direct medical costs have been calculated at 369 million euros and account for 46.7% of the total cost. Indirect costs have been estimated at 420.4 million euros and represent 53.3% of the total cost. Direct medical costs associated with anxiety represent 1% of all expenditure of the National Health Care System for the year 2002 in Spain.

This paper aims to contribute to the incorporation of economic information in the field of health care. As elsewhere (Ministry of Health of Netherlands, 1993), cost of illness studies should serve to aid in establishing priorities between the various health problems and needs in Spain.

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