

## Article

# The cost of somatisation among the working-age population in England for the year 2008–2009

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## ABSTRACT

Medically unexplained symptoms are one of the most commonly encountered symptoms across all healthcare settings. They are also responsible for a large proportion of disability in the workforce and decreased quality of life. These patients represent an important clinical phenomenon with considerable direct and indirect economic consequences.

This study aims to calculate the economic burden of somatisation among English adults in 2008–2009.

Using existing literature, estimates of prevalence, healthcare use and disability were combined in order to calculate the annual cost of healthcare use and productivity loss associated with these patients in excess of non-somatising patients.

Based on the results of our analysis, the incremental health care cost incurred by somatising patients is estimated to be £3 billion. This represents approximately 10% of total NHS expenditure on these services for the working-age population in 2008–2009. The cost of sickness

absence and decreased quality of life associated with these patients amounts to over £14 billion.

By highlighting the magnitude of this phenomenon at each level of the health system and the considerable impact of non-healthcare costs, this study serves to draw attention to a group of patients who are frequently unrecognised or misdiagnosed by physicians who tend to repeatedly pursue organic possibilities through multiple tests, procedures and operations. As economic perspectives play an increasing role in healthcare planning, the reduction of health care use and improvement of functioning among this group of patients should be a major goal. In order to realise these goals, changed pathways and behaviour in primary and secondary care are needed, along with improved access to psychological therapy services.

**Keywords:** cost, economics, England, medically unexplained symptoms, quality of life, somatisation, utilisation

## Introduction

Medically unexplained symptoms (MUS; Table 1) are the most commonly encountered symptoms in primary care.<sup>1-3</sup> They also have a high prevalence across secondary care settings<sup>4,5</sup> and are responsible for a large proportion of disability in the workforce

and decreased quality of life among the general population.<sup>6</sup>

While these patients are sometimes referred to as 'heartsink' patients or the 'worried well' and implicitly associated with overuse or abuse of the

**Table 1** Examples of conditions where somatisation plays a part

Specialty	Somatic presentation of mental disorder
Cardiology	Unexplained chest pain Cardiac neurosis
Gastroenterology	Unexplained abdominal pain
Neurology	Conversion states Pseudo-seizures
Diabetes	Burden of self-perceived disorder
Endocrine	Prolactin levels sensitive to stress levels
Accident and emergency	Self-harm
Orthopaedics and trauma	Chronic (back) pain
Plastic surgery	Self-esteem issues
ENT	Globus hystericus
Renal/urology	Sexual dysfunction Scrotal pain
Rheumatology	Unexplained joint pain/swelling Arthralgia
Pain clinic	Somatoform pain disorder Pain amplification
Respiratory	Panic disorder in asthma and COPD
Oncology	Medically unexplained decline
General medicine	General malaise/anergia Medically unexplained symptoms Multiple pains
Geriatric medicine	Pseudo-dementia Non-specific decline
Paediatrics	Recurrent abdominal pain Self-harm
Dermatology	Obsessive washing Dermatitis artefacta
Obstetrics and gynaecology	Unexplained abdominal pain Sexual dysfunction

Table adapted from Webb and Pieters, 2009<sup>38</sup>

healthcare system by those with no physical ailment, it is important to note that they are not malingerers and their symptoms are not factitious. These symptoms are experienced as real and are thought to represent a somatic manifestation of psychological distress, or abnormal activation of sensory pathways. Nor is somatisation a modern phenomenon in the illness experience. Over 2000 years ago Galen noted that 60% of people visiting a doctor suffered from symptoms that had emotional rather than physical causes.<sup>7</sup>

Although not all patients who somatise suffer from comorbid mental illness, MUS are strongly and consistently associated with emotional distress, with a considerable degree of diagnostic overlap with depression, anxiety and panic disorder.<sup>8–11</sup>

While there is little to indicate that these are discrete syndromes separated from the somatoform disorders by natural boundaries,<sup>12</sup> they each exhibit specific profiles of psychosocial impairment and unique patterns of healthcare use.<sup>8,10,11,13–15</sup> When somatisation is comorbid with depression and anxiety, patients exhibit greater disability and impairment than those in whom the conditions are independent.<sup>11,16</sup> A large literature demonstrates a linear relationship between the number of bodily symptoms, prevalence of comorbid anxiety and depression, degree of functional impairment, frequency of healthcare use and high costs.<sup>16–20</sup> However, somatoform disorders also appear to have a specific effect on costs and disability independently of other mental or physical illnesses.<sup>8</sup>

These patients represent an important clinical phenomenon with considerable direct and indirect economic consequences. They use significantly and disproportionately more medical (but not mental) health services across all settings compared to non-somatic controls;<sup>8,14,21</sup> have comparable or greater impairment of physical function, worse mental health and poorer perceived general health compared with other chronically ill patients;<sup>22</sup> and spend more days in bed per month than patients with major medical disorders,<sup>22,23</sup> take more sick leave,<sup>24,25</sup> have more restricted activity days<sup>21</sup> and have higher rates of unemployment<sup>26</sup> than the national average. Observational studies suggest that MUS patients make use of multiple healthcare services simultaneously,<sup>27</sup> often fail to keep scheduled appointments and frequently switch physicians.<sup>21,22,28</sup> They undergo surgery and treatment more often than non-somatizing patients,<sup>29</sup> putting them at risk from unnecessary procedures with the potential for iatrogenic harm.<sup>30</sup>

It has been estimated that 10–20% of total medical expenditure in the USA is on patients with somatisation,<sup>8,31,32</sup> with a per capita expenditure of two- to ninefold above average.<sup>8,22,33</sup> Extrapolating patient-level cost data to total healthcare expenditure,

Barsky *et al*<sup>8</sup> estimate that the total annual incremental cost of somatisation in the USA amounts to approximately \$256 billion (2002 dollars). Although the prevalence and consequences of MUS have been found to be similar across widely different countries and cultural settings<sup>34</sup> one must be wary about extrapolating the associated economic evidence to a British context.

In the UK, several studies have attempted to calculate either the aggregate or individual cost of conditions associated with somatisation. In 1989, Croft-Jeffries and Wilkinson<sup>35</sup> estimated the national cost of 'neurosis' to be £370 million (1985 pounds), with two-thirds of this expense attributed to lost productivity. The importance of secondary and tertiary care to these costs is illustrated by Shaw and Creed,<sup>36</sup> who calculated that a median of £286 per person (1990 pounds) was spent on medical investigations for somatic symptoms later attributed to a psychiatric disorder, and in a case study by Kinder *et al*<sup>37</sup> which estimated the cost of a single highly somatic patient to be £209 391 (2003 pounds) over 20 years, with inpatient stays and investigations comprising the majority of total cost in both studies.

Using existing literature, this study aims to employ a prevalence-based approach in order to calculate the economic burden of somatisation among English adults in 2008 to 2009. This burden consists of the direct costs of primary and secondary healthcare use and indirect costs associated with productivity loss in excess of non-somatizing patients. As this is a heterogeneous group of patients, this study also aims to account for the effect of varying levels of somatic severity on prevalence, healthcare use and costs.

## Methods

### Search strategy and data sources

A literature search was carried out to identify studies related to direct and indirect resource consumption of somatizing patients and the prevalence of this condition across all settings. A MEDLINE search of peer-reviewed articles (including those in press) from 1980 to 2009 was conducted using the key words: 'somatisation', 'medically unexplained', 'hypochondriasis', 'somatoform disorder' or 'conversion disorder' combined with 'healthcare use', 'cost', 'primary care', 'secondary care' or 'disability' in abstract, keywords or title. Potential studies were also identified from the bibliographies of retrieved

articles, several systematic reviews and literature already known to us.

All information was restricted to sources published in English and was obtained from peer reviewed journals and the public domain. Both prospective and retrospective studies, as well as cohort and trial populations, were included. Studies that focused on functional somatic syndromes (e.g. irritable bowel syndrome, fibromyalgia) or single unexplained symptoms (e.g. headache, back pain) were excluded. Also excluded were studies restricted to children (<18 years) and group-specific studies (e.g. refugees, veterans and adopted persons).

## Population

All prevalence and resource consumption data were limited to the working-age population (about 18–65 years). This was due to the limited amount of data for older age groups, and because studies which have included this age group note a consistently and significantly lower prevalence of somatoform disorder across all clinical settings.<sup>9,39,40,41</sup> Moreover, age makes it increasingly difficult to tease apart healthcare use and disability due to greater incidence of illness from that due to somatisation.

Prevalence and healthcare use were disaggregated according to severity of somatoform disorder because healthcare use increases with illness worry, which is in turn associated with the number of somatic symptoms and presence of comorbid anxiety and depression.<sup>16–20</sup>

Adopting the classification used by Woolfolk and Allen,<sup>42</sup> the term ‘subthreshold somatisation’ is used to refer to any somatoform disorder in which symptoms are not sufficiently numerous or diverse to qualify for a diagnosis of somatisation disorder (including abridged somatisation, undifferentiated and multisomatoform disorders). ‘Somatisation disorder’ is used to describe patients who meet full criteria for the disorder; these patients are generally thought to represent the extreme end of the somatisation spectrum.<sup>23</sup>

## Prevalence and healthcare use

Prevalence estimates vary considerably depending on the diagnostic method used for evaluation. For this study, estimates were obtained from studies which used diagnostic interviews conducted by trained professionals. Only DSM criteria were considered both in order to ensure inter-study comparability and because this is the classification system most often used in research. Studies which took care to exclude somatic symptoms due to

disease by medical record checks were preferred. In the majority of cases utilisation data were obtained from studies which used measures based on administrative databases or medical records.

Mental health costs were not included in our evaluation as there is a large literature demonstrating that mental healthcare is the only major healthcare service that does not show significantly increased rates of utilisation by this group of patients.<sup>8,14,21</sup>

Wherever possible, excess healthcare use by somatising patients was calculated as a ratio compared with non-somatising (control) patients. Applying this ratio to setting-specific prevalence and population data allowed incremental resource use by these patients to be calculated as a percentage of total use for the working-age population. This proportion was then applied to the expenditure associated with this age group across each setting to obtain the specific cost of somatisation from the perspective of the NHS. Output losses were calculated based on days of sickness absence in excess of the average population and unit costs were applied to obtain the indirect cost of somatisation from a societal perspective. Because of data limitations it was not possible to make a reliable estimate of costs associated with the possible impact of somatisation on unemployment and economic inactivity. Therefore, the figure for output losses is likely to be an underestimate. National expenditure data were obtained from the Department of Health (Keith Derbyshire by electronic correspondence, 14 August 2009) and unit costs were based on data from the Office for National Statistics (ONS)<sup>43</sup> and the Centre for Mental Health.<sup>44</sup>

## Excluded studies

On the basis of our inclusion criteria and interest in the overlap between rates of use and cost amongst patients with subthreshold somatisation and somatisation disorder, several studies which were initially identified as relevant were excluded as they did not allow for age adjustment,<sup>45–48</sup> nor did they specify type of healthcare provider<sup>20,49,50</sup> or account for affective comorbidity/severity of somatoform disorder.<sup>24,51,52</sup> From the remaining sources, estimates of prevalence, healthcare use and disability were combined in order to calculate the aggregate cost of somatisation among English adults in 2008–2009.

## General practice consultations

In the absence of accurate data on the number of patients who attend English general practices in any

given year, this figure was estimated based on ONS population statistics for this age group<sup>53</sup> and the finding that 81% of the working-age population attends a general practice surgery at least once per year.<sup>14</sup> Primary care prevalence rates of subthreshold somatisation and somatisation disorder were based on estimates from a Dutch study by de Waal *et al.*<sup>9</sup> Although these figures closely match those reported in several American studies,<sup>8,10,16</sup> Dutch estimates were chosen as the Dutch primary care system functions similarly to that in England. Consultation ratios for somatic and severely somatic patients were obtained from one German<sup>14</sup> and two Dutch studies.<sup>39,54</sup>

The percentage of consultations due to somatisation (i.e. in excess of non-somatising patients) was calculated by subtracting the total number of consultations given the average consulting ratio from the sum product of the number of patients in each group and their respective consultation ratios. As 54% of all primary care consultations are made by patients in this age group,<sup>55</sup> assuming that the average cost of a general practice consultation is broadly the same across all age groups, the same percentage of total general practice expenditure in England was attributed to this age group. The cost of somatisation-specific consultations was then calculated as a proportion of total expenditure for this age group. Table 2 provides an example of these calculations; a similar method is used for all areas of expenditure.

### General practice drug consumption

The average number of drugs prescribed to patients with subthreshold somatisation and somatisation disorder was obtained from Dutch<sup>39</sup> and American<sup>15</sup> studies, the only controlled studies to directly assess the number of unique prescription items taken by patients with varying degrees of somatoform disorder. Using these ratios and primary care population and prevalence data, the percentage of total excess prescriptions for somatising, working-age patients is obtained.

The proportion of total primary care prescriptions attributed to this age group is 63%, as calculated from the General Household Survey (GHS).<sup>56</sup> Applying the percentage of prescriptions that are issued to patients with subthreshold somatisation and somatisation disorder to the total primary care prescription expenditure for this age group results in an estimate of the total somatisation-specific expenditure for primary care prescription medication.

### Outpatient consultations

Outpatient consultations were analysed by first-time specialist consultation (referral) and follow-up appointment rates. Relevant data for patients with subthreshold somatisation and comorbid somatisation, anxiety and affective disorders were obtained from three German,<sup>14</sup> American<sup>8</sup> and British<sup>57</sup> studies. Data on the number of first-time and follow-up consultations for this age group in England were obtained from 2007–2008 Hospital Episode Statistics (HES).<sup>58</sup> To ensure consistency with prevalence and utilisation literature, specialties in which patients are unlikely to present with MUS<sup>a</sup> were excluded from calculations of the excess activity attributed to somatisation. These specialties were then included in the denominator in order to calculate the percentage of total consultations attributed to somatisation for this age group. The percentage of referral and follow-up consultations as a proportion of total outpatient consultations, as well as the percentage of consultations made by this age group, was calculated from HES<sup>59</sup> data and applied to total outpatient expenditure for 2008–2009. Applying the percentage of somatisation-specific referral and follow-up consultations to the expenditure for each type of consultation for this age group results in an estimate of somatisation-specific outpatient costs.

### Inpatient costs

Somatising patients are admitted more often to hospital,<sup>14,60</sup> undergo more surgical procedures<sup>29</sup> and have longer lengths of stay than their non-somatising counterparts. In the absence of detailed NHS cost and utilisation data pertaining to day case procedures, the cost of inpatient care was calculated as the number of days in hospital incurred by patients with subthreshold somatisation and somatisation disorder in excess of the national average. These data were obtained from German<sup>14</sup> and British<sup>61</sup> studies, and 2008–2009 HES<sup>62</sup> respectively.

These figures, combined with Danish prevalence data from Fink *et al.*,<sup>40</sup> were applied to the number of

<sup>a</sup> Restorative dentistry; paediatric dentistry; orthodontics; endodontics; peridontics; prosthodontics; surgical dentistry; paediatric surgery; A and E; critical care medicine; non-UK provider, specialty not known; clinical genetics; clinical cytogenetics and molecular genetics; rehabilitation; palliative medicine; paediatric cardiology; medical oncology; nuclear medicine; paediatrics; paediatric neurology; obstetrics; adult mental illness; child and adolescent psychiatry; clinical oncology; radiology; blood transfusion

**Table 2** How each area of expenditure was calculated**Example: GP consultations**

In the first series of calculations, prevalence and consultation rates are multiplied to obtain an estimate of the total number of consultations per 1000 patients for each subgroup (Column 4). This figure does not represent the actual number of consultations, but rather an adjusted total based on a consultation rate for non-somatising patients which has been normalised to 1 (i.e. the non-somatising population is used as the reference case and data are adjusted accordingly). Against the reference case, the number of somatisation-specific consultations is calculated (Column 6). Dividing the number of somatisation-specific consultations by the total number of consultations yields the percentage of consultations due to somatisation (Column 7). Although these steps vary slightly between different areas of expenditure, a final estimate in terms of the percentage of total healthcare use attributed to somatising patients is common to all areas.

Column 1 Prevalence of each subgroup	Column 2 Number of people belonging to each subgroup per 1000 patients	Column 3 Normalised consultation ratio	Column 4 Number of consultations (column 2 x 3)	Column 5 Number of consultations expected in absence of somatisation	Column 6 Number of somatisation- specific consultations (column 5 - 4)	Column 7 Percentage of total consultations due to somatisation (column 6 ÷ 4)
No somatisation 75.4%	754	1.00	754	754	0	0%
Subthreshold somatisation 23.4%	234	2.05	480	234	246	19.2%
Somatisation disorder 1.2%	12	3.61	43	12	31	2.5%
Total 100%	1000		1277	1000	277	21.7%

Total expenditure (for England in 2008–2009) for this area is then multiplied by the percentage of consultations made by the working-age population to yield total expenditure for this age group (column 10). Multiplying this figure by the percentage of consultations due to somatisation (as calculated above) results in an estimate of general practice expenditure for this population. This figure can be further broken down by subgroup using the percentages from Column 7. This second sequence of calculations is the same for all areas of expenditure.

Column 8 Total general practice expenditure in 2008–2009 (£)	Column 9 Percentage of total consultations made by the working-age population	Column 10 Total general practice expenditure for the working-age population (£; column 8 x 9)	(Column 7) Percentage of total consultations due to somatisation (as above)	Column 11 Somatisation- specific GP consultation expenditure (£; column 7 x 10)
7 142 000 000	54%	3 856 680 000	21.7%	836 617 667

total overnight admissions exclusive of maternal and psychiatric stays, calculated by subtracting the number of obstetric admissions from total admissions for the 15–59 age group and multiplying the result by the percentage of admissions that result in an overnight stay;<sup>62</sup> psychiatric data are not included in this database. This yields the number of

excess bed days due to somatisation, which is then divided by the total number of bed days for the working-age population, calculated by multiplying the number of admissions for this age group (including obstetric admissions) by the average length of stay for this age group of 5.5 days, as reported by the GHS;<sup>56</sup> this gives the number of somatisation-specific

excess bed days as a percentage of total bed days for the working-age population.

Total inpatient expenditure was multiplied by the percentage of cases for this age group in order to obtain a rough estimate of total inpatient expenditure for the working age population in England in 2008–2009. Applying the percentage of bed days attributed to somatisation to this cost results in an estimate of the cost incurred by patients with sub-threshold somatisation and somatisation disorder.

### Accident and emergency attendances

Only two studies address the proportion and number of somatisation attendances in UK settings, one reporting the proportion of somatising patients among 'routine attenders',<sup>63</sup> and the other the average number of attendances made by 'frequent attenders'.<sup>61</sup> American data<sup>60</sup> were not included, due to the many differences in patterns of use compared with English accident and emergency (A and E) wards.

The ratios and prevalence rates reported by the above-mentioned studies were applied to the number of A and E visits in England among the 20–69 year old population, as reported in the HES,<sup>64</sup> to obtain the number of attendances by somatising patients in excess of the national average<sup>b</sup> for this age group as a percentage of total attendances for the working-age population. The percentage of total attendances attributed to this age group was applied to total A and E expenditure and multiplied by the percentage of attendances due to somatisation to obtain the total cost of somatisation-specific A and E attendances.

### Sickness absence

While several studies make note of an increased number of disability days and days spent in bed among people with somatisation, two German studies and one British study report directly on the number of days absent from work due to ill health.<sup>14,24,65</sup> Although the number of sick days varies markedly from country to country, historically Germany and England have similar national average rates of days off due to illness (4% of total working days, or approximately seven days per year)<sup>66</sup> and it is therefore assumed that these studies are applicable to the English workforce. Using an expert estimate of £120 for the daily cost<sup>44</sup> results in the total cost of sickness absence attributable to somatisation.

<sup>b</sup> Derived from HES64 and ONS53 data

### Quality of life

In order to place a monetary value on the decreased quality of life experienced by patients with somatisation, mean SF-36 scores for patients with sub-threshold somatisation, somatisation disorder and no somatisation disorder were obtained from a study by Kroenke *et al.*<sup>67</sup> These values were transformed to EQ-5D preference-based weights for the British population using the algorithm reported and validated by Ara and Brazier.<sup>68</sup> Bringing together 18–65 year old population and prevalence data, the total number of quality adjusted life years (QALYs) lost each year as a result of somatisation is estimated at over 300 000. If each QALY is worth £30 000<sup>69</sup> we arrive at an estimate of the value of the reduction in quality of life caused by somatisation.

### Sensitivity analysis

One-way sensitivity analyses were conducted to explore the effect of altering the assumptions used in the estimation of the cost of somatisation. The effect of 20% changes in baseline prevalence and utilisation estimates, and the effect of reducing the cost of a QALY to £20 000 were evaluated.

## Results

### Prevalence

The prevalence of subthreshold somatisation and somatisation disorder in the general population is considerably lower than that found in clinical settings (Table 3), the main reason for this being that somatisation is closely associated with treatment-seeking behaviour.<sup>70</sup> Therefore, samples from the general population are less likely to be biased in terms of illness behaviour.<sup>71</sup> The greatest number of somatising patients is found in primary care settings where they make up approximately a quarter of all patients.<sup>8,13,16,48,72</sup> Somatising patients also account for a large amount of consultations in general outpatient settings (somatoform disorders are even more prevalent in certain well-researched settings such as neurology, gastroenterology, cardiology and gynaecology<sup>4,73–75</sup>) while Fink *et al.*<sup>40</sup> report that somatoform disorder is the most frequently encountered mental disorder on Danish inpatient wards. To the limited extent that the prevalence of somatisation in A and E wards has been explored, there is also evidence that many patients present to emergency departments with their symptoms.

**Table 3** Prevalence of subthreshold somatisation and somatisation disorder in the general population and across clinical settings

	Subthreshold (%)	Somatisation disorder (%)	Diagnostic assessment	Source
General population	11 <sup>(A)</sup>	0.6 <sup>(B)</sup>	(A) CIDI interview (B) DIS	(A) Jacobi <i>et al</i> , 2004 (Germany) <sup>77</sup> (B) Swartz <i>et al</i> , 1991 (USA) <sup>26</sup>
Primary care setting	23.4	1.2	SCAN interview, medical records obtained in cases of uncertainty	De Waal <i>et al</i> , 2004 (Netherlands) <sup>9</sup>
Outpatient setting	16.0 <sup>(A)</sup>	1.0 <sup>(B)</sup>	(A) PSE interview* (B) Hospital database, medical record check	(A) van Hermert <i>et al</i> , 1993 (Netherlands) <sup>5</sup> (B) Reid <i>et al</i> , 2002 (UK) <sup>57**</sup>
Inpatient setting	13.4	1.1	SCAN interview	Fink <i>et al</i> , 2004 (Denmark) <sup>40***</sup>
A and E	3.8 <sup>(A)</sup>	0.4 <sup>(B)</sup>	SCAN interview plus medical record check	(A) Williams <i>et al</i> , 2001 (UK) <sup>63</sup> (B) Theadom <i>et al</i> , 2006 (UK) <sup>61</sup>

\* With items relating to psychosomatic symptoms and hypochondriasis replaced by questions to enable somatisation disorder and hypochondriasis to be detected according to DSM-III-R criteria

\*\* Identified as 'frequent attenders' with two or more MUS. Psychiatric comorbidity rates of these patients reported in Reid *et al*, 2003

\*\*\* Including patients too physically ill for interview in denominator (on the assumption that these patients have a somatisation rate close to zero), resulting in lower (DSM-IV) estimated prevalence

### Healthcare use, sickness absence and quality of life effects

Table 4 represents the ratio of general practitioner (GP) consultations, prescription medications and outpatient consultations between patients with no somatisation, subthreshold somatisation and somatisation disorder; and the average adjusted<sup>c</sup> number of inpatient bed days, A and E attendances, days of sickness absence and net QALY loss associated with each form of somatisation in excess of the English working-age national average as reported in the literature.

The number of GP consultations made by somatising patients in excess of non-somatising patients was equivalent to 22% of all GP visits for this age group (Table 5). This is in accordance with findings

by Fink *et al*,<sup>76</sup> Peveler *et al*<sup>2</sup> and Katon *et al*.<sup>1</sup> Similarly, our finding that excess use by somatising patients accounts for over 25% of outpatient consultations is consistent with figures reported in the literature,<sup>4,5</sup> though it is not uncommon to find figures as high as 50–60% in specific settings.

### Healthcare costs

The aggregate incremental healthcare cost incurred by somatising patients is estimated to be approximately £3 billion (Table 5). Inpatient costs were the largest component of total somatisation-specific healthcare expenditure, followed by GP consultations, prescriptions, outpatient consultations and A and E attendances. This represents approximately 10% of total NHS expenditure on these services for the working-age population in 2008–2009.

<sup>c</sup> Proportionately adjusted using the working-age English average as the 'control' group



**Table 4** Annual healthcare use and output loss per person with subthreshold somatisation and somatisation disorder\*

GP consultations	Prescriptions	Outpatient consultations		Inpatient bed days <sup>i</sup>	A and E attendances <sup>ii</sup>	Sick days <sup>iii</sup>	QALYs lost
		Referral apptmnts	Follow-up apptmnts				
Ratio of healthcare use, non-somatising:somatising individuals				Number of units in excess of national average			
<b>Subthreshold somatisation</b>							
1:2.1 <sup>14,39</sup>	1:1.3 <sup>39</sup>	1:1.3 <sup>14,60</sup>	1:2.1 <sup>14,60</sup>	1.8 <sup>14</sup>	0.8 <sup>63</sup>	8.8 <sup>14</sup>	0.08 <sup>67</sup>
<b>Somatisation disorder</b>							
1:3.6 <sup>54</sup>	1:1.7 <sup>15</sup>	1:6.5 <sup>57</sup>	1:2.7 <sup>57</sup>	18.9 <sup>61</sup>	5.8 <sup>61</sup>	27.3 <sup>24,65</sup>	0.17 <sup>67</sup>

\* Source by reference number in superscript

<sup>i</sup> given a national average of 0.4 bed days per person per year<sup>56,62</sup><sup>ii</sup> given a national average of 0.2 A and E attendances per person per year<sup>64</sup><sup>iii</sup> given a national average of seven days of sickness absence per person per year<sup>66</sup>

The majority of resource use and costs in each setting is attributable to patients with subthreshold somatisation rather than somatisation disorder.

### Non-healthcare costs

As shown in Table 5, an estimated 42 million work days were lost due to somatisation-related sickness absence, resulting in a cost of approximately £5235 million to employers. The costs associated with the decreased quality of life which is experienced by patients suffering from somatisation are estimated at over £9 billion.

### Sensitivity analysis

The estimated costs were sensitive to the assumptions made in the analyses. Lower prevalence rates would obviously lead to lower costs: varying the assumed prevalence of somatisation by 20% across all settings results in a change of approximately 18% in total cost. Between settings, general practice consultation costs are least sensitive to variation in prevalence rates.

Most sensitive to change are the assumptions regarding incremental healthcare utilisation. Varying the ratio of incremental healthcare use by 20% in either direction across all settings results in approximately a 30% change in total healthcare cost from our baseline estimate. Changes in the number of inpatient bed days produce the greatest proportional changes in total cost, followed by GP

consultations, prescriptions, outpatient consultations and A and E attendances.

At a cost of £20 000 per QALY, the quality of life cost associated with somatisation is reduced by one-third to £6.2 billion.

### Discussion

This study sought to estimate the total aggregate cost of somatisation in the English working-age population by combining the best available data on prevalence, healthcare use, quality of life effects and output losses due to somatisation across a spectrum of severity with English resource use and expenditure data for the year 2008–2009.

Based on these estimates, the total annual burden of somatisation among working-age adults in England is estimated at nearly £18 billion per year. The cost of additional healthcare use accounts for about 17% of the total (£3 billion per year), output losses from sickness absence for nearly 30% (£5.2 billion per year) and the costs of reduced quality of life for the remainder (£9.3 billion per year).

This is the first study to analyse the total socio-economic cost of somatisation anywhere in Britain and the first to estimate the proportion of these costs incurred by patients with somatic disorders of varying severity. However, several notable comparisons exist between this study and others which have sought to estimate costs among a similar group of patients. First, our finding that the area of largest

**Table 5** Somatisation-specific costs among the working-age population in England in 2008–2009

Healthcare costs								
Type of resource	Unit of measurement	Percentage of total (adult) units attributed to somatisation			Cost (£ million)			
		Subthreshold somatisation	Somatisation disorder	Total	Subthreshold somatisation	Somatisation disorder	Total	
Primary care	Consultations	19.2	2.5	21.7	740	96	837	
	Prescriptions	5.8	0.7	6.5	285	36	321	
Hospital outpatient care	Referral consultations	4.9	4.9	9.8	41	42	83	
	Follow-up consultations	13.9	1.4	15.3	267	27	294	
Hospital inpatient care	Bed days	4.4	3.9	8.3	693	610	1303	
Accident and emergency	Attendances	3	2.2	5.2	32	23	54	
<b>Healthcare subtotal</b>							2892	
Non-healthcare costs								
Type of resource	Unit of measurement	Units attributed to somatisation			Average unit cost (£)	Cost (£ million)		
		Subthreshold somatisation	Somatisation disorder	Total		Subthreshold somatisation	Somatisation disorder	Total
Output losses	Sick days	39 869 720	3 757 572	42 374 768	120	4784	451	5235
Quality of life lost	QALYs	279 048	32 545	311 593	30 000	8371	876	9348
<b>Non-healthcare subtotal</b>							14 583	
<b>Total burden</b>							17 475	

healthcare expenditure is accounted for by inpatient bed days and the area of least expense is outpatient consultations is the same as the conclusions drawn by Kinder *et al.*,<sup>37</sup> Shaw and Creed<sup>36</sup> and Smith *et al.*<sup>22</sup> Second, our estimate that 10% of total healthcare expenditure for this age group is accounted for by somatising patients is similar to Barsky *et al.*'s figure of 16%.<sup>8</sup> We believe our estimate to be the more correct of the two as Barsky *et al.*<sup>8</sup> have based their figure on individual patient data and applied it at a national level without taking into account certain important exemptions (such as settings in which one would not encounter MUS: radiology, obstetrics, etc.).

This study has several limitations. First, in the absence of any single, nationally representative data source to allow estimation of all elements included in our cost calculations, estimates had to be built up from a wide variety of sources. Most notably, due to the heterogeneity of somatoform conditions and disease definitions, judgement had to be exercised in deciding which studies to include in prevalence and utilisation estimates in order to desegregate data by symptom severity, allow inter-study comparability and compatibility with an English setting, thus introducing a potential source of bias. Moreover, the very use of the somatoform disorders as diagnostic categories is not without controversy. The need to revise the diagnostic criteria of somatoform

disorders is undisputed among the vast majority of researchers<sup>78</sup> as the existing criteria of both the DSM-IV and ICD-10 are based largely on arbitrary cut-off values not supported by substantial clinical evidence<sup>73,79</sup> and lacking criterion validity.<sup>78</sup> Nevertheless, their use in this study is justified by the fact that they have consistently been shown to be good predictors of health service use and disability.<sup>78</sup>

Second, the complexity of the relationship between somatisation and medical illness makes it likely that our utilisation and cost estimates are conservative. Somatisation and organic illness frequently coexist. One may precipitate the other and in general somatising patients tend to be a group with higher rates of physical illness than non-somatising patients. Organic conditions may also develop following inappropriate treatment of somatising patients (e.g. side effects from drugs or adhesions following abdominal surgery). Although somatising patients have been shown to have increased healthcare use even when controlling for physical disease,<sup>8</sup> the presence of any associated organic illness often excludes these patients from prevalence and utilisation studies.

Third, this study did not account for the effect of demographic characteristics other than age on clinical prevalence and healthcare utilisation patterns. In particular, gender differences are found in a number of studies, with the association between female sex, the presence of somatisation and increased healthcare use becoming more obvious with increasing symptom severity.<sup>80,81</sup> It has been suggested that higher prevalence rates in women could be biased by a higher frequency of healthcare utilisation in women,<sup>82</sup> or gender bias on the part of diagnosing physicians.<sup>83</sup> Another possibility is the demonstrated but little-explored overlap between somatoform disorders and alcohol/drug abuse. It is possible that substance use disorders, which are vastly overrepresented among men, are a source of bias due to misattribution of the cause (or lack thereof) of symptoms in this group.<sup>84</sup> If so, both the social and healthcare costs associated with severe somatisation (i.e. somatisation with comorbid substance use disorder) are likely to be much higher.

Nevertheless, by highlighting the magnitude of the problem at each level of the health system and the considerable impact of non-healthcare costs, this study serves to draw attention to a group of patients who have fallen into the 'neglected wasteland between the walled citadels of medicine and psychiatry'.<sup>75</sup> These patients are frequently unrecognised or misdiagnosed by physicians who tend to repeatedly pursue organic possibilities through multiple tests, procedures and operations. Not only does this serve to reinforce illness behaviour and drive up

costs, but it also acts as a barrier to providing these patients with appropriate mental healthcare services.

The greatest healthcare costs were associated with inpatient care (£1303m) and GP consultation costs (£837m). This information is of value in identifying areas where changes in clinical behaviour can have the greatest economic benefit, as well as offering the patient improved levels of care. For example, identifying patients prior to planned admission who would benefit from a psychological assessment for somatisation spectrum disorders would offer a reduction in planned hospital activity and give the patient a more appropriate intervention. Specialities that might benefit from such an approach include gastroenterology, gynaecology, neurology and cardiology.

To realise such benefits, changed pathways and behaviour in primary and secondary care are needed, along with improved access to psychological therapy services. The UK Department of Health Programme 'Improving Access to Psychological Therapy' (IAPT) – [www.iapt.nhs.uk](http://www.iapt.nhs.uk) – delivers the core psychological therapy component. This economic analysis of the costs to the NHS and the wider economy provides evidence for a further investment in psychological therapies.

As economic perspectives play an increasing role in healthcare planning, the reduction of healthcare use and improvement of functioning among this group of patients should be a major goal. Removing barriers to holistic care through early recognition and communication of the fact that physical symptoms are not always a sign of organic disease, and early appreciation of the role that biopsychosocial factors play in all disease processes, has the potential to both improve outcomes and reduce costs across all settings.

In conclusion, this study provides the first estimate of the aggregate cost of somatisation in England, highlighting a well-established but poorly served public health problem that places an enormous burden on the healthcare system and society.

This group of patients holds enormous potential for reducing both healthcare demand and disability levels among a substantial section of the population. There is good evidence from several countries that psychological therapies can lead to decreased utilisation, improved wellbeing and between 9% and 53% reduction in costs, especially when implemented at the primary care level.<sup>85</sup> So far, a comprehensive cost-offset study has yet to be conducted in the UK and there is a need for such an evidence base in order to inform policy initiatives and decision making.

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#### CONFLICTS OF INTEREST

None.

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