

# Prevalence, incidence, morbidity and treatment patterns in a cohort of patients diagnosed with anxiety in UK primary care

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**Background.** Anxiety disorders are common and can cause substantial quality of life impairment.

**Objective.** The aim of this study was to investigate the frequency of anxiety in UK primary care. Treatment patterns and factors associated with an anxiety diagnosis were also assessed.

**Methods.** The Health Improvement Network was used to identify all patients aged 10–79 years with a new diagnosis of anxiety in 2002–04 ( $n = 40\,873$ ) and age-, sex- and calendar-year-matched controls ( $n = 50\,000$ ). A nested case–control analysis was used to quantify potential risk factors for anxiety by multivariate logistic regression.

**Results.** The prevalence of anxiety was 7.2% and the incidence was 9.7 per 1000 person-years. Incidence and prevalence were highest in women and young adults (20–29 years). Anxiety was associated with heavy alcohol use, smoking and addiction problems as well as stress, sleep and depression disorders. Anxiety patients used health care services more frequently than controls. Among patients diagnosed with anxiety, 63% were treated pharmacologically. Antidepressants accounted for almost 80% of prescriptions.

**Conclusions.** The prevalence and incidence of anxiety are high in UK primary care and are almost twice as high in women than in men. Anxiety is associated with other psychiatric morbidity as well as frequent health care use. Antidepressants are the most commonly used pharmacological treatment.

**Keywords.** Anxiety disorders, epidemiology, incidence, prevalence, primary health care.

## Introduction

Anxiety symptoms are very common.<sup>1</sup> Although often mild and transient, they can also be severe and persistent, causing significant personal distress, impairment of function and substantial reduction in patients' quality of life.<sup>2</sup> In such cases, an anxiety disorder is often diagnosed. Several types of anxiety disorder have been described.<sup>3–5</sup> Anxiety disorders represent the most common type of mental disorder, as reported by the World Health Organization (WHO) World Mental Health Survey of >60 000 adults from 14 countries.<sup>1</sup> Between 10% and 20% of adults who consult a primary care physician (PCP) for a non-psychiatric complaint in any given 12-month period have also had an

episode of an anxiety or depressive disorder.<sup>6</sup> Mixed anxiety and depressive disorder was the most common mental condition, according to UK National Statistics for the year 2000.<sup>7</sup> The estimated prevalence of generalized anxiety disorder was similar in men and women (4–5%), while mixed anxiety and depressive disorder was present in ~7% of men and 12% of women.<sup>7</sup>

Despite this high prevalence and the fact that anxiety disorders substantially impair functional status, these patients often do not receive as much attention as those with other mental disorders.<sup>2</sup> Furthermore, anxiety disorders are frequently co-morbid with depressive disorders, leading to a longer duration of psychiatric symptoms, greater psychosocial disability

and increased health care resource utilization than that occurs with either type of disorder alone.<sup>6</sup>

Most epidemiological studies and reviews have addressed the presence of anxiety in specific age groups<sup>8,9</sup> or focused on the epidemiology of a particular anxiety disorder such as social phobia, panic disorder/agoraphobia or generalized anxiety disorder.<sup>10–13</sup> Relatively, few longitudinal epidemiological studies have investigated anxiety disorders in the general population, yet this type of investigation is needed to establish the prevalence and incidence of anxiety disorders and to study risk factors and treatment patterns.

Clearly, there is a need to conduct a large longitudinal study within the general population that encompasses all anxiety disorders. In the UK, this is now possible with the advent of automated databases such as The Health Improvement Network (THIN) primary care database. The aims of the present study are to determine the prevalence and incidence of anxiety in UK primary care and to identify risk factors associated with a first diagnosis of an anxiety disorder and treatment patterns in patients with such a diagnosis.

## Methods

### *Design*

A cohort study was performed to identify patients with a diagnosis of anxiety from a source population in a primary care setting (THIN). All anxiety patients thus identified were further used as cases in a nested case–control analysis.

THIN includes information about demographics, consultation with PCPs, referrals, hospitalizations, laboratory tests and prescriptions written by PCPs. THIN is well validated<sup>14</sup> and has been used in many studies, including studies of antidepressant drugs.<sup>15,16</sup> Diagnoses and test procedures are recorded in the database using Read codes. Prescriptions written by PCPs are recorded automatically using a coded drug dictionary (Multilex).

### *Source population*

We identified all individuals recorded in THIN who were aged 10–79 years between 1 January 2002 and 31 December 2004 (the study period). Patients were included in the source population if they had been enrolled with a PCP for at least 2 years and if they had at least one prescription recorded in the previous year. Patients aged  $\geq 70$  years were excluded if they had fewer than two PCP visits registered in a follow-up period  $>1$  year as a proxy for incomplete data recording. All patients with a prior recorded code of anxiety were excluded as were patients who had five or more

recorded prescriptions for anxiolytic drugs before the diagnosis.

### *Identification of the incident anxiety and control cohorts*

All patients from the source population were followed until the first occurrence of one of the following end points: first anxiety diagnosis, death, reaching the age of 80 years or end of the study period (31 December 2004). We identified 40 837 patients with a first recorded code of anxiety during the study period. Identification codes included all Read codes describing anxiety. These included codes ranging from mild anxiousness symptoms to other disorders such as phobia, panic attack and generalized and mixed anxiety disorders. The date of diagnosis was considered to be the index date.

All remaining members of the source population were assigned a random date within the study period (2002–04). If this random date fell within a patient's person-time contribution to the study, the individual was eligible to be included in the control cohort and the random date was considered to be the index date. The same eligibility criteria as for the anxiety cohort were applied, with the additional condition of having no recorded diagnosis of anxiety at any time before the end of the study. From this pool of eligible individuals, we randomly sampled a group of patients frequency matched by age ( $\pm 1$  year), sex and year (index date) to the anxiety group ( $n = 50\ 000$ ).

### *Validation of anxiety diagnosis*

From all the identified incident anxiety cases, we randomly sampled 70 patients who were treated with any antidepressant, anxiolytic or hypnotic drugs within 90 days of the index date and 70 patients who were not prescribed any of these medications. The PCPs of these patients were requested, via questionnaires, to confirm the diagnosis of anxiety and to provide additional information related to the diagnosis (e.g. symptom intensity, related symptoms, related conditions, treatments and referrals or hospitalizations related to anxiety). We received 135 valid questionnaires: 121 of these were confirmed to be incident diagnoses of anxiety. The confirmation rates in pharmacologically treated and untreated cases were 73.5% and 89.6%, respectively. Because of these good confirmation rates, we did not validate the remaining members of the anxiety cohort.

### *Data collection*

Information on demographics (sex and age), lifestyle factors (smoking status and alcohol consumption), body mass index (BMI), socio-economic status (Townsend index<sup>17</sup>), health service use, prior morbidity status (assessed by Read codes) and drug use (assessed by Multilex codes) was obtained from the database at the index date in both groups.

We defined prior morbidity status as a recorded diagnosis of any of the following conditions at any time before the index date: cardiovascular, metabolic, psychiatric, gastrointestinal, respiratory and articular disorders, as well as pain, cancer and addiction problems. A history of pregnancy or any surgery was assessed in the year before the index date.

We also collected data on medication use, including anti-inflammatories, analgesics, acid-suppressing drugs, hormones and drugs used to treat central nervous system disorders, metabolic disorders or cardiovascular disorders. We classified drug exposure into four categories: current use (when the supply of the most recent prescription lasted until the index date or ended in the 30 days before the index date), recent use (drug supply ended 31–365 days before the index date), past use (drug supply ended >1 year before the index date) and non-use (no registered code for a prescription).

We also collected information on specific prescriptions of antidepressants, hypnotics, anxiolytics and antipsychotics in the first 3 months following a diagnosis of anxiety, as well as any other therapy that was recorded [e.g. psychotherapy and cognitive behavioural therapy (CBT)].

### Analyses

The prevalence of anxiety was calculated using as the numerator all cases of anxiety recorded during the study period (2002–04) with a diagnosis of anxiety in the previous 2 years ( $N = 108\,495$ ). All patients included in the source population ( $N = 1\,516\,481$ ) were used as the denominator. Age- and sex-specific prevalence estimates (%) of anxiety were also calculated.

The incidence per 1000 person-years was computed using all newly diagnosed cases of anxiety registered over the total person-time for the source population. We corrected the estimates of incidence by applying the confirmation rate obtained in the validation study.

A nested case-control analysis was performed to estimate the association of demographic characteristics, health service use and prior morbidities, as well as prior drug use, with a diagnosis of anxiety. The index date for patients in the anxiety cohort was the date of anxiety diagnosis and for the controls, the index date was a random date. Odds ratios (ORs) and 95% confidence intervals (CIs) were estimated by unconditional logistic regression. All risk estimates were adjusted by frequency-matched variables (age, sex and calendar year), as well as smoking status, number of PCP visits and psychological morbidity status (presence of stress, sleep and depressive disorders). The ORs were unaffected when the model was adjusted for BMI and alcohol use, so neither of these factors was included in the final model.

## Results

### Prevalence

The overall prevalence of anxiety was 7.2% (95% CI: 7.1–7.2); 4.9% in men and 9.2% in women (Fig. 1). The lowest prevalence (2%) was found in individuals aged 10–19 years, and the highest prevalence was found in individuals aged 40–49 years (9%).

### Incidence

Over the course of the follow-up period, we identified 40 837 new diagnoses of anxiety, which equated to 9.7 cases per 1000 person-years (95% CI: 9.6–9.8) (Fig. 2) after weighting the incidence by the confirmation rates obtained from the validation procedure. The overall incidence for women (12.6 per 1000 person-years) was nearly double that for men (6.8 per 1000 person-years). The highest incidence was found in young adults aged 20–29 years (13.6 per 1000 person-years): 17.8 per 1000 person-years in women and 9.6 per 1000 person-years in men.

### Risk factors, prior morbidity and drug use

Table 1 shows the associations between a first diagnosis of anxiety and demographic and lifestyle risk factors,

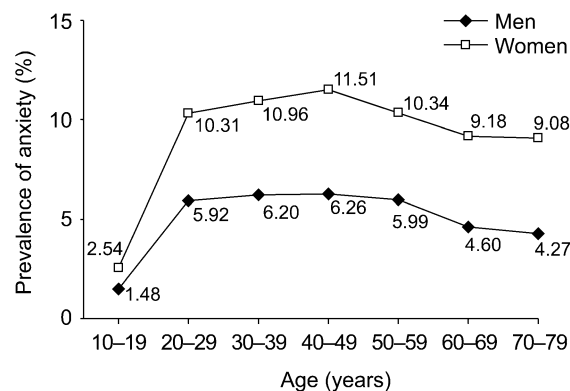


FIGURE 1 Prevalence of anxiety by age and sex during the study period (2002–04).

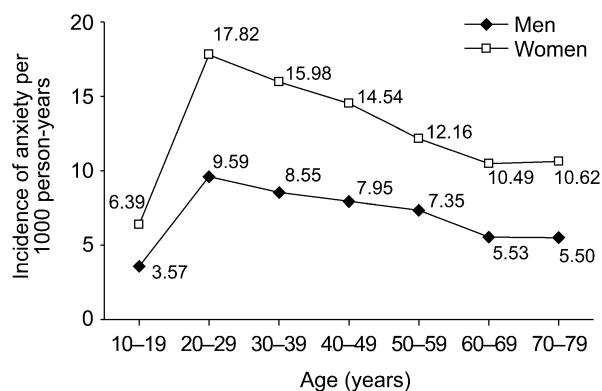


FIGURE 2 Incidence of anxiety by age and sex during the study period (2002–04).

TABLE 1 *Baseline characteristics and use of health care services in anxiety cases compared with controls with no diagnosis of anxiety and their association with a diagnosis of anxiety*

	Anxiety cases ( <i>n</i> = 40 837)		Controls ( <i>n</i> = 50 000)		OR <sup>a</sup>	95% CI
	<i>n</i>	%	<i>n</i>	%		
Sex						
Male	14 231	34.8	17 435	34.9	NA <sup>b</sup>	–
Female	26 606	65.2	32 565	65.1	NA <sup>b</sup>	–
Calendar year						
2002	12 406	30.4	15 120	30.2	NA <sup>b</sup>	–
2003	14 271	34.9	17 458	34.9	NA <sup>b</sup>	–
2004	14 160	34.7	17 422	34.8	NA <sup>b</sup>	–
Age (years)						
10–19	3033	7.4	3688	7.4	NA <sup>b</sup>	–
20–39	14 461	35.4	17 676	35.4	NA <sup>b</sup>	–
40–59	15 231	37.3	18 681	37.4	NA <sup>b</sup>	–
60–79	8112	19.9	9955	19.9	NA <sup>b</sup>	–
BMI (kg/m <sup>2</sup> )						
13–19	2840	7.0	2715	5.4	1.18	1.11–1.26
20–24	12 569	30.8	14 830	29.7	1	–
25–29	9799	24.0	12 022	24.0	0.90	0.86–0.93
≥30	6066	14.9	6995	14.0	0.84	0.80–0.88
Unknown	9563	23.4	13 438	26.9	0.99	0.95–1.04
Alcohol use (units per week)						
0	13 878	34.0	15 604	31.2	1	–
1–15	14 908	36.5	18 678	37.4	0.92	0.89–0.95
16–42	2899	7.1	3142	6.3	1.04	0.98–1.11
≥43	494	1.2	319	0.6	1.44	1.24–1.68
Unknown	8658	21.2	12 257	24.5	1.00	0.95–1.05
Smoking						
Never	18 553	45.4	25 477	51.0	1	–
Current	12 039	29.5	11 119	22.2	1.31	1.26–1.35
Former smoker	5287	12.9	5445	10.9	1.13	1.08–1.18
Unknown	4958	12.1	7959	15.9	1.06	1.00–1.11
Referral or hospitalization <sup>c</sup>						
No	20 474	50.1	32 703	65.4	1	–
Yes	20 363	49.9	17 297	34.6	1.24	1.21–1.28
PCP visits <sup>c</sup>						
0–2	7585	18.6	18 767	37.5	1	–
3–10	20 160	49.4	23 178	46.4	1.98	1.91–2.05
≥11	13 092	32.1	8055	16.1	3.32	3.18–3.46
Socio-economic status (Townsend index <sup>17</sup> )						
Least deprived	9027	22.1	12 800	25.6	1	–
Deprived 2	7762	19.0	10 493	21.0	1.01	0.97–1.06
Deprived 3	7928	19.4	10 013	20.0	1.03	0.99–1.07
Deprived 4	7782	19.1	8232	16.5	1.15	1.10–1.21
More deprived	6169	15.1	5444	10.9	1.33	1.27–1.40
Unknown	2169	5.3	3018	6.0	0.95	0.89–1.02

NA, not applicable; PCP, primary care practitioner.

<sup>a</sup>OR adjusted for age, sex, calendar year, smoking, PCP visits, stress and sleep and depression disorders.

<sup>b</sup>Not applicable due to the matched design.

<sup>c</sup>In the year prior to index date.

when compared with controls with no diagnosis of anxiety. Anxiety was more frequent among current smokers than those who had never smoked (OR: 1.31; 95% CI: 1.26–1.35), in heavy alcohol users compared with those who did not drink alcohol (OR: 1.44; 95% CI: 1.24–1.68) and was more common in patients with a low BMI (13–19 kg/m<sup>2</sup>; OR: 1.18; 95% CI: 1.11–1.26) than in those with a normal BMI (20–24 kg/m<sup>2</sup>). Anxiety was also significantly associated with lower socio-economic status (Table 1). Use of health services (PCP visits, referrals or hospitalization) was more

frequent in patients diagnosed with anxiety than in controls. Prior use of psychotherapy was also more common in patients with an anxiety diagnosis than in controls (OR: 2.33; 95% CI: 1.52–3.58).

Associations between a diagnosis of anxiety and prior morbidity were evaluated, as shown in Table 2. There was a strong association between a diagnosis of anxiety and previous diagnoses of psychological disorders such as stress (OR: 2.30; 95% CI: 2.18–2.42), sleep disorders (OR: 1.58; 95% CI: 1.50–1.67) and depression (OR: 2.64; 95% CI: 2.55–2.73) and also

with a history of addiction problems (OR: 1.42; 95% CI: 1.32–1.54). To a lesser extent, having a prior diagnosis of one of several gastrointestinal disorders such as irritable bowel syndrome (OR: 1.35; 95% CI: 1.27–1.43), gastroesophageal reflux disease (OR: 1.18; 95% CI: 1.12–1.24), dyspepsia (OR: 1.17; 95% CI: 1.12–1.22) or peptic ulcer disease (OR: 1.16; 95% CI: 1.07–1.26) was also associated with an increased risk of a diagnosis of anxiety (Table 2). Patients with

a prior diagnosis of a painful condition also had a higher risk of a diagnosis of anxiety (OR: 1.25; 95% CI: 1.21–1.29), even when the painful condition occurred only in the year before the study start date (data not shown).

Table 3 describes the use of prescription treatment among the anxiety and control groups. Current use of antidepressants (OR: 3.33; 95% CI: 3.14–3.53), antipsychotics (OR: 2.19; 95% CI: 1.97–2.45), anxiolytics

TABLE 2 Prior morbid conditions in anxiety cases compared with controls with no diagnosis of anxiety and their association with a diagnosis of anxiety

	Anxiety cases ( <i>n</i> = 40 837)		Controls ( <i>n</i> = 50 000)		OR <sup>a</sup>	95% CI
	<i>n</i>	%	<i>n</i>	%		
Psychiatric disorders						
Stress	6180	15.1	2593	5.2	2.30	2.18–2.42
Sleep disorder	5108	12.5	2656	5.3	1.58	1.50–1.67
Addiction problems	2163	5.3	1255	2.5	1.42	1.32–1.54
Depression	6928	17.0	14 703	29.4	2.64	2.55–2.73
Gastrointestinal disorders						
GERD	4690	11.5	3691	7.4	1.18	1.12–1.24
IBS	3649	8.9	2538	5.1	1.35	1.27–1.43
Dyspepsia	7088	17.4	5728	11.5	1.17	1.12–1.22
PUD	1492	3.7	1202	2.4	1.16	1.07–1.26
Painful conditions						
Pain	32 939	80.7	34 572	69.1	1.25	1.21–1.29
LBP	11 274	27.6	10 377	20.8	1.08	1.04–1.11
Migraine	3925	9.6	3349	6.7	1.11	1.06–1.17
COPD	974	2.4	677	1.4	1.20	1.08–1.34
Cancer	2082	5.1	2034	4.1	1.09	1.01–1.16

COPD, chronic obstructive pulmonary disease; GERD, gastroesophageal reflux disease; IBS, irritable bowel syndrome; LBP, lower back pain; PUD, peptic ulcer disease.

<sup>a</sup>OR adjusted for age, sex, calendar year, smoking, PCP visits, stress and sleep and depression disorders.

TABLE 3 Current<sup>a</sup> use of central nervous system drugs in anxiety cases compared with controls with no diagnosis of anxiety and their association with a diagnosis of anxiety

	Anxiety cases ( <i>n</i> = 40 837)		Controls ( <i>n</i> = 50 000)		OR <sup>b</sup>	95% CI
	<i>n</i>	%	<i>n</i>	%		
Antidepressants <sup>c</sup>	7685	18.8	2308	4.6	3.33	3.14–3.53
TCA-Ser	1666	4.1	780	1.6	1.68	1.54–1.85
TCA-Nor	247	0.6	80	0.2	1.94	1.48–2.54
SNRIs	695	1.7	195	0.4	1.88	1.59–2.22
SSRIs	5048	12.4	1186	2.4	3.66	3.41–3.93
MAOIs	16	0.04	7	0.01	0.95	0.37–2.44
Others <sup>d</sup>	487	1.2	122	0.2	1.32	1.20–1.45
Anti-migraine drugs	454	1.1	335	0.7	1.27	1.09–1.48
Antipsychotics	1336	3.3	498	1.0	2.19	1.97–2.45
Anxiolytics	921	2.3	143	0.3	5.85	4.87–7.02
Hypnotics	2016	4.9	554	1.1	2.98	2.69–3.30

MAOI, monoamine oxidase inhibitor; SNRI, serotonin and noradrenaline reuptake inhibitor; TCA-Nor, tricyclic antidepressants with a predominant action on the reuptake of noradrenaline; TCA-Ser, tricyclic antidepressants with an inhibitory action on the reuptake of serotonin.

<sup>a</sup>Current use defined as supply of the most recent prescription lasting until the index date or ending in the 30 days before the index date.

<sup>b</sup>OR adjusted for age, sex, calendar year, smoking, PCP visits, stress and sleep and depression disorders.

<sup>c</sup>For antidepressants, the sum of the different antidepressant classes is >7685 cases and 2308 controls because some patients may receive more than one type of antidepressant but are still counted as one in the overall antidepressant variable.

<sup>d</sup>Other antidepressants: mianserin, bupropion, reboxetine, mirtazapine, dibenzepin, maprotiline, iprindole, nomifensine, viloxazine, trazodone, nefazodone, opipramol, flupentixol and tryptophan.

(OR: 5.85; 95% CI: 4.87–7.02) or hypnotics (OR: 2.98; 95% CI: 2.69–3.30) was associated with an increased risk of a subsequent diagnosis of anxiety. Current use of other medications is shown in Table 4. Prior use of acid-suppressing drugs (OR: 1.50; 95% CI: 1.41–1.59) or paracetamol (OR: 1.23; 95% CI: 1.16–1.31) was a marker of an increased risk of a diagnosis of anxiety.

*Treatment patterns in the anxiety cohort*

When prescription patterns were studied, we found that 63% of patients with a diagnosis of anxiety (*n* = 25 772) were treated with antidepressant, anxiolytic, hypnotic or antipsychotic drugs in the first 3 months after the diagnosis was recorded (Table 5). In approximately half of these patients (*n* = 12 475), this was the first recorded prescription of such drugs. Among patients receiving treatment, the most frequently prescribed drug class was antidepressants (79.5%), followed by anxiolytics (24.4%) and hypnotics (16.2%). The most common antidepressants prescribed were the selective serotonin reuptake inhibitors (SSRIs) (57.5% of all treated anxiety cases), followed by tricyclic antidepressants with an inhibitory action on the reuptake of serotonin (14.1%). In general, benzodiazepines were used in 18% of all anxiety cases (results not shown).

At least 0.63% of patients with a new diagnosis of anxiety had a record of CBT or psychotherapy during the first 3 months after diagnosis; this proportion increased to 1.21% during the year after diagnosis.

**Discussion**

We found an overall prevalence of anxiety of 7.2%, which is similar to values reported in the literature. The WHO survey of 60 463 individuals conducted in 2001–03 in 14 countries reported a prevalence of anxiety disorders in Europe of 5.8–8.8%.<sup>1</sup> However, higher prevalence estimates were reported in a cross-

sectional survey within primary care carried out in Belgium (19.0%)<sup>18</sup> and in WHO survey results from the USA (18.2%) and France (12.0%).<sup>1</sup> Variations between countries may represent, in part, underlying differences in diagnostic criteria, as well as differences in study design. A stigma is associated with seeking help for psychological problems in some populations,<sup>19</sup> so this may also contribute to international variations in the reported prevalence of anxiety disorders. In addition, previous studies often focused on specific subtypes of anxiety<sup>10–13,20</sup> or specific patient populations such as children<sup>9</sup> or the elderly,<sup>8</sup> and the study populations were generally small. Therefore, the present study, with its large sample size and use of matched cases and controls, represents an improvement on most earlier reports in this area.

We found that the prevalence of anxiety disorders was almost twice as high in women than in men, which is in agreement with the results of previous studies.<sup>5</sup> UK national statistics for 2000 showed that women are more likely than men to have neurotic disorders or mixed anxiety and depression.<sup>7</sup> However, men and women had similar rates of general anxiety and panic disorders.

It is important to identify common risk factors, such as prior morbidities or medication, that might help PCPs to identify individuals at risk of an anxiety disorder. The present study shows an association between prior psychiatric disorders, in particular depression, and a first diagnosis of anxiety. Both depressive and anxiety disorders have long been associated in published reports,<sup>21,22</sup> with each significantly predicting the subsequent onset of the other.<sup>23</sup> More than half of patients consulting their PCP during an episode of an anxiety or depressive disorder also have a second depressive or anxiety disorder.<sup>6</sup> This co-morbidity substantially increases health care use and is associated with greater chronicity, slower recovery, increased rates of recurrence and greater psychosocial disability. Serotonergic and noradrenergic pathways may be

TABLE 4 Current use<sup>a</sup> of other drugs in anxiety cases compared with controls with no diagnosis of anxiety and their association with a diagnosis of anxiety

	Anxiety cases ( <i>n</i> = 40 837)		Controls ( <i>n</i> = 50 000)		OR <sup>b</sup>	95% CI
	<i>n</i>	%	<i>n</i>	%		
Acid-suppressing drugs <sup>c</sup>	3506	8.6	2229	4.5	1.50	1.41–1.59
PPIs	2816	6.9	1752	3.5	1.47	1.37–1.57
H <sub>2</sub> RAs	765	1.9	504	1.0	1.43	1.27–1.62
NSAIDs	3075	7.5	2856	5.7	1.00	0.94–1.07
Paracetamol	3786	9.3	2780	5.6	1.23	1.16–1.31

H<sub>2</sub>RA: histamine-2 receptor antagonist; NSAID, non-steroidal anti-inflammatory drug; PPI, proton pump inhibitor.

<sup>a</sup>Current use defined as supply of the most recent prescription lasting until the index date or ending in the 30 days before the index date.

<sup>b</sup>OR adjusted for age, sex, calendar year, smoking, PCP visits, stress and sleep and depression disorders and all drugs included in the table.

<sup>c</sup>For acid-suppressing drugs, the sum of the PPIs and H<sub>2</sub>RAs is >3506 cases and 2229 controls because some patients may receive more than one type of acid-suppressing drugs but are still counted as one in the overall acid-suppressing drugs variable.

TABLE 5 Patterns of antidepressant, antipsychotic, anxiolytic and hypnotic drug use among anxiety cases in the first 3 months after the anxiety diagnosis was recorded

Anxiety cases	<i>n</i> = 40 837
Total pharmacologically treated <sup>a</sup> (% of anxiety cases)	25 772 (63.1)
Antidepressant drugs <sup>b</sup> (% of treated cases)	20 499 (79.5)
TCA-Ser	3644 (14.1)
TCA-Nor	579 (2.2)
SSRIs	14 823 (57.5)
SNRIs	2033 (7.9)
MAOIs	19 (0.1)
Others	1442 (5.6)
Anxiolytic drugs (% of treated cases)	6285 (24.4)
Antidepressant <sup>b</sup> plus anxiolytics (% of treated cases)	2792 (10.8)
Hypnotic drugs (% of treated cases)	4166 (16.2)
Antipsychotic drugs (% of treated cases)	2973 (11.5)

MAOI, monoamine oxidase inhibitor; SNRI, serotonin and noradrenaline reuptake inhibitor; TCA-Nor, tricyclic antidepressants with a predominant action on the reuptake of noradrenaline.

<sup>a</sup>Total number of patients treated with antidepressant, anxiolytic, hypnotic or antipsychotic drugs within the first 3 months after the diagnosis of anxiety.

<sup>b</sup>For antidepressants, the sum of the different antidepressant classes is >20 499 because some patients may receive more than one type of antidepressant but are still counted as one in the overall antidepressant variable.

involved in both depressive and anxiety disorders.<sup>24,25</sup> However, substantial variation in the strength and consistency of risk factors has been found both in major depression and in generalized anxiety disorders, which suggests that the two disorders are not merely different manifestations of a single underlying syndrome.<sup>23</sup>

Painful conditions [e.g. lower back pain and migraine] were associated with a diagnosis of anxiety even after adjusting for related co-morbidity. The association between anxiety disorders and pain is well established.<sup>26</sup> We also found that prescription of certain drugs indicated for painful conditions was associated with a diagnosis of anxiety even after adjusting for related morbidity. Pharmacoepidemiological studies are needed to confirm these associations. A diagnosis of anxiety was also associated with a prior diagnosis of gastrointestinal disorders. This link was reinforced by the drug prescription results found in the present study, which showed that individuals with a diagnosis of anxiety were more likely to have received a prescription for acid-suppressing drugs than were controls.

We found that 37% of the anxiety cohort was not treated with an antidepressant, anxiolytic, hypnotic or antipsychotic drug in the 3 months after the diagnosis. A previous study documented that 41% of patients with anxiety go untreated,<sup>2</sup> while a study performed in six European countries found that 67.7% of patients

with any anxiety disorder (generalized anxiety, social phobia, specific phobia, agoraphobia or panic) and 74.5% of patients with pure anxiety disorder received no treatment.<sup>27</sup> The pattern of drug prescription that we observed for the anxiety cohort in the first 3 months after the diagnosis shows that PCPs are more likely to prescribe antidepressants, particularly SSRIs, than anxiolytics. This is in agreement with guideline recommendations that now favour SSRIs as first-line drugs over the traditional benzodiazepines (which have the potential for drug dependence and a greater likelihood of sedation) and TCAs (which have a greater burden of adverse events and greater toxicity in overdose).<sup>5</sup> CBT has been reported to be an effective therapy for anxiety disorders, and there is evidence that it has a longer duration of effect than pharmacological therapy or self-help.<sup>28</sup> There is limited data on the effectiveness of combination therapy versus pharmacological therapy or CBT alone. THIN may not contain complete information on CBT, which makes it difficult to assess how often it is used to treat patients with anxiety disorders in this patient population.

A major strength of this study is that it allows the identification of all newly diagnosed cases of anxiety in UK primary care, as well as the description of risk factors associated with a new diagnosis of anxiety at the primary care level. This design allows an extremely large number of patients to be included. Finally, the longitudinal nature of the study, together with the use of matched cases and controls, permits the accurate ascertainment of risk factors, prior morbidity and subsequent drug prescriptions.

There are, however, a number of potential limitations to the study. For example, we were only able to capture individuals who consulted with their PCPs regarding their symptoms and received a diagnosis of an anxiety disorder. These disorders are unlikely to be recorded in a systematic way, and the diagnostic codes used will vary between PCPs. It is also important to take into account that there is not enough information recorded in THIN to classify the identified cases based on the severity of their anxiety, which could influence the observed association with risk factors and treatment patterns. Another potential limitation is that prevalent cases may have been misclassified as incident cases if they had been in a long period of remission prior to the start of the study. The nature of the database also means that we could not detect patients diagnosed outside primary care (i.e. by a specialist, in hospital or by private doctors). This may cause a slight underestimation of the prevalence of anxiety compared with that in the general population, but it is applicable to and representative of the primary care setting.

This large longitudinal study shows that anxiety disorders are highly prevalent in UK primary care and that women are almost twice as likely as men to have

an anxiety disorder. The study also shows that there is a high incidence of anxiety disorders in UK primary care, particularly in women and in young adults. Patients diagnosed with anxiety tend to have a number of co-morbidities and to be frequent users of health care services. PCPs tend to prescribe primarily SSRIs for patients with anxiety, which is in accordance with treatment guidelines.<sup>5</sup> Our study suggests a number of risk factors that may help PCPs to identify patients at risk of developing a new anxiety disorder. This in turn could lead to early diagnosis and treatment, thus allowing potential complications to be avoided.

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## Declaration

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Ethical approval: South East UK Multicenter Research Ethics Committee [ref num: 06/MRE01/64].  
Conflicts of interest: EM-M, AR and LAG-R work for Centro Español de Investigación Farmacoepidemiológica, which has received unrestricted research grant from AstraZeneca. SJ is an employee of AstraZeneca. M-AW was an employee of AstraZeneca at the time the study was conducted.

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