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Research report

The cost of depression – A cost analysis from a large database

Katja Kleine-Budde [a,*], Romina Müller [a], Wolfram Kawohl [a,b], Anke Bramesfeld [a,c], Jörn Moock [a,1], Wulf Rössler [a,b,d,1]

[a] Leuphana University of Lüneburg, Innovation Incubator, Competence Tandem PsychNetwork, 21335 Lüneburg, Germany
[b] Department of General and Social Psychiatry, Psychiatric University Hospital, University of Zurich, Zurich, Switzerland
[c] Hanover Medical School, Institute Epidemiology, Social Medicine and Health System Research, Hanover, Germany
[d] Collegium Helveticum, A Joint Research Institute between the University of Zurich and the Swiss Federal Institute of Technology, Zurich, Switzerland

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ABSTRACT

Background: Depression poses a serious economic problem. We performed a cost-of-illness study using data from a German health insurance company to determine which costs are unique to that disease.
Methods: The analysis included every adult and continuously insured person. Using claims data from 2007 to 2009, we calculated the costs incurred by persons with depression, including services provided for inpatient and outpatient care, drugs and psychiatric outpatient clinics. Subgroup analyses were done using demographic and disease-specific variables. Longitudinal predictors of depression-related costs were obtained through a generalized estimating equations (GEE) analysis.
Results: This investigation involved 117,220 persons. Mean annual depression-specific costs per person were €458.9, with those costs decreasing over the study period. The main cost component (43.9% of the total) was inpatient care. It was found that persons with a severe course of disease and unemployed persons are more costly than other persons. The GEE analysis revealed that gender, age, residency within an urban area, occupational status and the type of diagnosis had a significant impact on these costs.
Limitations: Due to data constraints, we were unable to include all cost categories that might be related to depression and we had no control group of persons without depression.
Conclusions: Due to the influence of the severity of the disease on costs, effective treatment strategies are important in order to prevent a progression of the disease and an increase in costs.

1. Introduction

At any given time, depression affects about 6 to 12% of the German population (RKI, 2009, 2010). With a lifetime prevalence of 14% in Europe (Wittchen and Jacobi, 2006) it is the most common psychiatric illness among adults. According to the World Health Organization, depression is responsible for 12.4 YLDs (years lived with disability) in Europe (WHO, 2012a). Furthermore, it is the main cause of disability, ranking fourth on a list for the global burden of diseases. By 2020, this illness may rank second (WHO, 2012b).

Depression not only causes personal suffering but also poses a serious economic problem. First, because this chronically recurring disease generally affects each sufferer more than once, it requires constant treatment, which leads to immense costs for the health care system. Second, depression is responsible for an increasing number of lost work days (RKI, 2010). Absence from one's job and early retirement result in high costs for the entire society.

Cost-of-illness (COI) studies, which assess the economic burden of a disease, could be a useful instrument for policy decision-making. Total costs could be broken down into direct and indirect costs. Direct costs include all medical (e.g., inpatient and outpatient care, pharmaceuticals) and non-medical expenses (e.g., transportation). Indirect costs are the sum of all those attributable to productivity losses due to morbidity or mortality. The aim and perspective of a COI study determine its relevant cost categories, with the most frequent taking either a payer or societal perspective (Drummond et al., 2005; Tarricone, 2006).

For Germany, COI studies and general information about treatment costs are scarce. To our knowledge, only a few such investigations have been conducted there. Friemel et al. (2005)

* Correspondence to: Leuphana University of Lüneburg, Rotenbleicher Weg 67, 21335 Lüneburg. Tel.: +49 4131 677 7714; fax: +49 4131 677 7601.
E-mail addresses: kleine-budde@inkubator.leuphana.de (K. Kleine-Budde), romina.mueller@inkubator.leuphana.de (R. Müller), wolfram.kawohl@puk.zh.ch (W. Kawohl), anke.bramesfeld@inkubator.leuphana.de, bramesfeld.anke@mh-hannover.de (A. Bramesfeld), joern.moock@inkubator.leuphana.de (J. Moock), roessler@dgsp.uzh.ch (W. Rössler).
[1] Both authors contributed equally.

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calculated the costs of persons with depression and dysthymic disorder at €686 per person and year in 2002. Salize et al. (2004) estimated depression-specific costs of €2073 per person and year in 2001. When Luppa et al. (2008) examined the expenses associated with depressed elderly people (60+) in Germany, they found that treatment costs exceeded the mean costs for non-depressed people by one-third, i.e., €5241 versus €3648. Only one study used routine data to analyze the costs of depression. There, Stamm et al. (2010) reported that the long-term costs to care for depressed persons, from a payer perspective, were €2380 per person and year.

The Federal Statistical Office in Germany evaluates the burden of specific diseases on the basis of aggregated data. Those calculations in 2008 showed that depression cost 5233 million Euros. The cost distribution revealed that the largest portion (55.3%) went toward inpatient care, with another 19.2% of the total being used for drugs and 15.1% being attributed to outpatient services. Furthermore, 210 years out of 1000 years of employment were lost due to depression (Federal Statistical Office, 2012).

The international literature includes research with greater detail about the costs associated with depression. For example, Luppa et al. (2007) have presented a systematic review of 24 studies, with the majority coming from Anglo-American countries. There, the mean costs for depression-specific treatment range from $1345 to $2746 per year, with excess costs of $1076 to $5871.

Despite the high investment put toward treatment, depression remains one of the most important diseases. Because of its major influence on society and the health care system, its prevalence reinforces the need for more complete information about its burden. No previous estimates have been made about depression-specific costs in Germany from the payer perspective. The outcomes of our study are intended to close this gap. In addition to that main goal, a second objective was to assess the distribution of various categories for depression-specific costs so that we could determine which category was most responsible for those costs. We also looked for possible influence factors. Our third objective was to perform subgroup analyses and compare costs among different kinds of persons. Because of the large sample size, we were able to make a detailed evaluation of socioeconomic and disease-specific factors.

Finally, we sought to identify the cost distribution in the outpatient sector among different physician groups. Because general practitioners in particular diagnose and treat older persons for depression without referring them to a mental health specialist, we wanted to identify the costs linked to such treatment by physicians who do not specialize in psychiatric care.

2. Methods

2.1. Study design and data source

This study was a retrospective analysis using electronic health-insurance claims data from AOK Plus, a German statutory health insurance company. With a headquarter in eastern Germany, the majority of its 2,868,000 insures (on 01 January 2007) live in Saxony and Thuringia. These data, from January 2007 to December 2009, were for every insured person who had a diagnosis of bipolar disorder, depression or persistent mood disorder (International Classification of Diseases, 10th revision, ICD-Codes F31.0-F34.9) during that three-year period, either in inpatient or outpatient care. This database included about 400,000 persons.

Different datasets were retrieved for analysis. These included diagnoses and settled costs for inpatient and outpatient care, information about drugs and settled costs for psychiatric outpatient clinics and other service providers (e.g., physiotherapy). The information within the datasets covered every day of treatment, except the data on outpatient care. Data on outpatient care was given on a quarterly basis. Additional information was provided concerning personal characteristics of the insured persons regarding their age, gender, residential region, type of insurance and period of coverage.

2.2. Selection criteria

Included in the analysis was every adult and continuously insured person diagnosed in all three years with depression (ICD-Codes F32.0-F32.3, F32.8, F32.9, F33.0-F33.3, F33.8, F33.9), in either outpatient or inpatient care (here only discharge diagnoses were considered). To ensure that persons diagnosed only once in a year did not distort the results, we adopted a validation strategy. A person was included in the analysis if at least one of the following conditions was fulfilled:

- Depression was diagnosed by two or more physicians within the same quarter in outpatient care,
- Depression was diagnosed within one quarter in inpatient and outpatient care,
- Depression was diagnosed in two succeeding quarters either in inpatient and/or outpatient care.

2.3. Definition of cost variables

Depression-specific costs were defined as the sum of all claims that could be attributed to this diagnosis or which were directly related to its treatment. We considered four relevant resources: outpatient care, inpatient care, drugs and psychiatric outpatient clinics. Excluded were services from other providers such as physiotherapists because they were not linked with a diagnosis. Thus, we could not ensure that such a service had been prescribed strictly because of depression.

Costs for outpatient services in Germany are charged according to the official German Remuneration Scheme for Out-Patient Care (EBM). Every medical treatment is assigned a certain number of EBM points. To calculate those costs within our study, the sum of the EBM points was multiplied by 3.5048 Euro-cents, which reflected the value of a single point. This total was then added to additional costs, in Euros (such as postal communications). Outpatient costs were divided into those for mental health specialists, psychological psychotherapists, general practitioners and other specialists. The settled costs for mental health specialists and psychological psychotherapists were included, in total, when they diagnosed depression within the respective quarter. If a general practitioner or another specialist diagnosed a case of depression, the calculated costs (see above) were weighted by a ratio of the number of depression diagnoses to all other diagnoses.

The costs for inpatient care were fully considered when the discharge diagnosis was depression. To compute pharmaceutical costs, all prescribed drugs with the anatomical therapeutic chemical (ATC) classification system code of N06A (antidepressants) were included. Psychiatric outpatient clinics provide care between inpatient and outpatient care, supporting the standard practice either through aftercare or with psychiatric and psychotherapeutic services not available from residential doctors. Because this care is directly connected to mental illnesses, we included it in full.

All calculations were made from a payer perspective, stipulated as per person per year. Costs were not inflated but, instead, reflected the costs for a given year.