Research report

Economic costs of social phobia: A population-based study

C. Acarturk,⁎ Filip Smit, R. de Graaf, A. van Straten, M. ten Have, P. Cuijpers

Vrije Universiteit Amsterdam, Dept. Clinical Psychology, Amsterdam, The Netherlands
Netherlands Institute of Mental Health and Addiction, Utrecht, The Netherlands

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Abstract

Background: Information about the economic costs of social phobia is scant. In this study, we examine the economic costs of social phobia and subthreshold social phobia.

Methods: Data were derived from the Netherlands Mental Health Survey and Incidence Study (NEMESIS) which is a population-based prospective study (n=4,789). Costs related to health service uptake, patients’ out-of-pocket expenses, and costs arising from production losses were calculated for the reference year 2003. The costs for people with social phobia were compared with the costs for people with no mental disorder.

Results: The annual per capita total costs of social phobia were €11,952 (95% CI=7,891-16,013) which is significantly higher than the total costs for people with no mental disorder, €2957 (95% CI =2690–3224). When adjusting for mental and somatic comorbidity, the costs decreased to €6,100 (95% CI=2681–9519), or 136 million euro per year per 1 million inhabitants, which was still significantly higher than the costs for people with no mental disorder. The costs of subthreshold social phobia were also significantly higher than the costs for people without any mental disorder, at €4,687 (95% CI=2557–6816).

Limitations: The costs presented here are conservative lower estimates because we only included costs related to mental health services.

Conclusions: The economic costs associated with social phobia are substantial, and those of subthreshold social phobia approach those of the full-blown disorder.

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Keywords: Social phobia; Cost of illness; Economics; Service use

1. Introduction

Social phobia is characterized by a persistent fear of negative evaluation or scrutiny by others in social or performance situations (APA, 1994). Population studies indicate that social phobia is one of the most prevalent psychiatric disorders (Kasper, 1998; Kessler et al., 1994; Furmark et al., 1999). It is associated with huge losses in quality of life (Witcchen et al., 2000; Acarturk et al., 2008), serious functional impairment in various domains of life (Schneier et al., 1994) and high levels of service use (Magee et al., 1996). This debilitating mental disorder is also associated with increased
economic costs (Patel et al., 2002; Andlin-Sobocki et al., 2005). Previous research indicated that people with social phobia experience increased financial dependency (Schneier et al., 1992; Leon et al., 1995), reduced work productivity (Kessler and Frank, 1997; Wittchen et al., 2000; Wittchen and Beloch, 1996), high levels of unemployment (Patel et al., 2002; Wittchen and Beloch, 1996), absenteeism from work (Lecrubier et al., 2000; Wittchen and Beloch, 1996), and use of prescribed medication (Patel et al., 2002).

Despite these indications of the burden of social phobia, the economic cost of this disorder in the general population is less well studied (Patel et al., 2002; Löthgren, 2004; Greenberg et al., 1999; Smit et al., 2006; Konnopka et al., 2009). The only study that to our knowledge has specifically examined the economic costs of social phobia states that people with social phobia have significantly more GP contacts and they use significantly more prescribed oral medication compared to the not mentally disordered population (Patel et al., 2002). However, to understand the overall economic burden of social phobia, more research in this area is needed.

Social phobia often occurs together with other psychiatric disorders (Lecrubier et al., 2000). This co-morbidity leads to increased disability, lower quality of life (Wittchen et al., 2000) and higher economic costs (Patel et al., 2002). It is clear that if the costs of co-morbid disorders are included in calculating the burden of social phobia, that this burden will be overestimated. On the other hand, since co-morbidity is so common in social phobia, these extra costs cannot be ignored either (Greenberg et al., 1999). Therefore, it is important to take these co-morbid disorders into account when calculating costs for social phobia.

The present study firstly aims to examine whether social phobia is associated with significantly increased medical and non-medical costs compared to no mental disorder. This is performed in a large, representative, sample of the Dutch population. Secondly, we examine how the economic costs of social phobia are broken down according to the distinct types of social fears. Earlier research has documented that social fears other than the speaking fears are related to higher disease burden (Kessler et al., 1998). However, no previous study has investigated the relationship between type of fear and economic costs. This touches on another issue. According to some research, social phobia lies on a continuum, and its disease burden is related to the number of social fears rather than to the distinct types of fear (Stein et al., 2000). Therefore, it is also interesting to study the relationship between the economic costs and the number of social fears. Finally, we examine the economic costs of subthreshold social phobia. Previous research indicated that the burden of the illness and the reduction in work productivity in subthreshold social phobia resemble those of full-blown social phobia (Wittchen et al., 2000). Highlighting the economic burden of subthreshold social phobia may underscore the importance of developing awareness, recognition and effective treatment of social phobia especially in its early phases.

2. Methods

The present study is part of a series of studies on the costs of mental disorders with NEMESIS, beginning with the study of Smit et al. (2006) on the costs of common mental disorders and followed a study on the costs of minor depression (Cuijpers et al., 2007) and of panic disorder (Batelaan et al., 2007).

2.1. Subjects and procedure

The data from the Netherlands Mental Health Survey and Incidence Study (NEMESIS) which have been described in detail elsewhere (Bijl et al., 1998a) were used to conduct the present cost-of-illness study. The sample was obtained by means of a multistage, stratified and random procedure in three steps (Bijl et al., 1998b). First, a sample was drawn of 90 Dutch municipalities stratified on the basis of urbanization and geographic distribution. Second, a sample of private households (addresses) from post office registers was obtained. The number of households selected in each municipality was determined by the size of its population. The third step was to choose which individuals to interview. The residents of the selected households were sent a letter of introduction signed by the Minister of Health requesting them to take part. One respondent with the most recent birthday was randomly selected in each household, on condition that (s)he was between 18 and 64 years of age and sufficiently fluent in Dutch to be interviewed. To

Fig. 1. Annual per capita costs of social phobia related to the number of social fears.
schedule the appointments for the face-to-face interviews, the residents were contacted by telephone. Households with no telephone or with ex-directory numbers (18%) were visited in person. Eligible persons who were not immediately available were contacted later in the year. First the aims of the study were explained and then the participants provided informed consent. The study protocol was approved by an independent medical ethics committee.

In the first round of the data collection, from February through December 1996, a total of 7076 persons were interviewed (response rate of 69.7%) (Bijl et al., 1998b). Refusal was the most important reason for non-response. Although males in the age group 18–24 years were slightly underrepresented, the sample reflected adequately the Dutch population in terms of gender, civil status and urbanization level (Bijl et al., 1998b). The data were collected by 90 experienced interviewers. All of the interviewers underwent a 3 day training course in recruiting respondents and computer assisted interviewing. After that, there was a 4 day training course focussing specifically on the content of NEMESIS and the use of CIDI at the WHO-CIDI training centre of the Academic Medical Centre in Amsterdam.

All participants in the first wave \(T_0\) were approached for the follow-up \(T_1\) 1 year \((M=379\text{ days}, SD=35)\) after baseline. Of the 7076 persons from \(T_0\), 5618 (79.4%) could be re-interviewed at \(T_1\). The presence of a mental disorder at \(T_0\) slightly increased the probability of loss to follow-up between \(T_0\) and \(T_1\) \((OR=1.20, CI=1.04–1.38)\) (De Graaf et al., 2000). Social phobia also somewhat increased the probability of loss to follow-up between \(T_0\) and \(T_1\) \((OR=1.37, CI=1.07–1.75)\) (De Graaf et al., 2000). The present study is based on the \(T_1\) sample because medical consumption was measured at \(T_1\). We restricted our analyses to the index group of people presenting with social phobia and its co-morbidities \((N=109)\) and a reference group of people not meeting the diagnostic criteria for any mental disorder \((N=4770)\).

2.2. Measures

Diagnoses of mental disorders The diagnoses were based on DSM-III-R Axis I (Robins et al., 1998). The Composite International Diagnostic Interview (CIDI, WHO, 1990) Dutch 1.1 computerised version was used to determine the diagnoses (Ter Smitten et al., 1998). The CIDI is a structured interview developed by the World Health Organization (Smeets and Dingemans, 1993; Wittchen et al., 1991) on the basis of Diagnostic Interview Schedule (DIS) and the Present State Examination (PSE). It was designed for use by trained interviewers who are not clinicians. The CIDI is now being used worldwide, and WHO field trials have documented acceptable reliability and validity for nearly all diagnoses (Robins et al., 1998; Wittchen et al., 1991; Spitzer et al., 1991) with the exception of acute psychotic presentations. Whenever psychotic symptoms were detected, subjects were re-interviewed by trained clinicians with the Structured Clinical Interview for DSM-III-R, an instrument that is reliable and valid for diagnosing schizophrenia (Spitzer et al., 1991).

Social Fears: The following six social fears based on the DSM-III-R were assessed at \(T_1\): speaking fears (public speaking, talking with others, and speaking in front of a small group) and performance fears (using public toilets, eating or drinking in public, and writing while someone watches).

Subthreshold Social Phobia: If the subjects had at least one of those six social fears but did not experience significant functional impairment required to meet the diagnostic criteria for social phobia, then they were deemed to be cases of subthreshold social phobia.

Chronic medical condition was assessed at \(T_0\) with a questionnaire listing 31 common illnesses such as diabetes mellitus, chronic obstructive lung disease, cardiac disease, arthritis of knee or hip and cancer, from the Health Survey of Statistics Netherlands (CBS, 1989).

Sociodemographic variables such as gender, age, level of education (low=1, high=0), urbanicity (rural=municipalities with fewer than 500 households per square kilometre; urban=larger municipalities) cohabitation status (living alone=1, other=0), employment status (unemployment=1, other=0), and being a single parent \((1=\text{yes}, 0=\text{no})\) were assessed at \(T_0\).

2.3. Resource use and costing

The full economic costs of health services were calculated for the reference year 2003 in euros (€) (Oostenbrink et al., 2004). The time frame of the current study is restricted to this single year, so we did not correct for inflation, nor did we offset costs. The following types of costs were examined.

Direct medical costs are the costs related to health service use in the mental healthcare sector in the Netherlands, including general practitioners, social work and physiotherapy. Information on the subjects’ use of health services was obtained by means of a questionnaire which was based on the Trimbos and Institute of Medical Technology Assessment Cost Questionnaire for Psychiatry (TICP-P) (Van Roijen et al., 2002). Subjects register the number of GP visits,
sessions with psychiatrists, hospital days, etc. In a next step, medical resource use was costed by multiplying the number of health service units (consultations, hospital days, etc.) by their full economic costs (Oostenbrink et al., 2004). To these we added the costs of pharmacological interventions, calculated as the cost per standard daily dose (obtained from Pharmaceutical Compass at http://www.fk.cvz.nl) multiplied by the number of prescription days, plus the pharmacist’s dispensing fees of € 6.45 per prescription.

Direct non-medical costs occur when patients travel to health service providers and pay for parking. In the Netherlands, the average travel distance between a random address and a GP’s practice is 1.8 km. Travel distances to other health services are also known (Oostenbrink et al., 2004). This information was combined with the data about actual health service uptake. Travel distances were valued at € 0.16 per km and 1 h parking time was valued at € 2.50. To this we added the costs of the patients’ time spent in travel, waiting and treatment at € 8.30 per hour. We only focused on direct non-medical costs related to transportation, parking, time spent, waiting and in treatment and these costs did not include costs for supported housing, vocational rehabilitation, and other forms of psychiatric rehabilitation.

Indirect non-medical costs arise when production losses occur due to illness. Subjects were asked about the number of days spent in bed on account of illness. These days in bed were distributed proportionally over working days (resulting in production losses due to work loss days) and days off work (resulting in production losses in the domestic sphere). To value a lost day in a paid job we used the age and gender specific monetary counter-value of production losses that occur during absence from work (Koopmanschap et al., 1995). For people too ill to perform domestic tasks, these costs were valued at the market price of domestic help at € 8.30 per hour. We did not include costs of early retirement and disability funds.

All cost calculations were conducted in accordance with the Dutch guideline for health economic evaluations (Oostenbrink et al., 2004), which closely resembles other international guidelines (Langley, 1996; Siegel et al., 1997; Torrance et al., 1996).

2.4. Analysis

All analyses could be performed within the regression analysis framework. This approach also helped to take into account several data characteristics. Initial non-response and dropout were handled by using corrective weights. After weighting, the sample followed exactly the same multivariate distribution over age, gender, civil status and urbanization as the Dutch population according to Statistics Netherlands (www.cbs.nl). In order to account for the non-normality of the cost data, we based sample errors, 95% confidence intervals (CIs) and \( P \)-values on 2,500 bootstrap replications, while in each bootstrap step we obtained robust sample errors using the first-order Taylor-series linearization method. The latter was performed to obtain correct 95% CIs and \( P \)-values under weighting. In short, we conducted a series of re-weighted, robust, and bootstrapped regression analyses to arrive at the distinct cost estimates of social phobia.

First, we conducted four separate regression analyses, where the dependent variable was either total costs, direct medical costs, direct non-medical costs, or indirect non-medical costs. These were regressed on the contrast of interest — the variable “presence of social phobia versus no mental disorder”. Second, we repeated the above analyses, but now we adjusted the costs of social phobia for the statistically significant co-morbid disorders and chronic medical conditions. Next, we examined whether the costs of social phobia were related to specific symptoms. To this end, we created a new variable indicating whether the subject with social phobia had the specific symptom or not. Then we entered both variables as predictors of total costs. We repeated this procedure for every symptom of social phobia.

We subsequently examined whether an increase in number of social fears in social phobia was related to an increase in costs. We created a count variable with the number of social fears (one, two, and three or more social fears). This variable was entered in the regression equation as a predictor of total costs, direct medical costs, direct non-medical costs, and indirect medical costs.

Finally, to see how subthreshold social phobia was related to costs, another set of regression analyses was conducted. A variable indicating the presence of subthreshold social phobia was created and entered as a predictor of costs. Because the subthreshold sample was chosen from a sample without any mental disorder, we did not adjust the costs for other mental disorders but we adjusted them to somatic disorders. The analyses were conducted with Stata version 8.2/(STATA Corp., 2004, College Station, TX, USA).

3. Results

3.1. Demographics

Of the present sample 109 had social phobia and 124 had subthreshold social phobia. The whole sample
can be described as follows. 53% were women with a mean age of 42 years (range 18–64). The levels of education was distributed as follows: elementary 6%, lower vocational 36%, secondary 28%, higher vocational and academic 30%. Of the sample, 73% were living with a partner, 82% living in urban and 69% was employed. We refer to Table 1 for the demographics of the subsamples such as social phobia sample, no mental disorder sample and subthreshold social phobia sample.

3.2. Co-morbidity

All the subjects in the social phobia sample had at least one co-morbid condition, mostly simple phobia (42.2%), followed by depressive disorder (35.7%), generalized anxiety disorder (15.6%), dysthymia (13.7%), panic disorder (22.9%), agoraphobia (12.8%), alcohol abuse (6.4%) and alcohol dependence (7.3%). Moreover, 73% had at least one of the 31 common somatic illnesses. In addition, 68.5% of the subthreshold social phobia sample and 60% of the no mental disorder sample had at least one somatic illness.

3.3. Per capita costs of social phobia

The total cost of social phobia, €11,952 (SE=2145; 95% CI=7748–16,156) is significantly higher than the total cost for people with no mental disorder €2957 (SE=136; 95% CI=2690–3224). The annual per capita costs of €11,952 can be divided into three categories. First, direct medical costs, which are related to the health service uptake, amounting to €774 (SE=224; 95% CI=334–1213) in the social phobia sample. Second, the direct non-medical costs: €339 (SE=79; 95% CI=185–494). The highest costs in the social phobia sample are the indirect non-medical costs due to production losses, amounting to €11,446 (SE=2012; 95% CI=7502–15,391) (not in the table).

However, when we adjusted the costs for co-morbidity and somatic illnesses, the total costs of social phobia dropped to €5765, and indirect non-medical costs dropped to €5331. Both of these costs were thus partly explained by co-morbid dysthymia, alcohol abuse and somatic disorders. On the other hand when we controlled for other mental disorders and somatic disorders, direct medical costs and direct non-medical costs lost their statistical significance. In other words, the direct medical and non-medical costs of social phobia could be completely explained by the presence of co-morbid depression and simple phobia (Table 2).

We used the per capita costs to calculate the costs per 1 million inhabitants aged 18-65 years. This includes all cost categories (health service uptake, out-of-pocket expenses, production losses; and is equivalent to the per capita excess costs × prevalence × 1,000,000). With a prevalence rate of 4.8% (Bijl et al., 1998a), the unadjusted costs of social phobia was 574 million euro per year but become 277 million euro when adjusted for co-morbid mental and somatic illnesses.

3.4. Costs associated with specific social fears

We found only two specific social fears that were associated with increased costs. First, we established that the costs associated with social phobia manifested in the fear of using public toilets is significantly higher (Table 2, €29,374 (SE=8771; 95% CI=12,183–46,566). These higher total costs stem by and large from the indirect non-medical costs, €28,250 (SE=8544; 95% CI=11,504–44,997). Second, the presence of fear of speaking in front of a small group is associated with significantly higher total costs €16,164 (SE=3294; 95% CI=9708–22,620). Further analyses indicated that these higher total costs stem from both the direct medical costs, €1590 (SE=581; 95% CI=452–2,729) and the direct non-medical costs €559 (SE=179; 95% CI=208–910) (Table 3).
3.5. Costs associated with the number of social fears

To examine the possibility that an increasing number of social fears in social phobia is associated with higher per capita costs, we calculated the per capita costs associated with social phobia on the basis of one, two and three or more fears. The results indicated that an increasing number of social fears is significantly associated with higher total cost. As the number of fears increases the costs of social phobia also increase by €5344 (SE=963, 95% CI=3457–7230), 381 € for direct medical costs (SE=116, 95% CI=153–608), 156 € for direct non-medical costs (SE=37, 95% CI=84–229), and 5,099 € for indirect non-medical costs (SE=919, 95% CI=3.298–6.901) (Fig. 1).

3.6. Costs associated with subthreshold social phobia

People with subthreshold social phobia have significantly higher total costs: €4645 (SE=1086; 95% CI=2517–6773) compared to the people with no mental disorder. Their significantly higher total costs could be explained by their greater direct medical costs of €435 (SE=155; 95% CI=132–739) and their larger indirect non-medical costs of €2167 (SE=1026; 95% CI=2206–2314). However, when we adjusted the costs for somatic illnesses, the total and indirect non-medical costs of subthreshold social phobia lost their statistical significance. Both of these costs were thus totally explained by somatic disorders. On the other hand, their direct medical costs of €403 were still significantly higher compared to the ones of no mental illness sample (Table 2).

4. Discussion

This study investigated the economic costs of social phobia, not only in the people with social phobia but also at the level of society at large. The cost of social phobia appears to be substantial. Per million inhabitants, the adjusted costs of social phobia were 136 million euro. In the study of Andlin-Sobocki et al. (2005), it is acknowledged that mental disorders including social phobia were hardly associated with increased direct medical and direct non-medical costs, but with indirect non-medical costs. This finding is also in line with results presented in Patel et al. (2002) where it is stated that social phobia is strongly associated with reduced work productivity, high levels of unemployment or absenteeism from work. Moreover, in a recent systematic review of cost-of-illness studies and cost effectiveness analyses, it is stated that social phobia is one of the anxiety disorders that is associated with the lowest direct medical costs (Konnopka et al., 2009). This finding supports the view that people with social phobia seek less professional help for their social phobia related complaints (Grant et al., 2005). When the costs of social phobia were adjusted for other co-morbid mental disorders and somatic illness, all costs were reduced, although the total costs and the indirect non-medical costs remained significantly higher than the costs for people with no mental disorder. When the high comorbidity rate of social phobia with other anxiety, mood or substance use disorders is taken into consideration, this is an expected result. As stated by Greenberg et al. (1999), when assessing the real burden of a disorder, it is important not to overestimate it but also not to
underestimate it. In the present study, we calculated the costs of social phobia with and without adjusting for comorbid conditions. This approach gives a range of possible real costs of social phobia.

In addition to studying the economic costs of social phobia, we also examined the economic cost related to specific characteristics of social phobia, including the content and the number of social fears. The burden of social phobia in terms of quality of life, service use and comorbidity has previously been found to increase with an increasing number of social fears (Acarturk et al., 2008). As expected, the increasing number of social fears is related to higher economic costs, mostly with indirect non-medical costs. Similar results were found in previous research to the effect that the economic burden of social phobia is mainly associated with impairment and disability (Fehm et al., 2005) rather than health service use (Patel et al., 2002). With respect to the types of social fears, Kessler et al. (1998) found that speaking fears are associated with less impairment and lower rates of comorbidity than complex fears (other fears with or without speaking fears). Based on these previous findings, we hypothesized that complex fears which are more disabling would be more closely related to higher costs. However, two fears (one from each group) appeared to be related to higher costs: using public restrooms and speaking in front of a small group. This finding implies that more studies are needed to investigate the different effects of different types of social fears in studies with various types of social fears.

We also studied the economic costs of subthreshold social phobia. Our results indicated that the economic costs associated with subthreshold social phobia were considerable. The largest part of the costs of subthreshold social phobia stem from production losses. However, when the costs are adjusted for somatic disorders, costs related to indirect non-medical costs became no longer significant. After controlling for somatic disorders, an interesting result was found. Unlike people with social phobia, people with subthreshold social phobia have significantly higher uptake rates of mental health services and GP than people with no mental disorder. People with full-blown social phobia may be less inhibited and seek more professional help. This situation calls for efforts to identify these people in the earliest possible stage of their disorder and offer them an intervention before they manifest with symptoms of avoidance.

Our study has a number of strengths and limitations. Its main strengths are the inclusion of a relatively large, representative community sample (\(n=4879\), calculating direct medical and non-medical costs, as well as the direct non-medical costs, the use of well-validated diagnostic instruments for the presence of mental disorders, and including subthreshold social phobia (which to our knowledge has not been done before). However, there are also a number of limitations. First, we used the data from the second wave of the NEMESIS study in which attrition had occurred. Although corrective weights were used some substantial distortion of the results might have occurred. Second, although the number of subjects was large, it was relatively small for economic studies (Sturm et al., 1999).

The costs reported in the present paper should be interpreted as conservative estimates. First, although it is known that mental disorders also produce medical costs

Table 3
Annual per capita costs\(^a\) (in €) of social phobia with specific social fears (sample errors and 95% confidence intervals, weighted\(^b\) analysis, \(n=109\)).

<table>
<thead>
<tr>
<th>Social Fears</th>
<th>Costs(^c)</th>
<th>SE</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Speaking in public</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>11,120</td>
<td>2256</td>
<td>6648–15,592</td>
</tr>
<tr>
<td>No</td>
<td>14,810</td>
<td>4965</td>
<td>4969–24,652</td>
</tr>
<tr>
<td>Using public toilets</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>31,673</td>
<td>9331*</td>
<td>13,177–50,169</td>
</tr>
<tr>
<td>No</td>
<td>10,217</td>
<td>1991</td>
<td>6271–14,164</td>
</tr>
<tr>
<td>Eating or drinking in public places</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>20,881</td>
<td>5835*</td>
<td>9316–32,447</td>
</tr>
<tr>
<td>No</td>
<td>9950</td>
<td>2158*</td>
<td>5674–14,227</td>
</tr>
<tr>
<td>Talking to people when you might have nothing to say</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>10,842</td>
<td>2825*</td>
<td>5242–16,442</td>
</tr>
<tr>
<td>No</td>
<td>12,763</td>
<td>2945*</td>
<td>6924–18,601</td>
</tr>
<tr>
<td>Writing while being observed</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>18,180</td>
<td>5025*</td>
<td>8166–28,194</td>
</tr>
<tr>
<td>No</td>
<td>9548</td>
<td>2023*</td>
<td>5540–13,558</td>
</tr>
<tr>
<td>Talking in front of a small group</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>16,553</td>
<td>3751*</td>
<td>9117–23,988</td>
</tr>
<tr>
<td>No</td>
<td>8191</td>
<td>2037*</td>
<td>4152–12,229</td>
</tr>
</tbody>
</table>

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\(^a\)Costs are the societal costs, including direct medical, direct non-medical and indirect non-medical costs.

\(^b\)(Robust) sample errors and 95% confidence intervals are based on 2500 bootstraps.

\(^c\)The sum of the direct medical, direct non-medical and indirect non-medical costs is not exactly same as the total costs, because each type of cost was estimated separately and may vary slightly.

\(\*p \leq 0.05\).
outside the sector of mental health services (Greenberg et al., 1999), we only included the costs related to mental health services and pharmacological treatment. Second, the costs presented here may be underestimated because they are based on self-report, which is known to result in underestimation (Van den Brink et al., 2004). Third, production losses may also be underestimated because it is well known that people who are ill, but nevertheless go to work, are working less efficiently and this reduced efficiency can result in very substantial productivity losses (Brower et al., 1999; Lim et al., 2000). This type of productivity loss, however, was not included in our study.

Our results indicate that social phobia is not only disabling for the affected patient, but also incurs major societal costs. From a public health perspective, it is important to develop awareness about effective treatments for social phobia (Fehm et al., 2005; Montgomery, 1998), and encourage people with social phobia to apply for mental health care for problems specifically related to social phobia. Moreover, awareness about social phobia among health care practitioners could also lead to early detection of subthreshold social phobia cases before they develop into fully-fledged social phobia. This prevention would lead to less impairment and higher quality of life for those people. Besides personal gains, this would yield reduced economic costs, and less burden on their families, employers, and the state. When one considers that social phobia generally precedes other co-morbid conditions (Ruscio et al., 2008), it is very important to increase awareness of effective treatments for social phobia (Fehm et al., 2005; Montgomery, 1998) in the community. If people with social phobia, their family or their employers could recognize this mental health situation more readily, a greater number of people would apply for treatment - preferably in the early stages of the disease. Effective treatment of social phobia could change the lives of the majority of patients with that condition and this could lead to positive economic consequences, specifically in the field of productivity.

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Conflict of interests
There are no conflicts of interest, for any of the authors.

References
STATA Corporation, 2004. Stata/SE 8.2 for Windows. STATA statistical software. Stata Corporation, College Station, TX.