BMJ Open

The association between atopic disorders and mental ill health: a UK-based retrospective cohort study

Journal:	*BMJ Open*
Manuscript ID	bmjopen-2024-089181
Article Type:	Original research
Date Submitted by the Author:	06-Jun-2024
Complete List of Authors:	Minhas, Sonica; University of Birmingham, Institute of Applied Health Research Chandan, Joht Singh; University of Birmingham, Institute of Applied Health Research; National Institute for Health and Care Research (NIHR) Birmingham Biomedical Research Centre Knibb, Rebecca; Aston University Diwakar, Lavanya; University of Birmingham, Institute of Applied Health Research; University Hospitals of North Midlands NHS Trust Adderley, Nicola; University of Birmingham, Institute of Applied Health Research; National Institute for Health and Care Research (NIHR) Birmingham Biomedical Research Centre
Keywords:	MENTAL HEALTH, Allergy < THORACIC MEDICINE, EPIDEMIOLOGIC STUDIES

I, the Submitting Author has the right to grant and does grant on behalf of all authors of the Work (as defined in the below author licence), an exclusive licence and/or a non-exclusive licence for contributions from authors who are: i) UK Crown employees; ii) where BMJ has agreed a CC-BY licence shall apply, and/or iii) in accordance with the terms applicable for US Federal Government officers or employees acting as part of their official duties; on a worldwide, perpetual, irrevocable, royalty-free basis to BMJ Publishing Group Ltd ("BMJ") its licensees and where the relevant Journal is co-owned by BMJ to the co-owners of the Journal, to publish the Work in this journal and any other BMJ products and to exploit all rights, as set out in our licence.

The Submitting Author accepts and understands that any supply made under these terms is made by BMJ to the Submitting Author unless you are acting as an employee on behalf of your employer or a postgraduate student of an affiliated institution which is paying any applicable article publishing charge ("APC") for Open Access articles. Where the Submitting Author wishes to make the Work available on an Open Access basis (and intends to pay the relevant APC), the terms of reuse of such Open Access shall be governed by a Creative Commons licence – details of these licences and which Creative Commons licence will apply to this Work are set out in our licence referred to above.

Other than as permitted in any relevant BMJ Author's Self Archiving Policies, I confirm this Work has not been accepted for publication elsewhere, is not being considered for publication elsewhere and does not duplicate material already published. I confirm all authors consent to publication of this Work and authorise the granting of this licence.

The association between atopic disorders and mental ill health: a UK-based retrospective cohort study

Authors: Sonica Minhas, *Honorary Research Associate* [1], Joht Singh Chandan, *Clinical Associate Professor in Public Health* [1,2], Rebecca C Knibb, Associate Professor in Health Psychology[3], Nicola J Adderley*, *Associate Professor of Health Informatics and Epidemiology* [1,2], Lavanya Diwakar*, *Hon Associate Professor in Health Economics, Consultant Immunologist*[1,4]

*Joint senior authors

Institutional Affiliations:
[1]Institute of Applied Health Research, College of Medical and Dental Sciences, University of Birmingham, B15 2TT, UK
[2]National Institute for Health and Care Research (NIHR) Birmingham Biomedical Research Centre, Birmingham, UK
[3]Aston University, B4 7ET, UK
[4]University Hospitals of North Midlands NHS Trust, Stoke-on-Trent, ST4 6QG, UK

Corresponding Author:
Dr Lavanya Diwakar
l.diwakar@bham.ac.uk

Declarations

Competing Interests:
All authors have completed the Unified Competing Interest form (available on request from the corresponding author) and declare: no support from any organisation for the submitted work; no financial relationships with any organisations that might have an interest in the submitted work in the previous three years, no other relationships or activities that could appear to have influenced the submitted work.

Contribution Statement:
Conceptualization (LD, RCK, JSC, NA), data curation (JSC, NA), data analysis (SM, NA, JSC), methodology (NA, JSC), writing - original draft (SM), writing - review & editing (all authors: SM, RCK, JSC, NA, LD). All authors approved the final version.

Transparency Statement:
The lead author (the manuscript's guarantor) affirms that the manuscript is an honest, accurate, and transparent account of the study being reported; that no important aspects of the study have been omitted; and that any discrepancies from the study as originally planned have been explained.

Ethics Approval:
Anonymized data was used from the data provider to the University of Birmingham. The use of IQVIA Medical Research Data is approved by the United Kingdom Research Ethics Committee (reference number: 18/LO/0441); in accordance with this approval, the study protocol must be reviewed and approved by an independent Scientific Review Committee (SRC). The protocol has been approved for this project by the independent SRC (22SRC027). IQVIA Medical Research Data incorporates data from The Health Improvement Network (THIN), a Cegedim Database. Reference made to THIN is intended to be descriptive of the data asset licensed by IQVIA. This work has used de-identified data provided by patients as a part of their routine primary care. As the data is de-identified there is no opportunity/ability for the research team to seek independent written consent from those who contribute to the dataset.

Funding:
None

Data Sharing:
The data and analysis code can be obtained from the corresponding author following appropriate ethical approval.

Summary Boxes

Section 1: What is already known

Epidemiological research has found an association between atopic disorders and mental health disorders. The existing evidence base is strongest for the associations between allergic rhino-conjunctivitis and food allergies with mood disorders (anxiety and depression). Association with other mental health disorders such as psychosis, suicide, eating disorders and ADHD are less well-defined.

Section 2: What this study adds

Our study expands on the existing literature describing an association between atopic disorders and adverse mental health outcomes. Our study particularly adds to this body of research through inclusion of food allergy, drug allergy, anaphylaxis, urticaria in our exposed cohort. These disorders are less well studied, especially for associations with disorders other than depression and anxiety. Previously published literature is vastly from cross-sectional study designs with small sample sizes, which are unable to ascertain temporality or cause-and-effect. To the best of our knowledge, this is the largest UK based cohort study to investigate the relationship between atopic disorders and mental health outcomes.

Abstract

Objective
To examine the mental ill health burden associated with allergic and atopic disorders, in a UK primary care cohort.

Design
Population-based retrospective open cohort study

Setting
United Kingdom

Participants
2,491,086 individuals with primary-care recorded atopic disorder (food allergy, drug allergy, anaphylaxis, urticaria, allergic rhino-conjunctivitis) diagnosis were matched by sex, age (± 2 years), and Townsend deprivation score at index to 3,120,719 unexposed individuals.

Main Outcome Measures
The primary outcome was a composite of mental ill health (severe mental illness, anxiety, depression, eating disorders, obsessive-compulsive disorder [OCD], and self-harm). Cox regression was used to estimate adjusted hazard ratios with 95% confidence intervals for the composite mental ill health outcome and each of the individual mental health disorders.

Results
Between 1st January 1995 to 31st January 2022, a total of 2,491,086 eligible individuals were identified with a primary care recorded diagnosis of atopic disease and were matched to 3,120,719 unexposed individuals. 229,124 exposed individuals developed a mental ill health outcome during the study period (incidence ratio (IR) 144.13 per 10,000 person-years) compared to 203,450 in the unexposed group (IR 117.82 per 10,000 person-years). This translated to an adjusted hazard ratio (aHR) of 1.16 (95% confidence interval (CI) 1.15-1.17). Notably, the risk of anxiety was greatest, aHR 1.22 (95% CI 1.21-1.23). Our findings were robust to a sensitivity analysis, where individuals were also matched for asthma and eczema.

Conclusion
There is an increased risk of mental ill health disorders amongst patients with diagnosis of an allergic and atopic disorders. There is a need to consider dual delivery of allergy and psychology services to optimise mental wellbeing among this cohort.

Introduction

Atopic and allergic disorders (food allergy, drug allergy, anaphylaxis, urticaria, and allergic rhino-conjunctivitis) are common chronic conditions globally and in the UK population [1], with significant associated morbidity. [2] These disorders are caused by an aberrant immune system response, mediated by IgE antibodies to otherwise innocuous antigens (allergens). The effects can range from mild and local responses (e.g., mild allergic rhinitis) to life-threatening (e.g., anaphylaxis).

Mental health disorders also have a high prevalence in the UK, with a 2014 survey showing that 1 in 6 people aged 16 years and older in England met the criteria for a common mental disorder (CMD).[3] Mental health disorders are an important cause of disability and are a risk factor for premature mortality.[4,5] Severe mental illness (SMI) is defined as a subset of mental health disorders resulting in functional and occupational impairment, limiting major life activities.[6] Data from England in 2018 to 2020 shows that people with SMI are five times more likely to die prematurely (before age 75 years) than those without an SMI. [7]

Increasingly, research suggests a relationship between atopic disease and mental health conditions.[8] Epidemiological research has shown associations between allergic rhinitis and mood disorders [9,10], suicidal ideation[11], and anxiety disorders.[12] Although less well studied, some research has shown that urticaria is also associated with reduced quality of life and greater symptoms of depression and anxiety.[13,14] Food allergy has been associated with reduced quality of life, anxiety and depression [15,16], as has anaphylaxis.[17] The majority of this research has been in non-UK cohorts and is limited by small sample sizes and cross-sectional design. Given the high prevalence of both atopic and mental health disorders, understanding any association between the two is vital for improving patient care and for targeting interventions to reduce the burden associated with both. Using UK primary care data, we investigated the associations between atopic disorders and the subsequent risk of developing mental ill health disorders. As there is already a strong evidence base for asthma, allergic rhinitis and atopic dermatitis [8–10], we focused our analysis on food allergy, drug allergy, anaphylaxis, urticaria, allergic rhino-conjunctivitis.

Methods

Study design, data source, and population

A UK population-based, retrospective, open cohort study was undertaken using data from the IQVIA Medical Research Database (IMRD) from 1st January 1995 to 28th February 2021. The IMRD UK database contains de-identified electronic medical records from UK primary care general practices using the Vision software system. It is nationally representative of the UK population, with respect to demographic structure and the prevalence of common comorbidities.[18,19] Patient data regarding symptoms, examination findings, and diagnoses is recorded using Read codes [20]- a hierarchical clinical coding system.

The 'Data extraction for epidemiological research (DExtER)' tool [21] was used to facilitate data extraction, transformation and loading in this study. The data analysis and reporting adhered to the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) statement (appendix A).[22]

To ensure accurate coding and reduce underreporting of outcomes, general practices were only eligible for inclusion from the later of the following two dates: one year after the installation of the Vision software system or the date acceptable mortality recording (AMR) was achieved.[23] AMR date is determined by the comparison between recording of death by practices and the predicted mortality, using national data, accounting for the demographic of a practices' catchment area. The AMR date is defined as the point where the national and practice mortality rates align.

Exposure and outcome definition

The aim of this study was to compare the risk of mental ill health (composite measure: defined through Read codes describing depression, anxiety, severe mental illness [psychosis, bipolar disorder or schizophrenia], eating disorders, OCD, and self-harm) in exposed patients (Read codes for food allergy, drug allergy, anaphylaxis, urticaria, allergic rhino-conjunctivitis) with unexposed patients (those without such codes). Codes for allergic and atopic disorders and mental ill health were selected with the help of general health practitioners, public health clinicians and immunologists to define the exposed cohort (see Appendix B for the codes used in this study). The primary outcome of interest was a composite of mental ill health but each of the aforementioned mental health disorders was also analysed separately. Patients with mental health disorders at baseline were excluded from the study.

Individuals with atopic disorders were matched to up to four unexposed individuals randomly selected from the remaining pool of eligible patients, by general practice, age (± 2 years), sex and Townsend deprivation quintile score [24] at baseline. The Townsend deprivation quintile score is a measure of socioeconomic status derived from national census data, including variables such as home ownership and employment.[25] A higher score correlates to greater socio-economic deprivation.

Follow-up period

Index date for patients in the exposed group was defined as the date of first Read code relating to atopic disorder diagnosis (incident cases) or the date of eligibility of cohort entry for those with pre-existing recoded Read code (prevalent cases). To prevent immortal time bias [23], matched unexposed patients were assigned the same index date. An open cohort design allows patients to be enrolled at different timepoints, and for each patient to contribute person-years of follow-up from the point of entry (index date) to the point of exit (exit date). Exit date was defined as the earliest of (i) the outcome, (ii) death, (iii) patient left the general practice, (iv) last date of data collection from the practice, or (v) study end date.

Study Covariates

Co-variates adjusted for in the analysis were: age, sex, alcohol use, smoking status, body mass index (BMI), Townsend deprivation quintile score, asthma exposure, and eczema exposure at baseline. These co-variates were selected due to their potential independent relationship with the development of mental ill health.[26,27] Our matching criteria included age, sex, and Townsend deprivation quintile score, however we also included these as covariates in the study models to account for any residual confounding.

BMI was calculated as weight in kilograms divided by height in meters squared and categorised as per the World Health Organization criteria (underweight <18·5kg/m^2, normal 18·5-24·9kg/m^2, overweight 25·0-29·9kg/m^2, obese >30·0kg/m^2). Smoking status (current smoker, non-current smoker, not available) and alcohol use (current drinker, non-current drinker, not available) were self-reported.

Statistical Analysis

STATA version 18 [28] was used for all analyses. Missing data was included as a separate missing category and was included in the regression analysis, in keeping with previously published work.[29–31]

Crude incidence rates (IR) were calculated for the exposed and unexposed groups by dividing the number of outcomes by person-years. A Cox proportional hazards regression model was used to derive unadjusted and adjusted hazard ratios (HR) with 95% confidence levels (CI) describing the association between atopic disorders and the risk of mental ill health (composite outcome) and then for each mental health disorder included in the study individually. Statistical significance was set at $p<0.05$. A sensitivity analysis was undertaken by matching participants for asthma and eczema exposure.

Patient and Public Involvement

There was no patient or public involvement in setting the research question or the outcome measures. No patients were asked to advise on the interpretation or writing up of results. This was deemed unnecessary as all patient related data used was anonymised.

Results

In this study, 2,491,086 individuals were identified with a primary care recorded diagnosis of atopic disease and they were matched to 3,120,719 unexposed individuals. All data describing baseline characteristics are outlined in Table 1. The exposed cohort had a median follow-up period of 5.10 person years (IQR 2.02 – 9.68) versus 4.11 (1.59 – 8.37) in the unexposed cohort. Due to matching, the mean age at cohort entry and sex distribution were similar, although exposed individuals were more likely to be female than unexposed individuals (54.64 vs 49.98%). Data on BMI, smoking status, drinking status, Townsend index, and ethnicity were missing in both groups. Where recorded, data on smoking status, drinking status, and Townsend index were similar between the groups. However, individuals in the exposed group were more likely to be obese (13.99% vs 9.94%) and of white ethnicity (42.19% vs 35.72%) compared to those in the unexposed group.

During the study period, there were 229,124 recorded outcomes of mental ill health in the exposed group (IR 144.13 per 10,000 person-years) compared to 203,450 in the unexposed group (IR 117.82 per 10,000 person-years); (Table 2). This translated to an aHR of 1.16 (95% CI 1.15-1.17). The risk of anxiety (aHR 1.22, 95% CI 1.21-1.23), depression (aHR 1.15, 95% CI 1.14-1.16), eating disorders (aHR 1.06, 95% CI 1.01-1.11), OCD (aHR 1.20, 95% CI 1.14 – 1.26), and self-harm (aHR 1.02, 95% CI 1.00-1.04) were greater in the exposed group compared to the unexposed group. By contrast, there was no difference in the risk of SMI between the two groups, aHR 0.99 (9% CI 0.95-1.03).

Tables 3a-3e describe the risk of mental ill health outcomes associated with each type of atopic disorder included in the exposure for this study (food allergy, drug allergy, anaphylaxis, urticaria, and allergic rhinitis respectively). All individual atopic disorders were associated with greater risk of mental ill health compared to non-exposed individuals: food allergy (aHR 1.07, 95% CI 1.03-1.11); drug allergy (aHR 1.28, 95% CI 1.27-1.29); anaphylaxis (aHR 1.43, 95% CI 1.32-1.54); urticaria (aHR 1.15, 95% CI 1.14-1.17); allergic rhinitis (aHR 1.26, 95% CI 1.22-1.30) (tables 3a-3e).

Notably, our results demonstrated that food allergy and drug allergy exposure were associated with increased risk of all mental health outcomes. Individuals with anaphylaxis exposure had the greatest risk of anxiety (aHR 1.59, 95% CI 1.41-1.79), OCD (aHR 2.37, 95% CI 1.28-4.40), and depression (aHR 1.36, 95% CI 1.23-1.50); (table 3c).

We carried out a sensitivity analysis, matching both groups for asthma and eczema in addition to other baseline characteristics (Table S1). The findings of the sensitivity analysis were similar to that of the main cohort. There was an increased risk of all mental ill health outcomes in those with atopic disease exposure compared to those without, aHR 1.16 (95% CI 1.15-1.16). The risk of all individual mental health outcomes except SMI was increased, reflecting the main cohort analysis: SMI (aHR 0.99, 95% CI 0.96-1.03); anxiety (aHR 1.21, 95% CI 1.20-1.23); depression (aHR 1.15, 95% CI 1.14-1.16); eating disorders (aHR 1.06, 95% CI 1.01-1.10); OCD (aHR 1.18, 95% CI 1.13-1.24); self-harm (aHR 1.03; 95% CI 1.01-1.05).

Tables S3-S7 describe the risk of mental ill health outcomes associated with each type of atopic disorder, in the sensitivity analysis, with patients also matched for asthma and eczema.

Discussion

Principal Findings

In this population-based UK retrospective cohort study, we found that individuals with primary care recorded exposure to atopic disease had a 16% higher risk of having a subsequent mental health diagnosis, compared to those with no such exposure. Analysis of each individual mental health outcome showed a positive association with atopy exposure, except SMI. These findings were robust to a sensitivity analysis, suggesting that the impact was related to atopy rather than eczema or asthma.

Consideration of individual atopic and allergic disorders showed that individuals with anaphylaxis exposure had the greatest risk of subsequent mental health diagnosis, with 43% increased risk compared to those without. They were most likely to be diagnosed with OCD, anxiety, or depression (137%, 59% and 36% increased risk respectively). Notably, only drug allergy and food allergy exposure conferred an increased risk of SMI.

Comparison with previous studies

The evidence base for atopic disorders (other than asthma, atopic dermatitis, and allergic rhinitis) and their relationship with mental health disorders is still emerging, especially for diagnoses other than depression and anxiety. Our study expands on the existing global literature. Our study supports the findings of previous studies demonstrating a relationship between atopic disorders and common mental health disorders (depression and anxiety). Although the strength of associations previously found varies across the conditions being assessed and the majority of previous studies explored mental health outcomes in those with allergic rhinitis, asthma, and/or eczema. Some evidence has also linked allergy, eating disorders [32], attention deficit hyperactivity disorder (ADHD) and suicides.[33] Our study has examined these association in a large sample, representative of the general UK population where previous studies have often included small sample sizes of clinical population, which may differ in their demographics from the general population.

Previous research has indicated a strong association between food allergy and anxiety, which could be driven by the fear of a life-threatening reaction.[16] Our study's findings provide support to this association. Individuals with food allergy in our study demonstrated a 15% increase in anxiety (aHR 1.15, 95% CI 1.09-1.22); (table 3a).

Previous research indicates the relationship between atopic disorders and mental health disorders appears to be bidirectional. Some studies have shown that individuals with depression are more likely to have a concomitant diagnosis of allergies, including non-food allergies. [34–37] A twin study from Finland suggested the possibility of a genetic link between allergy and depression. [38] Birth cohort studies from northern Finland have demonstrated strong association between depression and allergy, especially in females.[39,40] One northern Finland birth cohort study found females with atopy had an 80% increased risk of developing depression (aOR 1.8, 95% CI 1.2–2.6). [40]

Potential underlying mechanisms

It has been suggested that patients with allergies and mental health disorders have similar disruptions in immune pathways.[41] Depression and anxiety can enhance the inflammatory Th2 and Th17 pathways [33] which are also implicated in the aetiology of allergy.[42] Indeed, there is clinical evidence to suggest that this relationship could be bi-directional - that is, having a diagnosis of either allergy or a mental health disorder can increase the risk of the other (Zhang et al., 2022). In further support of this hypothesis, medication for depression has been shown to improve allergy symptoms [43] and vice-versa.[44] Poor allergy management can worsen outcomes too: a Canadian study found increased tics, anxiety and disruptive behaviour patterns in children aged 5-10 years receiving hydroxyzine, a first-generation antihistamine. [45]

The data on the relationship between severity of allergy and mental health disease are less clear. One study suggested that the likelihood of mental health disease increases with increased severity of atopic dermatitis [46], but there are no data on the risks related to other allergic conditions. One hypothesis is that immunological and inflammatory responses associated with atopy may predispose to increased risk of mental health disorders, particularly depression.[47] In sensitised individuals, exposure to an allergen

results in IgE-mediated activation of mast cells, causing mass secretion of chemicals such as histamine and cytokines (e.g., interleukin-4 (IL-4) and IL-13). Recent evidence suggests that these cytokines can alter neurotransmitter systems, contributing to the development of psychiatric disorders.[48] Pro-inflammatory cytokine exposure has been shown to induce symptoms of anhedonia, lethargy, sleep disturbance, and anorexia- all of which are established symptoms of depression.[49,50] Many pathophysiologic pathways in the nervous system are posited to be involved in depression, including the monoaminergic pathway, dysfunction of the hypothalamic-pituitary axis (HPA), and glutamate transmission.[48,51]

A second hypothesis that can explain the observed relationship is that the chronicity of atopic and allergic disorders results in increased psychosocial stress. A review by Golding et al [15] reported that food allergies are associated with reduced reported health-related quality of life (HRQL), and greater symptoms of depression and anxiety, related to the vigilance required to avoid exposure to triggers and associated social consequences. Furthermore, the management for atopic and allergic disorders focuses on controlling symptoms and preventing flare ups; there are no curative treatments. Repeated relapses, unsuccessful lines of treatment, and the subsequent impact on functional status represent another source of stress for individuals [52], which can predispose to adverse mental health. This is particularly relevant to children; many of these disorders develop in early childhood and early childhood experiences can be fundamental to the development of mental ill health and through epigenetic modifications can predispose abnormal stress responses in adults [53], which is a risk factor for mental health disorders. Several studies demonstrate chronic physical illness and association with mental health disorders like depression, anxiety, and ADHD. [54,55]

It is possible (indeed likely) that both of these factors contribute to the relationship between atopic disorders and mental ill health.

Implications for clinical practice

A growing body of evidence demonstrates the impact of allergic disorders on long-term mental health outcomes, but few clinical guidelines or allergy services address this. There is a global unmet need for psychological support for patients in allergy clinics. [56,57] A recent global survey of psychological support needs found that for adults and parents in the UK, over 80% reported psychological distress related to their or their child's food allergy but less than 25% had been assessed for food allergy related distress and only 40% of those who needed it had been seen by a mental health professional.[56] This pattern was similar across many other countries in Europe and North and South America. This study reinforces the growing evidence base for the integration of psychological services into standard allergy care.

Strengths and Limitations

Strengths of this study include its large and diverse sample, which is generalisable to the UK population with respect to demographics and prevalence of chronic conditions.[18,19] To the best of our knowledge, this is the first large-scale UK primary-care based cohort study examining the relationship between atopic disorders and mental health disorders. The use

of electronic health records from a primary care database reduces recall bias as data is recorded during patient consultations. The study is novel for inclusion of a range of atopic and mental health disorders- many of which are poorly studied in the existing literature.

This study has a few key limitations which must be considered when interpreting the findings. First, the study uses data from electronic healthcare records which relies on accurate documentation by health care professionals in general practices contributing to the dataset. Heterogeneity in recording, which can affect both the exposure and outcomes of interest, can result in misclassification bias. However, the coding of mental health disorders is more likely to be complete as SMI feature in the in the Quality and Outcomes Framework (QOF; which is a UK primary care performance management reward scheme).[58]

Another limitation related to coding is that we are unable to stratify included patients by disease severity which could provide useful findings by sensitivity analysis. Similarly, factors such as educational status, parental psychiatric history which could be confounders cannot be included due to poor recording.

Recommendations for Future Research

Further longitudinal studies of large community-representative samples are required to further explore the association between the broad range of atopic disorders and mental health disorders. Future studies could explore with sub-group analyses differences in outcomes by age-of-onset and disease severity. Effect of psychological interventions, particularly on the most affected subgroups (e.g. those with history of anaphylaxis), should also be measured systematically.

Conclusion

Individuals with allergies and atopic disease were at an increased risk of developing mental ill health in this UK primary care cohort. A positive association was found between allergy and all mental health disorders (anxiety, depression, eating disorders, OCD, and self-harm) except SMI. Given the high prevalence of allergic and atopic disorders, this association underscores a substantial public mental health burden. Primary and secondary healthcare services should be aware of the potential risk of mental health disorders in patients presenting with allergic and atopic disorders. Appropriate referrals to suitable psychological support should be made where possible.

References

1 Thomsen SF. Epidemiology and natural history of atopic diseases. *Eur Clin Respir J*. 2015;2:24642.

2 Shin YH, Hwang J, Kwon R, *et al.* Global, regional, and national burden of allergic disorders and their risk factors in 204 countries and territories, from 1990 to 2019: A systematic analysis for the Global Burden of Disease Study 2019. *Allergy*. 2023;78:2232–54.

3 McManus S, Bebbington P, Jenkins R, *et al.* Mental health and wellbeing in England: Adult Psychiatric Morbidity Survey 2014. 2014. https://doi.org/10.1103/PhysRevB.77.235410

4 Rehm J, Shield KD. Global Burden of Disease and the Impact of Mental and Addictive Disorders. *Curr Psychiatry Rep*. 2019;21:10.

5 Charlson FJ, Baxter AJ, Dua T, *et al.* Excess mortality from mental, neurological and substance use disorders in the Global Burden of Disease Study 2010. *Epidemiol Psychiatr Sci*. 2015;24:121–40.

6 Public Health England. Severe mental illness (SMI) and physical health inequalities: briefing. London 2018.

7 Office for Health Improvement & Disparities. Premature mortality in adults with severe mental illness (SMI). London 2023.

8 Tzeng N-S, Chang H-A, Chung C-H, *et al.* Increased Risk of Psychiatric Disorders in Allergic Diseases: A Nationwide, Population-Based, Cohort Study . Front. Psychiatry . 2018;9. https://www.frontiersin.org/articles/10.3389/fpsyt.2018.00133

9 Oh H, Koyanagi A, DeVylder J, *et al.* Seasonal Allergies and Psychiatric Disorders in the United States. *Int J Environ Res Public Health*. 2018;15:1965.

10 Hurwitz EL, Morgenstern H. Cross-Sectional Associations of Asthma, Hay Fever, and Other Allergies with Major Depression and Low-Back Pain among Adults Aged 20-39 Years in the United States. *Am J Epidemiol*. 1999;150:1107–16.

11 Messias E, Clarke DE, Goodwin RD. Seasonal allergies and suicidality: results from the National Comorbidity Survey Replication. *Acta Psychiatr Scand*. 2010;122:139–42.

12 Patten SB, Williams JVA. Self-Reported Allergies and Their Relationship to Several Axis I Disorders in a Community Sample. *Int J Psychiatry Med*. 2007;37:11–22.

13 Tawil S, Irani C, Kfoury R, *et al.* Association of Chronic Urticaria with Psychological Distress: A Multicentre Cross-sectional Study. *Acta Derm Venereol*. 2023;103:adv00865.

14 Tat TS. Higher Levels of Depression and Anxiety in Patients with Chronic Urticaria. *Med Sci Monit*. 2019;25:115–20.

15 Golding MA, Batac ALR, Gunnarsson N V, *et al.* The burden of food allergy on children and teens: A systematic review. *Pediatr Allergy Immunol*. 2022;33:e13743.

16 Polloni L, Muraro A. Anxiety and food allergy: A review of the last two decades. *Clin Exp Allergy*. 2020;50:420–41.

17 Knibb RC, Huissoon AP, Baretto R, *et al.* The impact of anaphylaxis on the quality of life and mental health of adults. *Clin Exp Allergy*. 2023;53:121–5.

18 Blak BT, Thompson M, Dattani H, *et al.* Generalisability of The Health Improvement Network (THIN) database: demographics, chronic disease prevalence and mortality rates. *Inform Prim Care*. 2011;19:251–5.

19 THIN : The Health Improvement Network - Cegedim Health Data. https://www.cegedim-health-data.com/cegedim-health-data/thin-the-health-improvement-network/ (accessed 30 May 2023)

20 Booth N. What are the Read Codes? *Health Libr Rev*. 1994;11:177–82.

21 Gokhale KM, Chandan JS, Toulis K, *et al.* Data extraction for epidemiological research (DExtER): a novel tool for automated clinical epidemiology studies. *Eur J Epidemiol*. 2021;36:165–78.

22 von Elm E, Altman DG, Egger M, *et al.* The Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) statement: guidelines for reporting observational studies. *J Clin Epidemiol*. 2008;61:344–9.

23 Maguire A, Blak BT, Thompson M. The importance of defining periods of complete mortality reporting for research using automated data from primary care. *Pharmacoepidemiol Drug Saf*. 2009;18:76–83.

24 Townsend P, Phillimore P, Beattie A. *Health and Deprivation: Inequality and the North.* Bristol: Croom Helm 1988.

25 Office for National Statistics, National Records of Scotland, Northern Ireland Statistics and Research Agency, *et al.* 2011 UK Townsend Deprivation Scores . 2011. https://statistics.ukdataservice.ac.uk/dataset/2011-uk-townsend-deprivation-scores (accessed 12 September 2022)

26 Dragioti E, Radua J, Solmi M, *et al.* Global population attributable fraction of potentially modifiable risk factors for mental disorders: a meta-umbrella systematic review. *Mol Psychiatry 2022 278*. 2022;27:3510–9.

27 Oliveros B, Agulló-Tomás E, Márquez-álvarez LJ. Risk and Protective Factors of Mental Health Conditions: Impact of Employment, Deprivation and Social Relationships. *Int J Environ Res Public Health*. 2022;19. doi: 10.3390/IJERPH19116781

28 StataCorp. Stata Statistical Software: Release 18. College Station, TX 2023.

29 Nash K, Minhas S, Metheny N, *et al.* Association between childhood maltreatment and atopy in the UK: A population based retrospective cohort study. *eClinicalMedicine*. 2022;0:101730.

30 Minhas S, Qian Hui Lim R, Raindi D, *et al.* Exposure to domestic abuse and the subsequent risk of developing periodontal disease. *Heliyon*. 2022;8:e12631.

31 Chandan JS, Keerthy D, Gokhale KM, *et al.* The association between exposure to domestic abuse in women and the development of syndromes indicating central nervous system sensitization: A retrospective cohort study using UK primary care records. *Eur J Pain*. 2021;25:1283–91.

32 Jafri S, Frykas TL, Bingemann T, *et al.* Food Allergy, Eating Disorders and Body Image. *J Affect Disord Reports*. 2021;6:100197.

33 Postolache TT, Komarow H, Tonelli LH. Allergy: A risk factor for suicide? *Curr Treat Options Neurol*. 2008;10:363–76.

34 Patten SB, Williams JV, Lavorato DH, *et al.* Allergies and major depression: a longitudinal community study. *Biopsychosoc Med*. 2009;3:3.

35 Cuffel B, Wamboldt M, Borish L, *et al.* Economic Consequences of Comorbid Depression, Anxiety, and Allergic Rhinitis. *Psychosomatics*. 1999;40:491–6.

36 Bell IR, Jasnoski ML, Kagan J, *et al.* Depression and Allergies: Survey of a Nonclinical Population. *Psychother Psychosom*. 1991;55:24–31.

37 Goodwin RD, Castro M, Kovacs M. Major Depression and Allergy: Does Neuroticism Explain the Relationship? *Psychosom Med*. 2006;68:94–8.

38 Wamboldt MZ, Hewitt JK, Schmitz S, *et al.* Familial association between allergic disorders and depression in adult Finnish twins. *Am J Med Genet*. 2000;96:146–53.

39 Timonen M, Jokelainen J, Hakko H, *et al.* Atopy and depression: results from the Northern Finland 1966 Birth Cohort Study. *Mol Psychiatry*. 2003;8:738–44.

40 Timonen M, Jokelainen J, Silvennoinen-Kassinen S, *et al.* Association between skin test diagnosed atopy and professionally diagnosed depression: a northern finland 1966 birth cohort study. *Biol Psychiatry*. 2002;52:349–55.

41 Zhang Y, Zhen H, Yao W, *et al.* Antidepressant Drug, Desipramine, Alleviates Allergic Rhinitis by Regulating T reg and T h 17 Cells. *Int J Immunopathol Pharmacol*. 2013;26:107–15.

42 Wang J, Zhou Y, Zhang H, *et al.* Pathogenesis of allergic diseases and implications for therapeutic interventions. *Signal Transduct Target Ther*. 2023;8:138.

43 Zhang Y, Zhen H, Yao W, *et al.* Antidepressant Drug, Desipramine, Alleviates Allergic Rhinitis by Regulating T reg and T h 17 Cells. *Int J Immunopathol Pharmacol*. 2013;26:107–15.

44 Sastre J, Crespo A, Fernandez-Sanchez A, *et al.* Anxiety, Depression, and Asthma Control: Changes After Standardized Treatment. *J Allergy Clin Immunol Pract*. 2018;6:1953–9.

45 Gober HJ, Li KH, Yan K, *et al.* Hydroxyzine Use in Preschool Children and Its Effect on Neurodevelopment: A Population-Based Longitudinal Study. *Front Psychiatry*. 2022;12. doi: 10.3389/fpsyt.2021.721875

46 Yaghmaie P, Koudelka CW, Simpson EL. Mental health comorbidity in patients with atopic dermatitis. *J Allergy Clin Immunol*. 2013;131:428–33.

47 Corwin EJ. Understanding ytokines Part I: Physiology and Mechanism of Action. *Biol Res Nurs*. 2000;2:30–40.

48 Felger JC, Lotrich FE. Inflammatory cytokines in depression: Neurobiological mechanisms and therapeutic implications. *Neuroscience*. 2013;246:199–229.

49 Dantzer R. Cytokine-Induced Sickness Behavior: Where Do We Stand? *Brain Behav Immun*. 2001;15:7–24.

50 Dantzer R, O'Connor JC, Freund GG, *et al.* From inflammation to sickness and depression: when the immune system subjugates the brain. *Nat Rev Neurosci*. 2008;9:46–56.

51 Fries GR, Saldana VA, Finnstein J, *et al.* Molecular pathways of major depressive disorder converge on the synapse. *Mol Psychiatry*. 2023;28:284–97.

52 Chida Y, Hamer M, Steptoe A. A bidirectional relationship between psychosocial factors and atopic disorders: A systematic review and meta-analysis. *Psychosom Med*. 2008;70:102–16.

53 National Scientific Council on the Developing Child. Early Experiences Can Alter Gene Expression and Affect Long-Term Development: Working Paper No. 10. Boston 2010.

54 Turkel S, Pao M. Late Consequences of Pediatric Chronic Illness. *Psychiatr Clin North Am*. 2007;30:819.

55 Bennett SD, Kerry E, Fifield K, *et al.* A drop-in centre for treating mental health problems in children with chronic illness: Outcomes for parents and their relationship with child outcomes. *JCPP Adv*. 2021;1:e12046.

56 Knibb R, Halsey M, James P, *et al.* Psychological services for food allergy: The unmet need for patients and families in the United Kingdom. *Clin Exp Allergy*. 2019;49:1390–4.

57 Knibb RC, Jones CJ, Herbert LJ, *et al.* Psychological support needs for children with food allergy and their families: A systematic review. *Pediatr Allergy Immunol*. 2024;35:e14108.

58 National Institute for Health and Care Excellence. NICE Quality and Outcomes Framework indicator. 2023. https://www.nice.org.uk/standards-and-indicators/qofindicators (accessed 23 July 2023)

Table 1: Baseline Characteristics

	Exposed	Unexposed
Number of patients (n)	2,491,086	3,120,719
Number of patients with asthma diagnosis (n)	472,984	289,969
Number of patients with eczema diagnosis (n)	455,348	367,786
Median (IQR) follow-up period (person years)	5.10 (2.02 – 9.68)	4.11 (1.59 – 8.37)
Mean (SD) age at cohort entry (years)	39.42 (23.65)	35.81 (22.17)
Sex (n)		
Male	1,129,954	1,561,074
Female	1,361,132	1,559,645
Body mass index, n (%)		
Underweight (<18·5 kg/m^2)	40,490 (1.63)	52,235 (1.67)
Normal (18·5-24·9 kg/m^2)	687,723 (27.61)	823,574 (26.39)
Overweight (25·0-29·9 kg/m^2)	541,784 (21.75)	559,329 (17.92)
Obese (>30·0 kg/m^2)	348,395 (13.99)	310,123 (9.94)
Not available	872,694 (35.03)	1,375,458 (44.08)
Smoking status, n (%)		
Current smoker	348,532 (13.99)	474,771 (15.21)
Non-current smoker	1,574,697 (63.21)	1,681,583 (53.88)
Not available	567,857 (22.80)	964,365 (30.90)
Drinking status, n (%)		
Current Drinker	1,266,898 (50.86)	1,394,975 (44.70)
Non-current drinker	370,169 (14.86)	382,726 (12.26)
Not available	854,019 (34.28)	1,343,018 (43.04)
Townsend index, n (%)		
(Least deprived) 1	535,228 (21.49)	657,580 (21.07)
2	464,489 (18.65)	552,877 (17.72)
3	453,156 (18.19)	559,350 (17.92)
4	388,862 (15.61)	487,367 (15.62)
5	262,946 (10.56)	327,038 (10.48)
Not available	386,405 (15.51)	536,507 (17.19)
Ethnicity, n (%)		
White	1,050,939 (42.19)	1,114,783 (35.72)
Black	45,742 (1.84)	51,975 (1.67)
South Asian	66,060 (2.65)	74,028 (2.37)
Mixed	16,818 (0.68)	19,858 (0.64)
Other	37,641 (1.51)	54,616 (1.75)
Missing	1,273,886 (51.14)	1,805,459 (57.85)

Table 2: Hazard ratios with 95% confidence intervals (CI) for mental ill health among patients with any atopic or allergic disorder compared to matched unexposed individuals

		Number of outcomes	Person Years	Incidence Rate (per 10,000 person years)	Unadjusted Hazard Ratio	Adjusted Hazard Ratio*
Composite	**Exposed**	229,124	**15,900,000**	144.13	1.23 (1.23-1.24)	1.16 (1.15-1.17)
	Unexposed	203,450	**17,300,000**	117.82		
SMI	**Exposed**	5,581	**17,200,000**	32.46	1.00 (0.97-1.04)	0.99 (0.95-1.03)
	Unexposed	5,979	**18,400,000**	32.51		
Anxiety	**Exposed**	93,848	**16,700,000**	56.210	1.30 (1.29-1.31)	1.22 (1.21-1.23)
	Unexposed	77,479	**18,000,000**	43.05		
Depression	**Exposed**	138,658	16,400,000	84.59	1.25 (1.24-1.26)	1.15 (1.14-1.16)
	Unexposed	121,244	17,700,000	68.48		
Eating disorders	**Exposed**	4188	17,200,000	2.44	1.06 (1.01-1.10)	1.06 (1.01-1.11)
	Unexposed	4310	18,400,000	2.34		
OCD	**Exposed**	3565	17,200,000	2.07	1.20 (1.15-1.26)	1.20 (1.14-1.26)
	Unexposed	3163	18,400,000	1.72		
Self harm	**Exposed**	21,959	17,100,000	12.83	0.99 (0.98-1.01)	1.02 (1.00-1.04)
	Unexposed	23,619	18,300,000	12.90		

*Adjusted hazard ratio: adjusted for age, sex, alcohol use, smoking status, body mass index (BMI), Townsend deprivation quintile score, asthma, and eczema at baseline

Table 3: Hazard ratios with 95% confidence intervals (CI) for mental ill health among patients with specific atopic and allergic disorders

		Number of outcomes	Person Years	Incidence Rate (per 10,000 person years)	Unadjusted Hazard Ratio	Adjusted Hazard Ratio
Composite	**Exposed**	6,955	583,190	119.26	1.21 (1.17-1.25)	1.07 (1.03-1.11)
	Unexposed	6,335	648,193	97.73		
SMI	**Exposed**	180	617,205	2.92	1.18 (0.95-1.46)	1.13 (0.90-1.42)
	Unexposed	165	677,620	2.44		
Anxiety	**Exposed**	2,908	604,387	48.12	1.33 (1.26-1.40)	1.15 (1.09-1.22)
	Unexposed	2,355	**667,832**	35.26		
Depression	**Exposed**	3,692	597,935	61.75	1.18 (1.13-1.24)	1.03 (0.98-1.09)
	Unexposed	3,425	660,867	51.83		
Eating disorders	**Exposed**	263	616,739	4.26	1.20 (1.01-1.43)	1.09 (0.91-1.32)
	Unexposed	240	677,337	3.54		
OCD	**Exposed**	188	617,035	3.05	1.27 (1.03-1.57)	1.12 (0.89-1.41)
	Unexposed	158	677,684	2.33		
Self harm	**Exposed**	917	614,055	14.93	1.01 (0.92-1.10)	0.95 (0.86-1.05)
	Unexposed	970	674,407	14.38		

Table 3a: Food allergy

*Adjusted hazard ratio: adjusted for age, sex, alcohol use, smoking status, body mass index (BMI), Townsend deprivation quintile score, asthma, and eczema at baseline

Table 3b: Drug allergy

		Number of outcomes	Person Years	Incidence Rate (per 10,000 person years)	Unadjusted Hazard Ratio	Adjusted Hazard Ratio
Composite	**Exposed**	136,246	8,629,804	157.88	1.35 (1.33-1.36)	1.28 (1.26-1.29)
	Unexposed	104,501	8,773,298	119.11		
SMI	**Exposed**	3467	9,429,027	3.68	1.07 (1.02-1.13)	1.07 (1.02-1.12)
	Unexposed	3245	9,364,852	3.47		
Anxiety	**Exposed**	55,508	9,120,391	60.86	1.43 (1.41-1.45)	1.36 (1.34-1.37)
	Unexposed	39,114	9,159,493	42.70		
Depression	**Exposed**	85,637	8,920,011	96.01	1.35 (1.34-1.37)	1.27 (1.25-1.28)
	Unexposed	64,926	8,990,436	72.22		
Eating disorders	**Exposed**	1,834	9,434,611	1.94	1.09 (1.02-1.16)	1.12 (1.05-1.20)
	Unexposed	1,711	9,371,394	1.83		
OCD	**Exposed**	1,663	9,434,811	1.76	1.34 (1.24-1.44)	1.37 (1.27-1.47)
	Unexposed	1,241	9,372,528	1.32		
Self harm	**Exposed**	10,780	9,390,771	11.48	1.13 (1.10-1.16)	1.18 (1.15-1.22)
	Unexposed	9,531	9,333,037	10.21		

*Adjusted hazard ratio: adjusted for age, sex, alcohol use, smoking status, body mass index (BMI), Townsend deprivation quintile score, asthma, and eczema at baseline

Table 3c: Anaphylaxis

		Number of outcomes	Person Years	Incidence Rate (per 10,000 person years)	Unadjusted Hazard Ratio	Adjusted Hazard Ratio
Composite	**Exposed**	1,773	100,899	175.72	1.57 (1.46-1.69)	1.43 (1.32-1.54)
	Unexposed	1,229	108,556	113.21		
SMI	**Exposed**	33	111,340	2.96	0.99 (0.61-1.58)	0.93 (0.57-1.54)
	Unexposed	36	115,380	3.12		
Anxiety	**Exposed**	769	107,135	71.78	1.76 (1.57-1.97)	1.59 (1.42-1.79)
	Unexposed	460	112,994	40.71		
Depression	**Exposed**	1,050	104,749	100.24	1.51 (1.38-1.66)	1.36 (1.23-1.50)
	Unexposed	748	111,314	67.20		
Eating disorders	**Exposed**	31	111,337	2.78	1.08 (0.65-1.78)	0.89 (0.51-1.56)
	Unexposed	30	115,429	2.60		
OCD	**Exposed**	32	111,288	2.88	2.04 (1.13-3.68)	2.37 (1.28-4.40)
	Unexposed	17	115,524	1.47		
Self harm	**Exposed**	196	110,613	17.72	1.94 (1.53-2.47)	1.83 (1.42-2.36)
	Unexposed	105	115,123	9.12		

*Adjusted hazard ratio: adjusted for age, sex, alcohol use, smoking status, body mass index (BMI), Townsend deprivation quintile score, asthma, and eczema at baseline

Table 3d: Urticaria

		Number of outcomes	Person Years	Incidence Rate (per 10,000 person years)	Unadjusted Hazard Ratio	Adjusted Hazard Ratio
Composite	**Exposed**	43,001	2.966,951	144.93	1.25 (1.23-1.27)	1.15 (1.14-1.17)
	Unexposed	35,624	3,060,309	116.41		
SMI	**Exposed**	863	3,231,215	2.67	0.91 (0.83-0.99)	0.87 (0.79-0.96)
	Unexposed	950	3,261,340	2.91		
Anxiety	**Exposed**	18,675	3,123,901	59.78	1.33 (1.30-1.36)	1.23 (1.20-1.25)
	Unexposed	14,118	3,188,116	44.28		
Depression	**Exposed**	24,988	3,072,521	96.01	1.27 (1.25-1.29)	1.15 (1.13-1.17)
	Unexposed	20,251	3,143,972	72.22		
Eating disorders	**Exposed**	1,090	3,229,622	3.38	1.12 (1.03-1.22)	1.13 (1.03-1.23)
	Unexposed	992	3,261,134	3.04		
OCD	**Exposed**	786	3,230,785	2.43	1.24 (1.12-1.38)	1.20 (1.08-1.34)
	Unexposed	630	3,262,586	1.93		
Self harm	**Exposed**	5,105	3,209,184	15.91	1.03 (0.99-1.07)	1.03 (0.99-1.07)
	Unexposed	4,942	3,241,833	15.24		

*Adjusted hazard ratio: adjusted for age, sex, alcohol use, smoking status, body mass index (BMI), Townsend deprivation quintile score, asthma, and eczema at baseline

Table 3e: Allergic rhinitis

		Number of outcomes	Person Years	Incidence Rate (per 10,000 person years)	Unadjusted Hazard Ratio	Adjusted Hazard Ratio
Composite	**Exposed**	12,576	725,508	173.34	1.36 (1.32-1.39)	1.26 (1.22-1.30)
	Unexposed	8,368	650,841	128.57		
SMI	**Exposed**	239	812,716	2.94	0.98 (0.81-1.18)	0.92 (0.75-1.12)
	Unexposed	208	701,764	2.96		
Anxiety	**Exposed**	5,588	775,154	75.96	1.49 (1.43-1.56)	1.39 (1.33-1.45)
	Unexposed	3,400	682,732	49.80		
Depression	**Exposed**	7,308	760,744	96.06	1.35 (1.30-1.40)	1.23 (1.19-1.28)
	Unexposed	4,824	672,055	71.78		
Eating disorders	**Exposed**	349	811,814	4.30	1.33 (1.13-1.57)	1.34 (1.13-1.60)
	Unexposed	234	701,573	3.34		
OCD	**Exposed**	263	812,322	3.24	1.59 (1.29-1.95)	1.47 (1.18-1.82)
	Unexposed	142	702,130	2.02		
Self harm	**Exposed**	1,430	805,392	17.76	1.01 (0.94-1.09)	1.01 (0.93-1.09)
	Unexposed	1,212	696,241	17.41		

*Adjusted hazard ratio: adjusted for age, sex, alcohol use, smoking status, body mass index (BMI), Townsend deprivation quintile score, asthma, and eczema at baseline

STROBE Statement—Checklist of items that should be included in reports of ***cohort studies***

	Item No	Recommendation	Page No
Title and abstract	1	(*a*) Indicate the study's design with a commonly used term in the title or the abstract (*b*) Provide in the abstract an informative and balanced summary of what was done and what was found	1, 4
Introduction			
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported	5
Objectives	3	State specific objectives, including any prespecified hypotheses	5
Methods			
Study design	4	Present key elements of study design early in the paper	5-7
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection	5-7
Participants	6	(*a*) Give the eligibility criteria, and the sources and methods of selection of participants. Describe methods of follow-up (*b*) For matched studies, give matching criteria and number of exposed and unexposed	5-7
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable	5-7
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group	5-7
Bias	9	Describe any efforts to address potential sources of bias	5-7
Study size	10	Explain how the study size was arrived at	5-7
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why	5-7
Statistical methods	12	(*a*) Describe all statistical methods, including those used to control for confounding (*b*) Describe any methods used to examine subgroups and interactions (*c*) Explain how missing data were addressed (*d*) If applicable, explain how loss to follow-up was addressed (*e*) Describe any sensitivity analyses	5-7
Results			
Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed (b) Give reasons for non-participation at each stage (c) Consider use of a flow diagram	7-8
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders (b) Indicate number of participants with missing data for each variable of interest (c) Summarise follow-up time (eg, average and total amount)	7-8
Outcome data	15*	Report numbers of outcome events or summary measures over time	7-8

Main results	16	(*a*) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included (*b*) Report category boundaries when continuous variables were categorized (*c*) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period	7-8
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses	7-8
Discussion			
Key results	18	Summarise key results with reference to study objectives	8
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias	10
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence	8-11
Generalisability	21	Discuss the generalisability (external validity) of the study results	8-11
Other information			
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based	2

*Give information separately for exposed and unexposed groups.

Note: An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at http://www.plosmedicine.org/, Annals of Internal Medicine at http://www.annals.org/, and Epidemiology at http://www.epidem.com/). Information on the STROBE Initiative is available at http://www.strobe-statement.org.

Appendices

Appendix B: Read Code Lists

Food Allergy

Read Code	Description
13A6.00	Milk free diet - allergy
13A7.00	Egg free diet - allergy
14M1.00	H/O: food allergy
8CA4S00	Dietary education for food allergy
8CA4S11	Dietary advice for food allergy
J432.12	Cow's milk allergy
SN58.00	Food allergy
SN58000	Egg allergy
SN58100	Egg protein allergy
SN58200	Peanut allergy
SN58300	Nut allergy
SN58400	Wheat allergy
SN58500	Fish allergy
SN58600	Seafood allergy
SN58700	Shellfish allergy
SN58800	Mushroom allergy
SN58900	Allergy to strawberries
SN58911	Strawberry allergy
SN58A00	Allergy to soya
SN58B00	Allergy to banana
SN58C00	Allergy to tomato
ZC21L00	Advice to avoid nut intake
ZC2CF00	Dietary advice for food allergy

Drug Allergy

Read Code	Description
14L..00	H/O: drug allergy
14L1.00	H/O: penicillin allergy
14L2.00	H/O: antibiotic allergy NOS
14L3.00	H/O: anaesthetic allergy
14L4.00	H/O: analgesic allergy
14L5.00	H/O: vaccine allergy
14L5000	H/O: rotavirus vaccine allergy
14L6.00	H/O: serum allergy
14L7.00	H/O: cephalosporin allergy
14L8.00	H/O: tetracycline allergy
14L9.00	H/O: gentamicin allergy
14La.00	H/O: raloxifene allergy
14LA.00	H/O: erythromycin allergy
14Lb.00	H/O: teriparatide allergy
14LB.00	H/O: neomycin allergy

14Lc.00	H/O denosumab allergy
14LC.00	H/O: chloramphenicol allergy
14Ld.00	H/O calcitonin allergy
14LD.00	H/O: sulphonamide allergy
14LE.00	H/O: trimethoprim allergy
14LF.00	H/O: co-trimoxazole allergy
14LG.00	H/O: metronidazole allergy
14LH.00	H/O: nalidixic acid allergy
14LI.00	H/O: nitrofurantoin allergy
14LJ.00	H/O: influenza vaccine allergy
14LK.00	H/O: aspirin allergy
14LL.00	H/O: betablocker allergy
14LM.00	H/O: angiotensin converting enzyme inhibitor allergy
14LN.00	H/O: angiotensin II receptor antagonist allergy
14LP.00	H/O: warfarin allergy
14LQ.00	H/O: clopidogrel allergy
14LR.00	H/O: pneumococcal vaccine allergy
14LS.00	H/O: combined calcium and vitamin D3 preparation allergy
14LT.00	H/O: bisphosphonate allergy
14LT000	H/O ibandronic acid allergy
14LT200	H/O disodium etidronate allergy
14LT300	H/O alendronic acid allergy
14LT400	H/O risedronate sodium allergy
14LV.00	H/O: selective oestrogen receptor modulator allergy
14LW.00	H/O: strontium ranelate allergy
14LX.00	H/O: dipyridamole allergy
14LY.00	Phosphodiesterase-5 inhibitor allergy
14LZ.00	H/O: drug allergy NOS
1Z4..00	Allergic reaction to drug
1Z4..11	Drug allergy
1Z42.00	Ticagrelor allergy
1Z43.00	Anticoagulant allergy
1Z43000	Rivaroxaban allergy
1Z43100	Apixaban allergy
SN52.12	Allergic drug reaction NOS
ZV14.00	[V]Personal history of drug allergy
ZV14000	[V]Personal history of penicillin allergy
ZV14100	[V]Personal history of other antibiotic allergy
ZV14200	[V]Personal history of sulphonamide allergy
ZV14300	[V]Personal history of other anti-infective agent allergy

ZV14400	[V]Personal history of anaesthetic agent allergy
ZV14500	[V]Personal history of narcotic agent allergy
ZV14600	[V]Personal history of analgesic agent allergy
ZV14700	[V]Personal history of serum or vaccine allergy
ZV14800	[V]Personal history of aspirin allergy
ZV14900	[V]Personal history of co-proxamol allergy
ZV14A00	[V]Personal history of warfarin allergy
ZV14B00	[V]Personal history of clopidogrel allergy
ZV14C00	[V]Personal history of betablocker allergy
ZV14D00	[V]PH angiotensin-converting-enzyme inhibitor allergy
ZV14E00	[V]PH of angiotensin II receptor antagonist allergy
ZV14F00	[V]Personal history of influenza vaccine allergy
ZV14G00	[V]Personal history of pneumococcal vaccine allergy
ZV14H00	[V]Personal history of strontium ranelate allergy
ZV14J00	[V]PH of selective oestrogen receptor modulator allergy
ZV14K00	[V]Personal history of bisphosphonate allergy
ZV14L00	[V]Personal history of calcium allergy
ZV14M00	[V]Personal history of vitamin D3 allergy
ZV14y00	[V]Personal history of other specified drug allergy
ZV14z00	[V]Personal history of unspecified drug allergy

Anaphylaxis

Read Code	Description
14M5.00	H/O: anaphylactic shock
SN50.00	Anaphylactic shock
SN50.11	Anaphylaxis
SN50000	Anaphylactic shock due to adverse food reaction
SN50100	Anaphy shock due/adv efect/correct drug or med proprly admin
SN59300	Anaphylactic shock due to bee sting
SN59400	Anaphylactic shock due to wasp sting
SP34.00	Anaphylactic shock due to serum

ZV1B300	[V]Personal history of food induced anaphylaxis

Urticaria

Read Code	Description
2F8..00	O/E - weals present
C373400	Familial febrile urticaria
M12A200	Solar urticaria
M28..00	Urticaria
M280.00	Allergic urticaria
M280.11	Drug induced urticaria
M281.00	Idiopathic urticaria
M282.00	Urticaria due to cold and heat
M282000	Cold urticaria
M282100	Thermal urticaria
M282111	Heat urticaria
M282z00	Urticaria due to cold and heat NOS
M283.00	Dermatographic urticaria
M283.11	Factitial urticaria
M284.00	Vibratory urticaria
M285.00	Cholinergic urticaria
M286.00	Contact urticaria
M287.00	Physical urticaria
M28y.00	Other specified urticaria
M28y.11	Nettle rash
M28y000	Urticaria geographica
M28y100	Menstrual urticaria
M28y200	Urticaria persistans
M28yz00	Other specified urticaria NOS
M28z.00	Urticaria NOS
M28z.11	Hives
Myu4.00	[X]Urticaria and erythema
Myu4000	[X]Other urticaria
PH32100	Urticaria pigmentosa
SN51.00	Angioneurotic oedema
SN51.11	Angioedema
SP35400	Urticaria due to serum

Allergic Rhinitis

Read Code	Description
F4A3100	Vernal conjunctivitis of limbus and cornea
F4C0600	Acute atopic conjunctivitis
F4C0611	Acute allergic conjunctivitis
F4C1300	Vernal conjunctivitis
F4C1400	Other chronic allergic conjunctivitis
F4C1411	Allergic conjunctivitis

H17..00	Allergic rhinitis
H17..11	Perennial rhinitis
H17..12	Allergic rhinosinusitis
H170.00	Allergic rhinitis due to pollens
H170.11	Hay fever - pollens
H170.12	Pollinosis
H171.00	Allergic rhinitis due to other allergens
H171.11	Cat allergy
H171.12	Dander (animal) allergy
H171.13	Feather allergy
H171.14	Hay fever - other allergen
H171.15	House dust allergy
H171.16	House dust mite allergy
H171000	Allergy to animal
H171100	Dog allergy
H172.00	Allergic rhinitis due to unspecified allergen
H172.11	Hay fever - unspecified allergen
H17z.00	Allergic rhinitis NOS
H330.14	Pollen asthma
Hyu2000	[X]Other seasonal allergic rhinitis
Hyu2100	[X]Other allergic rhinitis
SN5A.00	Oral allergy syndrome

Serious mental illness

Read Code	**Description**
146D.00	H/O: manic depressive disorder
1BH3.00	Paranoid ideation
1S42.00	Manic mood
212T.00	Psychosis schizophrenia + bipolar affective disord resolved
212V.00	Bipolar affective disorder resolved
225E.00	O/E - paranoid delusions
9H8..00	On severe mental illness register
E1...00	Non-organic psychoses
E10..00	Schizophrenic disorders
E100.00	Simple schizophrenia
E100.11	Schizophrenia simplex
E100000	Unspecified schizophrenia
E100100	Subchronic schizophrenia
E100200	Chronic schizophrenic
E100300	Acute exacerbation of subchronic schizophrenia
E100400	Acute exacerbation of chronic schizophrenia
E100500	Schizophrenia in remission
E100z00	Simple schizophrenia NOS

E101.00	Hebephrenic schizophrenia
E101000	Unspecified hebephrenic schizophrenia
E101100	Subchronic hebephrenic schizophrenia
E101200	Chronic hebephrenic schizophrenia
E101300	Acute exacerbation of subchronic hebephrenic schizophrenia
E101400	Acute exacerbation of chronic hebephrenic schizophrenia
E101500	Hebephrenic schizophrenia in remission
E101z00	Hebephrenic schizophrenia NOS
E102.00	Catatonic schizophrenia
E102000	Unspecified catatonic schizophrenia
E102100	Subchronic catatonic schizophrenia
E102200	Chronic catatonic schizophrenia
E102300	Acute exacerbation of subchronic catatonic schizophrenia
E102400	Acute exacerbation of chronic catatonic schizophrenia
E102500	Catatonic schizophrenia in remission
E102z00	Catatonic schizophrenia NOS
E103.00	Paranoid schizophrenia
E103000	Unspecified paranoid schizophrenia
E103100	Subchronic paranoid schizophrenia
E103200	Chronic paranoid schizophrenia
E103300	Acute exacerbation of subchronic paranoid schizophrenia
E103400	Acute exacerbation of chronic paranoid schizophrenia
E103500	Paranoid schizophrenia in remission
E103z00	Paranoid schizophrenia NOS
E104.00	Acute schizophrenic episode
E105.00	Latent schizophrenia
E105000	Unspecified latent schizophrenia
E105100	Subchronic latent schizophrenia
E105200	Chronic latent schizophrenia
E105300	Acute exacerbation of subchronic latent schizophrenia
E105400	Acute exacerbation of chronic latent schizophrenia
E105500	Latent schizophrenia in remission
E105z00	Latent schizophrenia NOS
E106.00	Residual schizophrenia
E106.11	Restzustand - schizophrenia
E107.00	Schizo-affective schizophrenia
E107.11	Cyclic schizophrenia
E107000	Unspecified schizo-affective schizophrenia

E107100	Subchronic schizo-affective schizophrenia
E107200	Chronic schizo-affective schizophrenia
E107300	Acute exacerbation subchronic schizo-affective schizophrenia
E107400	Acute exacerbation of chronic schizo-affective schizophrenia
E107500	Schizo-affective schizophrenia in remission
E107z00	Schizo-affective schizophrenia NOS
E10y.00	Other schizophrenia
E10y.11	Cenesthopathic schizophrenia
E10y000	Atypical schizophrenia
E10y100	Coenesthopathic schizophrenia
E10yz00	Other schizophrenia NOS
E10z.00	Schizophrenia NOS
E11..11	Bipolar psychoses
E11..13	Manic psychoses
E110.00	Manic disorder single episode
E110.11	Hypomanic psychoses
E110000	Single manic episode unspecified
E110100	Single manic episode mild
E110200	Single manic episode moderate
E110300	Single manic episode severe without mention of psychosis
E110400	Single manic episode severe with psychosis
E110500	Single manic episode in partial or unspecified remission
E110600	Single manic episode in full remission
E110z00	Manic disorder single episode NOS
E111.00	Recurrent manic episodes
E111000	Recurrent manic episodes unspecified
E111100	Recurrent manic episodes mild
E111200	Recurrent manic episodes moderate
E111300	Recurrent manic episodes severe without mention psychosis
E111400	Recurrent manic episodes severe with psychosis
E111500	Recurrent manic episodes partial or unspecified remission
E111600	Recurrent manic episodes in full remission
E111z00	Recurrent manic episode NOS
E114.00	Bipolar affective disorder currently manic
E114.11	Manic-depressive - now manic
E114000	Bipolar affective disorder currently manic unspecified
E114100	Bipolar affective disorder currently manic mild

E114200	Bipolar affective disorder currently manic moderate
E114300	Bipolar affect disord currently manic severe no psychosis
E114400	Bipolar affect disord currently manic severe with psychosis
E114500	Bipolar affect disord currently manic part/unspec remission
E114600	Bipolar affective disorder currently manic full remission
E114z00	Bipolar affective disorder currently manic NOS
E115.00	Bipolar affective disorder currently depressed
E115.11	Manic-depressive - now depressed
E115000	Bipolar affective disorder currently depressed unspecified
E115100	Bipolar affective disorder currently depressed mild
E115200	Bipolar affective disorder currently depressed moderate
E115300	Bipolar affect disord now depressed severe no psychosis
E115400	Bipolar affect disord now depressed severe with psychosis
E115500	Bipolar affect disord now depressed part/unspec remission
E115600	Bipolar affective disorder now depressed in full remission
E115z00	Bipolar affective disorder currently depressed NOS
E116.00	Mixed bipolar affective disorder
E116000	Mixed bipolar affective disorder unspecified
E116100	Mixed bipolar affective disorder mild
E116200	Mixed bipolar affective disorder moderate
E116300	Mixed bipolar affective disorder severe no psychosis
E116400	Mixed bipolar affective disorder severe with psychosis
E116500	Mixed bipolar affective disorder partial/unspec remission
E116600	Mixed bipolar affective disorder in full remission
E116z00	Mixed bipolar affective disorder NOS
E117.00	Unspecified bipolar affective disorder

E117000	Unspecified bipolar affective disorder unspecified
E117100	Unspecified bipolar affective disorder mild
E117200	Unspecified bipolar affective disorder moderate
E117300	Unspecified bipolar affective disorder severe no psychosis
E117400	Unspecified bipolar affective disorder severe with psychosis
E117500	Unspecified bipolar affect disord partial/unspec remission
E117600	Unspecified bipolar affective disorder in full remission
E117z00	Unspecified bipolar affective disorder NOS
E11y.00	Other and unspecified manic-depressive psychoses
E11y000	Unspecified manic-depressive psychoses
E11y100	Atypical manic disorder
E11y300	Other mixed manic-depressive psychoses
E11yz00	Other and unspecified manic-depressive psychoses NOS
E12..00	Paranoid states
E120.00	Simple paranoid state
E121.00	Chronic paranoid psychosis
E123.00	Shared paranoid disorder
E12y.00	Other paranoid states
E12yz00	Other paranoid states NOS
E12z.00	Paranoid psychosis NOS
E13..00	Other nonorganic psychoses
E13..11	Reactive psychoses
E131.00	Acute hysterical psychosis
E133.00	Acute paranoid reaction
E134.00	Psychogenic paranoid psychosis
E13y.00	Other reactive psychoses
E13y000	Psychogenic stupor
E13y100	Brief reactive psychosis
E13yz00	Other reactive psychoses NOS
E13z.00	Nonorganic psychosis NOS
E13z.11	Psychotic episode NOS
E14..00	Psychoses with origin in childhood
E141.00	Disintegrative psychosis
E14y.00	Other childhood psychoses
E14y000	Atypical childhood psychoses
E14y100	Borderline psychosis of childhood
E14yz00	Other childhood psychoses NOS
E14z.00	Child psychosis NOS

E14z.11	Childhood schizophrenia NOS
E1y..00	Other specified non-organic psychoses
E1z..00	Non-organic psychosis NOS
Eu2..00	[X]Schizophrenia schizotypal and delusional disorders
Eu20.00	[X]Schizophrenia
Eu20000	[X]Paranoid schizophrenia
Eu20011	[X]Paraphrenic schizophrenia
Eu20100	[X]Hebephrenic schizophrenia
Eu20111	[X]Disorganised schizophrenia
Eu20200	[X]Catatonic schizophrenia
Eu20211	[X]Catatonic stupor
Eu20212	[X]Schizophrenic catalepsy
Eu20213	[X]Schizophrenic catatonia
Eu20214	[X]Schizophrenic flexibilatis cerea
Eu20300	[X]Undifferentiated schizophrenia
Eu20311	[X]Atypical schizophrenia
Eu20400	[X]Post-schizophrenic depression
Eu20500	[X]Residual schizophrenia
Eu20511	[X]Chronic undifferentiated schizophrenia
Eu20512	[X]Restzustand schizophrenic
Eu20600	[X]Simple schizophrenia
Eu20y00	[X]Other schizophrenia
Eu20y11	[X]Cenesthopathic schizophrenia
Eu20y12	[X]Schizophreniform disord NOS
Eu20y13	[X]Schizophrenifrm psychos NOS
Eu20z00	[X]Schizophrenia unspeified
Eu21.00	[X]Schizotypal disorder
Eu21.11	[X]Latent schizophrenic reaction
Eu21.12	[X]Borderline schizophrenia
Eu21.13	[X]Latent schizophrenia
Eu21.14	[X]Prepsychotic schizophrenia
Eu21.15	[X]Prodromal schizophrenia
Eu21.16	[X]Pseudoneurotic schizophrenia
Eu21.17	[X]Pseudopsychopathic schizophrenia
Eu22.00	[X]Persistent delusional disorders
Eu22000	[X]Delusional disorder
Eu22011	[X]Paranoid psychosis
Eu22012	[X]Paranoid state
Eu22013	[X]Paraphrenia - late
Eu22014	[X]Sensitiver Beziehungswahn
Eu22015	[X]Paranoia
Eu22300	[X]Paranoid state in remission
Eu22y12	[X]Involutional paranoid state
Eu23012	[X]Cycloid psychosis

Eu23100	[X]Acute polymorphic psychot disord with symp of schizophren
Eu23111	[X]Bouffee delirante with symptoms of schizophrenia
Eu23112	[X]Cycloid psychosis with symptoms of schizophrenia
Eu23200	[X]Acute schizophrenia-like psychotic disorder
Eu23211	[X]Brief schizophreniform disorder
Eu23212	[X]Brief schizophrenifrm psych
Eu23214	[X]Schizophrenic reaction
Eu23312	[X]Psychogenic paranoid psychosis
Eu23y00	[X]Other acute and transient psychotic disorders
Eu23z00	[X]Acute and transient psychotic disorder unspecified
Eu23z11	[X]Brief reactive psychosis NOS
Eu23z12	[X]Reactive psychosis
Eu24.12	[X]Induced paranoid disorder
Eu25.00	[X]Schizoaffective disorders
Eu25000	[X]Schizoaffective disorder manic type
Eu25011	[X]Schizoaffective psychosis manic type
Eu25012	[X]Schizophreniform psychosis manic type
Eu25100	[X]Schizoaffective disorder depressive type
Eu25111	[X]Schizoaffective psychosis depressive type
Eu25112	[X]Schizophreniform psychosis depressive type
Eu25200	[X]Schizoaffective disorder mixed type
Eu25211	[X]Cyclic schizophrenia
Eu25212	[X]Mixed schizophrenic and affective psychosis
Eu25y00	[X]Other schizoaffective disorders
Eu25z00	[X]Schizoaffective disorder unspecified
Eu25z11	[X]Schizoaffective psychosis NOS
Eu26.00	[X]Nonorganic psychosis in remission
Eu2y.00	[X]Other nonorganic psychotic disorders
Eu2y.11	[X]Chronic hallucinatory psychosis
Eu2z.00	[X]Unspecified nonorganic psychosis
Eu2z.11	[X]Psychosis NOS
Eu30.00	[X]Manic episode
Eu30.11	[X]Bipolar disorder single manic episode
Eu30000	[X]Hypomania
Eu30100	[X]Mania without psychotic symptoms
Eu30200	[X]Mania with psychotic symptoms

Eu30211	[X]Mania with mood-congruent psychotic symptoms
Eu30212	[X]Mania with mood-incongruent psychotic symptoms
Eu30213	[X]Manic stupor
Eu30y00	[X]Other manic episodes
Eu30z00	[X]Manic episode unspecified
Eu30z11	[X]Mania NOS
Eu31.00	[X]Bipolar affective disorder
Eu31.11	[X]Manic-depressive illness
Eu31.12	[X]Manic-depressive psychosis
Eu31.13	[X]Manic-depressive reaction
Eu31000	[X]Bipolar affective disorder current episode hypomanic
Eu31100	[X]Bipolar affect disorder cur epi manic wout psychotic symp
Eu31200	[X]Bipolar affect disorder cur epi manic with psychotic symp
Eu31300	[X]Bipolar affect disorder cur epi mild or moderate depressn
Eu31400	[X]Bipol aff disord curr epis sev depress no psychot symp
Eu31500	[X]Bipolar affect dis cur epi severe depres with psyc symp
Eu31600	[X]Bipolar affective disorder current episode mixed
Eu31700	[X]Bipolar affective disorder currently in remission
Eu31800	[X]Bipolar affective disorder type I
Eu31900	[X]Bipolar affective disorder type II
Eu31911	[X]Bipolar II disorder
Eu31y00	[X]Other bipolar affective disorders
Eu31y11	[X]Bipolar II disorder
Eu31y12	[X]Recurrent manic episodes
Eu31z00	[X]Bipolar affective disorder unspecified
Eu33213	[X]Manic-depress psychosis depressd no psychotic symptoms
Eu33312	[X]Manic-depress psychosis depressed type+psychotic symptoms
ZRby100	Profile of mood states bipolar
ZV11111	[V]Personal history of manic-depressive psychosis
ZV11112	[V]Personal history of manic-depressive psychosis

Anxiety

Read Code	Description
146G.00	H/O: agoraphobia
8CAZ000	Patient given advice about management of anxiety
8HHp.00	Referral for guided self-help for anxiety
E20..00	Neurotic disorders
E200.00	Anxiety states
E200000	Anxiety state unspecified
E200100	Panic disorder
E200200	Generalised anxiety disorder
E200400	Chronic anxiety
E200500	Recurrent anxiety
E200z00	Anxiety state NOS
E202.00	Phobic disorders
E202.11	Social phobic disorders
E202.12	Phobic anxiety
E202000	Phobia unspecified
E202100	Agoraphobia with panic attacks
E202200	Agoraphobia without mention of panic attacks
E202300	Social phobia fear of eating in public
E202400	Social phobia fear of public speaking
E202500	Social phobia fear of public washing
E202600	Acrophobia
E202700	Animal phobia
E202800	Claustrophobia
E202900	Fear of crowds
E202B00	Cancer phobia
E202C00	Dental phobia
E202E00	Fear of pregnancy
E202z00	Phobic disorder NOS
E20y.00	Other neurotic disorders
E20y200	Other occupational neurosis
E20y300	Psychasthenic neurosis
E20yz00	Other neurotic disorder NOS
E20z.00	Neurotic disorder NOS
E28..00	Acute reaction to stress
E280.00	Acute panic state due to acute stress reaction
E281.00	Acute fugue state due to acute stress reaction
E282.00	Acute stupor state due to acute stress reaction
E283.00	Other acute stress reactions
E283100	Acute posttrauma stress state
E283z00	Other acute stress reaction NOS

E284.00	Stress reaction causing mixed disturbance of emotion/conduct
E28z.00	Acute stress reaction NOS
E28z.12	Flying phobia
Eu22y11	[X]Delusional dysmorphophobia
Eu4..00	[X]Neurotic stress - related and somoform disorders
Eu40.00	[X]Phobic anxiety disorders
Eu40000	[X]Agoraphobia
Eu40011	[X]Agoraphobia without history of panic disorder
Eu40012	[X]Panic disorder with agoraphobia
Eu40100	[X]Social phobias
Eu40111	[X]Anthropophobia
Eu40112	[X]Social neurosis
Eu40200	[X]Specific (isolated) phobias
Eu40211	[X]Acrophobia
Eu40212	[X]Animal phobias
Eu40213	[X]Claustrophobia
Eu40214	[X]Simple phobia
Eu40300	[X]Needle phobia
Eu40y00	[X]Other phobic anxiety disorders
Eu40z00	[X]Phobic anxiety disorder unspecified
Eu40z11	[X]Phobia NOS
Eu40z12	[X]Phobic state NOS
Eu41.00	[X]Other anxiety disorders
Eu41000	[X]Panic disorder [episodic paroxysmal anxiety]
Eu41100	[X]Generalized anxiety disorder
Eu41111	[X]Anxiety neurosis
Eu41112	[X]Anxiety reaction
Eu41113	[X]Anxiety state
Eu41300	[X]Other mixed anxiety disorders
Eu41y00	[X]Other specified anxiety disorders
Eu41y11	[X]Anxiety hysteria
Eu41z00	[X]Anxiety disorder unspecified
Eu41z11	[X]Anxiety NOS
Eu42.11	[X]Anankastic neurosis
Eu42.12	[X]Obsessive-compulsive neurosis
Eu43.00	[X]Reaction to severe stress and adjustment disorders
Eu43000	[X]Acute stress reaction
Eu43012	[X]Acute reaction to stress
Eu43y00	[X]Other reactions to severe stress
Eu43z00	[X]Reaction to severe stress unspecified
Eu45212	[X]Dysmorphophobia nondelusional

Eu45215	[X]Nosophobia
Eu51511	[X]Dream anxiety disorder
Z481.00	Phobia counselling
Z4L1.00	Anxiety counselling
Z522400	Desensitisation - phobia
Z522600	Flooding - obsessional compulsive disorder
Z522700	Flooding - agoraphobia

Depression

Read Code	Description
E112.00	Single major depressive episode
E112.11	Agitated depression
E112.12	Endogenous depression first episode
E112.13	Endogenous depression first episode
E112.14	Endogenous depression
E112000	Single major depressive episode unspecified
E112100	Single major depressive episode mild
E112200	Single major depressive episode moderate
E112300	Single major depressive episode severe without psychosis
E112400	Single major depressive episode severe with psychosis
E112500	Single major depressive episode partial or unspec remission
E112600	Single major depressive episode in full remission
E112z00	Single major depressive episode NOS
E113.00	Recurrent major depressive episode
E113.11	Endogenous depression - recurrent
E113000	Recurrent major depressive episodes unspecified
E113100	Recurrent major depressive episodes mild
E113200	Recurrent major depressive episodes moderate
E113300	Recurrent major depressive episodes severe no psychosis
E113400	Recurrent major depressive episodes with psychosis
E113500	Recurrent major depressive episodes partial/unspec remission
E113600	Recurrent major depressive episodes in full remission
E113700	Recurrent depression
E113z00	Recurrent major depressive episode NOS
E118.00	Seasonal affective disorder

E11y200	Atypical depressive disorder
E11z200	Masked depression
E130.00	Reactive depressive psychosis
E135.00	Agitated depression
E291.00	Prolonged depressive reaction
E2B..00	Depressive disorder NEC
E2B1.00	Chronic depression
Eu32.00	[X]Depressive episode
Eu32.11	[X]Single episode of depressive reaction
Eu32.12	[X]Single episode of psychogenic depression
Eu32.13	[X]Single episode of reactive depression
Eu32000	[X]Mild depressive episode
Eu32100	[X]Moderate depressive episode
Eu32200	[X]Severe depressive episode without psychotic symptoms
Eu32211	[X]Single episode agitated depressn w'out psychotic symptoms
Eu32212	[X]Single episode major depression w'out psychotic symptoms
Eu32213	[X]Single episode vital depression w'out psychotic symptoms
Eu32300	[X]Severe depressive episode with psychotic symptoms
Eu32311	[X]Single episode of major depression and psychotic symptoms
Eu32312	[X]Single episode of psychogenic depressive psychosis
Eu32313	[X]Single episode of psychotic depression
Eu32314	[X]Single episode of reactive depressive psychosis
Eu32400	[X]Mild depression
Eu32500	[X]Major depression mild
Eu32600	[X]Major depression moderately severe
Eu32700	[X]Major depression severe without psychotic symptoms
Eu32800	[X]Major depression severe with psychotic symptoms
Eu32y00	[X]Other depressive episodes
Eu32y11	[X]Atypical depression
Eu32y12	[X]Single episode of masked depression NOS
Eu32z00	[X]Depressive episode unspecified
Eu32z11	[X]Depression NOS
Eu32z12	[X]Depressive disorder NOS

Eu32z13	[X]Prolonged single episode of reactive depression
Eu32z14	[X] Reactive depression NOS
Eu33.00	[X]Recurrent depressive disorder
Eu33.11	[X]Recurrent episodes of depressive reaction
Eu33.12	[X]Recurrent episodes of psychogenic depression
Eu33.13	[X]Recurrent episodes of reactive depression
Eu33.14	[X]Seasonal depressive disorder
Eu33.15	[X]SAD - Seasonal affective disorder
Eu33000	[X]Recurrent depressive disorder current episode mild
Eu33100	[X]Recurrent depressive disorder current episode moderate
Eu33200	[X]Recurr depress disorder cur epi severe without psyc sympt
Eu33211	[X]Endogenous depression without psychotic symptoms
Eu33212	[X]Major depression recurrent without psychotic symptoms
Eu33214	[X]Vital depression recurrent without psychotic symptoms
Eu33300	[X]Recurrent depress disorder cur epi severe with psyc symp
Eu33311	[X]Endogenous depression with psychotic symptoms
Eu33313	[X]Recurr severe episodes/major depression+psychotic symptom
Eu33314	[X]Recurr severe episodes/psychogenic depressive psychosis
Eu33315	[X]Recurrent severe episodes of psychotic depression
Eu33316	[X]Recurrent severe episodes/reactive depressive psychosis
Eu33400	[X]Recurrent depressive disorder currently in remission
Eu33y00	[X]Other recurrent depressive disorders
Eu33z00	[X]Recurrent depressive disorder unspecified
Eu33z11	[X]Monopolar depression NOS
Eu34100	[X]Dysthymia

Eating Disorders

Read Code	Description

1467.00	H/O: anorexia nervosa
1JZ..00	Suspected binge eating disorder
8HTN.00	Referral to eating disorders clinic
9Nk9.00	Seen in eating disorder clinic
E275200	Pica
E264200	Cyclical vomiting - psychogenic
E271.00	Anorexia nervosa
E275.00	Other and unspecified non-organic eating disorders
E275000	Unspecified non-organic eating disorder
E275100	Bulimia (non-organic overeating)
E275111	Compulsive eating disorder
E275400	Psychogenic vomiting NOS
E275y00	Other specified non-organic eating disorder
E275z00	Non-organic eating disorder NOS
Eu50.00	[X]Eating disorders
Eu50000	[X]Anorexia nervosa
Eu50100	[X]Atypical anorexia nervosa
Eu50200	[X]Bulimia nervosa
Eu50211	[X]Bulimia NOS
Eu50212	[X]Hyperorexia nervosa
Eu50300	[X]Atypical bulimia nervosa
Eu50400	[X]Overeating associated with other psychological disturbncs
Eu50411	[X]Psychogenic overeating
Eu50500	[X]Vomiting associated with other psychological disturbances
Eu50511	[X]Psychogenic vomiting
Eu50y00	[X]Other eating disorders
Eu50y12	[X]Psychogenic loss of appetite
Eu50z00	[X]Eating disorder
Fy05.00	Nocturnal sleep-related eating disorder
R036011	[D]Bulimia NOS
Z4B5.00	Eating disorder counselling
ZC2CD00	Dietary advice for eating disorder

Obsessive Compulsive Disorder (OCD)

Read Code	**Description**
E203.00	Obsessive-compulsive disorders
E203.11	Anancastic neurosis
E203000	Compulsive neurosis
E203100	Obsessional neurosis
E203z00	Obsessive-compulsive disorder NOS
Eu42.00	[X]Obsessive - compulsive disorder
Eu42.11	[X]Anankastic neurosis
Eu42.12	[X]Obsessive-compulsive neurosis

Eu42000	[X]Predominantly obsessional thoughts or ruminations
Eu42100	[X]Predominantly compulsive acts [obsessional rituals]
Eu42200	[X]Mixed obsessional thoughts and acts
Eu42y00	[X]Other obsessive-compulsive disorders
Eu42z00	[X]Obsessive-compulsive disorder unspecified

Self-harm

Read Code	Description
ZX1H.00	Self-asphyxiation
146B.00	H/O: deliberate self harm
146A.00	H/O: attempted suicide
14K1.00	Intentional overdose of prescription only medication
14K0.00	H/O: repeated overdose
1BD4.00	Suicide risk
1BD8.00	At risk of DSH - deliberate self harm
1BDA.00	Thoughts of deliberate self harm
1BD6.00	Moderate suicide risk
1BDC.00	Intent of deliberate self harm with detailed plans
1BDB.00	Plans for deliberate self harm without intent
1JP..00	Suspected drug overdose
8G6..00	Anti-suicide psychotherapy
SL...14	Overdose of biological substance
SL90.00	Antidepressant poisoning
SL90z00	Anti-depressant poisoning NOS
TK...17	Para-suicide
TK01011	Suicide and self inflicted injury by amobarbital
TK01200	Suicide and self inflicted injury by Butabarbitone
TK01411	Suicide and self inflicted injury by phenobarbital
TK01500	Suicide and self inflicted injury by Quinalbarbitone
TK01511	Suicide and self inflicted injury by secobarbital
TK55.00	Suicide and selfinflicted injury by explosives
TK...13	Poisoning - self-inflicted
TK60100	Self inflicted lacerations to wrist
TK00.00	Suicide + selfinflicted poisoning by analgesic/antipyretic

TK...12	Injury - self-inflicted
TK0..00	Suicide + selfinflicted poisoning by solid/liquid substances
TK04.00	Suicide + selfinflicted poisoning by other drugs/medicines
TK60111	Slashed wrists self inflicted
TK30.00	Suicide and selfinflicted injury by hanging
TK...14	Suicide and self harm
TK60.00	Suicide and selfinflicted injury by cutting
TK03.00	Suicide + selfinflicted poisoning tranquilliser/psychotropic
TK02.00	Suicide + selfinflicted poisoning by oth sedatives/hypnotics
TK3..00	Suicide + selfinflicted injury by hang/strangulate/suffocate
TK6..00	Suicide and selfinflicted injury by cutting and stabbing
TK0z.00	Suicide + selfinflicted poisoning by solid/liquid subst NOS
TK...11	Cause of overdose - deliberate
TK01.00	Suicide + selfinflicted poisoning by barbiturates
TK61.00	Suicide and selfinflicted injury by stabbing
TK7..00	Suicide and selfinflicted injury by jumping from high place
TK4..00	Suicide and selfinflicted injury by drowning
TK...15	Attempted suicide
TK3y.00	Suicide + selfinflicted inj oth mean hang/strangle/suffocate
TK6z.00	Suicide and selfinflicted injury by cutting and stabbing NOS
TKx..00	Suicide and selfinflicted injury by other means
TK1..00	Suicide + selfinflicted poisoning by gases in domestic use
TK07.00	Suicide + selfinflicted poisoning by corrosive/caustic subst
TK51.00	Suicide and selfinflicted injury by shotgun
TK7z.00	Suicide+selfinflicted injury-jump from high place NOS
TK2..00	Suicide + selfinflicted poisoning by other gases and vapours
TK21.00	Suicide and selfinflicted poisoning by other carbon monoxide
TK70.00	Suicide+selfinflicted injury-jump from residential premises

TK3z.00	Suicide + selfinflicted inj by hang/strangle/suffocate NOS
TK01400	Suicide and self inflicted injury by Phenobarbitone
TK71.00	Suicide+selfinflicted injury-jump from oth manmade structure
TK1z.00	Suicide + selfinflicted poisoning by domestic gases NOS
TK31.00	Suicide + selfinflicted injury by suffocation by plastic bag
TK5..00	Suicide and selfinflicted injury by firearms and explosives
TKx0.00	Suicide + selfinflicted injury-jump/lie before moving object
TK06.00	Suicide + selfinflicted poisoning by agricultural chemical
TK01z00	Suicide and self inflicted injury by barbiturates
TK10.00	Suicide + selfinflicted poisoning by gas via pipeline
TK72.00	Suicide+selfinflicted injury-jump from natural sites
TK11.00	Suicide + selfinflicted poisoning by liquified petrol gas
TK2z.00	Suicide + selfinflicted poisoning by gases and vapours NOS
TK01000	Suicide and self inflicted injury by Amylobarbitone
TK2y.00	Suicide + selfinflicted poisoning by other gases and vapours
TK52.00	Suicide and selfinflicted injury by hunting rifle
TK53.00	Suicide and selfinflicted injury by military firearms
TK5z.00	Suicide and selfinflicted injury by firearms/explosives NOS
TK01100	Suicide and self inflicted injury by Barbitone
TK01300	Suicide and self inflicted injury by Pentabarbitone
TK08.00	Suicide + selfinflicted poisoning by arsenic + its compounds
TK1y.00	Suicide and selfinflicted poisoning by other utility gas
TK50.00	Suicide and selfinflicted injury by handgun
TK...00	Suicide and selfinflicted injury

TKx0z00	Suicide + selfinflicted inj-jump/lie before moving obj NOS
TKz..00	Suicide and selfinflicted injury NOS
TKx1.00	Suicide and selfinflicted injury by burns or fire
TKx2.00	Suicide and selfinflicted injury by scald
TKy..00	Late effects of selfinflicted injury
TKxz.00	Suicide and selfinflicted injury by other means NOS
TKxy.00	Suicide and selfinflicted injury by other specified means
TKx0000	Suicide + selfinflicted injury-jumping before moving object
TKx4.00	Suicide and selfinflicted injury by electrocution
TKx5.00	Suicide and selfinflicted injury by crashing motor vehicle
TKx6.00	Suicide and selfinflicted injury by crashing of aircraft
TKx3.00	Suicide and selfinflicted injury by extremes of cold
U200100	[X]Intent self poison nonopioid analgesic at res institut
U200300	[X]Int self poison nonopioid analges in sport/athletic area
U200400	[X]Intent self pois nonopioid analgesic in street/highway
U200700	[X]Int self poison/exposure to nonopioid analgesic on farm
U201100	[X]Intent self poison antiepileptic at res institut
U201200	[X]Intent self pois nonopioid analges school/pub admin area
U201300	[X]Int self poison antiepileptic in sport/athletic area
U201400	[X]Intent self pois antiepileptic in street/highway
U201500	[X]Intent self pois antiepileptic trade/service area
U201600	[X]Int self poison antiepileptic indust/construct area
U201700	[X]Int self poison/exposure to antiepileptic on farm
U201y00	[X]Intent self poison antiepileptic other spec place

U202100	[X]Intent self poison sedative hypnotic at res institut
U202200	[X]Int self poison sedative hypnotic school/pub admin area
U202300	[X]Int self poison sedative hypnotic in sport/athletic area
U2...11	[X]Self inflicted injury
U2...14	[X]Attempted suicide
U2...15	[X]Para-suicide
U2...13	[X]Suicide
U200.00	[X]Intent self poison/exposure to nonopioid analgesic
U2...12	[X]Injury - self-inflicted
U200.13	[X]Overdose - aspirin
U202.12	[X]Overdose - diazepam
U202.00	[X]Intent self poison/exposure to sedative hypnotic
U2...00	[X]Intentional self-harm
U202.16	[X]Overdose - benzodiazepine
U200.12	[X]Overdose - ibuprofen
U202.11	[X]Overdose - sleeping tabs
U202.13	[X]Overdose - temazepam
U20..00	[X]Intentional self poisoning/exposure to noxious substances
U200000	[X]Int self poison/exposure to nonopioid analgesic at home
U202.17	[X]Overdose - barbiturate
U200z00	[X]Intent self poison nonopioid analgesic unspecif place
U201.00	[X]Intent self poison/exposure to antiepileptic
U202.15	[X]Overdose - nitrazepam
U202000	[X]Int self poison/exposure to sedative hypnotic at home
U201z00	[X]Intent self poison antiepileptic unspecif place
U201000	[X]Int self poison/exposure to antiepileptic at home
U200600	[X]Int self pois nonopioid analgesic indust/construct area
U200y00	[X]Int self poison nonopioid analgesic other spec place
U202.18	[X]Overdose - amobarbital
U200200	[X]Int self poison nonopioid analges school/pub admin area
U202.14	[X]Overdose - flurazepam

U200.11	[X]Overdose - paracetamol
U200500	[X]Intent self pois nonopioid analgesic trade/service area
U202400	[X]Intent self pois sedative hypnotic in street/highway
U202500	[X]Intent self pois sedative hypnotic trade/service area
U202600	[X]Int self pois sedative hypnotic indust/construct area
U202700	[X]Int self poison/exposure to sedative hypnotic on farm
U203000	[X]Int self poison/exposure to antiparkinson drug at home
U203100	[X]Intent self poison antiparkinson drug at res institut
U203200	[X]Int self poison antparkinson drug school/pub admin area
U203300	[X]Int self poison antparkinson drug in sport/athletic area
U203400	[X]Intent self pois antiparkinson drug in street/highway
U203500	[X]Intent self pois antiparkinson drug trade/service area
U203600	[X]Int self pois antiparkinson drug indust/construct area
U203700	[X]Int self poison/exposure to antiparkinson drug on farm
U203y00	[X]Int self poison antiparkinson drug other spec place
U203z00	[X]Intent self poison antiparkinson drug unspecif place
U204100	[X]Intent self poison psychotropic drug at res institut
U204200	[X]Int self poison psychotropic drug school/pub admin area
U204300	[X]Int self poison psychotropic drug in sport/athletic area
U204400	[X]Intent self pois psychotropic drug in street/highway
U204500	[X]Intent self pois psychotropic drug trade/service area
U204600	[X]Int self pois psychotropic drug indust/construct area
U204700	[X]Int self poison/exposure to psychotropic drug on farm

U205100	[X]Intent self poison narcotic drug at res institut
U205200	[X]Int self poison narcotic drug school/pub admin area
U205300	[X]Int self poison narcotic drug in sport/athletic area
U205400	[X]Intent self pois narcotic drug in street/highway
U205500	[X]Intent self pois narcotic drug trade/service area
U205600	[X]Int self pois narcotic drug indust/construct area
U205700	[X]Int self poison/exposure to narcotic drug on farm
U206100	[X]Intent self poison hallucinogen at res institut
U206200	[X]Int self poison hallucinogenschool/pub admin area
U206300	[X]Int self poison hallucinogenin sport/athletic area
U206400	[X]Intent self pois hallucinogen in street/highway
U206500	[X]Intent self pois hallucinogen trade/service area
U206600	[X]Int self pois hallucinogen indust/construct area
U206700	[X]Int self poison/exposure to hallucinogen on farm
U206y00	[X]Int self poison hallucinogen other spec place
U207100	[X]Intent self poison oth autonomic drug at res institut
U207200	[X]Int self poison oth autonom drug school/pub admin area
U207300	[X]Int self poison oth autonom drug in sport/athletic area
U207400	[X]Intent self pois oth autonomic drug in street/highway
U207500	[X]Intent self pois oth autonomic drug trade/service area
U207600	[X]Int self pois oth autonomic drug indust/construct area
U207700	[X]Int self poison/exposure to oth autonomic drug on farm
U207y00	[X]Int self poison oth autonomic drug other spec place

U205.00	[X]Intent self poison/exposure to narcotic drug
U204.11	[X]Overdose - antidepressant
U204.12	[X]Overdose - amitriptyline
U204.13	[X]Overdose - SSRI
U208000	[X]Int self poison/exposure to oth/unsp drug/medicam home
U204000	[X]Int self poison/exposure to psychotropic drug at home
U206.00	[X]Intent self poison/exposure to hallucinogen
U205000	[X]Int self poison/exposure to narcotic drug at home
U202z00	[X]Intent self poison sedative hypnotic unspecif place
U204z00	[X]Intent self poison psychotropic drug unspecif place
U205z00	[X]Intent self poison narcotic drug unspecif place
U207.00	[X]Intent self poison/exposure to oth autonomic drug
U207000	[X]Int self poison/exposure to oth autonomic drug at home
U207z00	[X]Intent self poison oth autonomic drug unspecif place
U202y00	[X]Int self poison sedative hypnotic other spec place
U204y00	[X]Int self poison psychotropic drug other spec place
U205y00	[X]Int self poison narcotic drug other spec place
U206000	[X]Int self poison/exposure to hallucinogen at home
U206z00	[X]Intent self poison hallucinogen unspecif place
U208.00	[X]Int self poison/exposure to other/unspec drug/medicament
U208100	[X]Intent self poison oth/unsp drug/medicam res institut
U208200	[X]Int self poison oth/uns drug/med school/pub admin area
U208300	[X]Int self poison oth/uns drug/med in sport/athletic area
U208400	[X]Intent self pois oth/unsp drug/medic in street/highway

U208500	[X]Intent self pois oth/unsp drug/medic trade/service area
U208700	[X]Int self poison/exposure to oth/unsp drug/medic on farm
U209100	[X]Intent self poison alcohol at res institut
U209200	[X]Int self poison alcohol school/pub admin area
U209300	[X]Int self poison alcohol in sport/athletic area
U209400	[X]Intent self pois alcohol in street/highway
U209500	[X]Intent self pois alcohol trade/service area
U209600	[X]Int self pois alcohol indust/construct area
U209700	[X]Int self poison/exposure to alcohol on farm
U20A100	[X]Int self poison org solvent halogen hydrocarb res instit
U20A200	[X]Int self poison org solvent halogen hydrocarb school
U20A300	[X]Int self poison org solvent halogen hydrocarb sport area
U20A500	[X]Int self poison org solvent halogen hydrocarb trade area
U20A600	[X]Int self pois org solvent halogen hydrocarb indust area
U20A700	[X]Int self poison org solvent halogen hydrocarb on farm
U20Ay00	[X]Int self pois org solv halogen hydrocarp oth spec place
U20B100	[X]Intent self poison other gas/vapour at res institut
U20B300	[X]Int self poison other gas/vapour in sport/athletic area
U20B400	[X]Intent self pois other gas/vapour in street/highway
U20B500	[X]Intent self pois other gas/vapour trade/service area
U20B600	[X]Int self pois other gas/vapour indust/construct area
U20B700	[X]Int self poison/exposure to other gas/vapour on farm
U20C000	[X]Int self poison/exposure to pesticide at home
U20C100	[X]Intent self poison pesticide at res institut

U20C200	[X]Int self poison pesticide school/pub admin area
U20C300	[X]Int self poison pesticide in sport/athletic area
U20C400	[X]Intent self pois pesticide in street/highway
U20C500	[X]Intent self pois pesticide trade/service area
U20C600	[X]Int self pois pesticide indust/construct area
U20Cz00	[X]Intent self poison pesticide unspecif place
U20y100	[X]Intent self poison unspecif chemical at res institut
U20y300	[X]Int self poison unspecif chemical in sport/athletic area
U20y400	[X]Intent self pois unspecif chemical in street/highway
U20y500	[X]Intent self pois unspecif chemical trade/service area
U20y600	[X]Int self pois unspecif chemical indust/construct area
U20y700	[X]Int self poison/exposure to unspecif chemical on farm
U20yy00	[X]Int self poison unspecif chemical other spec place
U20B.00	[X]Intent self poison/exposure to other gas/vapour
U20B.11	[X]Self carbon monoxide poisoning
U20y.00	[X]Intent self poison/exposure to unspecif chemical
U20y000	[X]Int self poison/exposure to unspecif chemical at home
U20A.00	[X]Intentional self poison organ solvent halogen hydrocarb
U209z00	[X]Intent self poison alcohol unspecif place
U209000	[X]Int self poison/exposure to alcohol at home
U20C.11	[X]Self poisoning with weedkiller
U20B000	[X]Int self poison/exposure to other gas/vapour at home
U20C.12	[X]Self poisoning with paraquat
U20yz00	[X]Intent self poison unspecif chemical unspecif place
U20C.00	[X]Intent self poison/exposure to pesticide

U20Az00	[X]Int self pois org solv halogen hydrocarb unspec place
U20Bz00	[X]Intent self poison other gas/vapour unspecif place
U208y00	[X]Int self poison oth/unsp drug/medic other spec place
U20A000	[X]Intent self pois organ solvent halogen hydrocarb home
U209y00	[X]Int self poison alcohol other spec place
U20B200	[X]Int self poison other gas/vapour school/pub admin area
U20Cy00	[X]Int self poison pesticide other spec place
U20A400	[X]Int self poison org solvent halogen hydrocarb in highway
U20By00	[X]Int self poison other gas/vapour other spec place
U20C700	[X]Int self poison/exposure to pesticide on farm
U20y200	[X]Int self poison unspecif chemical school/pub admin area
U208600	[X]Int self pois oth/unsp drug/medic indust/construct area
U20A.11	[X]Self poisoning from glue solvent
U214.00	[X]Intent self harm by hangng strangult/suffoct street/h'way
U223.00	[X]Intent self harm by drown/submersn occ sport/athlet area
U224.00	[X]Intent self harm by drowning/submersn occ street/highway
U225.00	[X]Intent self harm by drown/submersn occ trade/servce area
U226.00	[X]Intent self harm by drown/submers occ indust/constr area
U227.00	[X]Intent self harm by drowning/submersion occurrn on farm
U230.00	[X]Intention self harm by handgun discharge occurrn at home
U231.00	[X]Intent self harm by handgun disch occ in resid instit'n
U232.00	[X]Intent self harm h'gun disch occ sch oth ins/pub adm area
U233.00	[X]Intent self harm by handgun disch occ sport/athlet area
U234.00	[X]Intent self harm by handgun disch occ on street/highway

U235.00	[X]Intent self harm by handgun disch occ trade/service area
U236.00	[X]Intent self harm by handgun disch occ indust/constr area
U237.00	[X]Intention self harm by handgun discharge occurrn on farm
U23y.00	[X]Intent self harm by handgun disch occ at oth specif plce
U23z.00	[X]Intent self harm by handgun disch occ at unspecif place
U241.00	[X]Int self harm rifl s'gun/lrg frarm disch occ resid instit
U242.00	[X]Int slf hrm rifl s'gun/lrg frarm dis sch/ins/pub adm area
U243.00	[X]Int self harm rifl s'gun/lrg frarm disch sprt/athlet area
U244.00	[X]Int self harm rifl s'gun/lrg frarm disch occ street/h'way
U245.00	[X]Int self harm rifl s'gun/lrg frarm disch trad/servce area
U246.00	[X]Int slf hrm rifl s'gun/lrg frarm disch indust/constr area
U247.00	[X]Intent self harm rifle sh'gun/largr firarm disch occ farm
U24y.00	[X]Int self harm rifl s'gun/lrg frarm disch oth specif place
U24z.00	[X]Int self harm rifl s'gun/lrg frarm disch occ unspec place
U250.00	[X]Intent self harm oth/unspecif firearm disch occ at home
U251.00	[X]Intent self harm oth/unsp firearm disch occ resid instit
U252.00	[X]Inten self harm oth/uns firarm disch sch/ins/pub adm area
U253.00	[X]Inten self harm oth/uns firearm disch occ sprt/athl area
U254.00	[X]Intent self harm oth/unsp firearm disch occ street/h'way
U255.00	[X]Intent self harm oth/uns firearm disch trade/servce area
U256.00	[X]Inten self harm oth/uns firearm disch indust/constr area
U257.00	[X]Intent self harm oth/unspecif firearm disch occ on farm
U25y.00	[X]Intent self harm oth/unsp firearm disch oth specif place

U25z.00	[X]Intent self harm oth/unsp firearm disch occ unspecif plce
U260.00	[X]Intention self harm by explosive material occurrn home
U261.00	[X]Intention self harm by explosiv materl occ resid instit
U262.00	[X]Intent self harm by explosiv materl sch/ins/pub adm area
U263.00	[X]Intent self harm by explosv materl occ sport/athlet area
U264.00	[X]Intention self harm by explosiv materl occ street/highway
U265.00	[X]Intent self harm by explosv materl occ trade/servce area
U266.00	[X]Intent self harm by explosv materl occ indust/constr area
U267.00	[X]Intention self harm by explosive material occurrn farm
U22..00	[X]Intentional self harm by drowning and submersion
U21z.00	[X]Intent self harm by hangng strangul/suffoct unspecif plce
U24..00	[X]Intent self harm by rifle shotgun/larger firearm disch
U211.00	[X]Intent self harm by hangng strangult/suffoct resid instit
U212.00	[X]Inten slf harm hang strang/suffc sch oth ins/pub adm area
U21y.00	[X]Intent self harm by hangng strangul/suffoct oth spec plce
U22y.00	[X]Intent self harm by drown/submersn occ oth specif place
U22z.00	[X]Intent self harm by drown/submersn occ unspecified place
U220.00	[X]Intent self harm by drowning/submersion occurrn at home
U213.00	[X]Intent self harm by hang strangl/suffc sport/athlet area
U215.00	[X]Intent self harm by hang strangl/suffc trade/service area
U216.00	[X]Intent self harm by hang strangl/suffc indust/constr area
U217.00	[X]Intent self harm by hanging strangulat/suffocat occ farm
U221.00	[X]Intent self harm by drowning/submersn occ resid instit'n

U25..00	[X]Intent self harm by other/unspecified firearm discharge
U222.00	[X]Intent self harm drown/submers occ sch/ins/pub adm area
U23..00	[X]Intentional self harm by handgun discharge
U240.00	[X]Intent self harm rifle sh'gun/largr firarm disch occ home
U26..00	[X]Intentional self harm by explosive material
U210.00	[X]Intent self harm by hanging strangulat/suffocat occ home
U26y.00	[X]Intent self harm by explosiv materl occ oth specif place
U26z.00	[X]Intent self harm by explosiv materl occ unspecif place
U271.00	[X]Intent self harm by smoke fire/flame occ resid instit'n
U272.00	[X]Intent self harm by smoke fire/flame sch/ins/pub adm area
U273.00	[X]Intent self harm by smok fire/flam occ sport/athlet area
U275.00	[X]Intent self harm by smok fire/flam occ trade/servce area
U276.00	[X]Intent self harm by smok fire/flam occ indust/constr area
U277.00	[X]Intention self harm by smoke fire/flames occurrn on farm
U281.00	[X]Intent self harm by steam hot vapour/obj occ resid instit
U283.00	[X]Int self harm by steam hot vapour/obj occ sport/athl area
U284.00	[X]Intent self harm by steam hot vapour/obj occ street/h'way
U285.00	[X]Int self harm by steam hot vapour/obj trade/service area
U286.00	[X]Int self harm by steam hot vapour/obj indust/constr area
U287.00	[X]Intent self harm by steam hot vapour/hot obj occ on farm
U28y.00	[X]Intent self harm by steam hot vapour/obj oth specif place
U293.00	[X]Intent self harm by sharp object occ sports/athlet area
U2A4.00	[X]Intention self harm by blunt object occ street/highway

U2A5.00	[X]Intent self harm by blunt object occ trade/service area
U2A6.00	[X]Intent self harm by blunt object occ indust/constr area
U2A7.00	[X]Intentional self harm by blunt object occurrence on farm
U2Ay.00	[X]Intention self harm by blunt object occ oth specif place
U2B2.00	[X]Int self harm jump fr high place sch oth ins/pub adm area
U2B3.00	[X]Intent self harm by jump from high place sport/athl area
U2B5.00	[X]Intent self harm by jump from high place trad/servce area
U2B7.00	[X]Intent self harm by jumping from high place occ on farm
U2C0.00	[X]Intent self harm by jump/lying befor moving obj occ home
U2C1.00	[X]Int self harm jump/lying befr mov obje occ resid instit'n
U2C2.00	[X]Int self harm jump/lying bef mov obj sch/ins/pub adm area
U2C3.00	[X]Int self harm jump/lying bef mov obj occ sprt/athlet area
U2C5.00	[X]Int self harm jump/lying bef mov obj occ trad/servce area
U2C6.00	[X]Int self harm jump/lying befr mov obj indust/constr area
U290.00	[X]Intentional self harm by sharp object occurrence at home
U29z.00	[X]Intentional self harm by sharp object occ unspecif place
U27..00	[X]Intentional self harm by smoke fire and flames
U2A..00	[X]Intentional self harm by blunt object
U2C..00	[X]Intent self harm by jumping / lying before moving object
U28..00	[X]Intentional self harm by steam hot vapours / hot objects
U29y.00	[X]Intention self harm by sharp object occ oth specif place
U291.00	[X]Intent self harm by sharp object occ resident instit'n
U2B0.00	[X]Intent self harm by jumping from high place occ at home

U270.00	[X]Intention self harm by smoke fire/flames occurrn at home
U2Bz.00	[X]Int self harm by jump from high place occ unspecif place
U280.00	[X]Intent self harm by steam hot vapour/hot obj occ at home
U27z.00	[X]Intent self harm by smoke fire/flames occ unspecif place
U2A3.00	[X]Intent self harm by blunt object occ sports/athlet area
U2B4.00	[X]Intent self harm by jump from high place occ street/h'way
U2A2.00	[X]Intent self harm blunt obj occ sch oth ins/pub adm area
U296.00	[X]Intent self harm by sharp object occ indust/constr area
U2A1.00	[X]Intent self harm by blunt object occ resident instit'n
U27y.00	[X]Intent self harm by smoke fire/flame occ oth specif plce
U2B1.00	[X]Intent self harm by jump from high place occ resid instit
U2By.00	[X]Int self harm by jump from high place occ oth specif plce
U2C4.00	[X]Int self harm jump/lying befr mov obje occ street/highway
U274.00	[X]Intent self harm by smoke fire/flame occ street/highway
U282.00	[X]Int self harm by steam hot vapor/obj sch/ins/pub adm area
U28z.00	[X]Intent self harm by steam hot vapour/obj occ unspec place
U294.00	[X]Intention self harm by sharp object occ street/highway
U295.00	[X]Intent self harm by sharp object occ trade/service area
U297.00	[X]Intentional self harm by sharp object occurrence on farm
U2A0.00	[X]Intentional self harm by blunt object occurrence at home
U2B6.00	[X]Int self harm by jump from high place indust/constr area
U2Az.00	[X]Intentional self harm by blunt object occ unspecif place
U2B..00	[X]Intentional self harm by jumping from a high place

U292.00	[X]Intent self harm sharp obj occ sch oth ins/pub adm area
U2C7.00	[X]Intent self harm by jump/lying befor moving obj occ farm
U2Cz.00	[X]Int self harm jump/lying bef mov obje occ unspecif place
U2D1.00	[X]Intent self harm by crash motor vehicl occ resid instit'n
U2D2.00	[X]Int self harm crash motor vehicl occ sch/ins/pub adm area
U2D3.00	[X]Intent self harm by crash motor vehicl occ sprt/athl area
U2D5.00	[X]Intent self harm crash motor vehicl occ trade/servce area
U2D7.00	[X]Intent self harm by crash of motor vehicl occurrn on farm
U2y2.00	[X]Intent self harm oth specif mean occ sch/ins/pub adm area
U2y3.00	[X]Intent self harm by oth specif means occ sport/athl area
U2y4.00	[X]Intent self harm by oth specif means occ street/highway
U2y5.00	[X]Intent self harm by oth specif means occ trad/servce area
U2y7.00	[X]Intentionl self harm by oth specif means occurrn on farm
U2z3.00	[X]Intent self harm unspecif means occurrn sport/athlet area
U2z4.00	[X]Intent self harm by unspecif means occurrn street/highway
U2z5.00	[X]Intent self harm unspecif means occurrn trade/servce area
U2z6.00	[X]Intent self harm unspecif mean occurrn indust/constr area
U2z7.00	[X]Intentional self harm by unspecif means occurrn on farm
U30..11	[X]Deliberate drug poisoning
U2y0.00	[X]Intentionl self harm by oth specif means occurrn at home
U2zz.00	[X]Intent self harm by unspecif means occ at unspecif place
U2z0.00	[X]Intentional self harm by unspecif means occurrn at home
U2D..00	[X]Intentional self harm by crashing of motor vehicle

U2yz.00	[X]Intent self harm by oth specif means occ unspecif place
U2y1.00	[X]Intent self harm by oth specif means occ resid instit'n
U2yy.00	[X]Intent self harm oth specif means occ oth specif place
U2z2.00	[X]Intent self harm by unspec mean occ sch/ins/pub adm area
U2zy.00	[X]Intent self harm by unspecif means occ oth specif place
U2Dz.00	[X]Intent self harm by crash motor vehic occ unspecif place
U2z1.00	[X]Intent self harm by unspecif means occurrn resid instit'n
U2Cy.00	[X]Int self harm jump/lying bef mov obje occ oth specif plce
U2D0.00	[X]Intent self harm by crash of motor vehicl occurrn at home
U2D4.00	[X]Intent self harm by crash motor vehicl occ street/highway
U2D6.00	[X]Intent self harm crash motor vehic occ indust/constr area
U2Dy.00	[X]Intent self harm by crash motor vehic occ oth specif plce
U2y6.00	[X]Intent self harm oth specif means occ indust/constr area
U2y..00	[X]Intentional self harm by other specified means
U44..00	[X]Rifle shotgun+larger firearm discharge undetermin intent
U45..00	[X]Other+unspecified firearm discharge undetermined intent
U4B..00	[X]Falling jumping/pushed from high place undeterm intent
U4Bz.00	[X]Fall jump/push frm high plce undt intnt occ unspecif plce
U613200	[X]Overdose of radiation given during therapy
U72..00	[X]Sequel intentn self-harm assault+event of undeterm intent
U720.00	[X]Sequelae of intentional self-harm
Z9K3100	Removing objects that could be used for suicide attempt
ZV1B200	[V]Personal history of self-harm
ZX15.00	Drowning self
ZX11500	Biting own tongue

ZX11600	Biting sides of own cheeks
ZX12.00	Burning self
ZX...00	Self-harm
ZX13.11	Cuts self
ZX1..00	Self-injurious behaviour
ZX11200	Biting own fingers
ZX11.11	Bites self
ZX13.00	Cutting self
ZX11.00	Biting self
ZX1..14	Self-abusive behaviour
ZX11100	Biting own hand
ZX13200	Cutting own throat
ZX1..12	SIB - Self-injurious behaviour
ZX11300	Biting own toes
ZX11400	Biting own arm
ZX...11	Self-damage
ZX1L400	Self-mutilation of eyes
ZX1LD00	[X]Self mutilation
ZX1N.00	Stabbing self
ZX1LA00	Removing own nails
ZX1L500	Enucleation of own eyes
ZX14.00	Damaging own wounds
ZX1M.00	Shooting self
ZX1L200	Self-mutilation of genitalia
ZX14300	Poking fingers into wound
ZX1L300	Self-mutilation of penis
ZX1Q.00	Throwing self in front of train
ZX1S.00	Throwing self onto floor
ZX1L600	Self-mutilation of ears
ZX1L811	Snapping own bones
ZX1L800	Breaking own bones
ZX1R.11	Jumping in front of vehicle
ZX1R.00	Throwing self in front of vehicle
SL...15	Overdose of drug
U20..11	[X]Deliberate drug overdose / other poisoning
ZX1..13	Deliberate self-harm
U29..00	[X]Intentional self harm by sharp object
SLHz.00	Drug and medicament poisoning NOS
ZX13100	Cutting own wrists
U21..00	[X]Intent self harm by hanging strangulation / suffocation
U2z..00	[X]Intentional self harm by unspecified means
1BD5.00	High suicide risk
ZX1G.00	Scratches self

U209.00	[X]Intent self poison/exposure to alcohol
ZX1I.00	Self-scalding
U208z00	[X]Intent self poison oth/unsp drug/medic unspecif place
TK20.00	Suicide + selfinflicted poisoning by motor veh exhaust gas
U204.00	[X]Intent self poison/exposure to psychotropic drug
ZX1L.00	Self-mutilation
U41..00	[X]Hanging strangulation + suffocation undetermined intent
ZX1H100	Self-strangulation
ZX1L100	Self-mutilation of hands
ZX1K.11	Setting fire to self
TKx7.00	Suicide and selfinflicted injury caustic subst excl poison
ZX1J.00	Self-electrocution
ZX1E.00	Pinching self
8G6Z.00	Anti-suicide psychotherapy NOS
TK54.00	Suicide and selfinflicted injury by other firearm
ZX1K.00	Self-incineration
ZX1H200	Self-suffocation
TKx0100	Suicide + selfinflicted injury-lying before moving object
U203.00	[X]Intent self poison/exposure to antiparkinson drug
ZX1Q.11	Jumping under train
ZX1K.12	Setting self alight
TK05.00	Suicide + selfinflicted poisoning by drug or medicine NOS
ZX16.00	Gouging own body parts
U2E..00	[X]Self mutilation
ZX18.00	Hanging self
ZX1B200	Jumping from bridge
ZX1B.00	Jumping from height
ZX1B100	Jumping from building
ZX1B300	Jumping from cliff
ZX16100	Gouging own flesh
ZX16200	Gouging own eyes

Table S1: Baseline Characteristics

	Exposed	Unexposed
Number of patients (n)	2,491,086	3,120,795
Number of patients with asthma diagnosis (n)	472,984	289,733
Number of patients with eczema diagnosis (n)	455,348	368,631
Median (IQR) follow-up period (person years)	5.10 (2.02 – 9.68)	4.10 (1.59 – 8.34)
Mean (SD) age at cohort entry (years)	39.42 (23.65)	35.82 (22.18)
Sex (n)		
Male	1,129,954	1,561,600
Female	1,361,132	1,559,195
Body mass index, n (%)		
Underweight (<18·5 kg/m^2)	40,490 (1.63)	52,183 (1.67)
Normal (18·5-24·9 kg/m^2)	687,723 (27.61)	823,813 (26.37)
Overweight (25·0-29·9 kg/m^2)	541,784 (21.75)	559,747 (17.94)
Obese (>30·0 kg/m^2)	348,395 (13.99)	309,638 (9.92)
Not available	872,694 (35.03)	1,376,414 (44.10)
Smoking status, n (%)		
Current smoker	348,532 (13.99)	474,997 (15.22)
Non-current smoker	1,574,697 (63.21)	1,681,427 (53.88)
Not available	567,857 (22.80)	964,371 (30.90)
Drinking status, n (%)		
Current Drinker	1,266,898 (50.86)	1,394,009 (44.67)
Non-current drinker	370,169 (14.86)	383,121 (12.28)
Not available	854,019 (34.28)	1,343,665 (43.06)
Townsend index, n (%)		
(Least deprived) 1	535,228 (21.49)	657,876 (21.08)
2	464,489 (18.65)	552,836 (17.71)
3	453,156 (18.19)	559,287 (17.92)
4	388,862 (15.61)	487,405 (15.62)
5	262,946 (10.56)	327,192(10.48)
Not available	386,405 (15.51)	536,199 (17.18)
Ethnicity, n (%)		
White	1,050,939 (42.19)	1,102,464 (35.33)
Black	45,742 (1.84)	51,693 (1.66)
South Asian	66,060 (2.65)	74,762 (2.40)
Mixed	16,818 (0.68)	19,759 (0.63)
Other	37,641 (1.51)	54,566 (1.75)
Missing	1,273,886 (51.14)	1,817,551 (58.24)

Table S2: Hazard ratios with 95% confidence intervals (CI) for mental ill health among patients with any atopic or allergic disorder compared to matched unexposed individuals

		Number of outcomes	Person Years	Incidence Rate (per 10,000 person years)	Unadjusted Hazard Ratio	Adjusted Hazard Ratio
Composite	**Exposed**	229,124	15,900,000	144.13	1.23 (1.22-1.24)	1.16 (1.15-1.16)
	Unexposed	203,514	17,200,000	118.20		
SMI	**Exposed**	5,581	17,200,000	32.46	1.00 (0.97-1.04)	0.99 (0.95-1.03)
	Unexposed	5,954	18,300,000	32.46		
Anxiety	**Exposed**	93,848	16,700,000	56.21	1.30 (1.29-1.31)	1.21 (1.20-1.23)
	Unexposed	77,388	18,000,000	43.11		
Depression	**Exposed**	138,658	16,400,000	84.59	1.24 (1.23-1.26)	1.15 (1.14-1.16)
	Unexposed	121,378	17,700,000	68.75		
Eating disorders	**Exposed**	4,188	17,200,000	2.44	1.06 (1.01-1.10)	1.06 (1.01-1.10)
	Unexposed	4,295	18,300,000	2.34		
OCD	**Exposed**	3,565	17,200,000	2.07	1.19 (1.13-1.25)	1.18 (1.13-1.24)
	Unexposed	3,191	18,400,000	1.74		
Self harm	**Exposed**	21,959	17,100,000	12.83	1.00 (0.98-1.02)	1.03 (1.01-1.05)
	Unexposed	23,426	18,300,000	12.83		

*Adjusted hazard ratio: adjusted for age, sex, alcohol use, smoking status, body mass index (BMI), Townsend deprivation quintile score, asthma, and eczema at baseline

Table S3: Hazard ratios with 95% confidence intervals (CI) for mental ill-health among patients with food allergy only compared to matched unexposed individuals

		Number of outcomes	Person Years	Incidence Rate (per 10,000 person years)	Unadjusted Hazard Ratio	Adjusted Hazard Ratio
Composite	**Exposed**	6,955	583, 190	119.26	1.20 (1.16-1.24)	1.07 (1.03-1.11)
	Unexposed	6,409	651,196	98.42		
SMI	**Exposed**	180	617,205	29.16	1.27 (1.03-1.58)	1.26 (1.00-1.59)
	Unexposed	154	681,363	22.60		
Anxiety	**Exposed**	2,908	604,387	48.12	1.32 (1.25-1.39)	1.14 (1.08-1.21)
	Unexposed	2,390	671,622	35.59		
Depression	**Exposed**	3,692	597,935	61.75	1.16 (1.11-1.22)	1.02 (0.97-1.07)
	Unexposed	3,509	663,826	52.86		
Eating disorders	**Exposed**	263	616,739	4.26	1.17 (0.98-1.39)	1.10 (0.91-1.33)
	Unexposed	250	680,942	3.67		
OCD	**Exposed**	188	617,035	3.05	1.47 (1.18-1.83)	1.28 (1.01-1.63)
	Unexposed	138	681,327	2.03		
Self harm	**Exposed**	917	614,055	14.93	1.03 (0.94-1.13)	0.98 (0.89-1.08)
	Unexposed	954	677,879	14.07		

*Adjusted hazard ratio: adjusted for age, sex, alcohol use, smoking status, body mass index (BMI), Townsend deprivation quintile score, asthma, and eczema at baseline

Table S4: Hazard ratios with 95% confidence intervals (CI) for mental ill-health among patients with drug allergy only compared to matched unexposed individuals

		Number of outcomes	Person Years	Incidence Rate (per 10,000 person years)	Unadjusted Hazard Ratio	Adjusted Hazard Ratio
Composite	**Exposed**	136,246	8,629,804	157.88	1.34 (1.33-1.35)	1.27 (1.26-1.28)
	Unexposed	104,769	8,747,397	119.77		
SMI	**Exposed**	3,467	9,429,027	36.77	1.07 (1.02-1.12)	1.07 (1.02-1.12)
	Unexposed	3,256	9,340,622	34.86		
Anxiety	**Exposed**	55,508	**9,120,391**	60.86	1.43 (1.41-1.45)	1.36 (1.34-1.37)
	Unexposed	39,018	9,136,285	42.71		
Depression	**Exposed**	85,637	8,920,011	96,01	1.34 (1.33-1.36)	1.26 (1.24-1.27)
	Unexposed	65,211	8,964,301	72.75		
Eating disorders	**Exposed**	1,834	9,434,611	1.94	1.13 (1.06-1.21)	1.16 (1.09-1.24)
	Unexposed	1,648	9,347,463	1.76		
OCD	**Exposed**	1,663	9,434,811	1.76	1.30 (1.21-1.40)	1.34 (1.25-1.45)
	Unexposed	1,268	9,348,323	1.36		
Self harm	**Exposed**	10,780	9,390,771	11.48	1.13 (1.10-1.16)	1.19 (1.15-1.22)
	Unexposed	9,515	9,309,052	10.22		

*Adjusted hazard ratio: adjusted for age, sex, alcohol use, smoking status, body mass index (BMI), Townsend deprivation quintile score, asthma, and eczema at baseline

Table S5: Hazard ratios with 95% confidence intervals (CI) for mental ill-health among patients with anaphylaxis only compared to matched unexposed individuals

		Number of outcomes	Person Years	Incidence Rate (per 10,000 person years)	Unadjusted Hazard Ratio	Adjusted Hazard Ratio
Composite	**Exposed**	1,773	100,899	175.72	1.54 (1.43-1.65)	1.42 (1.31-1.53)
	Unexposed	1,260	108,843	115.76		
SMI	**Exposed**	33	111,340	2.96	0.90 (0.57-1.44)	0.89 (0.55-1.46)
	Unexposed	38	115,815	3.28		
Anxiety	**Exposed**	769	107,135	71.78	1.76 (1.56-1.97)	1.61 (1.43-1.82)
	Unexposed	462	113,477	40.71		
Depression	**Exposed**	1,050	104,749	100.24	1.52 (1.39-1.67)	1.40 (1.27-1.55)
	Unexposed	747	111,561	66.96		
Eating disorders	**Exposed**	31	111,337	2.78	1.12 (0.67-1.86)	0.93 (0.54-1.63)
	Unexposed	29	115,840	2.50		
OCD	**Exposed**	32	111,288	2.87	2.18 (1.19-3.97)	2.59 (1.38-4.86)
	Unexposed	16	115,901	1.38		
Self harm	**Exposed**	196	110,613	17.72	1.46 (1.18-1.82)	1.43 (1.13-1.80)
	Unexposed	139	115,346	12.05		

*Adjusted hazard ratio: adjusted for age, sex, alcohol use, smoking status, body mass index (BMI), Townsend deprivation quintile score, asthma, and eczema at baseline

Table S6: Hazard ratios with 95% confidence intervals (CI) for mental ill-health among patients with urticaria only compared to matched unexposed individuals

		Number of outcomes	Person Years	Incidence Rate (per 10,000 person years)	Unadjusted Hazard Ratio	Adjusted Hazard Ratio
Composite	**Exposed**	43,001	2,966,951	175.72	1.25 (1.24-1.27)	1.16 (1.14-1.18)
	Unexposed	35,369	3,050,446	115.76		
SMI	**Exposed**	863	3,231,215	2.67	0.88 (0.80-0.97)	0.85 (0.77-0.93)
	Unexposed	974	3,249,189	3.00		
Anxiety	**Exposed**	18,675	3,123,901	59.78	1.33 (1.30-1.36)	1.22 (1.20-1.25)
	Unexposed	14,051	3,176,950	44.23		
Depression	**Exposed**	24,988	3,072,521	81.33	1.28 (1.25-1.30)	1.16 (1.14-1.18)
	Unexposed	20,079	3,132,763	64.09		
Eating disorders	**Exposed**	1,090	3,229,622	3.38	1.14 (1.05-1.24)	1.14 (1.04-1.24)
	Unexposed	972	3,249,245	2.99		
OCD	**Exposed**	786	3,230,785	2.43	1.21 (1.09-1.35)	1.18 (1.06-1.31)
	Unexposed	645	3,250,544	1.98		
Self harm	**Exposed**	5,105	3,209,184	15.91	1.05 (1.01-1.09)	1.05 (1.01-1.09)
	Unexposed	4,838	3,230,221	14.98		

*Adjusted hazard ratio: adjusted for age, sex, alcohol use, smoking status, body mass index (BMI), Townsend deprivation quintile score, asthma, and eczema at baseline

Table S7: Hazard ratios with 95% confidence intervals (CI) for mental ill-health among patients with allergic rhinitis only compared to matched unexposed individuals

		Number of outcomes	Person Years	Incidence Rate (per 10,000 person years)	Unadjusted Hazard Ratio	Adjusted Hazard Ratio
Composite	**Exposed**	104,297	7,075,459	147.41	1.21 (1.20-1.22)	1.12 (1.11-1.13)
	Unexposed	95,412	7,744,558	123.20		
SMI	**Exposed**	2,354	7,695,113	3.06	0.96 (0.91-1.02)	0.96 (0.91-1.02)
	Unexposed	2,622	8,282,321	3.17		
Anxiety	**Exposed**	44,525	7,448,442	59.78	1.30 (1.27-1.31)	1.19 (1.18-1.21)
	Unexposed	37,075	8,091,138	45.82		
Depression	**Exposed**	61,919	7,318,942	84.60	1.22 (1.20-1.23)	1.12 (1.11-1.13)
	Unexposed	55,821	7,960,109	70.13		
Eating disorders	**Exposed**	2,200	7,694,901	2.86	1.06 (1.00-1.12)	1.02 (0.96-1.09)
	Unexposed	2,284	8,284,274	2.76		
OCD	**Exposed**	1,972	7,695,515	2.56	1.23 (1.15-1.31)	1.18 (1.10-1.26)
	Unexposed	1,726	8,286,295	2.08		
Self harm	**Exposed**	10,787	7,652,323	14.10	0.93 (0.91-0.95)	0.93 (0.91-0.96)
	Unexposed	12,491	8,234,424	15.17		

*Adjusted hazard ratio: adjusted for age, sex, alcohol use, smoking status, body mass index (BMI), Townsend deprivation quintile score, asthma, and eczema at baseline

BMJ Open

The association between atopic disorders and mental ill health: a UK-based retrospective cohort study

Journal:	*BMJ Open*
Manuscript ID	bmjopen-2024-089181.R1
Article Type:	Original research
Date Submitted by the Author:	05-May-2025
Complete List of Authors:	Minhas, Sonica; University of Birmingham, Institute of Applied Health Research Chandan, Joht Singh; University of Birmingham, Institute of Applied Health Research; National Institute for Health and Care Research (NIHR) Birmingham Biomedical Research Centre Knibb, Rebecca; Aston University Diwakar, Lavanya; University of Birmingham, Institute of Applied Health Research; University Hospitals of North Midlands NHS Trust Adderley, Nicola; University of Birmingham, Institute of Applied Health Research; National Institute for Health and Care Research (NIHR) Birmingham Biomedical Research Centre
Primary Subject Heading:	Immunology (including allergy)
Secondary Subject Heading:	Public health, Epidemiology
Keywords:	MENTAL HEALTH, Allergy < THORACIC MEDICINE, EPIDEMIOLOGIC STUDIES, PUBLIC HEALTH, Primary Care < Primary Health Care

I, the Submitting Author has the right to grant and does grant on behalf of all authors of the Work (as defined in the below author licence), an exclusive licence and/or a non-exclusive licence for contributions from authors who are: i) UK Crown employees; ii) where BMJ has agreed a CC-BY licence shall apply, and/or iii) in accordance with the terms applicable for US Federal Government officers or employees acting as part of their official duties; on a worldwide, perpetual, irrevocable, royalty-free basis to BMJ Publishing Group Ltd ("BMJ") its licensees and where the relevant Journal is co-owned by BMJ to the co-owners of the Journal, to publish the Work in this journal and any other BMJ products and to exploit all rights, as set out in our licence.

The Submitting Author accepts and understands that any supply made under these terms is made by BMJ to the Submitting Author unless you are acting as an employee on behalf of your employer or a postgraduate student of an affiliated institution which is paying any applicable article publishing charge ("APC") for Open Access articles. Where the Submitting Author wishes to make the Work available on an Open Access basis (and intends to pay the relevant APC), the terms of reuse of such Open Access shall be governed by a Creative Commons licence – details of these licences and which Creative Commons licence will apply to this Work are set out in our licence referred to above.

Other than as permitted in any relevant BMJ Author's Self Archiving Policies, I confirm this Work has not been accepted for publication elsewhere, is not being considered for publication elsewhere and does not duplicate material already published. I confirm all authors consent to publication of this Work and authorise the granting of this licence.

The association between atopic disorders and mental ill health: a UK-based retrospective cohort study

Authors: Sonica Minhas, *Honorary Research Associate* [1], Joht Singh Chandan, *Clinical Professor in Public Health* [1,2], Rebecca C Knibb, Professor in Health Psychology[3], Nicola J Adderley*, *Associate Professor of Health Informatics and Epidemiology* [1,2], Lavanya Diwakar*, *Hon Associate Professor in Health Economics, Consultant Immunologist*[1,4]

*Joint senior authors

Institutional Affiliations:
[1]Institute of Applied Health Research, College of Medical and Dental Sciences, University of Birmingham, B15 2TT, UK
[2]National Institute for Health and Care Research (NIHR) Birmingham Biomedical Research Centre, Birmingham, UK
[3]Aston University, B4 7ET, UK
[4]University Hospitals of North Midlands NHS Trust, Stoke-on-Trent, ST4 6QG, UK

Corresponding Author:
Dr Lavanya Diwakar
l.diwakar@bham.ac.uk

Declarations

Competing Interests:
All authors have completed the Unified Competing Interest form (available on request from the corresponding author) and declare: no support from any organisation for the submitted work; no financial relationships with any organisations that might have an interest in the submitted work in the previous three years, no other relationships or activities that could appear to have influenced the submitted work.

Contribution Statement:
Conceptualization (LD, RCK, JSC, NA), data curation (JSC, NA), data analysis (SM, NA, JSC), methodology (NA, JSC), writing - original draft (SM), writing - review & editing (all authors: SM, RCK, JSC, NA, LD). All authors approved the final version. LD is the guarantor.

Transparency Statement:
The lead author (the manuscript's guarantor) affirms that the manuscript is an honest, accurate, and transparent account of the study being reported; that no important aspects of the study have been omitted; and that any discrepancies from the study as originally planned have been explained.

Ethics Approval:
Anonymized data was used from the data provider to the University of Birmingham. The use of IQVIA Medical Research Data is approved by the United Kingdom Research Ethics Committee (reference number: 18/LO/0441); in accordance with this approval, the study protocol must be reviewed and approved by an independent Scientific Review Committee (SRC). The protocol has been approved for this project by the independent SRC (22SRC027). IQVIA Medical Research Data incorporates data from The Health Improvement Network (THIN), a Cegedim Database. Reference made to THIN is intended to be descriptive of the data asset licensed by IQVIA. This work has used de-identified data provided by patients as a part of their routine primary care. As the data is de-identified there is no opportunity/ability for the research team to seek independent written consent from those who contribute to the dataset.

Funding:
None

Data Sharing:
The data and analysis code can be obtained from the corresponding author following appropriate ethical approval.

Abstract

Objective

To examine the mental ill health burden associated with allergic and atopic disorders, in a UK primary care cohort.

Design

Population-based retrospective open cohort study

Setting

United Kingdom

Participants

2,491,086 individuals with primary-care recorded atopic disorder (food allergy, drug allergy, anaphylaxis, urticaria, allergic rhino-conjunctivitis) diagnosis were matched by sex, age (± 2 years), and socio-economic deprivation (Townsend quintile score) at index to 3,120,719 unexposed individuals. The mean age of exposed patients at cohort entry was 39.42 years (standard deviation [SD] 23.65) compared to 35.81 years (SD 22.17) for unexposed patients

Main Outcome Measures

The primary outcome was a composite of mental ill health (severe mental illness, anxiety, depression, eating disorders, obsessive-compulsive disorder [OCD], and self-harm), identified using Read codes. Cox regression was used to estimate adjusted hazard ratios with 95% confidence intervals for the composite mental ill health outcome and each of the individual mental health disorders. Covariates adjusted for were age, sex, alcohol use, smoking status, body mass index (BMI), Townsend deprivation quintile score, asthma exposure, and eczema exposure at baseline.

Results

Between 1st January 1995 to 31st January 2022, a total of 2,491,086 eligible individuals were identified with a primary care recorded diagnosis of atopic disease and were matched to 3,120,719 unexposed individuals. 229,124 exposed individuals developed a mental ill health outcome during the study period (incidence ratio (IR) 144.13 per 10,000 person-years) compared to 203,450 in the unexposed group (IR 117.82 per 10,000 person-years). This translated to an adjusted hazard ratio (aHR) of 1.16 (95% confidence interval (CI) 1.15-1.17). Notably, the risk of anxiety was greatest, aHR 1.22 (95% CI 1.21-1.23). Our findings were robust to a sensitivity analysis, where individuals were also matched for asthma and eczema.

Conclusion

There is an increased risk of mental ill health disorders amongst patients with diagnosis of an allergic and atopic disorders. There is a need to consider dual delivery of allergy and psychology services to optimise mental wellbeing among this cohort.

Strengths and limitations of this study

- Large study sample of approximately 2.5 million patients which is representative of the UK general population with respect to demographics and comorbid conditions
- Data (diagnoses for exposure and outcomes of interest) are derived from electronic primary care records reducing recall bias, as diagnoses are recorded at the time of consultation
- Risk of heterogeneity in recording which can create misclassification bias, although this affects both the exposures and outcomes of interest.
- Due to poor recording in the primary care database, we are unable to perform stratification by disease severity status and account for confounders such as educational level and parental psychiatric history

Introduction

Atopic and allergic disorders (food allergy, drug allergy, anaphylaxis, urticaria, and allergic rhino-conjunctivitis) are common chronic conditions globally and in the UK population [1], with significant associated morbidity.[2] These disorders are caused by an aberrant immune system response, mediated by immunoglobulin E (IgE) antibiodies to otherwise innocuous antigens (allergens). The effects can range from mild and local responses (e.g., mild allergic rhinitis) to life-threatening (e.g., anaphylaxis).

Mental health disorders are also highly prevalent in the UK, with a 2014 survey showing that 1 in 6 people aged 16 years and older in England met the criteria for a common mental disorder (CMD).[3] CMDs comprise of mental health disorders that interfere with daily functioning, but not insight or cognition. This includes different types of depression and anxiety, mixed depression-anxiety, phobias, obsessive compulsive disorder (OCD) and panic disorder.[4] Mental health disorders are an important cause of disability and are a risk factor for premature mortality.[5,6] Severe mental illness (SMI), by contrast, is a subset of mental health disorders characterized by a greater degree of functional and occupational impairment, limiting major life activities and typically includes psychoses and bipolar disorder.[7] Data from England in 2018 to 2020 shows that people with SMI are five times more likely to die prematurely (before age 75 years) than those without an SMI.[8]

Increasingly, research suggests a relationship between atopic disease and mental health conditions.[9] Epidemiological research has shown associations between allergic rhinitis and mood disorders [10,11], suicidal ideation[12], and anxiety disorders.[13] Although less well studied, some research has shown that urticaria is also associated with reduced quality of life and greater symptoms of depression and anxiety.[14,15] Food allergy has been associated with reduced quality of life, anxiety and depression [16,17], as has anaphylaxis.[18] The majority of this research has been in non-UK cohorts and is limited by small sample sizes and cross-sectional design. Given the high prevalence of both atopic and mental health disorders, understanding any association between the two is vital for improving patient care and for targeting interventions to reduce the burden associated with both. Using UK primary care data, we investigated the associations between atopic disorders and the subsequent risk of developing mental ill health disorders. As there is already a strong evidence base for asthma, allergic rhinitis and atopic dermatitis [9–11], we focused our analysis on food allergy, drug allergy, anaphylaxis, urticaria, allergic rhino-conjunctivitis.

Methods

Study design, data source, and population

A UK population-based, retrospective, open cohort study was undertaken using data from the IQVIA Medical Research Database (IMRD) from 1st January 1995 to 28th February 2021. The IMRD UK database contains de-identified electronic medical records from UK primary care general practices using the Vision software system. It is nationally representative of the UK population, with respect to demographic structure and the prevalence of common comorbidities.[19,20] Patient data regarding symptoms, examination findings, and diagnoses is recorded using Read codes [21]- a hierarchical clinical coding system used in UK primary care.

The 'Data extraction for epidemiological research (DExtER)' tool [22] was used to facilitate data extraction, transformation and loading in this study. The data analysis and reporting adhered to the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) statement (appendix A).[23]

To ensure accurate coding and reduce underreporting of outcomes, general practices were only eligible for inclusion from the later of the following two dates: one year after the installation of the Vision software system or the date acceptable mortality recording (AMR) was achieved.[24] AMR date is determined by the comparison between recording of death by practices and the predicted mortality, using national data, accounting for the demographic of a practices' catchment area. The AMR date is defined as the point where the national and practice mortality rates align.

Exposure and outcome definition

The aim of this study was to compare the risk of mental ill health (composite measure: defined through Read codes describing depression, anxiety, severe mental illness [psychosis, bipolar disorder or schizophrenia], eating disorders, OCD, and self-harm) in exposed patients (Read codes for food allergy, drug allergy, anaphylaxis, urticaria, allergic rhino-conjunctivitis) with unexposed patients (those without such codes). For this analysis, self-harm includes any deliberate act of inflicting harm on oneself, regardless of suicidal intent. Codes for allergic and atopic disorders and mental ill health were selected with the help of general health practitioners, public health clinicians and immunologists to define the exposed cohort (see Appendix B for the codes used in this study). The primary outcome of interest was a composite of mental ill health but each of the aforementioned mental health disorders was also analysed separately. Patients with mental health disorders at baseline were excluded from the study.

Individuals with atopic disorders were matched to up to four unexposed individuals randomly selected from the remaining pool of eligible patients, by general practice, age (± 2 years), sex and Townsend deprivation quintile score [25] at baseline. The Townsend deprivation quintile score is a measure of socioeconomic status derived from national census data, including variables such as home ownership and employment.[26] A higher score correlates to greater socio-economic deprivation.

Follow-up period

Index date for patients in the exposed group was defined as the date of first Read code relating to atopic disorder diagnosis (incident cases) or the date of eligibility of cohort entry for those with pre-existing recoded Read code (prevalent cases). To prevent immortal time bias [24], matched unexposed patients were assigned the same index date. An open cohort design allows patients to be enrolled at different timepoints, and for each patient to contribute person-years of follow-up from the point of entry (index date) to the point of exit (exit date). Exit date was defined as the earliest of (i) the outcome, (ii) death, (iii) patient left the general practice, (iv) last date of data collection from the practice, or (v) study end date.

Study Covariates

Co-variates adjusted for in the analysis were: age, sex, alcohol use, smoking status, body mass index (BMI), Townsend deprivation quintile score, asthma exposure, and eczema exposure at baseline. These co-variates were selected due to their potential independent relationship with the development of mental ill health.[27,28] Our matching criteria included age, sex, and Townsend deprivation quintile score, however we also included these as covariates in the study models to account for any residual confounding.

BMI was calculated as weight in kilograms divided by height in meters squared and categorised as per the World Health Organization criteria (underweight <18·5kg/m^2, normal 18·5-24·9kg/m^2, overweight 25·0-29·9kg/m^2, obese >30·0kg/m^2). Smoking status (current smoker, non-current smoker, not available) and alcohol use (current drinker, non-current drinker, not available) were self-reported.

Statistical Analysis

STATA version 18 [29] was used for all analyses. Missing data was included as a separate missing category and was included in the regression analysis, in keeping with previously published work.[30–32]

Crude incidence rates (IR) were calculated for the exposed and unexposed groups by dividing the number of outcomes by person-years. A Cox proportional hazards regression model was used to derive unadjusted and adjusted hazard ratios (HR) with 95% confidence levels (CI) describing the association between atopic disorders and the risk of mental ill health (composite outcome) and then for each mental health disorder included in the study individually. Statistical significance was set at $p<0.05$. A sensitivity analysis was undertaken by matching participants for asthma and eczema exposure.

Patient and Public Involvement

Patients and/or the public were not involved in setting the research or interpretation and write up of results. This was deemed unnecessary as all patient related data used was anonymised.

Results

In this study, 2,491,086 individuals were identified with a primary care recorded diagnosis of atopic disease and they were matched to 3,120,719 unexposed individuals. All data describing baseline characteristics are outlined in Table 1. The exposed cohort had a median follow-up period of 5.10 person years (IQR 2.02 – 9.68) versus 4.11 (1.59 – 8.37) in the unexposed cohort. Due to matching, the mean age at cohort entry and sex distribution were similar, although exposed individuals were more likely to be female than unexposed individuals (54.64 vs 49.98%). Data on BMI, smoking status, drinking status, Townsend index, and ethnicity were missing in both groups. Where recorded, data on smoking status, drinking status, and Townsend index were similar between the groups. However, individuals in the exposed group were more likely to be obese (13.99% vs 9.94%) and of white ethnicity (42.19% vs 35.72%) compared to those in the unexposed group.

During the study period, there were 229,124 recorded outcomes of mental ill health in the exposed group (IR 144.13 per 10,000 person-years) compared to 203,450 in the unexposed

group (IR 117.82 per 10,000 person-years); (Table 2). This translated to an aHR of 1.16 (95% CI 1.15-1.17). The risk of anxiety (aHR 1.22, 95% CI 1.21-1.23), depression (aHR 1.15, 95% CI 1.14-1.16), eating disorders (aHR 1.06, 95% CI 1.01-1.11), OCD (aHR 1.20, 95% CI 1.14 – 1.26), and self-harm (aHR 1.02, 95% CI 1.00-1.04) were greater in the exposed group compared to the unexposed group. By contrast, there was no difference in the risk of SMI between the two groups, aHR 0.99 (9% CI 0.95-1.03).

Tables 3a-3e describe the risk of mental ill health outcomes associated with each type of atopic disorder included in the exposure for this study (food allergy, drug allergy, anaphylaxis, urticaria, and allergic rhinitis respectively). All individual atopic disorders were associated with greater risk of mental ill health compared to non-exposed individuals: food allergy (aHR 1.07, 95% CI 1.03-1.11); drug allergy (aHR 1.28, 95% CI 1.27-1.29); anaphylaxis (aHR 1.43, 95% CI 1.32-1.54); urticaria (aHR 1.15, 95% CI 1.14-1.17); allergic rhinitis (aHR 1.12, 95% CI 1.12-1.14) (tables 3a-3e).

Notably, our results demonstrated that food allergy and drug allergy exposure were associated with increased risk of all mental health outcomes. Individuals with anaphylaxis exposure had the greatest risk of anxiety (aHR 1.59, 95% CI 1.41-1.79), OCD (aHR 2.37, 95% CI 1.28-4.40), and depression (aHR 1.36, 95% CI 1.23-1.50); (table 3c).

We carried out a sensitivity analysis, matching both groups for asthma and eczema in addition to other baseline characteristics (Table S1). The findings of the sensitivity analysis were similar to that of the main cohort. There was an increased risk of all mental ill health outcomes in those with atopic disease exposure compared to those without, aHR 1.16 (95% CI 1.15-1.16). The risk of all individual mental health outcomes except SMI was increased, reflecting the main cohort analysis: SMI (aHR 0.99, 95% CI 0.96-1.03); anxiety (aHR 1.21, 95% CI 1.20-1.23); depression (aHR 1.15, 95% CI 1.14-1.16); eating disorders (aHR 1.06, 95% CI 1.01-1.10); OCD (aHR 1.18, 95% CI 1.13-1.24); self-harm (aHR 1.03; 95% CI 1.01-1.05).

Tables S3-S7 describe the risk of mental ill health outcomes associated with each type of atopic disorder, in the sensitivity analysis, with patients also matched for asthma and eczema.

Discussion

Principal Findings

In this population-based UK retrospective cohort study, we found that individuals with primary care recorded exposure to atopic disease had a 16% higher risk of having a subsequent mental health diagnosis, compared to those with no such exposure. Analysis of each individual mental health outcome showed a positive association with atopy exposure, except SMI. These findings were robust to a sensitivity analysis, suggesting that the impact was related to atopy rather than eczema or asthma.

Consideration of individual atopic and allergic disorders showed that individuals with anaphylaxis exposure had the greatest risk of subsequent mental health diagnosis, with 43%

increased risk compared to those without. They were most likely to be diagnosed with OCD, anxiety, or depression (137%, 59% and 36% increased risk respectively). Notably, only drug allergy and food allergy exposure conferred an increased risk of SMI.

Comparison with previous studies

The evidence base for atopic disorders (other than asthma, atopic dermatitis, and allergic rhinitis) and their relationship with mental health disorders is still emerging, especially for diagnoses other than depression and anxiety. Our study expands on the existing global literature. Our study supports the findings of previous studies demonstrating a relationship between atopic disorders and common mental health disorders (depression and anxiety). Although the strength of associations previously found varies across the conditions being assessed and the majority of previous studies explored mental health outcomes in those with allergic rhinitis, asthma, and/or eczema. Some evidence has also linked allergy, eating disorders [33], attention deficit hyperactivity disorder (ADHD) and suicides.[34] Our study has examined these association in a large sample, representative of the general UK population where previous studies have often included small sample sizes of clinical population, which may differ in their demographics from the general population.

Previous research has indicated a strong association between food allergy and anxiety, which could be driven by the fear of a life-threatening reaction.[17] Our study's findings provide support to this association. Individuals with food allergy in our study demonstrated a 15% increase in anxiety (aHR 1.15, 95% CI 1.09-1.22); (table 3a).

Previous research indicates the relationship between atopic disorders and mental health disorders appears to be bidirectional. Some studies have shown that individuals with depression are more likely to have a concomitant diagnosis of allergies, including non-food allergies. [35–38] A twin study from Finland suggested the possibility of a genetic link between allergy and depression. [39] Birth cohort studies from northern Finland have demonstrated strong association between depression and allergy, especially in females.[40,41] One northern Finland birth cohort study found females with atopy had an 80% increased risk of developing depression (aOR 1.8, 95% CI 1.2–2.6). [41]

Potential underlying mechanisms

It has been suggested that patients with allergies and mental health disorders have similar disruptions in immune pathways.[42] Depression and anxiety can enhance the inflammatory Th2 and Th17 pathways [34] which are also implicated in the aetiology of allergy.[43] Indeed, there is clinical evidence to suggest that this relationship could be bi-directional - that is, having a diagnosis of either allergy or a mental health disorder can increase the risk of the other (Zhang et al., 2022). In further support of this hypothesis, medication for depression has been shown to improve allergy symptoms [42] and vice-versa.[44] Poor allergy management can worsen outcomes too: a Canadian study found increased tics, anxiety and disruptive behaviour patterns in children aged 5-10 years receiving hydroxyzine, a first-generation antihistamine. [45]

The data on the relationship between severity of allergy and mental health disease are less clear. One study suggested that the likelihood of mental health disease increases with

increased severity of atopic dermatitis [46], but there are no data on the risks related to other allergic conditions. One hypothesis is that immunological and inflammatory responses associated with atopy may predispose to increased risk of mental health disorders, particularly depression.[47] In sensitised individuals, exposure to an allergen results in IgE-mediated activation of mast cells, causing mass secretion of chemicals such as histamine and cytokines (e.g., interleukin-4 (IL-4) and IL-13). Recent evidence suggests that these cytokines can alter neurotransmitter systems, contributing to the development of psychiatric disorders.[48] Pro-inflammatory cytokine exposure has been shown to induce symptoms of anhedonia, lethargy, sleep disturbance, and anorexia- all of which are established symptoms of depression.[49,50] Many pathophysiologic pathways in the nervous system are posited to be involved in depression, including the monoaminergic pathway, dysfunction of the hypothalamic-pituitary axis (HPA), and glutamate transmission.[48,51]

A second hypothesis that can explain the observed relationship is that the chronicity of atopic and allergic disorders results in increased psychosocial stress. A review by Golding et al [16] reported that food allergies are associated with reduced reported health-related quality of life (HRQL), and greater symptoms of depression and anxiety, related to the vigilance required to avoid exposure to triggers and associated social consequences. Furthermore, the management for atopic and allergic disorders focuses on controlling symptoms and preventing flare ups; there are no curative treatments. Repeated relapses, unsuccessful lines of treatment, and the subsequent impact on functional status represent another source of stress for individuals [52], which can predispose to adverse mental health. This is particularly relevant to children; many of these disorders develop in early childhood and early childhood experiences can be fundamental to the development of mental ill health and through epigenetic modifications can predispose abnormal stress responses in adults [53], which is a risk factor for mental health disorders. Several studies demonstrate chronic physical illness and association with mental health disorders like depression, anxiety, and ADHD. [54,55]

It is possible (indeed likely) that both of these factors contribute to the relationship between atopic disorders and mental ill health.

Implications for clinical practice

A growing body of evidence demonstrates the impact of allergic disorders on long-term mental health outcomes, but few clinical guidelines or allergy services address this. There is a global unmet need for psychological support for patients in allergy clinics. [56,57] A recent global survey of psychological support needs found that for adults and parents in the UK, over 80% reported psychological distress related to their or their child's food allergy but less than 25% had been assessed for food allergy related distress and only 40% of those who needed it had been seen by a mental health professional.[56] This pattern was similar across many other countries in Europe and North and South America. This study reinforces the growing evidence base for the integration of psychological services into standard allergy care.

Strengths and Limitations

Strengths of this study include its large and diverse sample, which is generalisable to the UK population with respect to demographics and prevalence of chronic conditions.[19,20] To the best of our knowledge, this is the first large-scale UK primary-care based cohort study examining the relationship between atopic disorders and mental health disorders. The use of electronic health records from a primary care database reduces recall bias as data is recorded during patient consultations. The study is novel for inclusion of a range of atopic and mental health disorders- many of which are poorly studied in the existing literature.

This study has a few key limitations which must be considered when interpreting the findings. First, the study uses data from electronic healthcare records which relies on accurate documentation by health care professionals in general practices contributing to the dataset. Heterogeneity in recording, which can affect both the exposure and outcomes of interest, can result in misclassification bias. However, the coding of mental health disorders is more likely to be complete as SMI feature in the in the Quality and Outcomes Framework (QOF; which is a UK primary care performance management reward scheme).[58] Additionally, whilst we recognized post-traumatic stress disorder as an important outcome, we could not include it in this analysis due to underdiagnosis in UK primary care settings and subsequent inconsistent coding in the database. [59] Another limitation related to coding is that we are unable to stratify included patients by disease severity which could provide useful findings by sensitivity analysis. Similarly, factors such as educational status, parental psychiatric history which could be confounders cannot be included due to poor recording.

Recommendations for Future Research

Further longitudinal studies of large community-representative samples are required to further explore the association between the broad range of atopic disorders and mental health disorders, including post-traumatic stress disorder. Future studies could explore with sub-group analyses differences in outcomes by age-of-onset and disease severity. Effect of psychological interventions, particularly on the most affected subgroups (e.g. those with history of anaphylaxis), should also be measured systematically.

Conclusion

Individuals with allergies and atopic disease were at an increased risk of developing mental ill health in this UK primary care cohort. A positive association was found between allergy and all mental health disorders (anxiety, depression, eating disorders, OCD, and self-harm) except SMI. Given the high prevalence of allergic and atopic disorders, this association underscores a substantial public mental health burden. Primary and secondary healthcare services should be aware of the potential risk of mental health disorders in patients presenting with allergic and atopic disorders. Appropriate referrals to suitable psychological support should be made where possible.

References

1 Thomsen SF. Epidemiology and natural history of atopic diseases. *Eur Clin Respir J*. 2015;2:24642.

2 Shin YH, Hwang J, Kwon R, *et al.* Global, regional, and national burden of allergic disorders and their risk factors in 204 countries and territories, from 1990 to 2019: A systematic analysis for the Global Burden of Disease Study 2019. *Allergy*. 2023;78:2232–54.

3 McManus S, Bebbington P, Jenkins R, *et al.* Mental health and wellbeing in England: Adult Psychiatric Morbidity Survey 2014. 2014. https://doi.org/10.1103/PhysRevB.77.235410

4 McManus S, Bebbington P, Jenkins R, *et al.* Mental Health and Wellbeing in England: Adult Psychiatric Morbidity Survey 2014. Leeds 2016.

5 Rehm J, Shield KD. Global Burden of Disease and the Impact of Mental and Addictive Disorders. *Curr Psychiatry Rep*. 2019;21:10.

6 Charlson FJ, Baxter AJ, Dua T, *et al.* Excess mortality from mental, neurological and substance use disorders in the Global Burden of Disease Study 2010. *Epidemiol Psychiatr Sci*. 2015;24:121–40.

7 Public Health England. Severe mental illness (SMI) and physical health inequalities: briefing. London 2018.

8 Office for Health Improvement & Disparities. Premature mortality in adults with severe mental illness (SMI). London 2023.

9 Tzeng N-S, Chang H-A, Chung C-H, *et al.* Increased Risk of Psychiatric Disorders in Allergic Diseases: A Nationwide, Population-Based, Cohort Study . Front. Psychiatry . 2018;9. https://www.frontiersin.org/articles/10.3389/fpsyt.2018.00133

10 Oh H, Koyanagi A, DeVylder J, *et al.* Seasonal Allergies and Psychiatric Disorders in the United States. *Int J Environ Res Public Health*. 2018;15:1965.

11 Hurwitz EL, Morgenstern H. Cross-Sectional Associations of Asthma, Hay Fever, and Other Allergies with Major Depression and Low-Back Pain among Adults Aged 20-39 Years in the United States. *Am J Epidemiol*. 1999;150:1107–16.

12 Messias E, Clarke DE, Goodwin RD. Seasonal allergies and suicidality: results from the National Comorbidity Survey Replication. *Acta Psychiatr Scand*. 2010;122:139–42.

13 Patten SB, Williams JVA. Self-Reported Allergies and Their Relationship to Several Axis I Disorders in a Community Sample. *Int J Psychiatry Med*. 2007;37:11–22.

14 Tawil S, Irani C, Kfoury R, *et al.* Association of Chronic Urticaria with Psychological Distress: A Multicentre Cross-sectional Study. *Acta Derm Venereol*. 2023;103:adv00865.

15 Tat TS. Higher Levels of Depression and Anxiety in Patients with Chronic Urticaria. *Med Sci Monit*. 2019;25:115–20.

16 Golding MA, Batac ALR, Gunnarsson N V, *et al.* The burden of food allergy on children and teens: A systematic review. *Pediatr Allergy Immunol*. 2022;33:e13743.

17 Polloni L, Muraro A. Anxiety and food allergy: A review of the last two decades. *Clin Exp Allergy*. 2020;50:420–41.

18 Knibb RC, Huissoon AP, Baretto R, *et al.* The impact of anaphylaxis on the quality of life and mental health of adults. *Clin Exp Allergy*. 2023;53:121–5.

19 Blak BT, Thompson M, Dattani H, *et al.* Generalisability of The Health Improvement

Network (THIN) database: demographics, chronic disease prevalence and mortality rates. *Inform Prim Care*. 2011;19:251–5.

20 THIN : The Health Improvement Network - Cegedim Health Data. https://www.cegedim-health-data.com/cegedim-health-data/thin-the-health-improvement-network/ (accessed 30 May 2023)

21 Booth N. What are the Read Codes? *Health Libr Rev*. 1994;11:177–82.

22 Gokhale KM, Chandan JS, Toulis K, *et al.* Data extraction for epidemiological research (DExtER): a novel tool for automated clinical epidemiology studies. *Eur J Epidemiol*. 2021;36:165–78.

23 von Elm E, Altman DG, Egger M, *et al.* The Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) statement: guidelines for reporting observational studies. *J Clin Epidemiol*. 2008;61:344–9.

24 Maguire A, Blak BT, Thompson M. The importance of defining periods of complete mortality reporting for research using automated data from primary care. *Pharmacoepidemiol Drug Saf*. 2009;18:76–83.

25 Townsend P, Phillimore P, Beattie A. *Health and Deprivation: Inequality and the North.* Bristol: Croom Helm 1988.

26 Office for National Statistics, National Records of Scotland, Northern Ireland Statistics and Research Agency, *et al.* 2011 UK Townsend Deprivation Scores . 2011. https://statistics.ukdataservice.ac.uk/dataset/2011-uk-townsend-deprivation-scores (accessed 12 September 2022)

27 Dragioti E, Radua J, Solmi M, *et al.* Global population attributable fraction of potentially modifiable risk factors for mental disorders: a meta-umbrella systematic review. *Mol Psychiatry 2022 278*. 2022;27:3510–9.

28 Oliveros B, Agulló-Tomás E, Márquez-álvarez LJ. Risk and Protective Factors of Mental Health Conditions: Impact of Employment, Deprivation and Social Relationships. *Int J Environ Res Public Health*. 2022;19. doi: 10.3390/IJERPH19116781

29 StataCorp. Stata Statistical Software: Release 18. College Station, TX 2023.

30 Nash K, Minhas S, Metheny N, *et al.* Association between childhood maltreatment and atopy in the UK: A population based retrospective cohort study. *eClinicalMedicine*. 2022;0:101730.

31 Minhas S, Qian Hui Lim R, Raindi D, *et al.* Exposure to domestic abuse and the subsequent risk of developing periodontal disease. *Heliyon*. 2022;8:e12631.

32 Chandan JS, Keerthy D, Gokhale KM, *et al.* The association between exposure to domestic abuse in women and the development of syndromes indicating central nervous system sensitization: A retrospective cohort study using UK primary care records. *Eur J Pain*. 2021;25:1283–91.

33 Jafri S, Frykas TL, Bingemann T, *et al.* Food Allergy, Eating Disorders and Body Image. *J Affect Disord Reports*. 2021;6:100197.

34 Postolache TT, Komarow H, Tonelli LH. Allergy: A risk factor for suicide? *Curr Treat Options Neurol*. 2008;10:363–76.

35 Patten SB, Williams JV, Lavorato DH, *et al.* Allergies and major depression: a longitudinal community study. *Biopsychosoc Med*. 2009;3:3.

36 Cuffel B, Wamboldt M, Borish L, *et al.* Economic Consequences of Comorbid Depression, Anxiety, and Allergic Rhinitis. *Psychosomatics*. 1999;40:491–6.

37 Bell IR, Jasnoski ML, Kagan J, *et al.* Depression and Allergies: Survey of a Nonclinical Population. *Psychother Psychosom*. 1991;55:24–31.

38 Goodwin RD, Castro M, Kovacs M. Major Depression and Allergy: Does Neuroticism Explain the Relationship? *Psychosom Med*. 2006;68:94–8.

39 Wamboldt MZ, Hewitt JK, Schmitz S, *et al.* Familial association between allergic disorders and depression in adult Finnish twins. *Am J Med Genet*. 2000;96:146–53.

40 Timonen M, Jokelainen J, Hakko H, *et al.* Atopy and depression: results from the Northern Finland 1966 Birth Cohort Study. *Mol Psychiatry*. 2003;8:738–44.

41 Timonen M, Jokelainen J, Silvennoinen-Kassinen S, *et al.* Association between skin test diagnosed atopy and professionally diagnosed depression: a northern finland 1966 birth cohort study. *Biol Psychiatry*. 2002;52:349–55.

42 Zhang Y, Zhen H, Yao W, *et al.* Antidepressant Drug, Desipramine, Alleviates Allergic Rhinitis by Regulating T reg and T h 17 Cells. *Int J Immunopathol Pharmacol*. 2013;26:107–15.

43 Wang J, Zhou Y, Zhang H, *et al.* Pathogenesis of allergic diseases and implications for therapeutic interventions. *Signal Transduct Target Ther*. 2023;8:138.

44 Sastre J, Crespo A, Fernandez-Sanchez A, *et al.* Anxiety, Depression, and Asthma Control: Changes After Standardized Treatment. *J Allergy Clin Immunol Pract*. 2018;6:1953–9.

45 Gober HJ, Li KH, Yan K, *et al.* Hydroxyzine Use in Preschool Children and Its Effect on Neurodevelopment: A Population-Based Longitudinal Study. *Front Psychiatry*. 2022;12. doi: 10.3389/fpsyt.2021.721875

46 Yaghmaie P, Koudelka CW, Simpson EL. Mental health comorbidity in patients with atopic dermatitis. *J Allergy Clin Immunol*. 2013;131:428–33.

47 Corwin EJ. Understanding ytokines Part I: Physiology and Mechanism of Action. *Biol Res Nurs*. 2000;2:30–40.

48 Felger JC, Lotrich FE. Inflammatory cytokines in depression: Neurobiological mechanisms and therapeutic implications. *Neuroscience*. 2013;246:199–229.

49 Dantzer R. Cytokine-Induced Sickness Behavior: Where Do We Stand? *Brain Behav Immun*. 2001;15:7–24.

50 Dantzer R, O'Connor JC, Freund GG, *et al.* From inflammation to sickness and depression: when the immune system subjugates the brain. *Nat Rev Neurosci*. 2008;9:46–56.

51 Fries GR, Saldana VA, Finnstein J, *et al.* Molecular pathways of major depressive disorder converge on the synapse. *Mol Psychiatry*. 2023;28:284–97.

52 Chida Y, Hamer M, Steptoe A. A bidirectional relationship between psychosocial factors and atopic disorders: A systematic review and meta-analysis. *Psychosom Med*. 2008;70:102–16.

53 National Scientific Council on the Developing Child. Early Experiences Can Alter Gene Expression and Affect Long-Term Development: Working Paper No. 10. Boston 2010.

54 Turkel S, Pao M. Late Consequences of Pediatric Chronic Illness. *Psychiatr Clin North Am*. 2007;30:819.

55 Bennett SD, Kerry E, Fifield K, *et al.* A drop-in centre for treating mental health problems in children with chronic illness: Outcomes for parents and their relationship with child outcomes. *JCPP Adv*. 2021;1:e12046.

56 Knibb R, Halsey M, James P, *et al.* Psychological services for food allergy: The unmet need for patients and families in the United Kingdom. *Clin Exp Allergy*. 2019;49:1390–4.

57 Knibb RC, Jones CJ, Herbert LJ, *et al.* Psychological support needs for children with

food allergy and their families: A systematic review. *Pediatr Allergy Immunol*. 2024;35:e14108.

58 National Institute for Health and Care Excellence. NICE Quality and Outcomes Framework indicator. 2023. https://www.nice.org.uk/standards-and-indicators/qofindicators (accessed 23 July 2023)

59 Ehlers A, Gene-Cos N, Perrin S. Low Recognition of Posttraumatic Stress Disorder in Primary Care. *London J Prim Care*. 2009;2:36–42.

Table 1: Baseline Characteristics

	Exposed	Unexposed
Number of patients (n)	2,491,086	3,120,719
Number of patients with asthma diagnosis (n)	472,984	289,969
Number of patients with eczema diagnosis (n)	455,348	367,786
Median (IQR) follow-up period (person years)	5.10 (2.02 – 9.68)	4.11 (1.59 – 8.37)
Mean (SD) age at cohort entry (years)	39.42 (23.65)	35.81 (22.17)
Sex (n)		
Male	1,129,954	1,561,074
Female	1,361,132	1,559,645
Body mass index, n (%)		
Underweight (<18·5 kg/m^2)	40,490 (1.63)	52,235 (1.67)
Normal (18·5-24·9 kg/m^2)	687,723 (27.61)	823,574 (26.39)
Overweight (25·0-29·9 kg/m^2)	541,784 (21.75)	559,329 (17.92)
Obese (>30·0 kg/m^2)	348,395 (13.99)	310,123 (9.94)
Not available	872,694 (35.03)	1,375,458 (44.08)
Smoking status, n (%)		
Current smoker	348,532 (13.99)	474,771 (15.21)
Non-current smoker	1,574,697 (63.21)	1,681,583 (53.88)
Not available	567,857 (22.80)	964,365 (30.90)
Drinking status, n (%)		
Current Drinker	1,266,898 (50.86)	1,394,975 (44.70)
Non-current drinker	370,169 (14.86)	382,726 (12.26)
Not available	854,019 (34.28)	1,343,018 (43.04)
Townsend index, n (%)		
(Least deprived) 1	535,228 (21.49)	657,580 (21.07)
2	464,489 (18.65)	552,877 (17.72)
3	453,156 (18.19)	559,350 (17.92)
4	388,862 (15.61)	487,367 (15.62)
5	262,946 (10.56)	327,038 (10.48)
Not available	386,405 (15.51)	536,507 (17.19)
Ethnicity, n (%)		
White	1,050,939 (42.19)	1,114,783 (35.72)
Black	45,742 (1.84)	51,975 (1.67)
South Asian	66,060 (2.65)	74,028 (2.37)
Mixed	16,818 (0.68)	19,858 (0.64)
Other	37,641 (1.51)	54,616 (1.75)
Missing	1,273,886 (51.14)	1,805,459 (57.85)

Table 2: Hazard ratios with 95% confidence intervals (CI) for mental ill health among patients with any atopic or allergic disorder compared to matched unexposed individuals

		Number of outcomes	Person Years	Incidence Rate (per 10,000 person years)	Unadjusted Hazard Ratio	Adjusted Hazard Ratio*
Composite	**Exposed**	229,124	**15,900,000**	144.13	1.23 (95% CI1.23-1.24, p<0.001)	1.16 (95% CI 1.15-1.17, p<0.001)
	Unexposed	203,450	**17,300,000**	117.82		
SMI	**Exposed**	5,581	**17,200,000**	32.46	1.00 (95% CI 0.97-1.04, p 0.895)	0.99 (95% CI 0.95-1.03, p 0.546)
	Unexposed	5,979	**18,400,000**	32.51		
Anxiety	**Exposed**	93,848	**16,700,000**	56.210	1.30 (95% CI 1.29-1.31, p<0.001)	1.22 (95% CI 1.21-1.23, p<0.001)
	Unexposed	77,479	**18,000,000**	43.05		
Depression	**Exposed**	138,658	16,400,000	84.59	1.25 (95% CI 1.24-1.26, p<0.001)	1.15 (95% CI 1.14-1.16, p<0.001)
	Unexposed	121,244	17,700,000	68.48		
Eating disorders	**Exposed**	4188	17,200,000	2.44	1.06 (95% CI 1.01-1.10, p 0.013)	1.06 (95% CI 1.01-1.11, p 0.01)
	Unexposed	4310	18,400,000	2.34		
OCD	**Exposed**	3565	17,200,000	2.07	1.20 (95% CI 1.15-1.26, p<0.001)	1.20 (95% CI 1.14-1.26, p<0.001)
	Unexposed	3163	18,400,000	1.72		
Self harm	**Exposed**	21,959	17,100,000	12.83	0.99 (95% CI 0.98-1.01, p 0.518)	1.02 (95% CI 1.00-1.04, p 0.012)
	Unexposed	23,619	18,300,000	12.90		

/bmjopen-2024-089181 on 31 May 2025. Downloaded from

*Adjusted hazard ratio: adjusted for age, sex, alcohol use, smoking status, body mass index (BMI), Townsend deprivation quintile score, asthma, and eczema at baseline

Table 3: Hazard ratios with 95% confidence intervals (CI) for mental ill health among patients with specific atopic and allergic disorders

Table 3a: Food allergy

		Number of outcomes	Person Years	Incidence Rate (per 10,000 person years)	Unadjusted Hazard Ratio	Adjusted Hazard Ratio
Composite	**Exposed**	6,955	583,190	119.26	1.21 (95% CI 1.17-1.25, p<0.001)	1.07 (95% CI 1.03-1.11, p<0.001)
	Unexposed	6,335	648,193	97.73		
SMI	**Exposed**	180	617,205	2.92	1.18 (95% 0.95-1.46, p 0.129)	1.13 (95% CI 0.90-1.42, p 0.276)
	Unexposed	165	677,620	2.44		
Anxiety	**Exposed**	2,908	604,387	48.12	1.33 (95% CI 1.26-1.40, p<0.001)	1.15 (95% CI 1.09-1.22, p<0.001)
	Unexposed	2,355	**667,832**	35.26		
Depression	**Exposed**	3,692	597,935	61.75	1.18 (95% CI 1.13-1.24, p<0.001)	1.03 (95% CI 0.98-1.09, p 0.164)
	Unexposed	3,425	660,867	51.83		
Eating disorders	**Exposed**	263	616,739	4.26	1.20 (95% CI 1.01-1.43, p 0.042)	1.09 (95% CI 0.91-1.32, p 0.351)
	Unexposed	240	677,337	3.54		
OCD	**Exposed**	188	617,035	3.05	1.27 (95% CI 1.03-1.57, p 0.028)	1.12 (95% CI 0.89-1.41, p 0.341)
	Unexposed	158	677,684	2.33		
Self harm	**Exposed**	917	614,055	14.93	1.01 (95% CI 0.92-1.10, p 0.891)	0.95 (95% CI 0.86-1.05, p 0.316)
	Unexposed	970	674,407	14.38		

*Adjusted hazard ratio: adjusted for age, sex, alcohol use, smoking status, body mass index (BMI), Townsend deprivation quintile score, asthma, and eczema at baseline

Table 3b: Drug allergy

		Number of outcomes	Person Years	Incidence Rate (per 10,000 person years)	Unadjusted Hazard Ratio	Adjusted Hazard Ratio
Composite	**Exposed**	136,246	8,629,804	157.88	1.35 (95% CI 1.33-1.36, p<0.001)	1.28 (95% CI 1.27-1.29, p<0.001)
	Unexposed	104,501	8,773,298	119.11		
SMI	**Exposed**	3467	9,429,027	3.68	1.07 (95% CI 1.02-1.13, p 0.004)	1.07 (95% CI 1.02-1.12, p 0.007)
	Unexposed	3245	9,364,852	3.47		
Anxiety	**Exposed**	55,508	9,120,391	60.86	1.43 (95% CI 1.41-1.45, p<0.001)	1.36 (95% CI 1.34-1.37, p<0.001)
	Unexposed	39,114	9,159,493	42.70		
Depression	**Exposed**	85,637	8,920,011	96.01	1.35 (95% CI 1.34-1.37, p<0.001)	1.27 (95% CI 1.25-1.28, p<0.001)
	Unexposed	64,926	8,990,436	72.22		
Eating disorders	**Exposed**	1,834	9,434,611	1.94	1.09 (95% CI 1.02-1.16, p 0.011)	1.12 (95% CI 1.05-1.20, p 0.001)
	Unexposed	1,711	9,371,394	1.83		
OCD	**Exposed**	1,663	9,434,811	1.76	1.34 (95% CI 1.24-1.44, p<0.001)	1.37 (95% CI 1.27-1.47, p<0.001)
	Unexposed	1,241	9,372,528	1.32		
Self harm	**Exposed**	10,780	9,390,771	11.48	1.13 (95% CI 1.10-1.16, p<0.001)	1.18 (95% CI 1.15-1.22, p<0.001)
	Unexposed	9,531	9,333,037	10.21		

*Adjusted hazard ratio: adjusted for age, sex, alcohol use, smoking status, body mass index (BMI), Townsend deprivation quintile score, asthma, and eczema at baseline

Table 3c: Anaphylaxis

		Number of outcomes	Person Years	Incidence Rate (per 10,000 person years)	Unadjusted Hazard Ratio	Adjusted Hazard Ratio
Composite	**Exposed**	1,773	100,899	175.72	1.57 (95% CI 1.46-1.69, p<0.001)	1.43 (95% CI 1.32-1.54, p<0.001)
	Unexposed	1,229	108,556	113.21		
SMI	**Exposed**	33	111,340	2.96	0.99 (95% CI 0.61-1.58, p 0.951)	0.93 (95% CI 0.57-1.54, p 0.782)
	Unexposed	36	115,380	3.12		
Anxiety	**Exposed**	769	107,135	71.78	1.76 (95% CI 1.57-1.97, p<0.001)	1.59 (95% CI 1.41-1.79, p<0.001)
	Unexposed	460	112,994	40.71		
Depression	**Exposed**	1,050	104,749	100.24	1.51 (95% CI 1.38-1.66, p<0.001)	1.36 (95% CI 1.23-1.50, p<0.001)
	Unexposed	748	111,314	67.20		
Eating disorders	**Exposed**	31	111,337	2.78	1.08 (95% CI 0.65-1.78, p 0.777)	0.89 (95% CI 0.51-1.56, p 0.693)
	Unexposed	30	115,429	2.60		
OCD	**Exposed**	32	111,288	2.88	2.04 (95% CI 1.13-3.68, p 0.018)	2.37 (95% CI 1.28-4.40, p 0.006)
	Unexposed	17	115,524	1.47		
Self harm	**Exposed**	196	110,613	17.72	1.94 (95% CI 1.53-2.47, p<0.001)	1.83 (95% CI 1.42-2.36, p<0.001)
	Unexposed	105	115,123	9.12		

*Adjusted hazard ratio: adjusted for age, sex, alcohol use, smoking status, body mass index (BMI), Townsend deprivation quintile score, asthma, and eczema at baseline

Table 3d: Urticaria

		Number of outcomes	Person Years	Incidence Rate (per 10,000 person years)	Unadjusted Hazard Ratio	Adjusted Hazard Ratio
Composite	**Exposed**	43,001	2.966,951	144.93	1.25 (95% CI 1.23-1.27, p<0.001)	1.15 (95% CI 1.14-1.17, p<0.001)
	Unexposed	35,624	3,060,309	116.41		
SMI	**Exposed**	863	3,231,215	2.67	0.91 (95% CI 0.83-0.99, p 0.035)	0.87 (95% CI 0.79-0.96, p 0.004)
	Unexposed	950	3,261,340	2.91		
Anxiety	**Exposed**	18,675	3,123,901	59.78	1.33 (95% CI 1.30-1.36, p<0.001)	1.23 (95% CI 1.20-1.25, p<0.001)
	Unexposed	14,118	3,188,116	44.28		
Depression	**Exposed**	24,988	3,072,521	96.01	1.27 (95% CI 1.25-1.29, p<0.001)	1.15 (95% CI 1.13-1.17, p<0.001)
	Unexposed	20,251	3,143,972	72.22		
Eating disorders	**Exposed**	1,090	3,229,622	3.38	1.12 (95% CI 1.03-1.22. p 0.008)	1.13 (95% CI 1.03-1.23, p 0.007)
	Unexposed	992	3,261,134	3.04		
OCD	**Exposed**	786	3,230,785	2.43	1.24 (95% CI 1.12-1.38, p<0.001)	1.20 (95% CI 1.08-1.34, p<0.001)
	Unexposed	630	3,262,586	1.93		
Self harm	**Exposed**	5,105	3,209,184	15.91	1.03 (95% CI 0.99-1.07, p 0.162)	1.03 (95% CI 0.99-1.07, p 0.136)
	Unexposed	4,942	3,241,833	15.24		

*Adjusted hazard ratio: adjusted for age, sex, alcohol use, smoking status, body mass index (BMI), Townsend deprivation quintile score, asthma, and eczema at baseline

Table 3e: Allergic rhinitis

		Number of outcomes	Person Years	Incidence Rate (per 10,000 person years)	Unadjusted Hazard Ratio	Adjusted Hazard Ratio
Composite	**Exposed**	12,576	725,508	173.34	1.21 (95% CI 1.20-1.22, p<0.001)	1.12 (95% CI 1.12-1.14, p<0.001)
	Unexposed	8,368	650,841	128.57		
SMI	**Exposed**	239	812,716	2.94	0.95 (95% CI 0.90-1.01, p 0.101)	0.96 (95% CI 0.90-1.02, p 0.199)
	Unexposed	208	701,764	2.96		
Anxiety	**Exposed**	5,588	775,154	75.96	1.30 (95% CI 1.29-1.32, p<0.001)	1.21 (95% CI 1.19-1.23, p<0.001)
	Unexposed	3,400	682,732	49.80		
Depression	**Exposed**	7,308	760,744	96.06	1.22 (95% CI 1.21-1.24, p<0.001)	1.12 (95% CI 1.11-1.14, p<0.001)
	Unexposed	4,824	672,055	71.78		
Eating disorders	**Exposed**	349	811,814	4.30	1.09 (95% CI 1.03-1.16, p 0.004)	1.06 (95% CI 0.99-1.13, p 0.081)
	Unexposed	234	701,573	3.34		
OCD	**Exposed**	263	812,322	3.24	1.26 (95% CI 1.18-1.35, p<0.001)	1.23 (95% CI 1.14-1.31, p<0.001)
	Unexposed	142	702,130	2.02		
Self harm	**Exposed**	1,430	805,392	17.76	0.93 (95% CI 0.90-0.95, p<0.001)	0.93 (95% CI 0.91-0.96, p<0.001)
	Unexposed	1,212	696,241	17.41		

*Adjusted hazard ratio: adjusted for age, sex, alcohol use, smoking status, body mass index (BMI), Townsend deprivation quintile score, asthma, and eczema at baseline

STROBE Statement—Checklist of items that should be included in reports of ***cohort studies***

	Item No	Recommendation	Page No
Title and abstract	1	(*a*) Indicate the study's design with a commonly used term in the title or the abstract (*b*) Provide in the abstract an informative and balanced summary of what was done and what was found	1, 4
Introduction			
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported	5
Objectives	3	State specific objectives, including any prespecified hypotheses	5
Methods			
Study design	4	Present key elements of study design early in the paper	5-7
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection	5-7
Participants	6	(*a*) Give the eligibility criteria, and the sources and methods of selection of participants. Describe methods of follow-up (*b*) For matched studies, give matching criteria and number of exposed and unexposed	5-7
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable	5-7
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group	5-7
Bias	9	Describe any efforts to address potential sources of bias	5-7
Study size	10	Explain how the study size was arrived at	5-7
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why	5-7
Statistical methods	12	(*a*) Describe all statistical methods, including those used to control for confounding (*b*) Describe any methods used to examine subgroups and interactions (*c*) Explain how missing data were addressed (*d*) If applicable, explain how loss to follow-up was addressed (*e*) Describe any sensitivity analyses	5-7
Results			
Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed (b) Give reasons for non-participation at each stage (c) Consider use of a flow diagram	7-8
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders (b) Indicate number of participants with missing data for each variable of interest (c) Summarise follow-up time (eg, average and total amount)	7-8
Outcome data	15*	Report numbers of outcome events or summary measures over time	7-8

Main results	16	(*a*) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included (*b*) Report category boundaries when continuous variables were categorized (*c*) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period	7-8
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses	7-8
Discussion			
Key results	18	Summarise key results with reference to study objectives	8
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias	10
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence	8-11
Generalisability	21	Discuss the generalisability (external validity) of the study results	8-11
Other information			
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based	2

*Give information separately for exposed and unexposed groups.

Note: An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at http://www.plosmedicine.org/, Annals of Internal Medicine at http://www.annals.org/, and Epidemiology at http://www.epidem.com/). Information on the STROBE Initiative is available at http://www.strobe-statement.org.

Appendices

Appendix B: Read Code Lists

Food Allergy

Read Code	Description
13A6.00	Milk free diet - allergy
13A7.00	Egg free diet - allergy
14M1.00	H/O: food allergy
8CA4S00	Dietary education for food allergy
8CA4S11	Dietary advice for food allergy
J432.12	Cow's milk allergy
SN58.00	Food allergy
SN58000	Egg allergy
SN58100	Egg protein allergy
SN58200	Peanut allergy
SN58300	Nut allergy
SN58400	Wheat allergy
SN58500	Fish allergy
SN58600	Seafood allergy
SN58700	Shellfish allergy
SN58800	Mushroom allergy
SN58900	Allergy to strawberries
SN58911	Strawberry allergy
SN58A00	Allergy to soya
SN58B00	Allergy to banana
SN58C00	Allergy to tomato
ZC21L00	Advice to avoid nut intake
ZC2CF00	Dietary advice for food allergy

Drug Allergy

Read Code	Description
14L..00	H/O: drug allergy
14L1.00	H/O: penicillin allergy
14L2.00	H/O: antibiotic allergy NOS
14L3.00	H/O: anaesthetic allergy
14L4.00	H/O: analgesic allergy
14L5.00	H/O: vaccine allergy
14L5000	H/O: rotavirus vaccine allergy
14L6.00	H/O: serum allergy
14L7.00	H/O: cephalosporin allergy
14L8.00	H/O: tetracycline allergy
14L9.00	H/O: gentamicin allergy
14La.00	H/O: raloxifene allergy
14LA.00	H/O: erythromycin allergy
14Lb.00	H/O: teriparatide allergy
14LB.00	H/O: neomycin allergy

14Lc.00	H/O denosumab allergy
14LC.00	H/O: chloramphenicol allergy
14Ld.00	H/O calcitonin allergy
14LD.00	H/O: sulphonamide allergy
14LE.00	H/O: trimethoprim allergy
14LF.00	H/O: co-trimoxazole allergy
14LG.00	H/O: metronidazole allergy
14LH.00	H/O: nalidixic acid allergy
14LI.00	H/O: nitrofurantoin allergy
14LJ.00	H/O: influenza vaccine allergy
14LK.00	H/O: aspirin allergy
14LL.00	H/O: betablocker allergy
14LM.00	H/O: angiotensin converting enzyme inhibitor allergy
14LN.00	H/O: angiotensin II receptor antagonist allergy
14LP.00	H/O: warfarin allergy
14LQ.00	H/O: clopidogrel allergy
14LR.00	H/O: pneumococcal vaccine allergy
14LS.00	H/O: combined calcium and vitamin D3 preparation allergy
14LT.00	H/O: bisphosphonate allergy
14LT000	H/O ibandronic acid allergy
14LT200	H/O disodium etidronate allergy
14LT300	H/O alendronic acid allergy
14LT400	H/O risedronate sodium allergy
14LV.00	H/O: selective oestrogen receptor modulator allergy
14LW.00	H/O: strontium ranelate allergy
14LX.00	H/O: dipyridamole allergy
14LY.00	Phosphodiesterase-5 inhibitor allergy
14LZ.00	H/O: drug allergy NOS
1Z4..00	Allergic reaction to drug
1Z4..11	Drug allergy
1Z42.00	Ticagrelor allergy
1Z43.00	Anticoagulant allergy
1Z43000	Rivaroxaban allergy
1Z43100	Apixaban allergy
SN52.12	Allergic drug reaction NOS
ZV14.00	[V]Personal history of drug allergy
ZV14000	[V]Personal history of penicillin allergy
ZV14100	[V]Personal history of other antibiotic allergy
ZV14200	[V]Personal history of sulphonamide allergy
ZV14300	[V]Personal history of other anti-infective agent allergy

ZV14400	[V]Personal history of anaesthetic agent allergy
ZV14500	[V]Personal history of narcotic agent allergy
ZV14600	[V]Personal history of analgesic agent allergy
ZV14700	[V]Personal history of serum or vaccine allergy
ZV14800	[V]Personal history of aspirin allergy
ZV14900	[V]Personal history of co-proxamol allergy
ZV14A00	[V]Personal history of warfarin allergy
ZV14B00	[V]Personal history of clopidogrel allergy
ZV14C00	[V]Personal history of betablocker allergy
ZV14D00	[V]PH angiotensin-converting-enzyme inhibitor allergy
ZV14E00	[V]PH of angiotensin II receptor antagonist allergy
ZV14F00	[V]Personal history of influenza vaccine allergy
ZV14G00	[V]Personal history of pneumococcal vaccine allergy
ZV14H00	[V]Personal history of strontium ranelate allergy
ZV14J00	[V]PH of selective oestrogen receptor modulator allergy
ZV14K00	[V]Personal history of bisphosphonate allergy
ZV14L00	[V]Personal history of calcium allergy
ZV14M00	[V]Personal history of vitamin D3 allergy
ZV14y00	[V]Personal history of other specified drug allergy
ZV14z00	[V]Personal history of unspecified drug allergy

Anaphylaxis

Read Code	Description
14M5.00	H/O: anaphylactic shock
SN50.00	Anaphylactic shock
SN50.11	Anaphylaxis
SN50000	Anaphylactic shock due to adverse food reaction
SN50100	Anaphy shock due/adv efect/correct drug or med proprly admin
SN59300	Anaphylactic shock due to bee sting
SN59400	Anaphylactic shock due to wasp sting
SP34.00	Anaphylactic shock due to serum

ZV1B300	[V]Personal history of food induced anaphylaxis

Urticaria

Read Code	Description
2F8..00	O/E - weals present
C373400	Familial febrile urticaria
M12A200	Solar urticaria
M28..00	Urticaria
M280.00	Allergic urticaria
M280.11	Drug induced urticaria
M281.00	Idiopathic urticaria
M282.00	Urticaria due to cold and heat
M282000	Cold urticaria
M282100	Thermal urticaria
M282111	Heat urticaria
M282z00	Urticaria due to cold and heat NOS
M283.00	Dermatographic urticaria
M283.11	Factitial urticaria
M284.00	Vibratory urticaria
M285.00	Cholinergic urticaria
M286.00	Contact urticaria
M287.00	Physical urticaria
M28y.00	Other specified urticaria
M28y.11	Nettle rash
M28y000	Urticaria geographica
M28y100	Menstrual urticaria
M28y200	Urticaria persistans
M28yz00	Other specified urticaria NOS
M28z.00	Urticaria NOS
M28z.11	Hives
Myu4.00	[X]Urticaria and erythema
Myu4000	[X]Other urticaria
PH32100	Urticaria pigmentosa
SN51.00	Angioneurotic oedema
SN51.11	Angioedema
SP35400	Urticaria due to serum

Allergic Rhinitis

Read Code	Description
F4A3100	Vernal conjunctivitis of limbus and cornea
F4C0600	Acute atopic conjunctivitis
F4C0611	Acute allergic conjunctivitis
F4C1300	Vernal conjunctivitis
F4C1400	Other chronic allergic conjunctivitis
F4C1411	Allergic conjunctivitis

H17..00	Allergic rhinitis
H17..11	Perennial rhinitis
H17..12	Allergic rhinosinusitis
H170.00	Allergic rhinitis due to pollens
H170.11	Hay fever - pollens
H170.12	Pollinosis
H171.00	Allergic rhinitis due to other allergens
H171.11	Cat allergy
H171.12	Dander (animal) allergy
H171.13	Feather allergy
H171.14	Hay fever - other allergen
H171.15	House dust allergy
H171.16	House dust mite allergy
H171000	Allergy to animal
H171100	Dog allergy
H172.00	Allergic rhinitis due to unspecified allergen
H172.11	Hay fever - unspecified allergen
H17z.00	Allergic rhinitis NOS
H330.14	Pollen asthma
Hyu2000	[X]Other seasonal allergic rhinitis
Hyu2100	[X]Other allergic rhinitis
SN5A.00	Oral allergy syndrome

Serious mental illness

Read Code	**Description**
146D.00	H/O: manic depressive disorder
1BH3.00	Paranoid ideation
1S42.00	Manic mood
212T.00	Psychosis schizophrenia + bipolar affective disord resolved
212V.00	Bipolar affective disorder resolved
225E.00	O/E - paranoid delusions
9H8..00	On severe mental illness register
E1...00	Non-organic psychoses
E10..00	Schizophrenic disorders
E100.00	Simple schizophrenia
E100.11	Schizophrenia simplex
E100000	Unspecified schizophrenia
E100100	Subchronic schizophrenia
E100200	Chronic schizophrenic
E100300	Acute exacerbation of subchronic schizophrenia
E100400	Acute exacerbation of chronic schizophrenia
E100500	Schizophrenia in remission
E100z00	Simple schizophrenia NOS

E101.00	Hebephrenic schizophrenia
E101000	Unspecified hebephrenic schizophrenia
E101100	Subchronic hebephrenic schizophrenia
E101200	Chronic hebephrenic schizophrenia
E101300	Acute exacerbation of subchronic hebephrenic schizophrenia
E101400	Acute exacerbation of chronic hebephrenic schizophrenia
E101500	Hebephrenic schizophrenia in remission
E101z00	Hebephrenic schizophrenia NOS
E102.00	Catatonic schizophrenia
E102000	Unspecified catatonic schizophrenia
E102100	Subchronic catatonic schizophrenia
E102200	Chronic catatonic schizophrenia
E102300	Acute exacerbation of subchronic catatonic schizophrenia
E102400	Acute exacerbation of chronic catatonic schizophrenia
E102500	Catatonic schizophrenia in remission
E102z00	Catatonic schizophrenia NOS
E103.00	Paranoid schizophrenia
E103000	Unspecified paranoid schizophrenia
E103100	Subchronic paranoid schizophrenia
E103200	Chronic paranoid schizophrenia
E103300	Acute exacerbation of subchronic paranoid schizophrenia
E103400	Acute exacerbation of chronic paranoid schizophrenia
E103500	Paranoid schizophrenia in remission
E103z00	Paranoid schizophrenia NOS
E104.00	Acute schizophrenic episode
E105.00	Latent schizophrenia
E105000	Unspecified latent schizophrenia
E105100	Subchronic latent schizophrenia
E105200	Chronic latent schizophrenia
E105300	Acute exacerbation of subchronic latent schizophrenia
E105400	Acute exacerbation of chronic latent schizophrenia
E105500	Latent schizophrenia in remission
E105z00	Latent schizophrenia NOS
E106.00	Residual schizophrenia
E106.11	Restzustand - schizophrenia
E107.00	Schizo-affective schizophrenia
E107.11	Cyclic schizophrenia
E107000	Unspecified schizo-affective schizophrenia

E107100	Subchronic schizo-affective schizophrenia
E107200	Chronic schizo-affective schizophrenia
E107300	Acute exacerbation subchronic schizo-affective schizophrenia
E107400	Acute exacerbation of chronic schizo-affective schizophrenia
E107500	Schizo-affective schizophrenia in remission
E107z00	Schizo-affective schizophrenia NOS
E10y.00	Other schizophrenia
E10y.11	Cenesthopathic schizophrenia
E10y000	Atypical schizophrenia
E10y100	Coenesthopathic schizophrenia
E10yz00	Other schizophrenia NOS
E10z.00	Schizophrenia NOS
E11..11	Bipolar psychoses
E11..13	Manic psychoses
E110.00	Manic disorder single episode
E110.11	Hypomanic psychoses
E110000	Single manic episode unspecified
E110100	Single manic episode mild
E110200	Single manic episode moderate
E110300	Single manic episode severe without mention of psychosis
E110400	Single manic episode severe with psychosis
E110500	Single manic episode in partial or unspecified remission
E110600	Single manic episode in full remission
E110z00	Manic disorder single episode NOS
E111.00	Recurrent manic episodes
E111000	Recurrent manic episodes unspecified
E111100	Recurrent manic episodes mild
E111200	Recurrent manic episodes moderate
E111300	Recurrent manic episodes severe without mention psychosis
E111400	Recurrent manic episodes severe with psychosis
E111500	Recurrent manic episodes partial or unspecified remission
E111600	Recurrent manic episodes in full remission
E111z00	Recurrent manic episode NOS
E114.00	Bipolar affective disorder currently manic
E114.11	Manic-depressive - now manic
E114000	Bipolar affective disorder currently manic unspecified
E114100	Bipolar affective disorder currently manic mild

E114200	Bipolar affective disorder currently manic moderate
E114300	Bipolar affect disord currently manic severe no psychosis
E114400	Bipolar affect disord currently manic severe with psychosis
E114500	Bipolar affect disord currently manic part/unspec remission
E114600	Bipolar affective disorder currently manic full remission
E114z00	Bipolar affective disorder currently manic NOS
E115.00	Bipolar affective disorder currently depressed
E115.11	Manic-depressive - now depressed
E115000	Bipolar affective disorder currently depressed unspecified
E115100	Bipolar affective disorder currently depressed mild
E115200	Bipolar affective disorder currently depressed moderate
E115300	Bipolar affect disord now depressed severe no psychosis
E115400	Bipolar affect disord now depressed severe with psychosis
E115500	Bipolar affect disord now depressed part/unspec remission
E115600	Bipolar affective disorder now depressed in full remission
E115z00	Bipolar affective disorder currently depressed NOS
E116.00	Mixed bipolar affective disorder
E116000	Mixed bipolar affective disorder unspecified
E116100	Mixed bipolar affective disorder mild
E116200	Mixed bipolar affective disorder moderate
E116300	Mixed bipolar affective disorder severe no psychosis
E116400	Mixed bipolar affective disorder severe with psychosis
E116500	Mixed bipolar affective disorder partial/unspec remission
E116600	Mixed bipolar affective disorder in full remission
E116z00	Mixed bipolar affective disorder NOS
E117.00	Unspecified bipolar affective disorder

E117000	Unspecified bipolar affective disorder unspecified
E117100	Unspecified bipolar affective disorder mild
E117200	Unspecified bipolar affective disorder moderate
E117300	Unspecified bipolar affective disorder severe no psychosis
E117400	Unspecified bipolar affective disorder severe with psychosis
E117500	Unspecified bipolar affect disord partial/unspec remission
E117600	Unspecified bipolar affective disorder in full remission
E117z00	Unspecified bipolar affective disorder NOS
E11y.00	Other and unspecified manic-depressive psychoses
E11y000	Unspecified manic-depressive psychoses
E11y100	Atypical manic disorder
E11y300	Other mixed manic-depressive psychoses
E11yz00	Other and unspecified manic-depressive psychoses NOS
E12..00	Paranoid states
E120.00	Simple paranoid state
E121.00	Chronic paranoid psychosis
E123.00	Shared paranoid disorder
E12y.00	Other paranoid states
E12yz00	Other paranoid states NOS
E12z.00	Paranoid psychosis NOS
E13..00	Other nonorganic psychoses
E13..11	Reactive psychoses
E131.00	Acute hysterical psychosis
E133.00	Acute paranoid reaction
E134.00	Psychogenic paranoid psychosis
E13y.00	Other reactive psychoses
E13y000	Psychogenic stupor
E13y100	Brief reactive psychosis
E13yz00	Other reactive psychoses NOS
E13z.00	Nonorganic psychosis NOS
E13z.11	Psychotic episode NOS
E14..00	Psychoses with origin in childhood
E141.00	Disintegrative psychosis
E14y.00	Other childhood psychoses
E14y000	Atypical childhood psychoses
E14y100	Borderline psychosis of childhood
E14yz00	Other childhood psychoses NOS
E14z.00	Child psychosis NOS

E14z.11	Childhood schizophrenia NOS
E1y..00	Other specified non-organic psychoses
E1z..00	Non-organic psychosis NOS
Eu2..00	[X]Schizophrenia schizotypal and delusional disorders
Eu20.00	[X]Schizophrenia
Eu20000	[X]Paranoid schizophrenia
Eu20011	[X]Paraphrenic schizophrenia
Eu20100	[X]Hebephrenic schizophrenia
Eu20111	[X]Disorganised schizophrenia
Eu20200	[X]Catatonic schizophrenia
Eu20211	[X]Catatonic stupor
Eu20212	[X]Schizophrenic catalepsy
Eu20213	[X]Schizophrenic catatonia
Eu20214	[X]Schizophrenic flexibilatis cerea
Eu20300	[X]Undifferentiated schizophrenia
Eu20311	[X]Atypical schizophrenia
Eu20400	[X]Post-schizophrenic depression
Eu20500	[X]Residual schizophrenia
Eu20511	[X]Chronic undifferentiated schizophrenia
Eu20512	[X]Restzustand schizophrenic
Eu20600	[X]Simple schizophrenia
Eu20y00	[X]Other schizophrenia
Eu20y11	[X]Cenesthopathic schizophrenia
Eu20y12	[X]Schizophreniform disord NOS
Eu20y13	[X]Schizophrenifrm psychos NOS
Eu20z00	[X]Schizophrenia unspeified
Eu21.00	[X]Schizotypal disorder
Eu21.11	[X]Latent schizophrenic reaction
Eu21.12	[X]Borderline schizophrenia
Eu21.13	[X]Latent schizophrenia
Eu21.14	[X]Prepsychotic schizophrenia
Eu21.15	[X]Prodromal schizophrenia
Eu21.16	[X]Pseudoneurotic schizophrenia
Eu21.17	[X]Pseudopsychopathic schizophrenia
Eu22.00	[X]Persistent delusional disorders
Eu22000	[X]Delusional disorder
Eu22011	[X]Paranoid psychosis
Eu22012	[X]Paranoid state
Eu22013	[X]Paraphrenia - late
Eu22014	[X]Sensitiver Beziehungswahn
Eu22015	[X]Paranoia
Eu22300	[X]Paranoid state in remission
Eu22y12	[X]Involutional paranoid state
Eu23012	[X]Cycloid psychosis

Eu23100	[X]Acute polymorphic psychot disord with symp of schizophren
Eu23111	[X]Bouffee delirante with symptoms of schizophrenia
Eu23112	[X]Cycloid psychosis with symptoms of schizophrenia
Eu23200	[X]Acute schizophrenia-like psychotic disorder
Eu23211	[X]Brief schizophreniform disorder
Eu23212	[X]Brief schizophrenifrm psych
Eu23214	[X]Schizophrenic reaction
Eu23312	[X]Psychogenic paranoid psychosis
Eu23y00	[X]Other acute and transient psychotic disorders
Eu23z00	[X]Acute and transient psychotic disorder unspecified
Eu23z11	[X]Brief reactive psychosis NOS
Eu23z12	[X]Reactive psychosis
Eu24.12	[X]Induced paranoid disorder
Eu25.00	[X]Schizoaffective disorders
Eu25000	[X]Schizoaffective disorder manic type
Eu25011	[X]Schizoaffective psychosis manic type
Eu25012	[X]Schizophreniform psychosis manic type
Eu25100	[X]Schizoaffective disorder depressive type
Eu25111	[X]Schizoaffective psychosis depressive type
Eu25112	[X]Schizophreniform psychosis depressive type
Eu25200	[X]Schizoaffective disorder mixed type
Eu25211	[X]Cyclic schizophrenia
Eu25212	[X]Mixed schizophrenic and affective psychosis
Eu25y00	[X]Other schizoaffective disorders
Eu25z00	[X]Schizoaffective disorder unspecified
Eu25z11	[X]Schizoaffective psychosis NOS
Eu26.00	[X]Nonorganic psychosis in remission
Eu2y.00	[X]Other nonorganic psychotic disorders
Eu2y.11	[X]Chronic hallucinatory psychosis
Eu2z.00	[X]Unspecified nonorganic psychosis
Eu2z.11	[X]Psychosis NOS
Eu30.00	[X]Manic episode
Eu30.11	[X]Bipolar disorder single manic episode
Eu30000	[X]Hypomania
Eu30100	[X]Mania without psychotic symptoms
Eu30200	[X]Mania with psychotic symptoms

Eu30211	[X]Mania with mood-congruent psychotic symptoms
Eu30212	[X]Mania with mood-incongruent psychotic symptoms
Eu30213	[X]Manic stupor
Eu30y00	[X]Other manic episodes
Eu30z00	[X]Manic episode unspecified
Eu30z11	[X]Mania NOS
Eu31.00	[X]Bipolar affective disorder
Eu31.11	[X]Manic-depressive illness
Eu31.12	[X]Manic-depressive psychosis
Eu31.13	[X]Manic-depressive reaction
Eu31000	[X]Bipolar affective disorder current episode hypomanic
Eu31100	[X]Bipolar affect disorder cur epi manic wout psychotic symp
Eu31200	[X]Bipolar affect disorder cur epi manic with psychotic symp
Eu31300	[X]Bipolar affect disorder cur epi mild or moderate depressn
Eu31400	[X]Bipol aff disord curr epis sev depress no psychot symp
Eu31500	[X]Bipolar affect dis cur epi severe depres with psyc symp
Eu31600	[X]Bipolar affective disorder current episode mixed
Eu31700	[X]Bipolar affective disorder currently in remission
Eu31800	[X]Bipolar affective disorder type I
Eu31900	[X]Bipolar affective disorder type II
Eu31911	[X]Bipolar II disorder
Eu31y00	[X]Other bipolar affective disorders
Eu31y11	[X]Bipolar II disorder
Eu31y12	[X]Recurrent manic episodes
Eu31z00	[X]Bipolar affective disorder unspecified
Eu33213	[X]Manic-depress psychosis depressd no psychotic symptoms
Eu33312	[X]Manic-depress psychosis depressed type+psychotic symptoms
ZRby100	Profile of mood states bipolar
ZV11111	[V]Personal history of manic-depressive psychosis
ZV11112	[V]Personal history of manic-depressive psychosis

Anxiety

Read Code	Description
146G.00	H/O: agoraphobia
8CAZ000	Patient given advice about management of anxiety
8HHp.00	Referral for guided self-help for anxiety
E20..00	Neurotic disorders
E200.00	Anxiety states
E200000	Anxiety state unspecified
E200100	Panic disorder
E200200	Generalised anxiety disorder
E200400	Chronic anxiety
E200500	Recurrent anxiety
E200z00	Anxiety state NOS
E202.00	Phobic disorders
E202.11	Social phobic disorders
E202.12	Phobic anxiety
E202000	Phobia unspecified
E202100	Agoraphobia with panic attacks
E202200	Agoraphobia without mention of panic attacks
E202300	Social phobia fear of eating in public
E202400	Social phobia fear of public speaking
E202500	Social phobia fear of public washing
E202600	Acrophobia
E202700	Animal phobia
E202800	Claustrophobia
E202900	Fear of crowds
E202B00	Cancer phobia
E202C00	Dental phobia
E202E00	Fear of pregnancy
E202z00	Phobic disorder NOS
E20y.00	Other neurotic disorders
E20y200	Other occupational neurosis
E20y300	Psychasthenic neurosis
E20yz00	Other neurotic disorder NOS
E20z.00	Neurotic disorder NOS
E28..00	Acute reaction to stress
E280.00	Acute panic state due to acute stress reaction
E281.00	Acute fugue state due to acute stress reaction
E282.00	Acute stupor state due to acute stress reaction
E283.00	Other acute stress reactions
E283100	Acute posttrauma stress state
E283z00	Other acute stress reaction NOS

E284.00	Stress reaction causing mixed disturbance of emotion/conduct
E28z.00	Acute stress reaction NOS
E28z.12	Flying phobia
Eu22y11	[X]Delusional dysmorphophobia
Eu4..00	[X]Neurotic stress - related and somoform disorders
Eu40.00	[X]Phobic anxiety disorders
Eu40000	[X]Agoraphobia
Eu40011	[X]Agoraphobia without history of panic disorder
Eu40012	[X]Panic disorder with agoraphobia
Eu40100	[X]Social phobias
Eu40111	[X]Anthropophobia
Eu40112	[X]Social neurosis
Eu40200	[X]Specific (isolated) phobias
Eu40211	[X]Acrophobia
Eu40212	[X]Animal phobias
Eu40213	[X]Claustrophobia
Eu40214	[X]Simple phobia
Eu40300	[X]Needle phobia
Eu40y00	[X]Other phobic anxiety disorders
Eu40z00	[X]Phobic anxiety disorder unspecified
Eu40z11	[X]Phobia NOS
Eu40z12	[X]Phobic state NOS
Eu41.00	[X]Other anxiety disorders
Eu41000	[X]Panic disorder [episodic paroxysmal anxiety]
Eu41100	[X]Generalized anxiety disorder
Eu41111	[X]Anxiety neurosis
Eu41112	[X]Anxiety reaction
Eu41113	[X]Anxiety state
Eu41300	[X]Other mixed anxiety disorders
Eu41y00	[X]Other specified anxiety disorders
Eu41y11	[X]Anxiety hysteria
Eu41z00	[X]Anxiety disorder unspecified
Eu41z11	[X]Anxiety NOS
Eu42.11	[X]Anankastic neurosis
Eu42.12	[X]Obsessive-compulsive neurosis
Eu43.00	[X]Reaction to severe stress and adjustment disorders
Eu43000	[X]Acute stress reaction
Eu43012	[X]Acute reaction to stress
Eu43y00	[X]Other reactions to severe stress
Eu43z00	[X]Reaction to severe stress unspecified
Eu45212	[X]Dysmorphophobia nondelusional

Eu45215	[X]Nosophobia
Eu51511	[X]Dream anxiety disorder
Z481.00	Phobia counselling
Z4L1.00	Anxiety counselling
Z522400	Desensitisation - phobia
Z522600	Flooding - obsessional compulsive disorder
Z522700	Flooding - agoraphobia

Depression

Read Code	Description
E112.00	Single major depressive episode
E112.11	Agitated depression
E112.12	Endogenous depression first episode
E112.13	Endogenous depression first episode
E112.14	Endogenous depression
E112000	Single major depressive episode unspecified
E112100	Single major depressive episode mild
E112200	Single major depressive episode moderate
E112300	Single major depressive episode severe without psychosis
E112400	Single major depressive episode severe with psychosis
E112500	Single major depressive episode partial or unspec remission
E112600	Single major depressive episode in full remission
E112z00	Single major depressive episode NOS
E113.00	Recurrent major depressive episode
E113.11	Endogenous depression - recurrent
E113000	Recurrent major depressive episodes unspecified
E113100	Recurrent major depressive episodes mild
E113200	Recurrent major depressive episodes moderate
E113300	Recurrent major depressive episodes severe no psychosis
E113400	Recurrent major depressive episodes with psychosis
E113500	Recurrent major depressive episodes partial/unspec remission
E113600	Recurrent major depressive episodes in full remission
E113700	Recurrent depression
E113z00	Recurrent major depressive episode NOS
E118.00	Seasonal affective disorder

E11y200	Atypical depressive disorder
E11z200	Masked depression
E130.00	Reactive depressive psychosis
E135.00	Agitated depression
E291.00	Prolonged depressive reaction
E2B..00	Depressive disorder NEC
E2B1.00	Chronic depression
Eu32.00	[X]Depressive episode
Eu32.11	[X]Single episode of depressive reaction
Eu32.12	[X]Single episode of psychogenic depression
Eu32.13	[X]Single episode of reactive depression
Eu32000	[X]Mild depressive episode
Eu32100	[X]Moderate depressive episode
Eu32200	[X]Severe depressive episode without psychotic symptoms
Eu32211	[X]Single episode agitated depressn w'out psychotic symptoms
Eu32212	[X]Single episode major depression w'out psychotic symptoms
Eu32213	[X]Single episode vital depression w'out psychotic symptoms
Eu32300	[X]Severe depressive episode with psychotic symptoms
Eu32311	[X]Single episode of major depression and psychotic symptoms
Eu32312	[X]Single episode of psychogenic depressive psychosis
Eu32313	[X]Single episode of psychotic depression
Eu32314	[X]Single episode of reactive depressive psychosis
Eu32400	[X]Mild depression
Eu32500	[X]Major depression mild
Eu32600	[X]Major depression moderately severe
Eu32700	[X]Major depression severe without psychotic symptoms
Eu32800	[X]Major depression severe with psychotic symptoms
Eu32y00	[X]Other depressive episodes
Eu32y11	[X]Atypical depression
Eu32y12	[X]Single episode of masked depression NOS
Eu32z00	[X]Depressive episode unspecified
Eu32z11	[X]Depression NOS
Eu32z12	[X]Depressive disorder NOS

Eu32z13	[X]Prolonged single episode of reactive depression
Eu32z14	[X] Reactive depression NOS
Eu33.00	[X]Recurrent depressive disorder
Eu33.11	[X]Recurrent episodes of depressive reaction
Eu33.12	[X]Recurrent episodes of psychogenic depression
Eu33.13	[X]Recurrent episodes of reactive depression
Eu33.14	[X]Seasonal depressive disorder
Eu33.15	[X]SAD - Seasonal affective disorder
Eu33000	[X]Recurrent depressive disorder current episode mild
Eu33100	[X]Recurrent depressive disorder current episode moderate
Eu33200	[X]Recurr depress disorder cur epi severe without psyc sympt
Eu33211	[X]Endogenous depression without psychotic symptoms
Eu33212	[X]Major depression recurrent without psychotic symptoms
Eu33214	[X]Vital depression recurrent without psychotic symptoms
Eu33300	[X]Recurrent depress disorder cur epi severe with psyc symp
Eu33311	[X]Endogenous depression with psychotic symptoms
Eu33313	[X]Recurr severe episodes/major depression+psychotic symptom
Eu33314	[X]Recurr severe episodes/psychogenic depressive psychosis
Eu33315	[X]Recurrent severe episodes of psychotic depression
Eu33316	[X]Recurrent severe episodes/reactive depressive psychosis
Eu33400	[X]Recurrent depressive disorder currently in remission
Eu33y00	[X]Other recurrent depressive disorders
Eu33z00	[X]Recurrent depressive disorder unspecified
Eu33z11	[X]Monopolar depression NOS
Eu34100	[X]Dysthymia

Eating Disorders

Read Code	Description

1467.00	H/O: anorexia nervosa
1JZ..00	Suspected binge eating disorder
8HTN.00	Referral to eating disorders clinic
9Nk9.00	Seen in eating disorder clinic
E275200	Pica
E264200	Cyclical vomiting - psychogenic
E271.00	Anorexia nervosa
E275.00	Other and unspecified non-organic eating disorders
E275000	Unspecified non-organic eating disorder
E275100	Bulimia (non-organic overeating)
E275111	Compulsive eating disorder
E275400	Psychogenic vomiting NOS
E275y00	Other specified non-organic eating disorder
E275z00	Non-organic eating disorder NOS
Eu50.00	[X]Eating disorders
Eu50000	[X]Anorexia nervosa
Eu50100	[X]Atypical anorexia nervosa
Eu50200	[X]Bulimia nervosa
Eu50211	[X]Bulimia NOS
Eu50212	[X]Hyperorexia nervosa
Eu50300	[X]Atypical bulimia nervosa
Eu50400	[X]Overeating associated with other psychological disturbncs
Eu50411	[X]Psychogenic overeating
Eu50500	[X]Vomiting associated with other psychological disturbances
Eu50511	[X]Psychogenic vomiting
Eu50y00	[X]Other eating disorders
Eu50y12	[X]Psychogenic loss of appetite
Eu50z00	[X]Eating disorder
Fy05.00	Nocturnal sleep-related eating disorder
R036011	[D]Bulimia NOS
Z4B5.00	Eating disorder counselling
ZC2CD00	Dietary advice for eating disorder

Obsessive Compulsive Disorder (OCD)

Read Code	Description
E203.00	Obsessive-compulsive disorders
E203.11	Anancastic neurosis
E203000	Compulsive neurosis
E203100	Obsessional neurosis
E203z00	Obsessive-compulsive disorder NOS
Eu42.00	[X]Obsessive - compulsive disorder
Eu42.11	[X]Anankastic neurosis
Eu42.12	[X]Obsessive-compulsive neurosis

Eu42000	[X]Predominantly obsessional thoughts or ruminations
Eu42100	[X]Predominantly compulsive acts [obsessional rituals]
Eu42200	[X]Mixed obsessional thoughts and acts
Eu42y00	[X]Other obsessive-compulsive disorders
Eu42z00	[X]Obsessive-compulsive disorder unspecified

Self-harm

Read Code	Description
ZX1H.00	Self-asphyxiation
146B.00	H/O: deliberate self harm
146A.00	H/O: attempted suicide
14K1.00	Intentional overdose of prescription only medication
14K0.00	H/O: repeated overdose
1BD4.00	Suicide risk
1BD8.00	At risk of DSH - deliberate self harm
1BDA.00	Thoughts of deliberate self harm
1BD6.00	Moderate suicide risk
1BDC.00	Intent of deliberate self harm with detailed plans
1BDB.00	Plans for deliberate self harm without intent
1JP..00	Suspected drug overdose
8G6..00	Anti-suicide psychotherapy
SL...14	Overdose of biological substance
SL90.00	Antidepressant poisoning
SL90z00	Anti-depressant poisoning NOS
TK...17	Para-suicide
TK01011	Suicide and self inflicted injury by amobarbital
TK01200	Suicide and self inflicted injury by Butabarbitone
TK01411	Suicide and self inflicted injury by phenobarbital
TK01500	Suicide and self inflicted injury by Quinalbarbitone
TK01511	Suicide and self inflicted injury by secobarbital
TK55.00	Suicide and selfinflicted injury by explosives
TK...13	Poisoning - self-inflicted
TK60100	Self inflicted lacerations to wrist
TK00.00	Suicide + selfinflicted poisoning by analgesic/antipyretic

TK...12	Injury - self-inflicted
TK0..00	Suicide + selfinflicted poisoning by solid/liquid substances
TK04.00	Suicide + selfinflicted poisoning by other drugs/medicines
TK60111	Slashed wrists self inflicted
TK30.00	Suicide and selfinflicted injury by hanging
TK...14	Suicide and self harm
TK60.00	Suicide and selfinflicted injury by cutting
TK03.00	Suicide + selfinflicted poisoning tranquilliser/psychotropic
TK02.00	Suicide + selfinflicted poisoning by oth sedatives/hypnotics
TK3..00	Suicide + selfinflicted injury by hang/strangulate/suffocate
TK6..00	Suicide and selfinflicted injury by cutting and stabbing
TK0z.00	Suicide + selfinflicted poisoning by solid/liquid subst NOS
TK...11	Cause of overdose - deliberate
TK01.00	Suicide + selfinflicted poisoning by barbiturates
TK61.00	Suicide and selfinflicted injury by stabbing
TK7..00	Suicide and selfinflicted injury by jumping from high place
TK4..00	Suicide and selfinflicted injury by drowning
TK...15	Attempted suicide
TK3y.00	Suicide + selfinflicted inj oth mean hang/strangle/suffocate
TK6z.00	Suicide and selfinflicted injury by cutting and stabbing NOS
TKx..00	Suicide and selfinflicted injury by other means
TK1..00	Suicide + selfinflicted poisoning by gases in domestic use
TK07.00	Suicide + selfinflicted poisoning by corrosive/caustic subst
TK51.00	Suicide and selfinflicted injury by shotgun
TK7z.00	Suicide+selfinflicted injury-jump from high place NOS
TK2..00	Suicide + selfinflicted poisoning by other gases and vapours
TK21.00	Suicide and selfinflicted poisoning by other carbon monoxide
TK70.00	Suicide+selfinflicted injury-jump from residential premises

TK3z.00	Suicide + selfinflicted inj by hang/strangle/suffocate NOS
TK01400	Suicide and self inflicted injury by Phenobarbitone
TK71.00	Suicide+selfinflicted injury-jump from oth manmade structure
TK1z.00	Suicide + selfinflicted poisoning by domestic gases NOS
TK31.00	Suicide + selfinflicted injury by suffocation by plastic bag
TK5..00	Suicide and selfinflicted injury by firearms and explosives
TKx0.00	Suicide + selfinflicted injury-jump/lie before moving object
TK06.00	Suicide + selfinflicted poisoning by agricultural chemical
TK01z00	Suicide and self inflicted injury by barbiturates
TK10.00	Suicide + selfinflicted poisoning by gas via pipeline
TK72.00	Suicide+selfinflicted injury-jump from natural sites
TK11.00	Suicide + selfinflicted poisoning by liquified petrol gas
TK2z.00	Suicide + selfinflicted poisoning by gases and vapours NOS
TK01000	Suicide and self inflicted injury by Amylobarbitone
TK2y.00	Suicide + selfinflicted poisoning by other gases and vapours
TK52.00	Suicide and selfinflicted injury by hunting rifle
TK53.00	Suicide and selfinflicted injury by military firearms
TK5z.00	Suicide and selfinflicted injury by firearms/explosives NOS
TK01100	Suicide and self inflicted injury by Barbitone
TK01300	Suicide and self inflicted injury by Pentabarbitone
TK08.00	Suicide + selfinflicted poisoning by arsenic + its compounds
TK1y.00	Suicide and selfinflicted poisoning by other utility gas
TK50.00	Suicide and selfinflicted injury by handgun
TK...00	Suicide and selfinflicted injury

TKx0z00	Suicide + selfinflicted inj-jump/lie before moving obj NOS
TKz..00	Suicide and selfinflicted injury NOS
TKx1.00	Suicide and selfinflicted injury by burns or fire
TKx2.00	Suicide and selfinflicted injury by scald
TKy..00	Late effects of selfinflicted injury
TKxz.00	Suicide and selfinflicted injury by other means NOS
TKxy.00	Suicide and selfinflicted injury by other specified means
TKx0000	Suicide + selfinflicted injury-jumping before moving object
TKx4.00	Suicide and selfinflicted injury by electrocution
TKx5.00	Suicide and selfinflicted injury by crashing motor vehicle
TKx6.00	Suicide and selfinflicted injury by crashing of aircraft
TKx3.00	Suicide and selfinflicted injury by extremes of cold
U200100	[X]Intent self poison nonopioid analgesic at res institut
U200300	[X]Int self poison nonopioid analges in sport/athletic area
U200400	[X]Intent self pois nonopioid analgesic in street/highway
U200700	[X]Int self poison/exposure to nonopioid analgesic on farm
U201100	[X]Intent self poison antiepileptic at res institut
U201200	[X]Intent self pois nonopioid analges school/pub admin area
U201300	[X]Int self poison antiepileptic in sport/athletic area
U201400	[X]Intent self pois antiepileptic in street/highway
U201500	[X]Intent self pois antiepileptic trade/service area
U201600	[X]Int self poison antiepileptic indust/construct area
U201700	[X]Int self poison/exposure to antiepileptic on farm
U201y00	[X]Intent self poison antiepileptic other spec place

U202100	[X]Intent self poison sedative hypnotic at res institut
U202200	[X]Int self poison sedative hypnotic school/pub admin area
U202300	[X]Int self poison sedative hypnotic in sport/athletic area
U2...11	[X]Self inflicted injury
U2...14	[X]Attempted suicide
U2...15	[X]Para-suicide
U2...13	[X]Suicide
U200.00	[X]Intent self poison/exposure to nonopioid analgesic
U2...12	[X]Injury - self-inflicted
U200.13	[X]Overdose - aspirin
U202.12	[X]Overdose - diazepam
U202.00	[X]Intent self poison/exposure to sedative hypnotic
U2...00	[X]Intentional self-harm
U202.16	[X]Overdose - benzodiazepine
U200.12	[X]Overdose - ibuprofen
U202.11	[X]Overdose - sleeping tabs
U202.13	[X]Overdose - temazepam
U20..00	[X]Intentional self poisoning/exposure to noxious substances
U200000	[X]Int self poison/exposure to nonopioid analgesic at home
U202.17	[X]Overdose - barbiturate
U200z00	[X]Intent self poison nonopioid analgesic unspecif place
U201.00	[X]Intent self poison/exposure to antiepileptic
U202.15	[X]Overdose - nitrazepam
U202000	[X]Int self poison/exposure to sedative hypnotic at home
U201z00	[X]Intent self poison antiepileptic unspecif place
U201000	[X]Int self poison/exposure to antiepileptic at home
U200600	[X]Int self pois nonopioid analgesic indust/construct area
U200y00	[X]Int self poison nonopioid analgesic other spec place
U202.18	[X]Overdose - amobarbital
U200200	[X]Int self poison nonopioid analges school/pub admin area
U202.14	[X]Overdose - flurazepam

U200.11	[X]Overdose - paracetamol
U200500	[X]Intent self pois nonopioid analgesic trade/service area
U202400	[X]Intent self pois sedative hypnotic in street/highway
U202500	[X]Intent self pois sedative hypnotic trade/service area
U202600	[X]Int self pois sedative hypnotic indust/construct area
U202700	[X]Int self poison/exposure to sedative hypnotic on farm
U203000	[X]Int self poison/exposure to antiparkinson drug at home
U203100	[X]Intent self poison antiparkinson drug at res institut
U203200	[X]Int self poison antparkinson drug school/pub admin area
U203300	[X]Int self poison antparkinson drug in sport/athletic area
U203400	[X]Intent self pois antiparkinson drug in street/highway
U203500	[X]Intent self pois antiparkinson drug trade/service area
U203600	[X]Int self pois antiparkinson drug indust/construct area
U203700	[X]Int self poison/exposure to antiparkinson drug on farm
U203y00	[X]Int self poison antiparkinson drug other spec place
U203z00	[X]Intent self poison antiparkinson drug unspecif place
U204100	[X]Intent self poison psychotropic drug at res institut
U204200	[X]Int self poison psychotropic drug school/pub admin area
U204300	[X]Int self poison psychotropic drug in sport/athletic area
U204400	[X]Intent self pois psychotropic drug in street/highway
U204500	[X]Intent self pois psychotropic drug trade/service area
U204600	[X]Int self pois psychotropic drug indust/construct area
U204700	[X]Int self poison/exposure to psychotropic drug on farm

U205100	[X]Intent self poison narcotic drug at res institut
U205200	[X]Int self poison narcotic drug school/pub admin area
U205300	[X]Int self poison narcotic drug in sport/athletic area
U205400	[X]Intent self pois narcotic drug in street/highway
U205500	[X]Intent self pois narcotic drug trade/service area
U205600	[X]Int self pois narcotic drug indust/construct area
U205700	[X]Int self poison/exposure to narcotic drug on farm
U206100	[X]Intent self poison hallucinogen at res institut
U206200	[X]Int self poison hallucinogenschool/pub admin area
U206300	[X]Int self poison hallucinogenin sport/athletic area
U206400	[X]Intent self pois hallucinogen in street/highway
U206500	[X]Intent self pois hallucinogen trade/service area
U206600	[X]Int self pois hallucinogen indust/construct area
U206700	[X]Int self poison/exposure to hallucinogen on farm
U206y00	[X]Int self poison hallucinogen other spec place
U207100	[X]Intent self poison oth autonomic drug at res institut
U207200	[X]Int self poison oth autonom drug school/pub admin area
U207300	[X]Int self poison oth autonom drug in sport/athletic area
U207400	[X]Intent self pois oth autonomic drug in street/highway
U207500	[X]Intent self pois oth autonomic drug trade/service area
U207600	[X]Int self pois oth autonomic drug indust/construct area
U207700	[X]Int self poison/exposure to oth autonomic drug on farm
U207y00	[X]Int self poison oth autonomic drug other spec place

U205.00	[X]Intent self poison/exposure to narcotic drug
U204.11	[X]Overdose - antidepressant
U204.12	[X]Overdose - amitriptyline
U204.13	[X]Overdose - SSRI
U208000	[X]Int self poison/exposure to oth/unsp drug/medicam home
U204000	[X]Int self poison/exposure to psychotropic drug at home
U206.00	[X]Intent self poison/exposure to hallucinogen
U205000	[X]Int self poison/exposure to narcotic drug at home
U202z00	[X]Intent self poison sedative hypnotic unspecif place
U204z00	[X]Intent self poison psychotropic drug unspecif place
U205z00	[X]Intent self poison narcotic drug unspecif place
U207.00	[X]Intent self poison/exposure to oth autonomic drug
U207000	[X]Int self poison/exposure to oth autonomic drug at home
U207z00	[X]Intent self poison oth autonomic drug unspecif place
U202y00	[X]Int self poison sedative hypnotic other spec place
U204y00	[X]Int self poison psychotropic drug other spec place
U205y00	[X]Int self poison narcotic drug other spec place
U206000	[X]Int self poison/exposure to hallucinogen at home
U206z00	[X]Intent self poison hallucinogen unspecif place
U208.00	[X]Int self poison/exposure to other/unspec drug/medicament
U208100	[X]Intent self poison oth/unsp drug/medicam res institut
U208200	[X]Int self poison oth/uns drug/med school/pub admin area
U208300	[X]Int self poison oth/uns drug/med in sport/athletic area
U208400	[X]Intent self pois oth/unsp drug/medic in street/highway

U208500	[X]Intent self pois oth/unsp drug/medic trade/service area
U208700	[X]Int self poison/exposure to oth/unsp drug/medic on farm
U209100	[X]Intent self poison alcohol at res institut
U209200	[X]Int self poison alcohol school/pub admin area
U209300	[X]Int self poison alcohol in sport/athletic area
U209400	[X]Intent self pois alcohol in street/highway
U209500	[X]Intent self pois alcohol trade/service area
U209600	[X]Int self pois alcohol indust/construct area
U209700	[X]Int self poison/exposure to alcohol on farm
U20A100	[X]Int self poison org solvent halogen hydrocarb res instit
U20A200	[X]Int self poison org solvent halogen hydrocarb school
U20A300	[X]Int self poison org solvent halogen hydrocarb sport area
U20A500	[X]Int self poison org solvent halogen hydrocarb trade area
U20A600	[X]Int self pois org solvent halogen hydrocarb indust area
U20A700	[X]Int self poison org solvent halogen hydrocarb on farm
U20Ay00	[X]Int self pois org solv halogen hydrocarp oth spec place
U20B100	[X]Intent self poison other gas/vapour at res institut
U20B300	[X]Int self poison other gas/vapour in sport/athletic area
U20B400	[X]Intent self pois other gas/vapour in street/highway
U20B500	[X]Intent self pois other gas/vapour trade/service area
U20B600	[X]Int self pois other gas/vapour indust/construct area
U20B700	[X]Int self poison/exposure to other gas/vapour on farm
U20C000	[X]Int self poison/exposure to pesticide at home
U20C100	[X]Intent self poison pesticide at res institut

U20C200	[X]Int self poison pesticide school/pub admin area
U20C300	[X]Int self poison pesticide in sport/athletic area
U20C400	[X]Intent self pois pesticide in street/highway
U20C500	[X]Intent self pois pesticide trade/service area
U20C600	[X]Int self pois pesticide indust/construct area
U20Cz00	[X]Intent self poison pesticide unspecif place
U20y100	[X]Intent self poison unspecif chemical at res institut
U20y300	[X]Int self poison unspecif chemical in sport/athletic area
U20y400	[X]Intent self pois unspecif chemical in street/highway
U20y500	[X]Intent self pois unspecif chemical trade/service area
U20y600	[X]Int self pois unspecif chemical indust/construct area
U20y700	[X]Int self poison/exposure to unspecif chemical on farm
U20yy00	[X]Int self poison unspecif chemical other spec place
U20B.00	[X]Intent self poison/exposure to other gas/vapour
U20B.11	[X]Self carbon monoxide poisoning
U20y.00	[X]Intent self poison/exposure to unspecif chemical
U20y000	[X]Int self poison/exposure to unspecif chemical at home
U20A.00	[X]Intentional self poison organ solvent halogen hydrocarb
U209z00	[X]Intent self poison alcohol unspecif place
U209000	[X]Int self poison/exposure to alcohol at home
U20C.11	[X]Self poisoning with weedkiller
U20B000	[X]Int self poison/exposure to other gas/vapour at home
U20C.12	[X]Self poisoning with paraquat
U20yz00	[X]Intent self poison unspecif chemical unspecif place
U20C.00	[X]Intent self poison/exposure to pesticide

U20Az00	[X]Int self pois org solv halogen hydrocarb unspec place
U20Bz00	[X]Intent self poison other gas/vapour unspecif place
U208y00	[X]Int self poison oth/unsp drug/medic other spec place
U20A000	[X]Intent self pois organ solvent halogen hydrocarb home
U209y00	[X]Int self poison alcohol other spec place
U20B200	[X]Int self poison other gas/vapour school/pub admin area
U20Cy00	[X]Int self poison pesticide other spec place
U20A400	[X]Int self poison org solvent halogen hydrocarb in highway
U20By00	[X]Int self poison other gas/vapour other spec place
U20C700	[X]Int self poison/exposure to pesticide on farm
U20y200	[X]Int self poison unspecif chemical school/pub admin area
U208600	[X]Int self pois oth/unsp drug/medic indust/construct area
U20A.11	[X]Self poisoning from glue solvent
U214.00	[X]Intent self harm by hangng strangult/suffoct street/h'way
U223.00	[X]Intent self harm by drown/submersn occ sport/athlet area
U224.00	[X]Intent self harm by drowning/submersn occ street/highway
U225.00	[X]Intent self harm by drown/submersn occ trade/servce area
U226.00	[X]Intent self harm by drown/submers occ indust/constr area
U227.00	[X]Intent self harm by drowning/submersion occurrn on farm
U230.00	[X]Intention self harm by handgun discharge occurrn at home
U231.00	[X]Intent self harm by handgun disch occ in resid instit'n
U232.00	[X]Intent self harm h'gun disch occ sch oth ins/pub adm area
U233.00	[X]Intent self harm by handgun disch occ sport/athlet area
U234.00	[X]Intent self harm by handgun disch occ on street/highway

U235.00	[X]Intent self harm by handgun disch occ trade/service area
U236.00	[X]Intent self harm by handgun disch occ indust/constr area
U237.00	[X]Intention self harm by handgun discharge occurrn on farm
U23y.00	[X]Intent self harm by handgun disch occ at oth specif plce
U23z.00	[X]Intent self harm by handgun disch occ at unspecif place
U241.00	[X]Int self harm rifl s'gun/lrg frarm disch occ resid instit
U242.00	[X]Int slf hrm rifl s'gun/lrg frarm dis sch/ins/pub adm area
U243.00	[X]Int self harm rifl s'gun/lrg frarm disch sprt/athlet area
U244.00	[X]Int self harm rifl s'gun/lrg frarm disch occ street/h'way
U245.00	[X]Int self harm rifl s'gun/lrg frarm disch trad/servce area
U246.00	[X]Int slf hrm rifl s'gun/lrg frarm disch indust/constr area
U247.00	[X]Intent self harm rifle sh'gun/largr firarm disch occ farm
U24y.00	[X]Int self harm rifl s'gun/lrg frarm disch oth specif place
U24z.00	[X]Int self harm rifl s'gun/lrg frarm disch occ unspec place
U250.00	[X]Intent self harm oth/unspecif firearm disch occ at home
U251.00	[X]Intent self harm oth/unsp firearm disch occ resid instit
U252.00	[X]Inten self harm oth/uns firarm disch sch/ins/pub adm area
U253.00	[X]Inten self harm oth/uns firearm disch occ sprt/athl area
U254.00	[X]Intent self harm oth/unsp firearm disch occ street/h'way
U255.00	[X]Intent self harm oth/uns firearm disch trade/servce area
U256.00	[X]Inten self harm oth/uns firearm disch indust/constr area
U257.00	[X]Intent self harm oth/unspecif firearm disch occ on farm
U25y.00	[X]Intent self harm oth/unsp firearm disch oth specif place

U25z.00	[X]Intent self harm oth/unsp firearm disch occ unspecif plce
U260.00	[X]Intention self harm by explosive material occurrn home
U261.00	[X]Intention self harm by explosiv materl occ resid instit
U262.00	[X]Intent self harm by explosiv materl sch/ins/pub adm area
U263.00	[X]Intent self harm by explosv materl occ sport/athlet area
U264.00	[X]Intention self harm by explosiv materl occ street/highway
U265.00	[X]Intent self harm by explosv materl occ trade/servce area
U266.00	[X]Intent self harm by explosv materl occ indust/constr area
U267.00	[X]Intention self harm by explosive material occurrn farm
U22..00	[X]Intentional self harm by drowning and submersion
U21z.00	[X]Intent self harm by hangng strangul/suffoct unspecif plce
U24..00	[X]Intent self harm by rifle shotgun/larger firearm disch
U211.00	[X]Intent self harm by hangng strangult/suffoct resid instit
U212.00	[X]Inten slf harm hang strang/suffc sch oth ins/pub adm area
U21y.00	[X]Intent self harm by hangng strangul/suffoct oth spec plce
U22y.00	[X]Intent self harm by drown/submersn occ oth specif place
U22z.00	[X]Intent self harm by drown/submersn occ unspecified place
U220.00	[X]Intent self harm by drowning/submersion occurrn at home
U213.00	[X]Intent self harm by hang strangl/suffc sport/athlet area
U215.00	[X]Intent self harm by hang strangl/suffc trade/service area
U216.00	[X]Intent self harm by hang strangl/suffc indust/constr area
U217.00	[X]Intent self harm by hanging strangulat/suffocat occ farm
U221.00	[X]Intent self harm by drowning/submersn occ resid instit'n

U25..00	[X]Intent self harm by other/unspecified firearm discharge
U222.00	[X]Intent self harm drown/submers occ sch/ins/pub adm area
U23..00	[X]Intentional self harm by handgun discharge
U240.00	[X]Intent self harm rifle sh'gun/largr firarm disch occ home
U26..00	[X]Intentional self harm by explosive material
U210.00	[X]Intent self harm by hanging strangulat/suffocat occ home
U26y.00	[X]Intent self harm by explosiv materl occ oth specif place
U26z.00	[X]Intent self harm by explosiv materl occ unspecif place
U271.00	[X]Intent self harm by smoke fire/flame occ resid instit'n
U272.00	[X]Intent self harm by smoke fire/flame sch/ins/pub adm area
U273.00	[X]Intent self harm by smok fire/flam occ sport/athlet area
U275.00	[X]Intent self harm by smok fire/flam occ trade/servce area
U276.00	[X]Intent self harm by smok fire/flam occ indust/constr area
U277.00	[X]Intention self harm by smoke fire/flames occurrn on farm
U281.00	[X]Intent self harm by steam hot vapour/obj occ resid instit
U283.00	[X]Int self harm by steam hot vapour/obj occ sport/athl area
U284.00	[X]Intent self harm by steam hot vapour/obj occ street/h'way
U285.00	[X]Int self harm by steam hot vapour/obj trade/service area
U286.00	[X]Int self harm by steam hot vapour/obj indust/constr area
U287.00	[X]Intent self harm by steam hot vapour/hot obj occ on farm
U28y.00	[X]Intent self harm by steam hot vapour/obj oth specif place
U293.00	[X]Intent self harm by sharp object occ sports/athlet area
U2A4.00	[X]Intention self harm by blunt object occ street/highway

U2A5.00	[X]Intent self harm by blunt object occ trade/service area
U2A6.00	[X]Intent self harm by blunt object occ indust/constr area
U2A7.00	[X]Intentional self harm by blunt object occurrence on farm
U2Ay.00	[X]Intention self harm by blunt object occ oth specif place
U2B2.00	[X]Int self harm jump fr high place sch oth ins/pub adm area
U2B3.00	[X]Intent self harm by jump from high place sport/athl area
U2B5.00	[X]Intent self harm by jump from high place trad/servce area
U2B7.00	[X]Intent self harm by jumping from high place occ on farm
U2C0.00	[X]Intent self harm by jump/lying befor moving obj occ home
U2C1.00	[X]Int self harm jump/lying befr mov obje occ resid instit'n
U2C2.00	[X]Int self harm jump/lying bef mov obj sch/ins/pub adm area
U2C3.00	[X]Int self harm jump/lying bef mov obj occ sprt/athlet area
U2C5.00	[X]Int self harm jump/lying bef mov obj occ trad/servce area
U2C6.00	[X]Int self harm jump/lying befr mov obj indust/constr area
U290.00	[X]Intentional self harm by sharp object occurrence at home
U29z.00	[X]Intentional self harm by sharp object occ unspecif place
U27..00	[X]Intentional self harm by smoke fire and flames
U2A..00	[X]Intentional self harm by blunt object
U2C..00	[X]Intent self harm by jumping / lying before moving object
U28..00	[X]Intentional self harm by steam hot vapours / hot objects
U29y.00	[X]Intention self harm by sharp object occ oth specif place
U291.00	[X]Intent self harm by sharp object occ resident instit'n
U2B0.00	[X]Intent self harm by jumping from high place occ at home

U270.00	[X]Intention self harm by smoke fire/flames occurrn at home
U2Bz.00	[X]Int self harm by jump from high place occ unspecif place
U280.00	[X]Intent self harm by steam hot vapour/hot obj occ at home
U27z.00	[X]Intent self harm by smoke fire/flames occ unspecif place
U2A3.00	[X]Intent self harm by blunt object occ sports/athlet area
U2B4.00	[X]Intent self harm by jump from high place occ street/h'way
U2A2.00	[X]Intent self harm blunt obj occ sch oth ins/pub adm area
U296.00	[X]Intent self harm by sharp object occ indust/constr area
U2A1.00	[X]Intent self harm by blunt object occ resident instit'n
U27y.00	[X]Intent self harm by smoke fire/flame occ oth specif plce
U2B1.00	[X]Intent self harm by jump from high place occ resid instit
U2By.00	[X]Int self harm by jump from high place occ oth specif plce
U2C4.00	[X]Int self harm jump/lying befr mov obje occ street/highway
U274.00	[X]Intent self harm by smoke fire/flame occ street/highway
U282.00	[X]Int self harm by steam hot vapor/obj sch/ins/pub adm area
U28z.00	[X]Intent self harm by steam hot vapour/obj occ unspec place
U294.00	[X]Intention self harm by sharp object occ street/highway
U295.00	[X]Intent self harm by sharp object occ trade/service area
U297.00	[X]Intentional self harm by sharp object occurrence on farm
U2A0.00	[X]Intentional self harm by blunt object occurrence at home
U2B6.00	[X]Int self harm by jump from high place indust/constr area
U2Az.00	[X]Intentional self harm by blunt object occ unspecif place
U2B..00	[X]Intentional self harm by jumping from a high place

U292.00	[X]Intent self harm sharp obj occ sch oth ins/pub adm area
U2C7.00	[X]Intent self harm by jump/lying befor moving obj occ farm
U2Cz.00	[X]Int self harm jump/lying bef mov obje occ unspecif place
U2D1.00	[X]Intent self harm by crash motor vehicl occ resid instit'n
U2D2.00	[X]Int self harm crash motor vehicl occ sch/ins/pub adm area
U2D3.00	[X]Intent self harm by crash motor vehicl occ sprt/athl area
U2D5.00	[X]Intent self harm crash motor vehicl occ trade/servce area
U2D7.00	[X]Intent self harm by crash of motor vehicl occurrn on farm
U2y2.00	[X]Intent self harm oth specif mean occ sch/ins/pub adm area
U2y3.00	[X]Intent self harm by oth specif means occ sport/athl area
U2y4.00	[X]Intent self harm by oth specif means occ street/highway
U2y5.00	[X]Intent self harm by oth specif means occ trad/servce area
U2y7.00	[X]Intentionl self harm by oth specif means occurrn on farm
U2z3.00	[X]Intent self harm unspecif means occurrn sport/athlet area
U2z4.00	[X]Intent self harm by unspecif means occurrn street/highway
U2z5.00	[X]Intent self harm unspecif means occurrn trade/servce area
U2z6.00	[X]Intent self harm unspecif mean occurrn indust/constr area
U2z7.00	[X]Intentional self harm by unspecif means occurrn on farm
U30..11	[X]Deliberate drug poisoning
U2y0.00	[X]Intentionl self harm by oth specif means occurrn at home
U2zz.00	[X]Intent self harm by unspecif means occ at unspecif place
U2z0.00	[X]Intentional self harm by unspecif means occurrn at home
U2D..00	[X]Intentional self harm by crashing of motor vehicle

U2yz.00	[X]Intent self harm by oth specif means occ unspecif place
U2y1.00	[X]Intent self harm by oth specif means occ resid instit'n
U2yy.00	[X]Intent self harm oth specif means occ oth specif place
U2z2.00	[X]Intent self harm by unspec mean occ sch/ins/pub adm area
U2zy.00	[X]Intent self harm by unspecif means occ oth specif place
U2Dz.00	[X]Intent self harm by crash motor vehic occ unspecif place
U2z1.00	[X]Intent self harm by unspecif means occurrn resid instit'n
U2Cy.00	[X]Int self harm jump/lying bef mov obje occ oth specif plce
U2D0.00	[X]Intent self harm by crash of motor vehicl occurrn at home
U2D4.00	[X]Intent self harm by crash motor vehicl occ street/highway
U2D6.00	[X]Intent self harm crash motor vehic occ indust/constr area
U2Dy.00	[X]Intent self harm by crash motor vehic occ oth specif plce
U2y6.00	[X]Intent self harm oth specif means occ indust/constr area
U2y..00	[X]Intentional self harm by other specified means
U44..00	[X]Rifle shotgun+larger firearm discharge undetermin intent
U45..00	[X]Other+unspecified firearm discharge undetermined intent
U4B..00	[X]Falling jumping/pushed from high place undeterm intent
U4Bz.00	[X]Fall jump/push frm high plce undt intnt occ unspecif plce
U613200	[X]Overdose of radiation given during therapy
U72..00	[X]Sequel intentn self-harm assault+event of undeterm intent
U720.00	[X]Sequelae of intentional self-harm
Z9K3100	Removing objects that could be used for suicide attempt
ZV1B200	[V]Personal history of self-harm
ZX15.00	Drowning self
ZX11500	Biting own tongue

ZX11600	Biting sides of own cheeks
ZX12.00	Burning self
ZX...00	Self-harm
ZX13.11	Cuts self
ZX1..00	Self-injurious behaviour
ZX11200	Biting own fingers
ZX11.11	Bites self
ZX13.00	Cutting self
ZX11.00	Biting self
ZX1..14	Self-abusive behaviour
ZX11100	Biting own hand
ZX13200	Cutting own throat
ZX1..12	SIB - Self-injurious behaviour
ZX11300	Biting own toes
ZX11400	Biting own arm
ZX...11	Self-damage
ZX1L400	Self-mutilation of eyes
ZX1LD00	[X]Self mutilation
ZX1N.00	Stabbing self
ZX1LA00	Removing own nails
ZX1L500	Enucleation of own eyes
ZX14.00	Damaging own wounds
ZX1M.00	Shooting self
ZX1L200	Self-mutilation of genitalia
ZX14300	Poking fingers into wound
ZX1L300	Self-mutilation of penis
ZX1Q.00	Throwing self in front of train
ZX1S.00	Throwing self onto floor
ZX1L600	Self-mutilation of ears
ZX1L811	Snapping own bones
ZX1L800	Breaking own bones
ZX1R.11	Jumping in front of vehicle
ZX1R.00	Throwing self in front of vehicle
SL...15	Overdose of drug
U20..11	[X]Deliberate drug overdose / other poisoning
ZX1..13	Deliberate self-harm
U29..00	[X]Intentional self harm by sharp object
SLHz.00	Drug and medicament poisoning NOS
ZX13100	Cutting own wrists
U21..00	[X]Intent self harm by hanging strangulation / suffocation
U2z..00	[X]Intentional self harm by unspecified means
1BD5.00	High suicide risk
ZX1G.00	Scratches self

U209.00	[X]Intent self poison/exposure to alcohol
ZX1I.00	Self-scalding
U208z00	[X]Intent self poison oth/unsp drug/medic unspecif place
TK20.00	Suicide + selfinflicted poisoning by motor veh exhaust gas
U204.00	[X]Intent self poison/exposure to psychotropic drug
ZX1L.00	Self-mutilation
U41..00	[X]Hanging strangulation + suffocation undetermined intent
ZX1H100	Self-strangulation
ZX1L100	Self-mutilation of hands
ZX1K.11	Setting fire to self
TKx7.00	Suicide and selfinflicted injury caustic subst excl poison
ZX1J.00	Self-electrocution
ZX1E.00	Pinching self
8G6Z.00	Anti-suicide psychotherapy NOS
TK54.00	Suicide and selfinflicted injury by other firearm
ZX1K.00	Self-incineration
ZX1H200	Self-suffocation
TKx0100	Suicide + selfinflicted injury-lying before moving object
U203.00	[X]Intent self poison/exposure to antiparkinson drug
ZX1Q.11	Jumping under train
ZX1K.12	Setting self alight
TK05.00	Suicide + selfinflicted poisoning by drug or medicine NOS
ZX16.00	Gouging own body parts
U2E..00	[X]Self mutilation
ZX18.00	Hanging self
ZX1B200	Jumping from bridge
ZX1B.00	Jumping from height
ZX1B100	Jumping from building
ZX1B300	Jumping from cliff
ZX16100	Gouging own flesh
ZX16200	Gouging own eyes

Table S1: Baseline Characteristics

	Exposed	Unexposed
Number of patients (n)	2,491,086	3,120,795
Number of patients with asthma diagnosis (n)	472,984	289,733
Number of patients with eczema diagnosis (n)	455,348	368,631
Median (IQR) follow-up period (person years)	5.10 (2.02 – 9.68)	4.10 (1.59 – 8.34)
Mean (SD) age at cohort entry (years)	39.42 (23.65)	35.82 (22.18)
Sex (n)		
Male	1,129,954	1,561,600
Female	1,361,132	1,559,195
Body mass index, n (%)		
Underweight (<18·5 kg/m^2)	40,490 (1.63)	52,183 (1.67)
Normal (18·5-24·9 kg/m^2)	687,723 (27.61)	823,813 (26.37)
Overweight (25·0-29·9 kg/m^2)	541,784 (21.75)	559,747 (17.94)
Obese (>30·0 kg/m^2)	348,395 (13.99)	309,638 (9.92)
Not available	872,694 (35.03)	1,376,414 (44.10)
Smoking status, n (%)		
Current smoker	348,532 (13.99)	474,997 (15.22)
Non-current smoker	1,574,697 (63.21)	1,681,427 (53.88)
Not available	567,857 (22.80)	964,371 (30.90)
Drinking status, n (%)		
Current Drinker	1,266,898 (50.86)	1,394,009 (44.67)
Non-current drinker	370,169 (14.86)	383,121 (12.28)
Not available	854,019 (34.28)	1,343,665 (43.06)
Townsend index, n (%)		
(Least deprived) 1	535,228 (21.49)	657,876 (21.08)
2	464,489 (18.65)	552,836 (17.71)
3	453,156 (18.19)	559,287 (17.92)
4	388,862 (15.61)	487,405 (15.62)
5	262,946 (10.56)	327,192(10.48)
Not available	386,405 (15.51)	536,199 (17.18)
Ethnicity, n (%)		
White	1,050,939 (42.19)	1,102,464 (35.33)
Black	45,742 (1.84)	51,693 (1.66)
South Asian	66,060 (2.65)	74,762 (2.40)
Mixed	16,818 (0.68)	19,759 (0.63)
Other	37,641 (1.51)	54,566 (1.75)
Missing	1,273,886 (51.14)	1,817,551 (58.24)

Table S2: Hazard ratios with 95% confidence intervals (CI) for mental ill-health among patients with any atopic or allergic disorder compared to matched unexposed individuals

		Number of outcomes	Person Years	Incidence Rate (per 10,000 person years)	Unadjusted Hazard Ratio	Adjusted Hazard Ratio
Composite	**Exposed**	229,124	15,900,000	144.13	1.23 (95% CI 1.22-1.24, p<0.001)	1.16 (95% CI 1.15-1.16, p<0.001)
	Unexposed	203,514	17,200,000	118.20		
SMI	**Exposed**	5,581	17,200,000	32.46	1.00 (95% CI 0.97-1.04, p 0.834)	0.99 (95% CI 0.96-1.03, p 0.734)
	Unexposed	5,954	18,300,000	32.46		
Anxiety	**Exposed**	93,848	16,700,000	56.21	1.30 (95% CI 1.29-1.31, p<0.001)	1.21 (95% CI 1.20-1.23, p<0.001)
	Unexposed	77,388	18,000,000	43.11		
Depression	**Exposed**	138,658	16,400,000	84.59	1.24 (95% CI 1.23-1.26, p<0.001)	1.15 (95% CI 1.14-1.16, p<0.001)
	Unexposed	121,378	17,700,000	68.75		
Eating disorders	**Exposed**	4,188	17,200,000	2.44	1.06 (95% CI 1.01-1.10, p 0.011)	1.06 (95% CI 1.01-1.10, p 0.013)
	Unexposed	4,295	18,300,000	2.34		
OCD	**Exposed**	3,565	17,200,000	2.07	1.19 (95% CI 1.13-1.25, p<0.001)	1.18 (95% CI 1.13-1.24, p<0.001)
	Unexposed	3,191	18,400,000	1.74		
Self harm	**Exposed**	21,959	17,100,000	12.83	1.00 (95% CI 0.98-1.02, p 0.945)	1.03 (95% CI 1.01-1.05, p 0.006)
	Unexposed	23,426	18,300,000	12.83		

*Adjusted hazard ratio: adjusted for age, sex, alcohol use, smoking status, body mass index (BMI), Townsend deprivation quintile score, asthma, and eczema at baseline

Table S3: Hazard ratios with 95% confidence intervals (CI) for mental ill-health among patients with food allergy only compared to matched unexposed individuals

		Number of outcomes	Person Years	Incidence Rate (per 10,000 person years)	Unadjusted Hazard Ratio	Adjusted Hazard Ratio
Composite	**Exposed**	6,955	583, 190	119.26	1.20 (95% CI 1.16-1.24, p<0.001)	1.07 (95% CI 1.03-1.11, p<0.001)
	Unexposed	6,409	651,196	98.42		
SMI	**Exposed**	180	617,205	29.16	1.27 (95% CI 1.03-1.58, p 0.029)	1.26 (95% CI 1.00-1.59, p 0.046)
	Unexposed	154	681,363	22.60		
Anxiety	**Exposed**	2,908	604,387	48.12	1.32 (95% CI 1.25-1.39, p<0.001)	1.14 (95% CI 1.08-1.21, p<0.001)
	Unexposed	2,390	671,622	35.59		
Depression	**Exposed**	3,692	597,935	61.75	1.16 (95% CI 1.11-1.22, p<0.001)	1.02 (95% CI 0.97-1.07, p 0.378)
	Unexposed	3,509	663,826	52.86		
Eating disorders	**Exposed**	263	616,739	4.26	1.17 (95% CI 0.98-1.39, p 0.082)	1.10 (95% CI 0.91-1.33, p 0.315)
	Unexposed	250	680,942	3.67		
OCD	**Exposed**	188	617,035	3.05	1.47 (95% CI 1.18-1.83, p 0.001)	1.28 (95% CI 1.01-1.63, p 0.042)
	Unexposed	138	681,327	2.03		
Self harm	**Exposed**	917	614,055	14.93	1.03 (95% CI 0.94-1.13, p 0.505)	0.98 (95% CI 0.89-1.08, p 0.681)
	Unexposed	954	677,879	14.07		

*Adjusted hazard ratio: adjusted for age, sex, alcohol use, smoking status, body mass index (BMI), Townsend deprivation quintile score, asthma, and eczema at baseline

/bmjopen-2024-089181 on 31 May 2025. Downloaded from

Table S4: Hazard ratios with 95% confidence intervals (CI) for mental ill-health among patients with drug allergy only compared to matched unexposed individuals

		Number of outcomes	Person Years	Incidence Rate (per 10,000 person years)	Unadjusted Hazard Ratio	Adjusted Hazard Ratio
Composite	**Exposed**	136,246	8,629,804	157.88	1.34 (95% CI 1.33-1.35, p<0.001)	1.27 (95% CI 1.26-1.28, p<0.001)
	Unexposed	104,769	8,747,397	119.77		
SMI	**Exposed**	3,467	9,429,027	36.77	1.07 (95% CI 1.02-1.12, p 0.007)	1.07 (95% CI 1.02-1.12, p 0.004)
	Unexposed	3,256	9,340,622	34.86		
Anxiety	**Exposed**	55,508	**9,120,391**	60.86	1.43 (95% CI 1.41-1.45, p<0.001)	1.36 (95% CI 1.34-1.37, p<0.001)
	Unexposed	39,018	9,136,285	42.71		
Depression	**Exposed**	85,637	8,920,011	96,01	1.34 (95% CI 1.33-1.36, p<0.001)	1.26 (95% CI 1.24-1.27, p<0.001)
	Unexposed	65,211	8,964,301	72.75		
Eating disorders	**Exposed**	1,834	9,434,611	1.94	1.13 (95% CI 1.06-1.21, p<0.001)	1.16 (95% CI 1.09-1.24, p<0.001)
	Unexposed	1,648	9,347,463	1.76		
OCD	**Exposed**	1,663	9,434,811	1.76	1.30 (95% CI 1.21-1.40, p<0.001)	1.34 (95% CI 1.25-1.45, p<0.001)
	Unexposed	1,268	9,348,323	1.36		
Self harm	**Exposed**	10,780	9,390,771	11.48	1.13 (95% CI 1.10-1.16, p<0.001)	1.19 (95% CI 1.15-1.22, p<0.001)
	Unexposed	9,515	9,309,052	10.22		

*Adjusted hazard ratio: adjusted for age, sex, alcohol use, smoking status, body mass index (BMI), Townsend deprivation quintile score, asthma, and eczema at baseline

Table S5: Hazard ratios with 95% confidence intervals (CI) for mental ill health among patients with anaphylaxis only compared to matched unexposed individuals

		Number of outcomes	Person Years	Incidence Rate (per 10,000 person years)	Unadjusted Hazard Ratio	Adjusted Hazard Ratio
Composite	**Exposed**	1,773	100,899	175.72	1.54 (95% CI 1.43-1.65, p<0.001)	1.42 (95% CI 1.31-1.53, p<0.001)
	Unexposed	1,260	108,843	115.76		
SMI	**Exposed**	33	111,340	2.96	0.90 (95% CI 0.57-1.44, p 0.675)	0.89 (95% CI 0.54-1.46. p 0.656)
	Unexposed	38	115,815	3.28		
Anxiety	**Exposed**	769	107,135	71.78	1.76 (95% CI 1.56-1.97, p<0.001)	1.61 (95% CI 1.43-1.82, p<0.001)
	Unexposed	462	113,477	40.71		
Depression	**Exposed**	1,050	104,749	100.24	1.52 (95% CI 1.39-1.67. p<0.001)	1.40 (95% CI 1.27-1.55, p<0.001)
	Unexposed	747	111,561	66.96		
Eating disorders	**Exposed**	31	111,337	2.78	1.12 (95% CI 0.67-1.86, p 0.664)	0.93 (95% CI 0.54-1.63, p 0.813)
	Unexposed	29	115,840	2.50		
OCD	**Exposed**	32	111,288	2.87	2.18 (95% CI 1.19-3.97, p 0.011)	2.59 (95% CI 1.38-4.86, p 0.003)
	Unexposed	16	115,901	1.38		
Self harm	**Exposed**	196	110,613	17.72	1.46 (95% CI 1.18-1.82, p 0.001)	1.43 (95% CI 1.13-1.80, p 0.003)
	Unexposed	139	115,346	12.05		

*Adjusted hazard ratio: adjusted for age, sex, alcohol use, smoking status, body mass index (BMI), Townsend deprivation quintile score, asthma, and eczema at baseline

Table S6: Hazard ratios with 95% confidence intervals (CI) for mental ill-health among patients with urticaria only compared to matched unexposed individuals

		Number of outcomes	Person Years	Incidence Rate (per 10,000 person years)	Unadjusted Hazard Ratio	Adjusted Hazard Ratio
Composite	**Exposed**	43,001	2,966,951	175.72	1.25 (95% CI 1.24-1.27, p<0.001)	1.16 (95% CI 1.14-1.18, p<0.001)
	Unexposed	35,369	3,050,446	115.76		
SMI	**Exposed**	863	3,231,215	2.67	0.88 (95% CI 0.80-0.97, p 0.007)	0.85 (95% CI 0.77-0.93, p<0.001)
	Unexposed	974	3,249,189	3.00		
Anxiety	**Exposed**	18,675	3,123,901	59.78	1.33 (95% CI 1.30-1.36, p<0.001)	1.22 (95% CI 1.20-1.25, p<0.001)
	Unexposed	14,051	3,176,950	44.23		
Depression	**Exposed**	24,988	3,072,521	81.33	1.28 (95% CI 1.25-1.30, p<0.001)	1.16 (95% CI 1.14-1.18, p<0.001)
	Unexposed	20,079	3,132,763	64.09		
Eating disorders	**Exposed**	1,090	3,229,622	3.38	1.14 (95% CI 1.05-1.24, p 0.003)	1.14 (95% CI 1.04-1.24, p 0.004)
	Unexposed	972	3,249,245	2.99		
OCD	**Exposed**	786	3,230,785	2.43	1.21 (95% CI 1.09-1.35, p<0.001)	1.18 (95% CI 1.06-1.31, p 0.002)
	Unexposed	645	3,250,544	1.98		
Self harm	**Exposed**	5,105	3,209,184	15.91	1.05 (95% CI 1.01-1.09, p 0.021)	1.05 (95% CI 1.01-1.09, p 0.011)
	Unexposed	4,838	3,230,221	14.98		

*Adjusted hazard ratio: adjusted for age, sex, alcohol use, smoking status, body mass index (BMI), Townsend deprivation quintile score, asthma, and eczema at baseline

bmjopen-2024-089181 on 31 May 2025. Downloaded from

Table S7: Hazard ratios with 95% confidence intervals (CI) for mental ill-health among patients with allergic rhinitis only compared to matched unexposed individuals

		Number of outcomes	Person Years	Incidence Rate (per 10,000 person years)	Unadjusted Hazard Ratio	Adjusted Hazard Ratio
Composite	**Exposed**	104,297	7,075,459	147.41	1.21 (95% CI 1.20-1.22, p<0.001)	1.12 (95% CI 1.11-1.13, p<0.001)
	Unexposed	95,412	7,744,558	123.20		
SMI	**Exposed**	2,354	7,695,113	3.06	0.96 (95% CI 0.91-1.02, p 0.169)	0.96 (95% CI 0.91-1.02, p 0.147)
	Unexposed	2,622	8,282,321	3.17		
Anxiety	**Exposed**	44,525	7,448,442	59.78	1.30 (95% CI 1.27-1.31, p<0.001)	1.19 (95% CI 1.18-1.21, p<0.001)
	Unexposed	37,075	8,091,138	45.82		
Depression	**Exposed**	61,919	7,318,942	84.60	1.22 (95% CI 1.20-1.23, p<0.001)	1.12 (95% CI 1.11-1.13, p<0.001)
	Unexposed	55,821	7,960,109	70.13		
Eating disorders	**Exposed**	2,200	7,694,901	2.86	1.06 (95% CI 1.00-1.12, p 0.065)	1.02 (95% CI 0.96-1.09, p 0.516)
	Unexposed	2,284	8,284,274	2.76		
OCD	**Exposed**	1,972	7,695,515	2.56	1.23 (95% CI 1.15-1.31, p<0.001)	1.18 (95% CI 1.10-1.26, p<0.001)
	Unexposed	1,726	8,286,295	2.08		
Self harm	**Exposed**	10,787	7,652,323	14.10	0.93 (95% CI 0.91-0.95, p<0.001)	0.93 (95% CI 0.91-0.96, p<0.001)
	Unexposed	12,491	8,234,424	15.17		

*Adjusted hazard ratio: adjusted for age, sex, alcohol use, smoking status, body mass index (BMI), Townsend deprivation quintile score, asthma, and eczema at baseline