

## Costs and Offset Effect in Panic Disorders

L. SALVADOR-CARULLA, J. SEGUÍ, P. FERNÁNDEZ-CANO and J. CANET

**Background.** The study is aimed at assessing the costs before and after the diagnosis and the provision of effective treatment for panic disorder (PD), and the offset effect related to the psychiatric encounter.

**Method.** A 24-month prepost design was used to collect data on clinical status and health care services utilisation in a natural environment. The 61 PD patients' assessment included the SCID-UP, ratings on general functioning, improvement, severity of symptoms and level of disability. All health care services used and lost workdays were recorded.

**Results.** Both sociodemographic characteristics and the outcome show that this was a standard group of PD patients, who received effective treatment for their condition. The total direct costs of health care use during the previous year and the year after the diagnosis were, respectively, US\$ 29 158 and US\$ 46 256. The indirect costs of lost productivity were US\$ 65 643 in period I and US\$ 13 883 in period II.

**Conclusions.** A strong offset effect (94%) has been found in this study, significantly greater than the one described for psychiatric disorders as a whole. The costs of nondiagnosis are usually overlooked when estimating the global costs of PD. Methods for improving early detection of PD may substantially reduce the costs incurred before diagnosis.

The contribution of anxiety disorders to the overall costs of mental illness has been largely overlooked. The World Bank Report (1993) underlined the importance of neuropsychiatric diseases as the second morbidity burden due to non-infectious diseases in 1990, but it did not include anxiety disorders in the analysis. On the other hand, a recent report estimates that anxiety disorders account for 31.5% of the total costs of mental illness in the USA; while schizophrenia accounts for 20.5%, and mood disorders for another 22% (Rice & Miller, 1993).

Panic disorders (PD) are characterised by a long duration of the disease before the psychiatric encounter, intense somatic symptoms, and high levels of disability and comorbidity. As a consequence, subjects with PD frequently show significant help seeking behaviour, health care utilisation, and also an impairment both at work and in their general functioning. The use of out-patient mental health services is considered as high or higher than that experienced by patients with any other psychiatric diagnosis (Boyd, 1986); the pervasive social and health consequences of PD have been described as similar to or greater than those associated with major depression (Markowitz *et al*, 1989). Furthermore, patients with panic attacks not meeting full criteria of PD also show high service utilisation and impairment in occupational functioning (Klerman *et al*, 1991). Edlund & Swann (1987) analysed the extent of the disabilities of 30 PD patients studied over a period of

four months. They found complete incapacity to work for at least one month in 43% of their sample, while 37% had either lost or left their work as a result of their condition. Siegel *et al* (1990) estimated that individuals with PD visit medical facilities seven times more frequently than the general population does. Twice as many lost workdays were reported for full-time workers with panic compared to the general population. In spite of this, the available literature on the economic aspects of the disease is scarce and the costs related to nondiagnosis are rarely considered in the global estimates.

There is evidence that providing psychiatric care for mentally ill persons subsequently reduces the use of non-psychiatric services, a phenomenon known as the offset effect. A number of studies have addressed the changes in health care utilisation and their associated costs following the initiation of mental health treatment (Hankin *et al*, 1983; Mumford *et al*, 1984; Borus *et al*, 1985; Holder & Blose, 1987a; Holder & Blose, 1987b; von Korff *et al*, 1990; Levenson *et al*, 1992). Researchers have reported offset effects ranging from a 5% decrease in out-patient visits to an 85% decrease in hospital days of stay (Hankin *et al*, 1983), but they do not provide data on the offset effect related to specific conditions such as PD.

The present study is aimed at assessing this offset effect and the costs of PD before and after psychiatric diagnosis and treatment in a new psychiatric out-patient unit in a Comprehensive

Medical Plan (CMP) based in Barcelona (Spain). The perspective in this study is that of society, independently of who pays the costs (the CMP, the social security system or the patient). Only health care expenditure and the productivity lost due to disability are taken into account.

## Method

### Setting

La Alianza is the main CMP in Catalonia (one of the 17 autonomous regions of Spain), with more than 220 000 associates. Health insurance covers psychiatric care, but it does not include psychological treatment. In contrast with other specialities, psychiatric treatment was provided either by external psychiatrists under agreement or by other physicians until February 1991, when a psychiatry unit was opened in its main facility, the Hospital Central de La Alianza, in Barcelona.

### Data collection

During the first six months that the psychiatric unit was functioning (1 March 1991 to 31 August 1991), 86 patients received a DSM-III-R diagnosis of PD. Sixty-one (71%) completed a 12-month treatment and were selected for this study. A 24-month prepost design was used for collecting data on clinical and health care services utilisation. Data for period I (12 months prior to the first visit to the psychiatric unit) were obtained retrospectively from the patient and data for period II (12 months after the first visit) were gathered prospectively. Although 14 subjects reported previous encounters with other psychiatrists, none of them referred a previous formal diagnosis of PD. All the patients were interviewed, followed up and treated by a single experienced psychiatrist. The reliability of a patient's recall on service utilisation was assessed by cross-checking the EEG tests performed at the neurology unit during period I with the patient's report. An overall agreement of 93.5% was observed (unweighted kappa: 0.87). Apart from the questionnaire on service utilisation, the assessment included: a semi-structured interview in period I (SCID-UP), and ratings on general functioning (GAF), improvement (Visual Analogue Scale (VAS)) for the therapist and for the patient, severity of symptoms and level of disability (Hamilton's anxiety and depression scales, Marks and Matthews' Fear scale and Panic-Associated Symptom Scale (PASS)). The Spanish versions of these scales were administered at the end of every period. The general ratings were also completed by an experienced clinical psychologist at the end of period II.

All health care services used by the 61 patients, and the 29 working patients' lost workdays during both periods were recorded on the economic data sheet. For all items, the difference in units between periods I and II was multiplied by the unit price in 1992 values, so that discounting was not necessary. The reference point was set at the first visit to the unit and not at the final diagnosis of PD or at the first treatment event, so all diagnostic expenditures incurred after referral fell in period II.

Among all direct costs occasioned by PD, only health care expenses were estimated here, due to the difficulty in the calculation of personal and travel costs, and family or other social services and their relative weight. The excess costs derived from the comorbidity of other medical disorders were not included in this analysis. The health care expenses considered here are those incurred by: (a) therapeutic visits, (b) hospitalisation, (c) laboratory and diagnostic tests, (d) medication and (e) alternative medicine. The 1992 market price was used in order to assign monetary values to items a-c. The prices used are the official rates of the Barcelona Medical Association (BMA) for 1992. This is a fee negotiated between the BMA and the association of private health care providers in Barcelona. For target estimation, a 75% level has been chosen (see statistical analysis below). In the case of medication, retail prices have been used, since from the global perspective of society, it is secondary whether payment is made by social security or the patient. For contacts with alternative medicine, the price reported by the patient has been assigned. Among all the indirect costs of PD, only the lost workdays are counted in this study, and therefore only the working population has been analysed. This restrictive option has been chosen due to the difficulty in gauging a decrease in those activities without a defined schedule and intensity (for example house-keeping), even though their indirect costs might be as high as those of the working population. Subsequently, decreased work productivity and loss of higher incomes because of PD in the working population are not measured here. To estimate the costs derived from absenteeism, sporadic lost workdays were divided by 20 to be converted into months, while registered sick leave was divided by 30. The per capita gross income of Catalonia for the first quarter of 1992 has been used (official data from Spain's Instituto Nacional de Estadística); excluding the contribution to the social security system (US\$ 1796). It is assumed that the population studied is quite homogeneous from the socio-economic standpoint.

### Statistical analysis

Non-parametrical statistics were used for analysing the clinical data. An unweighted kappa analysis of concordance was used for calculating the reliability of patients' recall on EEG tests performed during period I. A sensitivity analysis was carried out to enhance confidence in the results on economic data. The official BMA fees include several levels of reimbursement, ranging from 50 to 100%, depending on the provider. Although wide-ranging, these were chosen as the limits for the sensitivity analysis. The variables included are: (a) number of medical visits, diagnostic tests and the medication in period I (90–110% of the referred number); and (b) charges for medical visits and laboratory tests (50–100% of the BMA official fee).

### Results

No major demographic or clinical differences were found between the 25 cases that did not complete the follow-up period and the 61 patients of the sample. Their respective ages were  $39.2 \pm 15$ , and  $42 \pm 13.2$  (mean  $\pm$  s.d.). The group lost at follow-up had a greater proportion of women (20/25 v. 42/61 of completers), and more working subjects (15/25 v. 29/61 of completers), although these differences were not significant.

### Clinical results

The mean age of onset of PD was  $32.2 \pm 13.1$  (range 12–71). The years passed since the first episode were  $10.3 \pm 11.9$  (0.1–63). The frequency of panic attacks during the previous month was high ( $15.9 \pm 19.4$ ; 0–90). Sixteen patients (26.2%) had PD without agoraphobia, 22 (36%) had limited avoidance and 23 (37.7%) had extensive avoidance. Psychiatric comorbidity was significant. Twelve patients (21.3%) fulfilled DSM–III–R criteria for alcohol abuse/dependence, and 30 patients (49.1%) presented a mood disorder. Dysthymia was diagnosed in 17 patients (27.8%), and major depression in 12 (19.6%). Nine patients (14.7%) had a dual diagnosis of obsessive–compulsive disorder, and seven (11.4%) of social phobia. Generalised anxiety was observed in 36 patients (59%). The treatment was decided according to the clinician's own criteria. Behaviour therapy was the only treatment provided in two cases (in one of them after the patient abandoned a combined treatment with alprazolam and clomipramine, and refused any other psychopharmacological treatment). The other 59 patients were treated with psychotropic drugs. A maximum dose was reached during the first

two months of treatment, continuing with a lower maintenance dose given for at least six months, and up to one year. The drug of choice most frequently prescribed was alprazolam, either alone or associated with antidepressants.

The following parameters were considered for assessing outcome at the end of period II: frequency of panic attacks during the previous month, general functioning, and ratings for improvement from the patient and from the physician. According to these, 41 patients (67.2%) showed a complete remission of PD or mild symptoms but no significant disability (during the previous month, one patient experienced a panic attack and another had two such attacks, but they were not associated with anticipatory anxiety or to any problem in general functioning). Twelve patients (19.6%) showed partial remission, and eight patients (13.1%) experienced little or no improvement after one year of treatment. The mean ratings in several clinical scales for period I and II are shown in Table 1. The full analysis of the clinical data exceeds the purpose of this paper and will be given at the completion of a two year follow-up period.

### Health service utilisation and costs

The number of visits to general practitioners and specialists other than a psychiatrist was reduced from 313 in period I to 15 in period II, the most frequently used in period I being: general practitioners (136 visits), neurologists (79), cardiologists (32), GI

Table 1  
Clinical status at the first psychiatric encounter (I) and after 12 months of treatment (II) in a sample of patients with panic disorder

Rating scales <sup>1</sup>	I <sup>2</sup>	II <sup>2</sup>	Wilcoxon assigned rank for ordinal variables
Panic attacks (last month)	15.9 $\pm$ 19.4	0.5 $\pm$ 1.7	z = 6.5*
GAF	53.6 $\pm$ 6.6	79.2 $\pm$ 13	z = 6.6*
PASS	16.6 $\pm$ 6.6	3.1 $\pm$ 5.2	z = 6.7*
M & MFS			
total	30.1 $\pm$ 23.6	7.4 $\pm$ 15.6	z = 6.4*
agoraphobia	17 $\pm$ 15.2	3.7 $\pm$ 8.1	z = 5.3*
HAM-D	20 $\pm$ 7.5	3.5 $\pm$ 5.7	z = 6.6*
HAM-A	26.8 $\pm$ 7.1	5.3 $\pm$ 6.9	z = 6.7*
VAS			
(none = 0/all = 10)			
physician	–	7.5 $\pm$ 2.4	–
patient	–	7.6 $\pm$ 2.4	–

1. GAF: Global Assessment of Functioning; PASS: Panic-Associated Symptom Scale; M & MFS: Marks & Matthews' Fear Scale; HAM-D: Hamilton's Depression Scale; HAM-A: Hamilton's Anxiety Scale; VAS: Visual Analogue Scale.

2. Mean  $\pm$  s.d. \*P < 0.001.

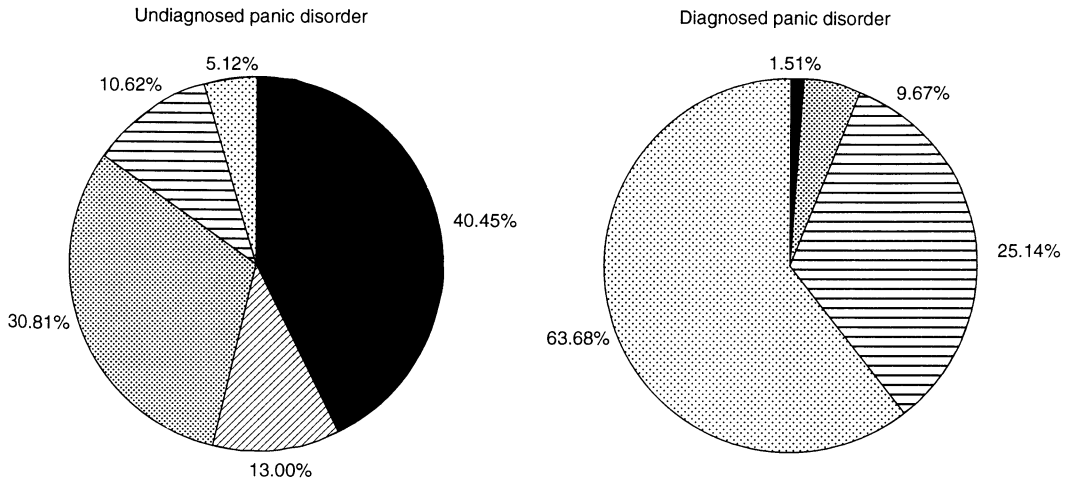


Fig. 1 Direct costs distribution in 61 patients with panic disorder before (period I) and after diagnosis (period II). (Alternative medicine is not included.) ■ Medical visits; ▨ Hospitalisation; ■ Laboratory; ▤ Drugs; ▩ Psychiatric visits.

specialists (29) and otorhinolaryngologists (27); and cardiologists (5), GI specialists (4) and general practitioners (4), in period II. The number of visits to emergency services decreased from 75 to 7. These figures represent a total of 6.4 non-psychiatric visits per patient during period I, compared to 0.4 during period II. These results show a remarkable offset effect (94% decrease in utilisation). On the contrary, the number of psychiatric visits grew from 40 to 793, as a result of the psychiatric diagnosis and subsequent treatment of PD.

There were three hospitalisations due to PD in period I, amounting to 22 nights of stay. There were no hospitalisations in period II. Standard blood tests, chest X-ray, EKG and thyroid hormones analyses were ordered routinely at the moment of diagnosis for those patients who had not been so analysed in period I. The number and variety of diagnostic tests decreased dramatically in period II. As an example, there were 6 CT scans, 31 EEGs, 10 full audiometry tests, and one bronchoscopy in period I, versus only one CT scan and no EEGs, audiometries or bronchoscopies in period II.

#### Pharmaceutical costs

The expenses in pharmaceuticals during period II were larger than in period I. Only two products (alprazolam and clomipramine) accounted for US\$ 10 112 during period II. As in the case of

medical visits, the type of medication varied from period I to period II in favour of psychotropic drugs adequate for PD (alprazolam, tricyclic antidepressants, MAOI). Medication during period I comprised a variety of drugs, including a whole range of psychotropics; but also analgesics, vitamins, anti-emetics, antivertigo and other agents which are not effective PD treatments.

Patients reported three visits for acupuncture and no visits to chiropractors. The patients' accounts of visits to healers and other paramedical settings were considered to be highly unreliable and are not taken into account here.

#### Workdays lost

The working population (29 patients) reported 31 sporadic workdays lost during period I, versus 28 in period II; registered sick leave was 1050 and 190 days, respectively. The indirect costs for lost productivity were calculated as US\$ 52 924 for period I and US\$ 11 193 for period II. One patient lost his job during period I, although this was not included in the cost analysis. Another patient reported a substantial decrease in earnings during the same period.

#### Direct costs

The direct costs are shown in Table 2. Prices have been converted into dollars at the exchange rate of 105 pesetas per one dollar (average exchange rate for

1992). The direct costs during period I and period II were, respectively, US\$ 29 158 and 46 256 (average costs per patient: \$478 in period I and \$758 in period II). The total direct costs were \$17 100 greater in period II than in period I, mostly due to the expenses of psychiatric visits and medication. The average direct costs in the 41 patients in remission at the end of period II were \$417 (359–438).

The indirect costs of lost productivity were \$65 643 in period I and \$13 883 in period II. The indirect costs were \$51 759 lower in period II (Salvador-Carulla *et al*, 1994).

**Discussion**

The methodology for the assessment of health service utilisation and costs of mental illness has been the subject of intense discussion. Aspects of this study can be criticised, such as the time set for the data collection, the analysis of the index month, the inclusion of completers only, the retrospective data collection for period I, the values assignment, and the use of the human capital approach for calculating indirect costs. These potential biases of the present design are examined elsewhere (Salvador-Carulla *et al*, 1994).

The demographic characteristics of this sample are comparable to those referred to in other follow-up studies (Noyes *et al*, 1990; Keller & Baker, 1992). This is also the case for the percentage and severity of avoidance restriction (Noyes *et al*, 1990), and for the comorbidity associated with PD (Breier *et al*, 1986; Klerman, 1992; Lepine *et al*, 1993). The patients experienced a range of recovery comparable to other studies (Noyes *et al*, 1990; Keller & Baker,

1992; Klerman, 1992; Mavissakalian & Perel, 1992). The sample studied in this natural environment was a standard group of PD patients, and the treatment approach provided effective results according to outcome standards. At the end of period II, a significant improvement in the quality of life of the patients is suggested by the decrease in the number of panic attacks, the number of symptoms related to PD and the level of restriction due to agoraphobia. The patients showed a better general functioning and a considerable subjective improvement.

A strong offset effect (94%) has been found in this study. This is significantly greater than the one described for general psychiatric disorders (Hankin *et al*, 1983; Borus *et al*, 1985). It may be due to the physical symptoms of PD, to the help seeking behaviour shown by these patients and to the lack of suitable knowledge about this condition among the physicians in our environment. The latter factor may be particularly important in this study, as the data were collected in a new psychiatric unit.

Without proper diagnosis and treatment, PD patients show a high utilisation of non-psychiatric services that is largely inefficient, as it is not accompanied by clinical improvement. These costs, partly related to misdiagnosis, must be considered when estimating the global burden due to PD. On the other hand, the provision of adequate care causes an increase in expenditure due to psychiatric visits and medication, but reduces the overall costs when absenteeism is considered. This factor has to be added to the improvement in the clinical condition and the quality of life of the patient. A better knowledge of PD may reduce the use of

Table 2  
Health Care Service (HCS) and direct costs in a sample of 61 patients during the 12 months prior to (I) and the 12 months after (II) the psychiatric encounter

Type of HCS	Units of HCS			Unit price <sup>1</sup>	Direct costs			Cost range <sup>2</sup>
	I	II	Difference		I	II	Difference	
1. Medical visits								
Non-psychiatric	388	22	366	-	11 738	699	11 039	6577 to 16 285
General practitioner	136	4	132	257	3495	103	3394	1639 to 4032
Specialists	177	11	166	314	5557	345	5217	2509 to 6217
Emergencies	75	7	68	357	2678	250	2428	1440 to 3595
Psychiatric	40	793	-753	371	1484	29 420	-27 968	-18 745 to -37 093
2. Days in hospital	22	0	22	1714	3771	0	3771	3771 to 3771
3. Laboratory	328	188	NA	NA	8938	4472	4466	2382 to 7147
4. Medication	NA	NA	NA	NA	3082	11 631	-8551	-8858 to -8243
5. Alternative medicine	3	0	3	476	143	0	143	143
Total							-17 100	-14 730 to -17 990

1. Prices and costs have been converted into U.S. dollars. Items 1 & 3 at 75% of BMA fee. Others at 100% of price. NA: not applicable.  
2. Includes sensitivity analysis: Price for items 1 & 3, 50–100% of BMA fee; Units in period I for items 1, 3 & 4: 90–110% of BMA fee.



non-psychiatric services and their associated costs prior to the psychiatric encounter. Providing standard training on PD for general practitioners and selected specialists such as neurologists or cardiologists may play a key role in reducing the costs induced by PD.

### References

- BORUS, J. F., OLENDZKI, M. C., KESSLER, L., *et al* (1985) The "Offset Effect" of mental health treatment on ambulatory medical care. Utilization and charges. *Archives of General Psychiatry*, **42**, 573–580.
- BOYD, J. H. (1986) Use of mental health services for the treatment of panic disorder. *American Journal of Psychiatry*, **143**, 1569–1574.
- BREIER, A., CHARNEY, D. S., HENINGER, G. R. (1986) Agoraphobia with panic attacks. *Archives of General Psychiatry*, **43**, 1209–1036.
- EDLUND, M. J. & SWANN, A. C. (1987) The economic and social cost of panic disorders. *Hospital and Community Psychiatry*, **38**, 1277–1280.
- HANKIN, J. R., KESSLER, L. G., GOLDBERG, I. D., *et al* (1983) A longitudinal study of offset in the use of nonpsychiatric services following specialized mental health care. *Medical Care*, **21**, 1099–1110.
- HOLDER, H. D. & BLOSE, J. O. (1987) Changes in health care costs and utilization associated with mental health treatment. *Hospital and Community Psychiatry*, **38**, 1070–1075.
- & ——— (1987) Mental Health Treatment and the Reduction of Health Care Costs: A Four-Year Study of US Federal Employees' enrollment with the Aetna Life Insurance Company. *Advances in Health Economics and Health Services Research*, **8**, 157–174.
- KELLER, M. B. & BAKER, L. A. (1992) The clinical course of panic disorder and depression. *Journal of Clinical Psychiatry*, **53** (suppl.), 5–8.
- KLERMAN, G. L. (1992) Treatments for panic disorder. *Journal of Clinical Psychiatry*, **53** (suppl.), 14–19.
- , WEISMANN, M. M., OUELLETTE, R., *et al* (1991) Panic attacks in the community. *Journal of the American Medical Association*, **265**, 742–746.
- LEPINE, J. P., CHIGNON, J. M. & TEHERANI, M. S. (1993) Suicide attempts in patients with panic disorders. *Archives of General Psychiatry*, **50**, 144–149.
- LEVENSON, J. L., HAMER, R. M. & ROSSITER, L. F. (1992) A randomized controlled study of psychiatric consultation guided by screening in general medical in-patients. *American Journal of Psychiatry*, **149**, 631–637.
- MARKOWITZ, J. S., WEISSMAN, M. M., OUELLETTE, R., *et al* (1989) Quality of life in panic disorder. *Archives of General Psychiatry*, **46**, 984–992.
- MAVISSAKALIAN, M. & PEREL, J. M. (1992) Clinical experiments in maintenance and discontinuation of imipramine therapy in panic disorder with agoraphobia. *Archives of General Psychiatry*, **49**, 318–323.
- MUMFORD, E., SCHLESINGER, H. J., GLASS, G. V., *et al* (1984) A new look at evidence about reduced cost of medical utilization following mental health treatment. *American Journal of Psychiatry*, **141**, 1145–1158.
- NOYES, R. Jr, REICH, J., CHRISTIANSEN, J., *et al* (1990) Outcome in panic disorder. Relationship to diagnostic subtypes and comorbidity. *Archives of General Psychiatry*, **47**, 809–818.
- RICE, D. P. & MILLER, L. S. (1993) The economic burden of mental disorders. *Advances in Health Economics and Health Services Research*, **14**, 37–53.
- SALVADOR-CARULLA, L., SEGUI, J., FERNANDEZ-CANO, P., *et al* (1994) Assessment of costs distribution and cost-offset after diagnosis of panic disorders. In *Current Therapeutic Approaches in Panic and other Anxiety Disorders* (eds G. Darcourt, J. Mendlewicz, G. Racagni, *et al*), pp. 61–70. International Academy of Biomedicine and Drug Research. Basel: Karger.
- SIEGEL, L., JONES, W. C. & WILSON, J. O. (1990) Economic and life consequences experienced by a group of individuals with panic disorder. *Journal of Anxiety Disorders*, **4**, 201–211.
- VON KORFF, M., KATON, W. & LIN, E. (1990) Psychological distress, physical symptoms, utilization and the cost-offset effect. In *Psychological Disorders in General Medical Settings* (eds N. Sartorius, D. Goldberg, G. de Girolamo, *et al*), pp. 159–169. Toronto: Hogrefe and Huber.
- WORLD BANK (1993) *World Development Report 1993*. Washington: Oxford University Press.

**L. Salvador-Carulla**, MD, University of Cadiz; **J. Seguí**, MD, Hospital de La Alianza, Barcelona; **P. Fernandez-Cano**, PhD, Regional Government of Castilla-La Mancha, Toledo; **J. Canet**, PhD, Centro de Psiquiatria y Psicologia, Barcelona, Spain

**Correspondence:** Luis Salvador-Carulla, Associate Professor of Psychiatry, Facultad de Medicina, Universidad de Cádiz, Pza. Fragela s/n, 11003-Cádiz (Spain)