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The epidemiology, management, and the associated burden of mental health illness, atopic and autoimmune conditions, and common infections in alopecia areata: Protocol for an observational study series

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The epidemiology, management, and the associated burden of mental health illness, atopic and autoimmune conditions, and common infections in alopecia areata: Protocol for an observational study series

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Abstract

Introduction:

Alopecia Areata (AA) is a common cause of immune-mediated non-scarring hair loss. Links between AA and common mental health, autoimmune and atopic conditions, and common infections have previously been described but remain incompletely elucidated and contemporary descriptions of the epidemiology of AA in the UK are lacking.

Methods and analysis:

Retrospective study series using a large population-based cohort (5.2 million) from the Oxford-Royal College of General Practitioners (RCGP) Research and Surveillance Centre (RSC) database, exploring four themes: AA epidemiology, mental health comorbidities, autoimmune/atopic associations and common infections.

In the epidemiology theme, we will describe the incidence and prevalence of AA overall and by age, sex, and sociodemographic factors. Healthcare utilisation (primary care visits and secondary care referrals) and treatments for AA will also be assessed. In the mental health theme, we will describe the prevalence and incidence of mental-health conditions (anxiety, depressive episodes, recurrent depressive disorder, adjustment disorder, agoraphobia, self-harm, and parasuicide) in people with AA compared with matched controls. We will also explore mental health treatment patterns (medication and psychological interventions), time off work and unemployment rates. Within the

1
2
3 autoimmune/atopic associations theme, we will examine the prevalence of atopic
4
5 (atopic dermatitis, allergic rhinitis, and asthma), psoriasis, and autoimmune
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7 conditions (Crohn's disease, ulcerative colitis, coeliac disease, type 1 diabetes,
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9 Hashimoto's thyroiditis, Grave's disease, rheumatoid arthritis, psoriatic arthritis,
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11 ankylosing spondylitis, systemic lupus erythematosus, polymyalgia rheumatica,
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13 Sjögren's syndrome, vitiligo, multiple sclerosis, and pernicious anaemia) in people
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15 with AA compared with matched controls. We will also estimate the incidence of
16
17 new onset atopic and autoimmune conditions after AA diagnosis. Within the
18
19 common infections theme, we will examine the incidence of common infections
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21 (respiratory Tract Infection, pneumonia, acute bronchitis, influenza, skin infection,
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23 urinary tract infection, genital infections, gastrointestinal infection, herpes
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25 simplex, herpes zoster, meningitis, COVID-19) in people with AA compared with
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27 matched controls.
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36 **Study Registration:** ClinicalTrials.gov observational study identifier

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Strengths and limitations of this study

- We will use a nationally representative primary care database of over 5.2 million people to explore the epidemiology of alopecia areata (AA), as well as associations of AA with mental health conditions, autoimmune and atopic conditions, and common infections.
- As national guidelines recommend initial assessment and management of AA is undertaken in primary care, this study will provide an accurate contemporary analysis of AA epidemiology in England in both children and adults.
- The Oxford-RCGP-RSC primary care dataset has a high level of completeness on sociodemographic and geographic data and therefore enables an assessment of variation in the incidence and prevalence of AA across England.
- Oxford-RCGP-RSC is the primary infectious disease sentinel network for the UK; the common infections to be explored are all regularly monitored conditions within the network.
- A limitation of the study is that a validated case definition of AA is not available for primary care databases; this will be mitigated by additional analysis to explore the sensitivity of findings when non-specific alopecia diagnostic codes (e.g. unspecified alopecia) are included.

Key words:

Alopecia areata, epidemiology, incidence, prevalence, common mental health conditions, depression, anxiety, autoimmune disease, atopic conditions, study protocol, common infections.

Introduction

Alopecia areata (AA) is a common cause of immune-mediated, non-scarring hair loss.(1) Clinical presentations of AA are heterogeneous, ranging from well-demarcated patches of hair loss on the scalp to total loss of hair on the scalp (*alopecia areata totalis*) or entire scalp and body (*alopecia areata universalis*). (2) Active AA is estimated to affect approximately 0.1-0.2% (2, 3) of the population worldwide, with a lifetime risk of 1.0-2.1%. (4-6)

Following the initial episode, the majority of those with limited patchy AA will experience spontaneous remission, but over 80% will have subsequent relapses. (7) Spontaneous remission has been reported to occur in less than 10% of those with extensive AA. (7) A number of treatment options can induce hair growth in people with AA, but none have been shown to have a durable impact on remission. (8)

AA has been associated with a number of autoimmune conditions, supporting the theory of an underlying autoimmune aetiology. (9) Atopic conditions and mental health disorders have also been demonstrated to be more common in people with AA, (9-11) although the temporal relationship between psychiatric conditions and AA remains poorly researched. (12) The association between AA and common infections is not well studied.

This study series, using a large contemporary population-based sample aims to explore and describe many important elements of AA over four key areas: i) the

1
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3 current epidemiology of AA; ii) the prevalence and incidence of psychiatric co-
4 morbidity in people with AA; iii) the prevalence and incidence of autoimmune
5 and atopic conditions in people with AA; iv) the incidence of common infections in
6 people with AA.
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15 Current knowledge

16 Epidemiology

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22 Population studies in the USA using the Rochester Epidemiology Project database
23 estimate the lifetime risk of AA to be 2.1%.⁽⁴⁾ The database contained information
24 from all patients registered with a healthcare provider in Olmsted County,
25 Minnesota from 1990-2009. Previous studies using this database from 1971-1974
26 estimated the overall prevalence of AA to be 0.1-0.2%,⁽¹³⁾ with no published
27 studies reporting prevalence estimates since this. Other epidemiological studies
28 have assessed the incidence of AA in patients referred to dermatology services.
29 Clinic-based studies from around the world have estimated the incidence of AA to
30 be in the region of 0.57-3.8%.⁽¹⁴⁻¹⁸⁾
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46 Worldwide, the majority of studies on AA have not found a significant difference in
47 incidence between males and females.⁽⁵⁾ AA onset occurs before the age of 40 in
48 82-86% of cases.⁽⁵⁾ To date, there have been no large population-based studies of
49 AA epidemiology in UK populations.
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Mental Health Comorbidities

It is well-recognised by clinical experts in AA that the condition can have a profound psychological impact and a possible comorbid burden of mental health conditions. A recent USA cross-sectional database study comparing 5,605 patients with AA with matched controls found a higher prevalence of mental health diagnoses in the AA group (32.8% vs 20.0%).(19) In particular, higher rates of depression (OR 2.18, 95%CI 1.80-2.63), anxiety disorders (OR 2.46, 95%CI 1.91-3.16), attention-deficit disorders (OR 8.11, 95%CI 5.22-12.59), adjustment disorders (OR 4.80, 95%CI 2.58-8.91) and obsessive compulsive disorders (OR 4.95, 95%CI 1.59-15.35) were observed when compared with controls.(19) These findings concur with previous work and a similar pattern is seen in other countries.(20-23)

Recently a British study identified a bi-directional positive association between major depressive disorder and AA.(24) In a sample of over 400,000 participants, major depressive disorder was seen to increase the risk of incident AA by 90% [HR 1.90, 95%CI 1.67-2.15] and AA was found to increase the risk of incident major depressive disorder by 34% [HR 1.34, 95%CI 1.23-1.46].(24) The association of other common mental health conditions with AA however was not assessed.

Autoimmune and atopic comorbidities

A central theory in AA pathogenesis is that it is an autoimmune phenomenon resulting from a disruption of hair follicle 'immune privilege', where numerous

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3 immunological mechanisms fail to prevent cytotoxic immune attack on cells and
4 antigens present at that site.(25)
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10 A number of studies have reported autoimmune conditions to occur more
11 frequently in those with AA than in the general population, however results are
12 conflicting and studies have been limited by potential recruiting, recall and
13 reporting biases.(26) A Taiwanese retrospective cohort study found individuals
14 with AA to have an overall increased risk of developing an autoimmune condition
15 when compared with matched controls (HR 1.86, 95%CI 1.32-2.63). In particular,
16 greater risks of incident systemic lupus erythematosus (SLE) (HR 5.02; 95%CI
17 2.08-12.51), psoriasis (HR 2.01; 95%CI 1.06-3.83) and rheumatoid arthritis (RA)
18 (HR 1.79; 95%CI 1.07-3.00) were observed.(27) There was no relationship
19 between AA and Hashimoto's thyroiditis or type 1 diabetes (T1DM). A recent
20 systematic review and meta-analysis found AA to be significantly associated with
21 Graves' Disease (OR 2.07, 95%CI 1.80-2.38) and Hashimoto's Thyroiditis (OR 2.15;
22 95%CI 1.71-2.72) but not with SLE, RA, Psoriasis or T1DM.(9)
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43 There has also been interest in the prevalence of co-morbid atopy in patients with
44 AA. The prevalence of atopy in patients with AA has been reported to be in the
45 range of 11-38.2%(5) representing cohorts from the USA, India and Singapore .(11,
46 14, 28, 29) A large meta-analysis found patients with AA had higher odds of having
47 atopic dermatitis (OR 2.36; 95%CI 1.80-3.09) or allergic rhinitis (OR 1.33;95%CI
48 1.19-1.47) when compared with controls.(9) It is not however surprising from a
49 pathogenesis perspective in terms of shared pathways of autoimmune
50 susceptibility; IL-13 loci have been associated with autoimmune and atopic
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3 conditions, and a genome-wide association study established that IL-13 is also
4 susceptible loci for AA. (30)
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10 Common infections

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13 It has been hypothesized that infections may act as triggers for AA; with particular
14 interest in *Helicobacter pylori*, cytomegalovirus, Epstein-Barr virus, hepatitis B
15 virus, hepatitis C virus, and human immunodeficiency virus but others have also
16 been suggested.(9, 31-38) Some case reports have suggested improvement or
17 resolution of AA with treatment of the associated infection.(33, 39). However, early
18 small-scale studies have failed to find convincing evidence to support
19 associations.(35, 36, 40)
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30 Multiple genetic loci have been identified to be both protective from infection but
31 increase the risk for autoimmune disease.(41) Examples include the HLA variants
32 HLA-DQ2 and HLA-DQ8 which confer protection against viral infections including
33 influenza but are associated with inflammatory bowel disease,(42, 43) and SH2B3
34 rs3184504*A gene variant protective against *Escherichia coli* infection but also
35 detrimental for inflammatory bowel disease.(44) These loci which, in the past have
36 conferred a genetic advantage, may still confer a reduced infection risk.(41) It is
37 currently unclear if the genetic predisposition for AA is caused by genetic factors
38 which also confer protection against any common infections. In other autoimmune
39 conditions infection risk is often increased as a result of the pathological changes
40 resulting from the condition itself, the effects of immune-modulatory treatment, or
41 through increased exposure to pathogens through healthcare contact.(45-51) An
42 understanding of the relative infection rates in people with AA compared to those
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3 without is of particular importance with the emergence of Janus kinase inhibitors
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5 as a potential treatment option.(52) Whilst this medication class can produce
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7 impressive hair regrowth results even in long-standing AA their use is associated
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9 with some increased infection risk; in particular, urinary tract infections, viral
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11 gastroenteritis fungal infections, and varicella zoster infection.(52)
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Aims and Objectives

We aim to perform a series of retrospective studies using a large population-based cohort in England, over a decade (1st January 2009 to 1st January 2019) exploring AA in four theme areas: epidemiology, mental health, autoimmune and atopic comorbidities and common infections.

Within the epidemiology theme, our initial objective is to provide a complete description of the incidence and prevalence of AA in England. We will explore the influence of socio-demographic and geographic factors on disease incidence and describe the current service utilisation and management patterns in AA during the year after diagnosis.

Within the mental health theme, we will explore the disease burden of common mental health conditions in people with AA compared with matched controls. We will calculate the prevalence of disease at AA diagnosis, the incidence of disease in the first two years after diagnosis and the influence of socio-demographic factors on the prevalence of common mental health conditions in AA. We will describe the mental health treatment burden in people (medication and psychological service use) with AA and depression and anxiety. We will also explore potential associations between AA and both time off work and unemployment.

Within the autoimmune and atopic comorbidities theme, we will examine the prevalence of atopic and autoimmune conditions at AA diagnosis, and the incidence

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3 of new onset atopic and autoimmune conditions in the first five years after
4 diagnosis in people with AA compared with matched controls.
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10 Within the common infections theme, we will examine the incidence of multiple
11 common infections in the first five years after diagnosis in people with AA
12 compared with matched controls.
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19 The primary and secondary objects of each study theme are formally described in
20 the Statistical Analysis Plan (Additional file 1).
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Methods and analysis

Data source

These studies will use routinely collected and collated data from the Oxford-Royal College of General Practitioners (RCGP) Research and Surveillance Centre (RSC) database to provide a broadly representative sample of the population of England. The RCGP RSC incorporates pseudonymised primary care records from over 200 GP practices distributed across England. Details of the cohort included in the database have been published previously.⁽⁵³⁾ At the current time, the database contains data from 2.6 million actively registered people and the historic records of up to 5.2 million people over the last 20 years.

The RCGP RSC database includes patient demographics, diagnoses, laboratory test results, primary care issued prescriptions and processes of care such as clinic visits and specialist referrals. These data are coded using the Read code system. UK general practice records provide several advantages for this study type; UK primary care is a registration-based system (a patient can only register with a single GP), records have been computerised since the 1990s, and pay-for-performance targets (introduced in 2004 through The Quality and Outcomes Framework; QOF) have resulted in consistent high-quality clinical data entry about chronic disease.^(54, 55) Studies in many chronic diseases such as atopic dermatitis, rheumatoid arthritis, diabetes, inflammatory bowel disease, and chronic obstructive pulmonary disease have been published using RCGP RSC data.^(51, 56-59) RCGP RSC practices get feedback on their data quality, with a particular

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3 emphasis on “episode typing” – designating cases first, new, or ongoing, which
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5 helps differentiate incidence from prevalence.(60)
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10 Study design

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14 Within RCGP RSC, people with and without AA will be identified using Read
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16 diagnostic codes. A range of study designs will be used across the studies and
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18 include; repeated cross-sectional design (epidemiology of AA), case-control design
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20 (the prevalence of common mental health conditions, atopic and autoimmune
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22 conditions, and common infections at AA diagnosis), and matched-cohort design
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24 (the incidence of common mental health conditions, atopic and autoimmune
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26 conditions, and common infections after AA diagnosis).
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33 Alopecia areata case detection

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36 We will identify cases of AA using specific diagnostic codes (Supplementary Table
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38 S1.1, Additional file 2). Confirmed AA will be defined as one or more AA code and
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40 no alternative diagnostic code in the subsequent 365 days (alternative diagnoses
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42 are defined in Supplementary Table S1.1, Additional file 2).
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48 For sensitivity analyses we will also extract alopecia recorded where the type has
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50 not been specified (Supplementary Table S1.1, Additional file 2) and alopecia
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52 extent if recorded (Supplementary Table S1.2, Additional file 2).
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Study 1: Epidemiology of alopecia areata

The incidence and lifetime prevalence of alopecia areata

We will describe the incidence and point prevalence of AA over 2009-2018 inclusive, by age group, sex, ethnicity, and socioeconomic status, and geographical region. Ethnicity will be categorised as follows based on UK census categories: White, Asian, Black African/Caribbean, Mixed, and Other.(61) Index of multiple deprivation (IMD) will be used as a measure of socioeconomic status.(62)

Service utilisation in people with alopecia areata

We will assess primary care visit frequency, up to one year, in people newly diagnosed with AA compared to matched controls without AA. Measures of healthcare management will also be assessed in people newly diagnosed with AA up to one year, comprising; secondary care dermatology referrals (Supplementary Table S1.3, Additional file 2) and primary care prescriptions for AA treatments (Supplementary Table S1.4, Additional file 2).

Study 2: Mental Health conditions in people with alopecia areata

We will assess the prevalence and incidence of three common mental conditions as defined by the International Statistical Classification of Diseases and Related Health Problems 10th Revision (ICD10) classification; depressive episodes (F32), recurrent depressive disorder (F33), and non-phobia related anxiety disorders (F41). These conditions have been chosen as they represent the most common mental health conditions presenting to primary care.(63) Conditions will be

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3 identified using algorithms validated in UK primary care. We selected the
4 algorithms to be used in the study to optimise the positive predictive value of case
5 identification. In brief, we will use a concurrent diagnosis and treatment code to
6 identify acute depression episodes and for recurrent depressive disorder either a
7 historical code for any depression and current treatment or a recurrent depressive
8 disorder specific diagnosis code (Supplementary Tables S2.1, S2.2 and S2.3,
9 Additional file 2). Anxiety disorder will be identified using a concurrent diagnosis
10 of an anxiety episode and treatment code (Supplementary Table S2.4, Additional
11 file 2).

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27 To assess prevalence, we will perform a case-control analysis to compare the
28 prevalence of mental health conditions between people newly diagnosed with AA
29 and controls. To assess incidence, we will perform a matched cohort analysis in the
30 subset of cases and controls free of the mental health conditions of interest at
31 baseline. In addition, we will examine the prevalence and incidence of other mental
32 health conditions; adjustment disorder, agoraphobia, self-harm, and
33 overdose/parasuicide attempts (Supplementary Tables S2.5–S2.9, Additional file
34 2).

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48 We will determine the treatment burden of mental health medications in AA
49 (selective serotonin reuptake inhibitors, serotonin and norepinephrine reuptake
50 inhibitors, tricyclic antidepressants, tetracyclic antidepressants, and monoamine
51 oxidase inhibitors, anxiolytic medications) and psychological intervention (referral
52 rates for counselling, secondary care psychiatrist referrals, including the referrals
53 to the clinical psychology services/specialists and UK Improving Access to
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3 Psychological Therapies (IAPT) program. (Supplementary Table S2.10, Additional
4 file 2)).
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8 We will also assess unemployment and time off work in people of working age (18-
9 64). Unemployment will be identified using codes relating to unemployment
10 recorded in the clinical record or the issuing of IB113 or ESA113 form
11 (Supplementary Table S3.1, Additional file 2). These forms are completed by GPs
12 when their patients are accessing incapacity benefits (historically) or employment
13 and support allowance (current) because of a disability or health condition
14 affecting their ability to work. Time off work will be assessed by reporting the rates
15 of issue of Med 3 (Statement of Fitness for Work) certification from primary care
16 (Supplementary Table S3.2, Additional file 2). These “fit notes” are required by
17 employers when employees have periods of absence from work for sickness lasting
18 longer than seven days.
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36 **Study 3: Autoimmune and atopic comorbidities in alopecia areata**

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39 We will assess the prevalence and incidence of autoimmune and atopic conditions
40 as listed in Table 1 and defined in Supplementary Tables S4, Additional file 2, in
41 people with AA. To assess prevalence, we will perform a case-control study to
42 compare the prevalence of these conditions between cases and controls. To assess
43 incidence, we will perform a matched cohort study to compare the incidence of new
44 autoimmune and atopic conditions in the same cases and controls after the point
45 of matching. Autoimmune and atopic conditions were included if prevalence has
46 been reported to be 0.3% or greater.^(9, 64-67) This cut-off was based on power
47 calculations suggesting this is minimum background prevalence required to detect
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3 a 2-fold difference in prevalence (Additional file 1). Excluded autoimmune
4 conditions due to low prevalence are Addison's disease, autoimmune haemolytic
5 anaemia, immune thrombocytopenic purpura, autoimmune hepatitis, systemic
6 sclerosis, myasthenia gravis, and systemic vasculitides.
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12 **Study 4: common infections in alopecia areata**

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15 We will assess the incidence of common infections in people with AA using a
16 matched cohort study to compare the incidence of common infections in cases and
17 controls. The common infections to be examined are listed in Table 2 and defined
18 in Supplementary Tables S5, Additional file 2.
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25 **Statistical methods**

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28 The full statistical analysis plan is provided in Additional file 1. Briefly, for Study 1,
29 AA prevalence will be calculated by dividing the number of AA cases by the total
30 number of eligible people in the study population. Point prevalence will be
31 reported for the cohort overall and stratified by sex and age. AA incidence will be
32 calculated by dividing the total number of new AA cases by the total person-years
33 of follow-up. Incidence rates will be stratified by calendar year, socio-demographic
34 factors (age group, sex, ethnicity, rural/urban classification and socioeconomic
35 status) and geographical region. Adjusted incidence rates will be estimated using
36 Poisson regression.
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52 Service utilisation (Study 1 and 2) will be evaluated by calculation of annual
53 primary care attendance rates, treatment rates (prescriptions per person per year),
54 and the total proportion of people with one or more referral for additional services
55 (dermatology review [Study 1], psychiatrist referral and counselling [Study 2]).
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5 For studies 1 (for comparison of primary care visit frequency only), 2 and 3,
6 matching will be performed as follows: control cohorts will be defined by matching
7 cases with people without a diagnosis of AA or other alopecia. The follow-up period
8 for each matched control will begin at the start of follow-up of their matched case.
9
10 Each case will be nearest neighbour matched with four controls by age and sex
11 within GP practices. After matching, if there are substantial differences in
12 socioeconomic status between cases and controls, re-matching with IMD as an
13 additional matching criterion will be considered. Study 4 will use the same nearest
14 neighbour matching process but cases will be defined as people diagnosed with AA
15 on or before 1st January 2014, people who develop AA during follow up will be
16 excluded from the pool of available controls prior to matching.
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34 For Study 2, we will report the prevalence of mental health conditions by socio-
35 demographic subgroups in cases and controls. The burden of treatment for mental
36 health conditions will be estimated as the total proportion of people prescribed
37 each treatment within one year after the study start. The burden of sick days will
38 be estimated as the total proportion of people issued a Med 3 certificate. To assess
39 differences in incident mental health conditions in the two years after the study
40 start, we will use adjusted Cox regression stratified by case/control status. Study 3
41 (atopic and autoimmune conditions) will similarly compare baseline disease
42 prevalence in cases and controls, and compare incidence of new onset conditions
43 in the five years after the study start using adjusted Cox regression.
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3 Study 4 will compare infection incidence in cases and controls up to five years.
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5 Infection incidence rates will be estimated by dividing the number of incident
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7 common infections by total person-years of follow-up. Adjusted Poisson regression
8
9 will be used to estimate the association between AA and rates of common infection.
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15 *Sensitivity analyses*

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18 We will compare prevalence (Studies 2-3) and incidence (Studies 2-4) of the study
19
20 outcomes in people with non-specific alopecia codes only (i.e. no prior or
21
22 subsequent codes specifying alopecia type).
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25 In Study 4, we will use a Cox regression to estimate time to first infection. We will
26
27 also compare the results of the study outcomes when 1) people who develop AA
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29 during the follow up are included as cases and 2) when we perform matching using
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31 the time of AA diagnosis and follow for up to five years after diagnosis (or matched
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33 date for controls).
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40 **Data management**

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42 Individual patient data will be anonymised at the point of data extraction. All data
43
44 will remain in anonymised form and will be held on a secure server at the
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46 University of Surrey. All statistical analyses will be performed using R software.
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Discussion

Clinical Implications

Results derived from this study will be useful in monitoring trends in the incidence of AA in England and may identify factors that influence the disease distribution and treatment patterns. Furthermore, obtaining an accurate picture of the state of AA in the UK will help inform Health Needs Assessments and policy development.

A greater understanding of the prevalence of mental health conditions associated with AA and the directionality of these relationships may help with the development of psychological interventions in AA, as the approach required would likely differ if the symptoms patients are experiencing are pervasive or reactive to an episode of hair loss.(12, 68)

Awareness of AA as a potential risk factor or associated comorbidity for certain autoimmune and atopic conditions may help reduce delays in diagnosis for these conditions and increase vigilance of GPs and dermatologists when reviewing their patients with AA in detecting co-existent conditions. Future work may focus upon whether improved control of an underlying autoimmune or atopic condition may improve chances of achieving remission in AA.

Finally, analysing associations between AA and common infections may provide evidence to support the prescribing of immune modulating medications for the treatment of AA.

Strengths and limitations of the research methods

Several strengths of our study design are noteworthy. Only two previous studies on the incidence and prevalence of AA have been population-based, with the vast majority being conducted on clinic patients and thus leading to skewed prevalence estimates. This study will also provide a contemporary picture of the burden of AA, as the previous population-based studies were over 20 years ago, and this will be the first AA epidemiology study conducted in the UK. To our knowledge, our study examining common infections will be the first study to attempt to answer the question of whether AA confers protection or increased risk for common infections. A final key strength of this study is the use of the national infections surveillance network to analyse infection risk; with regular feedback to practices with a focus on the quality of infections recording the quality of recording of these infection events higher in this network than other data sources.

An ontological approach to detecting cases of AA and associated comorbidities will improve accuracy compared to the use of diagnostic codes alone.⁽⁶⁹⁾ Exclusion of individuals with potentially confounding conditions (i.e. other causes of hair loss) will also improve the accuracy of our estimates. The algorithms used to detect common mental health conditions have been previously validated in UK primary care. The completeness of GP data coding for prescriptions, referrals and issue of Med 3 certificates will ensure that our findings on AA and comorbidity management are robust and reliable, and the “episode typing” functionality of the RCGP RSC database will ensure incident and prevalent cases are appropriately assigned. The RCGP RSC database has been shown to be a representative sample of

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2
3 the UK population (53) and hence our results are broadly generalisable to the UK
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5 as a whole but should not be extended to populations which are dissimilar.
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10 There are also several limitations of the study design that are worthy of
11
12 consideration. This study does not attempt to detect cases of AA (or the
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14 comorbidities of interest) that do not present to medical attention and hence may
15
16 underestimate the true burden of disease. Furthermore, only coded data in the
17
18 database can be used and hence we rely upon accurate coding. Some individuals
19
20 may need to be excluded due to incomplete data, although in similar studies the
21
22 exclusion rate due to incomplete data has been low.(70, 71)
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29 Prevalence of Med 3 certification is well captured in primary care but the reason
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31 for issue is not available meaning that we cannot identify the condition relating to
32
33 the Med 3 certification. We cannot therefore determine whether the sick leave was
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35 as a result of AA. However, our case-control approach will provide a method for
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37 comparing Med 3 certificate issue rates in those affected and unaffected by AA. The
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39 use of Read codes to identify unemployment is likely to systemically under-
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41 estimate unemployment prevalence but is likely to be suitable for providing a
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43 comparison with controls.
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50 Another limitation is the possibility of missing treatment information from
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52 secondary care. Secondary care records in the UK are frequently not computerised
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54 and prescriptions are still commonly hand-written. At present there is no
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56 mechanism for universally capturing secondary care prescriptions and linking
57
58 them to primary care records. We are therefore likely to underestimate
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3 prescription rates for those with the most severe disease who are seen frequently
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5 in secondary care. Where prescriptions are issued from primary care the indication
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7 for the prescription is not available and we can therefore not confirm that the
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9 prescription is for the treatment of AA.
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15 **Plans for dissemination**

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18 We plan to publish the final study results in peer-reviewed journals and present
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20 early findings at scientific meetings.
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26 **Conclusions**

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29 This study series aims to provide the first large scale population-based analysis of
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31 the epidemiology of AA in the UK and the current patterns of healthcare utilisation
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33 and treatments in this group. We also aim to provide an extensive assessment of
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35 the association between common mental health conditions and work-related
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37 difficulties in people with AA; reporting the prevalence and incidence of these
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39 conditions in people with new onset AA and matched controls. We aim to provide
40
41 an extensive evaluation of the prevalence and incidence of autoimmune and atopic
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43 conditions in people with new onset AA and matched controls. Finally, we aim to
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45 provide evidence for baseline common infection risk in people with AA which can
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47 be used to support treatment decisions regarding the use of immune-modulating
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49 medications for AA. This study series will extend our knowledge of the current
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51 disease burden from AA and associated conditions.
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List of abbreviations

Abbreviation	Description
AA	Alopecia Areata
CI	Confidence Interval
HR	Hazard Ratio
IAPT	Improving Access to Psychological Therapies
IMD	Index of Multiple Deprivation
LRTI	Lower respiratory tract infection
OR	Odds Ratio
RA	Rheumatoid Arthritis
RCGP	Royal College of General Practitioners
RSC	Research and Surveillance Centre
SLE	Systemic Lupus Erythematosus
T1DM	Type 1 Diabetes

Declarations

Patient and Public Involvement statement

The design of this protocol did not involve patients or this public.

Ethics approval and dissemination

The study does not require formal research ethics committee (REC) approval as it will use anonymised routinely collected healthcare data; as defined by the NHS Health Research Authority research decision tool (<http://www.hra-decisiontools.org.uk/research/>) and the University of Surrey own Self-Assessment for Governance and Ethics (SAGE) tool. No patient identifiable information will be available to researchers. All participating practices display information to patients regarding data use through the RCGP RSC network. All patients who choose to opt out of data sharing do not have their data processed as part of RCGP RSC research studies. Approval for data access and use was granted by the RCGP and RSC Research Committee.

Consent for publication

Not applicable

Availability of data and materials

The RCGP RSC dataset can be accessed by *bone fide* researchers, approval is on a project-by-project basis (www.rcgp.org.uk/rsc). Researchers wishing to directly analyse the patient-level pseudonymised data will be required to complete information governance training and work on the data from the secure servers at the University of Surrey or University of Oxford. Patient-level data cannot be taken out of the secure networks.

Competing interests

SdeL is Director of RCGP RSC, he has received funding for projects from Eli Lilly, Astra Zeneca, GSK, Seqirus and Takeda – all through his Universities and none related to this study. WSC and WRG are employees of Pfizer Ltd. SH and CT are investigators on the Pfizer funded Allegro clinical trial. AEM, ART, CT, MH and AGM declare that they have no competing interests.

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Authors' contributions

The study was designed and developed by CT, MH, SH, ART, AEM, WSC, WRG, and AGM with input from SdeL. The protocol writing was directed and critically reviewed by CT, MH, SH, ART, AEM, WSC, WRG, SdeL, and AGM.

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Tables

Table 1. The autoimmune and atopic conditions to be explored. For full definitions see Supplementary Tables S4.1 – S4.16, Additional file 2

Disease category	Conditions
Atopic conditions	Atopic dermatitis, allergic rhinitis, asthma
Gastrointestinal	Crohn's disease*, ulcerative colitis, coeliac disease, pernicious anaemia
Endocrine	Type 1 diabetes, Hashimoto's thyroiditis, Grave's disease
Rheumatological	Rheumatoid arthritis, psoriatic arthritis, ankylosing spondylitis, systemic lupus erythematosus, polymyalgia rheumatica, Sjögren's syndrome
Dermatological	Psoriasis, vitiligo
Neurological	Multiple sclerosis

*Whilst there has been some debate about whether or not Crohn's disease is an autoimmune condition it involves a degree of immune dysregulation and is therefore included for completeness.(72)

Table 2. The common infections to be explored. *Inclusion of COVID-19 will depend on data availability.

Infection	Description
Upper respiratory tract infection	All infections of the upper respiratory tract including rhinitis, pharyngitis, sinusitis, and the common cold
Lower respiratory tract infection	All infection of the lower respiratory tract including pneumonia and acute bronchitis.
Pneumonia	A subgroup of LRTI consisting of bacterial and viral pneumonias
Acute bronchitis	A subgroup of LRTI consisting of inflammation of the large and medium airways usually of viral origin
Influenza	Confirmed cases of influenza and cases of influenza-like illness
Skin infection	Cellulitis and other infective skin conditions
Urinary tract infection	Infections of the urinary tract including cystitis and pyelonephritis
Genital infections	All infections of the genital tract including sexually transmitted infections and non-sexually transmitted infections
Gastrointestinal infection	All infections of the gastrointestinal tract including gastroenteritis
Herpes simplex	Mucocutaneous infections caused but herpes simplex viruses
Herpes zoster	Infections caused by the varicella-zoster virus
Meningitis	All infections, bacterial or viral, causing meningitis
COVID-19	Confirmed or clinically diagnosed COVID-19*

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The epidemiology, management, and the associated burden of mental health illness, atopic and autoimmune conditions, and common infections in alopecia areata: Statistical Analysis Plan

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For peer review only

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List of abbreviations

Abbreviation	Full Form
AA	Alopecia Areata
BMI	Body Mass Index
CKD	Chronic Kidney Disease stage 3-5
COPD	Chronic Obstructive Pulmonary Disorder
HR	Hazard Ratio
IMD	Index of Multiple Deprivation
NIHR	National Institute for Health Research
OR	Odds Ratio
RA	Rheumatoid Arthritis
RCGP RSC	Royal College of General Practitioners Research and Surveillance Centre
SD	Standard Deviation
SES	Socio-Economic Status
SLE	Systemic Lupus Erythematosus
SSRI	Selective Serotonin Reuptake Inhibitor
T1DM	Type 1 Diabetes
T2DM	Type 2 Diabetes

1. Introduction

1.1 Background

Alopecia areata (AA) is a common cause of immune-mediated, non-scarring hair loss. (1) Clinical presentations of AA are heterogeneous, ranging from well-demarcated patches of hair loss on the scalp to total loss of hair on the scalp (*alopecia areata totalis*) or entire scalp and body (*alopecia areata universalis*). (2) Active AA is estimated to affect approximately 0.1-0.2% (2, 3) of the population worldwide, with a lifetime risk of 1.0 -2.1%. (4-6)

Following the initial episode, the majority of those with limited patchy AA will experience spontaneous remission, but over 80% will have subsequent relapses. (7) Spontaneous remission has been reported to occur in less than 10% of those with extensive AA. (7) A number of treatment options can induce hair growth in people with AA, but none have been shown to have a durable impact on remission. (8)

AA has been associated with several autoimmune conditions supporting the theory of an underlying autoimmune aetiology. (9, 10) Atopic conditions and mental health disorders have also been demonstrated to be more common in people with AA, (9-11) although the temporal relationship between psychiatric conditions and AA remains poorly researched. (12) The association between AA and common infections is not well studied.

1.2. Purposes of analyses

This statistical analysis plan covers four related AA studies.

Study 1: Epidemiology of AA

Population studies in the USA using the Rochester Epidemiology Project database estimate the lifetime risk of AA to be 2.1%. (4) The database contained information from all patients registered with a healthcare provider in Olmstead County, Minnesota from 1990-2009. Previous studies using this database from 1971-1974 estimated the overall prevalence of AA to be 0.1-0.2%, (13) with no published studies reporting prevalence estimates since this. Other epidemiological studies have assessed the incidence of AA in patients referred to dermatology services. Clinic-based studies from around the world have estimated the incidence of AA to be in the region of 0.57-3.8%. (14-18)

Worldwide, the majority of studies on AA have not found a significant difference in incidence between males and females. (5) AA onset occurs before the age of 40 in 82-86% of cases. (5) To date, there have been no large population-based studies of AA epidemiology in UK populations.

Study 2: Mental health comorbidities in patients with AA

It is well recognised by clinical experts in AA that the condition can have a profound psychological impact and a possible comorbid burden of mental health conditions. A recent USA cross-sectional database study comparing 5,605 patients with AA with matched controls found a higher prevalence of mental health diagnoses in the AA group (32.8% vs 20.0%). (19) In particular, higher rates of depression (OR 2.18, 95%CI 1.80-2.63), anxiety disorders (OR 2.46, 95%CI 1.91-3.16), attention-deficit disorders (OR 8.11, 95%CI 5.22-12.59), adjustment disorders (OR 4.80, 95%CI 2.58-8.91) and obsessive compulsive

1 disorders (OR 4.95, 95%CI 1.59-15.35) were observed when compared with controls. (19)
2 These findings concur with previous work and a similar pattern is seen in other countries.
3 (20-23)

4
5 Recently a British study identified a bi-directional positive association between major
6 depressive disorder and AA. (24) In a sample of over 400,000 participants, major depressive
7 disorder was seen to increase the risk of incident AA by 90% [HR 1.90, 95%CI 1.67-2.15]
8 and AA was found to increase the risk of incident major depressive disorder by 34% [HR
9 1.34, 95%CI 1.23-1.46]. (24) The association of other common mental health conditions
10 with AA however was not assessed.
11

12 **Study 3: Autoimmune and atopic conditions in people with AA**

13 A central theory in AA pathogenesis is that it is an autoimmune phenomenon resulting from
14 a disruption of hair follicle 'immune privilege', where numerous immunological
15 mechanisms fail to prevent cytotoxic immune attack on cells and antigens present at that
16 site. (25)
17

18
19 A number of studies have reported autoimmune conditions to occur more frequently in
20 those with AA than in the general population, however results are conflicting, and studies
21 have been limited by potential recruiting, recall and reporting biases. (26) A Taiwanese
22 retrospective cohort study found individuals with AA to have an overall increased risk of
23 developing an autoimmune condition when compared with matched controls (HR 1.86,
24 95%CI 1.32-2.63). In particular, greater risks of incident systemic lupus erythematosus
25 (SLE) (HR 5.02; 95%CI 2.08-12.51), psoriasis (HR 2.01; 95%CI 1.06-3.83) and rheumatoid
26 arthritis (RA) (HR 1.79; 95%CI 1.07-3.00) were observed. (27) There was no relationship
27 between AA and Hashimoto's thyroiditis or type 1 diabetes (T1DM). A large USA cross-
28 sectional study of 3,658 individuals with AA, found that 14.6% had a diagnosis of thyroid
29 disease, 11.1% had T1DM, 4.3% had inflammatory bowel disease, 2.8% had vitiligo and 6.3%
30 had psoriasis. (10) These figures were all higher than would be expected in the general
31 population. A recent systematic review and meta-analysis found AA to be significantly
32 associated with Graves' Disease (OR 2.07, 95%CI 1.80-2.38) and Hashimoto's Thyroiditis
33 (OR 2.15; 95%CI 1.71-2.72) but not with SLE, RA, Psoriasis or T1DM. (9)
34
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36
37 There has also been interest in the prevalence of co-morbid atopy in patients with AA. The
38 prevalence of atopy in patients with AA has been reported to be in the range of 11-38.2%
39 (5) representing cohorts from the USA, India and Singapore. (10, 14, 28, 29) A large meta-
40 analysis found patients with AA had higher odds of having atopic dermatitis (OR 2.36;
41 95%CI 1.80-3.09) and allergic rhinitis (OR 1.33;95%CI 1.19-1.47) when compared with
42 controls. (9) It is not however surprising from a pathogenesis perspective in terms of shared
43 pathways of autoimmune susceptibility; IL-13 loci have been associated with autoimmune
44 and atopic conditions, and a genome-wide association study established that IL-13 is also
45 susceptible loci for AA. (30)
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48 **Study 4: Common infections in people with AA**

49
50 It has been hypothesized that infections may act as triggers for AA; with particular interest
51 in *Helicobacter pylori*, cytomegalovirus, Epstein-Barr virus, hepatitis B virus, hepatitis C
52 virus, and human immunodeficiency virus but others have also been suggested.(9, 31-38)
53 Some case reports has suggested improvement or resolution of AA with treatment of the
54 associated infection.(33, 39). However, early small-scale studies have failed to find
55 convincing evidence to support associations.(35, 36, 40)
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1 Multiple genetic loci have been identified to be both protective from infection but increase
2 the risk for autoimmune disease.(41) Examples include the HLA variants HLA-DQ2 and
3 HLA-DQ8 which confer protection against viral infections including influenza but are
4 associated with inflammatory bowel disease,(42, 43) and SH2B3 rs3184504*A gene variant
5 protective against Escherichia coli infection but also detrimental for inflammatory bowel
6 disease.(44) These loci which, in the past have conferred a genetic advantage, may still
7 confer a reduced infection risk.(41) It is currently unclear if the genetic predisposition for
8 AA is caused by genetic factors which also confer protection against any common infections.
9 In other autoimmune conditions, infection risk is often increased as a result of the
10 pathological changes resulting from the condition itself, the effects of immune-modulatory
11 treatment, or through increased exposure to pathogens through healthcare contact.(45-51)
12 An understanding of the relative infection rates in people with AA compared to those
13 without is of particular importance with the emergence of Janus kinase inhibitors as a
14 potential treatment option.(52) Whilst this medication class can produce impressive hair
15 regrowth results even in long-standing, AA their use is associated with some increased
16 infection risk; in particular, urinary tract infections, viral gastroenteritis fungal infections,
17 and varicella zoster infection.(52)

2. Study objectives and endpoints

2.1 Study objectives

2.1.1 Study 1

The overall purpose of study 1 is to describe the epidemiology (incidence and prevalence) of AA and to assess the current level of primary care service utilisation and management patterns associated with people diagnosed with AA.

2.1.2 Study 2

The overall purpose of study 2 is to assess the prevalence and incidence of mental health conditions (depressive episodes, recurrent depressive disorder and anxiety disorder) in adult people diagnosed with AA relative to a control population of people without a diagnosis of AA. In addition, the study will determine the treatment burden (medications and psychological interventions used to treat mental health conditions), 'sick day' burden, and unemployment burden of AA.

2.1.3 Study 3

The overall purpose of study 3 is to assess the prevalence and incidence of atopic and autoimmune conditions in adult people diagnosed with AA relative to a control population of people without AA.

2.1.4 Study 4

The overall purpose of study 4 is to assess the incidence of common infections in people diagnosed with AA relative to a control population of people without AA.

2.2 Primary objectives

2.2.1 Study 1

2.2.1.1

Describe the epidemiology of AA: Incidence of AA over time and by age, sex, ethnicity, and sociodemographic factors, and point prevalence by age and sex.

2.2.1.2

Describe current primary care service utilisation and management patterns in AA.

2.2.2 Study 2

2.2.2.1

Describe the prevalence of common mental health conditions (depressive episodes, recurrent depressive disorder and anxiety disorder) in adult people diagnosed with AA in a contemporary real-world population compared with matched controls without AA.

2.2.2.2

Describe the incidence of common mental health conditions (depressive episodes, recurrent depressive disorder and anxiety disorder) in adult people diagnosed with AA in a contemporary real-world population compared with matched controls in the first two years after AA diagnosis.

2.2.2.3

Describe the mental health treatment burden of adult people diagnosed with AA.

2.2.3 Study 3

2.2.3.1

Describe the prevalence of atopic and autoimmune conditions in adult people diagnosed with AA in a contemporary real-world population at diagnosis compared with matched controls without AA.

2.2.3.2

Describe the incidence of atopic and autoimmune conditions in adult people with AA in a contemporary real-world population compared with matched controls in the first five years after AA diagnosis.

2.2.4 Study 4

2.2.4.1

Describe the overall rate of common infections in people with AA in a contemporary real-world population at diagnosis compared with matched controls in the first five years after AA diagnosis.

2.2.4.2

1 Describe the rates of individual common infections in people with AA in a contemporary
2 real-world population at diagnosis compared with matched controls in the first five years
3 after AA diagnosis.
4
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6 **2.3 Secondary objectives:**

8 **2.3.1 Study 1**

10 **2.3.1.1**

11 Describe the geographic distribution of AA incidence within England. English regions
12 comprise; Greater London, South East, South West, West Midlands, North West, North East,
13 Yorkshire and the Humber, East Midlands, and East of England.
14
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16 **2.3.2 Study 2**

18 **2.3.2.1**

19 Describe the prevalence of additional mental health conditions (adjustment disorder,
20 agoraphobia, self-harm, and overdose/parasuicide attempts) in adult people diagnosed
21 with AA and controls.
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24 **2.3.2.2**

25 Describe the burden of 'sick days' in adult people diagnosed with AA and controls.
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28 **2.3.2.3**

29 Describe the prevalence of unemployment in adult people diagnosed with AA and controls.
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32 **2.3.3 Study 3**

33 None
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35 **2.3.4 Study 4**

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2.4 Primary endpoint

The primary endpoints for the four studies are listed in Table 1.

Study	Endpoints
1	Diagnosis of AA is the date of the first diagnosis code in the record and no alternative diagnosis that merits exclusion* diagnosed in the subsequent 365 days from date of AA diagnosis (see Supplementary Table S1.1, Additional file 2).
2	Diagnosis of AA is the date of the first diagnosis code in the record and no alternative diagnosis that merits exclusion* diagnosed in the subsequent 365 days from date of AA diagnosis (see Supplementary Table S1.1, Additional file 2). Diagnosis of a common mental health condition categorized as depressive episodes, recurrent depressive disorder or non-phobia related anxiety disorders at the time of AA diagnosis (See Supplementary Tables S2.1 - S2.4, Additional file 2). Time to diagnosis of a common mental health condition categorized as depressive episodes, recurrent depressive disorder or non-phobia related anxiety disorders in the first two years post AA diagnosis (See Supplementary Tables S2.1 -S2.4, Additional file 2)
3	Diagnosis of AA is the date of the first diagnosis code in the record and no alternative diagnosis that merits exclusion* diagnosed in the subsequent 365 days from date of AA diagnosis (see Supplementary Table S1.1, Additional file 2). Diagnosis of an atopic (atopic dermatitis, allergic rhinitis, asthma) or autoimmune condition (Supplementary Tables S4.1 – S4.16, Additional file 2) at the time of AA diagnosis. Time to diagnosis of an atopic (atopic dermatitis, allergic rhinitis, asthma) or autoimmune condition (Supplementary Tables S4.1 – S4.16, Additional file 2) in the first five years after AA diagnosis.
4	Diagnosis of AA is the date of the first diagnosis code in the record and no alternative diagnosis that merits exclusion* diagnosed in the subsequent 365 days from date of AA diagnosis (see Supplementary Table S1.1, Additional file 2). Diagnosis of a common infection (Upper and lower respiratory tract infection, Pneumonia, Acute bronchitis, Influenza, Skin infection, Urinary tract infection, Genital infections, Gastrointestinal infection, Herpes simplex , Herpes zoster, Meningitis and Covid-19 (depending on data availability)) (Supplementary Tables S5.1 – S5.12, Additional file 2) in the first five years after AA diagnosis.

Table 1: Primary endpoints. *Exclusion diagnoses are; any form of scarring alopecia, (53) traction alopecia, congenital alopecia, androgenetic alopecia, telogen effluvium, tinea capitis, trichotillomania, or secondary syphilis of the scalp (See Supplementary Table S1.1, Additional file 2)

2.5 Secondary endpoints

None

2.6 Other exploratory analyses

Study 1: Explore the incidence of AA by age (children) and age group (adults [18-30], [30-40], [50-60], [60,70], [70-80], ≥ 80). These age groups are provisional. If, during exploratory analysis, we find that these age groups obscure the true incidence of AA (for example if AA incidence rates change substantially across one of these age groups) then we may modify these groupings. Any changes will be clearly stated as such in a final manuscript.

3 General Study Design and Plan

The proposed studies will use the retrospectively collected data of all eligible patients within Oxford-Royal College of General Practitioners Research and Surveillance Centre database (RCGP RSC) at the date of data extraction. The RCGP RSC database incorporates pseudonymised primary care records from up to 200 GP practices distributed across England. Details of the cohort included in the database have been published previously. (54) The RCGP RSC cohort size (as of January 2019) is over 2.6 million actively registered patients, and historic records available for up to 5.2 million patients over the last 20 years. The cohort provides a broadly representative sample of the UK population.

The study period for study 2 and study 3 incidence analyses will be ten-years starting January 1, 2009 and ending December 31, 2018 inclusive.

For study 4, we will start data collection from the beginning of 2004 when the quality and outcomes framework was first introduced in primary care. The study period will end December 31, 2018.

3.1 Study Design

These are non-interventional studies. A range of study designs will be used across the studies as follows:

3.1.1 Study 1:

Cross-sectional design (incidence and prevalence of AA). Cohort design to assess healthcare utilisation in people with AA.

3.1.2 Study 2:

Case-control design for prevalence of mental health conditions (depressive episodes, recurrent depressive disorder and anxiety disorder) at AA diagnosis. Matched-cohort design for incidence of such conditions in the first two years after AA diagnosis in the subset of adult people diagnosed with AA without a mental health condition at baseline (and excluding controls if they have a baseline mental health condition).

3.1.3 Study 3:

Case-control design for prevalence of atopic and autoimmune conditions at AA diagnosis. Matched-cohort design for incidence of atopic and autoimmune conditions in the first five years after AA diagnosis in the subset of adult people diagnosed with AA without an atopic/autoimmune condition at baseline (and excluding controls if they have a baseline atopic/autoimmune condition).

3.1.4 Study 4:

Matched-cohort design for incidence of common infections in the first five years after AA diagnosis in the subset of people diagnosed with AA without a common infection at baseline (and excluding controls if they have a baseline common infection).

3.2 Data source and Read codes

The case and control cohorts will be identified from the RCGP RSC database. The RCGP RSC database contains complete data on all events and clinical entities coded in UK primary care. These include demographic information, clinical diagnoses, laboratory test results, primary care issued prescriptions, process of care codes (e.g. specialist dermatology reviews), and anthropometric measurements (e.g., body mass index (BMI)), and are coded using the Read Coding system. (55) Read code lists used to define variables have been developed in accordance with published guidelines. (55)

3.3 Data extraction

Individual patient data will be anonymised at the point of data extraction. All data will remain in anonymised form and will be held on a secure server at the University of Surrey. The data will not be used for any purposes other than for the research which is described in the respective protocols and which has been approved by the RCGP RSC Research Committee. The sponsor, Pfizer Ltd, will not have access to the individual anonymised patient data.

Queries will be executed to extract relevant data from the Structured Query Language (SQL) database using the Read code listed in Additional file 2.

3.4 Inclusion-Exclusion Criteria and General Study Population

3.4.1 AA definition

We will identify people diagnosed with AA using diagnosis Read codes which are specific to the condition (see Supplementary Table S1.1 (AA section), Additional file 2). A person will be considered to have a confirmed AA diagnosis if they have one or more of these diagnoses Read codes and no code for an alternative diagnosis in the subsequent 365 days. Alternative diagnoses which merit exclusion comprise any form of scarring alopecia, (53) traction alopecia, congenital alopecia, androgenetic alopecia, telogen effluvium, tinea capitis, trichotillomania, or secondary syphilis of the scalp (see Supplementary Table S1.1, Additional file 2). We will identify all incident cases of AA meeting this case definition over the study period which will form the case cohorts for the four studies. We will also extract data on the extent of the alopecia where this has been recorded (See Supplementary Table S1.2, Additional file 2).

Study 2 will identify three groups of common mental health conditions defined by the International Statistical Classification of Diseases and Related Health Problems 10th Revision (ICD10) classification (56) (depressive episodes (F32), recurrent depressive disorder (F33), and non-phobia related anxiety disorders (F41)) identified using algorithms validated in UK primary care. (57)

Study 3 will identify atopic conditions and autoimmune conditions respectively (Supplementary Tables S4.1 – S4.16, Additional file 2) using diagnostic Read codes.

Autoimmune conditions were selected based on a combination of expert knowledge and a minimum background population prevalence of 0.3% in the general population (refer to section 4.1.3). Case definition using Read codes for atopic dermatitis has been previously validated. An ontologically driven case definition is used for both allergic rhinitis and asthma. (55)

Study 4 will identify common infections using diagnostic Read codes (Supplementary Tables S5.1 – S5.12, Additional file 2).

3.5 Baseline socio-economic characteristics

Age, sex, socio-economic status (SES), and ethnicity will comprise the socio-economic factors used for stratification of the outcome measures. Ethnicity will be categorized as follows in accordance with the major UK census categories: (58, 59) White, Asian, Black African/Caribbean, Mixed, Other and not recorded. Deprivation will be defined using the official national deprivation measure; index of multiple deprivation (IMD). (60) This will be calculated at the point of data extraction, using patient postcode, with the resultant scores stratified by deprivation quintile according to the national distribution.

3.6 Epidemiology of AA

This will comprise of the incidence of AA over the study period (stratified by age group, sex ethnicity, and SES) and point prevalence (stratified by age and sex). The study will also describe the geographic distribution of AA by region across England.

3.7 Current service utilisation and management patterns

Current service utilisation will comprise of annual primary care visit rates, in Study 1 we will compare primary care visit frequency in people with AA and matched controls without AA.

The management patterns will comprise of an assessment of the percentage of the people with AA having a secondary care review (by dermatology (study 1) or mental health services (study 2)), and an assessment of primary care medication prescriptions issued to treat AA (Supplementary Table S1.4, Additional file 2). Primary care visits, secondary care reviews and medication to treat AA will all be limited to those within 365 days of AA diagnosis.

3.8 Mental health treatment, sick day, and unemployment burden

This will comprise of the rates for medications and psychological interventions used to treat mental health conditions in people diagnosed with AA. Antidepressant medication classes to be examined comprise; selective serotonin reuptake inhibitors (SSRIs) and related medications (serotonin and norepinephrine reuptake inhibitors; SNRIs), tricyclic antidepressants (TCAs) and related medications (tetracyclic antidepressant TeCAs), and monoamine oxidase inhibitors (MOAIs). Anxiolytic medications to be examined comprise all benzodiazepines and other related medications indicated for use in anxiety states. Psychological interventions comprise of will comprise; referral rates for counselling, secondary care psychiatrist referrals, including the referrals to the clinical psychology services/specialists and UK Improving Access to Psychological Therapies (IAPT) program. (61) (Supplementary Table S2.10, Additional file 2).

1 Additional mental health conditions consist of adjustment disorder, agoraphobia, self-harm,
2 and overdose/parasuicide attempts and will be identified using the presence of one or more
3 diagnosis codes appearing in the clinical record (Supplementary Tables S2.5 – S2.9,
4 Additional file 2).

5
6 Unemployment will be identified using Read codes relating to unemployment recorded in
7 the primary care record or the issuing of IB113 or ESA113 forms (Supplementary Table S3.1,
8 Additional file 2). Sick days will be indicated by the issuing of Med 3 certification from
9 primary care (Statement of Fitness for Work certification) (Supplementary Table S3.2,
10 Additional file 2).

14 4 Sample size calculations

15
16 In the controls, the prevalence of common conditions (e.g. depressive episodes) is assumed
17 to be 10%, less common conditions are assumed to be 1% and rare conditions (e.g. multiple
18 sclerosis) assumed to be 0.1%. Sample size calculations were performed in OpenEpi, (62)
19 results are presented using methods of Kelsey.(63)

21 4.1.1 Study 1

22
23 The analysis of the primary endpoint is a descriptive analysis of the incidence and
24 prevalence of AA, and no sample size calculation is therefore applicable.

25
26 Our inclusion criteria specify all people with a confirmed diagnosis of AA will be included
27 for analysis. The RCGP RSC database contains information on around 2 million actively
28 registered patients. Based on an AA prevalence of 0.2% (13), we would anticipate a sample
29 size of around 4,000 people diagnosed with AA for this study.

32 4.1.2 Study 2

33
34 Assuming 80% power, a 5% level of statistical significance, and a background population
35 prevalence of 15% for anxiety and 10% for depression, (64) our anticipated sample size for
36 AA (n = 4,000) would be sufficient to detect a prevalence difference of 1.8% in anxiety
37 between those with and without AA, and 1.5% difference in depression between those with
38 and without AA.

41 4.1.3 Study 3

42
43 A sample size calculation is applicable to estimate the incidence of atopic and autoimmune
44 conditions in people diagnosed with AA. There is, however, a paucity of large-scale
45 epidemiological data exploring the association between AA and either atopic or
46 autoimmune conditions on which to base the sample size calculations for this study.

47
48 A large population-based study based in Taiwan (65) found associations between the
49 presence of AA and the presence of atopic dermatitis (OR 2.24, 95% CI 1.95-2.58) and
50 allergic rhinitis (OR 1.29, 95% CI 1.18-1.41), and with the autoimmune condition psoriasis
51 (OR 2.80, 95% CI 2.24-3.50). No associations were found in either asthma (atopic) or RA
52 (autoimmune). Applying an estimate informed by this study of OR 2.0 for atopic conditions
53 and OR 2.8 for autoimmune conditions, assuming 80% power, a 5% level of statistical
54 significance, a 4:1 ratio of controls to cases and a probability of outcome in the control
55 cohort of 1% (less common condition prevalence) for both atopic and autoimmune
56 conditions, a total (both cases and controls) sample size of 6,034 for atopic conditions
57 (1,207 cases and 4,827 controls) and 2,133 for autoimmune conditions (427 cases and
58
59
60

1,706 controls) would be required to detect statistically significant differences between people diagnosed with AA and the control populations.

For the assessment of prevalence of co-existing autoimmune conditions, assuming 80% power, a 5% level of statistical significance, our anticipated sample size for AA (n = 4,000) and an OR 2.0 effect, we would have sufficient power to detect a difference between those with and without AA in autoimmune conditions having $\geq 0.3\%$ background population prevalence.

4.1.4 Study 4

A sample size calculation is applicable to estimate the incidence of common infections in people diagnosed with AA. There is, however, no previous data exploring the association between AA and common infections on which to base the sample size calculations for this study. We therefore estimate the number of people diagnosed with AA we will have for this study (n = 4,000) and use this number to estimate the minimum effect size we are powered to detect. Based on a Cox PH model, 80% power, a 5% level of statistical significance and a 4:1 ratio of controls to cases, we would have sufficient power to detect a difference between those with and without AA in common infections having $\geq 0.46\%$ background population prevalence.

5 Populations to be analysed

5.1 Inclusion Criteria

The cohorts for studies 1, 2 and 3 (cases and controls) will consist of patients contributing to RCGP RCS database during the study period (between January 1, 2009 and December 31, 2018 inclusive). The cohorts for study 4 (cases and controls) will consist of patients contributing to RCGP RCS database between January 1, 2004 and December 31, 2018 inclusive.

The AA prevalence population consists of patients actively registered and alive at the end date of the study period (December 31, 2018).

The AA incidence population consists of patients registered at any point during the study period but without a prior recorded AA diagnosis. The follow-up period for incident cases will begin on the latest of the date of diagnosis indicated by the first diagnostic AA Read code. Follow-up will end at the earliest of the study end-date (December 31, 2018), the date of patient transfer from an included practice or date of death.

Studies 1 and 4 will include both children and adults. Studies 2 and 3 will include only people aged ≥ 18 (as at date of AA diagnosis for cases or start of follow-up for controls). Only people aged ≥ 18 and ≤ 65 will be included in the unemployment and sick day analysis (Study 2).

5.2 Exclusion Criteria

The following exclusion criteria will be applied:

- People with the alternative non-AA diagnoses (section 3.4.1) (AA incidence cohort).
- People with AA diagnosis within 6 months of registration (AA incidence cohort).
- People with less than 1 year of follow up within the dataset (unless under 1 year old) (AA incidence and AA prevalence cohorts).

5.3 Matching process

The control cohorts will be defined by matching cases with people who have never been diagnosed with AA either prior to or during the study period, by age, sex, and time since practice registration, at GP practice level. After matching an assessment of sociodemographic differences using IMD quintiles will be performed. If there are substantial differences in socioeconomic status between cases and controls, re-matching with IMD as an additional matching criterion will be considered

Controls will require at least one year of follow-up when matched to minimize the risk of a non-recorded existing diagnosis of AA. The follow-up period for each matched control will begin at the start of follow-up of their matched case and have the same follow-up time criteria applied (where applicable).

Each case is matched with four controls using a nearest neighbour matching algorithm (66) to create a baseline matched dataset.

Study 1 will include all matched patients to compare rates of primary care visits. Study 2 (incidence of mental health after AA diagnosis) and study 3 (incidence of atopic and autoimmune conditions) will both use a subset of the baseline matched dataset; cases will be people diagnosed with AA without the relevant condition at their start of follow up, controls will be people not diagnosed with AA and without the relevant condition at their start of follow up.

The matching for the incidence of common infections (study 4) will use a different approach to studies 2 and 3: cases will be people diagnosed with AA on or before 1st January 2014 (exact date will be dependent on data availability) without the relevant infection, controls will be people not diagnosed with AA prior to this date and without the relevant infection. People who develop AA during the follow up will be excluded from the pool of available cohorts prior to matching. This approach will mitigate systematic recording bias that is likely due to an increased propensity of people with incident AA to consult within the months following diagnosis.

The case-control design studies (prevalence of mental health at AA diagnosis (study 2), and prevalence of atopic and autoimmune conditions at AA diagnosis (study 3)) will both define cases as people newly diagnosed with AA over the study period. For each case, the prevalence of the conditions of interest as at the date of AA diagnosis will be retrospectively established. Controls will be people not diagnosed with AA. For each control, the date of AA diagnosis of their matched case counterpart will then be used as the baseline date and the prevalence of the conditions of interest on that date will be retrospectively established.

In Study 2 and Study 3, the same baseline cases and control cohorts will be used for both the case-control and matched-cohort analyses.

5.4 AA definition exploratory analyses

To check the validity of our AA definition (section 3.4.1), annual incident trends of specified alopecia (AA), (Supplementary Table S1.1, Additional file 2), non-specific alopecia (Supplementary Table S1.1, Additional file 2) and other specified alopecia (Supplementary Table S1.1, Additional file 2) will be analysed for the purpose of identifying changes in coding practice. The AA case definition may be amended based on the results of this analysis if considered appropriate and necessary. Any changes required will be reported in full in a final study publication.

6 Statistical Analysis

6.1 Statistical principles

The mean, standard deviation (sd) and any other statistical measures, will be reported to one decimal place. Continuous data will be summarised in the form of means, sd, median, interquartile range (IQR) and range as appropriate. Categorical data will be summarised using frequencies and proportions. Chi-squared and t-tests will be performed to compare the frequency of dichotomous variables and the values of continuous variables where relevant. 95% CIs will be reported for main effect sizes. Statistical significance will be assessed using $p < 0.05$. Actual p-values will be reported except for p-values less than 3 decimal places which will be reported as " < 0.001 ". P-values > 0.1 will be reported to one decimal place, p-values between 0.01 and 0.1 will be reported to 2 decimal places, and p-values between 0.001 and 0.01 will be reported to three decimal places.

The assessment of any associations with baseline characteristics and the outcomes of interest (mental health conditions (study 2), autoimmune and atopic conditions (study 3) and common infections (study 4)) will be assessed using logistic regression, Cox proportional hazards models, Poisson regression or zero-inflated Poisson regression as appropriate depending on the characteristics of the outcome variable. A standard set of features will be used in all multivariable models: age, sex, ethnicity, socioeconomic status, BMI, smoking status, alcohol status, and historical propensity to consult (defined as the number of primary care visits an individual has in the year prior to their study start date). Specific co-morbidity adjustment will be specific to each analysis.

Assumptions of statistical approaches will be assessed, and transformations used if necessary (although it is not anticipated that the data will violate model assumptions).

6.2 Primary Endpoint Analysis

6.2.1 Study 1

AA incidence: Incident cases will be defined as people with a first ever diagnostic Read code for AA during the study period. To ensure cases are truly incident, people with an AA diagnosis within six months of registering with a practice will be excluded from the analysis (unless under one year old). Incidence of new onset AA will be calculated by dividing the total number of new cases by the total person-years of follow-up for the total eligible population over the study period. Incidence rates will be reported for the complete cohort and stratified by calendar year, sex and age (categorised), and SES factors. Adjusted incidence rates by socio-demographic factors (including geographic area classification) will be estimated using Poisson regression.

AA point prevalence: Prevalence cases will be defined as all people with a historical diagnostic Read code for AA and no exclusion code within one year of AA diagnosis. For this prevalence analysis all people will be included regardless of the date of AA diagnosis in relation to the date of registration with a practice. Cases with < 365 days of follow up from date of registration will be excluded from the analysis (unless under one year old). Point prevalence will be calculated by dividing the number of prevalent cases by the total number of eligible people in the study population at the study end date (December 31, 2018). Point prevalence will be reported for the complete cohort and stratified by sex and age (categorised).

1 We anticipate some attrition of recording of AA in the historic records. This is particularly
2 likely to be the case in records preceding the computerisation of primary care which
3 occurred in the 1990s. If we observe evidence of this being a major source of error in our
4 point calculations (as evidenced by a falling point incidence in the older adult population
5 despite there being a substantial number of incident diagnoses in this age group) then we
6 will consider using the actuarial life table method to estimate lifetime AA risk (67).
7

8 **Service utilisation and management patterns:** Service utilisation will be evaluated by
9 calculation of the annual rates of primary care visits for people diagnosed with AA in the
10 year following diagnosis. Primary care visits will be identified from the patient's electronic
11 health record.
12

13
14 Management patterns will be evaluated by calculation of annual proportion of people
15 referred for dermatology review in people diagnosed with AA in the year following
16 diagnosis. Secondary care dermatology reviews will be identified from Read codes.
17

18
19 In addition, management patterns will also comprise of the percentage of people diagnosed
20 with AA and prescribed AA medication, in primary care, grouped by medication class during
21 the year following diagnosis. Prescription information will be identified using Read and
22 EMIS codes.
23

24 6.2.2 Study 2

25
26 **Prevalence of mental health conditions:** Prevalence will be calculated by dividing the
27 number of prevalent people at the study start date by the total number of eligible people in
28 the study population at the same time point.
29

30
31 The prevalence of each common mental health condition (depressive episodes, recurrent
32 depressive disorder and anxiety disorder) category for people diagnosed with AA will be
33 reported in Study 2 and compared to the prevalence in the control population without AA.
34 The prevalence of mental health conditions by socio-demographic subgroups will also be
35 reported.
36

37
38 **Incidence of mental health conditions:** Incident cases will be defined as in Study 1.
39 Incidence rates of mental health conditions (depressive episodes, recurrent depressive
40 disorder and anxiety disorder) within two years of diagnosis date (matched follow-up start
41 date for controls) will be calculated in both cases and controls and compared.
42

43
44 Risk of developing a mental health condition (grouped by mental health condition category)
45 will be examined using time to failure analysis. Initially, unadjusted Cox proportional
46 hazards models, stratified by matched set (AA versus non-AA), will be used to provide
47 overall hazard ratios (HRs) as summary estimates for the association of the presence of AA
48 with the time to each mental health condition category in separate models. Models will be
49 subsequently adjusted for standard set factors (section 6.1) and comorbidities (type 2
50 diabetes (T2DM), hypertension, atrial fibrillation, angina, acute myocardial infarction,
51 stroke, heart failure, chronic liver disease, dementia, RA, asthma, Chronic obstructive
52 pulmonary disease, Chronic Kidney Disease stage 3-5 (CKD), malignancy and inflammatory
53 bowel disease) in multivariable analysis.
54

55
56 **Mental health treatment and management patterns:** The burden of treatment for
57 mental health conditions will be evaluated as the total percentage of people diagnosed with
58
59
60

AA and prescribed, within one year of AA diagnosis, a medication used to treat mental health conditions (section 3.8) (e.g. SSRIs), grouped by mental health condition category.

Management patterns will be evaluated by calculation of annual proportion of people referred for psychiatrist referral and counselling in people diagnosed with AA in the year following diagnosis (Supplementary Table S2.10, Additional file 2).

6.2.3 Study 3

Prevalence of atopic and autoimmune conditions: The prevalence of atopic and autoimmune conditions in both cases and controls will be reported and compared.

Incidence of atopic and autoimmune conditions: Incidence rates of atopic and autoimmune conditions within five years of diagnosis date (matched follow-up start date for controls) will be calculated in both cases and controls and compared.

Risk of developing an atopic or autoimmune condition will be examined using time to failure analysis. Initially, unadjusted Cox proportional hazards models, stratified by matched set (AA versus non-AA), will be used to provide overall HRs as summary estimates for the association of the presence of AA with the time to each of atopic and autoimmune conditions in separate models. Models will be subsequently adjusted for standard set factors (section 6.1) and comorbidities (hypertension, hyperlipidaemia, T2DM, peripheral arterial disease, atrial fibrillation, angina, myocardial infarction, stroke, heart failure, CKD, chronic obstructive pulmonary disorder (COPD), chronic liver disease, malignancy, dementia, fracture history, depression) in multivariable analysis.

6.2.4 Study 4

Incidence of common infections: Incidence rates of common infections within five years of diagnosis date (matched follow-up start date for controls) will be calculated at both overall and individual infection levels in both cases and controls and compared. : Initially, infection incidence rates in people with and without AA will be estimated by dividing the number of incident common infections by the sum of person-years of follow-up for each cohort over the period of interest. Unadjusted Poisson regression models, stratified by matched set (AA versus controls), will be used to provide overall incident rate ratios as summary estimates for the association between rates of common infections and the presence of AA. Models will subsequently be adjusted for standard set factors (section 6.1) and comorbidities (hypertension, hyperlipidaemia, T2DM, peripheral arterial disease, atrial fibrillation, angina, myocardial infarction, stroke, heart failure, CKD, COPD, chronic liver disease, malignancy, dementia, RA, depression).

6.3 Secondary Objective Analysis

6.2.1 Study 1

Geographical distribution of AA: The geographic distribution of people with AA will be calculated from the disease incidence. The adjusted incident rate ratios will be reported. Models will be adjusted for age category, sex, ethnicity, IMD and geographic area classification derived using patient postcode at the point of data extraction.

6.2.2 Study 2

Stratified prevalence of mental health conditions: The prevalence of mental health conditions (depressive episodes, recurrent depressive disorder and anxiety disorder) by sociodemographic subgroups will also be reported in both cases and controls.

1 **Additional mental health conditions:** The prevalence of additional mental health
2 conditions (adjustment disorder, agoraphobia, self-harm, and overdose/parasuicide
3 attempts) will be estimated as the total percentage of people diagnosed with AA and with
4 the presence of one or more diagnosis codes appearing in the clinical record
5
6

7 **Sick day and unemployment burden:** The burden of sick days will be estimated as the
8 total percentage of people diagnosed with AA and issued one or more Med 3 certificate. The
9 burden of unemployment will be estimated as the total percentage of people diagnosed with
10 AA and with a Read code relating to unemployment recorded in the primary care record or
11 an IB113 or ESA113 form issued.
12
13

14 6.2.3 Study 3

15 Not applicable.
16

17 6.2.4 Study 4

18 Not applicable.
19
20
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24

25 6.4 Sensitivity analysis

26
27
28 Study 2: Sensitivity analyses will be performed to compare the baseline prevalence and
29 incidence over two years post alopecia diagnosis of the three primary mental health
30 conditions (depressive episodes, recurrent depressive disorder and anxiety disorder) in
31 people with non-specific alopecia codes only (i.e. no prior or subsequent codes specifying
32 alopecia type) using the same matching process used for the primary analyses.
33
34

35 Study 3: We will replicate this sensitivity analysis to compare the baseline prevalence and
36 incidence of atopic and autoimmune conditions in people with non-specific alopecia codes
37 only.
38
39

40 Study 4: In the common infections theme, we will use a survival model to investigate time
41 to first infection. We will also compare the results of the study outcomes when 1) we
42 increase the number of cases to include people who develop AA during the follow up and 2)
43 use a similar matching approach to the other studies: perform matching using the time of
44 AA diagnosis and follow for up to five years after diagnosis (or matched date for controls).
45 Both of these approaches will be used to investigate the effect of bias.
46
47
48

49 6.5 Missing data

50 These studies will use the missing indicator variable method as missing data are considered
51 likely not to be missing at random, meaning multiple imputation approaches will lack
52 validity.
53
54

55 Patient will need to be excluded from analyses based on a matched design if they have
56 incomplete data in the fields (age, sex) required to run the matching process. In similar
57 studies, the exclusion rate due to incomplete data has been low (68, 69).
58
59
60

7 Study Limitations

These are discussed in the associated protocol manuscript.

8 Statistical software

All statistical analyses will be performed using R software.

9 Ethics

Study approval will be requested from the Research Committee of the RCGP RSC. These studies do not meet the requirements for formal ethics board review in their current form as defined using the NHS Health Research Authority research decision tool (<http://www.hra-decisiontools.org.uk/research/>).

The study will be conducted in accordance with legal and regulatory requirements, as well as with scientific purpose, value, and rigor and follow generally accepted research practices described in Guidelines for Good Pharmacoepidemiology Practices (GPP) issued by the International Society for Pharmacoepidemiology (ISPE), and Good Epidemiological Practice (GEP) guidelines issued by the International Epidemiological Association (IEA). Study reporting will be conducted in accordance with the relevant EQUATOR (Enhancing the QUALity and Transparency Of health Research) guidelines.

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Additional File 2

The epidemiology, management, and the associated burden of mental health illness, atopic and autoimmune conditions, and common infections in alopecia areata: Protocol for an observational study series

Dr Matthew Harries, Dr Abby Macbeth, Dr Susan Holmes, Professor Andrew R Thompson, Dr Wing Sin Chui, Dr William Romero Gallardo, Professor Andrew G Messenger, Dr Christos Tziotzios, Professor Simon de Lusignan

Codes used to define alopecia areata and related clinical conditions, dermatology referrals, and treatments for alopecia areata which may be issued in primary care

Supplementary table S1.1. Read codes to be used to identify cases of alopecia areata, non-specified alopecia and alternative diagnoses (exclusion diagnoses).

Alopecia Areata		
Read V2 Code	Term ID	Description
M2401	All	Alopecia areata
M240B	All	Alopecia totalis
M240K	All	Alopecia universalis
M240U	All	Ophiasis
Myu62	All	[X]Other alopecia areata
Read CTV3 Code	Term ID	Description
XE1BH	All	Alopecia areata
M240D	All	Ophiasic alopecia areata
M240B	All	Total alopecia areata
X509h	All	Alopecia universalis
X590h	All	Universal alopecia areata
Myu62	All	[x]Other alopecia areata
Non-specific alopecia		
Read V2 Code	Term ID	Description
M240.	All	Alopecia
M2400	All	Alopecia unspecified
M2408	All	Alopecia localis
M2409	All	Alopecia disseminata
M240z	All	Alopecia NOS
22D7.	All	O/E - alopecia
Read CTV3 Code	Term ID	Description
XE2Qa	All	Alopecia
X75wD	All	Partial loss of hair
X509c	All	Non-scarring alopecia
M2409	All	Diffuse alopecia
X509e	All	Circumscribed alopecia
M2408	All	Alopecia localis
M240z	All	Alopecia NOS
XE1BG	All	Alopecia unspecified
XM1YG	All	O/E - alopecia

XE1h9	All	O/E - patches of alopecia
Scarring alopecia		
Read V2 Code	Term ID	Description
M240Q	All	Pseudopelade
M147.	All	Erosive pustular dermatosis of the scalp
M24X.	All	Cicatricial alopecia, unspecified
M240R	All	Lichen planopilaris
M240P	All	Alopecia mucinosa
M2yF.	All	Follicular mucinosis
M240S	All	Folliculitis decalvans
M240T	All	Folliculitis ulerythematososa reticulata
X7055	All	Linear morphoea
M2440	All	Dissecting cellulitis of scalp
M261K	All	Acne keloidalis
M261J	All	Acne necrotica
M2448	All	Perifolliculitis capitis abscedens
M2447	All	Perifolliculitis of scalp
Read CTV3 Code	Term ID	Description
X509i	All	Scarring alopecia
X509i	All	Cicatricial alopecia
X50Eo	All	Lipoedematous alopecia
X509j	All	Alopecia parvimaclata
X509k	All	Pseudopelade
X509l	All	Tufted folliculitis
X509m	All	Erosive pustular dermatosis of the scalp
X509n	All	Traumatic alopecia
M240C	All	Alopecia follicularis
Myu65	All	[X]Other cicatricial alopecia
Myu6E	All	[X]Cicatricial alopecia, unspecified
X507b	All	Lichen planopilaris
X507i	All	Lichen planopilaris of scalp
X50Ff	All	Alopecia mucinosa
XaQbR	All	Follicular mucinosis
X500w	All	Folliculitis decalvans
X5076	All	Keratosis pilaris decalvans
M21y5	All	Folliculitis ulerythematososa reticulata
X500x	All	Folliculitis keloidalis
M2104	All	Linear scleroderma
M2440	All	Folliculitis abscedens et suffodiens
X50Es	All	Acne necrotica
X50Eq	All	Keloidalis nuchae
M2440	All	Dissecting cellulitis of scalp
M2448	All	Perifolliculitis capitis abscedens

M2447	All	Perifolliculitis of scalp
Congenital alopecia		
Read V2 Code	Term ID	Description
PH40.	All	Congenital alopecia
PH400	All	Congenital alopecia, unspecified
PH401	All	Congenital localised alopecia
PH402	All	Congenital generalised alopecia
PH40z	All	Congenital alopecia NOS
Read CTV3 Code	Term ID	Description
XE1MR	All	Congenital alopecia
X78De	All	Total congenital alopecia
X78Df	All	Congenital alopecia with keratin cysts
PH401	All	Congenital localised alopecia
PH40z	All	Congenital alopecia NOS
XE1MS	All	Congenital generalised alopecia
PH400	All	Congenital alopecia, unspecified
Traction or traumatic alopecia		
Read V2 Code	Term ID	Description
M240V	All	Traction alopecia
Read CTV3 Code	Term ID	Description
Ua1AS	All	Traction alopecia
X509n	All	Traumatic alopecia
X503h	All	Friction alopecia
Androgenetic alopecia		
Read V2 Code	Term ID	Description
M2402	All	Male pattern alopecia
M2403	All	Frontal alopecia of women
7G140	All	Hair bearing skin flap to scalp for male pattern baldness
7G1E.	All	Hair bearing graft of skin to scalp for male pattern baldness
7G1E0	All	Hair bearing punch graft to scalp for male pattern baldness
7G1E1	All	Hair bearing strip graft to scalp for male pattern baldness
7G1E2	All	Hair bearing graft to scalp for male pattern baldness NEC
Read CTV3 Code	Term ID	Description
M2402	Y50P7	Androgenetic alopecia
M2402	Y50P8	Male pattern alopecia
M2402	Y57P9	Male pattern baldness
M2402	Y57PA	Pattern baldness
M2403	All	Frontal alopecia of women
X509f	All	Involutional alopecia
7G140	All	Hair bearing skin flap to scalp for male pattern baldness

7G1E0	All	Hair bearing punch graft to scalp for male pattern baldness
XM1JM	All	Hair bearing graft of skin to scalp for male pattern baldness
7G1E2	All	Hair bearing graft to scalp for male pattern baldness NEC
7G1E1	All	Hair bearing strip graft to scalp for male pattern baldness
Telogen effluvium		
Read V2 Code	Term ID	Description
M240M	All	Telogen effluvium
Read CTV3 Code	Term ID	Description
X509q	All	Telogen effluvium
Anagen effluvium		
Read V2 Code	Term ID	Description
M240N	All	Anagen effluvium
Read CTV3 Code	Term ID	Description
M240N	All	Anagen effluvium
Tinea capitis		
Read V2 Code	Term ID	Description
AB00.	00	Dermatophytosis of scalp or beard
AB00.	11	Kerion
AB000	00	Dermatophytosis of scalp
AB000	11	Tinea Capitis
AB00z	00	Dermatophytosis of scalp or beard NOS
Read CTV3 Code	Term ID	Description
AB000	All	Tinea capitis
AB000	Y71oW	Scalp ringworm
AB000	Y71oX	Dermatophytosis of scalp
AB000	Y71oY	Tinea capitis
AB000	Y71oZ	Black dot ringworm
AB000	Y71od	Tinea tonsurans
AB000	Ya6oA	Tinea of the scalp
X70QN	All	Favus
X70QN	Y71ob	Favus
X70QN	Y71oc	Tinea favosa
X70QM	All	Suppurative ringworm
XE0SA	All	Dermatophytosis of scalp or beard
AB00z	All	Dermatophytosis of scalp or beard NOS
Secondary syphilis		
Read V2 Code	Term ID	Description
A913.	All	Secondary syphilis of skin or mucus membranes
A9133	All	Secondary syphilis of skin
A913z	All	Secondary syphilis of skin or mucus membranes NOS

A9181	All	Syphilitic alopecia
Read CTV3 Code	Term ID	Description
A913.	All	Secondary syphilis of skin and mucous membrane
A9133	All	Secondary syphilis of skin
A913z	All	Secondary syphilis of skin or mucus membranes NOS
A9181	All	Syphilitic alopecia
Trichotillomania		
Read V2 Code	Term ID	Description
Eu633	All	[X]Trichotillomania
Read CTV3 Code	Term ID	Description
Eu633	All	Trichotillomania

Supplementary table S1.2. Read codes to identify the extent of alopecia. The extent of disease will be considered to be that of the category recorded with the greatest extent

Alopecia Areata (Category: Localised)		
Read V2 Code	Term ID	Description
M2401	All	Alopecia areata
M240U	All	Ophiasis
Myu62	All	[X]Other alopecia areata
Read CTV3 Code	Term ID	Description
XE1BH	All	Alopecia areata
M240D	All	Ophiasic alopecia areata
Myu62	All	[x]Other alopecia areata
Alopecia Areata (Category: Totalis)		
Read V2 Code	Term ID	Description
M240B	All	Alopecia totalis
Read CTV3 Code	Term ID	Description
M240B	All	Total alopecia areata
Alopecia Areata (Category: Universalis)		
Read V2 Code	Term ID	Description
M240K	All	Alopecia universalis
Read CTV3 Code	Term ID	Description
X509h	All	Alopecia universalis
X590h	All	Universal alopecia areata

Supplementary table S1.3. Read codes to identify dermatology referrals.

Dermatology referrals		
Read V2 Code	Term ID	Description
8HJD.	All	Dermatology self-referral
8H43.	All	Dermatological referral
8H4S.	All	Referral to dermatology special interest general practitioner
8HHX.	All	Referral to dermatology nurse specialist
8HVI.	All	Private referral to dermatologist
8Hkq.	All	Referral to community dermatology service
8Hm0.	All	Referral to dermatology clinical assessment service
8HM3.	All	Listed for Dermatology admisn
8H3I.	All	Non-urgent dermatology admisn.
8HIJ4	All	Internal practice dermatology referral
8TOD.	All	Referral to paediatric dermatology service
Read CTV3 Code	Term ID	Description
8H43.	All	Dermatological referral
XaZJ0	All	Referral to teledermatology service
XaXsX	All	Referral to community dermatology service
8HJD.	All	Dermatology self-referral
XaBTS	All	Referral to dermatologist
8HVI.	All	Private referral to dermatologist
Xaaln	All	Internal practice dermatology referral
XaKCB	All	Referral to dermatology nurse specialist
XaXsX	All	Referral to community dermatology service
Xaacp	All	Referral to paediatric dermatology service
XaAeq	All	Referral for dermatology domiciliary visit
XaLqL	All	Referral to dermatology special interest general practitioner
XaQKh	All	Referral to dermatology clinical assessment service
8HK3.	All	Dermatology D.V. requested
XaAeq	All	Referral for dermatology DV

Supplementary table S1.4. Medications which may be issued in primary care for the treatment of alopecia areata.

* topical steroids will be grouped by potency; mild, moderate, potent, and very potent.

Medication group	Examples
Topical steroids*	Hydrocortisone, Bethamethasone, Fluocinolone acetonide, Clobetasol proprionate, Clobetasone butyrate, Mometasone
Minoxidil	Minoxidil
Systemic steroids	Prednisolone
Dithranol	Dithranol

Codes used to identify mental health conditions and treatments

Supplementary table S2.1. Algorithms used to identify anxiety (non-phobia related anxiety disorder), depression episodes, recurrent major depression, agoraphobia, adjustment disorder self-harm and parasuicide.

Expressions in capitals equate to Boolean expressions. *More than 1 year ago. SSRIs = selective serotonin reuptake inhibitors, TCA = tricyclic antidepressants, MAOI = monoamine oxidase inhibitors, CBT = cognitive behavioural therapy.

Clinical entity	ICD 10 code	Definition
Depressive episodes	F32	Any coded depressive episode (Supplementary table S2.2) AND concurrent treatment for depression
Recurrent depressive disorder	F33	(Any historical code* for a depressive episode [table S2.2] AND current treatment for depression) OR Any code for recurrent depressive disorder (Supplementary table S2.3)
Anxiety disorder	F41	Any coded anxiety episode (Supplementary table S2.4) AND concurrent treatment for anxiety
Adjustment disorder	F43.2	Any diagnosis code for adjustment disorder (Supplementary table S2.5)
Agoraphobia	F40.0	Any diagnosis code for agoraphobia (Supplementary table S2.6)
Self-harm	NA	Any diagnosis code or other strongly indicative code for self-harm (Supplementary table S2.7)
Parasuicide	NA	Any diagnosis code or other strongly indicative code for parasuicide including overdose (Supplementary tables S2.8 and S2.9)
Depression treatments	NA	SSRIs, TCAs, MAOIs, counselling, CBT, and psychotherapy (Supplementary table S2.10)
Anxiety treatments	NA	SSRIs, anxiolytics, counselling, CBT, and psychotherapy (Supplementary table S2.10)

Supplementary table S2.2. Read codes used to identify depression episodes.

Depression episodes		
Read V2 Code	Term ID	Description
E0013	All	Presenile dementia with depression
E0021	All	Senile dementia with depression
E112.	All	Single major depressive episode
E1120	All	Single major depressive episode, unspecified
E1121	All	Single major depressive episode, mild
E1122	All	Single major depressive episode, moderate
E1123	All	Single major depressive episode, severe, without mention of psychosis
E1124	All	Single major depressive episode, severe, with psychosis
E1125	All	Single major depressive episode, in partial or unspecified remission
E1126	All	Single major depressive episode, in full remission
E112z	All	Single major depressive episode NOS
E113.	All	Recurrent major depressive episode
E1130	All	Recurrent major depressive episodes, unspecified
E1131	All	Recurrent major depressive episodes, mild
E1132	All	Recurrent major depressive episodes, moderate
E1133	All	Recurrent major depressive episodes, severe, without mention of psychosis
E1134	All	Recurrent major depressive episodes, severe, with psychosis
E1137	All	Recurrent depressive disorder
E113z	All	Recurrent major depressive episode NOS
E118.	All	Seasonal affective disorder
E11y2	All	Atypical depressive disorder
E11z2	All	Masked depression
E130.	All	Reactive depressive psychosis
E135.	All	Agitated depression
E2003	All	Anxiety with depression
E291.	All	Prolonged depressive reaction
E2B..	All	Depressive disorder NEC
E2B1.	All	Chronic depression
E2B0.	All	Postviral depression
Eu204	All	[X]Post-schizophrenic depression
Eu251	All	[X]Schizoaffective disorder, depressive type
Eu32.	All	[X]Depressive episode
Eu320	All	[X]Mild depressive episode
Eu321	All	[X]Moderate depressive episode
Eu322	All	[X]Severe depressive episode without psychotic symptoms
Eu323	All	[X]Severe depressive episode with psychotic symptoms
Eu324	All	[X]Mild depression
Eu325	All	[X]Major depression, mild
Eu326	All	[X]Major depression, moderately severe

E1136	All	Recurrent major depressive episodes, in full remission
E113z	All	Recurrent major depressive episode NOS
X00SU	All	Masked depression
E11y2	All	Atypical depressive disorder
X00S8	All	Post-schizophrenic depression
XSEGJ	All	Major depressive disorder
XSKr7	All	Cotard syndrome
XSGol	All	Moderate major depression
XSGok	All	Mild major depression
XSGom	All	Severe major depression without psychotic features
XSGon	All	Severe major depression with psychotic features
E1137	All	Recurrent depressive disorder
E130.	All	Reactive depressive psychosis
E2B..	All	Depressive disorder NEC
E2B0.	All	Postviral depression
E2B1.	All	Chronic depression
Eu320	All	[X]Mild depressive episode
Eu321	All	[X]Moderate depressive episode
Eu331	All	[X]Recurrent depressive disorder, current episode moderate
XE1Y1	All	Recurrent major depressive episodes
XE1ZY	All	[X]Severe depressive episode without psychotic symptoms
XE1ZZ	All	[X]Severe depressive episode with psychotic symptoms
XE1Za	All	[X]Other depressive episodes
XE1Zb	All	[X]Depressive episode, unspecified
XE1Zd	All	[X]Recurrent depressive disorder, current episode severe without psychotic symptoms
XE1Ze	All	[X]Recurrent depressive disorder, current episode severe with psychotic symptoms
XE1Zf	All	[X]Recurrent depressive disorder, unspecified
XaB9J	All	Depression NOS
XaCHr	All	[X] Single episode agitated depression without psychotic symptoms
XaCHs	All	[X] Single episode major depression without psychotic symptoms
XaCIs	All	Mild depression
XaCIt	All	Moderate depression
XaCIu	All	Severe depression
E0013	All	Presenile dementia with depression
E0021	All	Senile dementia with depression

Supplementary table S2.3. Read codes used to identify a diagnosis of recurrent major depression.

Recurrent major depression		
Read V2 Code	Term ID	Description
E113.	All	Recurrent major depressive episode
E1130	All	Recurrent major depressive episodes, unspecified
E1131	All	Recurrent major depressive episodes, mild
E1132	All	Recurrent major depressive episodes, moderate
E1133	All	Recurrent major depressive episodes, severe, without mention of psychosis
E1134	All	Recurrent major depressive episodes, severe, with psychosis
E1135	All	Recurrent major depressive episodes, in partial or unspecified remission
E1136	All	Recurrent major depressive episodes, in full remission
E1137	All	Recurrent depressive disorder
E113z	All	Recurrent major depressive episode NOS
E2B1.	All	Chronic depression
Eu32A	All	[X]Recurrent major depressive episodes, severe, with psychosis, psychosis in remission
Eu33.	All	[X]Recurrent depressive disorder
Eu330	All	[X]Recurrent depressive disorder, current episode mild
Eu331	All	[X]Recurrent depressive disorder, current episode moderate
Eu332	All	[X]Recurrent depressive disorder, current episode severe without psychotic symptoms
Eu333	All	[X]Recurrent depressive disorder, current episode severe with psychotic symptoms
Eu334	All	[X]Recurrent depressive disorder, currently in remission
Eu33y	All	[X]Other recurrent depressive disorders
Eu33z	All	[X]Recurrent depressive disorder, unspecified
Read CTV3 Code	Term ID	Description
Xa0wV	All	Recurrent brief depressive disorder
XM1GC	All	Endogenous depression - recurrent
E1130	All	Recurrent major depressive episodes, unspecified
E1131	All	Recurrent major depressive episodes, mild
E1132	All	Recurrent major depressive episodes, moderate
E1133	All	Recurrent major depressive episodes, severe, without mention of psychosis
E1134	All	Recurrent major depressive episodes, severe, with psychosis
XaX54	All	Recurrent major depressive episodes, severe, with psychosis, psychosis in remission
E1135	All	Recurrent major depressive episodes, in partial or unspecified remission
E1136	All	Recurrent major depressive episodes, in full remission
E113z	All	Recurrent major depressive episode NOS
E1137	All	Recurrent depressive disorder

E2B1.	All	Chronic depression
Eu331	All	[X]Recurrent depressive disorder, current episode moderate
XE1Y1	All	Recurrent major depressive episodes
XE1Zd	All	[X]Recurrent depressive disorder, current episode severe without psychotic symptoms
XE1Ze	All	[X]Recurrent depressive disorder, current episode severe with psychotic symptoms
XE1Zf	All	[X]Recurrent depressive disorder, unspecified

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Supplementary table S2.4. Read codes used to identify anxiety episodes.

Anxiety episode		
Read V2 Code	Term ID	Description
E200.	All	Anxiety states
E2000	All	Anxiety state unspecified
E2001	All	Panic disorder
E2002	All	Generalised anxiety disorder
E2003	All	Anxiety with depression
E2004	All	Chronic anxiety
E2005	All	Recurrent anxiety
E200z	All	Anxiety state NOS
Eu41.	All	[X]Other anxiety disorders
Eu410	All	[X]Panic disorder [episodic paroxysmal anxiety]
Eu411	All	[X]Generalized anxiety disorder
Eu412	All	[X]Mixed anxiety and depressive disorder
Eu413	All	[X]Other mixed anxiety disorders
Eu41y	All	[X]Other specified anxiety disorders
Eu41z	All	[X]Anxiety disorder, unspecified
Read CTV3 Code	Term ID	Description
E200.	All	Anxiety disorder
XE1Y7	All	Panic disorder
Eu410	All	[X]Panic disorder [episodic paroxysmal anxiety]
E2002	All	Generalised anxiety disorder
X00Sb	All	Mixed anxiety and depressive disorder
X00RP	All	Organic anxiety disorder
E2004	All	Chronic anxiety
E2005	All	Recurrent anxiety
E200z	All	Anxiety state NOS
X00Sc	All	Anxiety hysteria
Eu41.	All	[X]Other anxiety disorders
Eu413	All	[X]Other mixed anxiety disorders
Eu41z	All	[X]Anxiety disorder, unspecified
XE1Zj	All	[X]Other specified anxiety disorders

Supplementary table S2.5. Read codes used to identify adjustment disorder.

Adjustment disorder		
Read V2 Code	Term ID	Description
E29..	All	Adjustment reaction
E290.	All	Brief depressive reaction
E2900	All	Grief reaction
E290z	All	Brief depressive reaction NOS
E291.	All	Prolonged depressive reaction
E292.	All	Adjustment reaction with predominant disturbance of other emotions
E2924	All	Adjustment reaction with anxious mood
E292y	All	Adjustment reaction with mixed disturbance of emotion
E292z	All	Adjustment reaction with disturbance of other emotion NOS
E293.	All	Adjustment reaction with predominant disturbance of conduct
E2930	All	Adjustment reaction with aggression
E2931	All	Adjustment reaction with antisocial behaviour
E2932	All	Adjustment reaction with destructiveness
E293z	All	Adjustment reaction with predominant disturbance of conduct NOS
E294.	All	Adjustment reaction with mixed disturbance of emotion and conduct
E29y.	All	Other adjustment reactions
E29y2	All	Adjustment reaction with physical symptoms
E29y3	All	Elective mutism due to an adjustment reaction
E29y5	All	Other adjustment reaction with withdrawal
E29yz	All	Other adjustment reactions NOS
E29z.	All	Adjustment reaction NOS
Read CTV3 Code	Term ID	Description
E29..	All	Adjustment disorder
E290.	All	Brief depressive adjustment reaction
E290z	All	Brief depressive reaction NOS
E291.	All	Prolonged depressive adjustment reaction
E2924	All	Adjustment reaction with anxious mood
E292y	All	Adjustment reaction with mixed disturbance of emotion
E293.	All	Adjustment reaction with predominant disturbance of conduct
E2930	All	Adjustment reaction with aggression
E2931	All	Adjustment reaction with antisocial behaviour
E2932	All	Adjustment reaction with destructiveness
E293z	All	Adjustment reaction with predominant disturbance of conduct NOS
E294.	All	Adjustment reaction with mixed disturbance of emotion and conduct
E292.	All	Adjustment reaction with predominant disturbance of other emotions
E292z	All	Adjustment reaction with disturbance of other emotion NOS
E29y.	All	Other adjustment reactions

E29yz	All	Other adjustment reactions NOS
E29y2	All	Adjustment reaction with physical symptoms
E29y3	All	Elective mutism due to an adjustment reaction
E29y5	All	Other adjustment reaction with withdrawal
E29z.	All	Adjustment reaction NOS

For peer review only

Supplementary table S2.6. Read codes used to identify agoraphobia.

Agoraphobia		
Read V2 Code	Term ID	Description
Eu400	All	[X]Agoraphobia
E2021	All	Agoraphobia with panic attacks
Eu400	All	[X]Panic disorder with agoraphobia
E2022	All	Agoraphobia without mention of panic attacks
Eu400	All	[X]Agoraphobia without history of panic disorder
E2029	All	Fear of crowds
Read CTV3 Code	Term ID	Description
X00SV	All	Agoraphobia
E2021	All	Agoraphobia with panic attacks
E2022	All	Agoraphobia without mention of panic attacks
XaK2c	All	H/O: agoraphobia
XaY00	All	Mobility inventory for agoraphobia
XaYS1	All	Mobility inventory for agoraphobia when alone score
XaYS0	All	Mobility inventory for agoraphobia when accompanied score
X00SV	All	Phobia of going out

Supplementary table S2.7. Read codes used to identify self-harm.

Self-harm		
Read V2 Code	Term ID	Description
U2...	All	[X]Intentional self-harm
U2E..	All	[X]Self mutilation
U2y..	All	[X]Intentional self harm by other specified means
U2y1.	All	[X]Intentional self harm by other specified means, occurrence in residential institution
U2y2.	All	[X]Intentional self harm by other specified means, occurrence at school, other institution and public administrative area
U2y3.	All	[X]Intentional self harm by other specified means, occurrence at sports and athletics area
U2y4.	All	[X]Intentional self harm by other specified means, occurrence on street and highway
U2y5.	All	[X]Intentional self harm by other specified means, occurrence at trade and service area
U2y6.	All	[X]Intentional self harm by other specified means, occurrence at industrial and construction area
U2y7.	All	[X]Intentional self harm by other specified means, occurrence on farm
U2yy.	All	[X]Intentional self harm by other specified means, occurrence at other specified place
U2yz.	All	[X]Intentional self harm by other specified means, occurrence at unspecified place
U2z..	All	[X]Intentional self harm by unspecified means
U2z..	All	[X]Intentional self harm by unspecified means
U2z0.	All	[X]Intentional self harm by unspecified means, occurrence at home
U2z1.	All	[X]Intentional self harm by unspecified means, occurrence in residential institution
U2z2.	All	[X]Intentional self harm by unspecified means, occurrence at school, other institution and public administrative area
U2z3.	All	[X]Intentional self harm by unspecified means, occurrence at sports and athletics area
U2z4.	All	[X]Intentional self harm by unspecified means, occurrence on street and highway
U2z5.	All	[X]Intentional self harm by unspecified means, occurrence at trade and service area
U2z6.	All	[X]Intentional self harm by unspecified means, occurrence at industrial and construction area
U2z7.	All	[X]Intentional self harm by unspecified means, occurrence on farm
U2zy.	All	[X]Intentional self harm by unspecified means, occurrence at other specified place
U2zz.	All	[X]Intentional self harm by unspecified means, occurrence at unspecified place
146B.	All	H/O: deliberate self harm
ZV1B2	All	[V]Personal history of self-harm
U720.	All	[X]Sequelae of intentional self-harm
TK601	All	Self inflicted lacerations to wrist
U26..	All	[X]Intentional self harm by explosive material

U260.	All	[X]Intentional self harm by explosive material, occurrence at home
U261.	All	[X]Intentional self harm by explosive material, occurrence in residential institution
U262.	All	[X]Intentional self harm by explosive material, occurrence at school, other institution and public administrative area
U263.	All	[X]Intentional self harm by explosive material, occurrence at sports and athletics area
U264.	All	[X]Intentional self harm by explosive material, occurrence on street and highway
U265.	All	[X]Intentional self harm by explosive material, occurrence at trade and service area
U266.	All	[X]Intentional self harm by explosive material, occurrence at industrial and construction area
U267.	All	[X]Intentional self harm by explosive material, occurrence on farm
U26y.	All	[X]Intentional self harm by explosive material, occurrence at other specified place
U26z.	All	[X]Intentional self harm by explosive material, occurrence at unspecified place
U27..	All	[X]Intentional self harm by smoke, fire and flames
U270.	All	[X]Intentional self harm by smoke, fire and flames, occurrence at home
U271.	All	[X]Intentional self harm by smoke, fire and flames, occurrence in residential institution
U272.	All	[X]Intentional self harm by smoke, fire and flames, occurrence at school, other institution and public administrative area
U273.	All	[X]Intentional self harm by smoke, fire and flames, occurrence at sports and athletics area
U274.	All	[X]Intentional self harm by smoke, fire and flames, occurrence on street and highway
U275.	All	[X]Intentional self harm by smoke, fire and flames, occurrence at trade and service area
U276.	All	[X]Intentional self harm by smoke, fire and flames, occurrence at industrial and construction area
U277.	All	[X]Intentional self harm by smoke, fire and flames, occurrence on farm
U27y.	All	[X]Intentional self harm by smoke, fire and flames, occurrence at other specified place
U27z.	All	[X]Intentional self harm by smoke, fire and flames, occurrence at unspecified place
U28..	All	[X]Intentional self harm by steam, hot vapours and hot objects
U280.	All	[X]Intentional self harm by steam, hot vapours and hot objects, occurrence at home
U281.	All	[X]Intentional self harm by steam, hot vapours and hot objects, occurrence in residential institution
U282.	All	[X]Intentional self harm by steam, hot vapours and hot objects, occurrence at school, other institution and public administrative area
U283.	All	[X]Intentional self harm by steam, hot vapours and hot objects, occurrence at sports and athletics area
U284.	All	[X]Intentional self harm by steam, hot vapours and hot objects, occurrence on street and highway

U285.	All	[X]Intentional self harm by steam, hot vapours and hot objects, occurrence at trade and service area
U286.	All	[X]Intentional self harm by steam, hot vapours and hot objects, occurrence at industrial and construction area
U287.	All	[X]Intentional self harm by steam, hot vapours and hot objects, occurrence on farm
U28y.	All	[X]Intentional self harm by steam, hot vapours and hot objects, occurrence at other specified place
U28z.	All	[X]Intentional self harm by steam, hot vapours and hot objects, occurrence at unspecified place
U29..	All	[X]Intentional self harm by sharp object
U290.	All	[X]Intentional self harm by sharp object, occurrence at home
U291.	All	[X]Intentional self harm by sharp object, occurrence in residential institution
U292.	All	[X]Intentional self harm by sharp object, occurrence at school, other institution and public administrative area
U293.	All	[X]Intentional self harm by sharp object, occurrence at sports and athletics area
U294.	All	[X]Intentional self harm by sharp object, occurrence on street and highway
U295.	All	[X]Intentional self harm by sharp object, occurrence at trade and service area
U296.	All	[X]Intentional self harm by sharp object, occurrence at industrial and construction area
U297.	All	[X]Intentional self harm by sharp object, occurrence on farm
U2A..	All	[X]Intentional self harm by blunt object
U2A0.	All	[X]Intentional self harm by blunt object, occurrence at home
U2A1.	All	[X]Intentional self harm by blunt object, occurrence in residential institution
U2A2.	All	[X]Intentional self harm by blunt object, occurrence at school, other institution and public administrative area
U2A3.	All	[X]Intentional self harm by blunt object, occurrence at sports and athletics area
U2A4.	All	[X]Intentional self harm by blunt object, occurrence on street and highway
U2A5.	All	[X]Intentional self harm by blunt object, occurrence at trade and service area
U2A6.	All	[X]Intentional self harm by blunt object, occurrence at industrial and construction area
U2A7.	All	[X]Intentional self harm by blunt object, occurrence on farm
U2Ay.	All	[X]Intentional self harm by blunt object, occurrence at other specified place
U2Az.	All	[X]Intentional self harm by blunt object, occurrence at unspecified place
Read CTV3 Code	Term ID	Description
XE22H	All	Suicide and self harm
X71BH	All	Self injury by cigarette burn
XE22K	All	Self injury with external chemical burn
Xa0EN	All	Self inflicted injury
ZV1B2	All	[V]Personal history of self-harm

XaF9U	All	H/O: deliberate self harm
U2A..	All	[X]Intentional self harm by blunt object
U2A0.	All	[X]Intentional self harm by blunt object, occurrence at home
U2A1.	All	[X]Intentional self harm by blunt object, occurrence in residential institution
U2A2.	All	[X]Intentional self harm by blunt object, occurrence at school, other institution and public administrative area
U2A3.	All	[X]Intentional self harm by blunt object, occurrence at sports and athletics area
U2A4.	All	[X]Intentional self harm by blunt object, occurrence on street and highway
U2A5.	All	[X]Intentional self harm by blunt object, occurrence at trade and service area
U2A6.	All	[X]Intentional self harm by blunt object, occurrence at industrial and construction area
U2A7.	All	[X]Intentional self harm by blunt object, occurrence on farm
U2Ay.	All	[X]Intentional self harm by blunt object, occurrence at other specified place
U2Az.	All	[X]Intentional self harm by blunt object, occurrence at unspecified place
U29..	All	[X]Intentional self harm by sharp object
U290.	All	[X]Intentional self harm by sharp object, occurrence at home
U291.	All	[X]Intentional self harm by sharp object, occurrence in residential institution
U292.	All	[X]Intentional self harm by sharp object, occurrence at school, other institution and public administrative area
U293.	All	[X]Intentional self harm by sharp object, occurrence at sports and athletics area
U294.	All	[X]Intentional self harm by sharp object, occurrence on street and highway
U295.	All	[X]Intentional self harm by sharp object, occurrence at trade and service area
U296.	All	[X]Intentional self harm by sharp object, occurrence at industrial and construction area
U297.	All	[X]Intentional self harm by sharp object, occurrence on farm
U29y.	All	[X]Intentional self harm by sharp object, occurrence at other specified place
U29z.	All	[X]Intentional self harm by sharp object, occurrence at unspecified place
XE22i	All	[X]Intentional self harm by self mutilation
X766K	All	Deliberate self-harm
X766U	All	Biting self
X766R	All	Biting own hand
Xa2zx	All	Biting own fingers
Xa2zy	All	Biting own toes
Xa2o5	All	Biting own arm
Xa2p5	All	Burning self
X766V	All	Cutting self
XaBA0	All	Cutting own wrists

1			
2			
3			
4	Ua1A4	All	Cutting own throat
5	Xa2pE	All	Damaging own wounds
6	Xa2pF	All	Reopening scars
7	Xa2pH	All	Poking fingers into wound
8			
9	XaAxe	All	Inserting objects into wound
10	Xa2ny	All	Gouging own body parts
11	Xa2nz	All	Gouging own flesh
12			
13	Xa2o0	All	Gouging own eyes
14	Xa2o1	All	Gouging own rectum
15	Xa30D	All	Gouging own vagina
16	E2731	All	Head-banging
17			
18	Xa2o2	All	Banging own head against object
19	Xa2o3	All	Banging own head against own body parts
20	Xa2pI	All	Hitting self
21	Xa2pJ	All	Punching self
22	Xa2pK	All	Slapping self
23			
24	X766S	All	Head-hitting
25	Xa2p3	All	Inserting foreign bodies into own orifices
26	Ua14Q	All	Self-electrocution
27	Xa2pQ	All	Nipping self
28	Xa2pM	All	Picking own skin
29	Xa2pR	All	Pinching self
30	Xa2pN	All	Rubbing own skin
31			
32	X766T	All	Scratches self
33	Xa303	All	Self-scalding
34	Ua14N	All	Self-incineration
35	X766L	All	Self-mutilation
36	X766M	All	Self-mutilation of hands
37			
38	Xa2nl	All	Self-mutilation of genitalia
39	X766N	All	Self-mutilation of penis
40	X766O	All	Self-mutilation of eyes
41	Xa2nm	All	Enucleation of own eyes
42	X766P	All	Self-mutilation of ears
43	Xa2no	All	Self-inducing a prolapse
44	Xa2nq	All	Breaking own bones
45	Xa2nr	All	Pulling own teeth out
46	Xa2nt	All	Eating own flesh
47	Xa2nv	All	Stripping own skin
48	U2E..	All	[X]Self mutilation
49	X766W	All	Swallowing objects
50	Xa2p2	All	Swallowing substances
51	X766Q	All	Self-inflicted skin problems
52	XE22c	All	[X]Intentional self-harm
53	U26..	All	[X]Intentional self harm by explosive material
54	U260.	All	[X]Intentional self harm by explosive material, occurrence at home
55			
56			
57			
58			
59			
60			

U261.	All	[X]Intentional self harm by explosive material, occurrence in residential institution
U262.	All	[X]Intentional self harm by explosive material, occurrence at school, other institution and public administrative area
U263.	All	[X]Intentional self harm by explosive material, occurrence at sports and athletics area
U264.	All	[X]Intentional self harm by explosive material, occurrence on street and highway
U265.	All	[X]Intentional self harm by explosive material, occurrence at trade and service area
U266.	All	[X]Intentional self harm by explosive material, occurrence at industrial and construction area
U267.	All	[X]Intentional self harm by explosive material, occurrence on farm
U26y.	All	[X]Intentional self harm by explosive material, occurrence at other specified place
U26z.	All	[X]Intentional self harm by explosive material, occurrence at unspecified place
U27..	All	[X]Intentional self harm by smoke, fire and flames
U270.	All	[X]Intentional self harm by smoke, fire and flames, occurrence at home
U271.	All	[X]Intentional self harm by smoke, fire and flames, occurrence in residential institution
U272.	All	[X]Intentional self harm by smoke, fire and flames, occurrence at school, other institution and public administrative area
U273.	All	[X]Intentional self harm by smoke, fire and flames, occurrence at sports and athletics area
U274.	All	[X]Intentional self harm by smoke, fire and flames, occurrence on street and highway
U275.	All	[X]Intentional self harm by smoke, fire and flames, occurrence at trade and service area
U276.	All	[X]Intentional self harm by smoke, fire and flames, occurrence at industrial and construction area
U277.	All	[X]Intentional self harm by smoke, fire and flames, occurrence on farm
U27y.	All	[X]Intentional self harm by smoke, fire and flames, occurrence at other specified place
U27z.	All	[X]Intentional self harm by smoke, fire and flames, occurrence at unspecified place
U28..	All	[X]Intentional self harm by steam, hot vapours and hot objects
U280.	All	[X]Intentional self harm by steam, hot vapours and hot objects, occurrence at home
U281.	All	[X]Intentional self harm by steam, hot vapours and hot objects, occurrence in residential institution
U282.	All	[X]Intentional self harm by steam, hot vapours and hot objects, occurrence at school, other institution and public administrative area
U283.	All	[X]Intentional self harm by steam, hot vapours and hot objects, occurrence at sports and athletics area
U284.	All	[X]Intentional self harm by steam, hot vapours and hot objects, occurrence on street and highway
U285.	All	[X]Intentional self harm by steam, hot vapours and hot objects, occurrence at trade and service area

U286.	All	[X]Intentional self harm by steam, hot vapours and hot objects, occurrence at industrial and construction area
U287.	All	[X]Intentional self harm by steam, hot vapours and hot objects, occurrence on farm
U28y.	All	[X]Intentional self harm by steam, hot vapours and hot objects, occurrence at other specified place
U28z.	All	[X]Intentional self harm by steam, hot vapours and hot objects, occurrence at unspecified place
U29..	All	[X]Intentional self harm by sharp object
U290.	All	[X]Intentional self harm by sharp object, occurrence at home
U291.	All	[X]Intentional self harm by sharp object, occurrence in residential institution
U292.	All	[X]Intentional self harm by sharp object, occurrence at school, other institution and public administrative area
U293.	All	[X]Intentional self harm by sharp object, occurrence at sports and athletics area
U294.	All	[X]Intentional self harm by sharp object, occurrence on street and highway
U295.	All	[X]Intentional self harm by sharp object, occurrence at trade and service area
U296.	All	[X]Intentional self harm by sharp object, occurrence at industrial and construction area
U297.	All	[X]Intentional self harm by sharp object, occurrence on farm
U2A..	All	[X]Intentional self harm by blunt object
U2A0.	All	[X]Intentional self harm by blunt object, occurrence at home
U2A1.	All	[X]Intentional self harm by blunt object, occurrence in residential institution
U2A2.	All	[X]Intentional self harm by blunt object, occurrence at school, other institution and public administrative area
U2A3.	All	[X]Intentional self harm by blunt object, occurrence at sports and athletics area
U2A4.	All	[X]Intentional self harm by blunt object, occurrence on street and highway
U2A5.	All	[X]Intentional self harm by blunt object, occurrence at trade and service area
U2A6.	All	[X]Intentional self harm by blunt object, occurrence at industrial and construction area
U2A7.	All	[X]Intentional self harm by blunt object, occurrence on farm
U2Ay.	All	[X]Intentional self harm by blunt object, occurrence at other specified place
U2Az.	All	[X]Intentional self harm by blunt object, occurrence at unspecified place

Supplementary table S2.8. Read codes used to identify parasuicide.

Parasuicide		
Read V2 Code	Term ID	Description
U21..	All	[X]Intent self harm by hanging, strangulation/suffocation
U210.	All	[X]Int self harm by hanging, strangulation/suffocation occ home
U211.	All	[X]Intent self harm by hanging, strangulation/suffocation at res institut
U212.	All	[X]Int self harm by hanging, strangulation/suffocation in school/pub admin area
U213.	All	[X]Intent self harm by hanging, strangulation/suffocation in sport/athletic area
U214.	All	[X]Int self harm by hanging, strangulation/suffocation in street/highway
U215.	All	[X]Intent self harm by hanging, strangulation/suffocation trade/service area
U216.	All	[X]Int self harm by hanging, strangulation/suffocation indust/construct area
U217.	All	[X]Int self harm by hanging, strangulation/suffocation occ farm
U21y.	All	[X]Int self harm by hanging, strangulation/suffocation other spec place
U21z.	All	[X]Intent self harm by hanging, strangulation/suffocation unspecif place
U22..	All	[X]Intent self harm by drowning and submersion
U220.	All	[X]Int self harm by drowning and submersion occ home
U221.	All	[X]Intent self harm by drowning and submersion at res institut
U222.	All	[X]Int self harm by drowning and submersion in school/pub admin area
U223.	All	[X]Intent self harm by drowning and submersion in sport/athletic area
U224.	All	[X]Int self harm by drowning and submersion in street/highway
U225.	All	[X]Intent self harm by drowning and submersion trade/service area
U226.	All	[X]Int self harm by drowning and submersion indust/construct area
U227.	All	[X]Int self harm by drowning and submersion occ farm
U22y.	All	[X]Int self harm by drowning and submersion other spec place
U22z.	All	[X]Intent self harm by drowning and submersion unspecif place
U23..	All	[X]Intent self harm by handgun discharge
U230.	All	[X]Int self harm by handgun discharge occ home
U231.	All	[X]Intent self harm by handgun discharge at res institut
U232.	All	[X]Int self harm by handgun discharge in school/pub admin area
U233.	All	[X]Intent self harm by handgun discharge in sport/athletic area
U234.	All	[X]Int self harm by handgun discharge in street/highway
U235.	All	[X]Intent self harm by handgun discharge trade/service area
U236.	All	[X]Int self harm by handgun discharge indust/construct area
U237.	All	[X]Int self harm by handgun discharge occ farm
U23y.	All	[X]Int self harm by handgun discharge other spec place
U23z.	All	[X]Intent self harm by handgun discharge unspecif place

U24..	All	[X]Intentional self harm by rifle, shotgun and larger firearm discharge
U240.	All	[X]Intentional self harm by rifle, shotgun and larger firearm discharge, occurrence at home
U241.	All	[X]Intentional self harm by rifle, shotgun and larger firearm discharge, occurrence in residential institution
U242.	All	[X]Intentional self harm by rifle, shotgun and larger firearm discharge, occurrence at school, other institution and public administrative area
U243.	All	[X]Intentional self harm by rifle, shotgun and larger firearm discharge, occurrence at sports and athletics area
U244.	All	[X]Intentional self harm by rifle, shotgun and larger firearm discharge, occurrence on street and highway
U245.	All	[X]Intentional self harm by rifle, shotgun and larger firearm discharge, occurrence at trade and service area
U246.	All	[X]Intentional self harm by rifle, shotgun and larger firearm discharge, occurrence at industrial and construction area
U247.	All	[X]Intentional self harm by rifle, shotgun and larger firearm discharge, occurrence on farm
U24y.	All	[X]Intentional self harm by rifle, shotgun and larger firearm discharge, occurrence at other specified place
U24z.	All	[X]Intentional self harm by rifle, shotgun and larger firearm discharge, occurrence at unspecified place
U25..	All	[X]Intentional self harm by other and unspecified firearm discharge
U250.	All	[X]Intentional self harm by other and unspecified firearm discharge, occurrence at home
U251.	All	[X]Intentional self harm by other and unspecified firearm discharge, occurrence in residential institution
U252.	All	[X]Intentional self harm by other and unspecified firearm discharge, occurrence at school, other institution and public administrative area
U253.	All	[X]Intentional self harm by other and unspecified firearm discharge, occurrence at sports and athletics area
U254.	All	[X]Intentional self harm by other and unspecified firearm discharge, occurrence on street and highway
U255.	All	[X]Intentional self harm by other and unspecified firearm discharge, occurrence at trade and service area
U256.	All	[X]Intentional self harm by other and unspecified firearm discharge, occurrence at industrial and construction area
U257.	All	[X]Intentional self harm by other and unspecified firearm discharge, occurrence on farm
U25y.	All	[X]Intentional self harm by other and unspecified firearm discharge, occurrence at other specified place
U25z.	All	[X]Intentional self harm by other and unspecified firearm discharge, occurrence at unspecified place
2...	All	[X]Suicide
TK...	All	Attempted suicide
TK0..	All	Suicide and selfinflicted poisoning by solid and liquid substances
TK00.	All	Suicide and selfinflicted poisoning by analgesics, antipyretics and anti-rheumatics
TK01.	All	Suicide + selfinflicted poisoning by barbiturates
TK010	All	Suicide and self inflicted injury by Amylobarbitone

TK011	All	Suicide and self inflicted injury by Barbitone
TK012	All	Suicide and self inflicted injury by Butabarbitalone
TK013	All	Suicide and self inflicted injury by Pentabarbitalone
TK014	All	Suicide and self inflicted injury by Phenobarbitalone
TK015	All	Suicide and self inflicted injury by Quinalbarbitalone
TK01z	All	Suicide and self inflicted injury by barbiturates
TK02.	All	Suicide and selfinflicted poisoning by other sedatives and hypnotics
TK03.	All	Suicide and selfinflicted poisoning by tranquillisers and other psychotropic agents
TK04.	All	Suicide and selfinflicted poisoning by other drugs and medicines
TK05.	All	Suicide + selfinflicted poisoning by drug or medicine NOS
TK06.	All	Suicide and selfinflicted poisoning by agricultural and horticultural chemical and pharmaceutical preparations other than plant foods and fertilizers
TK07.	All	Suicide and selfinflicted poisoning by corrosive and caustic substances
TK08.	All	Suicide and selfinflicted poisoning by arsenic and its compounds
TK0z.	All	Suicide and selfinflicted poisoning by solid and liquid substances NOS
TK1..	All	Suicide + selfinflicted poisoning by gases in domestic use
TK10.	All	Suicide and selfinflicted poisoning by gas distributed by pipeline
TK11.	All	Suicide and selfinflicted poisoning by liquefied petroleum gas distributed in mobile containers
TK1y.	All	Suicide and selfinflicted poisoning by other utility gas
TK1z.	All	Suicide and selfinflicted poisoning by gases in domestic use NOS
TK2..	All	Suicide and selfinflicted poisoning by other gases and vapours
TK20.	All	Suicide and selfinflicted poisoning by motor vehicle exhaust gas
TK21.	All	Suicide and selfinflicted poisoning by other carbon monoxide
TK2y.	All	Suicide and selfinflicted poisoning by other gases and vapours
TK2z.	All	Suicide + selfinflicted poisoning by gases and vapours NOS
TK3..	All	Suicide and selfinflicted injury by hanging, strangulation and suffocation
TK31.	All	Suicide and selfinflicted injury by suffocation by plastic bag
TK3y.	All	Suicide and selfinflicted injury by other means of hanging, strangulation and suffocation
TK3z.	All	Suicide and selfinflicted injury by hanging, strangulation and suffocation NOS
TK4..	All	Suicide and selfinflicted injury by drowning
TK5..	All	Suicide and selfinflicted injury by firearms and explosives
TK50.	All	Suicide and selfinflicted injury by handgun
TK51.	All	Suicide and selfinflicted injury by shotgun
TK52.	All	Suicide and selfinflicted injury by hunting rifle
TK53.	All	Suicide and selfinflicted injury by military firearms
TK54.	All	Suicide and selfinflicted injury by other firearm
TK55.	All	Suicide and selfinflicted injury by explosives
TK5z.	All	Suicide and selfinflicted injury by firearms and explosives NOS
TK6..	All	Suicide and selfinflicted injury by cutting and stabbing instruments

TK60.	All	Suicide and selfinflicted injury by cutting
TK61.	All	Suicide and selfinflicted injury by stabbing
TK6z.	All	Suicide and selfinflicted injury by cutting and stabbing instruments NOS
TK7..	All	Suicide and selfinflicted injury by jumping from high place
TK70.	All	Suicide and selfinflicted injury by jumping from residential premises
TK71.	All	Suicide and selfinflicted injury by jumping from other manmade structure
TK72.	All	Suicide and selfinflicted injury by jumping from natural sites
TK72.	All	Suicide and selfinflicted injury by jumping from natural sites
TK7z.	All	Suicide and selfinflicted injury by jumping from high place NOS
TKx..	All	Suicide and selfinflicted injury by other means
TKx0.	All	Suicide and selfinflicted injury by jumping or lying before moving object
TKx01	All	Suicide and selfinflicted injury by lying before moving object
TKx0z	All	Suicide and selfinflicted injury by jumping or lying before moving object NOS
TKx1.	All	Suicide and selfinflicted injury by burns or fire
TKx2.	All	Suicide and selfinflicted injury by scald
TKx3.	All	Suicide and selfinflicted injury by extremes of cold
TKx4.	All	Suicide and selfinflicted injury by electrocution
TKx5.	All	Suicide and selfinflicted injury by crashing of motor vehicle
TKx6.	All	Suicide and selfinflicted injury by crashing of aircraft
TKx7.	All	Suicide and selfinflicted injury by caustic substances, except poisoning
TKxy.	All	Suicide and selfinflicted injury by other specified means
TKxz.	All	Suicide and selfinflicted injury by other means NOS
TKz..	All	Suicide and selfinflicted injury NOS
Read CTV3 Code	Term ID	Description
Xa04L	All	Parasuicide
Xa3jI	All	Attempted suicide NOS
146A.	All	H/O: attempted suicide
XM1Fs	All	Self hanging, strangulation or suffocation
TK3..	All	Suicide and selfinflicted injury by hanging, strangulation and suffocation
TK30.	All	Suicide or attempted suicide by hanging
Xa3jC	All	Attempted suicide - hanging
Xa3jL	All	Suicide - hanging
TK3y.	All	Suicide and selfinflicted injury by other means of hanging, strangulation and suffocation
TK3z.	All	Suicide and selfinflicted injury by hanging, strangulation and suffocation NOS
XE22I	All	Suicide and selfinflicted injury by suffocation by plastic bag
Xa3jD	All	Attempted suicide - suffocation
Xa3jM	All	Suicide - suffocation
TK0..	All	Suicide and selfinflicted poisoning by solid and liquid substances

TK0z.	All	Suicide and selfinflicted poisoning by solid and liquid substances NOS
TK4..	All	Suicide and selfinflicted injury by drowning
TK5..	All	Suicide or selfinflicted injury by firearms and explosives
TK50.	All	Suicide or selfinflicted injury by handgun
TK51.	All	Suicide or selfinflicted injury by shotgun
TK52.	All	Suicide or selfinflicted injury by hunting rifle
TK53.	All	Suicide or selfinflicted injury by military firearm
TK54.	All	Suicide and selfinflicted injury by other firearm
TK55.	All	Suicide or selfinflicted injury by explosives
TK5z.	All	Suicide and selfinflicted injury by firearms and explosives NOS
Xa3jF	All	Attempted suicide - firearms
Xa3jO	All	Suicide - firearms
TK6..	All	Suicide or selfinflicted injury by cutting and stabbing
TK60.	All	Suicide or selfinflicted injury by cutting
TK61.	All	Suicide or selfinflicted injury by stabbing
TK6z.	All	Suicide and selfinflicted injury by cutting and stabbing instruments NOS
Xa3jG	All	Attempted suicide - cut/stab
Xa3jP	All	Suicide - cut/stab
TK7..	All	Suicide or self injury by jumping from a height
TK70.	All	Suicide and selfinflicted injury by jumping from residential premises
TK71.	All	Suicide and selfinflicted injury by jumping from other man-made structure
TK72.	All	Suicide and selfinflicted injury by jumping from natural sites
TK72.	All	Suicide and selfinflicted injury by jumping from natural sites
TK7z.	All	Suicide and selfinflicted injury by jumping from high place NOS
X71B6	All	Suicide or self injury by jumping from high man-made structure
X71B7	All	Suicide or self injury by jumping from high building
X71B8	All	Suicide or self injury by jumping from bridge
X71B9	All	Suicide or self injury by jumping from high natural feature
X71BA	All	Suicide or self injury by jumping off cliff
Xa3jH	All	Attempted suicide - jumping from a high place
Xa3jQ	All	Suicide - jumping from a high place
TKx..	All	Suicide and selfinflicted injury by other means
TKx0.	All	Suicide and selfinflicted injury by jumping or lying before moving object
TKx00	All	Suicide and selfinflicted injury by jumping before moving object
TKx01	All	Suicide and selfinflicted injury by lying before moving object
TKx0z	All	Suicide and selfinflicted injury by jumping or lying before moving object NOS
TKxy.	All	Suicide and selfinflicted injury by other specified means
TKxz.	All	Suicide and selfinflicted injury by other means NOS
TKx1.	All	Suicide or self injury by burning or fire
TKx2.	All	Suicide or self injury by scalding
X71BF	All	Suicide or self injury by igniting petrol soaked clothing

X71BG	All	Suicide or self injury by arson
TKx3.	All	Suicide or self injury by exposure to cold
TKx4.	All	Suicide or self injury by electric current
TKx7.	All	Suicide and selfinflicted injury by caustic substances, excluding poisoning
TKz..	All	Suicide and selfinflicted injury NOS
Xa3jI	All	Attempted suicide NOS
Xa3jR	All	Suicide NOS
X71B3	All	Self poisoning by gas
TK1..	All	Suicide and selfinflicted poisoning by gases in domestic use
TK21.	All	Suicide and selfinflicted poisoning by other carbon monoxide
TK2y.	All	Suicide and selfinflicted poisoning by other gases and vapours
TK2z.	All	Suicide and selfinflicted poisoning by gases and vapours NOS
X71B4	All	Self poisoning by carbon monoxide
TK20.	All	Self poisoning by motor vehicle exhaust gas
X71B5	All	Self poisoning by coal gas
X71BB	All	Suicide or self injury associated with moving vehicles
TKx5.	All	Suicide or selfinflicted injury by crashing motor vehicle
TKx6.	All	Suicide or selfinflicted injury by crashing of aircraft
X71BC	All	Suicide or self injury by placing self in path of moving vehicle
X71BD	All	Suicide or self injury by placing self in path of moving motor vehicle
X71BE	All	Suicide or self injury by placing self in path of moving railway vehicle
XE22J	All	Suicide or attempted suicide by drowning
Xa3jE	All	Attempted suicide - drowning
Xa3jN	All	Suicide - drowning
XM1Fs	All	Self hanging, strangulation or suffocation
TK3..	All	Suicide and selfinflicted injury by hanging, strangulation and suffocation
TK30.	All	Suicide or attempted suicide by hanging
Xa3jL	All	Suicide - hanging
TK3y.	All	Suicide and selfinflicted injury by other means of hanging, strangulation and suffocation
TK3z.	All	Suicide and selfinflicted injury by hanging, strangulation and suffocation NOS
XE22I	All	Suicide and selfinflicted injury by suffocation by plastic bag
Xa3jD	All	Attempted suicide - suffocation
Xa3jM	All	Suicide - suffocation
TK50.	All	Suicide or selfinflicted injury by handgun
Ua1AA	All	Hanging self
Ua1AB	All	Drowning self
Ua1A9	All	Jumping from height
Ua1A8	All	Jumping from building
Ua1A7	All	Jumping from bridge
Ua14U	All	Jumping from cliff
Ua1AE	All	Self-asphyxiation

Ua1AD	All	Self-strangulation
Ua1AC	All	Self-suffocation
Ua14S	All	Throwing self in front of vehicle
Ua14T	All	Throwing self in front of train
X71B0	All	Self poisoning by non-drug solid or liquid agents
TK07.	All	Self poisoning by corrosive or caustic substance
TK08.	All	Self poisoning by arsenic or its compounds
X71B2	All	Self poisoning by plants or parts of plants
XM1FX	All	Self poisoning by agricultural chemical
TK06.	All	Suicide and selfinflicted poisoning by agricultural and horticultural chemical and pharmaceutical preparations other than plant foods and fertilizers
X71B1	All	Self poisoning by paraquat
Ua14R	All	Shooting self
Xa2pL	All	Stabbing self
U21..	All	[X]Intent self harm by hanging, strangulation/suffocation
U210.	All	[X]Int self harm by hanging, strangulation/suffocation occ home
U211.	All	[X]Intent self harm by hanging, strangulation/suffocation at res institut
U212.	All	[X]Int self harm by hanging, strangulation/suffocation in school/pub admin area
U213.	All	[X]Intent self harm by hanging, strangulation/suffocation in sport/athletic area
U214.	All	[X]Int self harm by hanging, strangulation/suffocation in street/highway
U215.	All	[X]Intent self harm by hanging, strangulation/suffocation trade/service area
U216.	All	[X]Int self harm by hanging, strangulation/suffocation indust/construct area
U217.	All	[X]Int self harm by hanging, strangulation/suffocation occ farm
U21y.	All	[X]Int self harm by hanging, strangulation/suffocation other spec place
U21z.	All	[X]Intent self harm by hanging, strangulation/suffocation unspecif place
U22..	All	[X]Intent self harm by drowning and submersion
U220.	All	[X]Int self harm by drowning and submersion occ home
U221.	All	[X]Intent self harm by drowning and submersion at res institut
U222.	All	[X]Int self harm by drowning and submersion in school/pub admin area
U223.	All	[X]Intent self harm by drowning and submersion in sport/athletic area
U224.	All	[X]Int self harm by drowning and submersion in street/highway
U225.	All	[X]Intent self harm by drowning and submersion trade/service area
U226.	All	[X]Int self harm by drowning and submersion indust/construct area
U227.	All	[X]Int self harm by drowning and submersion occ farm
U22y.	All	[X]Int self harm by drowning and submersion other spec place
U22z.	All	[X]Intent self harm by drowning and submersion unspecif place
U23..	All	[X]Intent self harm by handgun discharge

U230.	All	[X]Int self harm by handgun discharge occ home
U231.	All	[X]Intent self harm by handgun discharge at res institut
U232.	All	[X]Int self harm by handgun discharge in school/pub admin area
U233.	All	[X]Intent self harm by handgun discharge in sport/athletic area
U234.	All	[X]Int self harm by handgun discharge in street/highway
U235.	All	[X]Intent self harm by handgun discharge trade/service area
U236.	All	[X]Int self harm by handgun discharge indust/construct area
U237.	All	[X]Int self harm by handgun discharge occ farm
U23y.	All	[X]Int self harm by handgun discharge other spec place
U23z.	All	[X]Intent self harm by handgun discharge unspecif place
U24..	All	[X]Intentional self harm by rifle, shotgun and larger firearm discharge
U240.	All	[X]Intentional self harm by rifle, shotgun and larger firearm discharge, occurrence at home
U241.	All	[X]Intentional self harm by rifle, shotgun and larger firearm discharge, occurrence in residential institution
U242.	All	[X]Intentional self harm by rifle, shotgun and larger firearm discharge, occurrence at school, other institution and public administrative area
U243.	All	[X]Intentional self harm by rifle, shotgun and larger firearm discharge, occurrence at sports and athletics area
U244.	All	[X]Intentional self harm by rifle, shotgun and larger firearm discharge, occurrence on street and highway
U245.	All	[X]Intentional self harm by rifle, shotgun and larger firearm discharge, occurrence at trade and service area
U246.	All	[X]Intentional self harm by rifle, shotgun and larger firearm discharge, occurrence at industrial and construction area
U247.	All	[X]Intentional self harm by rifle, shotgun and larger firearm discharge, occurrence on farm
U24y.	All	[X]Intentional self harm by rifle, shotgun and larger firearm discharge, occurrence at other specified place
U24z.	All	[X]Intentional self harm by rifle, shotgun and larger firearm discharge, occurrence at unspecified place
U25..	All	[X]Intentional self harm by other and unspecified firearm discharge
U250.	All	[X]Intentional self harm by other and unspecified firearm discharge, occurrence at home
U251.	All	[X]Intentional self harm by other and unspecified firearm discharge, occurrence in residential institution
U252.	All	[X]Intentional self harm by other and unspecified firearm discharge, occurrence at school, other institution and public administrative area
U253.	All	[X]Intentional self harm by other and unspecified firearm discharge, occurrence at sports and athletics area
U254.	All	[X]Intentional self harm by other and unspecified firearm discharge, occurrence on street and highway
U255.	All	[X]Intentional self harm by other and unspecified firearm discharge, occurrence at trade and service area
U256.	All	[X]Intentional self harm by other and unspecified firearm discharge, occurrence at industrial and construction area
U257.	All	[X]Intentional self harm by other and unspecified firearm discharge, occurrence on farm

U25y.	All	<input checked="" type="checkbox"/> Intentional self harm by other and unspecified firearm discharge, occurrence at other specified place
U25z.	All	<input checked="" type="checkbox"/> Intentional self harm by other and unspecified firearm discharge, occurrence at unspecified place

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Supplementary table S2.9. Read codes used to identify overdose.

Medication overdose		
Read V2 Code	Term ID	Description
U20..	All	[X]Intentional self poisoning /exposure to noxious substance
U200.	All	[X]Intent self poison/exposure to nonopioid analgesic
U2000	All	[X]Int self poison/exposure to nonopioid analgesic at home
U2001	All	[X]Intent self poison nonopioid analgesic at res institut
U2002	All	[X]Int self poison nonopioid analgesic in school/pub admin area
U2003	All	[X]Intent self pois nonopioid analgesic in sport/athletic area
U2004	All	[X]Int self pois to nonopioid analgesic in street/highway
U2005	All	[X]Intent self pois to nonopioid analgesic trade/service area
U2006	All	[X]Int self pois to nonopioid analgesic indust/construct area
U2007	All	[X]Int self poison/exposure to nonopioid analgesic on farm
U200y	All	[X]Int self poison nonopioid analgesic other spec place
U200z	All	[X]Intent self poison to nonopioid analgesic unspecif place
U201.	All	[X]Intent self poison/exposure to antiepileptic
U2010	All	[X]Int self poison/exposure to antiepileptic at home
U2011	All	[X]Intent self poison antiepileptic at res institut
U2012	All	[X]Int self poison antiepileptic in school/pub admin area
U2013	All	[X]Intent self pois antiepileptic in sport/athletic area
U2014	All	[X]Int self pois antiepileptic in street/highway
U2015	All	[X]Intent self pois antiepileptic trade/service area
U2016	All	[X]Int self poison antiepileptic indust/construct area
U2017	All	[X]Int self poison/exposure to antiepileptic on farm
U201y	All	[X]Int self poison antiepileptic other spec place
U201z	All	[X]Intent self poison antiepileptic unspecif place
U202.	All	[X]Intent self poison/exposure to sedative hypnotic
U2020	All	[X]Int self poison/exposure to sedative hypnotic at home
U2021	All	[X]Intent self poison sedative hypnotic at res institut
U2022	All	[X]Int self poison sedative hypnotic in school/pub admin area
U2023	All	[X]Intent self pois sedative hypnotic in sport/athletic area
U2024	All	[X]Int self pois sedative hypnotic in street/highway
U2025	All	[X]Intent self pois sedative hypnotic trade/service area
U2026	All	[X]Int self poison sedative hypnotic indust/construct area
U2027	All	[X]Int self poison/exposure to sedative hypnotic on farm
U202y	All	[X]Int self poison sedative hypnotic other spec place
U202z	All	[X]Intent self poison sedative hypnotic unspecif place
U203.	All	[X]Intent self poison/exposure to antiparkinson drug
U2030	All	[X]Int self poison/exposure to antiparkinson drug at home
U2031	All	[X]Intent self poison antiparkinson drug at res institut
U2032	All	[X]Int self poison antiparkinson drug in school/pub admin area
U2033	All	[X]Intent self pois antiparkinson drug in sport/athletic area
U2034	All	[X]Int self pois antiparkinson drug in street/highway

1	U2035	All	[X]Intent self pois antiparkinson drug trade/service area
2	U2036	All	[X]Int self poison antiparkinson drug indust/construct area
3	U2037	All	[X]Int self poison/exposure to antiparkinson drug on farm
4	U203y	All	[X]Int self poison antiparkinson drug other spec place
5	U203z	All	[X]Intent self poison antiparkinson drug unspecif place
6	U204.	All	[X]Intent self poison/exposure to psychotropic drug
7	U2040	All	[X]Int self poison/exposure to psychotropic drug at home
8	U2041	All	[X]Intent self poison psychotropic drug at res institut
9	U2042	All	[X]Int self poison psychotropic drug in school/pub admin area
10	U2043	All	[X]Intent self pois psychotropic drug in sport/athletic area
11	U2044	All	[X]Int self pois psychotropic drug in street/highway
12	U2045	All	[X]Intent self pois psychotropic drug trade/service area
13	U2046	All	[X]Int self poison psychotropic drug indust/construct area
14	U2047	All	[X]Int self poison/exposure to psychotropic drug on farm
15	U204y	All	[X]Int self poison psychotropic drug other spec place
16	U204z	All	[X]Intent self poison psychotropic drug unspecif place
17	U205.	All	[X]Intent self poison/exposure to narcotic drug
18	U2050	All	[X]Int self poison/exposure to narcotic drug at home
19	U2051	All	[X]Intent self poison narcotic drug at res institut
20	U2052	All	[X]Int self poison narcotic drug in school/pub admin area
21	U2053	All	[X]Intent self pois narcotic drug in sport/athletic area
22	U2054	All	[X]Int self pois narcotic drug in street/highway
23	U2055	All	[X]Intent self pois narcotic drug trade/service area
24	U2056	All	[X]Int self poison narcotic drug indust/construct area
25	U2057	All	[X]Int self poison/exposure to narcotic drug on farm
26	U205y	All	[X]Int self poison narcotic drug other spec place
27	U205z	All	[X]Intent self poison narcotic drug unspecif place
28	U206.	All	[X]Intent self poison/exposure to hallucinogen
29	U2060	All	[X]Int self poison/exposure to hallucinogen at home
30	U2061	All	[X]Intent self poison hallucinogen at res institut
31	U2062	All	[X]Int self poison hallucinogen in school/pub admin area
32	U2063	All	[X]Intent self pois hallucinogen in sport/athletic area
33	U2064	All	[X]Int self pois hallucinogen in street/highway
34	U2065	All	[X]Intent self pois hallucinogen trade/service area
35	U2066	All	[X]Int self poison hallucinogen indust/construct area
36	U2067	All	[X]Int self poison/exposure to hallucinogen on farm
37	U206y	All	[X]Int self poison hallucinogen other spec place
38	U206z	All	[X]Intent self poison hallucinogen unspecif place
39	U207.	All	[X]Intent self poison/exposure to oth autonom drug
40	U2070	All	[X]Int self poison/exposure to oth autonom drug at home
41	U2071	All	[X]Intent self poison oth autonom drug at res institut
42	U2072	All	[X]Int self poison oth autonom drug in school/pub admin area
43	U2073	All	[X]Intent self pois oth autonom drug in sport/athletic area
44	U2074	All	[X]Int self pois oth autonom drug in street/highway
45	U2075	All	[X]Intent self pois oth autonom drug trade/service area

U2076	All	[X]Int self poison oth autonom drug indust/construct area
U2077	All	[X]Int self poison/exposure to oth autonom drug on farm
U207y	All	[X]Int self poison oth autonom drug other spec place
U207z	All	[X]Intent self poison oth autonom drug unspecif place
U208.	All	[X]Intent self poison/exposure to other/unspec drug/medicament
U2080	All	[X]Int self poison/exposure to other/unspec drug/medicament at home
U2081	All	[X]Intent self poison other/unspec drug/medicament at res institut
U2082	All	[X]Int self poison other/unspec drug/medicament in school/pub admin area
U2083	All	[X]Intent self pois other/unspec drug/medicament in sport/athletic area
U2084	All	[X]Int self pois other/unspec drug/medicament in street/highway
U2085	All	[X]Intent self pois other/unspec drug/medicament trade/service area
U2086	All	[X]Int self poison other/unspec drug/medicament indust/construct area
U2087	All	[X]Int self poison/exposure to other/unspec drug/medicament on farm
U208y	All	[X]Int self poison other/unspec drug/medicament other spec place
U208z	All	[X]Intent self poison other/unspec drug/medicament unspecif place
U209.	All	[X]Intent self poison/exposure to alcohol
U2090	All	[X]Int self poison/exposure to alcohol at home
U2091	All	[X]Intent self poison alcohol at res institut
U2092	All	[X]Int self poison alcohol in school/pub admin area
U2093	All	[X]Intent self pois alcohol in sport/athletic area
U2094	All	[X]Int self pois alcohol in street/highway
U2095	All	[X]Intent self pois alcohol trade/service area
U2096	All	[X]Int self poison alcohol indust/construct area
U2097	All	[X]Int self poison/exposure alcohol on farm
U209y	All	[X]Int self poison alcohol other spec place
U209z	All	[X]Intent self poison alcohol unspecif place
U20A.	All	[X]Intent self poison/exposure to organ solvent, halogen, hydrocarb
U20A0	All	[X]Int self poison/exposure to organ solvent, halogen, hydrocarb at home
U20A1	All	[X]Intent self poison organ solvent, halogen, hydrocarb at res institut
U20A2	All	[X]Int self poison organ solvent, halogen, hydrocarb in school/pub admin area
U20A3	All	[X]Intent self pois organ solvent, halogen, hydrocarb in sport/athletic area
U20A4	All	[X]Int self pois organ solvent, halogen, hydrocarb in street/highway
U20A5	All	[X]Intent self pois organ solvent, halogen, hydrocarb trade/service area
U20A6	All	[X]Int self poison organ solvent, halogen, hydrocarb indust/construct area
U20A7	All	[X]Int self poison/exposure organ solvent, halogen, hydrocarb on farm
U20Ay	All	[X]Int self poison organ solvent, halogen, hydrocarb other spec place

U20Az	All	[X]Intent self poison organ solvent, halogen, hydrocarb unspecif place
U20B.	All	[X]Intent self poison/exposure to other gas/vapour
U20B0	All	[X]Int self poison/exposure to other gas/vapour at home
U20B1	All	[X]Intent self poison other gas/vapour at res institut
U20B2	All	[X]Int self poison other gas/vapour in school/pub admin area
U20B3	All	[X]Intent self pois other gas/vapour in sport/athletic area
U20B4	All	[X]Int self pois other gas/vapour in street/highway
U20B5	All	[X]Intent self pois other gas/vapour trade/service area
U20B6	All	[X]Int self poison other gas/vapour indust/construct area
U20B7	All	[X]Int self poison/exposure other gas/vapourl on farm
U20By	All	[X]Int self poison other gas/vapour other spec place
U20Bz	All	[X]Intent self poison other gas/vapour unspecif place
U20C.	All	[X]Intent self poison/exposure to pesticide
U20C0	All	[X]Int self poison/exposure to pesticide at home
U20C1	All	[X]Intent self poison pesticide at res institut
U20C2	All	[X]Int self poison pesticide in school/pub admin area
U20C3	All	[X]Intent self pois pesticide in sport/athletic area
U20C4	All	[X]Int self pois pesticide in street/highway
U20C5	All	[X]Intent self pois pesticidel trade/service area
U20C6	All	[X]Int self poison pesticide indust/construct area
U20C7	All	[X]Int self poison/exposure pesticide on farm
U20Cy	All	[X]Int self poison pesticide other spec place
U20Cz	All	[X]Intent self poison pesticide unspecif place
U20y.	All	[X]Intent self poison/exposure to unspecif chemical
U20y0	All	[X]Int self poison/exposure to unspecif chemical at home
U20y1	All	[X]Intent self poison unspecif chemical at res institut
U20y2	All	[X]Int self poison unspecif chemical in school/pub admin area
U20y3	All	[X]Intent self pois unspecif chemical in sport/athletic area
U20y4	All	[X]Int self pois unspecif chemical in street/highway
U20y5	All	[X]Intent self pois unspecif chemical trade/service area
U20y6	All	[X]Int self poison unspecif chemical indust/construct area
U20y7	All	[X]Int self poison/exposure unspecif chemical on farm
U20yy	All	[X]Int self poison unspecif chemical other spec place
U20yz	All	[X]Intent self poison unspecif chemical unspecif place
14K0.	All	H/O: repeated overdose
1JP..	All	Suspected drug overdose
TK...	All	Cause of overdose - deliberate
Read CTV3 Code	Term ID	Description
U200.	All	[X]Intent self poison/exposure to nonopioid analgesic
U2000	All	[X]Int self poison/exposure to nonopioid analgesic at home
U2001	All	[X]Intent self poison nonopioid analgesic at res institut
U2002	All	[X]Int self poison nonopioid analgesic in school/pub admin area
U2003	All	[X]Intent self pois nonopioid analgesic in sport/athletic area

1			
2			
3			
4	U2004	All	[X]Int self pois to nonopioid analgesic in street/highway
5	U2005	All	[X]Intent self pois to nonopioid analgesic trade/service area
6	U2006	All	[X]Int self pois to nonopioid analgesic indust/construct area
7	U2007	All	[X]Int self poison/exposure to nonopioid analgesic on farm
8	U200y	All	[X]Int self poison nonopioid analgesic other spec place
9	U200z	All	[X]Intent self poison to nonopioid analgesic unspecif place
10	U201.	All	[X]Intent self poison/exposure to antiepileptic
11	U2010	All	[X]Int self poison/exposure to antiepileptic at home
12	U2011	All	[X]Intent self poison antiepileptic at res institut
13	U2012	All	[X]Int self poison antiepileptic in school/pub admin area
14	U2013	All	[X]Intent self pois antiepileptic in sport/athletic area
15	U2014	All	[X]Int self pois antiepileptic in street/highway
16	U2015	All	[X]Intent self pois antiepileptic trade/service area
17	U2016	All	[X]Int self poison antiepileptic indust/construct area
18	U2017	All	[X]Int self poison/exposure to antiepileptic on farm
19	U201y	All	[X]Int self poison antiepileptic other spec place
20	U201z	All	[X]Intent self poison antiepileptic unspecif place
21	U2030	All	[X]Int self poison/exposure to antiparkinson drug at home
22	U2031	All	[X]Intent self poison antiparkinson drug at res institut
23	U2032	All	[X]Int self poison antiparkinson drug in school/pub admin area
24	U2033	All	[X]Intent self pois antiparkinson drug in sport/athletic area
25	U2034	All	[X]Int self pois antiparkinson drug in street/highway
26	U2035	All	[X]Intent self pois antiparkinson drug trade/service area
27	U2036	All	[X]Int self poison antiparkinson drug indust/construct area
28	U2037	All	[X]Int self poison/exposure to antiparkinson drug on farm
29	U203y	All	[X]Int self poison antiparkinson drug other spec place
30	U203z	All	[X]Intent self poison antiparkinson drug unspecif place
31	XE22f	All	[X]Intent self poison/exposure to narcotic drug
32	U2050	All	[X]Int self poison/exposure to narcotic drug at home
33	U2051	All	[X]Intent self poison narcotic drug at res institut
34	U2052	All	[X]Int self poison narcotic drug in school/pub admin area
35	U2053	All	[X]Intent self pois narcotic drug in sport/athletic area
36	U2054	All	[X]Int self pois narcotic drug in street/highway
37	U2055	All	[X]Intent self pois narcotic drug trade/service area
38	U2056	All	[X]Int self poison narcotic drug indust/construct area
39	U2057	All	[X]Int self poison/exposure to narcotic drug on farm
40	U205y	All	[X]Int self poison narcotic drug other spec place
41	U205z	All	[X]Intent self poison narcotic drug unspecif place
42	U206.	All	[X]Intent self poison/exposure to hallucinogen
43	U2060	All	[X]Int self poison/exposure to hallucinogen at home
44	U2061	All	[X]Intent self poison hallucinogen at res institut
45	U2062	All	[X]Int self poison hallucinogen in school/pub admin area
46	U2063	All	[X]Intent self pois hallucinogen in sport/athletic area
47	U2064	All	[X]Int self pois hallucinogen in street/highway
48	U2065	All	[X]Intent self pois hallucinogen trade/service area
49			
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U2066	All	[X]Int self poison hallucinogen indust/construct area
U2067	All	[X]Int self poison/exposure to hallucinogen on farm
U206y	All	[X]Int self poison hallucinogen other spec place
U206z	All	[X]Intent self poison hallucinogen unspecif place
U207.	All	[X]Intent self poison/exposure to oth autonom drug
U2070	All	[X]Int self poison/exposure to oth autonom drug at home
U2071	All	[X]Intent self poison oth autonom drug at res institut
U2072	All	[X]Int self poison oth autonom drug in school/pub admin area
U2073	All	[X]Intent self pois oth autonom drug in sport/athletic area
U2074	All	[X]Int self pois oth autonom drug in street/highway
U2075	All	[X]Intent self pois oth autonom drug trade/service area
U2076	All	[X]Int self poison oth autonom drug indust/construct area
U2077	All	[X]Int self poison/exposure to oth autonom drug on farm
U207y	All	[X]Int self poison oth autonom drug other spec place
U207z	All	[X]Intent self poison oth autonom drug unspecif place
U208.	All	[X]Intent self poison/exposure to other/unspec drug/medicament
U2080	All	[X]Int self poison/exposure to other/unspec drug/medicament at home
U2081	All	[X]Intent self poison other/unspec drug/medicament at res institut
U2082	All	[X]Int self poison other/unspec drug/medicament in school/pub admin area
U2083	All	[X]Intent self pois other/unspec drug/medicament in sport/athletic area
U2084	All	[X]Int self pois other/unspec drug/medicament in street/highway
U2085	All	[X]Intent self pois other/unspec drug/medicament trade/service area
U2086	All	[X]Int self poison other/unspec drug/medicament indust/construct area
U2087	All	[X]Int self poison/exposure to other/unspec drug/medicament on farm
U208y	All	[X]Int self poison other/unspec drug/medicament other spec place
U208z	All	[X]Intent self poison other/unspec drug/medicament unspecif place
SyuFc	All	[X]Poisoning by other & unspecified drugs and biologic substances
U209.	All	[X]Intent self poison/exposure to alcohol
U2090	All	[X]Int self poison/exposure to alcohol at home
U2091	All	[X]Intent self poison alcohol at res institut
U2092	All	[X]Int self poison alcohol in school/pub admin area
U2093	All	[X]Intent self pois alcohol in sport/athletic area
U2094	All	[X]Int self pois alcohol in street/highway
U2095	All	[X]Intent self pois alcohol trade/service area
U2096	All	[X]Int self poison alcohol indust/construct area
U2097	All	[X]Int self poison/exposure alcohol on farm
U209y	All	[X]Int self poison alcohol other spec place
U209z	All	[X]Intent self poison alcohol unspecif place
U20A.	All	[X]Intent self poison/exposure to organ solvent, halogen, hydrocarb
U20A0	All	[X]Int self poison/exposure to organ solvent, halogen, hydrocarb at home

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4	U20A1	All	[X]Intent self poison organ solvent, halogen, hydrocarbat res institut
5	U20A2	All	[X]Int self poison organ solvent, halogen, hydrocarb in school/pub admin area
6			
7	U20A3	All	[X]Intent self pois organ solvent, halogen, hydrocarb in sport/athletic area
8			
9	U20A4	All	[X]Int self pois organ solvent, halogen, hydrocarb in street/highway
10			
11	U20A5	All	[X]Intent self pois organ solvent, halogen, hydrocarb trade/service area
12			
13	U20A6	All	[X]Int self poison organ solvent, halogen, hydrocarb indust/construct area
14			
15	U20A7	All	[X]Int self poison/exposure organ solvent, halogen, hydrocarb on farm
16			
17	U20Ay	All	[X]Int self poison organ solvent, halogen, hydrocarb other spec place
18			
19	U20Az	All	[X]Intent self poison organ solvent, halogen, hydrocarb unspecif place
20			
21	XE22g	All	[X]Intent self poison/exposure to other gas/vapour
22	U20B0	All	[X]Int self poison/exposure to other gas/vapour at home
23	U20B1	All	[X]Intent self poison other gas/vapour at res institut
24	U20B2	All	[X]Int self poison other gas/vapour in school/pub admin area
25	U20B3	All	[X]Intent self pois other gas/vapour in sport/athletic area
26	U20B4	All	[X]Int self pois other gas/vapour in street/highway
27	U20B5	All	[X]Intent self pois other gas/vapour trade/service area
28	U20B6	All	[X]Int self poison other gas/vapour indust/construct area
29	U20B7	All	[X]Int self poison/exposure other gas/vapourl on farm
30			
31	U20By	All	[X]Int self poison other gas/vapour other spec place
32	U20Bz	All	[X]Intent self poison other gas/vapour unspecif place
33			
34	U20C.	All	[X]Intent self poison/exposure to pesticide
35	U20C0	All	[X]Int self poison/exposure to pesticide at home
36	U20C1	All	[X]Intent self poison pesticide at res institut
37	U20C2	All	[X]Int self poison pesticide in school/pub admin area
38	U20C3	All	[X]Intent self pois pesticide in sport/athletic area
39	U20C4	All	[X]Int self pois pesticide in street/highway
40	U20C5	All	[X]Intent self pois pesticidel trade/service area
41	U20C6	All	[X]Int self poison pesticide indust/construct area
42	U20C7	All	[X]Int self poison/exposure pesticide on farm
43	U20Cy	All	[X]Int self poison pesticide other spec place
44	U20Cz	All	[X]Intent self poison pesticide unspecif place
45			
46	Xa59l	All	Intentional pesticide product poisoning
47	U20y.	All	[X]Intent self poison/exposure to unspecif chemical
48	U20y0	All	[X]Int self poison/exposure to unspecif chemical at home
49	U20y1	All	[X]Intent self poison unspecif chemical at res institut
50	U20y2	All	[X]Int self poison unspecif chemical in school/pub admin area
51	U20y3	All	[X]Intent self pois unspecif chemical in sport/athletic area
52	U20y4	All	[X]Int self pois unspecif chemical in street/highway
53	U20y5	All	[X]Intent self pois unspecif chemical trade/service area
54	U20y6	All	[X]Int self poison unspecif chemical indust/construct area
55			
56			
57			
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59			
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U20y7	All	[X]Int self poison/exposure unspecif chemical on farm
U20yy	All	[X]Int self poison unspecif chemical other spec place
U20yz	All	[X]Intent self poison unspecif chemical unspecif place
TK0z.	All	Suicide and selfinflicted poisoning by solid and liquid substances NOS
XM0Ba	All	Deliberate self poisoning
TK0..	All	Suicide and selfinflicted poisoning by solid and liquid substances
X71Am	All	Deliberate overdose of drug or pharmaceutical preparation
TK00.	All	Suicide and selfinflicted poisoning by analgesics, antipyretics and anti-rheumatics
TK01.	All	Suicide and selfinflicted poisoning by barbiturates
TK010	All	Suicide and self inflicted injury by amobarbital
TK011	All	Suicide and self inflicted injury by Barbitone
TK012	All	Suicide and self inflicted injury by Butabarbitone
TK013	All	Suicide and self inflicted injury by Pentabarbitone
TK014	All	Suicide and self inflicted injury by phenobarbital
TK015	All	Suicide and self inflicted injury by secobarbital
TK01z	All	Suicide and self inflicted injury by barbiturates
TK02.	All	Suicide and selfinflicted poisoning by other sedatives and hypnotics
TK03.	All	Suicide and selfinflicted poisoning by tranquillisers and other psychotropic agents
TK04.	All	Suicide and selfinflicted poisoning by other drugs and medicines
TK05.	All	Suicide and selfinflicted poisoning by drug or medicine NOS
X71Ap	All	Deliberate overdose of aspirin
X71Ax	All	Deliberate overdose of diazepam
X71Av	All	Deliberate overdose of methadone
X71Az	All	Deliberate overdose of temazepam
X71Ar	All	Deliberate overdose of co-proxamol
X71At	All	Deliberate overdose of diamorphine
X71Aw	All	Deliberate overdose of benzodiazepine
X71Au	All	Deliberate overdose of dihydrocodeine
X71As	All	Deliberate overdose of opiate analgesic
X71Ay	All	Deliberate overdose of chlordiazepoxide
X71Aq	All	Deliberate overdose of combined analgesic
X71An	All	Deliberate overdose of non-opiate analgesics
Xa0Jl	All	Deliberate overdose of non-steroidal anti-inflammatory agent
XaR4S	All	Intentional overdose of prescription only medication
Xa62F	All	Intentional over-the-counter product overdose
Xa65i	All	Intentional bismuth compound overdose
Xa65m	All	Intentional sucralfate overdose
Xa65q	All	Intentional liquorice overdose
Xa65u	All	Intentional misoprostol overdose
Xa65z	All	Intentional cimetidine overdose
Xa663	All	Intentional famotidine overdose
Xa667	All	Intentional nizatidine overdose

Xa66B	All	Intentional ranitidine overdose
Xa66D	All	Intentional overdose of H2 antagonist
Xa66I	All	Intentional omeprazole overdose
Xa66M	All	Intentional lansoprazole overdose
Xa66Q	All	Intentional carbenoxolone overdose
Xa66U	All	Intentional pirenzepine overdose
Xa66Y	All	Intentional 5-aminosalicylic acid overdose
Xa66d	All	Intentional aluminium hydroxide overdose
Xa66h	All	Intentional magnesium trisilicate overdose
Xa66l	All	Intentional loperamide overdose
Xa66p	All	Intentional kaolin overdose
Xa66u	All	Intentional cisapride overdose
Xa66z	All	Intentional nabilone overdose
Xa673	All	Intentional domperidone overdose
Xa677	All	Intentional metoclopramide overdose
Xa67B	All	Intentional 5-HT3-receptor antagonist overdose
Xa67G	All	Intentional bisacodyl overdose
Xa67K	All	Intentional dantron overdose
Xa67O	All	Intentional sodium picosulfate overdose
Xa67S	All	Intentional lactulose overdose
Xa67W	All	Intentional magnesium sulphate overdose
Xa67a	All	Intentional bulk-forming laxative overdose
Xa67e	All	Intentional anthraquinone laxative overdose
Xa67i	All	Intentional cascara overdose
Xa67m	All	Intentional senna overdose
Xa67q	All	Intentional docusate overdose
Xa67v	All	Intentional castor oil overdose
Xa67z	All	Intentional phenolphthalein overdose
Xa684	All	Intentional dioctyl sulphosuccinate overdose
Xa688	All	Intentional antispasmodic overdose
Xa68C	All	Intentional bile agent overdose
Xa69o	All	Intentional immunostimulant overdose
Xa69u	All	Intentional mitobronitol overdose
Xa69y	All	Intentional busulfan overdose
Xa6A2	All	Intentional treosulfan overdose
Xa6A6	All	Intentional thiotepa overdose
Xa6AB	All	Intentional chlorambucil overdose
Xa6AF	All	Intentional cyclophosphamide overdose
Xa6AJ	All	Intentional ethoglucid overdose
Xa6AN	All	Intentional ifosfamide overdose
Xa6AR	All	Intentional melphalan overdose
Xa6AV	All	Intentional estramustine overdose
Xa6AZ	All	Intentional chlormethine overdose
Xa6Ae	All	Intentional carmustine overdose
Xa6Ai	All	Intentional lomustine overdose

Xa6An	All	Intentional dacarbazine overdose
Xa6As	All	Intentional dactinomycin overdose
Xa6Aw	All	Intentional bleomycin overdose
Xa6B0	All	Intentional mitomycin overdose
Xa6B4	All	Intentional plicamycin overdose
Xa6B8	All	Intentional aclarubicin overdose
Xa6BC	All	Intentional mitoxantrone overdose
Xa6BG	All	Intentional doxorubicin overdose
Xa6BK	All	Intentional epirubicin overdose
Xa6B0	All	Intentional idarubicin overdose
Xa6BT	All	Intentional mercuric oxide overdose
Xa6BX	All	Intentional methotrexate overdose
Xa6Bb	All	Intentional mercaptopurine overdose
Xa6Bf	All	Intentional tioguanine overdose
Xa6Bj	All	Intentional pentostatin overdose
Xa6Bn	All	Intentional cytarabine overdose
Xa6Br	All	Intentional fluorouracil overdose
Xa6Bv	All	Intentional etoposide overdose
Xa6Bz	All	Intentional amsacrine overdose
Xa6C3	All	Intentional carboplatin overdose
Xa6C7	All	Intentional cisplatin overdose
Xa6CB	All	Intentional hydroxycarbamide overdose
Xa6CF	All	Intentional procarbazine overdose
Xa6CJ	All	Intentional razoxane overdose
Xa6CN	All	Intentional crisantaspase overdose
Xa6CR	All	Intentional paclitaxel overdose
Xa6CV	All	Intentional fludarabine overdose
Xa6CZ	All	Intentional aminoglutethimide overdose
Xa6Ce	All	Intentional trilostane overdose
Xa6Ci	All	Intentional tamoxifen overdose
Xa6Cm	All	Intentional formestane overdose
Xa6Cr	All	Intentional vinblastine overdose
Xa6Cv	All	Intentional vincristine overdose
Xa6Cz	All	Intentional vindesine overdose
Xa6D4	All	Intentional ciclosporin overdose
Xa6D8	All	Intentional azathioprine overdose
Xa6DD	All	Intentional central appetite depressant overdose
Xa6DI	All	Intentional levodopa overdose
Xa6DM	All	Intentional amantadine overdose
Xa6DQ	All	Intentional lisuride overdose
Xa6DU	All	Intentional bromocriptine overdose
Xa6DZ	All	Intentional lithium overdose
Xa6Dd	All	Intentional amitriptyline overdose
Xa6Dh	All	Intentional amoxapine overdose
Xa6DI	All	Intentional butriptyline overdose

Xa6Dp	All	Intentional clomipramine overdose
Xa6Dt	All	Intentional desipramine overdose
Xa6Dx	All	Intentional dosulepin overdose
Xa6E1	All	Intentional doxepin overdose
Xa6E5	All	Intentional imipramine overdose
Xa6E9	All	Intentional iprindole overdose
Xa6ED	All	Intentional lofepramine overdose
Xa6EH	All	Intentional nortriptyline overdose
Xa6EL	All	Intentional protriptyline overdose
Xa6EP	All	Intentional trimipramine overdose
Xa6Zp	All	Intentional overdose of tricyclic antidepressant
Xa6EU	All	Intentional phenelzine overdose
Xa6EY	All	Intentional iproniazid overdose
Xa6Ec	All	Intentional isocarboxazid overdose
Xa6Eg	All	Intentional tranlycypromine overdose
Xa6Ek	All	Intentional moclobemide overdose
Xa6Eo	All	Intentional tryptophan overdose
Xa6Es	All	Intentional venlafaxine overdose
Xa6Ex	All	Intentional sertraline overdose
Xa6F1	All	Intentional paroxetine overdose
Xa6F5	All	Intentional nefazodone overdose
Xa6F9	All	Intentional citalopram overdose
Xa6FD	All	Intentional fluoxetine overdose
Xa6FH	All	Intentional fluvoxamine overdose
Xa6FM	All	Intentional maprotiline overdose
Xa6FQ	All	Intentional mianserin overdose
Xa6FU	All	Intentional trazodone overdose
Xa6FY	All	Intentional viloxazine overdose
Xa6Fd	All	Intentional beclamide overdose
Xa6Fh	All	Intentional lamotrigine overdose
Xa6Fl	All	Intentional piracetam overdose
Xa6Fp	All	Intentional gabapentin overdose
Xa6Ft	All	Intentional overdose by sodium valproate
Xa6Fy	All	Intentional methylphenobarbital overdose
Xa6G2	All	Intentional phenobarbital overdose
Xa6G6	All	Intentional primidone overdose
Xa6GA	All	Intentional overdose by carbamazepine
Xa6GE	All	Intentional vigabatrin overdose
X711g	All	Accidental overdose of phenytoin
Xa6GL	All	Intentional ethosuximide overdose
Xa6GP	All	Intentional clonazepam overdose
Xa6GV	All	Intentional zopiclone overdose
Xa6GZ	All	Intentional zolpidem overdose
Xa6Gd	All	Intentional chlormezanone overdose
Xa6Gh	All	Intentional methyprylone overdose

Xa6Gl	All	Intentional paraldehyde overdose
Xa6Gq	All	Intentional amobarbital overdose
Xa6Gu	All	Intentional butabarbital overdose
Xa6Gy	All	Intentional cyclobarbitone overdose
Xa6H2	All	Intentional secobarbital overdose
Xa6H7	All	Intentional flunitrazepam overdose
Xa6HB	All	Intentional flurazepam overdose
Xa6HF	All	Intentional loprozepam overdose
Xa6HJ	All	Intentional lormetazepam overdose
Xa6HN	All	Intentional nitrazepam overdose
Xa6HR	All	Intentional triazolam overdose
Xa6HV	All	Intentional alprazolam overdose
Xa6HZ	All	Intentional bromazepam overdose
X71Ay	All	Deliberate overdose of chlordiazepoxide
Xa6Hg	All	Intentional clobazam overdose
Xa6Hk	All	Intentional dipotassium clorazepate overdose
Xa6Ho	All	Intentional ketazolam overdose
Xa6Hs	All	Intentional medazepam overdose
Xa6Hw	All	Intentional oxazepam overdose
Xa6I0	All	Intentional prazepam overdose
Xa6I4	All	Intentional midazolam overdose
X71Ax	All	Deliberate overdose of diazepam
Xa6IB	All	Intentional lorazepam overdose
X71Az	All	Deliberate overdose of temazepam
X71Aw	All	Deliberate overdose of benzodiazepine
Xa6IL	All	Intentional meprobamate overdose
Xa6IQ	All	Intentional chloral hydrate overdose
Xa6IU	All	Intentional dichloralphenazone overdose
Xa6IY	All	Intentional triclofos sodium overdose
Xa6Ic	All	Intentional buspirone overdose
Xa6Ig	All	Intentional clomethiazole overdose
Xa6Il	All	Intentional sulphiride overdose
Xa6Ip	All	Intentional loxapine overdose
Xa6It	All	Intentional clozapine overdose
Xa6Ix	All	Intentional risperidone overdose
Xa6J1	All	Intentional tetrabenazine overdose
Xa6J6	All	Intentional benperidol overdose
Xa6JA	All	Intentional trifluperidol overdose
Xa6JE	All	Intentional haloperidol overdose
Xa6JI	All	Intentional droperidol overdose
Xa6JN	All	Intentional pimozide overdose
Xa6JR	All	Intentional fluspirilene overdose
Xa6JW	All	Intentional levomepromazine overdose
Xa6Ja	All	Intentional pericyazine overdose
Xa6Je	All	Intentional fluphenazine decanoate overdose

Xa6Ji	All	Intentional fluphenazine enanthate overdose
Xa6Jm	All	Intentional thiethylperazine overdose
Xa6Jq	All	Intentional chlorpromazine overdose
Xa6Ju	All	Intentional pipotiazine overdose
Xa6Jy	All	Intentional promazine overdose
Xa6K2	All	Intentional thioridazine overdose
Xa6K6	All	Intentional perphenazine overdose
Xa6KA	All	Intentional prochlorperazine overdose
Xa6KE	All	Intentional trifluoperazine overdose
Xa6KJ	All	Intentional chlorprothixene overdose
Xa6KN	All	Intentional flupentixol decanoate overdose
Xa6KR	All	Intentional zuclopenthixol decanoate overdose
Xa6KV	All	Intentional zuclopenthixol overdose
Xa6KZ	All	Intentional flupentixol overdose
Xa6Kd	All	Intentional oxypertine overdose
Xa6Kh	All	Intentional remoxipride overdose
Xa6Kj	All	Intentional overdose of non-barbiturate hypnotic
Xa6Ko	All	Intentional selegiline overdose
Xa6Kt	All	Intentional amfetamine overdose
Xa6Ky	All	Intentional antabuse overdose
Xa6L3	All	Intentional cannabis overdose
Xa6L7	All	Intentional overdose by lysergic acid
Xa6LB	All	Intentional psilocybin overdose
Xa6LF	All	Intentional mescaline overdose
Xa6LJ	All	Intentional overdose of ecstasy
Xa6LN	All	Intentional overdose by cocaine
Xa6LR	All	Intentional overdose by crack cocaine
Xa6LV	All	Intentional caffeine overdose
Xa6Lb	All	Intentional atenolol overdose
Xa6Lf	All	Intentional propranolol overdose
Xa6Lh	All	Intentional overdose of beta-adrenergic blocking drug
Xa6Lm	All	Intentional phenoxybenzamine overdose
Xa6Lq	All	Intentional nicotine overdose
Xa6Lu	All	Intentional overdose by calcium-channel blockers
Xa6Lz	All	Intentional pilocarpine overdose
Xa6M3	All	Intentional acetylcholine overdose
Xa6M7	All	Intentional anticholinesterase overdose
Xa6MD	All	Intentional metaraminol overdose
Xa6MI	All	Intentional salbutamol overdose
Xa6ML	All	Intentional overdose of isoprenaline
Xa6MQ	All	Intentional clonidine overdose
Xa6MV	All	Intentional hyoscine overdose
Xa6MZ	All	Intentional atropine overdose
Xa6Me	All	Intentional acetylcysteine overdose
Xa6Mj	All	Intentional nikethamide overdose

Xa6Mo	All	Intentional chlorphenamine overdose
Xa6Ms	All	Intentional diphenhydramine overdose
Xa6N0	All	Intentional thonzylamine overdose
Xa6N4	All	Intentional tripeleennamine overdose
Xa6N8	All	Intentional hydroxyzine overdose
Xa6ND	All	Intentional aminophylline overdose
Xa6NH	All	Intentional theophylline overdose
Xa6NL	All	Intentional bronchodilator preparations overdose
Xa6NR	All	Intentional dithranol overdose
Xa6NW	All	Intentional gamolenic acid overdose
Xa6Nb	All	Intentional etretinate overdose
Xa6Nf	All	Intentional acitretin overdose
Xa6Nj	All	Intentional tretinoin overdose
Xa6Nn	All	Intentional isotretinoin overdose
Xa6Nt	All	Intentional allopurinol overdose
Xa6Nx	All	Intentional colchicine overdose
Xa6O3	All	Intentional baclofen overdose
Xa6O7	All	Intentional methocarbamol overdose
Xa6OB	All	Intentional gold salt overdose
Xa6OG	All	Intentional papaverine overdose
Xa6OL	All	Intentional prostaglandin overdose
Xa6OS	All	Intentional naloxone overdose
Xa6OW	All	Intentional protamine sulphate overdose
Xa6Oa	All	Intentional alternative medicine overdose
Xa6Oj	All	Intentional flucytosine overdose
Xa6On	All	Intentional griseofulvin overdose
Xa6Or	All	Intentional amphotericin B overdose
Xa6Ov	All	Intentional nystatin overdose
Xa6P0	All	Intentional idoxuridine overdose
Xa6P5	All	Intentional pyrimethamine overdose
Xa6P9	All	Intentional chloroquine overdose
Xa6PD	All	Intentional primaquine overdose
Xa6PH	All	Intentional quinine overdose
Xa6PL	All	Intentional mefloquine overdose
Xa6PP	All	Intentional proguanil overdose
Xa6PU	All	Intentional piperazine overdose
Xa6PY	All	Intentional tiabendazole overdose
Xa6Pe	All	Intentional kanamycin overdose
Xa6Pi	All	Intentional streptomycin overdose
Xa6Pm	All	Intentional gentamicin overdose
Xa6Pq	All	Intentional tobramycin overdose
Xa6Pu	All	Intentional netilmicin overdose
Xa6Pz	All	Intentional erythromycin overdose
Xa6Q3	All	Intentional azithromycin overdose
Xa6Q7	All	Intentional clarithromycin overdose

Xa6QB	All	Intentional sodium fusidate overdose
Xa6QF	All	Intentional spectinomycin overdose
Xa6QJ	All	Intentional vancomycin overdose
Xa6QN	All	Intentional trimethoprim overdose
Xa6QR	All	Intentional nitrofurantoin derivative overdose
Xa6QV	All	Intentional fusidic acid overdose
Xa6QZ	All	Intentional 4-quinolones overdose
Xa6Qe	All	Intentional ampicillin overdose
Xa6Qj	All	Intentional cloxacillin overdose
Xa6Qn	All	Intentional carbenicillin overdose
Xa6Qr	All	Intentional flucloxacillin overdose
Xa6Qx	All	Intentional cefadroxil overdose
Xa6R1	All	Intentional cefalexin overdose
Xa6R5	All	Intentional cephalothin overdose
Xa6R9	All	Intentional cefazolin overdose
Xa6RD	All	Intentional cefradine overdose
Xa6RH	All	Intentional latamoxef overdose
Xa6RM	All	Intentional cefaclor overdose
Xa6RQ	All	Intentional cefuroxime overdose
Xa6RU	All	Intentional cephamandole overdose
Xa6RZ	All	Intentional cefotaxime overdose
Xa6Rd	All	Intentional ceftazidime overdose
Xa6Rh	All	Intentional ceftizoxime overdose
Xa6Rl	All	Intentional cefixime overdose
Xa6Rp	All	Intentional cefodizime overdose
Xa6Rt	All	Intentional cefpodoxime overdose
Xa6Rx	All	Intentional ceftriaxone overdose
Xa6SA	All	Intentional cefpirome overdose
Xa6S1	All	Intentional ceftibuten overdose
Xa6S5	All	Intentional cefsulodin overdose
Xa6SG	All	Intentional doxycycline overdose
Xa6SK	All	Intentional minocycline overdose
Xa6SO	All	Intentional oxytetracycline overdose
Xa6SS	All	Intentional tetracycline overdose
Xa6SW	All	Intentional chloramphenicol overdose
Xa6Sa	All	Intentional co-trimoxazole overdose
Xa6Sf	All	Intentional antimony compound overdose
Xa6Sj	All	Intentional hydroxyquinoline overdose
Xa6Sp	All	Intentional rifampin overdose
Xa6St	All	Intentional isoniazid overdose
Xa6Sx	All	Intentional ethambutol overdose
Xa6T1	All	Intentional antileprotic drug overdose
Xa6T5	All	Intentional pesticide product overdose
Xa6TB	All	Intentional gamma globulin overdose
Xa6TF	All	Intentional vaccine overdose

Xa6TJ	All	Intentional antisera overdose
Xa6TO	All	Intentional glucagon overdose
Xa6TU	All	Intentional carbimazole overdose
Xa6TY	All	Intentional thiouracil overdose
Xa6Td	All	Intentional prednisone overdose
Xa6Th	All	Intentional dexamethasone overdose
Xa6Tl	All	Intentional insulin overdose
Xa6Tr	All	Intentional acetoexamide overdose
Xa6Tv	All	Intentional chlorpropamide overdose
Xa6Tz	All	Intentional overdose by glibenclamide
Xa6U3	All	Intentional tolbutamide overdose
Xa6U8	All	Intentional overdose by metformin
Xa6UD	All	Intentional progestogen overdose
Xa6UI	All	Intentional nandrolone overdose
Xa6UM	All	Intentional oxymetholone overdose
Xa6UQ	All	Intentional methandriol overdose
Xa6UU	All	Intentional oral contraceptive overdose
Xa6UZ	All	Intentional testosterone overdose
Xa6Ud	All	Intentional oestrogen overdose
Xa6Ui	All	Intentional liothyronine overdose
Xa6Xh	All	Intentional streptokinase overdose
Xa6Xl	All	Intentional urokinase overdose
Xa6Um	All	Intentional thyroxin overdose
Xa6Uz	All	Intentional heparin overdose
Xa6V3	All	Intentional coumarin overdose
Xa6V7	All	Intentional warfarin sodium overdose
Xa6VD	All	Intentional ferrous sulphate overdose
Xa6VI	All	Intentional iodide overdose
Xa6VN	All	Intentional vitamin A overdose
Xa6VR	All	Intentional vitamin D overdose
Xa6VV	All	Intentional vitamin K overdose
Xa6Va	All	Intentional nicotinic acid derivative overdose
Xa6Ve	All	Intentional folic acid overdose
Xa6Vi	All	Intentional potassium overdose
Xa6Vo	All	Intentional clofibrate overdose
Xa6Vu	All	Intentional disopyramide overdose
Xa6Vy	All	Intentional quinidine overdose
Xa6W2	All	Intentional procainamide overdose
Xa6W7	All	Intentional bretylium overdose
Xa6WC	All	Intentional amiodarone overdose
Xa6WJ	All	Intentional bendroflumethiazide overdose
Xa6WN	All	Intentional chlorothiazide overdose
Xa6WS	All	Intentional furosemide overdose
Xa6WW	All	Intentional bumetanide overdose
Xa6Wa	All	Intentional etacrynic acid overdose

Xa6We	All	Intentional potassium sparing diuretic overdose
Xa6Wi	All	Intentional osmotic diuretic overdose
Xa6Wn	All	Intentional mersalyl overdose
Xa6Ws	All	Intentional acetazolamide overdose
Xa6Wy	All	Intentional guanethidine overdose
Xa6X2	All	Intentional overdose by angiotensin-converting-enzyme inhibitors
Xa6X5	All	Intentional antihypertensive overdose
Xa6XA	All	Intentional digoxin overdose
Xa6XE	All	Intentional phosphodiesterase inhibitor overdose
Xa6XJ	All	Intentional ergot alkaloid overdose
Xa6XO	All	Intentional diazoxide overdose
Xa6XS	All	Intentional hydralazine overdose
Xa6XW	All	Intentional dipyridamole overdose
Xa6Xh	All	Intentional streptokinase overdose
Xa6Xl	All	Intentional urokinase overdose
Xa6Tl	All	Intentional insulin overdose
Xa6TF	All	Intentional vaccine overdose
Xa6TO	All	Intentional glucagon overdose
Xa6Lq	All	Intentional nicotine overdose
Xa6TJ	All	Intentional antisera overdose
U204.	All	[X]Overdose - SSRI
U2040	All	[X]Intentional self poisoning by and exposure to psychotropic drugs, occurrence at home
U2041	All	[X]Intentional self poisoning by and exposure to psychotropic drugs, occurrence in residential institution
U2042	All	[X]Intentional self poisoning by and exposure to psychotropic drugs, occurrence at school, other institution and public administrative area
U2043	All	[X]Intentional self poisoning by and exposure to psychotropic drugs, occurrence at sports and athletics area
U2044	All	[X]Intentional self poisoning by and exposure to psychotropic drugs, occurrence on street and highway
U2045	All	[X]Intentional self poisoning by and exposure to psychotropic drugs, occurrence at trade and service area
U2046	All	[X]Intentional self poisoning by and exposure to psychotropic drugs, occurrence at industrial and construction area
U2047	All	[X]Intentional self poisoning by and exposure to psychotropic drugs, occurrence on farm
U204y	All	[X]Intentional self poisoning by and exposure to psychotropic drugs, occurrence at other specified place
U204z	All	[X]Intentional self poisoning by and exposure to psychotropic drugs, occurrence at unspecified place
Xa1Py	All	H/O: repeated overdose
U2020	All	[X]Intentional self poisoning by and exposure to sedative hypnotics, occurrence at home
U2021	All	[X]Intentional self poisoning by and exposure to sedative hypnotics, occurrence in residential institution

U2022	All	[X]Intentional self poisoning by and exposure to sedative hypnotics, occurrence at school, other institution and public administrative area
U2023	All	[X]Intentional self poisoning by and exposure to sedative hypnotics, occurrence at sports and athletics area
U2024	All	[X]Intentional self poisoning by and exposure to sedative hypnotics, occurrence on street and highway
U2025	All	[X]Intentional self poisoning by and exposure to sedative hypnotics, occurrence at trade and service area
U2026	All	[X]Intentional self poisoning by and exposure to sedative hypnotics, occurrence at industrial and construction area
U2027	All	[X]Intentional self poisoning by and exposure to sedative hypnotics, occurrence on farm
U202y	All	[X]Intentional self poisoning by and exposure to sedative hypnotics, occurrence at other specified place
U202z	All	[X]Intentional self poisoning by and exposure to sedative hypnotics, occurrence at unspecified place
Xa67B	All	Intentional 5-HT ₃ -receptor antagonist overdose
Xa4kL	All	Intentional paracetamol poisoning
Xa4kP	All	Intentional paracetamol and dextropropoxyphene poisoning
Xa4kV	All	Intentional aspirin poisoning
Xa4kY	All	Intentional salicylic acid salt poisoning
Xa4kb	All	Intentional pentazocine poisoning
Xa4kf	All	Intentional phenazocine poisoning
Xa4kk	All	Intentional dextromoramide poisoning
Xa4ko	All	Intentional dextropropoxyphene poisoning
Xa4ks	All	Intentional dipipanone poisoning
Xa4kv	All	Intentional methadone poisoning
Xa4l0	All	Intentional buprenorphine poisoning
Xa4l3	All	Intentional poisoning by codeine
Xa4l6	All	Intentional heroin poisoning
Xa4l9	All	Intentional poisoning by dihydrocodeine
Xa4lD	All	Intentional nalbuphine poisoning
Xa4lG	All	Intentional morphine poisoning
Xa4lM	All	Intentional alfentanil poisoning
Xa4lQ	All	Intentional fentanyl poisoning
Xa4lT	All	Intentional pethidine poisoning
Xa4lX	All	Intentional phenoperidine poisoning
Xa4lb	All	Intentional meptazinol poisoning
Xa4lf	All	Intentional levorphanol poisoning
Xa4li	All	Intentional narcotic poisoning
Xa4lo	All	Intentional poisoning by combination analgesic
Xa4ls	All	Intentional acemetacin poisoning
Xa4lw	All	Intentional azapropazone poisoning
Xa4m0	All	Intentional diclofenac poisoning
Xa4m4	All	Intentional etodolac poisoning
Xa4m8	All	Intentional felbinac poisoning

Xa4mC	All	Intentional fenbufen poisoning
Xa4mG	All	Intentional fenoprofen poisoning
Xa4mK	All	Intentional flurbiprofen poisoning
Xa4mN	All	Intentional ibuprofen poisoning
Xa4mQ	All	Intentional indometacin poisoning
Xa4mU	All	Intentional ketoprofen poisoning
Xa4mY	All	Intentional ketorolac poisoning
Xa4mc	All	Intentional mefenamic acid poisoning
Xa4mg	All	Intentional nabumetone poisoning
Xa4mj	All	Intentional naproxen poisoning
Xa4mn	All	Intentional nefopam poisoning
Xa4mr	All	Intentional oxyphenbutazone poisoning
Xa4mu	All	Intentional phenylbutazone poisoning
Xa4my	All	Intentional piroxicam poisoning
Xa4n2	All	Intentional sulindac poisoning
Xa4n6	All	Intentional tenoxicam poisoning
Xa4nA	All	Intentional tiaprofenic acid poisoning
Xa4nE	All	Intentional tolmetin poisoning
Xa4nJ	All	Intentional radiopharmaceutical poisoning
Xa4nR	All	Intentional X-ray contrast media poisoning
Xa4nV	All	Intentional magnetic resonance imaging contrast media poisoning
Xa4nN	All	Intentional X-ray diagnostic contrast media poisoning
Xa4nZ	All	Intentional allergen extract vaccine poisoning
Xa4nd	All	Intentional diagnostic dye poisoning
Xa53n	All	Intentional dextromethorphan poisoning
Xa53q	All	Intentional guaifenesin poisoning
Xa53t	All	Intentional terpin hydrate poisoning
Xa53w	All	Intentional poisoning by bronchodilator drug
Xa53z	All	Intentional aminophylline poisoning
Xa542	All	Intentional theophylline poisoning
Xa545	All	Intentional poisoning by herbal asthma mixture
Xa548	All	Intentional anti-common cold drug poisoning
Xa54B	All	Intentional local antipruritic poisoning
Xa54E	All	Intentional local astringent and detergent poisoning
Xa54H	All	Intentional hair treatment poisoning
Xa54L	All	Intentional allopurinol poisoning
Xa54O	All	Intentional colchicine poisoning
Xa54R	All	Intentional probenecid poisoning
Xa54X	All	Intentional gold salt poisoning
Xa54a	All	Intentional antirheumatic poisoning
Xa54v	All	Intentional chelating agent poisoning
Xa54z	All	Intentional alternative medicine poisoning
Xa556	All	Intentional flucytosine poisoning
Xa559	All	Intentional griseofulvin poisoning
Xa55C	All	Intentional amphotericin B poisoning

Xa55F	All	Intentional nystatin poisoning
Xa55I	All	Intentional trichomycin poisoning
Xa55L	All	Intentional idoxuridine poisoning
Xa55x	All	Intentional kanamycin poisoning
Xa560	All	Intentional streptomycin poisoning
Xa564	All	Intentional gentamicin poisoning
Xa568	All	Intentional tobramycin poisoning
Xa56C	All	Intentional netilmicin poisoning
Xa56F	All	Intentional erythromycin poisoning
Xa56J	All	Intentional azithromycin poisoning
Xa56N	All	Intentional clarithromycin poisoning
Xa56Q	All	Intentional oleandomycin poisoning
Xa56T	All	Intentional spiramycin poisoning
Xa56X	All	Intentional sodium fusidate poisoning
Xa56b	All	Intentional spectinomycin poisoning
Xa56f	All	Intentional vancomycin poisoning
Xa56j	All	Intentional trimethoprim poisoning
Xa56m	All	Intentional nitrofurantoin derivative poisoning
Xa56q	All	Intentional fusidic acid poisoning
Xa56u	All	Intentional 4-quinolones poisoning
Xa6QZ	All	Intentional 4-quinolones overdose
Xa56x	All	Intentional ampicillin poisoning
Xa570	All	Intentional cloxacillin poisoning
Xa573	All	Intentional carbenicillin poisoning
Xa576	All	Intentional penicillin G poisoning
Xa57A	All	Intentional flucloxacillin poisoning
Xa57E	All	Intentional piperacillin poisoning
Xa57J	All	Intentional cefadroxil poisoning
Xa57M	All	Intentional cefalexin poisoning
Xa57P	All	Intentional cephalothin poisoning
Xa57T	All	Intentional cefazolin poisoning
Xa57X	All	Intentional cefradine poisoning
Xa57b	All	Intentional latamoxef poisoning
Xa57k	All	Intentional cefuroxime poisoning
Xa57g	All	Intentional cefaclor poisoning
Xa57o	All	Intentional cephmandole poisoning
Xa57t	All	Intentional cefotaxime poisoning
Xa57x	All	Intentional ceftazidime poisoning
Xa581	All	Intentional ceftizoxime poisoning
Xa585	All	Intentional cefixime poisoning
Xa589	All	Intentional cefodizime poisoning
Xa58D	All	Intentional cefpodoxime poisoning
Xa58H	All	Intentional ceftriaxone poisoning
Xa58L	All	Intentional ceftibuten poisoning
Xa58P	All	Intentional cefsulodin poisoning

Xa58U	All	Intentional ceftiofime poisoning
Xa58X	All	Intentional cephaloridine poisoning
Xa58a	All	Intentional sulfadiazine poisoning
Xa58d	All	Intentional sulphafurazole poisoning
Xa58g	All	Intentional sulfamethoxazole poisoning
Xa58j	All	Intentional doxycycline poisoning
Xa58m	All	Intentional minocycline poisoning
Xa58p	All	Intentional oxytetracycline poisoning
Xa58s	All	Intentional tetracycline poisoning
Xa58v	All	Intentional chloramphenicol poisoning
Xa58z	All	Intentional co-trimoxazole poisoning
Xa59F	All	Intentional hydroxyquinoline poisoning
Xa59I	All	Intentional diiodohydroxyquinoline poisoning
Xa59L	All	Intentional rifampin poisoning
Xa59O	All	Intentional isoniazid poisoning
Xa59R	All	Intentional ethambutol poisoning
Xa59U	All	Intentional cycloserine poisoning
Xa59Y	All	Intentional antileprotic drug poisoning
Xa59b	All	Intentional ethionamide poisoning
Xa59e	All	Intentional para-aminosalicylic acid poisoning
Xa59h	All	Intentional sulphone poisoning
Xa59l	All	Intentional pesticide product poisoning

Supplementary table S2.10. Read codes used to identify non-medication based treatments for depression or anxiety.

Counselling		
Read V2 Code	Term ID	Description
67...	11	Counselling/health education
671..	All	Counselling - general
6712.	All	Counselling offered
6714.	All	Counselling carried out
6715.	All	Counselling by other agency
6716.	All	Counselling of benefit
6717.	All	Counselling of no benefit
671Z.	All	Counselling - general NOS
672..	All	Person counselled
6721.	All	Patient counselled
6722.	All	Family counselled
673..	All	Person counselled by
6731.	All	Counselled by a doctor
6732.	All	Counselled by a nurse
6733.	All	Counselled by a health visitor
6735.	All	Counselled by a social worker
6736.	All	Counselled by a counsellor
6737.	All	Counselled by a vol. worker
673Z.	All	Counselled by person NOS
8M8..	All	Counselling requested
9NJ1.	All	In-house counselling
9NJR.	All	In-house counselling first appointment
9NJT.	All	In-house counselling follow-up appointment
Read CTV3 Code	Term ID	Description
X71Ec	All	Counselling
X71Ep	All	Coping strategy counselling
XaEC1	All	Phobia counselling
XaD27	All	Family counselling
6779.	All	Psychological counselling
XaECG	All	Anxiety counselling
XaECF	All	Self-esteem counselling
XaI8j	All	Stress counselling
672..	All	Person counselled
6721.	All	Patient counselled
6722.	All	Family counselled
XE1TI	All	Person counselled by
6715.	All	Counselling by other agency
6731.	All	Counselled by a doctor

6732.	All	Counselled by a nurse
6733.	All	Counselled by a health visitor
6735.	All	Counselled by a social worker
6736.	All	Counselled by a counsellor
6737.	All	Counselled by voluntary worker
673Z.	All	Counselled by person NOS
Xa07L	All	Counselled by member of primary health care team
9N2B.	All	Seen by counsellor
XaAS4	All	Seen by mental health counsellor
XaBT1	All	Refer to counsellor
XaAfj	All	Referral to mental health counsellor
9NJ1.	All	In-house counselling
XaLnp	All	In-house counselling first appointment
XaLnr	All	In-house counselling follow-up appointment
671..	All	Counselling - general
6712.	All	Counselling offered
6714.	All	Counselling carried out
6716.	All	Counselling of benefit
6717.	All	Counselling of no benefit
671Z.	All	Counselling - general NOS
XaAOd	All	Under care of counsellor
XaAOh	All	Under care of mental health counsellor
Cognitive Behavioural Therapy		
Read V2 Code	Term ID	Description
8G13.	All	Cognitive-behaviour therapy
8G130	All	Cognitive behavioural therapy parenting programme
8G131	All	CBTp - cognitive behavioural therapy for psychosis
7L1a.	All	Cognitive behavioural therapy
7L1a0	All	Cognitive behavioural therapy by unidisciplinary team
7L1a1	All	Cognitive behavioural therapy by multidisciplinary team
7L1ay	All	Other specified cognitive behavioural therapy
7L1az	All	Cognitive behavioural therapy NOS
8G510	All	Group cognitive behavioural therapy
8G15.	All	Computerised cognitive behavioural therapy
8HLK.	All	Referral for cognitive behavioural therapy
Read CTV3 Code	Term ID	Description
Ub0qp	All	Cognitive and behavioural therapy
XaABO	All	Cognitive - behaviour therapy
Xad6j	All	Cognitive behavioural therapy for psychosis
Xaaa6	All	Cognitive behavioural therapy parenting programme
XaQC0	All	Guided self help cognitive behavioural therapy
XaKzQ	All	Computerised cognitive behavioural therapy
Xa8I9	All	Generic cognitive behavioural therapy

XaM2I	All	Cognitive behavioural therapy by unidisciplinary team
XaM2J	All	Cognitive behavioural therapy by multidisciplinary team
XaM2K	All	Other specified cognitive behavioural therapy
XaM2L	All	Cognitive behavioural therapy NOS
XaR2j	All	Referral to cognitive behavioural therapist
XaR5D	All	Referral for cognitive behavioural therapy
XaYgB	All	Referral for high intensity cognitive behavioural therapy
Psychotherapy		
Read V2 Code	Term ID	Description
8G...	All	Psychotherapy
8G1..	All	General psychotherapy
8G10.	All	Psychotherapy - behavioural
8G100	All	Behavioural activation therapy
8G101	All	Dialectical behaviour therapy
8G102	All	Behavioural parent training
8G11.	All	Psychotherapy - cognitive
8G12.	All	Psychotherapy - psychodynamic
8G120	All	Short-term psychodynamic therapy
8G121	All	Dynamic interpersonal therapy
8G122	All	Focal psychodynamic therapy
8G14.	All	Cognitive analytic therapy
8G15.	All	Computerised cognitive behavioural therapy
8G16.	All	Interpersonal psychotherapy
8G18.	All	Cognitive stimulation therapy
9NIK.	All	Seen by psychotherapist
9NIK0	All	Seen by trainee psychotherapist
8HHT.	All	Referral to psychotherapist
ZV57D	All	[V]Psychotherapy, not elsewhere classified
ZV673	All	[V]Psychotherapy or other treatment for mental disorder follow-up
8G9Z.	All	Other psychotherapy NOS
8G9..	All	Other psychotherapy
Read CTV3 Code	Term ID	Description
X71bp	All	Psychotherapy
XaaUO	All	Cognitive rehabilitation therapy
XaItc	All	Brief solution focused psychotherapy
Xa8IG	All	Psychoanalytic and psychodynamic therapy
Xa8IJ	All	Long-term exploratory psychotherapy
3841.	All	Psychoanalysis
XaA8V	All	Generic psychoanalysis
XaA8W	All	Independent psychoanalysis
XaA8T	All	Kleinian psychoanalysis
XaA8U	All	Bion-based group psychoanalysis
XaA8X	All	Classical psychoanalysis

XaA8Y	All	Lacanian psychoanalysis
XaA8g	All	Group psychoanalysis
XaA8U	All	Bion-based group psychoanalysis
384Z.	All	Psychological analysis NOS
Xa8IM	All	Jungian-based therapy
Xa8IN	All	Generic Jungian-based therapy
Xa8IP	All	Analytical psychology
Xa8IR	All	Long-term psychodynamic psychotherapy
XaA8Z	All	Developmental psychodynamic psychotherapy
XaA8c	All	Supportive expressive psychodynamic psychotherapy
XaA8d	All	Psychodynamic-interpersonal psychotherapy
XaEVq	All	Psychodynamic psychotherapy
Xad7C	All	Focal psychodynamic therapy
Xa8IR	All	Long-term psychodynamic psychotherapy
XaA8Z	All	Developmental psychodynamic psychotherapy
XaA8c	All	Supportive expressive psychodynamic psychotherapy
XaA8d	All	Psychodynamic-interpersonal psychotherapy
Xa8II	All	Short-term psychodynamic therapy
XaXuc	All	Dynamic interpersonal therapy
XaA9g	All	Specific task orientated psychotherapy
XE0iL	All	Psychotherapy/sociotherapy
8G9Z.	All	Other psychotherapy NOS
8G9..	All	Other psychotherapy

Codes used to identify time off work and unemployment

Supplementary table S3.1. Read codes used to identify unemployment.

Unemployment		
Read V2 Code	Term ID	Description
13J7.	All	Unemployed
13J70	All	Recently unemployed
13J71	All	Chronic unemployment
ZV620	All	[V]Unemployment
13R..	All	Unemployment benefits
13R1.	All	Unemployment benefits
13R2.	All	Redundancy payment
13RZ.	All	Unemployment benefit NOS
13JX.	All	Time off work
13JG.	All	Voluntarily redundant
13J3.	All	Loss of job
13J30	All	Sacked from work
13J8.	All	Redundant
13JJ.	All	Unfit for work
13JJ0	All	Benefit agency reports unfit for work
13JJ1	All	Benefit agency reports unfit for work but fit note no longer required
13Jk.	All	Not in employment, education or training
9DG4.	All	IB 113 DLS incapacity for work form paid
9DG2.	All	IB 113 DLS incapacity for work form sent
9DG3.	All	IB 113 DLS incapacity for work form received
9DG1.	All	IB 113 DLS incapacity for work form completed
9DQ3.	All	ESA113 form paid
9DQ1.	All	ESA113 form sent
9DQ2.	All	ESA113 form received
9DQ0.	All	ESA113 form completed
130D.	All	Employment and support allowance
Read CTV3 Code	Term ID	Description
13J7.	All	Unemployed
13J70	All	Recently unemployed
13J71	All	Chronic unemployment
ZV620	All	[V]Unemployment
XaPhf	All	Benefit agency reports unfit for work
Xabd4	All	Benefit agency reports unfit for work but fit note no longer required
13J8.	All	Redundant
13JG.	All	Voluntarily redundant

Ua2BD	All	Unfit to return to work
Ua2BE	All	Physically unfit for work
U12BF	All	Mentally unfit for work
13JX.	All	Time off work
XaZHu	All	ESA113 form paid
XaZHt	All	ESA113 form sent
XaZHs	All	ESA113 form received
XaZHj	All	ESA113 form completed
XaBhC	All	Employment and support allowance
XacJr	All	Not in employment, education or training
XE0pT	All	Loss of job
Ua0V9	All	Dismissed from job
Ua0VA	All	Unfair dismissal from job
XaCIW	All	IB 113 DLS incapacity for work form paid
XaCIU	All	IB 113 DLS incapacity for work form sent
XaCIV	All	IB 113 DLS incapacity for work form received
XaCIT	All	IB 113 DLS incapacity for work form completed
13JJ.	All	Unfit for work
13J6.	All	Medically retired

Supplementary table S3.2. Read codes used to identify time off work via the issuing of Med 3 (“fit notes”) certificates.

Unemployment		
Read V2 Code	Term ID	Description
9D1..	All	MED3 - doctor's statement
9D11.	All	MED3 issued to patient
9D12.	All	MED3 duplicate issued
9D15.	All	eMED3 (2010) new statement issued, not fit for work
9D17.	All	eMED3 (2010) duplicate issued, not fit for work
9D19.	All	MED3 (2010) issued by hand, not fit for work
9D1C.	All	MED3 (2010) issued to patient
9D1D.	All	MED3 (2010) duplicate issued
9D1E.	All	MED3 (2010) issued - recommend phased return to work
9D1F.	All	MED3 (2010) issued - recommend altered hours
9D1G.	All	MED3 (2010) issued - recommend amended duties
9D1Z.	All	MED3 - NOS
Read CTV3 Code	Term ID	Description
XaBHd	All	MED3 status
XaXf2	All	MED3 (2010) duplicate issued
XaXf1	All	MED3 (2010) issued to patient
XaXf5	All	MED3 (2010) issued - recommend amended duties
XaXf4	All	MED3 (2010) issued - recommend altered hours
XaXf3	All	MED3 (2010) issued - recommend phased return to work
9D11.	All	MED3 issued to patient
XaX1R	All	MED3 (2010) issued by hand, not fit for work
XaX1L	All	eMED3 (2010) duplicate issued, not fit for work
XaX1E	All	eMED3 (2010) new statement issued, not fit for work
9D12.	All	MED3 duplicate issued
9D1Z.	All	MED3 - NOS

Definitions of atopic and autoimmune conditions with Read code lists.

Supplementary table S4.1. The case definitions for included atopic and autoimmune conditions.

Condition	Definition
Atopic conditions	
Atopic dermatitis	Defined using the validated algorithm by Abuabara et al. (2017)(1)
Allergic rhinitis	A diagnosis code for allergic rhinitis (Supplementary table S4.2)
Asthma	Defined using the RCGP RSC asthma algorithm(2)
Gastrointestinal conditions	
Crohn's disease	A diagnosis code for Crohn's and no conflicting code for ulcerative colitis (where conflicted codes occur the most recent diagnosis code is used to define the condition) (Supplementary table S4.3)
Ulcerative colitis	A diagnosis code for ulcerative colitis and no conflicting code for Crohn's disease (where conflicted codes occur the most recent diagnosis code is used to define the condition) (Supplementary table S4.4)
Coeliac disease	A diagnosis code for Coeliac disease (Supplementary table S4.5)
Pernicious anaemia	A diagnosis code for pernicious anaemia (Supplementary table S4.6)
Endocrine conditions	
Type 1 diabetes	Defined using the RCGP RSC diabetes type algorithm(3)
Hashimoto's thyroiditis	Either: <ul style="list-style-type: none"> • A code for Hashimoto's thyroiditis (Supplementary table S4.7) OR • A code for "non-specific hypothyroidism" AND no code for "non-autoimmune hypothyroidism"
Grave's disease	A diagnosis code for Grave's disease (Supplementary table S4.8)
Rheumatological conditions	
Rheumatoid arthritis	Defined using the validated algorithm by Muller et al. (2015)(4)
Psoriatic arthritis	A diagnosis code for psoriatic arthritis (Supplementary table S4.9)
Ankylosing spondylitis	A diagnosis code for ankylosing spondylitis (Supplementary table S4.10)
Systemic lupus erythematosus	A diagnosis code for systemic lupus erythematosus (Supplementary table S4.11)
Polymyalgia rheumatica	A diagnosis code for polymyalgia rheumatica (Supplementary table S4.12)
Sjögren's syndrome	A diagnosis code for Sjögren's syndrome (Supplementary table S4.13)
Dermatological conditions	
Psoriasis	A diagnosis code for psoriasis (Supplementary table S4.14)
Vitiligo	A diagnosis code for vitiligo (Supplementary table S4.15)

Neurological conditions

Multiple sclerosis	A diagnosis code for multiple sclerosis (Supplementary table S4.16)
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For peer review only

Supplementary table S4.2. Read codes used to identify allergic rhinitis.

Allergic rhinitis		
Read V2 Code	Term ID	Description
H17..	All	Allergic rhinitis
H170.	All	Allergic rhinitis due to pollens
H171.	All	Allergic rhinitis due to other allergens
H1710	All	Allergy to animal
H1711	All	Dog allergy
H172.	All	Allergic rhinitis due to unspecified allergen
H17z.	All	Allergic rhinitis NOS
14B1.	All	H/O: hay fever
H3300	All	Hay fever with asthma
Read CTV3 Code	Term ID	Description
XE0Y5	All	Allergic rhinitis
Xa0IX	All	Seasonal allergic rhinitis
XE2QI	All	Allergic rhinitis due to pollens
Hyu20	All	[X]Other seasonal allergic rhinitis
X00I8	All	Hay fever - other allergen
X00I9	All	Hay fever - unspecified allergen
X1020	All	Hay fever with asthma
X00IA	All	Perennial allergic rhinitis
X00IB	All	Perennial allergic rhinitis with seasonal variation
H17z.	All	Allergic rhinitis NOS
Hyu21	All	[X]Other allergic rhinitis
XE0Y6	All	Allergic rhinitis due to other allergens
XE0Y7	All	Allergic rhinitis due to unspecified allergen
14B1.	All	H/O: hay fever

Supplementary table S4.3. Read codes used to Crohn's disease.

Crohn's disease		
Read V2 Code	Term ID	Description
J40..	All	Regional enteritis- Crohn's disease
J400.	All	Regional enteritis of the small bowel
J4000	All	Regional enteritis of the duodenum
J4001	All	Regional enteritis of the jejunum
J4002	All	Crohn's disease of the terminal ileum
J4003	All	Crohn's disease of the ileum unspecified
J4004	All	Crohn's disease of the ileum NOS
J4005	All	Exacerbation of Crohn's disease of small intestine
J400z	All	Crohn's disease of the small bowel NOS
J40..	All	Crohn's disease
J4010	All	Regional enteritis of the colon
J4011	All	Regional enteritis of the rectum
J4012	All	Exacerbation of Crohn's disease of large intestine
J401z	All	Crohn's disease of the large bowel NOS
J40z.	All	Crohn's disease NOS
Read CTV3 Code	Term ID	Description
XE2QL	All	Crohn's disease
Xa0lh	All	Regional enteritis
X302r	All	Crohn's jejunitis
X302t	All	Crohn's ileitis
J4003	All	Crohn's disease of the ileum unspecified
J4004	All	Crohn's disease of the ileum NOS
J4002	All	Crohn's disease of terminal ileum
J400.	All	Regional enteritis of small bowel
XaK6C	All	Exacerbation of Crohn's disease of small intestine
J400z	All	Crohn's disease of the small bowel NOS
J401.	All	Regional enteritis of the large bowel
XE0af	All	Crohn's disease of the large bowel NOS
XaK6D	All	Exacerbation of Crohn's disease of large intestine
J40z.	All	Regional enteritis NOS
J4010	All	Crohn's colitis
J4011	All	Crohn's proctitis
X3050	All	Perianal Crohn's disease
Jyu40	All	[X]Other Crohn's disease
J4001	Y30Fy	Regional enteritis of the jejunum

Supplementary table S4.4. Read codes used to identify Ulcerative colitis.

Ulcerative colitis		
Read V2 Code	Term ID	Description
J41..	All	Ulcerative colitis and/or proctitis
J410.	All	Ulcerative proctocolitis
J4100	All	Ulcerative ileocolitis
J4101	All	Ulcerative colitis
J4102	All	Ulcerative rectosigmoiditis
J4103	All	Ulcerative proctitis
J4104	All	Exacerbation of ulcerative colitis
J410z	All	Ulcerative proctocolitis NOS
J411.	All	Ulcerative (chronic) enterocolitis
J412.	All	Ulcerative (chronic) ileocolitis
J413.	All	Ulcerative pancolitis
N0454	All	Juvenile arthritis in ulcerative colitis
N0310	All	Arthropathy in ulcerative colitis
Read CTV3 Code	Term ID	Description
XE0ag	All	Ulcerative colitis
XaZ2j	All	Left sided ulcerative colitis
XaYzX	All	Ulcerative pancolitis
XaK6E	All	Exacerbation of ulcerative colitis
J410.	All	Ulcerative proctocolitis
J4100	All	Ulcerative ileocolitis
J410z	All	Ulcerative proctocolitis NOS
Jyu41	All	[X]Other ulcerative colitis
J4103	Y30D7	Ulcerative proctitis

Supplementary table S4.5. Read codes used to identify Coeliac disease.

Coeliac disease		
Read V2 Code	Term ID	Description
J690.	All	Coeliac disease
J6900	All	Congenital coeliac disease
J6901	All	Acquired coeliac disease
J690z	All	Coeliac disease NOS
6648.	All	Coeliac disease monitoring
66480	All	Coeliac disease annual review
68W4.	All	Coeliac disease autoantibody profile positive
Read CTV3 Code	Term ID	Description
XE0bL	All	Childhood coeliac disease
X3037	All	Adult coeliac disease
J6901	All	Acquired coeliac disease
J690z	All	Coeliac disease NOS
XE0bK	All	Coeliac disease
XaQIX	All	Coeliac disease autoantibody profile positive
XaXGl	All	Coeliac disease monitoring
J6900	All	Congenital coeliac disease
Pernicious anaemia		
Read V2 Code	Term ID	Description
D010.	All	Pernicious anaemia
F3815	All	Myasthenic syndrome due to pernicious anaemia
Read CTV3 Code	Term ID	Description
XE2ro	All	Pernicious anaemia
X20CE	All	Selective malabsorption of cyanocobalamin
X20CC	All	Congenital deficiency of intrinsic factor
X20CD	All	Biermer's congenital pernicious anaemia
F3815	All	Myasthenic syndrome due to pernicious anaemia

Supplementary table S4.6. Read codes used to identify pernicious anaemia.

Pernicious anaemia		
Read V2 Code	Term ID	Description
D010.	All	Pernicious anaemia
F3815	All	Myasthenic syndrome due to pernicious anaemia
Read CTV3 Code	Term ID	Description
XE2ro	All	Pernicious anaemia
X20CE	All	Selective malabsorption of cyanocobalamin
X20CC	All	Congenital deficiency of intrinsic factor
X20CD	All	Biermer's congenital pernicious anaemia
F3815	All	Myasthenic syndrome due to pernicious anaemia

Supplementary table S4.7. Read codes used to identify Hashimoto's thyroiditis.

This will be defined as either a code for Hashimoto's thyroiditis or a non-specific code for hypothyroidism and no codes for any non-autoimmune hypothyroidism.

Hashimoto's thyroiditis		
Read V2 Code	Term ID	Description
C052.	All	Hashimoto's disease
C05y4	All	Chronic thyroiditis with transient thyrotoxicosis
C046.	All	Autoimmune myxoedema
L1815	All	Postpartum thyroiditis
Read CTV3 Code	Term ID	Description
X40G1	All	Thyrotoxicosis due to Hashimoto's thyroiditis
X40Gm	All	Hashitoxicosis - transient
X40Ha	All	Struma lymphomatosis
X40HE	All	Autoimmune hypothyroidism
X40HF	All	Hypothyroidism due to Hashimoto's thyroiditis
X40HG	All	Hypothyroidism due to TSH receptor blocking antibody
X40HW	All	Hashimoto's disease
X40HY	All	Lymphadenoid goitre
X40HZ	All	Lymphocytic thyroiditis - autoimmune
XE10C	All	Autoimmune thyroiditis
X40HW	All	Hashimoto's thyroiditis
X40Gm	All	Hashitoxicosis - transient
X40HY	All	Lymphadenoid goitre
X40HZ	All	Lymphocytic thyroiditis - autoimmune
X40Ha	All	Struma lymphomatosis
X40Dj	All	Postpartum thyroiditis
Non-specific hypothyroidism		
Read V2 Code	Term ID	Description
C04..	All	Acquired hypothyroidism
C045.	All	Acquired atrophy of thyroid
C046.	All	Autoimmune myxoedema
C04y.	All	Other acquired hypothyroidism
C04z.	All	Hypothyroidism NOS
C04z0	All	Premature puberty due to hypothyroidism
C04z1	All	Myxoedema coma
C05y.	All	Other and unspecified chronic thyroiditis
F3953	All	Myopathy due to myxoedema
F1441	All	Cerebellar ataxia due to myxoedema
F11x5	All	Cerebral degeneration due to myxoedema
1432	All	H/O: hypothyroidism
66BB.	All	Hypothyroidism annual review

90j..	All	Hypothyroidism monitoring administration
90j0.	All	Hypothyroidism monitoring first letter
90j1.	All	Hypothyroidism monitoring second letter
90j2.	All	Hypothyroidism monitoring third letter
90j3.	All	Hypothyroidism monitoring verbal invite
90j4.	All	Hypothyroidism monitoring telephone invitation
F3814	All	Myasthenic syndrome due to hypothyroidism
90j4.	All	Hypothyroidism monitoring telephone invitation
Read CTV3 Code	Term ID	Description
X40IQ	All	Hypothyroid
XE108	All	Acquired hypothyroidism
X40HI	All	Compensated hypothyroidism
X005I	All	Myxoedema coma
C04y.	All	Other acquired hypothyroidism
X40HD	All	Hypothyroid goitre, acquired
XE10A	All	Hypothyroidism NOS
Xa3ed	All	Acquired hypothyroidism NOS
XaLUg	All	Hypothyroidism review
XaOjl	All	Hypothyroidism annual review
X40HD	All	Hypothyroid goitre, acquired
XaJul	All	Hypothyroidism monitoring invitation
XaMFm	All	Hypothyroidism monitoring telephone invitation
XaKbz	All	Hypothyroidism monitoring verbal invite
XaJuO	All	Hypothyroidism monitoring third letter
XaJuN	All	Hypothyroidism monitoring second letter
XaJuM	All	Hypothyroidism monitoring first letter
C06y1	All	Thyroid atrophy
X40I1	All	Atrophy of thyroid - acquired
F3953	All	Myxoedema myopathy
F11x5	All	Myxoedema encephalopathy
F1441	All	Myxoedema cerebellar degeneration
PK251	All	Aplasia of thyroid with myxoedema
X00Ao	All	Myxoedema neuropathy
1432.	All	H/O: hypothyroidism
C04z0	All	Premature puberty due to hypothyroidism
C05y.	All	Other and unspecified chronic thyroiditis
Non-autoimmune hypothyroidism		
Read V2 Code	Term ID	Description
C0A..	All	Congenital iodine deficiency syndrome
C0A0.	All	Congenital iodine-deficiency syndrome, neurological type
C0A1.	All	Congenital iodine-deficiency syndrome, myxoedematous type
C0A2.	All	Congenital iodine-deficiency syndrome, mixed type
C0A3.	All	Iodine-deficiency-related diffuse (endemic) goitre

C0A4.	All	Iodine-deficiency-related multinodular (endemic) goitre
C0A5.	All	Subclinical iodine-deficiency hypothyroidism
C0AX.	All	Iodine-deficiency-related (endemic) goitre, unspecified
C03..	All	Congenital hypothyroidism
C030.	All	Pendred's syndrome
C031.	All	Goitrous cretin
C03y.	All	Other specified congenital hypothyroidism
C03y0	All	Congenital hypothyroidism with diffuse goitre
C03y1	All	Congenital hypothyroidism without goitre
C03z.	All	Congenital hypothyroidism NOS
C040.	All	Postsurgical hypothyroidism
C041.	All	Other postablative hypothyroidism
C0410	All	Irradiation hypothyroidism
C041z	All	Postablative hypothyroidism NOS
C042.	All	Iodine hypothyroidism
C043.	All	Other iatrogenic hypothyroidism
C0430	All	Hypothyroidism resulting from para-aminosalicylic acid
C0431	All	Hypothyroidism resulting from phenylbutazone
C0432	All	Hypothyroidism resulting from resorcinol
C043z	All	Iatrogenic hypothyroidism NOS
C044.	All	Postinfectious hypothyroidism
71100	All	Total thyroidectomy
71101	All	Subtotal thyroidectomy
5A11.	All	Thyroid gland ablat - irradiat
5A12.	All	Thyroid tumour/metast irradiat
C1343	All	TSH - thyroid-stimulating hormone deficiency
Q4337	All	Neonatal jaunduce with congenital hypothyroidism
Read CTV3 Code	Term ID	Description
C03..	All	Congenital hypothyroidism
Xa017	All	Congenital hypothyroidism with diffuse goitre
X40H8	All	Congenital hypothyroidism without goitre
PK251	All	Congenital thyroid aplasia
X40HA	All	Congenital thyroid hypoplasia
X40HB	All	Congenital atrophy of thyroid
X40HC	All	Congenital hypothyroidism with ectopic thyroid
C03y.	All	Other specified congenital hypothyroidism
XE107	All	Congenital hypothyroidism NOS
X40I7	All	Congenital iodine deficiency hypothyroidism
X40I8	All	Congenital iodine deficiency syndrome - myxoedematous type
X40I9	All	Congenital iodine deficiency syndrome - mixed type
X40HL	All	Iatrogenic hypothyroidism
X40HM	All	Postablative hypothyroidism
XE109	All	Post-surgical hypothyroidism
C0410	All	Irradiation hypothyroidism

X40HN	All	Radioactive iodine-induced hypothyroidism
C041.	All	Other postablative hypothyroidism
C041z	All	Postablative hypothyroidism NOS
C043.	All	Other iatrogenic hypothyroidism
C043z	All	Iatrogenic hypothyroidism NOS
X40HO	All	Drug-induced hypothyroidism
C0430	All	Hypothyroidism resulting from para-aminosalicylic acid
C0431	All	Hypothyroidism resulting from phenylbutazone
C0432	All	Hypothyroidism resulting from resorcinol
X40HP	All	Post-infectious hypothyroidism
X40IB	All	Subclinical iodine deficiency hypothyroidism
C042.	All	Iodine hypothyroidism
C1343	All	TSH deficiency
X40LB	All	Isolated TSH deficiency
X40LC	All	Idiopathic TSH deficiency
X40Hv	All	Hypothyroidism due to iodide trapping defect
X40Hw	All	Hypothyroidism due to iodide organification defect
X40Hx	All	Hypothyroidism due to coupling defect
X40Hy	All	Hypothyroidism due to deiodase defect
X40Hz	All	Hypothyroidism due to thyroglobulin synthesis defect
Cyu11	All	[X]Other specified hypothyroidism
Xa3ec	All	Hypothyroidism - congenital and acquired
C03..	All	Congenital hypothyroidism
Xa0l7	All	Congenital hypothyroidism with diffuse goitre
X40H8	All	Congenital hypothyroidism without goitre
PK251	All	Congenital thyroid aplasia
X40HA	All	Congenital thyroid hypoplasia
X40HB	All	Congenital atrophy of thyroid
X40HC	All	Congenital hypothyroidism with ectopic thyroid
C03y.	All	Other specified congenital hypothyroidism
XE107	All	Congenital hypothyroidism NOS
X40I7	All	Congenital iodine deficiency hypothyroidism
X40I8	All	Congenital iodine deficiency syndrome - myxoedematous type
X40I9	All	Congenital iodine deficiency syndrome - mixed type
X40HL	All	Iatrogenic hypothyroidism
X40HM	All	Postablative hypothyroidism
XE109	All	Post-surgical hypothyroidism
C0410	All	Irradiation hypothyroidism
X40HN	All	Radioactive iodine-induced hypothyroidism
C041.	All	Other postablative hypothyroidism
C041z	All	Postablative hypothyroidism NOS
C043.	All	Other iatrogenic hypothyroidism
C043z	All	Iatrogenic hypothyroidism NOS
X40HO	All	Drug-induced hypothyroidism
C0430	All	Hypothyroidism resulting from para-aminosalicylic acid

C0431	All	Hypothyroidism resulting from phenylbutazone
C0432	All	Hypothyroidism resulting from resorcinol
X40HP	All	Post-infectious hypothyroidism
X40IB	All	Subclinical iodine deficiency hypothyroidism
C042.	All	Iodine hypothyroidism
C1343	All	TSH deficiency
X40LB	All	Isolated TSH deficiency
X40LC	All	Idiopathic TSH deficiency
X40Hv	All	Hypothyroidism due to iodide trapping defect
X40Hw	All	Hypothyroidism due to iodide organification defect
X40Hx	All	Hypothyroidism due to coupling defect
X40Hy	All	Hypothyroidism due to deiodase defect
X40Hz	All	Hypothyroidism due to thyroglobulin synthesis defect
Cyu11	All	[X]Other specified hypothyroidism
Xa3ec	All	Hypothyroidism - congenital and acquired
Xa08g	All	Transient neonatal hypothyroidism
Q4337	All	Neonatal jaundice with congenital hypothyroidism

Supplementary table S4.8. Read codes used to identify Grave's disease.

Grave's disease		
Read V2 Code	Term ID	Description
66B4.	All	Thyroid eye disease
C020.	All	Graves' disease
C0200	All	Toxic diffuse goitre with no crisis
C0201	All	Toxic diffuse goitre with crisis
C020z	All	Toxic diffuse goitre NOS
F4G2.	All	Endocrine exophthalmos
F4G20	All	Thyrotoxic exophthalmos
F4G21	All	Exophthalmic ophthalmoplegia
F4G2z	All	Endocrine exophthalmos NOS
Read CTV3 Code	Term ID	Description
F4G2.	All	Dysthyroid ophthalmopathy
F4G20	All	Thyrotoxic exophthalmos
F4G21	All	Exophthalmic ophthalmoplegia
F4G2z	All	Endocrine exophthalmos NOS
X400I	All	Graves' disease
X40Gk	All	Thyrotoxicosis due to Graves' disease
X400K	All	Juvenile Graves' disease
X400R	All	Exophthalmic goitre
X40Gk	All	Thyrotoxicosis due to Graves' disease
XS29G	All	Thyroid eye disease
XE105	All	Toxic diffuse goitre
C0200	All	Toxic diffuse goitre with no crisis
C0201	All	Toxic diffuse goitre with crisis
C020z	All	Toxic diffuse goitre NOS

Supplementary table S4.9. Read codes used to identify psoriatic arthritis.

Psoriatic arthritis		
Read V2 Code	Term ID	Description
M160.	All	Psoriatic arthropathy
M1601	All	Distal interphalangeal psoriatic arthropathy
M160z	All	Psoriatic arthropathy NOS
Nyu13	All	[X]Other psoriatic arthropathies
M1600	All	Psoriasis spondylitica
M1602	All	Arthritis mutilans
Read CTV3 Code	Term ID	Description
M160.	All	Psoriatic arthritis
M1600	All	Psoriatic arthritis with spine involvement
X7026	All	Psoriatic arthritis with distal interphalangeal joint involvement
X7027	All	Psoriatic arthritis - destructive type
X7028	All	Psoriatic dactylitis
X701u	All	Juvenile psoriatic arthritis
X701v	All	Juvenile psoriatic arthritis with psoriasis
X701w	All	Juvenile psoriatic arthritis without psoriasis
M160z	All	Psoriatic arthropathy NOS
Nyu13	All	[X]Other psoriatic arthropathies
Ankylosing spondylitis		
Read V2 Code	Term ID	Description
N100.	All	Ankylosing spondylitis
N0450	All	Juvenile ankylosing spondylitis
Read CTV3 Code	Term ID	Description
N100.	All	Ankylosing spondylitis
X7023	All	Ankylosing spondylitis with organ / system involvement
X7024	All	Ankylosing spondylitis with multisystem involvement
X701x	All	Juvenile ankylosing spondylitis

Supplementary table S4.10. Read codes used to identify ankylosing spondylitis.

Ankylosing spondylitis		
Read V2 Code	Term ID	Description
N100.	All	Ankylosing spondylitis
N0450	All	Juvenile ankylosing spondylitis
Read CTV3 Code	Term ID	Description
N100.	All	Ankylosing spondylitis
X7023	All	Ankylosing spondylitis with organ / system involvement
X7024	All	Ankylosing spondylitis with multisystem involvement
X701x	All	Juvenile ankylosing spondylitis

Supplementary table S4.11. Read codes used to identify systemic lupus erythematosus.

Systemic lupus erythematosus		
Read V2 Code	Term ID	Description
N000.	All	Systemic lupus erythematosus
N0000	All	Disseminated lupus erythematosus
N0001	All	Libman-Sacks disease
N0002	All	Drug-induced systemic lupus erythematosus
N0003	All	Systemic lupus erythematosus with organ or system involvement
N0004	All	Systemic lupus erythematosus with pericarditis
N0005	All	Neonatal lupus erythematosus
N0006	All	Cerebral lupus
N000z	All	Systemic lupus erythematosus NOS
K01x4	All	Nephrotic syndrome in systemic lupus erythematosus
Read CTV3 Code	Term ID	Description
N000.	All	Systemic lupus erythematosus
X704X	All	Systemic lupus erythematosus with organ/system involvement
XE0da	All	Lupus nephritis
X30Kn	All	Lupus nephritis - WHO Class I
X30Ko	All	Lupus nephritis - WHO Class II
X30Kp	All	Lupus nephritis - WHO Class III
X30Kq	All	Lupus nephritis - WHO Class IV
X30Kr	All	Lupus nephritis - WHO Class V
X30Ks	All	Lupus nephritis - WHO Class VI
XM197	All	[EDTA] Lupus erythematosus associated with renal failure
X00Dx	All	Cerebral lupus
X704a	All	Lupus panniculitis
N0001	All	Libman-Sacks disease
XaC1J	All	Systemic lupus erythematosus with pericarditis
X704c	All	Systemic lupus erythematosus with multisystem involvement
N0002	All	Drug-induced systemic lupus erythematosus
N000z	All	Systemic lupus erythematosus NOS
Nyu43	All	[X]Other forms of systemic lupus erythematosus
X0046	All	Chorea in systemic lupus erythematosus
H57y4	All	Lung disease with systemic lupus erythematosus
XaBE1	All	Renal tubulo-interstitial disord in systemic lupus erythematosus

Supplementary table S4.12. Read codes used to identify polymyalgia rheumatica.

Polymyalgia rheumatica		
Read V2 Code	Term ID	Description
N20..	All	Polymyalgia rheumatica
N200.	All	Giant cell arteritis with polymyalgia rheumatica
Read CTV3 Code	Term ID	Description
XE1FJ	All	Polymyalgia rheumatica
X705I	All	Giant cell arteritis with polymyalgia rheumatica

Supplementary table S4.13. Read codes used to identify Sjögren's syndrome.

Sjögren's syndrome		
Read V2 Code	Term ID	Description
N002.	All	Sicca (Sjogren's) syndrome
F3967	All	Myopathy due to Sjogren's disease
H57y3	All	Lung disease with Sjogren's disease
Read CTV3 Code	Term ID	Description
Xa0hF	All	Sjogren's syndrome
X705A	All	Primary Sjogren's syndrome
X705B	All	Primary Sjogren's syndrome with organ/system involvement
X705C	All	Primary Sjogren's syndrome with multisystem involvement
X705D	All	Secondary Sjogren's syndrome
X705E	All	Secondary Sjogren's syndrome with organ/system involvement
X705F	All	Secondary Sjogren's syndrome with multisystem involvement
F3967	All	Myopathy due to Sjogren's disease
H57y3	All	Lung disease with Sjogren's disease

Supplementary table S4.14. Read codes used to identify psoriasis.

Psoriasis		
Read V2 Code	Term ID	Description
M16..	All	Psoriasis and similar disorders
M161.	All	Other psoriasis
M1610	All	Psoriasis unspecified
M1611	All	Psoriasis annularis
M1612	All	Psoriasis circinata
M1613	All	Psoriasis diffusa
M1614	All	Psoriasis discoidea
M1615	All	Psoriasis geographica
M1616	All	Guttate psoriasis
M1617	All	Psoriasis gyrata
M1618	All	Psoriasis inveterata
M1619	All	Psoriasis ostracea
M161A	All	Psoriasis palmaris
M161B	All	Psoriasis plantaris
M161C	All	Psoriasis punctata
M161D	All	Pustular psoriasis
M161E	All	Psoriasis universalis
M161F	All	Psoriasis vulgaris
M161G	All	Acrodermatitis continua
M161H	All	Erythrodermic psoriasis
M161J	All	Flexural psoriasis
M161z	All	Psoriasis NOS
M166.	All	Palmoplantar pustular psoriasis
M16y.	All	Other psoriasis and similar disorders
M16y0	All	Scalp psoriasis
M16z.	All	Psoriasis and similar disorders NOS
Myu30	All	[X]Other psoriasis
Read CTV3 Code	Term ID	Description
X506Y	All	Psoriasis
XaY0x	All	Pustular psoriasis
X506p	All	Generalised pustular psoriasis
X506q	All	Acute generalised pustular psoriasis
X506r	All	Generalised pustular psoriasis of pregnancy
X506s	All	Pustular psoriasis in children
X506t	All	Juvenile pustular psoriasis
X506u	All	Infantile pustular psoriasis
X506l	All	Localised pustular psoriasis
X506m	All	Palmoplantar pustular psoriasis
M07y0	All	Acute palmoplantar pustular psoriasis
M161A	All	Psoriasis palmaris

M161B	All	Psoriasis plantaris
X506o	All	Lapiere type of psoriasis
X506v	All	Circinate and annular pustular psoriasis
M1611	All	Psoriasis annularis
M1612	All	Psoriasis circinata
M1614	All	Plaque psoriasis
XaNXa	All	Chronic large plaque psoriasis
M1616	All	Guttate psoriasis
X506Z	All	Flexural psoriasis
X506a	All	Unstable psoriasis
X506b	All	Erythrodermic psoriasis
X506i	All	Scalp psoriasis
M161.	All	Other psoriasis
M1610	All	Psoriasis unspecified
M1613	All	Psoriasis diffusa
M1615	All	Psoriasis geographica
M1617	All	Psoriasis gyrata
M1618	All	Psoriasis inveterata
M161C	All	Psoriasis punctata
M161E	All	Psoriasis universalis
XaNXt	All	Psoriasis vulgaris
M161z	All	Psoriasis NOS
Myu30	All	[X]Other psoriasis

Supplementary table S4.15. Read codes used to identify vitiligo.

Vitiligo		
Read V2 Code	Term ID	Description
M2951	All	Vitiligo
F4E53	All	Vitiligo of eyelid
Read CTV3 Code	Term ID	Description
M2951	All	Vitiligo
F4E53	All	Vitiligo of eyelid
X508z	All	Occupational vitiligo

Supplementary table S4.16. Read codes used to identify multiple sclerosis.

Multiple sclerosis		
Read V2 Code	Term ID	Description
666A.	All	Multiple sclerosis review
9mD..	All	Multiple sclerosis monitoring administration
9mD0.	All	Multiple sclerosis monitoring first letter
9mD1.	All	Multiple sclerosis monitoring second letter
9mD2.	All	Multiple sclerosis monitoring telephone invitation
9mD3.	All	Multiple sclerosis monitoring third letter
F20..	All	Multiple sclerosis
F200.	All	Multiple sclerosis of the brain stem
F201.	All	Multiple sclerosis of the spinal cord
F202.	All	Generalised multiple sclerosis
F203.	All	Exacerbation of multiple sclerosis
F204.	All	Benign multiple sclerosis
F205.	All	Malignant multiple sclerosis
F206.	All	Primary progressive multiple sclerosis
F207.	All	Relapsing and remitting multiple sclerosis
F208.	All	Secondary progressive multiple sclerosis
F20z.	All	Multiple sclerosis NOS
8CS1.	All	Multiple sclerosis care plan agreed
9kG..	All	Specialised services for patients with multiple sclerosis - enhanced services administration
Read CTV3 Code	Term ID	Description
XaKvm	All	Multiple sclerosis review
XaKvn	All	Multiple sclerosis multidisciplinary review
XaX9A	All	Multiple sclerosis monitoring administration
XaX9F	All	Multiple sclerosis monitoring first letter
XaX9H	All	Multiple sclerosis monitoring second letter
XaX9J	All	Multiple sclerosis monitoring telephone invitation
XaX9L	All	Multiple sclerosis monitoring third letter
F20..	All	Multiple sclerosis
XaP1V	All	Secondary progressive multiple sclerosis
XaP1B	All	Relapsing and remitting multiple sclerosis
XaP0r	All	Primary progressive multiple sclerosis
XaP0X	All	Malignant multiple sclerosis
XaOzZ	All	Benign multiple sclerosis
X005c	All	Acute relapsing multiple sclerosis
X005d	All	Chronic progressive multiple sclerosis
X005e	All	Remittent-progressive multiple sclerosis
F200.	All	Multiple sclerosis of the brainstem
F201.	All	Multiple sclerosis of the spinal cord
F202.	All	Generalised multiple sclerosis

F203.	All	Exacerbation of multiple sclerosis
F20z.	All	Multiple sclerosis NOS
XaPSc	All	Management of multiple sclerosis in palliative phase
XaPSb	All	Management of multiple sclerosis in progressive disability phase
XaPSa	All	Management of multiple sclerosis in stable disability phase
XaPSZ	All	Management of multiple sclerosis in early disease phase
XaPSY	All	Management of multiple sclerosis in onset phase
XaXsg	All	Referral to community multiple sclerosis team
XaKA8	All	Specialised services for patients with multiple sclerosis enhanced services administration
XaKzg	All	Multiple sclerosis care plan agreed

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Definitions of common infections with Read code lists.

Supplementary table S5.1. The case definitions for included Upper Respiratory Tract Infections.

Upper Respiratory Tract Infections		
Read V2 Code	Term ID	Description
F51..	All	Nonsuppurative otitis media + eustachian tube disorders
F510.	All	Acute non suppurative otitis media
F5100	All	Acute otitis media with effusion
F5101	All	Acute serous otitis media
F5102	All	Acute mucoid otitis media
F5103	All	Acute sanguinous otitis media
F5104	All	Acute allergic serous otitis media
F5105	All	Acute allergic mucoid otitis media
F5106	All	Acute allergic sanguinous otitis media
F510z	All	Acute nonsuppurative otitis media NOS
F52..	All	Suppurative and unspecified otitis media
F520.	All	Acute suppurative otitis media
F5200	All	Acute suppurative otitis media tympanic membrane intact
F5201	All	Acute suppurative otitis media tympanic membrane ruptured
F5203	All	Acute suppurative otitis media due to disease EC
F520z	All	Acute suppurative otitis media NOS
F526.	All	Acute left otitis media
F527.	All	Acute right otitis media
F528.	All	Acute bilateral otitis media
F52z.	All	Otitis media NOS
H00..	All	Acute nasopharyngitis
H01..	All	Acute sinusitis
H010.	All	Acute maxillary sinusitis
H011.	All	Acute frontal sinusitis
H012.	All	Acute ethmoidal sinusitis
H013.	All	Acute sphenoidal sinusitis
H014.	All	Acute rhinosinusitis
H01y.	All	Other acute sinusitis
H01y0	All	Acute pansinusitis
H01yz	All	Other acute sinusitis NOS
H01z.	All	Acute sinusitis NOS
H02..	All	Acute pharyngitis
H020.	All	Acute gangrenous pharyngitis
H021.	All	Acute phlegmonous pharyngitis
H022.	All	Acute ulcerative pharyngitis

H023.	All	Acute bacterial pharyngitis
H0230	All	Acute pneumococcal pharyngitis
H0231	All	Acute staphylococcal pharyngitis
H023z	All	Acute bacterial pharyngitis NOS
H024.	All	Acute viral pharyngitis
H025.	All	Allergic pharyngitis
H02z.	All	Acute pharyngitis NOS
H03..	All	Acute tonsillitis
H030.	All	Acute erythematous tonsillitis
H031.	All	Acute follicular tonsillitis
H032.	All	Acute ulcerative tonsillitis
H033.	All	Acute catarrhal tonsillitis
H034.	All	Acute gangrenous tonsillitis
H035.	All	Acute bacterial tonsillitis
H0350	All	Acute pneumococcal tonsillitis
H0351	All	Acute staphylococcal tonsillitis
H035z	All	Acute bacterial tonsillitis NOS
H036.	All	Acute viral tonsillitis
H037.	All	Recurrent acute tonsillitis
H03z.	All	Acute tonsillitis NOS
H04..	All	Acute laryngitis and tracheitis
H040.	All	Acute laryngitis
H0400	All	Acute oedematous laryngitis
H0401	All	Acute ulcerative laryngitis
H0402	All	Acute catarrhal laryngitis
H0403	All	Acute phlegmonous laryngitis
H0404	All	Acute haemophilus influenzae laryngitis
H0405	All	Acute pneumococcal laryngitis
H0406	All	Acute suppurative laryngitis
H040w	All	Acute viral laryngitis unspecified
H040x	All	Acute bacterial laryngitis unspecified
H040z	All	Acute laryngitis NOS
H041.	All	Acute tracheitis
H0410	All	Acute tracheitis without obstruction
H0411	All	Acute tracheitis with obstruction
H041z	All	Acute tracheitis NOS
H042.	All	Acute laryngotracheitis
H0420	All	Acute laryngotracheitis without obstruction
H0421	All	Acute laryngotracheitis with obstruction
H042z	All	Acute laryngotracheitis NOS
H043.	All	Acute epiglottitis (non strep)
H0430	All	Acute epiglottitis without obstruction

H0431	All	Acute epiglottitis with obstruction
H0432	All	Acute obstructive laryngitis
H043z	All	Acute epiglottitis NOS
H044.	All	Croup
H04z.	All	Acute laryngitis and tracheitis NOS
H05..	All	Other acute upper respiratory infections
H050.	All	Acute laryngopharyngitis
H051.	All	Acute upper respiratory tract infection
H052.	All	Pharyngotracheitis
H053.	All	Tracheopharyngitis
H054.	All	Recurrent upper respiratory tract infection
H055.	All	Pharyngolaryngitis
H05y.	All	Other upper respiratory infections of multiple sites
H05z.	All	Upper respiratory infection NOS
H0y..	All	Other specified acute respiratory infections
H0z..	All	Acute respiratory infection NOS
Read CTV3 Code	Term ID	Description
A3401	All	Streptococcal laryngitis
A3403	All	Streptococcal tonsillitis
A740.	All	Herpangina
AA12.	All	Vincent's angina - pharyngitis
F51..	All	Non-suppurative otitis media with eustachian tube disorders
F510.	All	Acute non-suppurative otitis media
F5100	All	Acute otitis media: [with effusion] or [secretory]
F5101	All	Acute non-suppurative otitis media - serous
F5102	All	Acute non-suppurative otitis media - mucoid
F5103	All	Acute non-suppurative otitis media - sanguinous
F5104	All	Acute allergic serous otitis media
F5105	All	Acute allergic mucoid otitis media
F5106	All	Acute allergic sanguinous otitis media
F510z	All	Acute non-suppurative otitis media NOS
F52..	All	Suppurative and unspecified otitis media
F520.	All	Acute suppurative otitis media
F5200	All	Acute suppurative otitis media - tympanic membrane intact
F5201	All	Acute suppurative otitis media - tympanic membrane ruptured
F5203	All	Acute suppurative otitis media due to disease EC
F520z	All	Acute suppurative otitis media NOS
F526.	All	Acute left otitis media
F527.	All	Acute right otitis media
F528.	All	Acute bilateral otitis media
F52z.	All	Ear infection &/or otitis media NOS
FyuP0	All	[X]Other acute non-suppurative otitis media
H00..	All	(Acute nasopharyngitis or rhinitis) or (common cold)

H01..	All	Sinusitis (& acute)
H010.	All	Acute maxillary sinusitis
H011.	All	Acute frontal sinusitis
H012.	All	Acute ethmoidal sinusitis
H013.	All	Acute sphenoidal sinusitis
H014.	All	NULL
H01y.	All	Other acute sinusitis
H01y0	All	Acute pansinusitis
H01yz	All	Other acute sinusitis NOS
H01z.	All	Acute sinusitis NOS
H02..	All	Throat: [acute pharyngitis] or [sore NOS (& viral)] or [infection]
H020.	All	Acute gangrenous pharyngitis
H021.	All	Acute phlegmonous pharyngitis
H022.	All	Acute ulcerative pharyngitis
H023.	All	Acute bacterial pharyngitis
H0230	All	Acute pneumococcal pharyngitis
H0231	All	Acute staphylococcal pharyngitis
H023z	All	Acute bacterial pharyngitis NOS
H024.	All	Acute viral pharyngitis
H025.	All	Allergic pharyngitis
H02z.	All	Acute pharyngitis NOS
H03..	All	Tonsillitis (& acute)
H030.	All	Acute erythematous tonsillitis
H031.	All	Acute follicular tonsillitis
H032.	All	Acute ulcerative tonsillitis
H033.	All	Acute catarrhal tonsillitis
H034.	All	Acute gangrenous tonsillitis
H035.	All	Acute bacterial tonsillitis
H0350	All	Acute pneumococcal tonsillitis
H0351	All	Acute staphylococcal tonsillitis
H035z	All	Acute bacterial tonsillitis NOS
H036.	All	Acute viral tonsillitis
H037.	All	Recurrent acute tonsillitis
H03z.	All	Acute tonsillitis NOS
H04..	All	NULL
H040.	All	Acute laryngitis
H0400	All	Acute oedematous laryngitis
H0401	All	Acute ulcerative laryngitis
H0402	All	Acute catarrhal laryngitis
H0403	All	Acute phlegmonous laryngitis
H0404	All	Acute haemophilus influenzae laryngitis
H0405	All	Acute pneumococcal laryngitis

H0406	All	Acute suppurative laryngitis
H040w	All	Acute viral laryngitis unspecified
H040x	All	Acute bacterial laryngitis unspecified
H040z	All	Acute laryngitis NOS
H041.	All	Acute tracheitis
H0410	All	Acute tracheitis without obstruction
H0411	All	Acute tracheitis with obstruction
H041z	All	Acute tracheitis NOS
H042.	All	Laryngotracheitis (& acute)
H0420	All	Acute laryngotracheitis without obstruction
H0421	All	Acute laryngotracheitis with obstruction
H042z	All	Acute laryngotracheitis NOS
H043.	All	Epiglottitis: [viral] or [acute non streptococcal]
H0430	All	Acute epiglottitis without obstruction
H0431	All	Acute epiglottitis with obstruction
H0432	All	NULL
H043z	All	Acute epiglottitis NOS
H044.	All	NULL
H04z.	All	Acute laryngitis and tracheitis NOS
H05..	All	Other acute upper respiratory infections
H050.	All	Acute laryngopharyngitis
H051.	All	NULL
H052.	All	NULL
H053.	All	Tracheopharyngitis
H054.	All	Recurrent upper respiratory tract infection
H055.	All	Pharyngolaryngitis
H05y.	All	Other upper respiratory infections of multiple sites
H05z.	All	Upper respiratory tract infection (& viral) NOS
H0y..	All	Other specified acute respiratory infections
H0z..	All	Acute respiratory infection NOS
X00iq	All	Recurrent acute suppurative otitis media
X00m1	All	Pott's puffy tumour
X00mH	All	Acute herpes simplex pharyngitis
X00mI	All	Acute herpes zoster pharyngitis
X00mJ	All	Enteroviral lymphonodular pharyngitis
X00mL	All	Glandular fever pharyngitis
X00mq	All	Vincent's tonsillitis
X00n1	All	Acute simple laryngitis
X00n2	All	Vincent's laryngitis
X00n4	All	Acute membranous laryngitis
X00n5	All	Acute subglottic laryngitis
X00n6	All	Recurrent allergic croup

X1003	All	Viral upper respiratory tract infection NOS
Xa0IW	All	Acute laryngotracheobronchitis
Xa86D	All	Acute viral laryngotracheitis
XaKyZ	All	Acute obstructive laryngitis
XE0Xo	All	Acute laryngotracheitis
XE0Xq	All	Upper respiratory infection NOS
XE17D	All	Otitis media NOS
XE1A1	All	Suppurative otitis media &/or ([left] or [right]) &/or purulent otitis media
XE2QD	All	Acute otitis media with effusion
XM1QT	All	Acute fibrinous laryngotracheobronchitis

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Supplementary table S5.2. The case definitions for included Lower Respiratory Tract Infections.

Lower Respiratory Tract Infections		
Pneumonia		
Read V2 Code	Term ID	Description
H20..	All	Viral pneumonia
H200.	All	Pneumonia due to adenovirus
H201.	All	Pneumonia due to respiratory syncytial virus
H202.	All	Pneumonia due to parainfluenza virus
H203.	All	Pneumonia due to human metapneumovirus
H20y.	All	Viral pneumonia NEC
H20y0	All	Severe acute respiratory syndrome
H20z.	All	Viral pneumonia NOS
H21..	All	Lobar (pneumococcal) pneumonia
H22..	All	Other bacterial pneumonia
H220.	All	Pneumonia due to klebsiella pneumoniae
H221.	All	Pneumonia due to pseudomonas
H222.	All	Pneumonia due to haemophilus influenzae
H223.	All	Pneumonia due to streptococcus
H2230	All	Pneumonia due to streptococcus, group B
H224.	All	Pneumonia due to staphylococcus
H22y.	All	Pneumonia due to other specified bacteria
H22y0	All	Pneumonia due to escherichia coli
H22y1	All	Pneumonia due to proteus
H22y2	All	Pneumonia - Legionella
H22y3	All	Pneumonia due to Gram negative bacteria
H22yX	All	Pneumonia due to other aerobic gram-negative bacteria
H22yz	All	Pneumonia due to bacteria NOS
H22z.	All	Bacterial pneumonia NOS
H23..	All	Pneumonia due to other specified organisms
H230.	All	Pneumonia due to Eaton's agent
H231.	All	Pneumonia due to mycoplasma pneumoniae
H232.	All	Pneumonia due to pleuropneumonia like organisms
H233.	All	Chlamydial pneumonia
H23z.	All	Pneumonia due to specified organism NOS
H24..	All	Pneumonia with infectious diseases EC
H240.	All	Pneumonia with measles
H241.	All	Pneumonia with cytomegalic inclusion disease
H242.	All	Pneumonia with ornithosis
H243.	All	Pneumonia with whooping cough
H244.	All	Pneumonia with tularaemia
H245.	All	Pneumonia with anthrax
H246.	All	Pneumonia with aspergillosis

H247.	All	Pneumonia with other systemic mycoses
H2470	All	Pneumonia with candidiasis
H2471	All	Pneumonia with coccidioidomycosis
H2472	All	Pneumonia with histoplasmosis
H247z	All	Pneumonia with systemic mycosis NOS
H24y.	All	Pneumonia with other infectious diseases EC
H24y0	All	Pneumonia with actinomycosis
H24y1	All	Pneumonia with nocardiasis
H24y2	All	Pneumonia with pneumocystis carinii
H24y3	All	Pneumonia with Q-fever
H24y4	All	Pneumonia with salmonellosis
H24y5	All	Pneumonia with toxoplasmosis
H24y6	All	Pneumonia with typhoid fever
H24y7	All	Pneumonia with varicella
H24yz	All	Pneumonia with other infectious diseases EC NOS
H24z.	All	Pneumonia with infectious diseases EC NOS
H25..	All	Bronchopneumonia due to unspecified organism
H26..	All	Pneumonia due to unspecified organism
H260.	All	Lobar pneumonia due to unspecified organism
H2600	All	Lung consolidation
H261.	All	Basal pneumonia due to unspecified organism
H262.	All	Postoperative pneumonia
H263.	All	Pneumonitis, unspecified
H28..	All	Atypical pneumonia
Read CTV3 Code	Term ID	Description
H20..	All	Viral pneumonia (& chest infection)
H200.	All	Adenoviral pneumonia
H201.	All	Pneumonia due to respiratory syncytial virus
H202.	All	Parainfluenzal pneumonia
H203.	All	NULL
H20y.	All	Viral pneumonia NEC
H20y0	All	NULL
H20z.	All	Viral pneumonia NOS
H21..	All	Pneumococcal pneumonia (& lobar)
H22..	All	Other bacterial pneumonia
H220.	All	Pneumonia due to Klebsiella pneumoniae
H221.	All	Pseudomonal pneumonia
H222.	All	Haemophilus influenzae pneumonia
H223.	All	Streptococcal pneumonia
H2230	All	Group B streptococcal pneumonia
H224.	All	Staphylococcal pneumonia
H22y.	All	Pneumonia due to other specified bacteria
H22y0	All	Escherichia coli pneumonia
H22y1	All	Proteus pneumonia

H22y2	All	Legionella pneumonia
H22y3	All	NULL
H22yX	All	NULL
H22yz	All	Pneumonia due to bacteria NOS
H22z.	All	Bacterial pneumonia NOS
H23..	All	Pneumonia due to other specified organisms
H230.	All	NULL
H231.	All	NULL
H232.	All	Pneumonia due to pleuropneumonia-like organism
H233.	All	NULL
H23z.	All	Pneumonia due to specified organism NOS
H24..	All	(Pneumonia) or (chest infection) with infectious diseases EC
H240.	All	Measles pneumonia
H241.	All	Cytomegalovirus pneumonia
H242.	All	Ornithosis with pneumonia
H243.	All	Pertussis pneumonia
H244.	All	Tularaemia pneumonia
H245.	All	Anthrax pneumonia
H246.	All	Pneumonia with aspergillosis
H247.	All	Pneumonia with other systemic mycoses
H2470	All	Candidal pneumonia
H2471	All	Pneumonia with coccidioidomycosis
H2472	All	Pneumonia with histoplasmosis
H247z	All	Pneumonia with systemic mycosis NOS
H24y.	All	Pneumonia with other infectious diseases EC
H24y0	All	Actinomycotic pneumonia
H24y1	All	Nocardial pneumonia
H24y2	All	Pneumocystis carinii pneumonia
H24y3	All	Q fever pneumonia
H24y4	All	NULL
H24y5	All	Toxoplasma pneumonia
H24y6	All	Typhoid pneumonia
H24y7	All	Chickenpox pneumonia
H24yz	All	Pneumonia with other infectious diseases EC NOS
H24z.	All	Pneumonia with infectious diseases EC NOS
H25..	All	Bronchopneumonia: [unspecified organism] or [chest infection - unspecified]
H26..	All	Pneumonia due to unspecified organism
H260.	All	Lobar pneumonia due to unspecified organism
H2600	All	NULL
H261.	All	NULL
H262.	All	NULL
H263.	All	NULL
H28..	All	NULL
X100h	All	Giant cell pneumonia
XaBE9	All	Basal pneumonia due to unspecified organism

XaDtl	All	Legionnaire's disease
XEOYJ	All	Bronchopneumonia due to unspecified organism
Acute Bronchitis		
Read V2 Code	Term ID	Description
H06..	All	Acute bronchitis and bronchiolitis
H060.	All	Acute bronchitis
H0600	All	Acute fibrinous bronchitis
H0601	All	Acute membranous bronchitis
H0602	All	Acute pseudomembranous bronchitis
H0603	All	Acute purulent bronchitis
H0604	All	Acute croupous bronchitis
H0605	All	Acute tracheobronchitis
H0606	All	Acute pneumococcal bronchitis
H0607	All	Acute streptococcal bronchitis
H0608	All	Acute haemophilus influenzae bronchitis
H0609	All	Acute neisseria catarrhalis bronchitis
H060A	All	Acute bronchitis due to mycoplasma pneumoniae
H060B	All	Acute bronchitis due to coxsackievirus
H060C	All	Acute bronchitis due to parainfluenza virus
H060D	All	Acute bronchitis due to respiratory syncytial virus
H060E	All	Acute bronchitis due to rhinovirus
H060F	All	Acute bronchitis due to echovirus
H060v	All	Subacute bronchitis unspecified
H060w	All	Acute viral bronchitis unspecified
H060x	All	Acute bacterial bronchitis unspecified
H060z	All	Acute bronchitis NOS
H061.	All	Acute bronchiolitis
H0610	All	Acute capillary bronchiolitis
H0611	All	Acute obliterating bronchiolitis
H0612	All	Acute bronchiolitis with bronchospasm
H0613	All	Acute exudative bronchiolitis
H0614	All	Obliterating fibrous bronchiolitis
H0615	All	Acute bronchiolitis due to respiratory syncytial virus
H0616	All	Acute bronchiolitis due to other specified organisms
H0617	All	Acute bronchiolitis due to human metapneumovirus
H061z	All	Acute bronchiolitis NOS
H062.	All	Acute lower respiratory tract infection
H06z.	All	Acute bronchitis or bronchiolitis NOS
H06z0	All	Chest infection NOS
H06z1	All	Lower resp tract infection
H06z2	All	Recurrent chest infection
H30..	All	Bronchitis unspecified
H300.	All	Tracheobronchitis NOS

H301.	All	Laryngotracheobronchitis
H302.	All	Wheezy bronchitis
H30z.	All	Bronchitis NOS
Read CTV3 Code	Term ID	Description
A33y.	All	Whooping cough - other specified organism
A33yz	All	Other whooping cough NOS
A33z.	All	Whooping cough NOS
Ayu39	All	[X]Whooping cough due to other Bordetella species
Ayu3A	All	[X]Whooping cough, unspecified
H06..	All	Acute bronchitis and bronchiolitis
H060.	All	Acute bronchitis (& wheezy)
H0600	All	Acute fibrinous bronchitis
H0601	All	Acute membranous bronchitis
H0602	All	Acute pseudomembranous bronchitis
H0603	All	Acute purulent bronchitis
H0604	All	Acute croupous bronchitis
H0605	All	Acute tracheobronchitis
H0606	All	Acute pneumococcal bronchitis
H0607	All	Acute streptococcal bronchitis
H0608	All	Acute haemophilus influenzae bronchitis
H0609	All	Acute Neisseria catarrhalis bronchitis
H060A	All	NULL
H060B	All	Acute coxsackievirus bronchitis
H060C	All	Acute parainfluenza virus bronchitis
H060D	All	Acute respiratory syncytial virus bronchitis
H060E	All	Acute bronchitis due to rhinovirus
H060F	All	Acute echovirus bronchitis
H060v	All	Subacute bronchitis unspecified
H060w	All	Acute viral bronchitis unspecified
H060x	All	Acute bacterial bronchitis unspecified
H060z	All	Acute bronchitis NOS
H061.	All	Acute bronchiolitis
H0610	All	Acute capillary bronchiolitis
H0611	All	Acute obliterating bronchiolitis
H0612	All	Acute bronchiolitis with bronchospasm
H0613	All	Acute exudative bronchiolitis
H0614	All	Obliterating fibrous bronchiolitis
H0615	All	Acute bronchiolitis due to respiratory syncytial virus
H0616	All	Acute bronchiolitis due to other specified organisms
H0617	All	NULL
H061z	All	Acute bronchiolitis NOS
H062.	All	NULL

H06z.	All	Acute bronchitis or bronchiolitis NOS
H06z0	All	Chest infection (& NOS)
H06z1	All	Respiratory tract infection (& [acute lower] or [lower])
H06z2	All	NULL
H243.	All	Pertussis pneumonia
H30..	All	Bronchitis: [unspecified (& chest infection)] or [recurrent wheezy]
H300.	All	Tracheobronchitis NOS
H301.	All	Laryngotracheobronchitis
H302.	All	NULL
H30z.	All	Bronchitis NOS
Hyu10	All	[X]Acute bronchitis due to other specified organisms
Hyu11	All	[X]Acute bronchiolitis due to other specified organisms
X1006	All	Chest infection - unspecified bronchitis
X1007	All	Acute bacterial bronchitis
X1009	All	Acute mycoplasmal bronchitis
X100A	All	Acute chlamydial bronchitis
X100B	All	Acute viral bronchitis
X100C	All	Acute viral bronchiolitis
X100D	All	Acute bronchiolitis due to adenovirus
Xa0IW	All	Acute laryngotracheobronchitis
Xa0IZ	All	Asthmatic bronchitis
XaDtB	All	Acute infective bronchitis
XaDth	All	Acute infective tracheobronchitis
XaYYt	All	Acute bronchiolitis due to human metapneumovirus
XE0Qw	All	Whooping cough
XE0Xr	All	Acute bronchitis
XE0YL	All	Bronchitis unspecified
XE0Yt	All	Acute: [bronchitis] or [chest infections] or [tracheobronchitis]
XM1QT	All	Acute fibrinous laryngotracheobronchitis
XM1QX	All	Acute wheezy bronchitis

Supplementary table S5.3. The case definitions for included Pneumonia and Pneumonitis.

Pneumonia and Pneumonitis		
Read V2 Code	Term ID	Description
H20..	All	Viral pneumonia
H200.	All	Pneumonia due to adenovirus
H201.	All	Pneumonia due to respiratory syncytial virus
H202.	All	Pneumonia due to parainfluenza virus
H203.	All	Pneumonia due to human metapneumovirus
H20y.	All	Viral pneumonia NEC
H20y0	All	Severe acute respiratory syndrome
H20z.	All	Viral pneumonia NOS
H21..	All	Lobar (pneumococcal) pneumonia
H22..	All	Other bacterial pneumonia
H220.	All	Pneumonia due to klebsiella pneumoniae
H221.	All	Pneumonia due to pseudomonas
H222.	All	Pneumonia due to haemophilus influenzae
H223.	All	Pneumonia due to streptococcus
H2230	All	Pneumonia due to streptococcus, group B
H224.	All	Pneumonia due to staphylococcus
H22y.	All	Pneumonia due to other specified bacteria
H22y0	All	Pneumonia due to escherichia coli
H22y1	All	Pneumonia due to proteus
H22y2	All	Pneumonia - Legionella
H22y3	All	Pneumonia due to Gram negative bacteria
H22yX	All	Pneumonia due to other aerobic gram-negative bacteria
H22yz	All	Pneumonia due to bacteria NOS
H22z.	All	Bacterial pneumonia NOS
H23..	All	Pneumonia due to other specified organisms
H230.	All	Pneumonia due to Eaton's agent
H231.	All	Pneumonia due to mycoplasma pneumoniae
H232.	All	Pneumonia due to pleuropneumonia like organisms
H233.	All	Chlamydial pneumonia
H23z.	All	Pneumonia due to specified organism NOS
H24..	All	Pneumonia with infectious diseases EC
H240.	All	Pneumonia with measles
H241.	All	Pneumonia with cytomegalic inclusion disease
H242.	All	Pneumonia with ornithosis
H243.	All	Pneumonia with whooping cough
H244.	All	Pneumonia with tularaemia
H245.	All	Pneumonia with anthrax
H246.	All	Pneumonia with aspergillosis
H247.	All	Pneumonia with other systemic mycoses

H2470	All	Pneumonia with candidiasis
H2471	All	Pneumonia with coccidioidomycosis
H2472	All	Pneumonia with histoplasmosis
H247z	All	Pneumonia with systemic mycosis NOS
H24y.	All	Pneumonia with other infectious diseases EC
H24y0	All	Pneumonia with actinomycosis
H24y1	All	Pneumonia with nocardiasis
H24y2	All	Pneumonia with pneumocystis carinii
H24y3	All	Pneumonia with Q-fever
H24y4	All	Pneumonia with salmonellosis
H24y5	All	Pneumonia with toxoplasmosis
H24y6	All	Pneumonia with typhoid fever
H24y7	All	Pneumonia with varicella
H24yz	All	Pneumonia with other infectious diseases EC NOS
H24z.	All	Pneumonia with infectious diseases EC NOS
H25..	All	Bronchopneumonia due to unspecified organism
H26..	All	Pneumonia due to unspecified organism
H260.	All	Lobar pneumonia due to unspecified organism
H2600	All	Lung consolidation
H261.	All	Basal pneumonia due to unspecified organism
H262.	All	Postoperative pneumonia
H263.	All	Pneumonitis, unspecified
H28..	All	Atypical pneumonia
Read CTV3 Code	Term ID	Description
H20..	All	Viral pneumonia (& chest infection)
H200.	All	Adenoviral pneumonia
H201.	All	Pneumonia due to respiratory syncytial virus
H202.	All	Parainfluenzal pneumonia
H203.	All	NULL
H20y.	All	Viral pneumonia NEC
H20y0	All	NULL
H20z.	All	Viral pneumonia NOS
H21..	All	Pneumococcal pneumonia (& lobar)
H22..	All	Other bacterial pneumonia
H220.	All	Pneumonia due to Klebsiella pneumoniae
H221.	All	Pseudomonal pneumonia
H222.	All	Haemophilus influenzae pneumonia
H223.	All	Streptococcal pneumonia
H2230	All	Group B streptococcal pneumonia
H224.	All	Staphylococcal pneumonia
H22y.	All	Pneumonia due to other specified bacteria
H22y0	All	Escherichia coli pneumonia
H22y1	All	Proteus pneumonia
H22y2	All	Legionella pneumonia

H22y3	All	NULL
H22yX	All	NULL
H22yz	All	Pneumonia due to bacteria NOS
H22z.	All	Bacterial pneumonia NOS
H23..	All	Pneumonia due to other specified organisms
H230.	All	NULL
H231.	All	NULL
H232.	All	Pneumonia due to pleuropneumonia-like organism
H233.	All	NULL
H23z.	All	Pneumonia due to specified organism NOS
H24..	All	(Pneumonia) or (chest infection) with infectious diseases EC
H240.	All	Measles pneumonia
H241.	All	Cytomegalovirus pneumonia
H242.	All	Ornithosis with pneumonia
H243.	All	Pertussis pneumonia
H244.	All	Tularaemia pneumonia
H245.	All	Anthrax pneumonia
H246.	All	Pneumonia with aspergillosis
H247.	All	Pneumonia with other systemic mycoses
H2470	All	Candidal pneumonia
H2471	All	Pneumonia with coccidioidomycosis
H2472	All	Pneumonia with histoplasmosis
H247z	All	Pneumonia with systemic mycosis NOS
H24y.	All	Pneumonia with other infectious diseases EC
H24y0	All	Actinomycotic pneumonia
H24y1	All	Nocardial pneumonia
H24y2	All	Pneumocystis carinii pneumonia
H24y3	All	Q fever pneumonia
H24y4	All	NULL
H24y5	All	Toxoplasma pneumonia
H24y6	All	Typhoid pneumonia
H24y7	All	Chickenpox pneumonia
H24yz	All	Pneumonia with other infectious diseases EC NOS
H24z.	All	Pneumonia with infectious diseases EC NOS
H25..	All	Bronchopneumonia: [unspecified organism] or [chest infection - unspecified]
H26..	All	Pneumonia due to unspecified organism
H260.	All	Lobar pneumonia due to unspecified organism
H2600	All	NULL
H261.	All	NULL
H262.	All	NULL
H263.	All	NULL
H28..	All	NULL
X100h	All	Giant cell pneumonia
XaBE9	All	Basal pneumonia due to unspecified organism
XaDtl	All	Legionnaire's disease

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XEOYJ	All	Bronchopneumonia due to unspecified organism
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Supplementary table S5.4. The case definitions for included Acute Bronchitis

Acute Bronchitis		
Read V2 Code	Term ID	Description
H06..	All	Acute bronchitis and bronchiolitis
H060.	All	Acute bronchitis
H0600	All	Acute fibrinous bronchitis
H0601	All	Acute membranous bronchitis
H0602	All	Acute pseudomembranous bronchitis
H0603	All	Acute purulent bronchitis
H0604	All	Acute croupous bronchitis
H0605	All	Acute tracheobronchitis
H0606	All	Acute pneumococcal bronchitis
H0607	All	Acute streptococcal bronchitis
H0608	All	Acute haemophilus influenzae bronchitis
H0609	All	Acute neisseria catarrhalis bronchitis
H060A	All	Acute bronchitis due to mycoplasma pneumoniae
H060B	All	Acute bronchitis due to coxsackievirus
H060C	All	Acute bronchitis due to parainfluenza virus
H060D	All	Acute bronchitis due to respiratory syncytial virus
H060E	All	Acute bronchitis due to rhinovirus
H060F	All	Acute bronchitis due to echovirus
H060v	All	Subacute bronchitis unspecified
H060w	All	Acute viral bronchitis unspecified
H060x	All	Acute bacterial bronchitis unspecified
H060z	All	Acute bronchitis NOS
H061.	All	Acute bronchiolitis
H0610	All	Acute capillary bronchiolitis
H0611	All	Acute obliterating bronchiolitis
H0612	All	Acute bronchiolitis with bronchospasm
H0613	All	Acute exudative bronchiolitis
H0614	All	Obliterating fibrous bronchiolitis
H0615	All	Acute bronchiolitis due to respiratory syncytial virus
H0616	All	Acute bronchiolitis due to other specified organisms
H0617	All	Acute bronchiolitis due to human metapneumovirus
H061z	All	Acute bronchiolitis NOS
H062.	All	Acute lower respiratory tract infection
H06z.	All	Acute bronchitis or bronchiolitis NOS
H06z0	All	Chest infection NOS
H06z1	All	Lower resp tract infection
H06z2	All	Recurrent chest infection
H30..	All	Bronchitis unspecified
H300.	All	Tracheobronchitis NOS

H301.	All	Laryngotracheobronchitis
H302.	All	Wheezy bronchitis
H30z.	All	Bronchitis NOS
Read CTV3 Code	Term ID	Description
A33y.	All	Whooping cough - other specified organism
A33yz	All	Other whooping cough NOS
A33z.	All	Whooping cough NOS
Ayu39	All	[X]Whooping cough due to other Bordetella species
Ayu3A	All	[X]Whooping cough, unspecified
H06..	All	Acute bronchitis and bronchiolitis
H060.	All	Acute bronchitis (& wheezy)
H0600	All	Acute fibrinous bronchitis
H0601	All	Acute membranous bronchitis
H0602	All	Acute pseudomembranous bronchitis
H0603	All	Acute purulent bronchitis
H0604	All	Acute croupous bronchitis
H0605	All	Acute tracheobronchitis
H0606	All	Acute pneumococcal bronchitis
H0607	All	Acute streptococcal bronchitis
H0608	All	Acute haemophilus influenzae bronchitis
H0609	All	Acute Neisseria catarrhalis bronchitis
H060A	All	NULL
H060B	All	Acute coxsackievirus bronchitis
H060C	All	Acute parainfluenza virus bronchitis
H060D	All	Acute respiratory syncytial virus bronchitis
H060E	All	Acute bronchitis due to rhinovirus
H060F	All	Acute echovirus bronchitis
H060v	All	Subacute bronchitis unspecified
H060w	All	Acute viral bronchitis unspecified
H060x	All	Acute bacterial bronchitis unspecified
H060z	All	Acute bronchitis NOS
H061.	All	Acute bronchiolitis
H0610	All	Acute capillary bronchiolitis
H0611	All	Acute obliterating bronchiolitis
H0612	All	Acute bronchiolitis with bronchospasm
H0613	All	Acute exudative bronchiolitis
H0614	All	Obliterating fibrous bronchiolitis
H0615	All	Acute bronchiolitis due to respiratory syncytial virus
H0616	All	Acute bronchiolitis due to other specified organisms
H0617	All	NULL
H061z	All	Acute bronchiolitis NOS
H062.	All	NULL

H06z.	All	Acute bronchitis or bronchiolitis NOS
H06z0	All	Chest infection (& NOS)
H06z1	All	Respiratory tract infection (& [acute lower] or [lower])
H06z2	All	NULL
H243.	All	Pertussis pneumonia
H30..	All	Bronchitis: [unspecified (& chest infection)] or [recurrent wheezy]
H300.	All	Tracheobronchitis NOS
H301.	All	Laryngotracheobronchitis
H302.	All	NULL
H30z.	All	Bronchitis NOS
Hyu10	All	[X]Acute bronchitis due to other specified organisms
Hyu11	All	[X]Acute bronchiolitis due to other specified organisms
X1006	All	Chest infection - unspecified bronchitis
X1007	All	Acute bacterial bronchitis
X1009	All	Acute mycoplasmal bronchitis
X100A	All	Acute chlamydial bronchitis
X100B	All	Acute viral bronchitis
X100C	All	Acute viral bronchiolitis
X100D	All	Acute bronchiolitis due to adenovirus
Xa0IW	All	Acute laryngotracheobronchitis
Xa0IZ	All	Asthmatic bronchitis
XaDtB	All	Acute infective bronchitis
XaDth	All	Acute infective tracheobronchitis
XaYYt	All	Acute bronchiolitis due to human metapneumovirus
XE0Qw	All	Whooping cough
XE0Xr	All	Acute bronchitis
XE0YL	All	Bronchitis unspecified
XE0Yt	All	Acute: [bronchitis] or [chest infections] or [tracheobronchitis]
XM1QT	All	Acute fibrinous laryngotracheobronchitis
XM1QX	All	Acute wheezy bronchitis

Supplementary table S5.5. The case definitions for included influenza and cases of influenza-like illness.

Influenza		
Read V2 Code	Term ID	Description
16L..	All	Influenza-like symptoms
H27..	All	Influenza
H270.	All	Influenza with pneumonia
H2700	All	Influenza with bronchopneumonia
H2701	All	Influenza with pneumonia, influenza virus identified
H270z	All	Influenza with pneumonia NOS
H271.	All	Influenza with other respiratory manifestation
H2710	All	Influenza with laryngitis
H2711	All	Influenza with pharyngitis
H271z	All	Influenza with respiratory manifestations NOS
H27y.	All	Influenza with other manifestations
H27y0	All	Influenza with encephalopathy
H27y1	All	Influenza with gastrointestinal tract involvement
H27yz	All	Influenza with other manifestations NOS
H27z.	All	Influenza NOS
H2A..	All	Influenza due to Influenza A virus subtype H1N1
Read CTV3 Code	Term ID	Description
16L..	All	NULL
G5203	All	Acute myocarditis - influenzal
H27..	All	Influenza
H270.	All	Influenzal pneumonia
H2700	All	Influenza with bronchopneumonia
H2701	All	Influenza with pneumonia, influenza virus identified
H270z	All	Influenza with pneumonia NOS
H271.	All	Influenza with other respiratory manifestation
H2710	All	Influenza with laryngitis
H2711	All	Influenza with pharyngitis
H271z	All	Influenza with respiratory manifestations NOS
H27y.	All	Influenza with other manifestations
H27y0	All	Influenza with encephalopathy
H27y1	All	Influenza with gastrointestinal tract involvement
H27yz	All	Influenza with other manifestations NOS
H27z.	All	(Influenza like illness) or (influenza NOS)
H2A..	All	NULL
Hyu04	All	[X]Influenza with other respiratory manifestations, influenza virus identified
Hyu05	All	[X]Influenza with other manifestations, influenza virus identified

Hyu06	All	[X]Influenza with other respiratory manifestations, virus not identified
Hyu07	All	[X]Influenza with other manifestations, virus not identified
XaC1s	All	Encephalitis due to influenza
XaC2H	All	Encephalitis due to influenza-virus identified
XaEGX	All	Encephalitis due to influenza-specific virus not identified
XaeVK	All	Influenza due to zoonotic influenza virus
XaeVL	All	Influenza due to pandemic influenza virus
XaeVM	All	Influenza due to seasonal influenza virus
XaeVN	All	Influenza with pneumonia due to seasonal influenza virus
XaIBK	All	Influenza-like symptoms
XaMih	All	Avian influenza
XaQQp	All	Influenza due to Influenza A virus subtype H1N1
XEOYK	All	Influenza NOS
XEOZJ	All	(Influenza NOS) or (influenza-like illness)
XM0rz	All	Influenza-like illness
XM0s0	All	Flu-like illness NOS

Supplementary table S5.6. The case definitions for included Skin infections.

Skin infections		
Read V2 Code	Term ID	Description
M0...	All	Skin and subcutaneous tissue infections
M00..	All	Carbuncle
M000.	All	Carbuncle of face
M0000	All	Carbuncle of ear
M0001	All	Carbuncle of face (excluding eye)
M0002	All	Carbuncle of nasal septum
M0003	All	Carbuncle of temple region
M000z	All	Carbuncle of face NOS
M001.	All	Carbuncle of neck
M002.	All	Carbuncle of trunk
M0020	All	Carbuncle of chest wall
M0021	All	Carbuncle of breast
M0022	All	Carbuncle of back
M0023	All	Carbuncle of abdominal wall
M0024	All	Carbuncle of umbilicus
M0025	All	Carbuncle of flank
M0026	All	Carbuncle of groin
M0027	All	Carbuncle of perineum
M002z	All	Carbuncle of trunk NOS
M003.	All	Carbuncle of upper arm and forearm
M0030	All	Carbuncle of shoulder
M0031	All	Carbuncle of axilla
M0032	All	Carbuncle of upper arm
M0033	All	Carbuncle of elbow
M0034	All	Carbuncle of forearm
M003z	All	Carbuncle of upper arm and forearm NOS
M004.	All	Carbuncle of hand
M0040	All	Carbuncle of wrist
M0041	All	Carbuncle of thumb
M0042	All	Carbuncle of finger
M004z	All	Carbuncle of hand NOS
M005.	All	Carbuncle of buttock
M0050	All	Carbuncle of anus
M0051	All	Carbuncle of gluteal region
M005z	All	Carbuncle of buttock NOS
M006.	All	Carbuncle of leg (excluding foot)
M0060	All	Carbuncle of hip
M0061	All	Carbuncle of thigh
M0062	All	Carbuncle of knee

M0063	All	Carbuncle of lower leg
M0064	All	Carbuncle of ankle
M006z	All	Carbuncle of leg (excluding foot) NOS
M007.	All	Carbuncle of foot
M0070	All	Carbuncle of foot unspecified
M0071	All	Carbuncle of heel
M0072	All	Carbuncle of toe
M007z	All	Carbuncle of foot NOS
M00y.	All	Carbuncle of other specified site
M00y0	All	Carbuncle of head (excluding face)
M00yz	All	Carbuncle of other specified site NOS
M00z.	All	Carbuncle NOS
M01..	All	Furuncle - boil
M010.	All	Boil of face
M0100	All	Boil of ear
M0101	All	Boil of face (excluding eye)
M0102	All	Boil of nasal septum
M0103	All	Boil of temple region
M0104	All	Boil of external nose
M010z	All	Boil of face NOS
M011.	All	Boil of neck
M012.	All	Boil of trunk
M0120	All	Boil of chest wall
M0121	All	Boil of breast
M0122	All	Boil of back
M0123	All	Boil of abdominal wall
M0124	All	Boil of umbilicus
M0125	All	Boil of flank
M0126	All	Boil of groin
M0127	All	Boil of perineum
M012z	All	Boil of trunk NOS
M013.	All	Boil of upper arm and forearm
M0130	All	Boil of shoulder
M0131	All	Boil of axilla
M0132	All	Boil of upper arm
M0133	All	Boil of elbow
M0134	All	Boil of forearm
M013z	All	Boil of upper arm and forearm NOS
M014.	All	Boil of hand
M0140	All	Boil of wrist
M0141	All	Boil of thumb
M0142	All	Boil of finger

M014z	All	Boil of hand NOS
M015.	All	Boil of buttock
M0150	All	Boil of anus
M0151	All	Boil of gluteal region
M015z	All	Boil of buttock NOS
M016.	All	Boil of leg (excluding foot)
M0160	All	Boil of hip
M0161	All	Boil of thigh
M0162	All	Boil of knee
M0163	All	Boil of lower leg
M0164	All	Boil of ankle
M016z	All	Boil of leg (excluding foot) NOS
M017.	All	Boil of foot
M0170	All	Boil of foot unspecified
M0171	All	Boil of heel
M0172	All	Boil of toe
M017z	All	Boil of foot NOS
M01y.	All	Boil of other specified site
M01y0	All	Boil of head (excluding face)
M01yz	All	Boil of other specified site NOS
M01z.	All	Boil NOS
M01z0	All	Multiple boils
M02..	All	Cellulitis and abscess of finger and toe
M020.	All	Cellulitis and abscess of finger
M0200	All	Cellulitis and abscess of finger unspecified
M0201	All	Finger pulp abscess
M0202	All	Onychia of finger
M0203	All	Paronychia of finger
M0204	All	Finger web space infection
M0205	All	Pulp space infection of finger/thumb
M020z	All	Cellulitis and abscess of finger NOS
M021.	All	Cellulitis and abscess of toe
M0210	All	Cellulitis and abscess of toe unspecified
M0211	All	Onychia of toe
M0212	All	Paronychia of toe
M0213	All	Pulp space infection of toe
M021z	All	Cellulitis and abscess of toe NOS
M02z.	All	Cellulitis and abscess of digit NOS
M03..	All	Other cellulitis and abscess
M030.	All	Cellulitis and abscess of face
M0300	All	Cellulitis and abscess of cheek (external)
M0301	All	Cellulitis and abscess of nose (external)

M0302	All	Cellulitis and abscess of chin
M0303	All	Cellulitis and abscess of submandibular region
M0304	All	Cellulitis and abscess of forehead
M0305	All	Cellulitis and abscess of temple region
M0306	All	Cellulitis of face
M030z	All	Cellulitis and abscess of face NOS
M031.	All	Cellulitis and abscess of neck
M032.	All	Cellulitis and abscess of trunk
M0320	All	Cellulitis and abscess of chest wall
M0321	All	Cellulitis and abscess of breast
M0322	All	Cellulitis and abscess of back
M0323	All	Cellulitis and abscess of abdominal wall
M0324	All	Cellulitis and abscess of umbilicus
M0325	All	Cellulitis and abscess of flank
M0326	All	Cellulitis and abscess of groin
M0327	All	Cellulitis and abscess of perineum
M0328	All	Cellulitis of trunk
M032z	All	Cellulitis and abscess of trunk NOS
M033.	All	Cellulitis and abscess of arm
M0330	All	Cellulitis and abscess of shoulder
M0331	All	Cellulitis and abscess of axilla
M0332	All	Cellulitis and abscess of upper arm
M0333	All	Cellulitis and abscess of elbow
M0334	All	Cellulitis and abscess of forearm
M033z	All	Cellulitis and abscess of arm NOS
M034.	All	Cellulitis and abscess of hand excluding digits
M0340	All	Cellulitis and abscess of hand unspecified
M0341	All	Cellulitis and abscess of wrist
M034z	All	Cellulitis and abscess of hand NOS
M035.	All	Cellulitis and abscess of buttock
M036.	All	Cellulitis and abscess of leg excluding foot
M0360	All	Cellulitis and abscess of hip
M0361	All	Cellulitis and abscess of thigh
M0362	All	Cellulitis and abscess of knee
M0363	All	Cellulitis and abscess of lower leg
M0364	All	Cellulitis and abscess of ankle
M036z	All	Cellulitis and abscess of leg NOS
M037.	All	Cellulitis and abscess of foot excluding toe
M0370	All	Cellulitis and abscess of foot unspecified
M0371	All	Cellulitis and abscess of heel
M0372	All	Cellulitis in diabetic foot
M037z	All	Cellulitis and abscess of foot NOS

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4	M038.	All	Cellulitis of external ear
5	M03y.	All	Other specified cellulitis and abscess
6	M03y0	All	Cellulitis and abscess of head unspecified
7	M03z.	All	Cellulitis and abscess NOS
8	M03z0	All	Cellulitis NOS
9	M03z1	All	Abscess NOS
10	M03zz	All	Cellulitis and abscess NOS
11	M04..	All	Acute lymphadenitis
12	M040.	All	Acute lymphadenitis of trunk
13	M041.	All	Acute lymphadenitis of upper limb
14	M042.	All	Acute lymphadenitis of lower limb
15	M043.	All	Acute lymphadenitis of face, head and neck
16	M05..	All	Impetigo
17	M050.	All	Impetigo contagiosa unspecified
18	M051.	All	Impetigo contagiosa bullosa
19	M052.	All	Impetigo contagiosa gyrata
20	M053.	All	Impetigo circinata
21	M054.	All	Impetigo neonatorum
22	M055.	All	Impetigo simplex
23	M056.	All	Impetigo follicularis
24	M057.	All	Chronic symmetrical impetigo
25	M05z.	All	Impetigo NOS
26	M06..	All	Pilonidal sinus/cyst
27	M060.	All	Pilonidal cyst with abscess
28	M061.	All	Pilonidal cyst with no abscess
29	M062.	All	Pilonidal sinus with abscess
30	M063.	All	Pilonidal sinus without abscess
31	M06z.	All	Pilonidal sinus/cyst NOS
32	M07..	All	Other local infections of skin and subcutaneous tissue
33	M070.	All	Pyoderma
34	M0700	All	Pyoderma chancriforme
35	M0701	All	Pyoderma faciale
36	M0702	All	Pyoderma gangrenosum
37	M0703	All	Pyoderma ulcerosum tropicalum
38	M070z	All	Pyoderma NOS
39	M071.	All	Pyogenic granuloma
40	M0710	All	Pyogenic granuloma unspecified
41	M0711	All	Pyogenic progressive granuloma
42	M0712	All	Granuloma telangiectaticum
43	M0713	All	Umbilical granuloma
44	M071z	All	Pyogenic granuloma NOS
45	M072.	All	Erythrasma
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M073.	All	Scalp infection
M07y.	All	Other specified local infection of skin or subcutaneous tissue
M07y0	All	Pustular bacterid
M07y1	All	Ecthyma
M07y2	All	Dermatitis vegetans
M07y3	All	Perleche
M07y4	All	Pitted keratolysis
M07y5	All	Inflammation of scar
M07yz	All	Other specified local infection of skin and subcutaneous tissue NOS
M07z.	All	Local infection skin/subcut tissue NOS
M07z0	All	Infection foot
M07z1	All	Infection toe
M07z2	All	Infection finger
M08..	All	Cutaneous cellulitis
M080.	All	[X]Cellulitis of finger and toe
M081.	All	[X]Cellulitis of other parts of limb
M082.	All	Cellulitis of face
M083.	All	Cellulitis of trunk
M084.	All	[X]Cellulitis of breast
M085.	All	Cellulitis of leg
M086.	All	Cellulitis of ankle
M087.	All	Chronic paronychia
M088.	All	Cellulitis of arm
M089.	All	Cellulitis of neck
M08A.	All	Cellulitis of axilla
M08B.	All	Cellulitis of foot
M08C.	All	Cellulitis of toe
M08y.	All	[X]Cellulitis of other sites
M09..	All	Cutaneous abscess
M090.	All	[X]Abscess of face
M091.	All	[X]Abscess of neck
M092.	All	[X]Abscess of trunk
M0920	All	[X]Abscess of buttock
M0921	All	[X]Abdominal wall abscess
M0922	All	[X]Perineal abscess
M093.	All	[X]Abscess of buttock
M094.	All	[X]Abscess of limb
M0940	All	[X]Abscess of axilla
M095.	All	Skin abscess
M09y.	All	[X]Abscess of other site
M0y..	All	Other specified infections of skin or subcutaneous tissue
M0z..	All	Skin and subcut tissue infection NOS

Read CTV3 Code	Term ID	Description
A056.	All	Amoebic ulcer of skin
A05y1	All	Amoebic balanitis
A170.	All	Tuberculosis of skin & subcutaneous tissue (& tuberculous lupus)
A1700	All	Lupus vulgaris
A1702	All	Scrofuloderma
A1703	All	Tuberculosis - lupus NOS
A1706	All	Lichen scrofulosorum
A1707	All	Tuberculosis papulonecrotica
A1708	All	Tuberculosis verrucosa cutis
A170z	All	Tuberculosis of skin and subcutaneous tissue NOS
A171.	All	Tuberculous erythema nodosum
A1710	All	Erythema induratum
A171z	All	Erythema nodosum with tuberculosis NOS
A201.	All	Cutaneous plague
A210.	All	Ulceroglandular tularaemia
A390.	All	(Cutaneous actinomycosis) or (erythrasma) or (trichomycosis axillaris)
A394.	All	Madura foot - actinomycotic
A39z0	All	Maduromycosis NOS
A5320	All	Herpes zoster with dermatitis of eyelid
A540.	All	Eczema herpeticum
A5441	All	Herpes simplex eyelid dermatitis
A546.	All	Herpes simplex whitlow
A781.	All	Warts: [viral] or [verrucae]
A7810	All	Verruca vulgaris
A7811	All	Plantar wart
A7812	All	(Warts: [genital] or [penile] or [venereal]) or (condylomata acuminatum)
A7813	All	Warts: [perianal] or [anal]
A781z	All	Unspecified viral warts
A783.	All	Cat scratch disease
A990.	All	(Chancroid [& bubo]) or (Ducrey's chancre)
A992.	All	(Granuloma inguinale) or (donovanosis) or (pudendal ulcer)
AA22.	All	Other early yaws skin lesions
AA23.	All	(Yaws hyperkeratosis) or (ghoul hand) or (wormeaten soles)
AB0..	All	(Dermatophytosis &/or tinea &/or ringworm) or (skin fungal infection)
AB00.	All	(Dermatophytosis of scalp or beard) or (Kerion)
AB000	All	Scalp ringworm
AB001	All	Dermatophytosis of beard
AB00z	All	Dermatophytosis of scalp or beard NOS
AB02.	All	Dermatophytosis of hand
AB03.	All	(Dermatophytosis of groin & perianal area) or (Dhobie itch) or (tinea cruris)
AB030	All	Dermatophytosis of groin

AB031	All	Dermatophytosis of the perianal area
AB03z	All	Dermatophytosis of groin and perianal area NOS
AB04.	All	Dermatophytosis of foot (& tinea pedis)
AB05.	All	(Dermatophytosis of the body) or (herpes circinatus) or (tinea corporis)
AB06.	All	(Deep seated dermatophytosis) or (granuloma: [trichophyticum] or [Majocchi's])
AB0y.	All	Other specified dermatophytosis
AB0z.	All	Dermatophytosis NOS
AB1..	All	Dermatophytosis other and unspecified
AB10.	All	Pityriasis versicolor
AB11.	All	Nigra: [tinea] or [keratomycosis]
AB1y.	All	Other specified dermatomycoses
AB1z.	All	Dermatomycosis NOS
AB230	All	Candidal: [intertrigo] or [nappy rash] or [submammary]
AB231	All	Other skin candidiasis
AB233	All	Candidal paronychia
AB330	All	Coccidioidal granuloma
AB500	All	Cutaneous blastomycosis
AB510	All	Mucocutaneous-lymphangitic paracoccidioidomycosis
AB620	All	Cutaneous chromomycosis
AB622	All	Subcutaneous phaeohyphomycotic abscess and cyst
AB64.	All	Mycotic: [mycetomas] or [madura foot]
AB640	All	Actinomycotic mycetoma
AD30.	All	(Scabies (& [Norwegian])) or (sarcoptic itch)
AD41.	All	(Infestation: [other arthropod] or [Chigoe] or [sand flea]) or (Jigger disease) or (Tungiasis)
Ayu50	All	[X]Other early skin lesions of yaws
AyuH4	All	[X]Other arthropod infestations
F4D10	All	Stye
F4D4.	All	Infective eyelid dermatitis of types resulting in deformity
F4D5.	All	Other eyelid infective dermatitis
F4D6.	All	Parasitic eyelid infestation
F5011	All	(Acute infective otitis externa) or (abscess external ear) or (cellulitis external ear)
F5018	All	Furunculosis of external auditory meatus
FyuB4	All	[X]Parasitic infestation of eyelid in diseases classified elsewhere
FyuB5	All	[X]Involvement of eyelid in other infectious diseases classified elsewhere
G7510	All	Kawasaki's disease
G751z	All	Acute febrile mucocutaneous lymph node syndrome NOS
J574G	All	Perianal infection
K2721	All	Penile boil
K2722	All	Penile carbuncle
K2723	All	Cellulitis of penis

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4	K2841	All	Boil of scrotum
5	K2842	All	Carbuncle of scrotum
6	K2843	All	Cellulitis of scrotum
7	K4242	All	Furuncle of vulva
8	K42y0	All	Carbuncle of vagina
9	K42y1	All	Carbuncle of labium
10	M0...	All	Infective dermatological disorders
11	M00..	All	Carbuncle
12	M000.	All	Carbuncle of face
13	M0000	All	Carbuncle of ear
14	M0001	All	Carbuncle of face (excluding eye)
15	M0002	All	Carbuncle of nasal septum
16	M0003	All	Carbuncle of temple region
17	M000z	All	Carbuncle of face NOS
18	M001.	All	Carbuncle of neck
19	M002.	All	Carbuncle of trunk
20	M0020	All	Carbuncle of chest wall
21	M0021	All	Carbuncle of breast
22	M0022	All	Carbuncle of back
23	M0023	All	Carbuncle of abdominal wall
24	M0024	All	Carbuncle of umbilicus
25	M0025	All	Carbuncle of flank
26	M0026	All	Carbuncle of groin
27	M0027	All	Carbuncle of perineum
28	M002z	All	Carbuncle of trunk NOS
29	M003.	All	Carbuncle of upper arm and forearm
30	M0030	All	Carbuncle of shoulder
31	M0031	All	Carbuncle of axilla
32	M0032	All	Carbuncle of upper arm
33	M0033	All	Carbuncle of elbow
34	M0034	All	Carbuncle of forearm
35	M003z	All	Carbuncle of upper arm and forearm NOS
36	M004.	All	Carbuncle of hand
37	M0040	All	Carbuncle of wrist
38	M0041	All	Carbuncle of thumb
39	M0042	All	Carbuncle of finger
40	M004z	All	Carbuncle of hand NOS
41	M005.	All	Carbuncle of buttock
42	M0050	All	Carbuncle of anus
43	M0051	All	Carbuncle of gluteal region
44	M005z	All	Carbuncle of buttock NOS
45	M006.	All	Carbuncle of leg (excluding foot)
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M0060	All	Carbuncle of hip
M0061	All	Carbuncle of thigh
M0062	All	Carbuncle of knee
M0063	All	Carbuncle of lower leg
M0064	All	Carbuncle of ankle
M006z	All	Carbuncle of leg (excluding foot) NOS
M007.	All	Carbuncle of foot
M0070	All	Carbuncle of foot unspecified
M0071	All	Carbuncle of heel
M0072	All	Carbuncle of toe
M007z	All	Carbuncle of foot NOS
M00y.	All	Carbuncle of other specified site
M00y0	All	Carbuncle of head (excluding face)
M00yz	All	Carbuncle of other specified site NOS
M00z.	All	Carbuncle NOS
M01..	All	Furuncle
M010.	All	Boil of face
M0100	All	Boil of ear
M0101	All	Boil of face (excluding eye)
M0102	All	Boil of nasal septum
M0103	All	Boil of temple region
M0104	All	Boil of external nose
M010z	All	Boil of face NOS
M011.	All	Boil of neck
M012.	All	Boil of trunk
M0120	All	Boil of chest wall
M0121	All	Boil of breast
M0122	All	Boil of back
M0123	All	Boil of abdominal wall
M0124	All	Boil of umbilicus
M0125	All	Boil of flank
M0126	All	Boil of groin
M0127	All	Boil of perineum
M012z	All	Boil of trunk NOS
M013.	All	Boil of upper arm and forearm
M0130	All	Boil of shoulder
M0131	All	Boil of axilla
M0132	All	Boil of upper arm
M0133	All	Boil of elbow
M0134	All	Boil of forearm
M013z	All	Boil of upper arm and forearm NOS
M014.	All	Boil of hand

M0140	All	Boil of wrist
M0141	All	Boil of thumb
M0142	All	Boil of finger
M014z	All	Boil of hand NOS
M015.	All	Boil of buttock
M0150	All	Boil of anus
M0151	All	Boil of gluteal region
M015z	All	Boil of buttock NOS
M016.	All	Boil of leg (excluding foot)
M0160	All	Boil of hip
M0161	All	Boil of thigh
M0162	All	Boil of knee
M0163	All	Boil of lower leg
M0164	All	Boil of ankle
M016z	All	Boil of leg (excluding foot) NOS
M017.	All	Boil of foot
M0170	All	Boil of foot unspecified
M0171	All	Boil of heel
M0172	All	Boil of toe
M017z	All	Boil of foot NOS
M01y.	All	Boil of other specified site
M01y0	All	Boil of head (excluding face)
M01yz	All	Boil of other specified site NOS
M01z.	All	Boils: [Recurrent] or [multiple sites] or [NOS]
M01z0	All	Multiple boils
M02..	All	Cellulitis and abscess of finger and toe
M020.	All	Cellulitis and abscess of finger
M0200	All	Cellulitis and abscess of finger unspecified
M0201	All	(Finger pulp abscess) or (felon) or (whitlow)
M0202	All	Onychia of finger
M0203	All	Finger: [perionychia] or [paronychia]
M0204	All	Finger web space infection
M0205	All	Pulp space infection of finger/thumb
M020z	All	Cellulitis and abscess of finger NOS
M021.	All	Cellulitis and abscess of toe
M0210	All	Cellulitis and abscess of toe unspecified
M0211	All	Onychia of toe
M0212	All	Paronychial infection of toe
M0213	All	Pulp space infection of toe
M021z	All	Toe: [Perionychia] or [cellulitis and abscess NOS]
M02z.	All	Digit: [paronychial infection] or [infected nailfold] or [cellulitis and abscess of NOS] or [nail infection NOS]

M03..	All	(Skin area excluding digits of hand or foot: [abscess] or [acute lymphangitis of skin] or [cellulitis]) or (other cellulitis and abscess)
M030.	All	Cellulitis and abscess of face
M0300	All	Cellulitis and abscess of cheek (& external)
M0301	All	Cellulitis and abscess of nose (& external)
M0302	All	Cellulitis and abscess of chin
M0303	All	Cellulitis and abscess of submandibular region
M0304	All	Cellulitis and abscess of forehead
M0305	All	Cellulitis and abscess of temple region
M0306	All	Cellulitis of face
M030z	All	Cellulitis and abscess of face NOS
M031.	All	(Cellulitis and abscess of neck) or (cervical abscess)
M032.	All	Cellulitis and abscess of trunk
M0320	All	Cellulitis and abscess of chest wall
M0321	All	Cellulitis and abscess of breast
M0322	All	Cellulitis and abscess of back
M0323	All	Cellulitis and abscess of abdominal wall
M0324	All	Cellulitis and abscess of umbilicus
M0325	All	Cellulitis and abscess of flank
M0326	All	Cellulitis and abscess of groin
M0327	All	Cellulitis and abscess of perineum
M0328	All	Cellulitis of trunk
M032z	All	Cellulitis and abscess of trunk NOS
M033.	All	Cellulitis and abscess of arm
M0330	All	Cellulitis and abscess of shoulder
M0331	All	Cellulitis and abscess of axilla
M0332	All	Cellulitis and abscess of upper arm
M0333	All	Cellulitis and abscess of elbow
M0334	All	Cellulitis and abscess of forearm
M033z	All	Cellulitis and abscess of arm NOS
M034.	All	Cellulitis and abscess of hand (& excluding digits)
M0340	All	Hand: (abscess and/or cellulitis) of (dorsum or palm or unspecified)
M0341	All	Cellulitis and abscess of wrist
M034z	All	Cellulitis and abscess of hand NOS
M035.	All	Cellulitis and abscess of buttock
M036.	All	Cellulitis and abscess of leg (& excluding foot)
M0360	All	Cellulitis and abscess of hip
M0361	All	Cellulitis and abscess of thigh
M0362	All	Cellulitis and abscess of knee
M0363	All	Cellulitis and abscess of lower leg
M0364	All	Cellulitis and abscess of ankle
M036z	All	Cellulitis and abscess of leg NOS
M037.	All	Cellulitis and abscess of foot (& excluding toe)

M0370	All	Cellulitis and abscess of foot unspecified
M0371	All	Cellulitis and abscess of heel
M0372	All	Cellulitis in diabetic foot
M037z	All	Cellulitis and abscess of foot NOS
M038.	All	NULL
M03y.	All	Other specified cellulitis and abscess
M03y0	All	(Cellulitis and abscess of head unspecified) or (abscess of scalp)
M03z.	All	Cellulitis and abscess NOS
M03z0	All	Cellulitis NOS
M03z1	All	Abscess NOS
M03zz	All	(Cellulitis and abscess NOS) or (acute lymphangitis NOS)
M04..	All	Acute: [lymphadenitis] or [abscess lymph node] or [cervical adenitis]
M040.	All	Acute lymphadenitis of trunk
M041.	All	Acute lymphadenitis of upper limb
M042.	All	Acute lymphadenitis of lower limb
M043.	All	Acute lymphadenitis of face, head and neck
M05..	All	Impetigo
M050.	All	Impetigo contagiosa unspecified
M051.	All	[Bullous impetigo] or [impetigo herpetiformis]
M052.	All	Impetigo contagiosa gyrata
M053.	All	Impetigo circinata
M054.	All	Impetigo neonatorum
M055.	All	Impetigo simplex
M056.	All	Impetigo follicularis
M057.	All	Chronic symmetrical impetigo
M05z.	All	Impetigo NOS
M06..	All	Pilonidal sinus/cyst
M060.	All	Pilonidal cyst with abscess
M061.	All	(Pilonidal cyst with no abscess) or (dermal sinus)
M062.	All	Pilonidal sinus with abscess
M063.	All	Pilonidal sinus without abscess
M06z.	All	Pilonidal sinus/cyst NOS
M07..	All	Other local infections of skin and subcutaneous tissue
M070.	All	Pyogenic infection of skin and subcutis
M0700	All	Chancriform pyoderma
M0701	All	Pyoderma faciale
M0702	All	Pyoderma gangrenosum
M0703	All	Pyoderma ulcerosum tropicalum
M070z	All	Pyoderma NOS
M071.	All	Pyogenic granuloma
M0710	All	Pyogenic granuloma unspecified
M0711	All	Pyogenic progressive granuloma

M0712	All	NULL
M0713	All	Umbilical granuloma
M071z	All	Pyogenic granuloma NOS
M072.	All	NULL
M073.	All	Scalp infection
M07y.	All	(Pustular eczema) or (other specified local infection of skin or subcutaneous tissue)
M07y0	All	Acute palmoplantar pustular psoriasis
M07y1	All	Ecthyma
M07y2	All	Dermatitis vegetans
M07y3	All	NULL
M07y4	All	NULL
M07y5	All	Inflammation of scar
M07yz	All	Infection: [toe] or [foot] or [finger] or [other specified local infection of skin and subcutaneous tissue NOS]
M07z.	All	(Septic spots) or (sinus) or (infected skin: [insect bite] or [ulcer] or [dermatitis] or [local infection skin/subcutaneous tissue NOS])
M07z0	All	NULL
M07z1	All	NULL
M07z2	All	NULL
M08..	All	NULL
M080.	All	(Cellulitis: [of thumb] or [[X] of finger and toe]) or (nail bed infection) or (septic thumb)
M081.	All	[X]Cellulitis of other parts limb
M082.	All	NULL
M083.	All	NULL
M084.	All	[X]Cellulitis of breast
M085.	All	NULL
M086.	All	Cellulitis of ankle
M087.	All	Chronic paronychia
M088.	All	NULL
M089.	All	NULL
M08A.	All	NULL
M08B.	All	NULL
M08C.	All	NULL
M08y.	All	[X]Cellulitis of other sites
M09..	All	NULL
M090.	All	Abscess of face
M091.	All	Abscess of neck
M092.	All	Abscess of trunk
M0920	All	NULL
M0921	All	NULL
M0922	All	NULL
M093.	All	Abscess of buttock

M094.	All	Abscess of limb
M0940	All	NULL
M095.	All	NULL
M09y.	All	[X]Abscess of other site
M0y..	All	Other specified infections of skin or subcutaneous tissue
M0z..	All	Infected: [sebaceous cyst] or [skin and subcut tissue NOS]
M102.	All	[Infective eczematoid dermatitis] or [Pustular eczema] or [Septic dermatitis]
M1512	All	Erythema marginatum
M15y0	All	Staphylococcal scalded skin syndrome
M15y6	All	Erythema marginatum in acute rheumatic fever
M161A	All	Psoriasis palmaris
M161B	All	Psoriasis plantaris
M163.	All	Pityriasis rosea
M21y0	All	Acrodermatitis chronica atrophicans
M2440	All	Dissecting cellulitis of scalp
M2441	All	Sycosis barbae
M2442	All	Folliculitis depilans
M2443	All	Pustular folliculitis
M2444	All	Perifolliculitis
M2446	All	Deep bacterial folliculitis
M2447	All	Perifolliculitis of scalp
M244z	All	Folliculitis NOS
Myu0.	All	[X]Infections of the skin and subcutaneous tissue
Myu01	All	[X]Other specified local infections of the skin and subcutaneous tissue
Myu02	All	[X]Impetiginisation of other dermatoses
SP30.	All	Generalised vaccinia
X00hk	All	Cellulitis of external ear
X00hm	All	Cellulitis of pinna
X00hn	All	Abscess of pinna
X00IR	All	Lupus vulgaris of nose
X00YN	All	Cellulitis of eyelid
X00YS	All	Infectious dermatosis of eyelid
X00YT	All	Bacterial dermatitis of eyelid
X00YU	All	Impetigo of eyelid
X00YV	All	Viral dermatitis of eyelid
X00YW	All	Fungal dermatitis of eyelid
X20QY	All	Cancrum oris
X4004	All	Gangrenous balanitis
X400A	All	Mycoplasma balanitis
X400B	All	Chlamydial balanitis
X400w	All	Fournier's gangrene of scrotum
X4087	All	Vulval amoebiasis

X4089	All	Chlamydial Bartholinitis
X408C	All	Vulval warts
X408D	All	Condyloma acuminata of vulva
X5002	All	Viral dermatological disorders
X5003	All	Pox virus infection of skin
X5004	All	Vaccinia
X5005	All	Eczema vaccinatum
X5006	All	Viral exanthem
X5007	All	Infectious mononucleosis exanthem
X500A	All	Dermatosis of suspected viral aetiology
X500b	All	Pseudomonas aeruginosa paronychia
X500B	All	Gianotti-Crosti syndrome
X500E	All	Chlamydial dermatological disorders
X500f	All	Recurrent boils
X500g	All	Boils of multiple sites
X500I	All	Exanthem due to ornithosis
X500J	All	Bacterial dermatological disorders
X500K	All	Non-bullous impetigo
X500L	All	Streptococcal impetigo
X500M	All	Staphylococcal non-bullous impetigo
X500N	All	Secondary impetiginisation
X500O	All	Scalp folliculitis
X500P	All	Staphylococcal folliculitis of scalp
X500q	All	Ecthyma gangrenosum
X500Q	All	Gram-negative folliculitis
X500r	All	Sycosis
X500R	All	Staphylococcal granuloma
X500s	All	Acute sycosis barbae
X500t	All	Sycosis cruris
X500u	All	Lupoid sycosis
X500U	All	Abscess of skin
X500v	All	Lupoid sycosis of beard
X500V	All	Cervical abscess
X500w	All	Folliculitis decalvans
X500W	All	Abscess of skin area excluding digits of hand or foot
X500x	All	Folliculitis keloidalis nuchae
X500X	All	Abscess of dorsum of hand
X500y	All	Chronic folliculitis of legs
X500Y	All	Abscess of palm of hand
X500z	All	Cutaneous cellulitis
X500Z	All	Abscess of scalp
X5010	All	Cellulitis of skin area excluding digits of hand or foot

X5011	All	Cellulitis of dorsum of hand
X5012	All	Cellulitis of palm of hand
X5013	All	Necrotising fasciitis
X5014	All	Necrotising fasciitis of scrotum and perineum
X5015	All	Progressive bacterial synergistic gangrene
X5018	All	Anaerobic cellulitis
X501b	All	Non-pyogenic bacterial infection of skin
X501c	All	Erythrasma
X501d	All	Pitted keratolysis
X501E	All	Cellulitis of leg
X501G	All	Acute lymphangitis NOS
X501H	All	Acute lymphangitis of skin excluding digits of hand or foot
X501I	All	Acute cervical adenitis
X501J	All	Site-specific pyogenic infection of skin and subcutis
X501N	All	Blistering distal dactylitis
X501O	All	Infection of nail
X501Q	All	Infection of toe web
X501r	All	Cutaneous involvement in listeriosis
X501R	All	Staphylococcal intertrigo
X501S	All	Streptococcal intertrigo
X501t	All	Fusobacterium infection of skin
X501U	All	Perianal streptococcal infection of newborn
X501v	All	Tropical ulcer
X501V	All	Botryomycosis
X501w	All	Desert sore
X501W	All	Staphylococcal botryomycosis
X501x	All	Corynebacterium pyogenes infection of skin
X501X	All	Cutaneous botryomycosis
X501Z	All	Dermatitis gangrenosa infantum
X5020	All	Moraxella infection of skin
X5021	All	Staphylococcal scarlatina
X502a	All	Primary cutaneous blastomycosis
X502A	All	Tuberculide
X502B	All	Papular tuberculide
X502E	All	Nodular tuberculide
X502H	All	Cutaneous complication of BCG immunisation
X502I	All	BCG granuloma
X502j	All	Chromomycosis
X502J	All	BCG ulcer
X502I	All	Subcutaneous zygomycosis
X502o	All	Systemic fungal infection affecting skin
X502p	All	Dermatophytide

X502P	All	Pityrosporum infection of skin
X502q	All	Trichophytide
X502Q	All	Pityrosporum folliculitis
X502r	All	Microsporide
X502R	All	Steroid-modified tinea infection
X502s	All	Epidermophytide
X502t	All	Parasitic infestation of skin
X502u	All	Nematode infestation of skin
X502U	All	Cutaneous alternariosis
X502v	All	Streptocerciasis
X502V	All	Scytalidium dimidiatum infection of skin
X502W	All	Scytalidium hyalinum infection of skin
X502Y	All	Systemic mycosis affecting skin
X5031	All	Amoebiasis of skin
X5038	All	Protozoal infestation of skin
X503J	All	Maculae ceruleae - disorder
X509H	All	Nail infection NOS
X509m	All	Erosive pustular dermatosis of the scalp
X50BW	All	Infected skin ulcer
X50Dw	All	Eosinophilic panniculitis
X50FB	All	Eosinophilic cellulitis
X50GV	All	Bullous pyoderma
X70HA	All	Tuberculous chancre
X70HB	All	Acute tuberculous ulcer
X70HC	All	Acute miliary cutaneous tuberculosis
X70HD	All	Cutaneous tuberculous gumma
X70Hy	All	Cutaneous mycobacterium ulcerans infection
X70Hz	All	Cutaneous mycobacterium marinum infection
X70I0	All	Swimming pool granuloma
X70I1	All	Fish tank granuloma
X70IA	All	Cutaneous streptococcal ulcer
X70IS	All	Gas gangrene of skin
X70JO	All	Herpes simplex infection of skin
X70JP	All	Chronic mucocutaneous herpes simplex infection
X70Lc	All	Giant condyloma acuminata
X70LO	All	Facial wart
X70LP	All	Hand wart
X70LQ	All	Periungual wart
X70LR	All	Subungual wart
X70LS	All	Filiform wart
X70LT	All	Digitate wart
X70LU	All	Butcher's wart

X70LV	All	Plane wart
X70LW	All	Mosaic plantar wart
X70LX	All	Myrmecia plantar wart
X70LY	All	Epidermodysplasia verruciformis
X70LZ	All	Anogenital warts
X70N8	All	Cutaneous gonorrhoea
X70N9	All	Gonococcal cellulitis
X70NB	All	Chancroid - anogenital ulcer
X70NC	All	Chancroid - extragenital ulcer
X70Nd	All	Anal warts
X70ND	All	Chancroid - latent infection
X70Nf	All	Penile warts
X70Nt	All	Donovanosis - anogenital ulcer
X70Nu	All	Donovanosis - inguinal lesion
X70Nv	All	Donovanosis - non-genital lesion
X70OR	All	Bacillary angiomatosis
X70Pi	All	Leptospiral rash
X70PJ	All	Penile amoebiasis
X70PL	All	Amoebic abscess of skin
X70Pn	All	Plantar papillomata of yaws
X70Po	All	Palmar papillomata of yaws
X70Pp	All	Macular yaws
X70Pq	All	Maculopapular yaws
X70Pr	All	Micropapular yaws
X70Ps	All	Papular yaws
X70Pt	All	Palmar yaws hyperkeratosis
X70Pu	All	Plantar yaws hyperkeratosis
X70PY	All	Erythema chronicum migrans
X70Qe	All	Cutaneous aspergillosis
X70QJ	All	Fungal dermatosis
X70QK	All	Mycetoma
X70QM	All	Kerion
X70QN	All	Favus
X70QO	All	Tinea faciei
X70Qp	All	Perineal candidiasis
X70QP	All	Tinea cruris
X70QQ	All	Nodular folliculitis
X70Qr	All	Candidiasis of skin
X70QR	All	Trichomyces axillaris
X70Qs	All	Napkin candidiasis
X70QS	All	Tinea imbricata
X70Qt	All	Submammary intertrigo

X70Qu	All	Candidiasis of finger web
X70Rc	All	Cutaneous histoplasmosis
X70Rd	All	Primary cutaneous histoplasmosis
X70RD	All	Cutaneous cryptococcosis
X70Re	All	Disseminated cutaneous histoplasmosis
X70RG	All	Cutaneous coccidioidomycosis
X70Rh	All	Disseminated cutaneous blastomycosis
X70RH	All	Subcutaneous coccidioidomycosis
X70Rj	All	Cutaneous lobomycosis
X70Rk	All	Primary lobomycotic nodule
X70RI	All	Chronic coalescent cutaneous lobomycosis
X70Rw	All	Cutaneous trichosporonosis
X70Rz	All	Cutaneous chromoblastomycosis
X70S0	All	Primary chromoblastomycotic nodule
X70S1	All	Cutaneous chromoblastomycotic abscess
X70S2	All	Lymphocutaneous chromoblastomycosis
X70S5	All	Phaeohyphomycosis of skin
X70S6	All	Phaeohyphomycotic subcutaneous cyst
X70SK	All	Conidiobolomycosis
X70SL	All	Rhinofacial conidiobolomycosis
X70SM	All	Disseminated conidiobolomycosis
X70SO	All	Cutaneous basidiobolomycosis
X70Tk	All	Onchodermatitis
X70Tm	All	Onchocercal subcutaneous nodule
X70Tn	All	Onchocercal depigmentation
X70To	All	Onchocercal lichenification
X70Tp	All	Sowda
X70UA	All	Cutaneous strongyloidiasis
X70UB	All	Strongyloidal ground itch
X70UC	All	Strongyloidal cutaneous larva migrans
X70UD	All	Larva currens
X70UJ	All	Gnathostomal cutaneous larva migrans
X70Ut	All	Scabetic nodule
X70Uu	All	Post-scabetic nodule
X70Uv	All	Crusted scabies
X70Uy	All	Arthropod dermatosis
X70Uz	All	Dermatosis due to mites
X70V0	All	Grocer's itch
X70V1	All	Baker's itch
X70V2	All	Copra itch
X70V3	All	Straw itch
X70V4	All	Grain itch

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4	X70V5	All	Grain-shoveller's itch
5	X70V6	All	Cotton-seed itch
6	X70V7	All	Bean itch
7	X70V8	All	Barley itch
8	X70V9	All	Demodex folliculitis
9	X70VA	All	Dermatophagoidal dermatosis
10	X70VB	All	Animal mite infestation
11	X70VC	All	Cheyletiella dermatitis
12	X70VD	All	Dog mite infestation
13	X70VE	All	Cat mite infestation
14	X70VF	All	Rabbit mite infestation
15	X70VG	All	Rat mite infestation
16	X70VH	All	Mouse mite infestation
17	X70VI	All	Bird mite infestation
18	X70VK	All	Fowl mite infestation
19	X70VL	All	Chiggers infestation
20	X70VM	All	Dermatoses due to plant mites
21	X70VN	All	Dermatosis due to bug
22	X70VQ	All	Flea infestation
23	X70VR	All	Jiggers infestation
24	X70VS	All	Tongueworm infection
25	X70VT	All	Tongueworm cyst
26	X70VU	All	Tongueworm granuloma
27	X70VV	All	Halzoun
28	X75vf	All	Paronychia
29	X75vg	All	Bacterial paronychia
30	X75wp	All	Folliculitis of lids
31	X78Rn	All	Infected sebaceous cyst
32	X78Rs	All	Warty dyskeratoma
33	XA00w	All	Infected insect bite
34	Xa0Aq	All	Neonatal pyoderma
35	Xa0bE	All	Streptococcal cellulitis
36	Xa0bF	All	Meleney's gangrene
37	Xa0bG	All	Cutaneous African histoplasmosis
38	Xa0bl	All	Larva migrans of skin
39	Xa0kT	All	Amoebic granuloma of skin
40	Xa0Qy	All	Complicated donovanosis
41	Xa0Ws	All	Staphylococcus aureus superficial folliculitis
42	Xa139	All	Site-specific infective disorders of skin
43	Xa13A	All	Intertrigo
44	Xa13C	All	Submammary monilia
45	Xa1y2	All	Abscess of toe
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Xa1ZW	All	Cutaneous disorders of Yaws
Xa2jn	All	Cellulitis of arm
Xa3gD	All	Carbuncle/boil
Xa3gE	All	Cellulitis of toe
Xa3gF	All	Cellulitis of hand excluding finger
Xa3gG	All	Cellulitis of leg, excluding foot
Xa3gH	All	Cellulitis of foot excluding toe
Xa40b	All	Cellulitis - digit NOS
Xa6qC	All	Perineal wart
Xa6qD	All	Female perineal wart
Xa7Ht	All	Cellulitis of heel
Xa7Hw	All	Axillary abscess
Xa7I2	All	Periorbital cellulitis
Xa7Ic	All	Infected nail bed
Xa7Id	All	Cellulitis of scalp
Xa7Iv	All	Infected face
Xa7Iz	All	Infected heel
Xa7m0	All	Infected thumb
Xa7m3	All	Septic finger
Xa7m4	All	Infected hand
Xa7nf	All	Intertrigo of abdominal skin fold
Xa7Ni	All	Infection toe
Xa7Nj	All	Infection foot
Xa7Nk	All	Infection finger
Xa7yw	All	Abscess of finger
Xa82g	All	Perineal abscess
Xa83I	All	Cellulitis of elbow
Xa83m	All	Abscess of elbow
Xa83W	All	Abscess of foot
Xa85W	All	Loin abscess
Xa86C	All	Cellulitis of abdominal wall
Xa89z	All	Boil of lower limb
Xa8A1	All	Carbuncle of upper limb
Xa8A4	All	Carbuncle of lower limb
Xa97f	All	Anogenital human papilloma virus infection
Xa97i	All	Early yaws skin lesion
Xa97k	All	Tinea pedis
Xa97I	All	Ringworm of body
Xa9CU	All	Pilonidal abscess
Xa9CY	All	Hidradenitis suppurativa
Xa9zj	All	Abscess of ankle
Xaa9L	All	Recurrent genital warts

XaB64	All	Cellulitis - anus or rectum
XaB65	All	Perianal cellulitis
XaBDy	All	Cellulitis of axilla
XaBEE	All	Cellulitis of neck
XaBj5	All	Abscess of back
XaBkZ	All	Groin abscess
XaBmh	All	Cellulitis of skin of back
XaBsM	All	Infection of big toe
XaBXe	All	Abdominal wall abscess
XaBXh	All	Abscess of big toe
XaBXi	All	Abscess of cheek
XaBXj	All	Abscess of thigh
XaBXk	All	Abscess of forehead
XaDbx	All	Toxocara larva migrans of skin
XaEGL	All	Hand warts
XaEJd	All	Prepatellar abscess
XaF8F	All	Preseptal cellulitis
XaFCr	All	Cellulitis of thigh
XaI8d	All	Abscess of lower limb
XaI8e	All	Abscess of upper limb
XaINT	All	Blind boil
XaLWv	All	Nasal furuncle
XaMgL	All	[X]Vulval warts
XaMgM	All	[X]Perineal warts
XaR2I	All	Recurrent cellulitis
XaY4a	All	Pustular eczema
XaY4o	All	Infected eczema
XaY4Z	All	Infective eczematoid dermatitis
XaYO5	All	Cellulitis of thumb
XaYOq	All	Bullous impetigo
XaYRx	All	Bullous staphylococcal impetigo
XEOaH	All	Angular cheilitis
XEOeV	All	Carbuncle of vulva
XEORS	All	Human papilloma virus infection of skin
XEORT	All	Genital warts
XEORU	All	Perianal warts
XEOS1	All	Chancroid
XEOS2	All	Donovanosis
XEOS7	All	Yaws hyperkeratosis
XEOS9	All	Dermatophytosis
XEOSA	All	Dermatophytosis of scalp or beard
XEOSC	All	Dermatophytosis of groin and perianal area

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	XE0SD	All	Dermatophytosis of the body
	XE0Se	All	Scabies
	XE0SE	All	Deep seated dermatophytosis
	XE0SF	All	Tinea nigra
	XE0Sg	All	Other arthropod infestation
	XE0SK	All	Candida intertrigo
	XE0SP	All	Eumycetoma
	XE0TC	All	(Actinomycosis (& [infections]) or (erythrasma)
	XE0Te	All	Viral warts (& [condyloma acuminatum])
	XE0Tg	All	Other viral warts
	XE0UC	All	(Tinea: [groin/perianal] or [cruris]) or (Dhobie itch)
	XE16h	All	Abscess of eyelid
	XE1Aa	All	Cellulitis and abscess of leg
	XE1Ab	All	Cellulitis and abscess of foot excluding toe
	XE1Ac	All	Cellulitis and abscess of head unspecified
	XE1Ad	All	Acute lymphadenitis
	XE1Ae	All	Pilonidal cyst with no abscess
	XE1Ag	All	Other specified local infection of skin or subcutaneous tissue
	XE1Ai	All	Other specified local infection of skin and subcutaneous tissue NOS
	XE1Aj	All	Local infection skin/subcut tissue NOS
	XE1Ak	All	[X]Cellulitis of finger and toe
	XE1Al	All	Skin and subcut tissue infection NOS
	XE1AO	All	Boil of upper limb
	XE1AP	All	Boil NOS
	XE1AQ	All	Finger pulp abscess
	XE1AR	All	Paronychia of finger
	XE1AS	All	Cellulitis and abscess of toe NOS
	XE1AT	All	Cellulitis and abscess of digit NOS
	XE1AU	All	Other cellulitis and abscess
	XE1AV	All	Cellulitis and abscess of cheek (external)
	XE1AW	All	Cellulitis and abscess of nose (external)
	XE1AX	All	Cellulitis and abscess of neck
	XE1AY	All	Cellulitis and abscess of hand excluding digits
	XE1AZ	All	Cellulitis and abscess of hand unspecified
	XE1Bc	All	(Carbuncle) &/or (boil) or (furuncle)
	XE1Be	All	Boil: (face) or (external auditory) or (external ear)
	XE1Bg	All	(Boil - upper arm and forearm) or (axillary furunculosis)
	XE1Bi	All	(Cellulitis &/or abscess finger/toe) or (felon - whitlow)
	XE1BJ	All	Superficial folliculitis
	XE1Bk	All	(Cellulitis - finger-paronychia) or (paronychia)
	XE1Bm	All	(Cellulitis/abscess: [NOS] or [other]) or (abscess NOS)
	XE1Bo	All	(Cellulitis/abscess - face) or (cellulitis - lips)

XE1Bq	All	Cellulitis -hand (& -excl. finger)
XE1Bs	All	Cellulitis (&/or abscess): [buttock] or [perirectal]
XE1Bu	All	Cellulitis - foot (& - excl. toe)
XE1Bw	All	(Impetigo) or (pemphigus neonatorum)
XE1By	All	(Pilonidal: [sinus &/or cyst] or [abscess]) or (dimple - parasacral)
XE1C0	All	(Skin infection, localised NOS) or (pyoderma) or (pyogenic granuloma)
XE1C2	All	(Skin infections NOS) or (perleche)
XE1Cq	All	Folliculitis
XE2RI	All	Toe: [cellulitis] or [paronychia]
XE2uC	All	Tuberculosis of skin and subcutaneous tissue
XE2uM	All	Dermatophytosis of foot
XE2v1	All	Multiple yaws papillomata
XE2xh	All	Phthiriasis pubis
XM0pU	All	Tinea kerion of beard
XM0tp	All	Cellulitis of hand
XM0tr	All	Cellulitis of foot
XM1PT	All	Superficial bacterial infection of skin
XM1R0	All	Acute abscess lymph node
XSBpB	All	Abscess of hand

Supplementary table S5.7. The case definitions for included Urinary tract infection.

Urinary tract infection		
Read V2 Code	Term ID	Description
K15..	All	Cystitis
K150.	All	Acute cystitis
K151.	All	Chronic interstitial cystitis
K1510	All	Hunner's ulcer
K1511	All	Panmural fibrosis of bladder
K1512	All	Submucous cystitis
K151z	All	Chronic interstitial cystitis NOS
K152.	All	Other chronic cystitis
K1520	All	Subacute cystitis
K152y	All	Chronic cystitis unspecified
K152z	All	Other chronic cystitis NOS
K153.	All	Trigonitis
K1530	All	Acute trigonitis
K1531	All	Chronic trigonitis
K1532	All	Urethrotigonitis
K153z	All	Trigonitis NOS
K154.	All	Cystitis in diseases EC
K1540	All	Cystitis in actinomycosis
K1541	All	Cystitis in amoebiasis
K1542	All	Cystitis in bilharziasis
K1543	All	Cystitis in echinococcus infestation
K1544	All	Cystitis in diphtheria
K1545	All	Cystitis in gonorrhoea
K1546	All	Cystitis in moniliasis
K1547	All	Cystitis in trichomoniasis
K1548	All	Cystitis in tuberculosis
K154z	All	Cystitis in diseases EC NOS
K155.	All	Recurrent cystitis
K15y.	All	Other specified cystitis
K15y0	All	Cystitis cystica
K15y1	All	Irradiation cystitis
K15y2	All	Abscess of bladder
K15y3	All	Malakoplakia of bladder
K15yz	All	Other cystitis NOS
K15z.	All	Cystitis NOS
K190.	All	Urinary tract infection, site not specified
K1900	All	Bacteriuria, site not specified
K1901	All	Pyuria, site not specified

K1902	All	Post operative urinary tract infection
K1903	All	Recurrent urinary tract infection
K1904	All	Chronic urinary tract infection
K1905	All	Urinary tract infection
K1906	All	Urosepsis
K190X	All	Persistent proteinuria, unspecified
K190z	All	Urinary tract infection, site not specified NOS
Read CTV3 Code	Term ID	Description
A32y3	All	Diphtheritic cystitis
A9811	All	Acute gonococcal cystitis
A9831	All	Chronic gonococcal cystitis
K15..	All	Inflammation of bladder
K150.	All	NULL
K151.	All	Chronic interstitial cystitis
K1510	All	Hunner's ulcer
K1511	All	Panmural fibrosis of bladder
K1512	All	Submucous cystitis
K151z	All	Chronic interstitial cystitis NOS
K152.	All	Other chronic cystitis
K1520	All	Subacute cystitis
K152y	All	Chronic cystitis unspecified
K152z	All	Other chronic cystitis NOS
K153.	All	(Trigonitis) or (follicular cystitis)
K1530	All	Acute trigonitis
K1531	All	Chronic trigonitis
K1532	All	Urethrotrigonitis
K153z	All	Trigonitis NOS
K154.	All	Cystitis in diseases EC
K1540	All	Actinomycotic cystitis
K1541	All	Amoebic cystitis
K1542	All	Schistosomiasis of bladder
K1543	All	Echinococcal cystitis
K1544	All	NULL
K1545	All	Gonococcal cystitis
K1546	All	Monilial cystitis
K1547	All	Trichomonal cystitis
K1548	All	Tuberculous cystitis
K154z	All	Cystitis in diseases EC NOS
K155.	All	Recurrent cystitis
K15y.	All	Other specified cystitis
K15y0	All	Cystitis cystica
K15y1	All	Irradiation cystitis

K15y2	All	Pyocystis
K15y3	All	NULL
K15yz	All	Other cystitis NOS
K15z.	All	Cystitis NOS
K1632	All	Diverticulitis of bladder
K190.	All	Urinary tract infection: [site not specified] or [recurrent]
K1900	All	Bacteriuria: [site not specified] or [asymptomatic]
K1901	All	Pyuria
K1902	All	Postoperative urinary tract infection
K1903	All	Recurrent urinary tract infection
K1904	All	Chronic urinary tract infection
K1905	All	NULL
K1906	All	NULL
K190X	All	NULL
K190z	All	Urinary tract infection, site not specified NOS
Kyu50	All	[X]Other chronic cystitis
Kyu51	All	[X]Other cystitis
X30Na	All	Recurrent cystitis - culture-negative
X30Nb	All	Chronic cystitis - culture negative
X30Nc	All	Chronic nonspecific cystitis
X30Nd	All	Acute radiation cystitis
X30Ne	All	Chronic radiation cystitis
X30Nf	All	Chemical cystitis
X30Ng	All	Leukoplakia of bladder
X30Nh	All	Malakoplakia of bladder
X30NV	All	Infective cystitis
X30NX	All	Chronic infective cystitis
X30NY	All	Non-infective cystitis
X30NZ	All	Acute cystitis - culture-negative
X30Pa	All	Recurrent infective cystitis
X30PZ	All	Acute culture positive cystitis
Xa0t3	All	Amyloid of bladder
Xa8EJ	All	Acute cystitis
Xa8EK	All	Chronic cystitis
XaA05	All	Bullous cystitis
XaB66	All	Acute infective cystitis
XaY6b	All	Follicular cystitis
XE0dq	All	Trigonitis
XE0fX	All	Acute cystitis (& [recurrent])
XE0fZ	All	(Cystitis NOS) or (trigonitis)
XM0sZ	All	Acute recurrent cystitis
XM10v	All	Infected diverticulum of bladder

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XM1Ox	All	Cystitis of pregnancy
XM1Us	All	Sterile pyuria

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Supplementary table S5.8. The case definitions for included Genital infections.

Genital infections		
Read V2 Code	Term ID	Description
AB21.	All	Candidal vulvovaginitis
AB210	All	Candidiasis of vulva
AB211	All	Candidiasis of vagina
AB21z	All	Candidal vulvovaginitis NOS
AB22.	All	Other urogenital candidiasis
AB220	All	Candidal balanitis
AB221	All	Perianal candidiasis
AB22z	All	Other urogenital candida NOS
K17..	All	Urethritis due to non venereal causes
K170.	All	Urethral and periurethral abscess
K1700	All	Urethral abscess unspecified
K1701	All	Bulbourethral gland abscess
K1702	All	Urethral gland abscess
K1703	All	Periurethral cellulitis
K1704	All	Periurethral abscess
K170z	All	Urethral abscess NOS
K172.	All	Candidal urethritis
K17y2	All	Skene's glands adenitis
K17y3	All	Cowperitis
K17y4	All	Urethral meatitis
K17y6	All	Verumontanitis
K17y7	All	Utriculus masculinus
K17yz	All	Other urethritis NOS
K17z.	All	Urethritis due to non venereal cause NOS
Read CTV3 Code	Term ID	Description
AB21.	All	Candidal vulvovaginitis
XE0SH	All	Candidal vulvovaginitis NOS
X407o	All	Streptococcal vulvovaginitis
X407r	All	Chlamydial vulvovaginitis
K4212	All	Vulvovaginitis unspecified
K4216	All	Vulvovaginitis in diseases EC
Xa16P	All	Infective vulvitis
X4087	All	Vulval amoebiasis
AB210	All	Candidiasis of vulva
X407h	All	Infective vaginitis
AB211	All	Vaginal candidiasis
Xa0Er	All	Trichomonal vaginitis
X407i	All	Bacterial vaginosis
X4080	All	Vaginal vault infection
AB22.	All	Other urogenital candidiasis
AB22z	All	Other urogenital candida NOS

XaBjl	All	Infective balanitis
X4007	All	Bacterial balanitis
X4008	All	Anaerobic balanitis
X400A	All	Mycoplasma balanitis
XE0SI	All	Candidal balanitis
A05y1	All	Amoebic balanitis
X70Qk	All	Anogenital candidiasis
XE0SJ	All	Perianal candidiasis
X70Qo	All	Anal candidiasis
X70Qj	All	Candida infection of genital region
X407N	All	Candidiasis of cervix
X70Qn	All	Penile candidiasis
XE0SI	All	Candidal balanitis
X30Oy	All	Infective urethritis
XE0dt	All	Non-venereal urethritis
X30P3	All	Tuberculous urethritis
X30P6	All	Urethral abscess
K1700	All	Urethral abscess unspecified
K170z	All	Urethral abscess NOS
K17y2	All	Skene's glands adenitis
K17y3	All	Cowperitis
K17y4	All	Urethral meatitis
X30PD	All	Male accessory gland infection
K17y6	All	Verumontanitis
K17yz	All	Other urethritis NOS
K1703	All	Periurethral cellulitis
K1704	All	Periurethral abscess

Supplementary table S5.9. The case definitions for included Gastrointestinal infection.

Gastrointestinal infection		
Read V2 Code	Term ID	Description
19G..	All	Diarrhoea and vomiting
1J8..	All	Suspected food poisoning
A0...	All	Intestinal infectious diseases
A00..	All	Cholera
A000.	All	Cholera - <i>Vibrio cholerae</i>
A001.	All	Cholera - <i>Vibrio cholerae</i> El Tor
A00z.	All	Cholera NOS
A01..	All	Typhoid and paratyphoid fevers
A010.	All	Typhoid fever
A011.	All	Paratyphoid fever A
A012.	All	Paratyphoid fever B
A013.	All	Paratyphoid fever C
A01z.	All	Paratyphoid fever NOS
A02..	All	Other salmonella infections
A020.	All	<i>Salmonella</i> gastroenteritis
A021.	All	<i>Salmonella</i> septicaemia
A022.	All	Localised salmonella infection
A0220	All	Local salmonella infection unspecified
A0221	All	<i>Salmonella</i> meningitis
A0222	All	<i>Salmonella</i> pneumonia
A0223	All	<i>Salmonella</i> arthritis
A0224	All	<i>Salmonella</i> osteomyelitis
A022z	All	Other local salmonella infection
A023.	All	<i>Salmonella</i> sepsis
A02y.	All	Other specified salmonella infection
A02z.	All	<i>Salmonella</i> infection NOS
A03..	All	Shigellosis
A030.	All	<i>Shigella dysenteriae</i> (group A)
A031.	All	<i>Shigella flexneri</i> (group B)
A032.	All	<i>Shigella boydii</i> (group C)
A033.	All	<i>Shigella sonnei</i> (group D)
A03y.	All	Other specified shigella infection
A03z.	All	Shigellosis NOS
A04..	All	Other bacterial food poisoning
A040.	All	Staphylococcal food poisoning
A041.	All	Botulism
A042.	All	<i>Clostridium perfringens</i> food poisoning
A043.	All	Other clostridia causing food poisoning
A044.	All	<i>Vibrio parahaemolyticus</i> food poisoning
A04y.	All	Other specified bacterial food poisoning

A04y0	All	Foodborne Bacillus cereus intoxication
A04z.	All	Food poisoning NOS
A05..	All	Amoebiasis
A050.	All	Acute amoebic dysentery
A051.	All	Chronic intestinal amoebiasis
A052.	All	Amoebic nondysenteric colitis
A053.	All	Amoebic liver abscess
A054.	All	Amoebic lung abscess
A055.	All	Amoebic brain abscess
A056.	All	Amoebic skin ulceration
A05y.	All	Amoebic infection of other sites
A05y0	All	Amoebic appendicitis
A05y1	All	Amoebic balanitis
A05y2	All	Amoeboma
A05yz	All	Amoebic infection of other sites NOS
A05z.	All	Amoebiasis NOS
A06..	All	Other protozoal intestinal diseases
A060.	All	Balantidiasis
A061.	All	Giardiasis - Lambliasis
A062.	All	Coccidiosis
A063.	All	Intestinal trichomoniasis
A064.	All	Cryptosporidiosis
A06y.	All	Other specified protozoal intestinal diseases
A06z.	All	Protozoal intestinal diseases NOS
A07..	All	Intestinal infection due to other organisms
A070.	All	Escherichia coli gastrointestinal tract infection
A0700	All	Enteropathogenic Escherichia coli infection
A0701	All	Enterotoxigenic Escherichia coli infection
A0702	All	Enteroinvasive Escherichia coli infection
A0703	All	Enterohaemorrhagic Escherichia coli infection
A071.	All	Arizona paracolon gastrointestinal tract infection
A072.	All	Aerobacter aerogenes gastrointestinal tract infection
A073.	All	Proteus gastrointestinal tract infection
A0730	All	Proteus mirabilis gastrointestinal tract infection
A0731	All	Proteus morganii gastrointestinal tract infection
A073z	All	Proteus gastrointestinal tract infection NOS
A074.	All	Other specified gastrointestinal tract bacterial infection
A0740	All	Staphylococcal gastrointestinal tract infection
A0741	All	Pseudomonas gastrointestinal tract infection
A0743	All	Campylobacter gastrointestinal tract infection
A0744	All	Enteritis due to Yersinia enterocolitica
A0745	All	Helicobacter pylori gastrointestinal tract infection
A074y	All	Other specified other gastrointestinal infection
A074z	All	Other specified gastrointestinal tract infections NOS
A075.	All	Unspecified bacterial enteritis

A076.	All	Enteritis due to specified virus
A0760	All	Enteritis due to adenovirus
A0761	All	Enteritis due to enterovirus
A0762	All	Enteritis due to rotavirus
A0763	All	Enteritis due to norovirus
A076z	All	Enteritis due to specified virus NOS
A07y.	All	Gastrointestinal tract infection due to specified organism NEC
A07y0	All	Viral gastroenteritis
A07y1	All	Infantile viral gastroenteritis
A07z.	All	Gastrointestinal tract infection due to specified organism NOS
A08..	All	Ill-defined intestinal tract infections
A080.	All	Infectious colitis, enteritis and gastroenteritis
A0801	All	Infectious colitis
A0802	All	Infectious enteritis
A0803	All	Infectious gastroenteritis
A0804	All	Catarrhal dysentery
A0805	All	Haemorrhagic dysentery
A080z	All	Infectious colitis, enteritis and gastroenteritis NOS
A081.	All	Colitis, enteritis and gastroenteritis presumed infectious
A0810	All	Colitis - presumed infectious origin
A0811	All	Enteritis - presumed infectious origin
A0812	All	Gastroenteritis - presumed infectious origin
A081z	All	Colitis, enteritis and gastroenteritis presumed infectious origin NOS
A082.	All	Infectious diarrhoea
A0820	All	Dysenteric diarrhoea
A0821	All	Epidemic diarrhoea
A082z	All	Infectious diarrhoea NOS
A083.	All	Diarrhoea of presumed infectious origin
A08z.	All	Ill defined gastrointestinal tract infections NOS
A0y..	All	Other specified infectious diseases of intestinal tract
A0z..	All	Intestinal tract infectious disease NOS
A3Ay2	All	Clostridium difficile infection
A78y1	All	Epidemic vomiting syndrome
Ayu00	All	[X]Cholera, unspecified
Ayu04	All	[X]Other shigellosis
Ayu05	All	[X]Shigellosis, unspecified
Ayu07	All	[X]Bacterial intestinal infection, unspecified
Ayu0F	All	[X]Viral intestinal infection, unspecified
Ayu0H	All	[X]Diarrhoea and gastroenteritis of presumed infectious origin
J43..	All	Other non-infective inflammatory gastroenteritis and colitis
J43z.	All	Other non-infective gastroenteritis and colitis NOS

Read CTV3 Code	Term ID	Description
19G..	All	NULL
1J8..	All	NULL
A0...	All	(Intestinal infectious diseases) or (food poisoning [& (bacterial)]) or (infective vomiting)
A00..	All	(Cholera) or (Vibrio cholerae)
A000.	All	Cholera - Vibrio cholerae
A001.	All	Cholera - Vibrio cholerae O1 El Tor biotype
A00z.	All	Cholera NOS
A01..	All	Typhoid and paratyphoid fevers
A010.	All	Fever: [typhoid] or [enteric]
A011.	All	Paratyphoid A
A012.	All	Paratyphoid B
A013.	All	Paratyphoid C
A01z.	All	Paratyphoid fever NOS
A02..	All	Other salmonella infections
A020.	All	Salmonellosis (& [gastroenteritis] or [food poisoning])
A021.	All	Salmonella septicaemia
A022.	All	Localised salmonella infection
A0220	All	Local salmonella infection unspecified
A0221	All	NULL
A0222	All	Salmonella pneumonia
A0223	All	Salmonella arthritis
A0224	All	Salmonella osteomyelitis
A022z	All	Other local salmonella infection
A023.	All	NULL
A02y.	All	Other specified salmonella infection
A02z.	All	Salmonella infection NOS
A03..	All	Shigellosis
A030.	All	(Shigella dysenteriae - group A) or (bacillary dysentery)
A031.	All	Shigella flexneri (group B)
A032.	All	Shigella boydii (group C)
A033.	All	Shigella sonnei: [group D] or [bacillary dysentery]
A03y.	All	Other specified shigella infection
A03z.	All	Shigellosis NOS
A04..	All	Other bacterial food poisoning
A040.	All	Staphylococcal food poisoning
A041.	All	NULL
A042.	All	Clostridium perfringens food poisoning
A043.	All	Other Clostridia causing food poisoning
A044.	All	Vibrio parahaemolyticus food poisoning
A04y.	All	Other specified bacterial food poisoning
A04y0	All	NULL
A04z.	All	Food poisoning NOS
A05..	All	Amoebiasis

A050.	All	Acute amoebic dysentery
A051.	All	Chronic intestinal amoebiasis
A052.	All	Amoebic nondysenteric colitis
A053.	All	Amoebic liver abscess
A054.	All	Amoebic lung abscess
A055.	All	Amoebic brain abscess
A056.	All	Amoebic ulcer of skin
A05y.	All	Amoebic infection of other sites
A05y0	All	Amoebic appendicitis
A05y1	All	Amoebic balanitis
A05y2	All	Amoeboma
A05yz	All	Amoebic infection of other sites NOS
A05z.	All	Amoebiasis NOS
A06..	All	Other protozoal intestinal diseases
A060.	All	Balantidiasis
A061.	All	Giardiasis: [lambliasis] or [colitis]
A062.	All	Coccidiosis (& [intestinal])
A063.	All	Trichomonas hominis infection
A064.	All	NULL
A06y.	All	Other specified protozoal intestinal diseases
A06z.	All	Protozoal intestinal diseases NOS
A07..	All	Intestinal infection due to other organisms
A070.	All	Escherichia coli gastrointestinal tract infection
A0700	All	NULL
A0701	All	NULL
A0702	All	NULL
A0703	All	NULL
A071.	All	Arizona paracolon gastrointestinal tract infection
A072.	All	Aerobacter aerogenes gastrointestinal tract infection
A073.	All	Proteus gastrointestinal tract infection
A0730	All	Proteus mirabilis gastrointestinal tract infection
A0731	All	Morganella morganii gastrointestinal tract infection
A073z	All	Proteus gastrointestinal tract infection NOS
A074.	All	Other specified gastrointestinal tract bacterial infection
A0740	All	Staphylococcal: [GIT infection] or [diarrhoea] or [toxin diarrhoea]
A0741	All	Pseudomonas: [GIT infection] or [pyocyanea diarrhoea]
A0743	All	(Campylobacter GIT infection (& [diarrhoea] or [enteritis]) or (helicobacter gastritis)
A0744	All	NULL
A0745	All	NULL
A074y	All	Other specified other gastrointestinal infection
A074z	All	Other specified gastrointestinal tract infections NOS
A075.	All	Unspecified bacterial enteritis

A076.	All	(Specified virus enteritis) or (viral: [diarrhoea] or [vomiting])
A0760	All	Enteritis due to adenovirus
A0761	All	Enteritis due to enterovirus
A0762	All	Enteritis due to rotavirus
A0763	All	NULL
A076z	All	Enteritis due to specified virus NOS
A07y.	All	Gastrointestinal tract infection due to specified organism NEC
A07y0	All	Viral gastroenteritis
A07y1	All	NULL
A07z.	All	Gastrointestinal tract infection due to specified organism NOS
A08..	All	(Ill-defined GIT infections) or (gastric flu)
A080.	All	Infectious colitis, enteritis and gastroenteritis
A0801	All	Infective colitis
A0802	All	Infective enteritis
A0803	All	Infectious gastroenteritis
A0804	All	Catarrhal dysentery
A0805	All	Haemorrhagic dysentery
A080z	All	Infectious colitis, enteritis and gastroenteritis NOS
A081.	All	Colitis and enteritis (& [gastroenteritis]) presumed infectious
A0810	All	Colitis - presumed infectious origin
A0811	All	Enteritis - presumed infectious origin
A0812	All	Gastroenteritis - presumed infectious origin
A081z	All	Colitis, enteritis and gastroenteritis presumed infectious origin NOS
A082.	All	Diarrhoea: [infectious] or [travellers]
A0820	All	Dysenteric diarrhoea
A0821	All	(Epidemic diarrhoea) or (viral gastroenteritis)
A082z	All	Infectious diarrhoea NOS
A083.	All	(Infectious diarrhoea: [presumed] or [? & vomiting]) or (infantile gastroenteritis)
A08z.	All	Ill-defined gastrointestinal tract infections NOS
A0y..	All	Other specified infectious diseases of intestinal tract
A0z..	All	Intestinal tract infectious disease NOS
A3Ay2	All	Clostridium difficile infection
A78y1	All	Epidemic vomiting syndrome
Ayu00	All	[X]Cholera, unspecified
Ayu04	All	[X]Other shigellosis
Ayu05	All	[X]Shigellosis, unspecified
Ayu07	All	[X]Bacterial intestinal infection, unspecified
Ayu0F	All	[X]Viral intestinal infection, unspecified
Ayu0H	All	[X]Diarrhoea and gastroenteritis of presumed infectious origin

H24y6	All	Typhoid pneumonia
J43..	All	(Gastroenteriti) or (enterocolitis) or (other non-infective inflammatory gastroenteritis and colitis)
J43z.	All	(Chronic diarrhoea) or (other non-infective gastroenteritis and colitis NOS)
X301R	All	Helicobacter gastritis
X303g	All	Colitis,enteritis ? infectious
X303I	All	Amoebic colitis
X303n	All	Fulminant amoebic colitis
X303q	All	Cytomegaloviral colitis
X30Bc	All	Prototheca diarrhoea
X30Bd	All	Food poisoning
X30BN	All	Gastroenteritis
X30BP	All	Vomiting - infective
X30BR	All	Adenoviral gastroenteritis
X30BS	All	Rotavirus gastroenteritis
X30BT	All	Norwalk virus gastroenteritis
X30BU	All	Small round structured virus gastroenteritis
X30BX	All	Dysentery
X70Ft	All	Infantile gastroenteritis
X70Fv	All	Bacterial food poisoning
X70Fw	All	Bacillus cereus food poisoning
X70Ge	All	Asymptomatic amoebic infection
X70Gf	All	Symptomatic non-invasive amoebic infection
X70Gg	All	Amoebic toxic megacolon
X70Gi	All	Amoebic perianal ulceration
X70GJ	All	Cholera - Vibrio cholerae O1 Classical biotype
X70GK	All	Cholera - non-O1 group vibrio
X70GL	All	Cholera - O139 group Vibrio cholerae
X70GN	All	Enterotoxigenic Escherichia coli gastrointestinal tract infection
X70GO	All	Travellers' diarrhoea
X70Gp	All	Cryptosporidiosis
X70GP	All	Enteropathogenic Escherichia coli gastrointestinal tract infection
X70GQ	All	Verotoxigenic Escherichia coli gastrointestinal tract infection
X70GR	All	Enteroinvasive Escherichia coli gastrointestinal tract infection
X70GS	All	Enteroadherent Escherichia coli gastrointestinal tract infection
X70GZ	All	Yersinia enterocolitis
X73Mv	All	Vibrio cholerae
Xa01t	All	Recurrent salmonella septicaemia
Xa2Vc	All	Astrovirus gastroenteritis
Xa2Vd	All	Calicivirus gastroenteritis

Xa3dy	All	Specific gastrointestinal infectious disease
Xa8ES	All	Acute infective gastroenteritis
Xa8I7	All	Salmonella food poisoning
Xa97W	All	Cholera - O1 group Vibrio cholerae
Xa97X	All	Staphylococcus aureus food poisoning
XaB5z	All	Enterocolitis
XaBE5	All	Helicobacter pylori gastrointestinal tract infection
XaBLu	All	Infantile viral gastroenteritis
XaDbT	All	Fungal gastroenteritis
XalnX	All	Suspected food poisoning
XaREr	All	Enteritis due to norovirus
XaYaf	All	Sepsis due to Salmonella
XE0aj	All	Other non-infective inflammatory gastroenteritis and colitis
XE0an	All	Other non-infective gastroenteritis and colitis NOS
XE0Qc	All	Cholera
XE0Qd	All	Typhoid fever
XE0Qe	All	Salmonella gastroenteritis
XE0Qf	All	Shigella dysenteriae (group A)
XE0Qg	All	Shigella sonnei (group D)
XE0Qi	All	Intestinal coccidiosis
XE0Qj	All	Staphylococcal gastrointestinal tract infection
XE0Qk	All	Pseudomonas gastrointestinal tract infection
XE0Ql	All	Campylobacter gastrointestinal tract infection
XE0Qm	All	Enteritis due to specified virus
XE0Qn	All	Ill-defined intestinal tract infections
XE0Qo	All	Colitis, enteritis and gastroenteritis presumed infectious
XE0Qp	All	Epidemic diarrhoea
XE0Qq	All	Diarrhoea of presumed infectious origin
XE0Sm	All	(Intestinal infectious diseases) or (unspecified enteritis)
XE0Ss	All	(Bacillary dysentery) or (shigellosis)
XE0Su	All	Giardiasis (& [colitis])
XE0Sw	All	(OS GIT infections) or (botulism) or (Campylobacter enteritis)
XE0Sy	All	Viral: [ill-defined GIT infections (& diarrhoea)] or [gastroenteritis]
XE0T0	All	(Gastroenteritis (& [viral NOS])) or (vomiting: [viral] or [& diarrhoea infection]) or (gastric flu)
XE0T2	All	Infectious: [intestinal disease NOS] or [diarrhoea NOS]
XM0pJ	All	Bacterial gastroenteritis
XM0pK	All	Bacillary dysentery

Supplementary table S5.10. The case definitions for included Herpes simplex.

Herpes simplex		
Read V2 Code	Term ID	Description
A54..	All	Herpes simplex
A540.	All	Eczema herpeticum - Kaposi's varicelliform eruption
A541.	All	Genital herpes simplex
A5410	All	Genital herpes unspecified
A5411	All	Herpetic vulvovaginitis
A5412	All	Herpetic ulceration of vulva
A5413	All	Herpetic infection of penis
A5414	All	Herpesviral infection of perianal skin and rectum
A5415	All	Anogenital herpesviral infection
A5416	All	Genital herpes simplex type 1
A5417	All	Genital herpes simplex type 2
A5418	All	Recurrent genital herpes simplex type 1
A5419	All	Recurrent genital herpes simplex type 2
A541z	All	Genital herpes simplex NOS
A542.	All	Herpetic gingivostomatitis
A543.	All	Herpetic meningoencephalitis
A544.	All	Ophthalmic herpes simplex
A5440	All	Unspecified ophthalmic herpes
A5441	All	Herpes simplex eyelid dermatitis
A5442	All	Herpes simplex dendritic keratitis
A5443	All	Herpes simplex disciform keratitis
A5444	All	Herpes simplex iridocyclitis
A5445	All	Herpes simplex ophthalmicus
A544z	All	Ophthalmic herpes simplex NOS
A545.	All	Herpes simplex septicaemia
A546.	All	Herpes simplex whitlow
A548.	All	[X] Herpes labialis
A54x.	All	Herpes simplex with other specified complication
A54x0	All	Visceral herpes simplex
A54x1	All	Herpes simplex meningitis
A54x2	All	Herpes simplex otitis externa
A54x3	All	Herpesviral vesicular dermatitis
A54x4	All	Herpes simplex pneumonia
A54xz	All	Herpes simplex with other specified complication NOS
A54y.	All	Herpes simplex with unspecified complication
A54z.	All	Herpes simplex no complication NOS
Read CTV3 Code	Term ID	Description
A54..	All	(Herpes simplex [& viral infection]) or (scumpox)
A540.	All	Eczema herpeticum
A541.	All	Genital herpes
A5410	All	Genital herpes unspecified (& [simplex group])

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4	A5411	All	Herpetic vulvovaginitis
5	A5412	All	Herpetic ulceration of vulva
6	A5413	All	Herpetic infection of penis
7	A5414	All	Herpesviral infection of perianal skin and rectum
8	A5415	All	Anogenital herpesviral infection
9	A5416	All	NULL
10	A5417	All	NULL
11	A5418	All	NULL
12	A5419	All	NULL
13	A541z	All	Genital herpes simplex NOS
14	A542.	All	Herpetic: [gingivostomatitis] or [cold sore] or [stomatitis]
15	A543.	All	(Herpetic meningoencephalitis) or (Simian B disease)
16	A544.	All	Ophthalmic herpes simplex
17	A5440	All	Unspecified ophthalmic herpes (& [simplex group])
18	A5441	All	Herpes simplex eyelid dermatitis
19	A5442	All	Herpes simplex dendritic keratitis
20	A5443	All	Herpes simplex disciform keratitis
21	A5444	All	Herpes simplex iridocyclitis
22	A5445	All	NULL
23	A544z	All	Ophthalmic herpes simplex NOS
24	A545.	All	Herpes simplex septicaemia
25	A546.	All	Herpes simplex whitlow
26	A548.	All	NULL
27	A54x.	All	Herpes simplex with other specified complication
28	A54x0	All	Visceral herpes simplex
29	A54x1	All	NULL
30	A54x2	All	NULL
31	A54x3	All	Herpesviral vesicular dermatitis
32	A54x4	All	NULL
33	A54xz	All	Herpes simplex with other specified complication NOS
34	A54y.	All	Herpes simplex with unspecified complication
35	A54z.	All	Herpes: [simplex, no complication NOS] or [labialis]
36	Ayu4G	All	[X]Anogenital herpes viral infection, unspecified
37	F5015	All	Herpes simplex otitis externa
38	X100g	All	Herpes simplex pneumonia
39	X70Ja	All	Herpes simiae infection
40	X70JU	All	Primary anogenital herpes
41	X70JV	All	Recurrent anogenital herpes
42	XaPEC	All	Genital herpes simplex type 1 infection
43	XaPED	All	Genital herpes simplex type 2 infection
44	XaPER	All	Recurrent genital herpes simplex type 1 infection
45	XaPES	All	Recurrent genital herpes simplex type 2 infection
46	XEORB	All	Herpes simplex infection
47	XEORC	All	Herpetic gingivostomatitis
48	XEORD	All	Herpes simplex encephalitis
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XE0RE	All	Herpes simplex no complication NOS
XE0TO	All	(Herpes simplex (& [type 1] or [type 2])) or (scrumpox)
XE2vG	All	Genital herpes unspecified
XE2vH	All	Unspecified ophthalmic herpes
XM02r	All	Herpes labialis

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Supplementary table S5.11. The case definitions for included Herpes zoster.

Herpes zoster		
Read V2 Code	Term ID	Description
A53..	All	Herpes zoster
A530.	All	Herpes zoster with meningitis
A531.	All	Herpes zoster with other central nervous system complication
A5310	All	Herpes zoster with other central nervous system complications
A5311	All	Geniculate herpes zoster
A5312	All	Postherpetic trigeminal neuralgia
A5313	All	Postherpetic polyneuropathy
A5314	All	Zoster encephalitis
A5315	All	Postzoster neuralgia
A531z	All	Herpes zoster with other central nervous system complication NOS
A532.	All	Herpes zoster with ophthalmic complication
A5320	All	Herpes zoster with dermatitis of eyelid
A5321	All	Herpes zoster with keratoconjunctivitis
A5322	All	Herpes zoster iridocyclitis
A5323	All	Ophthalmic herpes zoster infection
A5324	All	Herpes zoster ophthalmicus
A532z	All	Herpes zoster with other ophthalmic complication
A53x.	All	Herpes zoster with other specified complication
A53x0	All	Herpes zoster otitis externa
A53x1	All	Disseminated zoster
A53xz	All	Herpes zoster with other specified complication NOS
A53y.	All	Herpes zoster with unspecified complication
A53z.	All	Herpes zoster NOS
Read CTV3 Code	Term ID	Description
A53..	All	Herpes zoster [organism] or [infection - shingles]
A530.	All	NULL
A531.	All	(Herpes zoster with other CNS complication) or (postherpetic neuralgia)
A5310	All	NULL
A5311	All	(Geniculate herpes zoster) or (Ramsey Hunt syndrome)
A5312	All	NULL
A5313	All	Post-herpetic polyneuropathy
A5314	All	NULL
A5315	All	NULL
A531z	All	Herpes zoster with other central nervous system complication NOS
A532.	All	Herpes zoster with ophthalmic complication
A5320	All	Herpes zoster with dermatitis of eyelid
A5321	All	Herpes zoster with keratoconjunctivitis
A5322	All	Herpes zoster iridocyclitis
A5323	All	Ophthalmic herpes zoster infection
A5324	All	NULL

A53z	All	Herpes zoster with other ophthalmic complication
A53x.	All	Herpes zoster with other specified complication
A53x0	All	NULL
A53x1	All	Disseminated zoster
A53xz	All	Herpes zoster with other specified complication NOS
A53y.	All	Herpes zoster with unspecified complication
A53z.	All	Herpes zoster NOS

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Supplementary table S5.12. The case definitions for included Meningitis.

Herpes zoster		
Read V2 Code	Term ID	Description
F00..	All	Bacterial meningitis
F000.	All	Haemophilus meningitis
F001.	All	Pneumococcal meningitis
F002.	All	Streptococcal meningitis
F003.	All	Staphylococcal meningitis
F004.	All	Meningitis - tuberculous
F005.	All	Meningitis - meningococcal
F007.	All	Meningitis in other bacterial disease classified elsewhere
F0070	All	Meningitis due to gonococcus
F0071	All	Meningitis due to listeriosis
F0072	All	Meningitis due to neurosyphilis
F0073	All	Meningitis due to salmonella
F0074	All	Meningitis due to congenital syphilis
F0075	All	Meningitis due to secondary syphilis
F0076	All	Meningitis due to typhoid fever
F0077	All	Meningitis due to actinomycosis
F0078	All	Meningitis due to pertussis
F007z	All	Unspecified meningitis in bacterial disease EC
F00y.	All	Other specified bacterial meningitis
F00y0	All	Meningitis due to aerobacter aerogenes
F00y1	All	Meningitis due to bacillus pyocyaneus
F00y2	All	Meningitis due to escherichia coli
F00y3	All	Meningitis due to Friedlander bacillus
F00y4	All	Meningitis due to klebsiella pneumoniae
F00y5	All	Meningitis due to proteus morgani
F00y6	All	Meningitis due to pseudomonas
F00yz	All	Other specified bacterial meningitis NOS
F00z.	All	Bacterial meningitis NOS
F01..	All	Meningitis due to other organisms
F010.	All	Meningitis due to fungal organisms
F0100	All	Meningitis due to cryptococcus
F010z	All	Other fungal meningitis
F011.	All	Meningitis due to viral organisms EC
F0110	All	Meningitis due to coxsackie virus
F0111	All	Meningitis due to ECHO virus
F0112	All	Meningitis due to herpes zoster virus
F0113	All	Meningitis due to herpes simplex virus
F0114	All	Meningitis due to mumps virus
F0115	All	Meningitis due to lymphocytic choriomeningitis virus
F0116	All	Meningitis due to adenovirus
F0117	All	Varicella meningitis

F011y	All	Other viral meningitis
F011z	All	Meningitis - viral NOS
F012.	All	Meningitis due to trypanosomiasis
F013.	All	Meningitis due to sarcoidosis
F01y.	All	Other non-bacterial meningitis
F01y0	All	Meningitis due to leptospira
F01yz	All	Other non-bacterial meningitis NOS
F01z.	All	Meningitis due to organism NOS
F02..	All	Meningitis of unspecified cause
F020.	All	Nonpyogenic meningitis
F02z.	All	Unspecified meningitis
F03X.	All	Bacterial meningoenkephalitis and meningomyelitis, not elsewhere classified
A543.	00	Herpetic meningoenkephalitis
AD00.	00	Toxoplasma meningoenkephalitis
A1303	00	Tuberculous meningoenkephalitis
A1302	00	Tuberculous leptomeningitis
Read CTV3 Code	Term ID	Description
X000H	All	Meningitis
XaDmS	All	Infective meningitis
F00..	All	Bacterial meningitis
F0077	All	Actinomycotic meningitis
F00y0	All	Aerobacter meningitis
F00y2	All	Escherichia coli meningitis
F0070	All	Gonococcal meningitis
F000.	All	Haemophilus meningitis
F00y4	All	Klebsiella meningitis
F00y3	All	Meningitis due to Friedlander bacillus
F0071	All	Listeria meningitis
X000R	All	Meningitis in Lyme disease
F005.	All	Meningococcal meningitis
F0078	All	Meningitis due to pertussis
A206.	All	Plague meningitis
F001.	All	Pneumococcal meningitis
Xa9B4	All	Proteus meningitis
F00y6	All	Pseudomonas meningitis
F00y1	All	Meningitis due to bacillus pyocyaneus
F0073	All	Salmonella meningitis
F0076	All	Meningitis due to typhoid fever
F003.	All	Staphylococcal meningitis
X000P	All	Staphylococcus aureus meningitis
X000Q	All	Staphylococcus epidermidis meningitis
F002.	All	Streptococcal meningitis
Xa7pz	All	Syphilitic meningitis
F0074	All	Congenital syphilitic meningitis

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3			
4	X000T	All	Late congenital syphilitic meningitis
5	F0075	All	Secondary syphilitic meningitis
6	A9180	All	Acute secondary syphilitic meningitis
7	F004.	All	Tuberculous meningitis
8			
9	A1300	All	Tuberculosis of cerebral meninges
10	A1301	All	Tuberculosis of spinal meninges
11	A1302	All	Tuberculous leptomeningitis
12	A130z	All	Tuberculous meningitis NOS
13	AA0y0	All	Leptospiral meningitis
14	F007.	All	Meningitis in other bacterial disease classified elsewhere
15	F0072	All	Meningitis due to neurosyphilis
16	F007z	All	Unspecified meningitis in bacterial disease EC
17	F00y.	All	Other specified bacterial meningitis
18	F00yz	All	Other specified bacterial meningitis NOS
19	F00y5	All	Morganella morganii meningitis
20	F00z.	All	Bacterial meningitis NOS
21	Fyu00	All	[X]Other bacterial meningitis
22	Xa9B5	All	Viral meningitis
23	A4z1.	All	Adenoviral meningitis
24	A4z0.	All	Lymphocytic choriomeningitis
25	F0114	All	Mumps meningitis
26	X000M	All	Postmeasles meningitis
27	F0112	All	Meningitis due to herpes zoster virus
28	F0113	All	Herpes simplex meningitis
29	A42..	All	Enteroviral meningitis
30	F0110	All	Coxsackie viral meningitis
31	X000J	All	Coxsackie A viral meningitis
32	X000K	All	Coxsackie B viral meningitis
33	F0111	All	Echovirus meningitis
34	X000L	All	Chronic echovirus meningoencephalitis
35	A42y.	All	Other specified viral meningitis
36	Ayu8C	All	[X]Other viral meningitis
37	Ayu8D	All	[X]Viral meningitis, unspecified
38	F011.	All	Meningitis due to viral organisms EC
39	F011y	All	Other viral meningitis
40	Fyu01	All	[X]Meningitis in viral diseases classified elsewhere
41	XE0R7	All	Viral meningitis NOS
42	XE15A	All	Meningitis - viral NOS
43	F010.	All	Fungal meningitis
44	AB2y2	All	Candidal meningitis
45	F0100	All	Cryptococcal meningitis
46	AB32.	All	Coccidioidal meningitis
47	F010z	All	Other fungal meningitis
48	Fyu02	All	[X]Meningitis in mycoses classified elsewhere
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X000V	All	Parasitic meningitis
F012.	All	Meningitis due to trypanosomiasis
F01..	All	Meningitis due to other organisms
F01y.	All	Other non-bacterial meningitis
F01yz	All	Other non-bacterial meningitis NOS
F01z.	All	Meningitis due to organism NOS
Fyu03	All	[X]Meningitis in other specified infectious and parasitic diseases classified elsewhere
F02..	All	Meningitis of unspecified cause
F020.	All	Non-pyogenic meningitis
F02z.	All	Unspecified meningitis
Fyu04	All	[X]Meningitis due to other specified causes
X001F	All	Listeria meningoencephalitis
XE0RD	All	Herpetic meningoencephalitis
F0334	Y71kx	Toxoplasma meningoencephalitis
A1303	All	Tuberculous meningoencephalitis
X001N	Y00Ck	PAM - Primary amoebic meningoencephalitis
Fyu05	YMACn	[X]Bacterial meningoencephalitis and meningomyelitis, not elsewhere classified

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The epidemiology, management, and the associated burden of mental health illness, atopic and autoimmune conditions, and common infections in alopecia areata: Protocol for an observational study series

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The epidemiology, management, and the associated burden of mental health illness, atopic and autoimmune conditions, and common infections in alopecia areata: Protocol for an observational study series

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Abstract

Introduction:

Alopecia Areata (AA) is a common cause of immune-mediated non-scarring hair loss. Links between AA and common mental health, autoimmune and atopic conditions, and common infections have previously been described but remain incompletely elucidated and contemporary descriptions of the epidemiology of AA in the UK are lacking.

Methods and analysis:

Retrospective study series using a large population-based cohort (5.2 million) from the Oxford-Royal College of General Practitioners (RCGP) Research and Surveillance Centre (RSC) database, exploring four themes: AA epidemiology, mental health comorbidities, autoimmune/atopic associations and common infections.

In the epidemiology theme, we will describe the incidence and point prevalence of AA overall and by age, sex, and sociodemographic factors. Healthcare utilisation (primary care visits and secondary care referrals) and treatments for AA will also be assessed. In the mental health theme, we will explore the prevalence and incidence of mental-health conditions (anxiety, depressive episodes, recurrent depressive disorder, adjustment disorder, agoraphobia, self-harm, and parasuicide) in people with AA compared with matched controls. We will also explore mental health treatment patterns (medication and psychological interventions), time off work and unemployment rates. Within the

1
2
3 autoimmune/atopic associations theme, we will examine the prevalence of atopic
4
5 (atopic dermatitis, allergic rhinitis, asthma) and autoimmune conditions (Crohn's
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7 disease, ulcerative colitis, coeliac disease, type 1 diabetes, Hashimoto's thyroiditis,
8
9 Grave's disease, rheumatoid arthritis, psoriatic arthritis, ankylosing spondylitis,
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11 systemic lupus erythematosus, polymyalgia rheumatica, Sjögren's syndrome,
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13 psoriasis, vitiligo, multiple sclerosis, pernicious anaemia) in people with AA
14
15 compared with matched controls. We will also estimate the incidence of new onset
16
17 atopic and autoimmune conditions after AA diagnosis. Within the common
18
19 infections theme, we will examine the incidence of common infections (respiratory
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21 tract Infection, pneumonia, acute bronchitis, influenza, skin infection, urinary tract
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23 infection, genital infections, gastrointestinal infection, herpes simplex, herpes
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25 zoster, meningitis, COVID-19) in people with AA compared with matched controls.

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31 **Ethics and dissemination:**

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33 The Health Research Authority decision tool classed this a study of usual practice,
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35 ethics approval was not required. Study approval was granted by the RCGP RSC
36
37 Study Approval Committee. Results will be disseminated through peer reviewed
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39 publications.
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45 **Study Registration:** ClinicalTrials.gov observational study identifier

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Strengths and limitations of this study

- We will use a nationally representative primary care database of over 5.2 million people to explore the epidemiology of alopecia areata (AA), as well as associations of AA with mental health conditions, autoimmune and atopic conditions, and common infections.
- As national guidelines recommend initial assessment and management of AA is undertaken in primary care, this study will provide an accurate contemporary analysis of AA epidemiology in England in both children and adults.
- The Oxford-RCGP-RSC primary care dataset has a high level of completeness on sociodemographic and geographic data and therefore enables an assessment of variation in the incidence and prevalence of AA across England.
- Oxford-RCGP-RSC is the primary infectious disease sentinel network for the UK; the common infections to be explored are all regularly monitored conditions within the network.
- A limitation of the study is that a validated case definition of AA is not available for primary care databases; this will be mitigated by additional analysis to explore the sensitivity of findings when non-specific alopecia diagnostic codes (e.g. unspecified alopecia) are included.

Key words:

Alopecia areata, epidemiology, incidence, prevalence, common mental health conditions, depression, anxiety, autoimmune disease, atopic conditions, study protocol, common infections.

Introduction

Alopecia areata (AA) is a common cause of immune-mediated, non-scarring hair loss.(1) Clinical presentations of AA are heterogeneous, ranging from well-demarcated patches of hair loss on the scalp to total loss of hair on the scalp (*alopecia areata totalis*) or entire scalp and body (*alopecia areata universalis*).(2) Active AA is estimated to affect approximately 0.1-0.2%(2, 3) of the population worldwide, with a lifetime risk of 1.0-2.1%.(4-6)

Following the initial episode, the majority of those with limited patchy AA will experience spontaneous remission, but over 80% will have subsequent relapses.(7) Spontaneous remission has been reported to occur in less than 10% of those with extensive AA.(7) A number of treatment options can induce hair growth in people with AA, but none have been shown to have a durable impact on remission.(8)

AA has been associated with a number of autoimmune conditions, supporting the theory of an underlying autoimmune aetiology.(9) Atopic conditions and mental health disorders have also been demonstrated to be more common in people with AA,(9-11) although the temporal relationship between psychiatric conditions and AA remains poorly researched.(12) The association between AA and common infections is not well studied.

This study series, using a large contemporary population-based sample aims to explore and describe many important elements of AA over four key areas: i) the

1
2
3 current epidemiology of AA; ii) the prevalence and incidence of psychiatric co-
4 morbidity in people with AA; iii) the prevalence and incidence of autoimmune
5 and atopic conditions in people with AA; iv) the incidence of common infections in
6 people with AA.
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15 Current knowledge

16 Epidemiology

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19 Population studies in the USA using the Rochester Epidemiology Project database
20 estimate the lifetime risk of AA to be 2.1%.⁽⁴⁾ The database contained information
21 from all patients registered with a healthcare provider in Olmsted County,
22 Minnesota from 1990-2009. Previous studies using this database from 1971-1974
23 estimated the overall prevalence of AA to be 0.1-0.2%,⁽¹³⁾ with no published
24 studies reporting prevalence estimates since this. Other epidemiological studies
25 have assessed the incidence of AA in patients referred to dermatology services.
26
27 Clinic-based studies from around the world have estimated the incidence of AA to
28 be in the region of 0.57-3.8%.⁽¹⁴⁻¹⁸⁾
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46 Worldwide, the majority of studies on AA have not found a significant difference in
47 incidence between males and females.⁽⁵⁾ AA onset occurs before the age of 40 in
48 82-86% of cases.⁽⁵⁾ To date, there have been no large population-based studies of
49 AA epidemiology in UK populations.
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Mental Health Comorbidities

It is well-recognised by clinical experts in AA that the condition can have a profound psychological impact and a possible comorbid burden of mental health conditions. A recent USA cross-sectional database study comparing 5,605 patients with AA with matched controls found a higher prevalence of mental health diagnoses in the AA group (32.8% vs 20.0%).(19) In particular, higher rates of depression (OR 2.18, 95%CI 1.80-2.63), anxiety disorders (OR 2.46, 95%CI 1.91-3.16), attention-deficit disorders (OR 8.11, 95%CI 5.22-12.59), adjustment disorders (OR 4.80, 95%CI 2.58-8.91) and obsessive compulsive disorders (OR 4.95, 95%CI 1.59-15.35) were observed when compared with controls.(19) These findings concur with previous work and a similar pattern is seen in other countries.(20-23)

Recently a British study identified a bi-directional positive association between major depressive disorder and AA.(24) In a sample of over 400,000 participants, major depressive disorder was seen to increase the risk of incident AA by 90% [HR 1.90, 95%CI 1.67-2.15] and AA was found to increase the risk of incident major depressive disorder by 34% [HR 1.34, 95%CI 1.23-1.46].(24) The association of other common mental health conditions with AA however was not assessed.

Autoimmune and atopic comorbidities

A central theory in AA pathogenesis is that it is an autoimmune phenomenon resulting from a disruption of hair follicle 'immune privilege', where numerous

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3 immunological mechanisms fail to prevent cytotoxic immune attack on cells and
4 antigens present at that site.(25)
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10 A number of studies have reported autoimmune conditions to occur more
11 frequently in those with AA than in the general population, however results are
12 conflicting and studies have been limited by potential recruiting, recall and
13 reporting biases.(26) A Taiwanese retrospective cohort study found individuals
14 with AA to have an overall increased risk of developing an autoimmune condition
15 when compared with matched controls (HR 1.86, 95%CI 1.32-2.63). In particular,
16 greater risks of incident systemic lupus erythematosus (SLE) (HR 5.02; 95%CI
17 2.08-12.51), psoriasis (HR 2.01; 95%CI 1.06-3.83) and rheumatoid arthritis (RA)
18 (HR 1.79; 95%CI 1.07-3.00) were observed.(27) There was no relationship
19 between AA and Hashimoto's thyroiditis or type 1 diabetes (T1DM). A recent
20 systematic review and meta-analysis found AA to be significantly associated with
21 Graves' Disease (OR 2.07, 95%CI 1.80-2.38) and Hashimoto's Thyroiditis (OR 2.15;
22 95%CI 1.71-2.72) but not with SLE, RA, Psoriasis or T1DM.(9)
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43 There has also been interest in the prevalence of co-morbid atopy in patients with
44 AA. The prevalence of atopy in patients with AA has been reported to be in the
45 range of 11-38.2%(5) representing cohorts from the USA, India and Singapore .(11,
46 14, 28, 29) A large meta-analysis found patients with AA had higher odds of having
47 atopic dermatitis (OR 2.36; 95%CI 1.80-3.09) or allergic rhinitis (OR 1.33;95%CI
48 1.19-1.47) when compared with controls.(9) It is not however surprising from a
49 pathogenesis perspective in terms of shared pathways of autoimmune
50 susceptibility; IL-13 loci have been associated with autoimmune and atopic
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3 conditions, and a genome-wide association study established that IL-13 is also
4 susceptible loci for AA. (30)
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10 Common infections

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13 It has been hypothesized that infections may act as triggers for AA; with particular
14 interest in *Helicobacter pylori*, cytomegalovirus, Epstein-Barr virus, hepatitis B
15 virus, hepatitis C virus, and human immunodeficiency virus but others have also
16 been suggested.(9, 31-38) Some case reports have suggested improvement or
17 resolution of AA with treatment of the associated infection.(33, 39). However, early
18 small-scale studies have failed to find convincing evidence to support
19 associations.(35, 36, 40)
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30 Multiple genetic loci have been identified to be both protective from infection but
31 increase the risk for autoimmune disease.(41) Examples include the HLA variants
32 HLA-DQ2 and HLA-DQ8 which confer protection against viral infections including
33 influenza but are associated with inflammatory bowel disease,(42, 43) and SH2B3
34 rs3184504*A gene variant protective against *Escherichia coli* infection but also
35 detrimental for inflammatory bowel disease.(44) These loci which, in the past have
36 conferred a genetic advantage, may still confer a reduced infection risk.(41) It is
37 currently unclear if the genetic predisposition for AA is caused by genetic factors
38 which also confer protection against any common infections. In other autoimmune
39 conditions infection risk is often increased as a result of the pathological changes
40 resulting from the condition itself, the effects of immune-modulatory treatment, or
41 through increased exposure to pathogens through healthcare contact.(45-51) An
42 understanding of the relative infection rates in people with AA compared to those
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3 without is of particular importance with the emergence of Janus kinase inhibitors
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5 as a potential treatment option.(52) Whilst this medication class can produce
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7 impressive hair regrowth results even in long-standing AA their use is associated
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9 with some increased infection risk; in particular, urinary tract infections, viral
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11 gastroenteritis fungal infections, and varicella zoster infection.(52)
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For peer review only

Aims and Objectives

We aim to perform a series of retrospective studies using a large population-based cohort in England, over a decade (1st January 2009 to 1st January 2019) exploring AA in four theme areas: epidemiology, mental health, autoimmune and atopic comorbidities and common infections.

Within the epidemiology theme, our initial objective is to provide a complete description of the incidence and prevalence of AA in England. We will explore the influence of socio-demographic and geographic factors on disease incidence and describe the current service utilisation and management patterns in AA during the year after diagnosis.

Within the mental health theme, we will explore the disease burden of common mental health conditions in people with AA compared with matched controls. We will calculate the prevalence of disease at AA diagnosis, the incidence of disease in the first two years after diagnosis and the influence of socio-demographic factors on the prevalence of common mental health conditions in AA. We will describe the mental health treatment burden in people (medication and psychological service use) with AA and depression and anxiety. We will also explore potential associations between AA and both time off work and unemployment.

Within the autoimmune and atopic comorbidities theme, we will examine the prevalence of atopic and autoimmune conditions at AA diagnosis, and the incidence

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3 of new onset atopic and autoimmune conditions in the first five years after
4 diagnosis in people with AA compared with matched controls.
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10 Within the common infections theme, we will examine the incidence of multiple
11 common infections in the first five years after diagnosis in people with AA
12 compared with matched controls.
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19 The primary and secondary objects of each study theme are formally described in
20 the Statistical Analysis Plan (Additional file 1).
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Methods and analysis

Data source

These studies will use routinely collected and collated data from the Oxford-Royal College of General Practitioners (RCGP) Research and Surveillance Centre (RSC) database to provide a broadly representative sample of the population of England. The RCGP RSC incorporates pseudonymised primary care records from over 200 GP practices distributed across England. Details of the cohort included in the database have been published previously.⁽⁵³⁾ At the current time, the database contains data from 2.6 million actively registered people and the historic records of up to 5.2 million people over the last 20 years.

The RCGP RSC database includes patient demographics, diagnoses, laboratory test results, primary care issued prescriptions and processes of care such as clinic visits and specialist referrals. These data are coded using the Read code system. UK general practice records provide several advantages for this study type; UK primary care is a registration-based system (a patient can only register with a single GP), records have been computerised since the 1990s, and pay-for-performance targets (introduced in 2004 through The Quality and Outcomes Framework; QOF) have resulted in consistent high-quality clinical data entry about chronic disease.^(54, 55) Studies in many chronic diseases such as atopic dermatitis, rheumatoid arthritis, diabetes, inflammatory bowel disease, and chronic obstructive pulmonary disease have been published using RCGP RSC data.^(51, 56-59) RCGP RSC practices get feedback on their data quality, with a particular

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3 emphasis on “episode typing” – designating cases first, new, or ongoing, which
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5 helps differentiate incidence from prevalence.(60)
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10 Study design

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14 Within RCGP RSC, people with and without AA will be identified using Read
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16 diagnostic codes. A range of study designs will be used across the studies and
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18 include; repeated cross-sectional design (epidemiology of AA), case-control design
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20 (the prevalence of common mental health conditions, atopic and autoimmune
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22 conditions, and common infections at AA diagnosis), and matched-cohort design
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24 (the incidence of common mental health conditions, atopic and autoimmune
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26 conditions, and common infections after AA diagnosis).
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33 Alopecia areata case detection

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36 We will identify cases of AA using specific diagnostic codes (Supplementary Table
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38 S1.1, Additional file 2). Confirmed AA will be defined as one or more AA code and
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40 no alternative diagnostic code in the subsequent 365 days (alternative diagnoses
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42 are defined in Supplementary Table S1.1, Additional file 2). Specificity of findings
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44 to this case definition will be evaluated (see Sensitivity analysis and Supplementary
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46 Table S1.2, Additional file 2).
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Study 1: Epidemiology of alopecia areata

The incidence and lifetime prevalence of alopecia areata

We will describe the incidence and point prevalence of AA over 2009-2018 inclusive, by age group, sex, ethnicity, and socioeconomic status, and geographical region. Ethnicity will be categorised as follows based on UK census categories: White, Asian, Black African/Caribbean, Mixed, and Other.(61) Index of multiple deprivation (IMD) will be used as a measure of socioeconomic status.(62)

Service utilisation in people with alopecia areata

We will assess primary care visit frequency, up to one year, in people newly diagnosed with AA compared to matched controls without AA. Measures of healthcare management will also be assessed in people newly diagnosed with AA up to one year, comprising; secondary care dermatology referrals (Supplementary Table S1.3, Additional file 2) and primary care prescriptions for AA treatments (Supplementary Table S1.4, Additional file 2).

Study 2: Mental Health conditions in people with alopecia areata

We will assess the prevalence and incidence of three common mental conditions as defined by the International Statistical Classification of Diseases and Related Health Problems 10th Revision (ICD10) classification; depressive episodes (F32), recurrent depressive disorder (F33), and non-phobia related anxiety disorders (F41). These conditions have been chosen as they represent the most common mental health conditions presenting to primary care.(63) Conditions will be

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3 identified using algorithms validated in UK primary care. We selected the
4 algorithms to be used in the study to optimise the positive predictive value of case
5 identification. In brief, we will use a concurrent diagnosis and treatment code to
6 identify acute depression episodes and for recurrent depressive disorder either a
7 historical code for any depression and current treatment or a recurrent depressive
8 disorder specific diagnosis code (Supplementary Tables S2.1, S2.2 and S2.3,
9 Additional file 2). Anxiety disorder will be identified using a concurrent diagnosis
10 of an anxiety episode and treatment code (Supplementary Table S2.4, Additional
11 file 2).

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27 To assess prevalence, we will perform a case-control analysis to compare the
28 prevalence of mental health conditions between people newly diagnosed with AA
29 and controls. To assess incidence, we will perform a matched cohort analysis in the
30 subset of cases and controls free of the mental health conditions of interest at
31 baseline. In addition, we will examine the prevalence and incidence of other mental
32 health conditions; adjustment disorder, agoraphobia, self-harm, and
33 overdose/parasuicide attempts (Supplementary Tables S2.5–S2.9, Additional file
34 2).

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48 We will determine the treatment burden of mental health medications in AA
49 (selective serotonin reuptake inhibitors, serotonin and norepinephrine reuptake
50 inhibitors, tricyclic antidepressants, tetracyclic antidepressants, and monoamine
51 oxidase inhibitors, anxiolytic medications) and psychological intervention (referral
52 rates for counselling, secondary care psychiatrist referrals, including the referrals
53 to the clinical psychology services/specialists and UK Improving Access to
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3 Psychological Therapies (IAPT) program. (Supplementary Table S2.10, Additional
4 file 2)).
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8 We will also assess unemployment and time off work in people of working age (18-
9 64). Unemployment will be identified using codes relating to unemployment
10 recorded in the clinical record or the issuing of IB113 or ESA113 form
11 (Supplementary Table S3.1, Additional file 2). These forms are completed by GPs
12 when their patients are accessing incapacity benefits (historically) or employment
13 and support allowance (current) because of a disability or health condition
14 affecting their ability to work. Time off work will be assessed by reporting the rates
15 of issue of Med 3 (Statement of Fitness for Work) certification from primary care
16 (Supplementary Table S3.2, Additional file 2). These “fit notes” are required by
17 employers when employees have periods of absence from work for sickness lasting
18 longer than seven days.
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36 **Study 3: Autoimmune and atopic comorbidities in alopecia areata**

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39 We will assess the prevalence and incidence of autoimmune and atopic conditions
40 as listed in Table 1 and defined in Supplementary Tables S4, Additional file 2, in
41 people with AA. To assess prevalence, we will perform a case-control study to
42 compare the prevalence of these conditions between cases and controls. To assess
43 incidence, we will perform a matched cohort study to compare the incidence of new
44 autoimmune and atopic conditions in the same cases and controls after the point
45 of matching. Autoimmune and atopic conditions were included if prevalence has
46 been reported to be 0.3% or greater.^(9, 64-67) This cut-off was based on power
47 calculations suggesting this is minimum background prevalence required to detect
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3 a 2-fold difference in prevalence (Additional file 1). Excluded autoimmune
4 conditions due to low prevalence are Addison's disease, autoimmune haemolytic
5 anaemia, immune thrombocytopenic purpura, autoimmune hepatitis, systemic
6 sclerosis, myasthenia gravis, and systemic vasculitides.
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12 **Study 4: common infections in alopecia areata**

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15 We will assess the incidence of common infections in people with AA using a
16 matched cohort study to compare the incidence of common infections in cases and
17 controls. The common infections to be examined are listed in Table 2 and defined
18 in Supplementary Tables S5, Additional file 2.
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25 **Statistical methods**

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28 The full statistical analysis plan is provided in Additional file 1. Briefly, for Study 1,
29 AA prevalence will be calculated by dividing the number of AA cases by the total
30 number of eligible people in the study population. Point prevalence will be
31 reported for the cohort overall and stratified by sex and age. AA incidence will be
32 calculated by dividing the total number of new AA cases by the total person-years
33 of follow-up. Incidence rates will be stratified by calendar year, socio-demographic
34 factors (age group, sex, ethnicity, rural/urban classification and socioeconomic
35 status) and geographical region. Adjusted incidence rates will be estimated using
36 Poisson regression.
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52 Service utilisation (Study 1 and 2) will be evaluated by calculation of annual
53 primary care attendance rates, treatment rates (prescriptions per person per year),
54 and the total proportion of people with one or more referral for additional services
55 (dermatology review [Study 1], psychiatrist referral and counselling [Study 2]).
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5 For studies 1 (for comparison of primary care visit frequency only), 2 and 3,
6 matching will be performed as follows: control cohorts will be defined by matching
7 cases with people without a diagnosis of AA or other alopecia. The follow-up period
8 for each matched control will begin at the start of follow-up of their matched case.
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10 Each case will be nearest neighbour matched with four controls by age and sex
11 within GP practices. After matching, if there are substantial differences in
12 socioeconomic status between cases and controls, re-matching with IMD as an
13 additional matching criterion will be considered. Study 4 will use the same nearest
14 neighbour matching process but cases will be defined as people diagnosed with AA
15 on or before 1st January 2014, people who develop AA during follow up will be
16 excluded from the pool of available controls prior to matching.
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34 For Study 2, we will report the prevalence of mental health conditions by socio-
35 demographic subgroups in cases and controls. The burden of treatment for mental
36 health conditions will be estimated as the total proportion of people prescribed
37 each treatment within one year after the study start. The burden of sick days will
38 be estimated as the total proportion of people issued a Med 3 certificate. To assess
39 differences in incident mental health conditions in the two years after the study
40 start, we will use adjusted Cox regression stratified by case/control status. Study 3
41 (atopic and autoimmune conditions) will similarly compare baseline disease
42 prevalence in cases and controls, and compare incidence of new onset conditions
43 in the five years after the study start using adjusted Cox regression.
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3 Study 4 will compare infection incidence in cases and controls up to five years.
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5 Infection incidence rates will be estimated by dividing the number of incident
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7 common infections by total person-years of follow-up. Adjusted Poisson regression
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9 will be used to estimate the association between AA and rates of common infection.
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15 *Sensitivity analyses*

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18 To evaluate the specificity of any identified associations to our AA case definition,
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20 in sensitivity analysis we will extract alopecia recorded where the type has not
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22 been specified (Supplementary Table S1.1, Additional file 2). We will then assess
23
24 the characteristics of people with non-specific alopecia codes only (i.e. no prior or
25
26 subsequent codes specifying alopecia type) compared to the primary AA cohort. If
27
28 the characteristics are not markedly different, which would indicate the groups are
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30 clinically different and not comparable, we will evaluate major study outcomes in
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32 this non-specific AA cohort and compare results to those obtained for the primary
33
34 AA cohort. We will also evaluate whether stratifying analyses by alopecia extent is
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36 possible, dependent on how well this is recorded in primary care data
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38 (Supplementary Table S1.2, Additional file 2).
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46 In Study 4, we will use a Cox regression to estimate time to first infection. We will
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48 also compare the results of the study outcomes when 1) people who develop AA
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50 during the follow up are included as cases and 2) when we perform matching using
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52 the time of AA diagnosis and follow for up to five years after diagnosis (or matched
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54 date for controls).
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For peer review only

Discussion

Clinical Implications

Results derived from this study will be useful in monitoring trends in the incidence of AA in England and may identify factors that influence the disease distribution and treatment patterns. Furthermore, obtaining an accurate picture of the state of AA in the UK will help inform Health Needs Assessments and policy development.

A greater understanding of the prevalence of mental health conditions associated with AA and the directionality of these relationships may help with the development of psychological interventions in AA, as the approach required would likely differ if the symptoms patients are experiencing are pervasive or reactive to an episode of hair loss.(12, 68)

Awareness of AA as a potential risk factor or associated comorbidity for certain autoimmune and atopic conditions may help reduce delays in diagnosis for these conditions and increase vigilance of GPs and dermatologists when reviewing their patients with AA in detecting co-existent conditions. Future work may focus upon whether improved control of an underlying autoimmune or atopic condition may improve chances of achieving remission in AA.

Finally, analysing associations between AA and common infections may provide evidence to support the prescribing of immune modulating medications for the treatment of AA.

Strengths and limitations of the research methods

Several strengths of our study design are noteworthy. Only two previous studies on the incidence and prevalence of AA have been population-based, with the vast majority being conducted on clinic patients and thus leading to skewed prevalence estimates. This study will also provide a contemporary picture of the burden of AA, as the previous population-based studies were over 20 years ago, and this will be the first AA epidemiology study conducted in the UK. To our knowledge, our study examining common infections will be the first study to attempt to answer the question of whether AA confers protection or increased risk for common infections. A final key strength of this study is the use of the national infections surveillance network to analyse infection risk; with regular feedback to practices with a focus on the quality of infections recording the quality of recording of these infection events higher in this network than other data sources.

A limitation of the study is the lack of a validated AA case definition using primary care data. We are unable to develop one as we have access only to coded anonymised healthcare record data for this study. However, our ontological approach to detecting cases of AA and associated comorbidities will improve accuracy compared to the use of diagnostic codes alone.^(69, 70) Exclusion of individuals with potentially confounding conditions (i.e. other causes of hair loss) will also improve the accuracy of our estimates. The algorithms used to detect common mental health conditions have been previously validated in UK primary care. The completeness of GP data coding for prescriptions, referrals and issue of Med 3 certificates will ensure that our findings on AA and comorbidity

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3 management are robust and reliable, and the “episode typing” functionality of the
4 RCGP RSC database will ensure incident and prevalent cases are appropriately
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6 RCGP RSC database will ensure incident and prevalent cases are appropriately
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8 assigned. The RCGP RSC database has been shown to be a representative sample of
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10 the UK population (53) and hence our results are broadly generalisable to the UK
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12 as a whole but should not be extended to populations which are dissimilar.
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17 There are also other several limitations of the study design that are worthy of
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19 consideration. Whilst a previous study has shown the ethnic breakdown in primary
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21 care data is similar to the UK census and suitable for research,(71) 86% of people
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23 in the UK are from white ethnic groups, limiting power to evaluate people of non-
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25 white ethnicity despite the large sample size. Findings may not be generalisable to
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27 countries with a substantially different ethnicity mix to the UK. This study does not
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29 attempt to detect cases of AA (or the comorbidities of interest) that do not present
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31 to medical attention and hence may underestimate the true burden of disease.
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33 Furthermore, only coded data in the database can be used and hence we rely upon
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35 accurate coding. Some individuals may need to be excluded due to incomplete data,
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37 although in similar studies the exclusion rate due to incomplete data has been
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39 low.(72, 73)
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48 Prevalence of Med 3 certification is well captured in primary care but the reason
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50 for issue is not available meaning that we cannot identify the condition relating to
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52 the Med 3 certification. We cannot therefore determine whether the sick leave was
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54 as a result of AA. However, our case-control approach will provide a method for
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56 comparing Med 3 certificate issue rates in those affected and unaffected by AA. The
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58 use of Read codes to identify unemployment is likely to systemically under-
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3 estimate unemployment prevalence but is likely to be suitable for providing a
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5 comparison with controls.
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10 Another limitation is the possibility of missing treatment information from
11 secondary care. Secondary care records in the UK are frequently not computerised
12 and prescriptions are still commonly hand-written. At present there is no
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14 mechanism for universally capturing secondary care prescriptions and linking
15 them to primary care records. We are therefore likely to underestimate
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17 prescription rates for those with the most severe disease who are seen frequently
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19 in secondary care. Where prescriptions are issued from primary care the indication
20 for the prescription is not available and we can therefore not confirm that the
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22 prescription is for the treatment of AA.
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34 **Data management**

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36 Individual patient data will be anonymised at the point of data extraction. All data
37 will remain in anonymised form and will be held on a secure server at the
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39 University of Surrey. All statistical analyses will be performed using R software.
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44 **Patient and Public Involvement**

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46 The design of this protocol did not involve patients or this public.
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50 **Ethics approval and dissemination**

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52 Study approval has been granted by the RCGP RSC Study Approval Committee. The
53 study does not require formal research ethics committee (REC) approval as it will
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55 use anonymised routinely collected healthcare data; as defined by the NHS Health
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57 Research Authority research decision tool (<http://www.hra->
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3 decisiontools.org.uk/research/) and the University of Surrey own Self-Assessment
4 for Governance and Ethics (SAGE) tool. This observational study has been
5 registered with ClinicalTrials.gov (NCT03823794). The data will not be used for
6 any purposes other than for the research which is described in the respective
7 protocols and which has been approved by the RCGP RSC Study Approval
8 Committee. We plan to publish the final study results in peer-reviewed journals
9 and present early findings at scientific meetings.
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22 Conclusions

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25 This study series aims to provide the first large scale population-based analysis of
26 the epidemiology of AA in the UK and the current patterns of healthcare utilisation
27 and treatments in this group. We also aim to provide an extensive assessment of
28 the association between common mental health conditions and work-related
29 difficulties in people with AA; reporting the prevalence and incidence of these
30 conditions in people with new onset AA and matched controls. We aim to provide
31 an extensive evaluation of the prevalence and incidence of autoimmune and atopic
32 conditions in people with new onset AA and matched controls. Finally, we aim to
33 provide evidence for baseline common infection risk in people with AA which can
34 be used to support treatment decisions regarding the use of immune-modulating
35 medications for AA. This study series will extend our knowledge of the current
36 disease burden from AA and associated conditions.
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List of abbreviations

AA	Alopecia Areata
CI	Confidence Interval
HR	Hazard Ratio
IAPT	Improving Access to Psychological Therapies
IMD	Index of Multiple Deprivation
LRTI	Lower respiratory tract infection
OR	Odds Ratio
RA	Rheumatoid Arthritis
RCGP	Royal College of General Practitioners
RSC	Research and Surveillance Centre
SLE	Systemic Lupus Erythematosus
T1DM	Type 1 Diabetes

Declarations

Consent for publication

Not applicable

Availability of data and materials

The RCGP RSC dataset can be accessed by *bone fide* researchers, approval is on a project-by-project basis (www.rcgp.org.uk/rsc). Researchers wishing to directly analyse the patient-level pseudonymised data will be required to complete information governance training and work on the data from the secure servers at the University of Surrey or University of Oxford. Patient-level data cannot be taken out of the secure networks.

Competing interests

SdeL is Director of RCGP RSC, he has received funding for projects from Eli Lilly, Astra Zeneca, GSK, Seqirus and Takeda – all through his Universities and none related to this study. WSC and WRG are employees of Pfizer Ltd. SH and CT are investigators on the Pfizer funded Allegro clinical trial. AEM, ART, CT, MH and AGM declare that they have no competing interests.

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Authors' contributions

The study was designed and developed by CT, MH, SH, ART, AEM, WSC, WRG, and AGM with input from SdeL. The protocol writing was directed and critically reviewed by CT, MH, SH, ART, AEM, WSC, WRG, SdeL, and AGM.

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Tables

Table 1. The autoimmune and atopic conditions to be explored. For full definitions see Supplementary Tables S4.1 – S4.16, Additional file 2

Disease category	Conditions
Atopic conditions	Atopic dermatitis, allergic rhinitis, asthma
Gastrointestinal	Crohn's disease*, ulcerative colitis, coeliac disease, pernicious anaemia
Endocrine	Type 1 diabetes, Hashimoto's thyroiditis, Grave's disease
Rheumatological	Rheumatoid arthritis, psoriatic arthritis, ankylosing spondylitis, systemic lupus erythematosus, polymyalgia rheumatica, Sjögren's syndrome
Dermatological	Psoriasis, vitiligo
Neurological	Multiple sclerosis

*Whilst there has been some debate about whether or not Crohn's disease is an autoimmune condition it involves a degree of immune dysregulation and is therefore included for completeness.(74)

Table 2. The common infections to be explored. *Inclusion of COVID-19 will depend on data availability.

Infection	Description
Upper respiratory tract infection	All infections of the upper respiratory tract including rhinitis, pharyngitis, sinusitis, and the common cold
Lower respiratory tract infection	All infection of the lower respiratory tract including pneumonia and acute bronchitis.
Pneumonia	A subgroup of LRTI consisting of bacterial and viral pneumonias
Acute bronchitis	A subgroup of LRTI consisting of inflammation of the large and medium airways usually of viral origin
Influenza	Confirmed cases of influenza and cases of influenza-like illness
Skin infection	Cellulitis and other infective skin conditions
Urinary tract infection	Infections of the urinary tract including cystitis and pyelonephritis
Genital infections	All infections of the genital tract including sexually transmitted infections and non-sexually transmitted infections
Gastrointestinal infection	All infections of the gastrointestinal tract including gastroenteritis
Herpes simplex	Mucocutaneous infections caused by herpes simplex viruses
Herpes zoster	Infections caused by the varicella-zoster virus
Meningitis	All infections, bacterial or viral, causing meningitis
COVID-19	Confirmed or clinically diagnosed COVID-19*

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The epidemiology, management, and the associated burden of mental health illness, atopic and autoimmune conditions, and common infections in alopecia areata: Statistical Analysis Plan

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List of abbreviations

Abbreviation	Full Form
AA	Alopecia Areata
BMI	Body Mass Index
CKD	Chronic Kidney Disease stage 3-5
COPD	Chronic Obstructive Pulmonary Disorder
HR	Hazard Ratio
IMD	Index of Multiple Deprivation
NIHR	National Institute for Health Research
OR	Odds Ratio
RA	Rheumatoid Arthritis
RCGP RSC	Royal College of General Practitioners Research and Surveillance Centre
SD	Standard Deviation
SES	Socio-Economic Status
SLE	Systemic Lupus Erythematosus
SSRI	Selective Serotonin Reuptake Inhibitor
T1DM	Type 1 Diabetes
T2DM	Type 2 Diabetes

1. Introduction

1.1 Background

Alopecia areata (AA) is a common cause of immune-mediated, non-scarring hair loss. (1) Clinical presentations of AA are heterogeneous, ranging from well-demarcated patches of hair loss on the scalp to total loss of hair on the scalp (*alopecia areata totalis*) or entire scalp and body (*alopecia areata universalis*). (2) Active AA is estimated to affect approximately 0.1-0.2% (2, 3) of the population worldwide, with a lifetime risk of 1.0 -2.1%. (4-6)

Following the initial episode, the majority of those with limited patchy AA will experience spontaneous remission, but over 80% will have subsequent relapses. (7) Spontaneous remission has been reported to occur in less than 10% of those with extensive AA. (7) A number of treatment options can induce hair growth in people with AA, but none have been shown to have a durable impact on remission. (8)

AA has been associated with several autoimmune conditions supporting the theory of an underlying autoimmune aetiology. (9, 10) Atopic conditions and mental health disorders have also been demonstrated to be more common in people with AA, (9-11) although the temporal relationship between psychiatric conditions and AA remains poorly researched. (12) The association between AA and common infections is not well studied.

1.2. Purposes of analyses

This statistical analysis plan covers four related AA studies.

Study 1: Epidemiology of AA

Population studies in the USA using the Rochester Epidemiology Project database estimate the lifetime risk of AA to be 2.1%. (4) The database contained information from all patients registered with a healthcare provider in Olmstead County, Minnesota from 1990-2009. Previous studies using this database from 1971-1974 estimated the overall prevalence of AA to be 0.1-0.2%, (13) with no published studies reporting prevalence estimates since this. Other epidemiological studies have assessed the incidence of AA in patients referred to dermatology services. Clinic-based studies from around the world have estimated the incidence of AA to be in the region of 0.57-3.8%. (14-18)

Worldwide, the majority of studies on AA have not found a significant difference in incidence between males and females. (5) AA onset occurs before the age of 40 in 82-86% of cases. (5) To date, there have been no large population-based studies of AA epidemiology in UK populations.

Study 2: Mental health comorbidities in patients with AA

It is well recognised by clinical experts in AA that the condition can have a profound psychological impact and a possible comorbid burden of mental health conditions. A recent USA cross-sectional database study comparing 5,605 patients with AA with matched controls found a higher prevalence of mental health diagnoses in the AA group (32.8% vs 20.0%). (19) In particular, higher rates of depression (OR 2.18, 95%CI 1.80-2.63), anxiety disorders (OR 2.46, 95%CI 1.91-3.16), attention-deficit disorders (OR 8.11, 95%CI 5.22-12.59), adjustment disorders (OR 4.80, 95%CI 2.58-8.91) and obsessive compulsive

1 disorders (OR 4.95, 95%CI 1.59-15.35) were observed when compared with controls. (19)
2 These findings concur with previous work and a similar pattern is seen in other countries.
3 (20-23)
4

5 Recently a British study identified a bi-directional positive association between major
6 depressive disorder and AA. (24) In a sample of over 400,000 participants, major depressive
7 disorder was seen to increase the risk of incident AA by 90% [HR 1.90, 95%CI 1.67-2.15]
8 and AA was found to increase the risk of incident major depressive disorder by 34% [HR
9 1.34, 95%CI 1.23-1.46]. (24) The association of other common mental health conditions
10 with AA however was not assessed.
11

12 **Study 3: Autoimmune and atopic conditions in people with AA**

13 A central theory in AA pathogenesis is that it is an autoimmune phenomenon resulting from
14 a disruption of hair follicle 'immune privilege', where numerous immunological
15 mechanisms fail to prevent cytotoxic immune attack on cells and antigens present at that
16 site. (25)
17

18 A number of studies have reported autoimmune conditions to occur more frequently in
19 those with AA than in the general population, however results are conflicting, and studies
20 have been limited by potential recruiting, recall and reporting biases. (26) A Taiwanese
21 retrospective cohort study found individuals with AA to have an overall increased risk of
22 developing an autoimmune condition when compared with matched controls (HR 1.86,
23 95%CI 1.32-2.63). In particular, greater risks of incident systemic lupus erythematosus
24 (SLE) (HR 5.02; 95%CI 2.08-12.51), psoriasis (HR 2.01; 95%CI 1.06-3.83) and rheumatoid
25 arthritis (RA) (HR 1.79; 95%CI 1.07-3.00) were observed. (27) There was no relationship
26 between AA and Hashimoto's thyroiditis or type 1 diabetes (T1DM). A large USA cross-
27 sectional study of 3,658 individuals with AA, found that 14.6% had a diagnosis of thyroid
28 disease, 11.1% had T1DM, 4.3% had inflammatory bowel disease, 2.8% had vitiligo and 6.3%
29 had psoriasis. (10) These figures were all higher than would be expected in the general
30 population. A recent systematic review and meta-analysis found AA to be significantly
31 associated with Graves' Disease (OR 2.07, 95%CI 1.80-2.38) and Hashimoto's Thyroiditis
32 (OR 2.15; 95%CI 1.71-2.72) but not with SLE, RA, Psoriasis or T1DM. (9)
33
34

35 There has also been interest in the prevalence of co-morbid atopy in patients with AA. The
36 prevalence of atopy in patients with AA has been reported to be in the range of 11-38.2%
37 (5) representing cohorts from the USA, India and Singapore. (10, 14, 28, 29) A large meta-
38 analysis found patients with AA had higher odds of having atopic dermatitis (OR 2.36;
39 95%CI 1.80-3.09) and allergic rhinitis (OR 1.33;95%CI 1.19-1.47) when compared with
40 controls. (9) It is not however surprising from a pathogenesis perspective in terms of shared
41 pathways of autoimmune susceptibility; IL-13 loci have been associated with autoimmune
42 and atopic conditions, and a genome-wide association study established that IL-13 is also
43 susceptible loci for AA. (30)
44
45

46 **Study 4: Common infections in people with AA**

47 It has been hypothesized that infections may act as triggers for AA; with particular interest
48 in *Helicobacter pylori*, cytomegalovirus, Epstein-Barr virus, hepatitis B virus, hepatitis C
49 virus, and human immunodeficiency virus but others have also been suggested.(9, 31-38)
50 Some case reports has suggested improvement or resolution of AA with treatment of the
51 associated infection.(33, 39). However, early small-scale studies have failed to find
52 convincing evidence to support associations.(35, 36, 40)
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1 Multiple genetic loci have been identified to be both protective from infection but increase
2 the risk for autoimmune disease.(41) Examples include the HLA variants HLA-DQ2 and
3 HLA-DQ8 which confer protection against viral infections including influenza but are
4 associated with inflammatory bowel disease,(42, 43) and SH2B3 rs3184504*A gene variant
5 protective against Escherichia coli infection but also detrimental for inflammatory bowel
6 disease.(44) These loci which, in the past have conferred a genetic advantage, may still
7 confer a reduced infection risk.(41) It is currently unclear if the genetic predisposition for
8 AA is caused by genetic factors which also confer protection against any common infections.
9 In other autoimmune conditions, infection risk is often increased as a result of the
10 pathological changes resulting from the condition itself, the effects of immune-modulatory
11 treatment, or through increased exposure to pathogens through healthcare contact.(45-51)
12 An understanding of the relative infection rates in people with AA compared to those
13 without is of particular importance with the emergence of Janus kinase inhibitors as a
14 potential treatment option.(52) Whilst this medication class can produce impressive hair
15 regrowth results even in long-standing, AA their use is associated with some increased
16 infection risk; in particular, urinary tract infections, viral gastroenteritis fungal infections,
17 and varicella zoster infection.(52)

2. Study objectives and endpoints

2.1 Study objectives

2.1.1 Study 1

The overall purpose of study 1 is to describe the epidemiology (incidence and prevalence) of AA and to assess the current level of primary care service utilisation and management patterns associated with people diagnosed with AA.

2.1.2 Study 2

The overall purpose of study 2 is to assess the prevalence and incidence of mental health conditions (depressive episodes, recurrent depressive disorder and anxiety disorder) in adult people diagnosed with AA relative to a control population of people without a diagnosis of AA. In addition, the study will determine the treatment burden (medications and psychological interventions used to treat mental health conditions), 'sick day' burden, and unemployment burden of AA.

2.1.3 Study 3

The overall purpose of study 3 is to assess the prevalence and incidence of atopic and autoimmune conditions in adult people diagnosed with AA relative to a control population of people without AA.

2.1.4 Study 4

The overall purpose of study 4 is to assess the incidence of common infections in people diagnosed with AA relative to a control population of people without AA.

2.2 Primary objectives

2.2.1 Study 1

2.2.1.1

Describe the epidemiology of AA: Incidence of AA over time and by age, sex, ethnicity, and sociodemographic factors, and point prevalence by age and sex.

2.2.1.2

Describe current primary care service utilisation and management patterns in AA.

2.2.2 Study 2

2.2.2.1

Describe the prevalence of common mental health conditions (depressive episodes, recurrent depressive disorder and anxiety disorder) in adult people diagnosed with AA in a contemporary real-world population compared with matched controls without AA.

2.2.2.2

Describe the incidence of common mental health conditions (depressive episodes, recurrent depressive disorder and anxiety disorder) in adult people diagnosed with AA in a contemporary real-world population compared with matched controls in the first two years after AA diagnosis.

2.2.2.3

Describe the mental health treatment burden of adult people diagnosed with AA.

2.2.3 Study 3

2.2.3.1

Describe the prevalence of atopic and autoimmune conditions in adult people diagnosed with AA in a contemporary real-world population at diagnosis compared with matched controls without AA.

2.2.3.2

Describe the incidence of atopic and autoimmune conditions in adult people with AA in a contemporary real-world population compared with matched controls in the first five years after AA diagnosis.

2.2.4 Study 4

2.2.4.1

Describe the overall rate of common infections in people with AA in a contemporary real-world population at diagnosis compared with matched controls in the first five years after AA diagnosis.

2.2.4.2

1 Describe the rates of individual common infections in people with AA in a contemporary
2 real-world population at diagnosis compared with matched controls in the first five years
3 after AA diagnosis.
4
5

6 **2.3 Secondary objectives:**

8 **2.3.1 Study 1**

10 **2.3.1.1**

11 Describe the geographic distribution of AA incidence within England. English regions
12 comprise; Greater London, South East, South West, West Midlands, North West, North East,
13 Yorkshire and the Humber, East Midlands, and East of England.
14
15

16 **2.3.2 Study 2**

18 **2.3.2.1**

19 Describe the prevalence of additional mental health conditions (adjustment disorder,
20 agoraphobia, self-harm, and overdose/parasuicide attempts) in adult people diagnosed
21 with AA and controls.
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24 **2.3.2.2**

25 Describe the burden of 'sick days' in adult people diagnosed with AA and controls.
26
27

28 **2.3.2.3**

29 Describe the prevalence of unemployment in adult people diagnosed with AA and controls.
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32 **2.3.3 Study 3**

33 None
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35 **2.3.4 Study 4**

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2.4 Primary endpoint

The primary endpoints for the four studies are listed in Table 1.

Study	Endpoints
1	Diagnosis of AA is the date of the first diagnosis code in the record and no alternative diagnosis that merits exclusion* diagnosed in the subsequent 365 days from date of AA diagnosis (see Supplementary Table S1.1, Additional file 2).
2	Diagnosis of AA is the date of the first diagnosis code in the record and no alternative diagnosis that merits exclusion* diagnosed in the subsequent 365 days from date of AA diagnosis (see Supplementary Table S1.1, Additional file 2). Diagnosis of a common mental health condition categorized as depressive episodes, recurrent depressive disorder or non-phobia related anxiety disorders at the time of AA diagnosis (See Supplementary Tables S2.1 - S2.4, Additional file 2). Time to diagnosis of a common mental health condition categorized as depressive episodes, recurrent depressive disorder or non-phobia related anxiety disorders in the first two years post AA diagnosis (See Supplementary Tables S2.1 -S2.4, Additional file 2)
3	Diagnosis of AA is the date of the first diagnosis code in the record and no alternative diagnosis that merits exclusion* diagnosed in the subsequent 365 days from date of AA diagnosis (see Supplementary Table S1.1, Additional file 2). Diagnosis of an atopic (atopic dermatitis, allergic rhinitis, asthma) or autoimmune condition (Supplementary Tables S4.1 – S4.16, Additional file 2) at the time of AA diagnosis. Time to diagnosis of an atopic (atopic dermatitis, allergic rhinitis, asthma) or autoimmune condition (Supplementary Tables S4.1 – S4.16, Additional file 2) in the first five years after AA diagnosis.
4	Diagnosis of AA is the date of the first diagnosis code in the record and no alternative diagnosis that merits exclusion* diagnosed in the subsequent 365 days from date of AA diagnosis (see Supplementary Table S1.1, Additional file 2). Diagnosis of a common infection (Upper and lower respiratory tract infection, Pneumonia, Acute bronchitis, Influenza, Skin infection, Urinary tract infection, Genital infections, Gastrointestinal infection, Herpes simplex , Herpes zoster, Meningitis and Covid-19 (depending on data availability)) (Supplementary Tables S5.1 – S5.12, Additional file 2) in the first five years after AA diagnosis.

Table 1: Primary endpoints. *Exclusion diagnoses are; any form of scarring alopecia, (53) traction alopecia, congenital alopecia, androgenetic alopecia, telogen effluvium, tinea capitis, trichotillomania, or secondary syphilis of the scalp (See Supplementary Table S1.1, Additional file 2)

2.5 Secondary endpoints

None

2.6 Other exploratory analyses

Study 1: Explore the incidence of AA by age (children) and age group (adults [18-30], [30-40], [50-60], [60,70], [70-80], ≥ 80). These age groups are provisional. If, during exploratory analysis, we find that these age groups obscure the true incidence of AA (for example if AA incidence rates change substantially across one of these age groups) then we may modify these groupings. Any changes will be clearly stated as such in a final manuscript.

3 General Study Design and Plan

The proposed studies will use the retrospectively collected data of all eligible patients within Oxford-Royal College of General Practitioners Research and Surveillance Centre database (RCGP RSC) at the date of data extraction. The RCGP RSC database incorporates pseudonymised primary care records from up to 200 GP practices distributed across England. Details of the cohort included in the database have been published previously. (54) The RCGP RSC cohort size (as of January 2019) is over 2.6 million actively registered patients, and historic records available for up to 5.2 million patients over the last 20 years. The cohort provides a broadly representative sample of the UK population.

The study period for study 2 and study 3 incidence analyses will be ten-years starting January 1, 2009 and ending December 31, 2018 inclusive.

For study 4, we will start data collection from the beginning of 2004 when the quality and outcomes framework was first introduced in primary care. The study period will end December 31, 2018.

3.1 Study Design

These are non-interventional studies. A range of study designs will be used across the studies as follows:

3.1.1 Study 1:

Cross-sectional design (incidence and prevalence of AA). Cohort design to assess healthcare utilisation in people with AA.

3.1.2 Study 2:

Case-control design for prevalence of mental health conditions (depressive episodes, recurrent depressive disorder and anxiety disorder) at AA diagnosis. Matched-cohort design for incidence of such conditions in the first two years after AA diagnosis in the subset of adult people diagnosed with AA without a mental health condition at baseline (and excluding controls if they have a baseline mental health condition).

3.1.3 Study 3:

Case-control design for prevalence of atopic and autoimmune conditions at AA diagnosis. Matched-cohort design for incidence of atopic and autoimmune conditions in the first five years after AA diagnosis in the subset of adult people diagnosed with AA without an atopic/autoimmune condition at baseline (and excluding controls if they have a baseline atopic/autoimmune condition).

3.1.4 Study 4:

Matched-cohort design for incidence of common infections in the first five years after AA diagnosis in the subset of people diagnosed with AA without a common infection at baseline (and excluding controls if they have a baseline common infection).

3.2 Data source and Read codes

The case and control cohorts will be identified from the RCGP RSC database. The RCGP RSC database contains complete data on all events and clinical entities coded in UK primary care. These include demographic information, clinical diagnoses, laboratory test results, primary care issued prescriptions, process of care codes (e.g. specialist dermatology reviews), and anthropometric measurements (e.g. body mass index (BMI)), and are coded using the Read Coding system. (55) Read code lists used to define variables have been developed in accordance with published guidelines. (55)

3.3 Data extraction

Individual patient data will be anonymised at the point of data extraction. All data will remain in anonymised form and will be held on a secure server at the University of Surrey. The data will not be used for any purposes other than for the research which is described in the respective protocols and which has been approved by the RCGP RSC Research Committee. The sponsor, Pfizer Ltd, will not have access to the individual anonymised patient data.

Queries will be executed to extract relevant data from the Structured Query Language (SQL) database using the Read code listed in Additional file 2.

3.4 Inclusion-Exclusion Criteria and General Study Population

3.4.1 AA definition

We will identify people diagnosed with AA using diagnosis Read codes which are specific to the condition (see Supplementary Table S1.1 (AA section), Additional file 2). A person will be considered to have a confirmed AA diagnosis if they have one or more of these diagnoses Read codes and no code for an alternative diagnosis in the subsequent 365 days. Alternative diagnoses which merit exclusion comprise any form of scarring alopecia, (53) traction alopecia, congenital alopecia, androgenetic alopecia, telogen effluvium, tinea capitis, trichotillomania, or secondary syphilis of the scalp (see Supplementary Table S1.1, Additional file 2). We will identify all incident cases of AA meeting this case definition over the study period which will form the case cohorts for the four studies. We will also extract data on the extent of the alopecia where this has been recorded (See Supplementary Table S1.2, Additional file 2).

Study 2 will identify three groups of common mental health conditions defined by the International Statistical Classification of Diseases and Related Health Problems 10th Revision (ICD10) classification (56) (depressive episodes (F32), recurrent depressive disorder (F33), and non-phobia related anxiety disorders (F41)) identified using algorithms validated in UK primary care. (57)

Study 3 will identify atopic conditions and autoimmune conditions respectively (Supplementary Tables S4.1 – S4.16, Additional file 2) using diagnostic Read codes.

Autoimmune conditions were selected based on a combination of expert knowledge and a minimum background population prevalence of 0.3% in the general population (refer to section 4.1.3). Case definition using Read codes for atopic dermatitis has been previously validated. An ontologically driven case definition is used for both allergic rhinitis and asthma. (55)

Study 4 will identify common infections using diagnostic Read codes (Supplementary Tables S5.1 – S5.12, Additional file 2).

3.5 Baseline socio-economic characteristics

Age, sex, socio-economic status (SES), and ethnicity will comprise the socio-economic factors used for stratification of the outcome measures. Ethnicity will be categorized as follows in accordance with the major UK census categories: (58, 59) White, Asian, Black African/Caribbean, Mixed, Other and not recorded. Deprivation will be defined using the official national deprivation measure; index of multiple deprivation (IMD). (60) This will be calculated at the point of data extraction, using patient postcode, with the resultant scores stratified by deprivation quintile according to the national distribution.

3.6 Epidemiology of AA

This will comprise of the incidence of AA over the study period (stratified by age group, sex ethnicity, and SES) and point prevalence (stratified by age and sex). The study will also describe the geographic distribution of AA by region across England.

3.7 Current service utilisation and management patterns

Current service utilisation will comprise of annual primary care visit rates, in Study 1 we will compare primary care visit frequency in people with AA and matched controls without AA.

The management patterns will comprise of an assessment of the percentage of the people with AA having a secondary care review (by dermatology (study 1) or mental health services (study 2)), and an assessment of primary care medication prescriptions issued to treat AA (Supplementary Table S1.4, Additional file 2). Primary care visits, secondary care reviews and medication to treat AA will all be limited to those within 365 days of AA diagnosis.

3.8 Mental health treatment, sick day, and unemployment burden

This will comprise of the rates for medications and psychological interventions used to treat mental health conditions in people diagnosed with AA. Antidepressant medication classes to be examined comprise; selective serotonin reuptake inhibitors (SSRIs) and related medications (serotonin and norepinephrine reuptake inhibitors; SNRIs), tricyclic antidepressants (TCAs) and related medications (tetracyclic antidepressant TeCAs), and monoamine oxidase inhibitors (MOAIs). Anxiolytic medications to be examined comprise all benzodiazepines and other related medications indicated for use in anxiety states. Psychological interventions comprise of will comprise; referral rates for counselling, secondary care psychiatrist referrals, including the referrals to the clinical psychology services/specialists and UK Improving Access to Psychological Therapies (IAPT) program. (61) (Supplementary Table S2.10, Additional file 2).

1 Additional mental health conditions consist of adjustment disorder, agoraphobia, self-harm,
2 and overdose/parasuicide attempts and will be identified using the presence of one or more
3 diagnosis codes appearing in the clinical record (Supplementary Tables S2.5 – S2.9,
4 Additional file 2).

5
6 Unemployment will be identified using Read codes relating to unemployment recorded in
7 the primary care record or the issuing of IB113 or ESA113 forms (Supplementary Table S3.1,
8 Additional file 2). Sick days will be indicated by the issuing of Med 3 certification from
9 primary care (Statement of Fitness for Work certification) (Supplementary Table S3.2,
10 Additional file 2).

14 4 Sample size calculations

15
16 In the controls, the prevalence of common conditions (e.g. depressive episodes) is assumed
17 to be 10%, less common conditions are assumed to be 1% and rare conditions (e.g. multiple
18 sclerosis) assumed to be 0.1%. Sample size calculations were performed in OpenEpi, (62)
19 results are presented using methods of Kelsey.(63)

21 4.1.1 Study 1

22
23 The analysis of the primary endpoint is a descriptive analysis of the incidence and
24 prevalence of AA, and no sample size calculation is therefore applicable.

25
26 Our inclusion criteria specify all people with a confirmed diagnosis of AA will be included
27 for analysis. The RCGP RSC database contains information on around 2 million actively
28 registered patients. Based on an AA prevalence of 0.2% (13), we would anticipate a sample
29 size of around 4,000 people diagnosed with AA for this study.

32 4.1.2 Study 2

33
34 Assuming 80% power, a 5% level of statistical significance, and a background population
35 prevalence of 15% for anxiety and 10% for depression, (64) our anticipated sample size for
36 AA (n = 4,000) would be sufficient to detect a prevalence difference of 1.8% in anxiety
37 between those with and without AA, and 1.5% difference in depression between those with
38 and without AA.

42 4.1.3 Study 3

43
44 A sample size calculation is applicable to estimate the incidence of atopic and autoimmune
45 conditions in people diagnosed with AA. There is, however, a paucity of large-scale
46 epidemiological data exploring the association between AA and either atopic or
47 autoimmune conditions on which to base the sample size calculations for this study.

48
49 A large population-based study based in Taiwan (65) found associations between the
50 presence of AA and the presence of atopic dermatitis (OR 2.24, 95% CI 1.95-2.58) and
51 allergic rhinitis (OR 1.29, 95% CI 1.18-1.41), and with the autoimmune condition psoriasis
52 (OR 2.80, 95% CI 2.24-3.50). No associations were found in either asthma (atopic) or RA
53 (autoimmune). Applying an estimate informed by this study of OR 2.0 for atopic conditions
54 and OR 2.8 for autoimmune conditions, assuming 80% power, a 5% level of statistical
55 significance, a 4:1 ratio of controls to cases and a probability of outcome in the control
56 cohort of 1% (less common condition prevalence) for both atopic and autoimmune
57 conditions, a total (both cases and controls) sample size of 6,034 for atopic conditions
58 (1,207 cases and 4,827 controls) and 2,133 for autoimmune conditions (427 cases and
59 1,706 controls).

1,706 controls) would be required to detect statistically significant differences between people diagnosed with AA and the control populations.

For the assessment of prevalence of co-existing autoimmune conditions, assuming 80% power, a 5% level of statistical significance, our anticipated sample size for AA (n = 4,000) and an OR 2.0 effect, we would have sufficient power to detect a difference between those with and without AA in autoimmune conditions having $\geq 0.3\%$ background population prevalence.

4.1.4 Study 4

A sample size calculation is applicable to estimate the incidence of common infections in people diagnosed with AA. There is, however, no previous data exploring the association between AA and common infections on which to base the sample size calculations for this study. We therefore estimate the number of people diagnosed with AA we will have for this study (n = 4,000) and use this number to estimate the minimum effect size we are powered to detect. Based on a Cox PH model, 80% power, a 5% level of statistical significance and a 4:1 ratio of controls to cases, we would have sufficient power to detect a difference between those with and without AA in common infections having $\geq 0.46\%$ background population prevalence.

5 Populations to be analysed

5.1 Inclusion Criteria

The cohorts for studies 1, 2 and 3 (cases and controls) will consist of patients contributing to RCGP RCS database during the study period (between January 1, 2009 and December 31, 2018 inclusive). The cohorts for study 4 (cases and controls) will consist of patients contributing to RCGP RCS database between January 1, 2004 and December 31, 2018 inclusive.

The AA prevalence population consists of patients actively registered and alive at the end date of the study period (December 31, 2018).

The AA incidence population consists of patients registered at any point during the study period but without a prior recorded AA diagnosis. The follow-up period for incident cases will begin on the latest of the date of diagnosis indicated by the first diagnostic AA Read code. Follow-up will end at the earliest of the study end-date (December 31, 2018), the date of patient transfer from an included practice or date of death.

Studies 1 and 4 will include both children and adults. Studies 2 and 3 will include only people aged ≥ 18 (as at date of AA diagnosis for cases or start of follow-up for controls). Only people aged ≥ 18 and ≤ 65 will be included in the unemployment and sick day analysis (Study 2).

5.2 Exclusion Criteria

The following exclusion criteria will be applied:

- People with the alternative non-AA diagnoses (section 3.4.1) (AA incidence cohort).
- People with AA diagnosis within 6 months of registration (AA incidence cohort).
- People with less than 1 year of follow up within the dataset (unless under 1 year old) (AA incidence and AA prevalence cohorts).

5.3 Matching process

The control cohorts will be defined by matching cases with people who have never been diagnosed with AA either prior to or during the study period, by age, sex, and time since practice registration, at GP practice level. After matching an assessment of sociodemographic differences using IMD quintiles will be performed. If there are substantial differences in socioeconomic status between cases and controls, re-matching with IMD as an additional matching criterion will be considered

Controls will require at least one year of follow-up when matched to minimize the risk of a non-recorded existing diagnosis of AA. The follow-up period for each matched control will begin at the start of follow-up of their matched case and have the same follow-up time criteria applied (where applicable).

Each case is matched with four controls using a nearest neighbour matching algorithm (66) to create a baseline matched dataset.

Study 1 will include all matched patients to compare rates of primary care visits. Study 2 (incidence of mental health after AA diagnosis) and study 3 (incidence of atopic and autoimmune conditions) will both use a subset of the baseline matched dataset; cases will be people diagnosed with AA without the relevant condition at their start of follow up, controls will be people not diagnosed with AA and without the relevant condition at their start of follow up.

The matching for the incidence of common infections (study 4) will use a different approach to studies 2 and 3: cases will be people diagnosed with AA on or before 1st January 2014 (exact date will be dependent on data availability) without the relevant infection, controls will be people not diagnosed with AA prior to this date and without the relevant infection. People who develop AA during the follow up will be excluded from the pool of available cohorts prior to matching. This approach will mitigate systematic recording bias that is likely due to an increased propensity of people with incident AA to consult within the months following diagnosis.

The case-control design studies (prevalence of mental health at AA diagnosis (study 2), and prevalence of atopic and autoimmune conditions at AA diagnosis (study 3)) will both define cases as people newly diagnosed with AA over the study period. For each case, the prevalence of the conditions of interest as at the date of AA diagnosis will be retrospectively established. Controls will be people not diagnosed with AA. For each control, the date of AA diagnosis of their matched case counterpart will then be used as the baseline date and the prevalence of the conditions of interest on that date will be retrospectively established.

In Study 2 and Study 3, the same baseline cases and control cohorts will be used for both the case-control and matched-cohort analyses.

5.4 AA definition exploratory analyses

To check the validity of our AA definition (section 3.4.1), annual incident trends of specified alopecia (AA), (Supplementary Table S1.1, Additional file 2), non-specific alopecia (Supplementary Table S1.1, Additional file 2) and other specified alopecia (Supplementary Table S1.1, Additional file 2) will be analysed for the purpose of identifying changes in coding practice. The AA case definition may be amended based on the results of this analysis if considered appropriate and necessary. Any changes required will be reported in full in a final study publication.

6 Statistical Analysis

6.1 Statistical principles

The mean, standard deviation (sd) and any other statistical measures, will be reported to one decimal place. Continuous data will be summarised in the form of means, sd, median, interquartile range (IQR) and range as appropriate. Categorical data will be summarised using frequencies and proportions. Chi-squared and t-tests will be performed to compare the frequency of dichotomous variables and the values of continuous variables where relevant. 95% CIs will be reported for main effect sizes. Statistical significance will be assessed using $p < 0.05$. Actual p-values will be reported except for p-values less than 3 decimal places which will be reported as " < 0.001 ". P-values > 0.1 will be reported to one decimal place, p-values between 0.01 and 0.1 will be reported to 2 decimal places, and p-values between 0.001 and 0.01 will be reported to three decimal places.

The assessment of any associations with baseline characteristics and the outcomes of interest (mental health conditions (study 2), autoimmune and atopic conditions (study 3) and common infections (study 4)) will be assessed using logistic regression, Cox proportional hazards models, Poisson regression or zero-inflated Poisson regression as appropriate depending on the characteristics of the outcome variable. A standard set of features will be used in all multivariable models: age, sex, ethnicity, socioeconomic status, BMI, smoking status, alcohol status, and historical propensity to consult (defined as the number of primary care visits an individual has in the year prior to their study start date). Specific co-morbidity adjustment will be specific to each analysis.

Assumptions of statistical approaches will be assessed, and transformations used if necessary (although it is not anticipated that the data will violate model assumptions).

6.2 Primary Endpoint Analysis

6.2.1 Study 1

AA incidence: Incident cases will be defined as people with a first ever diagnostic Read code for AA during the study period. To ensure cases are truly incident, people with an AA diagnosis within six months of registering with a practice will be excluded from the analysis (unless under one year old). Incidence of new onset AA will be calculated by dividing the total number of new cases by the total person-years of follow-up for the total eligible population over the study period. Incidence rates will be reported for the complete cohort and stratified by calendar year, sex and age (categorised), and SES factors. Adjusted incidence rates by socio-demographic factors (including geographic area classification) will be estimated using Poisson regression.

AA point prevalence: Prevalence cases will be defined as all people with a historical diagnostic Read code for AA and no exclusion code within one year of AA diagnosis. For this prevalence analysis all people will be included regardless of the date of AA diagnosis in relation to the date of registration with a practice. Cases with < 365 days of follow up from date of registration will be excluded from the analysis (unless under one year old). Point prevalence will be calculated by dividing the number of prevalent cases by the total number of eligible people in the study population at the study end date (December 31, 2018). Point prevalence will be reported for the complete cohort and stratified by sex and age (categorised).

1 We anticipate some attrition of recording of AA in the historic records. This is particularly
2 likely to be the case in records preceding the computerisation of primary care which
3 occurred in the 1990s. If we observe evidence of this being a major source of error in our
4 point calculations (as evidenced by a falling point incidence in the older adult population
5 despite there being a substantial number of incident diagnoses in this age group) then we
6 will consider using the actuarial life table method to estimate lifetime AA risk (67).
7

8 **Service utilisation and management patterns:** Service utilisation will be evaluated by
9 calculation of the annual rates of primary care visits for people diagnosed with AA in the
10 year following diagnosis. Primary care visits will be identified from the patient's electronic
11 health record.
12

13
14 Management patterns will be evaluated by calculation of annual proportion of people
15 referred for dermatology review in people diagnosed with AA in the year following
16 diagnosis. Secondary care dermatology reviews will be identified from Read codes.
17

18
19 In addition, management patterns will also comprise of the percentage of people diagnosed
20 with AA and prescribed AA medication, in primary care, grouped by medication class during
21 the year following diagnosis. Prescription information will be identified using Read and
22 EMIS codes.
23

24 6.2.2 Study 2

25
26 **Prevalence of mental health conditions:** Prevalence will be calculated by dividing the
27 number of prevalent people at the study start date by the total number of eligible people in
28 the study population at the same time point.
29

30
31 The prevalence of each common mental health condition (depressive episodes, recurrent
32 depressive disorder and anxiety disorder) category for people diagnosed with AA will be
33 reported in Study 2 and compared to the prevalence in the control population without AA.
34 The prevalence of mental health conditions by socio-demographic subgroups will also be
35 reported.
36

37
38 **Incidence of mental health conditions:** Incident cases will be defined as in Study 1.
39 Incidence rates of mental health conditions (depressive episodes, recurrent depressive
40 disorder and anxiety disorder) within two years of diagnosis date (matched follow-up start
41 date for controls) will be calculated in both cases and controls and compared.
42

43
44 Risk of developing a mental health condition (grouped by mental health condition category)
45 will be examined using time to failure analysis. Initially, unadjusted Cox proportional
46 hazards models, stratified by matched set (AA versus non-AA), will be used to provide
47 overall hazard ratios (HRs) as summary estimates for the association of the presence of AA
48 with the time to each mental health condition category in separate models. Models will be
49 subsequently adjusted for standard set factors (section 6.1) and comorbidities (type 2
50 diabetes (T2DM), hypertension, atrial fibrillation, angina, acute myocardial infarction,
51 stroke, heart failure, chronic liver disease, dementia, RA, asthma, Chronic obstructive
52 pulmonary disease, Chronic Kidney Disease stage 3-5 (CKD), malignancy and inflammatory
53 bowel disease) in multivariable analysis.
54

55
56 **Mental health treatment and management patterns:** The burden of treatment for
57 mental health conditions will be evaluated as the total percentage of people diagnosed with
58
59
60

AA and prescribed, within one year of AA diagnosis, a medication used to treat mental health conditions (section 3.8) (e.g. SSRIs), grouped by mental health condition category.

Management patterns will be evaluated by calculation of annual proportion of people referred for psychiatrist referral and counselling in people diagnosed with AA in the year following diagnosis (Supplementary Table S2.10, Additional file 2).

6.2.3 Study 3

Prevalence of atopic and autoimmune conditions: The prevalence of atopic and autoimmune conditions in both cases and controls will be reported and compared.

Incidence of atopic and autoimmune conditions: Incidence rates of atopic and autoimmune conditions within five years of diagnosis date (matched follow-up start date for controls) will be calculated in both cases and controls and compared.

Risk of developing an atopic or autoimmune condition will be examined using time to failure analysis. Initially, unadjusted Cox proportional hazards models, stratified by matched set (AA versus non-AA), will be used to provide overall HRs as summary estimates for the association of the presence of AA with the time to each of atopic and autoimmune conditions in separate models. Models will be subsequently adjusted for standard set factors (section 6.1) and comorbidities (hypertension, hyperlipidaemia, T2DM, peripheral arterial disease, atrial fibrillation, angina, myocardial infarction, stroke, heart failure, CKD, chronic obstructive pulmonary disorder (COPD), chronic liver disease, malignancy, dementia, fracture history, depression) in multivariable analysis.

6.2.4 Study 4

Incidence of common infections: Incidence rates of common infections within five years of diagnosis date (matched follow-up start date for controls) will be calculated at both overall and individual infection levels in both cases and controls and compared. : Initially, infection incidence rates in people with and without AA will be estimated by dividing the number of incident common infections by the sum of person-years of follow-up for each cohort over the period of interest. Unadjusted Poisson regression models, stratified by matched set (AA versus controls), will be used to provide overall incident rate ratios as summary estimates for the association between rates of common infections and the presence of AA. Models will subsequently be adjusted for standard set factors (section 6.1) and comorbidities (hypertension, hyperlipidaemia, T2DM, peripheral arterial disease, atrial fibrillation, angina, myocardial infarction, stroke, heart failure, CKD, COPD, chronic liver disease, malignancy, dementia, RA, depression).

6.3 Secondary Objective Analysis

6.2.1 Study 1

Geographical distribution of AA: The geographic distribution of people with AA will be calculated from the disease incidence. The adjusted incident rate ratios will be reported. Models will be adjusted for age category, sex, ethnicity, IMD and geographic area classification derived using patient postcode at the point of data extraction.

6.2.2 Study 2

Stratified prevalence of mental health conditions: The prevalence of mental health conditions (depressive episodes, recurrent depressive disorder and anxiety disorder) by sociodemographic subgroups will also be reported in both cases and controls.

1 **Additional mental health conditions:** The prevalence of additional mental health
2 conditions (adjustment disorder, agoraphobia, self-harm, and overdose/parasuicide
3 attempts) will be estimated as the total percentage of people diagnosed with AA and with
4 the presence of one or more diagnosis codes appearing in the clinical record
5
6

7 **Sick day and unemployment burden:** The burden of sick days will be estimated as the
8 total percentage of people diagnosed with AA and issued one or more Med 3 certificate. The
9 burden of unemployment will be estimated as the total percentage of people diagnosed with
10 AA and with a Read code relating to unemployment recorded in the primary care record or
11 an IB113 or ESA113 form issued.
12
13

14 6.2.3 Study 3

15 Not applicable.
16

17 6.2.4 Study 4

18 Not applicable.
19
20
21
22
23
24

25 6.4 Sensitivity analysis

26
27
28 Study 2: Sensitivity analyses will be performed to compare the baseline prevalence and
29 incidence over two years post alopecia diagnosis of the three primary mental health
30 conditions (depressive episodes, recurrent depressive disorder and anxiety disorder) in
31 people with non-specific alopecia codes only (i.e. no prior or subsequent codes specifying
32 alopecia type) using the same matching process used for the primary analyses.
33
34

35 Study 3: We will replicate this sensitivity analysis to compare the baseline prevalence and
36 incidence of atopic and autoimmune conditions in people with non-specific alopecia codes
37 only.
38
39

40 Study 4: In the common infections theme, we will use a survival model to investigate time
41 to first infection. We will also compare the results of the study outcomes when 1) we
42 increase the number of cases to include people who develop AA during the follow up and 2)
43 use a similar matching approach to the other studies: perform matching using the time of
44 AA diagnosis and follow for up to five years after diagnosis (or matched date for controls).
45 Both of these approaches will be used to investigate the effect of bias.
46
47
48

49 6.5 Missing data

50 These studies will use the missing indicator variable method as missing data are considered
51 likely not to be missing at random, meaning multiple imputation approaches will lack
52 validity.
53
54

55 Patient will need to be excluded from analyses based on a matched design if they have
56 incomplete data in the fields (age, sex) required to run the matching process. In similar
57 studies, the exclusion rate due to incomplete data has been low (68, 69).
58
59
60

7 Study Limitations

These are discussed in the associated protocol manuscript.

8 Statistical software

All statistical analyses will be performed using R software.

9 Ethics

Study approval will be requested from the Research Committee of the RCGP RSC. These studies do not meet the requirements for formal ethics board review in their current form as defined using the NHS Health Research Authority research decision tool (<http://www.hra-decisiontools.org.uk/research/>).

The study will be conducted in accordance with legal and regulatory requirements, as well as with scientific purpose, value, and rigor and follow generally accepted research practices described in Guidelines for Good Pharmacoepidemiology Practices (GPP) issued by the International Society for Pharmacoepidemiology (ISPE), and Good Epidemiological Practice (GEP) guidelines issued by the International Epidemiological Association (IEA). Study reporting will be conducted in accordance with the relevant EQUATOR (Enhancing the QUALity and Transparency Of health Research) guidelines.

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Additional File 2

The epidemiology, management, and the associated burden of mental health illness, atopic and autoimmune conditions, and common infections in alopecia areata: Protocol for an observational study series

Dr Matthew Harries, Dr Abby Macbeth, Dr Susan Holmes, Professor Andrew R Thompson, Dr Wing Sin Chui, Dr William Romero Gallardo, Professor Andrew G Messenger, Dr Christos Tziotzios, Professor Simon de Lusignan

Codes used to define alopecia areata and related clinical conditions, dermatology referrals, and treatments for alopecia areata which may be issued in primary care

Supplementary table S1.1. Read codes to be used to identify cases of alopecia areata, non-specified alopecia and alternative diagnoses (exclusion diagnoses).

Alopecia Areata		
Read V2 Code	Term ID	Description
M2401	All	Alopecia areata
M240B	All	Alopecia totalis
M240K	All	Alopecia universalis
M240U	All	Ophiasis
Myu62	All	[X]Other alopecia areata
Read CTV3 Code	Term ID	Description
XE1BH	All	Alopecia areata
M240D	All	Ophiasic alopecia areata
M240B	All	Total alopecia areata
X509h	All	Alopecia universalis
X590h	All	Universal alopecia areata
Myu62	All	[x]Other alopecia areata
Non-specific alopecia		
Read V2 Code	Term ID	Description
M240.	All	Alopecia
M2400	All	Alopecia unspecified
M2408	All	Alopecia localis
M2409	All	Alopecia disseminata
M240z	All	Alopecia NOS
22D7.	All	O/E - alopecia
Read CTV3 Code	Term ID	Description
XE2Qa	All	Alopecia
X75wD	All	Partial loss of hair
X509c	All	Non-scarring alopecia
M2409	All	Diffuse alopecia
X509e	All	Circumscribed alopecia
M2408	All	Alopecia localis
M240z	All	Alopecia NOS
XE1BG	All	Alopecia unspecified
XM1YG	All	O/E - alopecia

XE1h9	All	O/E - patches of alopecia
Scarring alopecia		
Read V2 Code	Term ID	Description
M240Q	All	Pseudopelade
M147.	All	Erosive pustular dermatosis of the scalp
M24X.	All	Cicatricial alopecia, unspecified
M240R	All	Lichen planopilaris
M240P	All	Alopecia mucinosa
M2yF.	All	Follicular mucinosis
M240S	All	Folliculitis decalvans
M240T	All	Folliculitis ulerythematosa reticulata
X7055	All	Linear morphoea
M2440	All	Dissecting cellulitis of scalp
M261K	All	Acne keloidalis
M261J	All	Acne necrotica
M2448	All	Perifolliculitis capitis abscedens
M2447	All	Perifolliculitis of scalp
Read CTV3 Code	Term ID	Description
X509i	All	Scarring alopecia
X509i	All	Cicatricial alopecia
X50Eo	All	Lipoedematous alopecia
X509j	All	Alopecia parvimaculata
X509k	All	Pseudopelade
X509l	All	Tufted folliculitis
X509m	All	Erosive pustular dermatosis of the scalp
X509n	All	Traumatic alopecia
M240C	All	Alopecia follicularis
Myu65	All	[X]Other cicatricial alopecia
Myu6E	All	[X]Cicatricial alopecia, unspecified
X507b	All	Lichen planopilaris
X507i	All	Lichen planopilaris of scalp
X50Ff	All	Alopecia mucinosa
XaQbR	All	Follicular mucinosis
X500w	All	Folliculitis decalvans
X5076	All	Keratosis pilaris decalvans
M21y5	All	Folliculitis ulerythematosa reticulata
X500x	All	Folliculitis keloidalis
M2104	All	Linear scleroderma
M2440	All	Folliculitis abscedens et suffodiens
X50Es	All	Acne necrotica
X50Eq	All	Keloidalis nuchae
M2440	All	Dissecting cellulitis of scalp
M2448	All	Perifolliculitis capitis abscedens

M2447	All	Perifolliculitis of scalp
Congenital alopecia		
Read V2 Code	Term ID	Description
PH40.	All	Congenital alopecia
PH400	All	Congenital alopecia, unspecified
PH401	All	Congenital localised alopecia
PH402	All	Congenital generalised alopecia
PH40z	All	Congenital alopecia NOS
Read CTV3 Code	Term ID	Description
XE1MR	All	Congenital alopecia
X78De	All	Total congenital alopecia
X78Df	All	Congenital alopecia with keratin cysts
PH401	All	Congenital localised alopecia
PH40z	All	Congenital alopecia NOS
XE1MS	All	Congenital generalised alopecia
PH400	All	Congenital alopecia, unspecified
Traction or traumatic alopecia		
Read V2 Code	Term ID	Description
M240V	All	Traction alopecia
Read CTV3 Code	Term ID	Description
Ua1AS	All	Traction alopecia
X509n	All	Traumatic alopecia
X503h	All	Friction alopecia
Androgenetic alopecia		
Read V2 Code	Term ID	Description
M2402	All	Male pattern alopecia
M2403	All	Frontal alopecia of women
7G140	All	Hair bearing skin flap to scalp for male pattern baldness
7G1E.	All	Hair bearing graft of skin to scalp for male pattern baldness
7G1E0	All	Hair bearing punch graft to scalp for male pattern baldness
7G1E1	All	Hair bearing strip graft to scalp for male pattern baldness
7G1E2	All	Hair bearing graft to scalp for male pattern baldness NEC
Read CTV3 Code	Term ID	Description
M2402	Y50P7	Androgenetic alopecia
M2402	Y50P8	Male pattern alopecia
M2402	Y57P9	Male pattern baldness
M2402	Y57PA	Pattern baldness
M2403	All	Frontal alopecia of women
X509f	All	Involutional alopecia
7G140	All	Hair bearing skin flap to scalp for male pattern baldness

7G1E0	All	Hair bearing punch graft to scalp for male pattern baldness
XM1JM	All	Hair bearing graft of skin to scalp for male pattern baldness
7G1E2	All	Hair bearing graft to scalp for male pattern baldness NEC
7G1E1	All	Hair bearing strip graft to scalp for male pattern baldness
Telogen effluvium		
Read V2 Code	Term ID	Description
M240M	All	Telogen effluvium
Read CTV3 Code	Term ID	Description
X509q	All	Telogen effluvium
Anagen effluvium		
Read V2 Code	Term ID	Description
M240N	All	Anagen effluvium
Read CTV3 Code	Term ID	Description
M240N	All	Anagen effluvium
Tinea capitis		
Read V2 Code	Term ID	Description
AB00.	00	Dermatophytosis of scalp or beard
AB00.	11	Kerion
AB000	00	Dermatophytosis of scalp
AB000	11	Tinea Capitis
AB00z	00	Dermatophytosis of scalp or beard NOS
Read CTV3 Code	Term ID	Description
AB000	All	Tinea capitis
AB000	Y71oW	Scalp ringworm
AB000	Y71oX	Dermatophytosis of scalp
AB000	Y71oY	Tinea capitis
AB000	Y71oZ	Black dot ringworm
AB000	Y71od	Tinea tonsurans
AB000	Ya6oA	Tinea of the scalp
X70QN	All	Favus
X70QN	Y71ob	Favus
X70QN	Y71oc	Tinea favosa
X70QM	All	Suppurative ringworm
XE0SA	All	Dermatophytosis of scalp or beard
AB00z	All	Dermatophytosis of scalp or beard NOS
Secondary syphilis		
Read V2 Code	Term ID	Description
A913.	All	Secondary syphilis of skin or mucus membranes
A9133	All	Secondary syphilis of skin
A913z	All	Secondary syphilis of skin or mucus membranes NOS

A9181	All	Syphilitic alopecia
Read CTV3 Code	Term ID	Description
A913.	All	Secondary syphilis of skin and mucous membrane
A9133	All	Secondary syphilis of skin
A913z	All	Secondary syphilis of skin or mucus membranes NOS
A9181	All	Syphilitic alopecia
Trichotillomania		
Read V2 Code	Term ID	Description
Eu633	All	[X]Trichotillomania
Read CTV3 Code	Term ID	Description
Eu633	All	Trichotillomania

Supplementary table S1.2. Read codes to identify the extent of alopecia. The extent of disease will be considered to be that of the category recorded with the greatest extent

Alopecia Areata (Category: Localised)		
Read V2 Code	Term ID	Description
M2401	All	Alopecia areata
M240U	All	Ophiasis
Myu62	All	[X]Other alopecia areata
Read CTV3 Code	Term ID	Description
XE1BH	All	Alopecia areata
M240D	All	Ophiasic alopecia areata
Myu62	All	[x]Other alopecia areata
Alopecia Areata (Category: Totalis)		
Read V2 Code	Term ID	Description
M240B	All	Alopecia totalis
Read CTV3 Code	Term ID	Description
M240B	All	Total alopecia areata
Alopecia Areata (Category: Universalis)		
Read V2 Code	Term ID	Description
M240K	All	Alopecia universalis
Read CTV3 Code	Term ID	Description
X509h	All	Alopecia universalis
X590h	All	Universal alopecia areata

Supplementary table S1.3. Read codes to identify dermatology referrals.

Dermatology referrals		
Read V2 Code	Term ID	Description
8HJD.	All	Dermatology self-referral
8H43.	All	Dermatological referral
8H4S.	All	Referral to dermatology special interest general practitioner
8HHX.	All	Referral to dermatology nurse specialist
8HVI.	All	Private referral to dermatologist
8Hkq.	All	Referral to community dermatology service
8Hm0.	All	Referral to dermatology clinical assessment service
8HM3.	All	Listed for Dermatology admisn
8H3I.	All	Non-urgent dermatology admisn.
8HIJ4	All	Internal practice dermatology referral
8TOD.	All	Referral to paediatric dermatology service
Read CTV3 Code	Term ID	Description
8H43.	All	Dermatological referral
XaZJ0	All	Referral to teledermatology service
XaXsX	All	Referral to community dermatology service
8HJD.	All	Dermatology self-referral
XaBTS	All	Referral to dermatologist
8HVI.	All	Private referral to dermatologist
Xaaln	All	Internal practice dermatology referral
XaKCB	All	Referral to dermatology nurse specialist
XaXsX	All	Referral to community dermatology service
Xaacp	All	Referral to paediatric dermatology service
XaAeq	All	Referral for dermatology domiciliary visit
XaLqL	All	Referral to dermatology special interest general practitioner
XaQKh	All	Referral to dermatology clinical assessment service
8HK3.	All	Dermatology D.V. requested
XaAeq	All	Referral for dermatology DV

Supplementary table S1.4. Medications which may be issued in primary care for the treatment of alopecia areata.

* topical steroids will be grouped by potency; mild, moderate, potent, and very potent.

Medication group	Examples
Topical steroids*	Hydrocortisone, Bethamethasone, Fluocinolone acetonide, Clobetasol proprionate, Clobetasone butyrate, Mometasone
Minoxidil	Minoxidil
Systemic steroids	Prednisolone
Dithranol	Dithranol

Codes used to identify mental health conditions and treatments

Supplementary table S2.1. Algorithms used to identify anxiety (non-phobia related anxiety disorder), depression episodes, recurrent major depression, agoraphobia, adjustment disorder self-harm and parasuicide.

Expressions in capitals equate to Boolean expressions. *More than 1 year ago. SSRIs = selective serotonin reuptake inhibitors, TCA = tricyclic antidepressants, MAOI = monoamine oxidase inhibitors, CBT = cognitive behavioural therapy.

Clinical entity	ICD 10 code	Definition
Depressive episodes	F32	Any coded depressive episode (Supplementary table S2.2) AND concurrent treatment for depression
Recurrent depressive disorder	F33	(Any historical code* for a depressive episode [table S2.2] AND current treatment for depression) OR Any code for recurrent depressive disorder (Supplementary table S2.3)
Anxiety disorder	F41	Any coded anxiety episode (Supplementary table S2.4) AND concurrent treatment for anxiety
Adjustment disorder	F43.2	Any diagnosis code for adjustment disorder (Supplementary table S2.5)
Agoraphobia	F40.0	Any diagnosis code for agoraphobia (Supplementary table S2.6)
Self-harm	NA	Any diagnosis code or other strongly indicative code for self-harm (Supplementary table S2.7)
Parasuicide	NA	Any diagnosis code or other strongly indicative code for parasuicide including overdose (Supplementary tables S2.8 and S2.9)
Depression treatments	NA	SSRIs, TCAs, MAOIs, counselling, CBT, and psychotherapy (Supplementary table S2.10)
Anxiety treatments	NA	SSRIs, anxiolytics, counselling, CBT, and psychotherapy (Supplementary table S2.10)

Supplementary table S2.2. Read codes used to identify depression episodes.

Depression episodes		
Read V2 Code	Term ID	Description
E0013	All	Presenile dementia with depression
E0021	All	Senile dementia with depression
E112.	All	Single major depressive episode
E1120	All	Single major depressive episode, unspecified
E1121	All	Single major depressive episode, mild
E1122	All	Single major depressive episode, moderate
E1123	All	Single major depressive episode, severe, without mention of psychosis
E1124	All	Single major depressive episode, severe, with psychosis
E1125	All	Single major depressive episode, in partial or unspecified remission
E1126	All	Single major depressive episode, in full remission
E112z	All	Single major depressive episode NOS
E113.	All	Recurrent major depressive episode
E1130	All	Recurrent major depressive episodes, unspecified
E1131	All	Recurrent major depressive episodes, mild
E1132	All	Recurrent major depressive episodes, moderate
E1133	All	Recurrent major depressive episodes, severe, without mention of psychosis
E1134	All	Recurrent major depressive episodes, severe, with psychosis
E1137	All	Recurrent depressive disorder
E113z	All	Recurrent major depressive episode NOS
E118.	All	Seasonal affective disorder
E11y2	All	Atypical depressive disorder
E11z2	All	Masked depression
E130.	All	Reactive depressive psychosis
E135.	All	Agitated depression
E2003	All	Anxiety with depression
E291.	All	Prolonged depressive reaction
E2B..	All	Depressive disorder NEC
E2B1.	All	Chronic depression
E2B0.	All	Postviral depression
Eu204	All	[X]Post-schizophrenic depression
Eu251	All	[X]Schizoaffective disorder, depressive type
Eu32.	All	[X]Depressive episode
Eu320	All	[X]Mild depressive episode
Eu321	All	[X]Moderate depressive episode
Eu322	All	[X]Severe depressive episode without psychotic symptoms
Eu323	All	[X]Severe depressive episode with psychotic symptoms
Eu324	All	[X]Mild depression
Eu325	All	[X]Major depression, mild
Eu326	All	[X]Major depression, moderately severe

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4	E1136	All	Recurrent major depressive episodes, in full remission
5	E113z	All	Recurrent major depressive episode NOS
6	X00SU	All	Masked depression
7	E11y2	All	Atypical depressive disorder
8			
9	X00S8	All	Post-schizophrenic depression
10	XSEGJ	All	Major depressive disorder
11	XSKr7	All	Cotard syndrome
12	XSGol	All	Moderate major depression
13	XSGok	All	Mild major depression
14	XSGom	All	Severe major depression without psychotic features
15	XSGon	All	Severe major depression with psychotic features
16			
17	E1137	All	Recurrent depressive disorder
18	E130.	All	Reactive depressive psychosis
19	E2B..	All	Depressive disorder NEC
20	E2B0.	All	Postviral depression
21	E2B1.	All	Chronic depression
22			
23	Eu320	All	[X]Mild depressive episode
24	Eu321	All	[X]Moderate depressive episode
25	Eu331	All	[X]Recurrent depressive disorder, current episode moderate
26	XE1Y1	All	Recurrent major depressive episodes
27	XE1ZY	All	[X]Severe depressive episode without psychotic symptoms
28	XE1ZZ	All	[X]Severe depressive episode with psychotic symptoms
29	XE1Za	All	[X]Other depressive episodes
30	XE1Zb	All	[X]Depressive episode, unspecified
31			
32	XE1Zd	All	[X]Recurrent depressive disorder, current episode severe without psychotic symptoms
33			
34	XE1Ze	All	[X]Recurrent depressive disorder, current episode severe with psychotic symptoms
35	XE1Zf	All	[X]Recurrent depressive disorder, unspecified
36			
37	XaB9J	All	Depression NOS
38	XaCHr	All	[X] Single episode agitated depression without psychotic symptoms
39	XaCHs	All	[X] Single episode major depression without psychotic symptoms
40	XaCIs	All	Mild depression
41	XaCIt	All	Moderate depression
42	XaCIu	All	Severe depression
43			
44	E0013	All	Presenile dementia with depression
45	E0021	All	Senile dementia with depression
46			
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Supplementary table S2.3. Read codes used to identify a diagnosis of recurrent major depression.

Recurrent major depression		
Read V2 Code	Term ID	Description
E113.	All	Recurrent major depressive episode
E1130	All	Recurrent major depressive episodes, unspecified
E1131	All	Recurrent major depressive episodes, mild
E1132	All	Recurrent major depressive episodes, moderate
E1133	All	Recurrent major depressive episodes, severe, without mention of psychosis
E1134	All	Recurrent major depressive episodes, severe, with psychosis
E1135	All	Recurrent major depressive episodes, in partial or unspecified remission
E1136	All	Recurrent major depressive episodes, in full remission
E1137	All	Recurrent depressive disorder
E113z	All	Recurrent major depressive episode NOS
E2B1.	All	Chronic depression
Eu32A	All	[X]Recurrent major depressive episodes, severe, with psychosis, psychosis in remission
Eu33.	All	[X]Recurrent depressive disorder
Eu330	All	[X]Recurrent depressive disorder, current episode mild
Eu331	All	[X]Recurrent depressive disorder, current episode moderate
Eu332	All	[X]Recurrent depressive disorder, current episode severe without psychotic symptoms
Eu333	All	[X]Recurrent depressive disorder, current episode severe with psychotic symptoms
Eu334	All	[X]Recurrent depressive disorder, currently in remission
Eu33y	All	[X]Other recurrent depressive disorders
Eu33z	All	[X]Recurrent depressive disorder, unspecified
Read CTV3 Code	Term ID	Description
Xa0wV	All	Recurrent brief depressive disorder
XM1GC	All	Endogenous depression - recurrent
E1130	All	Recurrent major depressive episodes, unspecified
E1131	All	Recurrent major depressive episodes, mild
E1132	All	Recurrent major depressive episodes, moderate
E1133	All	Recurrent major depressive episodes, severe, without mention of psychosis
E1134	All	Recurrent major depressive episodes, severe, with psychosis
XaX54	All	Recurrent major depressive episodes, severe, with psychosis, psychosis in remission
E1135	All	Recurrent major depressive episodes, in partial or unspecified remission
E1136	All	Recurrent major depressive episodes, in full remission
E113z	All	Recurrent major depressive episode NOS
E1137	All	Recurrent depressive disorder

E2B1.	All	Chronic depression
Eu331	All	[X]Recurrent depressive disorder, current episode moderate
XE1Y1	All	Recurrent major depressive episodes
XE1Zd	All	[X]Recurrent depressive disorder, current episode severe without psychotic symptoms
XE1Ze	All	[X]Recurrent depressive disorder, current episode severe with psychotic symptoms
XE1Zf	All	[X]Recurrent depressive disorder, unspecified

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Supplementary table S2.4. Read codes used to identify anxiety episodes.

Anxiety episode		
Read V2 Code	Term ID	Description
E200.	All	Anxiety states
E2000	All	Anxiety state unspecified
E2001	All	Panic disorder
E2002	All	Generalised anxiety disorder
E2003	All	Anxiety with depression
E2004	All	Chronic anxiety
E2005	All	Recurrent anxiety
E200z	All	Anxiety state NOS
Eu41.	All	[X]Other anxiety disorders
Eu410	All	[X]Panic disorder [episodic paroxysmal anxiety]
Eu411	All	[X]Generalized anxiety disorder
Eu412	All	[X]Mixed anxiety and depressive disorder
Eu413	All	[X]Other mixed anxiety disorders
Eu41y	All	[X]Other specified anxiety disorders
Eu41z	All	[X]Anxiety disorder, unspecified
Read CTV3 Code	Term ID	Description
E200.	All	Anxiety disorder
XE1Y7	All	Panic disorder
Eu410	All	[X]Panic disorder [episodic paroxysmal anxiety]
E2002	All	Generalised anxiety disorder
X00Sb	All	Mixed anxiety and depressive disorder
X00RP	All	Organic anxiety disorder
E2004	All	Chronic anxiety
E2005	All	Recurrent anxiety
E200z	All	Anxiety state NOS
X00Sc	All	Anxiety hysteria
Eu41.	All	[X]Other anxiety disorders
Eu413	All	[X]Other mixed anxiety disorders
Eu41z	All	[X]Anxiety disorder, unspecified
XE1Zj	All	[X]Other specified anxiety disorders

Supplementary table S2.5. Read codes used to identify adjustment disorder.

Adjustment disorder		
Read V2 Code	Term ID	Description
E29..	All	Adjustment reaction
E290.	All	Brief depressive reaction
E2900	All	Grief reaction
E290z	All	Brief depressive reaction NOS
E291.	All	Prolonged depressive reaction
E292.	All	Adjustment reaction with predominant disturbance of other emotions
E2924	All	Adjustment reaction with anxious mood
E292y	All	Adjustment reaction with mixed disturbance of emotion
E292z	All	Adjustment reaction with disturbance of other emotion NOS
E293.	All	Adjustment reaction with predominant disturbance of conduct
E2930	All	Adjustment reaction with aggression
E2931	All	Adjustment reaction with antisocial behaviour
E2932	All	Adjustment reaction with destructiveness
E293z	All	Adjustment reaction with predominant disturbance of conduct NOS
E294.	All	Adjustment reaction with mixed disturbance of emotion and conduct
E29y.	All	Other adjustment reactions
E29y2	All	Adjustment reaction with physical symptoms
E29y3	All	Elective mutism due to an adjustment reaction
E29y5	All	Other adjustment reaction with withdrawal
E29yz	All	Other adjustment reactions NOS
E29z.	All	Adjustment reaction NOS
Read CTV3 Code	Term ID	Description
E29..	All	Adjustment disorder
E290.	All	Brief depressive adjustment reaction
E290z	All	Brief depressive reaction NOS
E291.	All	Prolonged depressive adjustment reaction
E2924	All	Adjustment reaction with anxious mood
E292y	All	Adjustment reaction with mixed disturbance of emotion
E293.	All	Adjustment reaction with predominant disturbance of conduct
E2930	All	Adjustment reaction with aggression
E2931	All	Adjustment reaction with antisocial behaviour
E2932	All	Adjustment reaction with destructiveness
E293z	All	Adjustment reaction with predominant disturbance of conduct NOS
E294.	All	Adjustment reaction with mixed disturbance of emotion and conduct
E292.	All	Adjustment reaction with predominant disturbance of other emotions
E292z	All	Adjustment reaction with disturbance of other emotion NOS
E29y.	All	Other adjustment reactions

E29yz	All	Other adjustment reactions NOS
E29y2	All	Adjustment reaction with physical symptoms
E29y3	All	Elective mutism due to an adjustment reaction
E29y5	All	Other adjustment reaction with withdrawal
E29z.	All	Adjustment reaction NOS

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Supplementary table S2.6. Read codes used to identify agoraphobia.

Agoraphobia		
Read V2 Code	Term ID	Description
Eu400	All	[X]Agoraphobia
E2021	All	Agoraphobia with panic attacks
Eu400	All	[X]Panic disorder with agoraphobia
E2022	All	Agoraphobia without mention of panic attacks
Eu400	All	[X]Agoraphobia without history of panic disorder
E2029	All	Fear of crowds
Read CTV3 Code	Term ID	Description
X00SV	All	Agoraphobia
E2021	All	Agoraphobia with panic attacks
E2022	All	Agoraphobia without mention of panic attacks
XaK2c	All	H/O: agoraphobia
XaY00	All	Mobility inventory for agoraphobia
XaYS1	All	Mobility inventory for agoraphobia when alone score
XaYS0	All	Mobility inventory for agoraphobia when accompanied score
X00SV	All	Phobia of going out

Supplementary table S2.7. Read codes used to identify self-harm.

Self-harm		
Read V2 Code	Term ID	Description
U2...	All	[X]Intentional self-harm
U2E..	All	[X]Self mutilation
U2y..	All	[X]Intentional self harm by other specified means
U2y1.	All	[X]Intentional self harm by other specified means, occurrence in residential institution
U2y2.	All	[X]Intentional self harm by other specified means, occurrence at school, other institution and public administrative area
U2y3.	All	[X]Intentional self harm by other specified means, occurrence at sports and athletics area
U2y4.	All	[X]Intentional self harm by other specified means, occurrence on street and highway
U2y5.	All	[X]Intentional self harm by other specified means, occurrence at trade and service area
U2y6.	All	[X]Intentional self harm by other specified means, occurrence at industrial and construction area
U2y7.	All	[X]Intentional self harm by other specified means, occurrence on farm
U2yy.	All	[X]Intentional self harm by other specified means, occurrence at other specified place
U2yz.	All	[X]Intentional self harm by other specified means, occurrence at unspecified place
U2z..	All	[X]Intentional self harm by unspecified means
U2z..	All	[X]Intentional self harm by unspecified means
U2z0.	All	[X]Intentional self harm by unspecified means, occurrence at home
U2z1.	All	[X]Intentional self harm by unspecified means, occurrence in residential institution
U2z2.	All	[X]Intentional self harm by unspecified means, occurrence at school, other institution and public administrative area
U2z3.	All	[X]Intentional self harm by unspecified means, occurrence at sports and athletics area
U2z4.	All	[X]Intentional self harm by unspecified means, occurrence on street and highway
U2z5.	All	[X]Intentional self harm by unspecified means, occurrence at trade and service area
U2z6.	All	[X]Intentional self harm by unspecified means, occurrence at industrial and construction area
U2z7.	All	[X]Intentional self harm by unspecified means, occurrence on farm
U2zy.	All	[X]Intentional self harm by unspecified means, occurrence at other specified place
U2zz.	All	[X]Intentional self harm by unspecified means, occurrence at unspecified place
146B.	All	H/O: deliberate self harm
ZV1B2	All	[V]Personal history of self-harm
U720.	All	[X]Sequelae of intentional self-harm
TK601	All	Self inflicted lacerations to wrist
U26..	All	[X]Intentional self harm by explosive material

U260.	All	[X]Intentional self harm by explosive material, occurrence at home
U261.	All	[X]Intentional self harm by explosive material, occurrence in residential institution
U262.	All	[X]Intentional self harm by explosive material, occurrence at school, other institution and public administrative area
U263.	All	[X]Intentional self harm by explosive material, occurrence at sports and athletics area
U264.	All	[X]Intentional self harm by explosive material, occurrence on street and highway
U265.	All	[X]Intentional self harm by explosive material, occurrence at trade and service area
U266.	All	[X]Intentional self harm by explosive material, occurrence at industrial and construction area
U267.	All	[X]Intentional self harm by explosive material, occurrence on farm
U26y.	All	[X]Intentional self harm by explosive material, occurrence at other specified place
U26z.	All	[X]Intentional self harm by explosive material, occurrence at unspecified place
U27..	All	[X]Intentional self harm by smoke, fire and flames
U270.	All	[X]Intentional self harm by smoke, fire and flames, occurrence at home
U271.	All	[X]Intentional self harm by smoke, fire and flames, occurrence in residential institution
U272.	All	[X]Intentional self harm by smoke, fire and flames, occurrence at school, other institution and public administrative area
U273.	All	[X]Intentional self harm by smoke, fire and flames, occurrence at sports and athletics area
U274.	All	[X]Intentional self harm by smoke, fire and flames, occurrence on street and highway
U275.	All	[X]Intentional self harm by smoke, fire and flames, occurrence at trade and service area
U276.	All	[X]Intentional self harm by smoke, fire and flames, occurrence at industrial and construction area
U277.	All	[X]Intentional self harm by smoke, fire and flames, occurrence on farm
U27y.	All	[X]Intentional self harm by smoke, fire and flames, occurrence at other specified place
U27z.	All	[X]Intentional self harm by smoke, fire and flames, occurrence at unspecified place
U28..	All	[X]Intentional self harm by steam, hot vapours and hot objects
U280.	All	[X]Intentional self harm by steam, hot vapours and hot objects, occurrence at home
U281.	All	[X]Intentional self harm by steam, hot vapours and hot objects, occurrence in residential institution
U282.	All	[X]Intentional self harm by steam, hot vapours and hot objects, occurrence at school, other institution and public administrative area
U283.	All	[X]Intentional self harm by steam, hot vapours and hot objects, occurrence at sports and athletics area
U284.	All	[X]Intentional self harm by steam, hot vapours and hot objects, occurrence on street and highway

U285.	All	[X]Intentional self harm by steam, hot vapours and hot objects, occurrence at trade and service area
U286.	All	[X]Intentional self harm by steam, hot vapours and hot objects, occurrence at industrial and construction area
U287.	All	[X]Intentional self harm by steam, hot vapours and hot objects, occurrence on farm
U28y.	All	[X]Intentional self harm by steam, hot vapours and hot objects, occurrence at other specified place
U28z.	All	[X]Intentional self harm by steam, hot vapours and hot objects, occurrence at unspecified place
U29..	All	[X]Intentional self harm by sharp object
U290.	All	[X]Intentional self harm by sharp object, occurrence at home
U291.	All	[X]Intentional self harm by sharp object, occurrence in residential institution
U292.	All	[X]Intentional self harm by sharp object, occurrence at school, other institution and public administrative area
U293.	All	[X]Intentional self harm by sharp object, occurrence at sports and athletics area
U294.	All	[X]Intentional self harm by sharp object, occurrence on street and highway
U295.	All	[X]Intentional self harm by sharp object, occurrence at trade and service area
U296.	All	[X]Intentional self harm by sharp object, occurrence at industrial and construction area
U297.	All	[X]Intentional self harm by sharp object, occurrence on farm
U2A..	All	[X]Intentional self harm by blunt object
U2A0.	All	[X]Intentional self harm by blunt object, occurrence at home
U2A1.	All	[X]Intentional self harm by blunt object, occurrence in residential institution
U2A2.	All	[X]Intentional self harm by blunt object, occurrence at school, other institution and public administrative area
U2A3.	All	[X]Intentional self harm by blunt object, occurrence at sports and athletics area
U2A4.	All	[X]Intentional self harm by blunt object, occurrence on street and highway
U2A5.	All	[X]Intentional self harm by blunt object, occurrence at trade and service area
U2A6.	All	[X]Intentional self harm by blunt object, occurrence at industrial and construction area
U2A7.	All	[X]Intentional self harm by blunt object, occurrence on farm
U2Ay.	All	[X]Intentional self harm by blunt object, occurrence at other specified place
U2Az.	All	[X]Intentional self harm by blunt object, occurrence at unspecified place
Read CTV3 Code	Term ID	Description
XE22H	All	Suicide and self harm
X71BH	All	Self injury by cigarette burn
XE22K	All	Self injury with external chemical burn
Xa0EN	All	Self inflicted injury
ZV1B2	All	[V]Personal history of self-harm

XaF9U	All	H/O: deliberate self harm
U2A..	All	[X]Intentional self harm by blunt object
U2A0.	All	[X]Intentional self harm by blunt object, occurrence at home
U2A1.	All	[X]Intentional self harm by blunt object, occurrence in residential institution
U2A2.	All	[X]Intentional self harm by blunt object, occurrence at school, other institution and public administrative area
U2A3.	All	[X]Intentional self harm by blunt object, occurrence at sports and athletics area
U2A4.	All	[X]Intentional self harm by blunt object, occurrence on street and highway
U2A5.	All	[X]Intentional self harm by blunt object, occurrence at trade and service area
U2A6.	All	[X]Intentional self harm by blunt object, occurrence at industrial and construction area
U2A7.	All	[X]Intentional self harm by blunt object, occurrence on farm
U2Ay.	All	[X]Intentional self harm by blunt object, occurrence at other specified place
U2Az.	All	[X]Intentional self harm by blunt object, occurrence at unspecified place
U29..	All	[X]Intentional self harm by sharp object
U290.	All	[X]Intentional self harm by sharp object, occurrence at home
U291.	All	[X]Intentional self harm by sharp object, occurrence in residential institution
U292.	All	[X]Intentional self harm by sharp object, occurrence at school, other institution and public administrative area
U293.	All	[X]Intentional self harm by sharp object, occurrence at sports and athletics area
U294.	All	[X]Intentional self harm by sharp object, occurrence on street and highway
U295.	All	[X]Intentional self harm by sharp object, occurrence at trade and service area
U296.	All	[X]Intentional self harm by sharp object, occurrence at industrial and construction area
U297.	All	[X]Intentional self harm by sharp object, occurrence on farm
U29y.	All	[X]Intentional self harm by sharp object, occurrence at other specified place
U29z.	All	[X]Intentional self harm by sharp object, occurrence at unspecified place
XE22i	All	[X]Intentional self harm by self mutilation
X766K	All	Deliberate self-harm
X766U	All	Biting self
X766R	All	Biting own hand
Xa2zx	All	Biting own fingers
Xa2zy	All	Biting own toes
Xa2o5	All	Biting own arm
Xa2p5	All	Burning self
X766V	All	Cutting self
XaBA0	All	Cutting own wrists

1			
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3			
4	Ua1A4	All	Cutting own throat
5	Xa2pE	All	Damaging own wounds
6	Xa2pF	All	Reopening scars
7	Xa2pH	All	Poking fingers into wound
8			
9	XaAxe	All	Inserting objects into wound
10	Xa2ny	All	Gouging own body parts
11	Xa2nz	All	Gouging own flesh
12			
13	Xa2o0	All	Gouging own eyes
14	Xa2o1	All	Gouging own rectum
15	Xa30D	All	Gouging own vagina
16	E2731	All	Head-banging
17			
18	Xa2o2	All	Banging own head against object
19	Xa2o3	All	Banging own head against own body parts
20	Xa2pI	All	Hitting self
21	Xa2pJ	All	Punching self
22	Xa2pK	All	Slapping self
23			
24	X766S	All	Head-hitting
25	Xa2p3	All	Inserting foreign bodies into own orifices
26			
27	Ua14Q	All	Self-electrocution
28	Xa2pQ	All	Nipping self
29	Xa2pM	All	Picking own skin
30	Xa2pR	All	Pinching self
31	Xa2pN	All	Rubbing own skin
32			
33	X766T	All	Scratches self
34	Xa303	All	Self-scalding
35			
36	Ua14N	All	Self-incineration
37	X766L	All	Self-mutilation
38	X766M	All	Self-mutilation of hands
39			
40	Xa2nl	All	Self-mutilation of genitalia
41	X766N	All	Self-mutilation of penis
42	X766O	All	Self-mutilation of eyes
43	Xa2nm	All	Enucleation of own eyes
44			
45	X766P	All	Self-mutilation of ears
46	Xa2no	All	Self-inducing a prolapse
47	Xa2nq	All	Breaking own bones
48	Xa2nr	All	Pulling own teeth out
49	Xa2nt	All	Eating own flesh
50	Xa2nv	All	Stripping own skin
51			
52	U2E..	All	[X]Self mutilation
53	X766W	All	Swallowing objects
54	Xa2p2	All	Swallowing substances
55	X766Q	All	Self-inflicted skin problems
56			
57	XE22c	All	[X]Intentional self-harm
58	U26..	All	[X]Intentional self harm by explosive material
59	U260.	All	[X]Intentional self harm by explosive material, occurrence at home
60			

U261.	All	[X]Intentional self harm by explosive material, occurrence in residential institution
U262.	All	[X]Intentional self harm by explosive material, occurrence at school, other institution and public administrative area
U263.	All	[X]Intentional self harm by explosive material, occurrence at sports and athletics area
U264.	All	[X]Intentional self harm by explosive material, occurrence on street and highway
U265.	All	[X]Intentional self harm by explosive material, occurrence at trade and service area
U266.	All	[X]Intentional self harm by explosive material, occurrence at industrial and construction area
U267.	All	[X]Intentional self harm by explosive material, occurrence on farm
U26y.	All	[X]Intentional self harm by explosive material, occurrence at other specified place
U26z.	All	[X]Intentional self harm by explosive material, occurrence at unspecified place
U27..	All	[X]Intentional self harm by smoke, fire and flames
U270.	All	[X]Intentional self harm by smoke, fire and flames, occurrence at home
U271.	All	[X]Intentional self harm by smoke, fire and flames, occurrence in residential institution
U272.	All	[X]Intentional self harm by smoke, fire and flames, occurrence at school, other institution and public administrative area
U273.	All	[X]Intentional self harm by smoke, fire and flames, occurrence at sports and athletics area
U274.	All	[X]Intentional self harm by smoke, fire and flames, occurrence on street and highway
U275.	All	[X]Intentional self harm by smoke, fire and flames, occurrence at trade and service area
U276.	All	[X]Intentional self harm by smoke, fire and flames, occurrence at industrial and construction area
U277.	All	[X]Intentional self harm by smoke, fire and flames, occurrence on farm
U27y.	All	[X]Intentional self harm by smoke, fire and flames, occurrence at other specified place
U27z.	All	[X]Intentional self harm by smoke, fire and flames, occurrence at unspecified place
U28..	All	[X]Intentional self harm by steam, hot vapours and hot objects
U280.	All	[X]Intentional self harm by steam, hot vapours and hot objects, occurrence at home
U281.	All	[X]Intentional self harm by steam, hot vapours and hot objects, occurrence in residential institution
U282.	All	[X]Intentional self harm by steam, hot vapours and hot objects, occurrence at school, other institution and public administrative area
U283.	All	[X]Intentional self harm by steam, hot vapours and hot objects, occurrence at sports and athletics area
U284.	All	[X]Intentional self harm by steam, hot vapours and hot objects, occurrence on street and highway
U285.	All	[X]Intentional self harm by steam, hot vapours and hot objects, occurrence at trade and service area

U286.	All	[X]Intentional self harm by steam, hot vapours and hot objects, occurrence at industrial and construction area
U287.	All	[X]Intentional self harm by steam, hot vapours and hot objects, occurrence on farm
U28y.	All	[X]Intentional self harm by steam, hot vapours and hot objects, occurrence at other specified place
U28z.	All	[X]Intentional self harm by steam, hot vapours and hot objects, occurrence at unspecified place
U29..	All	[X]Intentional self harm by sharp object
U290.	All	[X]Intentional self harm by sharp object, occurrence at home
U291.	All	[X]Intentional self harm by sharp object, occurrence in residential institution
U292.	All	[X]Intentional self harm by sharp object, occurrence at school, other institution and public administrative area
U293.	All	[X]Intentional self harm by sharp object, occurrence at sports and athletics area
U294.	All	[X]Intentional self harm by sharp object, occurrence on street and highway
U295.	All	[X]Intentional self harm by sharp object, occurrence at trade and service area
U296.	All	[X]Intentional self harm by sharp object, occurrence at industrial and construction area
U297.	All	[X]Intentional self harm by sharp object, occurrence on farm
U2A..	All	[X]Intentional self harm by blunt object
U2A0.	All	[X]Intentional self harm by blunt object, occurrence at home
U2A1.	All	[X]Intentional self harm by blunt object, occurrence in residential institution
U2A2.	All	[X]Intentional self harm by blunt object, occurrence at school, other institution and public administrative area
U2A3.	All	[X]Intentional self harm by blunt object, occurrence at sports and athletics area
U2A4.	All	[X]Intentional self harm by blunt object, occurrence on street and highway
U2A5.	All	[X]Intentional self harm by blunt object, occurrence at trade and service area
U2A6.	All	[X]Intentional self harm by blunt object, occurrence at industrial and construction area
U2A7.	All	[X]Intentional self harm by blunt object, occurrence on farm
U2Ay.	All	[X]Intentional self harm by blunt object, occurrence at other specified place
U2Az.	All	[X]Intentional self harm by blunt object, occurrence at unspecified place

Supplementary table S2.8. Read codes used to identify parasuicide.

Parasuicide		
Read V2 Code	Term ID	Description
U21..	All	[X]Intent self harm by hanging, strangulation/suffocation
U210.	All	[X]Int self harm by hanging, strangulation/suffocation occ home
U211.	All	[X]Intent self harm by hanging, strangulation/suffocation at res institut
U212.	All	[X]Int self harm by hanging, strangulation/suffocation in school/pub admin area
U213.	All	[X]Intent self harm by hanging, strangulation/suffocation in sport/athletic area
U214.	All	[X]Int self harm by hanging, strangulation/suffocation in street/highway
U215.	All	[X]Intent self harm by hanging, strangulation/suffocation trade/service area
U216.	All	[X]Int self harm by hanging, strangulation/suffocation indust/construct area
U217.	All	[X]Int self harm by hanging, strangulation/suffocation occ farm
U21y.	All	[X]Int self harm by hanging, strangulation/suffocation other spec place
U21z.	All	[X]Intent self harm by hanging, strangulation/suffocation unspecif place
U22..	All	[X]Intent self harm by drowning and submersion
U220.	All	[X]Int self harm by drowning and submersion occ home
U221.	All	[X]Intent self harm by drowning and submersion at res institut
U222.	All	[X]Int self harm by drowning and submersion in school/pub admin area
U223.	All	[X]Intent self harm by drowning and submersion in sport/athletic area
U224.	All	[X]Int self harm by drowning and submersion in street/highway
U225.	All	[X]Intent self harm by drowning and submersion trade/service area
U226.	All	[X]Int self harm by drowning and submersion indust/construct area
U227.	All	[X]Int self harm by drowning and submersion occ farm
U22y.	All	[X]Int self harm by drowning and submersion other spec place
U22z.	All	[X]Intent self harm by drowning and submersion unspecif place
U23..	All	[X]Intent self harm by handgun discharge
U230.	All	[X]Int self harm by handgun discharge occ home
U231.	All	[X]Intent self harm by handgun discharge at res institut
U232.	All	[X]Int self harm by handgun discharge in school/pub admin area
U233.	All	[X]Intent self harm by handgun discharge in sport/athletic area
U234.	All	[X]Int self harm by handgun discharge in street/highway
U235.	All	[X]Intent self harm by handgun discharge trade/service area
U236.	All	[X]Int self harm by handgun discharge indust/construct area
U237.	All	[X]Int self harm by handgun discharge occ farm
U23y.	All	[X]Int self harm by handgun discharge other spec place
U23z.	All	[X]Intent self harm by handgun discharge unspecif place

U24..	All	[X]Intentional self harm by rifle, shotgun and larger firearm discharge
U240.	All	[X]Intentional self harm by rifle, shotgun and larger firearm discharge, occurrence at home
U241.	All	[X]Intentional self harm by rifle, shotgun and larger firearm discharge, occurrence in residential institution
U242.	All	[X]Intentional self harm by rifle, shotgun and larger firearm discharge, occurrence at school, other institution and public administrative area
U243.	All	[X]Intentional self harm by rifle, shotgun and larger firearm discharge, occurrence at sports and athletics area
U244.	All	[X]Intentional self harm by rifle, shotgun and larger firearm discharge, occurrence on street and highway
U245.	All	[X]Intentional self harm by rifle, shotgun and larger firearm discharge, occurrence at trade and service area
U246.	All	[X]Intentional self harm by rifle, shotgun and larger firearm discharge, occurrence at industrial and construction area
U247.	All	[X]Intentional self harm by rifle, shotgun and larger firearm discharge, occurrence on farm
U24y.	All	[X]Intentional self harm by rifle, shotgun and larger firearm discharge, occurrence at other specified place
U24z.	All	[X]Intentional self harm by rifle, shotgun and larger firearm discharge, occurrence at unspecified place
U25..	All	[X]Intentional self harm by other and unspecified firearm discharge
U250.	All	[X]Intentional self harm by other and unspecified firearm discharge, occurrence at home
U251.	All	[X]Intentional self harm by other and unspecified firearm discharge, occurrence in residential institution
U252.	All	[X]Intentional self harm by other and unspecified firearm discharge, occurrence at school, other institution and public administrative area
U253.	All	[X]Intentional self harm by other and unspecified firearm discharge, occurrence at sports and athletics area
U254.	All	[X]Intentional self harm by other and unspecified firearm discharge, occurrence on street and highway
U255.	All	[X]Intentional self harm by other and unspecified firearm discharge, occurrence at trade and service area
U256.	All	[X]Intentional self harm by other and unspecified firearm discharge, occurrence at industrial and construction area
U257.	All	[X]Intentional self harm by other and unspecified firearm discharge, occurrence on farm
U25y.	All	[X]Intentional self harm by other and unspecified firearm discharge, occurrence at other specified place
U25z.	All	[X]Intentional self harm by other and unspecified firearm discharge, occurrence at unspecified place
2...	All	[X]Suicide
TK...	All	Attempted suicide
TK0..	All	Suicide and selfinflicted poisoning by solid and liquid substances
TK00.	All	Suicide and selfinflicted poisoning by analgesics, antipyretics and anti-rheumatics
TK01.	All	Suicide + selfinflicted poisoning by barbiturates
TK010	All	Suicide and self inflicted injury by Amylobarbitone

TK011	All	Suicide and self inflicted injury by Barbitone
TK012	All	Suicide and self inflicted injury by Butabarbitalone
TK013	All	Suicide and self inflicted injury by Pentabarbitalone
TK014	All	Suicide and self inflicted injury by Phenobarbitalone
TK015	All	Suicide and self inflicted injury by Quinalbarbitalone
TK01z	All	Suicide and self inflicted injury by barbiturates
TK02.	All	Suicide and selfinflicted poisoning by other sedatives and hypnotics
TK03.	All	Suicide and selfinflicted poisoning by tranquillisers and other psychotropic agents
TK04.	All	Suicide and selfinflicted poisoning by other drugs and medicines
TK05.	All	Suicide + selfinflicted poisoning by drug or medicine NOS
TK06.	All	Suicide and selfinflicted poisoning by agricultural and horticultural chemical and pharmaceutical preparations other than plant foods and fertilizers
TK07.	All	Suicide and selfinflicted poisoning by corrosive and caustic substances
TK08.	All	Suicide and selfinflicted poisoning by arsenic and its compounds
TK0z.	All	Suicide and selfinflicted poisoning by solid and liquid substances NOS
TK1..	All	Suicide + selfinflicted poisoning by gases in domestic use
TK10.	All	Suicide and selfinflicted poisoning by gas distributed by pipeline
TK11.	All	Suicide and selfinflicted poisoning by liquefied petroleum gas distributed in mobile containers
TK1y.	All	Suicide and selfinflicted poisoning by other utility gas
TK1z.	All	Suicide and selfinflicted poisoning by gases in domestic use NOS
TK2..	All	Suicide and selfinflicted poisoning by other gases and vapours
TK20.	All	Suicide and selfinflicted poisoning by motor vehicle exhaust gas
TK21.	All	Suicide and selfinflicted poisoning by other carbon monoxide
TK2y.	All	Suicide and selfinflicted poisoning by other gases and vapours
TK2z.	All	Suicide + selfinflicted poisoning by gases and vapours NOS
TK3..	All	Suicide and selfinflicted injury by hanging, strangulation and suffocation
TK31.	All	Suicide and selfinflicted injury by suffocation by plastic bag
TK3y.	All	Suicide and selfinflicted injury by other means of hanging, strangulation and suffocation
TK3z.	All	Suicide and selfinflicted injury by hanging, strangulation and suffocation NOS
TK4..	All	Suicide and selfinflicted injury by drowning
TK5..	All	Suicide and selfinflicted injury by firearms and explosives
TK50.	All	Suicide and selfinflicted injury by handgun
TK51.	All	Suicide and selfinflicted injury by shotgun
TK52.	All	Suicide and selfinflicted injury by hunting rifle
TK53.	All	Suicide and selfinflicted injury by military firearms
TK54.	All	Suicide and selfinflicted injury by other firearm
TK55.	All	Suicide and selfinflicted injury by explosives
TK5z.	All	Suicide and selfinflicted injury by firearms and explosives NOS
TK6..	All	Suicide and selfinflicted injury by cutting and stabbing instruments

TK60.	All	Suicide and selfinflicted injury by cutting
TK61.	All	Suicide and selfinflicted injury by stabbing
TK6z.	All	Suicide and selfinflicted injury by cutting and stabbing instruments NOS
TK7..	All	Suicide and selfinflicted injury by jumping from high place
TK70.	All	Suicide and selfinflicted injury by jumping from residential premises
TK71.	All	Suicide and selfinflicted injury by jumping from other manmade structure
TK72.	All	Suicide and selfinflicted injury by jumping from natural sites
TK72.	All	Suicide and selfinflicted injury by jumping from natural sites
TK7z.	All	Suicide and selfinflicted injury by jumping from high place NOS
TKx..	All	Suicide and selfinflicted injury by other means
TKx0.	All	Suicide and selfinflicted injury by jumping or lying before moving object
TKx01	All	Suicide and selfinflicted injury by lying before moving object
TKx0z	All	Suicide and selfinflicted injury by jumping or lying before moving object NOS
TKx1.	All	Suicide and selfinflicted injury by burns or fire
TKx2.	All	Suicide and selfinflicted injury by scald
TKx3.	All	Suicide and selfinflicted injury by extremes of cold
TKx4.	All	Suicide and selfinflicted injury by electrocution
TKx5.	All	Suicide and selfinflicted injury by crashing of motor vehicle
TKx6.	All	Suicide and selfinflicted injury by crashing of aircraft
TKx7.	All	Suicide and selfinflicted injury by caustic substances, except poisoning
TKxy.	All	Suicide and selfinflicted injury by other specified means
TKxz.	All	Suicide and selfinflicted injury by other means NOS
TKz..	All	Suicide and selfinflicted injury NOS
Read CTV3 Code	Term ID	Description
Xa04L	All	Parasuicide
Xa3jI	All	Attempted suicide NOS
146A.	All	H/O: attempted suicide
XM1Fs	All	Self hanging, strangulation or suffocation
TK3..	All	Suicide and selfinflicted injury by hanging, strangulation and suffocation
TK30.	All	Suicide or attempted suicide by hanging
Xa3jC	All	Attempted suicide - hanging
Xa3jL	All	Suicide - hanging
TK3y.	All	Suicide and selfinflicted injury by other means of hanging, strangulation and suffocation
TK3z.	All	Suicide and selfinflicted injury by hanging, strangulation and suffocation NOS
XE22I	All	Suicide and selfinflicted injury by suffocation by plastic bag
Xa3jD	All	Attempted suicide - suffocation
Xa3jM	All	Suicide - suffocation
TK0..	All	Suicide and selfinflicted poisoning by solid and liquid substances

TK0z.	All	Suicide and selfinflicted poisoning by solid and liquid substances NOS
TK4..	All	Suicide and selfinflicted injury by drowning
TK5..	All	Suicide or selfinflicted injury by firearms and explosives
TK50.	All	Suicide or selfinflicted injury by handgun
TK51.	All	Suicide or selfinflicted injury by shotgun
TK52.	All	Suicide or selfinflicted injury by hunting rifle
TK53.	All	Suicide or selfinflicted injury by military firearm
TK54.	All	Suicide and selfinflicted injury by other firearm
TK55.	All	Suicide or selfinflicted injury by explosives
TK5z.	All	Suicide and selfinflicted injury by firearms and explosives NOS
Xa3jF	All	Attempted suicide - firearms
Xa3jO	All	Suicide - firearms
TK6..	All	Suicide or selfinflicted injury by cutting and stabbing
TK60.	All	Suicide or selfinflicted injury by cutting
TK61.	All	Suicide or selfinflicted injury by stabbing
TK6z.	All	Suicide and selfinflicted injury by cutting and stabbing instruments NOS
Xa3jG	All	Attempted suicide - cut/stab
Xa3jP	All	Suicide - cut/stab
TK7..	All	Suicide or self injury by jumping from a height
TK70.	All	Suicide and selfinflicted injury by jumping from residential premises
TK71.	All	Suicide and selfinflicted injury by jumping from other man-made structure
TK72.	All	Suicide and selfinflicted injury by jumping from natural sites
TK72.	All	Suicide and selfinflicted injury by jumping from natural sites
TK7z.	All	Suicide and selfinflicted injury by jumping from high place NOS
X71B6	All	Suicide or self injury by jumping from high man-made structure
X71B7	All	Suicide or self injury by jumping from high building
X71B8	All	Suicide or self injury by jumping from bridge
X71B9	All	Suicide or self injury by jumping from high natural feature
X71BA	All	Suicide or self injury by jumping off cliff
Xa3jH	All	Attempted suicide - jumping from a high place
Xa3jQ	All	Suicide - jumping from a high place
TKx..	All	Suicide and selfinflicted injury by other means
TKx0.	All	Suicide and selfinflicted injury by jumping or lying before moving object
TKx00	All	Suicide and selfinflicted injury by jumping before moving object
TKx01	All	Suicide and selfinflicted injury by lying before moving object
TKx0z	All	Suicide and selfinflicted injury by jumping or lying before moving object NOS
TKxy.	All	Suicide and selfinflicted injury by other specified means
TKxz.	All	Suicide and selfinflicted injury by other means NOS
TKx1.	All	Suicide or self injury by burning or fire
TKx2.	All	Suicide or self injury by scalding
X71BF	All	Suicide or self injury by igniting petrol soaked clothing

X71BG	All	Suicide or self injury by arson
TKx3.	All	Suicide or self injury by exposure to cold
TKx4.	All	Suicide or self injury by electric current
TKx7.	All	Suicide and selfinflicted injury by caustic substances, excluding poisoning
TKz..	All	Suicide and selfinflicted injury NOS
Xa3jI	All	Attempted suicide NOS
Xa3jR	All	Suicide NOS
X71B3	All	Self poisoning by gas
TK1..	All	Suicide and selfinflicted poisoning by gases in domestic use
TK21.	All	Suicide and selfinflicted poisoning by other carbon monoxide
TK2y.	All	Suicide and selfinflicted poisoning by other gases and vapours
TK2z.	All	Suicide and selfinflicted poisoning by gases and vapours NOS
X71B4	All	Self poisoning by carbon monoxide
TK20.	All	Self poisoning by motor vehicle exhaust gas
X71B5	All	Self poisoning by coal gas
X71BB	All	Suicide or self injury associated with moving vehicles
TKx5.	All	Suicide or selfinflicted injury by crashing motor vehicle
TKx6.	All	Suicide or selfinflicted injury by crashing of aircraft
X71BC	All	Suicide or self injury by placing self in path of moving vehicle
X71BD	All	Suicide or self injury by placing self in path of moving motor vehicle
X71BE	All	Suicide or self injury by placing self in path of moving railway vehicle
XE22J	All	Suicide or attempted suicide by drowning
Xa3jE	All	Attempted suicide - drowning
Xa3jN	All	Suicide - drowning
XM1Fs	All	Self hanging, strangulation or suffocation
TK3..	All	Suicide and selfinflicted injury by hanging, strangulation and suffocation
TK30.	All	Suicide or attempted suicide by hanging
Xa3jL	All	Suicide - hanging
TK3y.	All	Suicide and selfinflicted injury by other means of hanging, strangulation and suffocation
TK3z.	All	Suicide and selfinflicted injury by hanging, strangulation and suffocation NOS
XE22I	All	Suicide and selfinflicted injury by suffocation by plastic bag
Xa3jD	All	Attempted suicide - suffocation
Xa3jM	All	Suicide - suffocation
TK50.	All	Suicide or selfinflicted injury by handgun
Ua1AA	All	Hanging self
Ua1AB	All	Drowning self
Ua1A9	All	Jumping from height
Ua1A8	All	Jumping from building
Ua1A7	All	Jumping from bridge
Ua14U	All	Jumping from cliff
Ua1AE	All	Self-asphyxiation

Ua1AD	All	Self-strangulation
Ua1AC	All	Self-suffocation
Ua14S	All	Throwing self in front of vehicle
Ua14T	All	Throwing self in front of train
X71B0	All	Self poisoning by non-drug solid or liquid agents
TK07.	All	Self poisoning by corrosive or caustic substance
TK08.	All	Self poisoning by arsenic or its compounds
X71B2	All	Self poisoning by plants or parts of plants
XM1FX	All	Self poisoning by agricultural chemical
TK06.	All	Suicide and selfinflicted poisoning by agricultural and horticultural chemical and pharmaceutical preparations other than plant foods and fertilizers
X71B1	All	Self poisoning by paraquat
Ua14R	All	Shooting self
Xa2pL	All	Stabbing self
U21..	All	[X]Intent self harm by hanging, strangulation/suffocation
U210.	All	[X]Int self harm by hanging, strangulation/suffocation occ home
U211.	All	[X]Intent self harm by hanging, strangulation/suffocation at res institut
U212.	All	[X]Int self harm by hanging, strangulation/suffocation in school/pub admin area
U213.	All	[X]Intent self harm by hanging, strangulation/suffocation in sport/athletic area
U214.	All	[X]Int self harm by hanging, strangulation/suffocation in street/highway
U215.	All	[X]Intent self harm by hanging, strangulation/suffocation trade/service area
U216.	All	[X]Int self harm by hanging, strangulation/suffocation indust/construct area
U217.	All	[X]Int self harm by hanging, strangulation/suffocation occ farm
U21y.	All	[X]Int self harm by hanging, strangulation/suffocation other spec place
U21z.	All	[X]Intent self harm by hanging, strangulation/suffocation unspecif place
U22..	All	[X]Intent self harm by drowning and submersion
U220.	All	[X]Int self harm by drowning and submersion occ home
U221.	All	[X]Intent self harm by drowning and submersion at res institut
U222.	All	[X]Int self harm by drowning and submersion in school/pub admin area
U223.	All	[X]Intent self harm by drowning and submersion in sport/athletic area
U224.	All	[X]Int self harm by drowning and submersion in street/highway
U225.	All	[X]Intent self harm by drowning and submersion trade/service area
U226.	All	[X]Int self harm by drowning and submersion indust/construct area
U227.	All	[X]Int self harm by drowning and submersion occ farm
U22y.	All	[X]Int self harm by drowning and submersion other spec place
U22z.	All	[X]Intent self harm by drowning and submersion unspecif place
U23..	All	[X]Intent self harm by handgun discharge

U230.	All	[X]Int self harm by handgun discharge occ home
U231.	All	[X]Intent self harm by handgun discharge at res institut
U232.	All	[X]Int self harm by handgun discharge in school/pub admin area
U233.	All	[X]Intent self harm by handgun discharge in sport/athletic area
U234.	All	[X]Int self harm by handgun discharge in street/highway
U235.	All	[X]Intent self harm by handgun discharge trade/service area
U236.	All	[X]Int self harm by handgun discharge indust/construct area
U237.	All	[X]Int self harm by handgun discharge occ farm
U23y.	All	[X]Int self harm by handgun discharge other spec place
U23z.	All	[X]Intent self harm by handgun discharge unspecif place
U24..	All	[X]Intentional self harm by rifle, shotgun and larger firearm discharge
U240.	All	[X]Intentional self harm by rifle, shotgun and larger firearm discharge, occurrence at home
U241.	All	[X]Intentional self harm by rifle, shotgun and larger firearm discharge, occurrence in residential institution
U242.	All	[X]Intentional self harm by rifle, shotgun and larger firearm discharge, occurrence at school, other institution and public administrative area
U243.	All	[X]Intentional self harm by rifle, shotgun and larger firearm discharge, occurrence at sports and athletics area
U244.	All	[X]Intentional self harm by rifle, shotgun and larger firearm discharge, occurrence on street and highway
U245.	All	[X]Intentional self harm by rifle, shotgun and larger firearm discharge, occurrence at trade and service area
U246.	All	[X]Intentional self harm by rifle, shotgun and larger firearm discharge, occurrence at industrial and construction area
U247.	All	[X]Intentional self harm by rifle, shotgun and larger firearm discharge, occurrence on farm
U24y.	All	[X]Intentional self harm by rifle, shotgun and larger firearm discharge, occurrence at other specified place
U24z.	All	[X]Intentional self harm by rifle, shotgun and larger firearm discharge, occurrence at unspecified place
U25..	All	[X]Intentional self harm by other and unspecified firearm discharge
U250.	All	[X]Intentional self harm by other and unspecified firearm discharge, occurrence at home
U251.	All	[X]Intentional self harm by other and unspecified firearm discharge, occurrence in residential institution
U252.	All	[X]Intentional self harm by other and unspecified firearm discharge, occurrence at school, other institution and public administrative area
U253.	All	[X]Intentional self harm by other and unspecified firearm discharge, occurrence at sports and athletics area
U254.	All	[X]Intentional self harm by other and unspecified firearm discharge, occurrence on street and highway
U255.	All	[X]Intentional self harm by other and unspecified firearm discharge, occurrence at trade and service area
U256.	All	[X]Intentional self harm by other and unspecified firearm discharge, occurrence at industrial and construction area
U257.	All	[X]Intentional self harm by other and unspecified firearm discharge, occurrence on farm

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U25y.	All	<input checked="" type="checkbox"/> Intentional self harm by other and unspecified firearm discharge, occurrence at other specified place
U25z.	All	<input checked="" type="checkbox"/> Intentional self harm by other and unspecified firearm discharge, occurrence at unspecified place

For peer review only

Supplementary table S2.9. Read codes used to identify overdose.

Medication overdose		
Read V2 Code	Term ID	Description
U20..	All	[X]Intentional self poisoning /exposure to noxious substance
U200.	All	[X]Intent self poison/exposure to nonopioid analgesic
U2000	All	[X]Int self poison/exposure to nonopioid analgesic at home
U2001	All	[X]Intent self poison nonopioid analgesic at res institut
U2002	All	[X]Int self poison nonopioid analgesic in school/pub admin area
U2003	All	[X]Intent self pois nonopioid analgesic in sport/athletic area
U2004	All	[X]Int self pois to nonopioid analgesic in street/highway
U2005	All	[X]Intent self pois to nonopioid analgesic trade/service area
U2006	All	[X]Int self pois to nonopioid analgesic indust/construct area
U2007	All	[X]Int self poison/exposure to nonopioid analgesic on farm
U200y	All	[X]Int self poison nonopioid analgesic other spec place
U200z	All	[X]Intent self poison to nonopioid analgesic unspecif place
U201.	All	[X]Intent self poison/exposure to antiepileptic
U2010	All	[X]Int self poison/exposure to antiepileptic at home
U2011	All	[X]Intent self poison antiepileptic at res institut
U2012	All	[X]Int self poison antiepileptic in school/pub admin area
U2013	All	[X]Intent self pois antiepileptic in sport/athletic area
U2014	All	[X]Int self pois antiepileptic in street/highway
U2015	All	[X]Intent self pois antiepileptic trade/service area
U2016	All	[X]Int self poison antiepileptic indust/construct area
U2017	All	[X]Int self poison/exposure to antiepileptic on farm
U201y	All	[X]Int self poison antiepileptic other spec place
U201z	All	[X]Intent self poison antiepileptic unspecif place
U202.	All	[X]Intent self poison/exposure to sedative hypnotic
U2020	All	[X]Int self poison/exposure to sedative hypnotic at home
U2021	All	[X]Intent self poison sedative hypnotic at res institut
U2022	All	[X]Int self poison sedative hypnotic in school/pub admin area
U2023	All	[X]Intent self pois sedative hypnotic in sport/athletic area
U2024	All	[X]Int self pois sedative hypnotic in street/highway
U2025	All	[X]Intent self pois sedative hypnotic trade/service area
U2026	All	[X]Int self poison sedative hypnotic indust/construct area
U2027	All	[X]Int self poison/exposure to sedative hypnotic on farm
U202y	All	[X]Int self poison sedative hypnotic other spec place
U202z	All	[X]Intent self poison sedative hypnotic unspecif place
U203.	All	[X]Intent self poison/exposure to antiparkinson drug
U2030	All	[X]Int self poison/exposure to antiparkinson drug at home
U2031	All	[X]Intent self poison antiparkinson drug at res institut
U2032	All	[X]Int self poison antiparkinson drug in school/pub admin area
U2033	All	[X]Intent self pois antiparkinson drug in sport/athletic area
U2034	All	[X]Int self pois antiparkinson drug in street/highway

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4	U2035	All	[X]Intent self pois antiparkinson drug trade/service area
5	U2036	All	[X]Int self poison antiparkinson drug indust/construct area
6	U2037	All	[X]Int self poison/exposure to antiparkinson drug on farm
7	U203y	All	[X]Int self poison antiparkinson drug other spec place
8	U203z	All	[X]Intent self poison antiparkinson drug unspecif place
9	U204.	All	[X]Intent self poison/exposure to psychotropic drug
10	U2040	All	[X]Int self poison/exposure to psychotropic drug at home
11	U2041	All	[X]Intent self poison psychotropic drug at res institut
12	U2042	All	[X]Int self poison psychotropic drug in school/pub admin area
13	U2043	All	[X]Intent self pois psychotropic drug in sport/athletic area
14	U2044	All	[X]Int self pois psychotropic drug in street/highway
15	U2045	All	[X]Intent self pois psychotropic drug trade/service area
16	U2046	All	[X]Int self poison psychotropic drug indust/construct area
17	U2047	All	[X]Int self poison/exposure to psychotropic drug on farm
18	U204y	All	[X]Int self poison psychotropic drug other spec place
19	U204z	All	[X]Intent self poison psychotropic drug unspecif place
20	U205.	All	[X]Intent self poison/exposure to narcotic drug
21	U2050	All	[X]Int self poison/exposure to narcotic drug at home
22	U2051	All	[X]Intent self poison narcotic drug at res institut
23	U2052	All	[X]Int self poison narcotic drug in school/pub admin area
24	U2053	All	[X]Intent self pois narcotic drug in sport/athletic area
25	U2054	All	[X]Int self pois narcotic drug in street/highway
26	U2055	All	[X]Intent self pois narcotic drug trade/service area
27	U2056	All	[X]Int self poison narcotic drug indust/construct area
28	U2057	All	[X]Int self poison/exposure to narcotic drug on farm
29	U205y	All	[X]Int self poison narcotic drug other spec place
30	U205z	All	[X]Intent self poison narcotic drug unspecif place
31	U206.	All	[X]Intent self poison/exposure to hallucinogen
32	U2060	All	[X]Int self poison/exposure to hallucinogen at home
33	U2061	All	[X]Intent self poison hallucinogen at res institut
34	U2062	All	[X]Int self poison hallucinogen in school/pub admin area
35	U2063	All	[X]Intent self pois hallucinogen in sport/athletic area
36	U2064	All	[X]Int self pois hallucinogen in street/highway
37	U2065	All	[X]Intent self pois hallucinogen trade/service area
38	U2066	All	[X]Int self poison hallucinogen indust/construct area
39	U2067	All	[X]Int self poison/exposure to hallucinogen on farm
40	U206y	All	[X]Int self poison hallucinogen other spec place
41	U206z	All	[X]Intent self poison hallucinogen unspecif place
42	U207.	All	[X]Intent self poison/exposure to oth autonom drug
43	U2070	All	[X]Int self poison/exposure to oth autonom drug at home
44	U2071	All	[X]Intent self poison oth autonom drug at res institut
45	U2072	All	[X]Int self poison oth autonom drug in school/pub admin area
46	U2073	All	[X]Intent self pois oth autonom drug in sport/athletic area
47	U2074	All	[X]Int self pois oth autonom drug in street/highway
48	U2075	All	[X]Intent self pois oth autonom drug trade/service area
49			
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U2076	All	[X]Int self poison oth autonom drug indust/construct area
U2077	All	[X]Int self poison/exposure to oth autonom drug on farm
U207y	All	[X]Int self poison oth autonom drug other spec place
U207z	All	[X]Intent self poison oth autonom drug unspecif place
U208.	All	[X]Intent self poison/exposure to other/unspec drug/medicament
U2080	All	[X]Int self poison/exposure to other/unspec drug/medicament at home
U2081	All	[X]Intent self poison other/unspec drug/medicament at res institut
U2082	All	[X]Int self poison other/unspec drug/medicament in school/pub admin area
U2083	All	[X]Intent self pois other/unspec drug/medicament in sport/athletic area
U2084	All	[X]Int self pois other/unspec drug/medicament in street/highway
U2085	All	[X]Intent self pois other/unspec drug/medicament trade/service area
U2086	All	[X]Int self poison other/unspec drug/medicament indust/construct area
U2087	All	[X]Int self poison/exposure to other/unspec drug/medicament on farm
U208y	All	[X]Int self poison other/unspec drug/medicament other spec place
U208z	All	[X]Intent self poison other/unspec drug/medicament unspecif place
U209.	All	[X]Intent self poison/exposure to alcohol
U2090	All	[X]Int self poison/exposure to alcohol at home
U2091	All	[X]Intent self poison alcohol at res institut
U2092	All	[X]Int self poison alcohol in school/pub admin area
U2093	All	[X]Intent self pois alcohol in sport/athletic area
U2094	All	[X]Int self pois alcohol in street/highway
U2095	All	[X]Intent self pois alcohol trade/service area
U2096	All	[X]Int self poison alcohol indust/construct area
U2097	All	[X]Int self poison/exposure alcohol on farm
U209y	All	[X]Int self poison alcohol other spec place
U209z	All	[X]Intent self poison alcohol unspecif place
U20A.	All	[X]Intent self poison/exposure to organ solvent, halogen, hydrocarb
U20A0	All	[X]Int self poison/exposure to organ solvent, halogen, hydrocarb at home
U20A1	All	[X]Intent self poison organ solvent, halogen, hydrocarb at res institut
U20A2	All	[X]Int self poison organ solvent, halogen, hydrocarb in school/pub admin area
U20A3	All	[X]Intent self pois organ solvent, halogen, hydrocarb in sport/athletic area
U20A4	All	[X]Int self pois organ solvent, halogen, hydrocarb in street/highway
U20A5	All	[X]Intent self pois organ solvent, halogen, hydrocarb trade/service area
U20A6	All	[X]Int self poison organ solvent, halogen, hydrocarb indust/construct area
U20A7	All	[X]Int self poison/exposure organ solvent, halogen, hydrocarb on farm
U20Ay	All	[X]Int self poison organ solvent, halogen, hydrocarb other spec place

U20Az	All	[X]Intent self poison organ solvent, halogen, hydrocarb unspecif place
U20B.	All	[X]Intent self poison/exposure to other gas/vapour
U20B0	All	[X]Int self poison/exposure to other gas/vapour at home
U20B1	All	[X]Intent self poison other gas/vapour at res institut
U20B2	All	[X]Int self poison other gas/vapour in school/pub admin area
U20B3	All	[X]Intent self pois other gas/vapour in sport/athletic area
U20B4	All	[X]Int self pois other gas/vapour in street/highway
U20B5	All	[X]Intent self pois other gas/vapour trade/service area
U20B6	All	[X]Int self poison other gas/vapour indust/construct area
U20B7	All	[X]Int self poison/exposure other gas/vapourl on farm
U20By	All	[X]Int self poison other gas/vapour other spec place
U20Bz	All	[X]Intent self poison other gas/vapour unspecif place
U20C.	All	[X]Intent self poison/exposure to pesticide
U20C0	All	[X]Int self poison/exposure to pesticide at home
U20C1	All	[X]Intent self poison pesticide at res institut
U20C2	All	[X]Int self poison pesticide in school/pub admin area
U20C3	All	[X]Intent self pois pesticide in sport/athletic area
U20C4	All	[X]Int self pois pesticide in street/highway
U20C5	All	[X]Intent self pois pesticidel trade/service area
U20C6	All	[X]Int self poison pesticide indust/construct area
U20C7	All	[X]Int self poison/exposure pesticide on farm
U20Cy	All	[X]Int self poison pesticide other spec place
U20Cz	All	[X]Intent self poison pesticide unspecif place
U20y.	All	[X]Intent self poison/exposure to unspecif chemical
U20y0	All	[X]Int self poison/exposure to unspecif chemical at home
U20y1	All	[X]Intent self poison unspecif chemical at res institut
U20y2	All	[X]Int self poison unspecif chemical in school/pub admin area
U20y3	All	[X]Intent self pois unspecif chemical in sport/athletic area
U20y4	All	[X]Int self pois unspecif chemical in street/highway
U20y5	All	[X]Intent self pois unspecif chemical trade/service area
U20y6	All	[X]Int self poison unspecif chemical indust/construct area
U20y7	All	[X]Int self poison/exposure unspecif chemical on farm
U20yy	All	[X]Int self poison unspecif chemical other spec place
U20yz	All	[X]Intent self poison unspecif chemical unspecif place
14K0.	All	H/O: repeated overdose
1JP..	All	Suspected drug overdose
TK...	All	Cause of overdose - deliberate
Read CTV3 Code	Term ID	Description
U200.	All	[X]Intent self poison/exposure to nonopioid analgesic
U2000	All	[X]Int self poison/exposure to nonopioid analgesic at home
U2001	All	[X]Intent self poison nonopioid analgesic at res institut
U2002	All	[X]Int self poison nonopioid analgesic in school/pub admin area
U2003	All	[X]Intent self pois nonopioid analgesic in sport/athletic area

U2004	All	[X]Int self pois to nonopioid analgesic in street/highway
U2005	All	[X]Intent self pois to nonopioid analgesic trade/service area
U2006	All	[X]Int self pois to nonopioid analgesic indust/construct area
U2007	All	[X]Int self poison/exposure to nonopioid analgesic on farm
U200y	All	[X]Int self poison nonopioid analgesic other spec place
U200z	All	[X]Intent self poison to nonopioid analgesic unspecif place
U201.	All	[X]Intent self poison/exposure to antiepileptic
U2010	All	[X]Int self poison/exposure to antiepileptic at home
U2011	All	[X]Intent self poison antiepileptic at res institut
U2012	All	[X]Int self poison antiepileptic in school/pub admin area
U2013	All	[X]Intent self pois antiepileptic in sport/athletic area
U2014	All	[X]Int self pois antiepileptic in street/highway
U2015	All	[X]Intent self pois antiepileptic trade/service area
U2016	All	[X]Int self poison antiepileptic indust/construct area
U2017	All	[X]Int self poison/exposure to antiepileptic on farm
U201y	All	[X]Int self poison antiepileptic other spec place
U201z	All	[X]Intent self poison antiepileptic unspecif place
U2030	All	[X]Int self poison/exposure to antiparkinson drug at home
U2031	All	[X]Intent self poison antiparkinson drug at res institut
U2032	All	[X]Int self poison antiparkinson drug in school/pub admin area
U2033	All	[X]Intent self pois antiparkinson drug in sport/athletic area
U2034	All	[X]Int self pois antiparkinson drug in street/highway
U2035	All	[X]Intent self pois antiparkinson drug trade/service area
U2036	All	[X]Int self poison antiparkinson drug indust/construct area
U2037	All	[X]Int self poison/exposure to antiparkinson drug on farm
U203y	All	[X]Int self poison antiparkinson drug other spec place
U203z	All	[X]Intent self poison antiparkinson drug unspecif place
XE22f	All	[X]Intent self poison/exposure to narcotic drug
U2050	All	[X]Int self poison/exposure to narcotic drug at home
U2051	All	[X]Intent self poison narcotic drug at res institut
U2052	All	[X]Int self poison narcotic drug in school/pub admin area
U2053	All	[X]Intent self pois narcotic drug in sport/athletic area
U2054	All	[X]Int self pois narcotic drug in street/highway
U2055	All	[X]Intent self pois narcotic drug trade/service area
U2056	All	[X]Int self poison narcotic drug indust/construct area
U2057	All	[X]Int self poison/exposure to narcotic drug on farm
U205y	All	[X]Int self poison narcotic drug other spec place
U205z	All	[X]Intent self poison narcotic drug unspecif place
U206.	All	[X]Intent self poison/exposure to hallucinogen
U2060	All	[X]Int self poison/exposure to hallucinogen at home
U2061	All	[X]Intent self poison hallucinogen at res institut
U2062	All	[X]Int self poison hallucinogen in school/pub admin area
U2063	All	[X]Intent self pois hallucinogen in sport/athletic area
U2064	All	[X]Int self pois hallucinogen in street/highway
U2065	All	[X]Intent self pois hallucinogen trade/service area

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2			
3			
4	U2066	All	[X]Int self poison hallucinogen indust/construct area
5	U2067	All	[X]Int self poison/exposure to hallucinogen on farm
6	U206y	All	[X]Int self poison hallucinogen other spec place
7	U206z	All	[X]Intent self poison hallucinogen unspecif place
8			
9	U207.	All	[X]Intent self poison/exposure to oth autonom drug
10	U2070	All	[X]Int self poison/exposure to oth autonom drug at home
11	U2071	All	[X]Intent self poison oth autonom drug at res institut
12	U2072	All	[X]Int self poison oth autonom drug in school/pub admin area
13	U2073	All	[X]Intent self pois oth autonom drug in sport/athletic area
14	U2074	All	[X]Int self pois oth autonom drug in street/highway
15	U2075	All	[X]Intent self pois oth autonom drug trade/service area
16	U2076	All	[X]Int self poison oth autonom drug indust/construct area
17	U2077	All	[X]Int self poison/exposure to oth autonom drug on farm
18	U207y	All	[X]Int self poison oth autonom drug other spec place
19	U207z	All	[X]Intent self poison oth autonom drug unspecif place
20	U208.	All	[X]Intent self poison/exposure to other/unspec drug/medicament
21			[X]Int self poison/exposure to other/unspec drug/medicament at
22	U2080	All	home
23	U2081	All	[X]Intent self poison other/unspec drug/medicament at res institut
24			[X]Int self poison other/unspec drug/medicament in school/pub
25	U2082	All	admin area
26			[X]Intent self pois other/unspec drug/medicament in sport/athletic
27	U2083	All	area
28	U2084	All	[X]Int self pois other/unspec drug/medicament in street/highway
29			[X]Intent self pois other/unspec drug/medicament trade/service
30	U2085	All	area
31			[X]Int self poison other/unspec drug/medicament indust/construct
32	U2086	All	area
33			[X]Int self poison/exposure to other/unspec drug/medicament on
34	U2087	All	farm
35	U208y	All	[X]Int self poison other/unspec drug/medicament other spec place
36	U208z	All	[X]Intent self poison other/unspec drug/medicament unspecif place
37	SyuFc	All	[X]Poisoning by other & unspecified drugs and biologic substances
38	U209.	All	[X]Intent self poison/exposure to alcohol
39	U2090	All	[X]Int self poison/exposure to alcohol at home
40	U2091	All	[X]Intent self poison alcohol at res institut
41	U2092	All	[X]Int self poison alcohol in school/pub admin area
42	U2093	All	[X]Intent self pois alcohol in sport/athletic area
43	U2094	All	[X]Int self pois alcohol in street/highway
44	U2095	All	[X]Intent self pois alcohol trade/service area
45	U2096	All	[X]Int self poison alcohol indust/construct area
46	U2097	All	[X]Int self poison/exposure alcohol on farm
47	U209y	All	[X]Int self poison alcohol other spec place
48	U209z	All	[X]Intent self poison alcohol unspecif place
49	U20A.	All	[X]Intent self poison/exposure to organ solvent, halogen, hydrocarb
50			[X]Int self poison/exposure to organ solvent, halogen, hydrocarb at
51	U20A0	All	home
52			
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U20A1	All	[X]Intent self poison organ solvent, halogen, hydrocarbat res institut
U20A2	All	[X]Int self poison organ solvent, halogen, hydrocarb in school/pub admin area
U20A3	All	[X]Intent self pois organ solvent, halogen, hydrocarb in sport/athletic area
U20A4	All	[X]Int self pois organ solvent, halogen, hydrocarb in street/highway
U20A5	All	[X]Intent self pois organ solvent, halogen, hydrocarb trade/service area
U20A6	All	[X]Int self poison organ solvent, halogen, hydrocarb indust/construct area
U20A7	All	[X]Int self poison/exposure organ solvent, halogen, hydrocarb on farm
U20Ay	All	[X]Int self poison organ solvent, halogen, hydrocarb other spec place
U20Az	All	[X]Intent self poison organ solvent, halogen, hydrocarb unspecif place
XE22g	All	[X]Intent self poison/exposure to other gas/vapour
U20B0	All	[X]Int self poison/exposure to other gas/vapour at home
U20B1	All	[X]Intent self poison other gas/vapour at res institut
U20B2	All	[X]Int self poison other gas/vapour in school/pub admin area
U20B3	All	[X]Intent self pois other gas/vapour in sport/athletic area
U20B4	All	[X]Int self pois other gas/vapour in street/highway
U20B5	All	[X]Intent self pois other gas/vapour trade/service area
U20B6	All	[X]Int self poison other gas/vapour indust/construct area
U20B7	All	[X]Int self poison/exposure other gas/vapourl on farm
U20By	All	[X]Int self poison other gas/vapour other spec place
U20Bz	All	[X]Intent self poison other gas/vapour unspecif place
U20C.	All	[X]Intent self poison/exposure to pesticide
U20C0	All	[X]Int self poison/exposure to pesticide at home
U20C1	All	[X]Intent self poison pesticide at res institut
U20C2	All	[X]Int self poison pesticide in school/pub admin area
U20C3	All	[X]Intent self pois pesticide in sport/athletic area
U20C4	All	[X]Int self pois pesticide in street/highway
U20C5	All	[X]Intent self pois pesticidel trade/service area
U20C6	All	[X]Int self poison pesticide indust/construct area
U20C7	All	[X]Int self poison/exposure pesticide on farm
U20Cy	All	[X]Int self poison pesticide other spec place
U20Cz	All	[X]Intent self poison pesticide unspecif place
Xa59l	All	Intentional pesticide product poisoning
U20y.	All	[X]Intent self poison/exposure to unspecif chemical
U20y0	All	[X]Int self poison/exposure to unspecif chemical at home
U20y1	All	[X]Intent self poison unspecif chemical at res institut
U20y2	All	[X]Int self poison unspecif chemical in school/pub admin area
U20y3	All	[X]Intent self pois unspecif chemical in sport/athletic area
U20y4	All	[X]Int self pois unspecif chemical in street/highway
U20y5	All	[X]Intent self pois unspecif chemical trade/service area
U20y6	All	[X]Int self poison unspecif chemical indust/construct area

U20y7	All	[X]Int self poison/exposure unspecif chemical on farm
U20yy	All	[X]Int self poison unspecif chemical other spec place
U20yz	All	[X]Intent self poison unspecif chemical unspecif place
TK0z.	All	Suicide and selfinflicted poisoning by solid and liquid substances NOS
XM0Ba	All	Deliberate self poisoning
TK0..	All	Suicide and selfinflicted poisoning by solid and liquid substances
X71Am	All	Deliberate overdose of drug or pharmaceutical preparation
TK00.	All	Suicide and selfinflicted poisoning by analgesics, antipyretics and anti-rheumatics
TK01.	All	Suicide and selfinflicted poisoning by barbiturates
TK010	All	Suicide and self inflicted injury by amobarbital
TK011	All	Suicide and self inflicted injury by Barbitone
TK012	All	Suicide and self inflicted injury by Butabarbitone
TK013	All	Suicide and self inflicted injury by Pentabarbitone
TK014	All	Suicide and self inflicted injury by phenobarbital
TK015	All	Suicide and self inflicted injury by secobarbital
TK01z	All	Suicide and self inflicted injury by barbiturates
TK02.	All	Suicide and selfinflicted poisoning by other sedatives and hypnotics
TK03.	All	Suicide and selfinflicted poisoning by tranquillisers and other psychotropic agents
TK04.	All	Suicide and selfinflicted poisoning by other drugs and medicines
TK05.	All	Suicide and selfinflicted poisoning by drug or medicine NOS
X71Ap	All	Deliberate overdose of aspirin
X71Ax	All	Deliberate overdose of diazepam
X71Av	All	Deliberate overdose of methadone
X71Az	All	Deliberate overdose of temazepam
X71Ar	All	Deliberate overdose of co-proxamol
X71At	All	Deliberate overdose of diamorphine
X71Aw	All	Deliberate overdose of benzodiazepine
X71Au	All	Deliberate overdose of dihydrocodeine
X71As	All	Deliberate overdose of opiate analgesic
X71Ay	All	Deliberate overdose of chlordiazepoxide
X71Aq	All	Deliberate overdose of combined analgesic
X71An	All	Deliberate overdose of non-opiate analgesics
Xa0Jl	All	Deliberate overdose of non-steroidal anti-inflammatory agent
XaR4S	All	Intentional overdose of prescription only medication
Xa62F	All	Intentional over-the-counter product overdose
Xa65i	All	Intentional bismuth compound overdose
Xa65m	All	Intentional sucralfate overdose
Xa65q	All	Intentional liquorice overdose
Xa65u	All	Intentional misoprostol overdose
Xa65z	All	Intentional cimetidine overdose
Xa663	All	Intentional famotidine overdose
Xa667	All	Intentional nizatidine overdose

Xa66B	All	Intentional ranitidine overdose
Xa66D	All	Intentional overdose of H2 antagonist
Xa66I	All	Intentional omeprazole overdose
Xa66M	All	Intentional lansoprazole overdose
Xa66Q	All	Intentional carbenoxolone overdose
Xa66U	All	Intentional pirenzepine overdose
Xa66Y	All	Intentional 5-aminosalicylic acid overdose
Xa66d	All	Intentional aluminium hydroxide overdose
Xa66h	All	Intentional magnesium trisilicate overdose
Xa66l	All	Intentional loperamide overdose
Xa66p	All	Intentional kaolin overdose
Xa66u	All	Intentional cisapride overdose
Xa66z	All	Intentional nabilone overdose
Xa673	All	Intentional domperidone overdose
Xa677	All	Intentional metoclopramide overdose
Xa67B	All	Intentional 5-HT3-receptor antagonist overdose
Xa67G	All	Intentional bisacodyl overdose
Xa67K	All	Intentional dantron overdose
Xa67O	All	Intentional sodium picosulfate overdose
Xa67S	All	Intentional lactulose overdose
Xa67W	All	Intentional magnesium sulphate overdose
Xa67a	All	Intentional bulk-forming laxative overdose
Xa67e	All	Intentional anthraquinone laxative overdose
Xa67i	All	Intentional cascara overdose
Xa67m	All	Intentional senna overdose
Xa67q	All	Intentional docusate overdose
Xa67v	All	Intentional castor oil overdose
Xa67z	All	Intentional phenolphthalein overdose
Xa684	All	Intentional dioctyl sulphosuccinate overdose
Xa688	All	Intentional antispasmodic overdose
Xa68C	All	Intentional bile agent overdose
Xa69o	All	Intentional immunostimulant overdose
Xa69u	All	Intentional mitobronitol overdose
Xa69y	All	Intentional busulfan overdose
Xa6A2	All	Intentional treosulfan overdose
Xa6A6	All	Intentional thiotepa overdose
Xa6AB	All	Intentional chlorambucil overdose
Xa6AF	All	Intentional cyclophosphamide overdose
Xa6AJ	All	Intentional ethoglucid overdose
Xa6AN	All	Intentional ifosfamide overdose
Xa6AR	All	Intentional melphalan overdose
Xa6AV	All	Intentional estramustine overdose
Xa6AZ	All	Intentional chlormethine overdose
Xa6Ae	All	Intentional carmustine overdose
Xa6Ai	All	Intentional lomustine overdose

Xa6An	All	Intentional dacarbazine overdose
Xa6As	All	Intentional dactinomycin overdose
Xa6Aw	All	Intentional bleomycin overdose
Xa6B0	All	Intentional mitomycin overdose
Xa6B4	All	Intentional plicamycin overdose
Xa6B8	All	Intentional aclarubicin overdose
Xa6BC	All	Intentional mitoxantrone overdose
Xa6BG	All	Intentional doxorubicin overdose
Xa6BK	All	Intentional epirubicin overdose
Xa6B0	All	Intentional idarubicin overdose
Xa6BT	All	Intentional mercuric oxide overdose
Xa6BX	All	Intentional methotrexate overdose
Xa6Bb	All	Intentional mercaptopurine overdose
Xa6Bf	All	Intentional tioguanine overdose
Xa6Bj	All	Intentional pentostatin overdose
Xa6Bn	All	Intentional cytarabine overdose
Xa6Br	All	Intentional fluorouracil overdose
Xa6Bv	All	Intentional etoposide overdose
Xa6Bz	All	Intentional amsacrine overdose
Xa6C3	All	Intentional carboplatin overdose
Xa6C7	All	Intentional cisplatin overdose
Xa6CB	All	Intentional hydroxycarbamide overdose
Xa6CF	All	Intentional procarbazine overdose
Xa6CJ	All	Intentional razoxane overdose
Xa6CN	All	Intentional crisantaspase overdose
Xa6CR	All	Intentional paclitaxel overdose
Xa6CV	All	Intentional fludarabine overdose
Xa6CZ	All	Intentional aminoglutethimide overdose
Xa6Ce	All	Intentional trilostane overdose
Xa6Ci	All	Intentional tamoxifen overdose
Xa6Cm	All	Intentional formestane overdose
Xa6Cr	All	Intentional vinblastine overdose
Xa6Cv	All	Intentional vincristine overdose
Xa6Cz	All	Intentional vindesine overdose
Xa6D4	All	Intentional ciclosporin overdose
Xa6D8	All	Intentional azathioprine overdose
Xa6DD	All	Intentional central appetite depressant overdose
Xa6DI	All	Intentional levodopa overdose
Xa6DM	All	Intentional amantadine overdose
Xa6DQ	All	Intentional lisuride overdose
Xa6DU	All	Intentional bromocriptine overdose
Xa6DZ	All	Intentional lithium overdose
Xa6Dd	All	Intentional amitriptyline overdose
Xa6Dh	All	Intentional amoxapine overdose
Xa6DI	All	Intentional butriptyline overdose

Xa6Dp	All	Intentional clomipramine overdose
Xa6Dt	All	Intentional desipramine overdose
Xa6Dx	All	Intentional dosulepin overdose
Xa6E1	All	Intentional doxepin overdose
Xa6E5	All	Intentional imipramine overdose
Xa6E9	All	Intentional iprindole overdose
Xa6ED	All	Intentional lofepramine overdose
Xa6EH	All	Intentional nortriptyline overdose
Xa6EL	All	Intentional protriptyline overdose
Xa6EP	All	Intentional trimipramine overdose
Xa6Zp	All	Intentional overdose of tricyclic antidepressant
Xa6EU	All	Intentional phenelzine overdose
Xa6EY	All	Intentional iproniazid overdose
Xa6Ec	All	Intentional isocarboxazid overdose
Xa6Eg	All	Intentional tranlycypromine overdose
Xa6Ek	All	Intentional moclobemide overdose
Xa6Eo	All	Intentional tryptophan overdose
Xa6Es	All	Intentional venlafaxine overdose
Xa6Ex	All	Intentional sertraline overdose
Xa6F1	All	Intentional paroxetine overdose
Xa6F5	All	Intentional nefazodone overdose
Xa6F9	All	Intentional citalopram overdose
Xa6FD	All	Intentional fluoxetine overdose
Xa6FH	All	Intentional fluvoxamine overdose
Xa6FM	All	Intentional maprotiline overdose
Xa6FQ	All	Intentional mianserin overdose
Xa6FU	All	Intentional trazodone overdose
Xa6FY	All	Intentional viloxazine overdose
Xa6Fd	All	Intentional beclamide overdose
Xa6Fh	All	Intentional lamotrigine overdose
Xa6Fl	All	Intentional piracetam overdose
Xa6Fp	All	Intentional gabapentin overdose
Xa6Ft	All	Intentional overdose by sodium valproate
Xa6Fy	All	Intentional methylphenobarbital overdose
Xa6G2	All	Intentional phenobarbital overdose
Xa6G6	All	Intentional primidone overdose
Xa6GA	All	Intentional overdose by carbamazepine
Xa6GE	All	Intentional vigabatrin overdose
X711g	All	Accidental overdose of phenytoin
Xa6GL	All	Intentional ethosuximide overdose
Xa6GP	All	Intentional clonazepam overdose
Xa6GV	All	Intentional zopiclone overdose
Xa6GZ	All	Intentional zolpidem overdose
Xa6Gd	All	Intentional chlormezanone overdose
Xa6Gh	All	Intentional methyprylone overdose

Xa6Gl	All	Intentional paraldehyde overdose
Xa6Gq	All	Intentional amobarbital overdose
Xa6Gu	All	Intentional butabarbital overdose
Xa6Gy	All	Intentional cyclobarbitone overdose
Xa6H2	All	Intentional secobarbital overdose
Xa6H7	All	Intentional flunitrazepam overdose
Xa6HB	All	Intentional flurazepam overdose
Xa6HF	All	Intentional loprozepam overdose
Xa6HJ	All	Intentional lormetazepam overdose
Xa6HN	All	Intentional nitrazepam overdose
Xa6HR	All	Intentional triazolam overdose
Xa6HV	All	Intentional alprazolam overdose
Xa6HZ	All	Intentional bromazepam overdose
X71Ay	All	Deliberate overdose of chlordiazepoxide
Xa6Hg	All	Intentional clobazam overdose
Xa6Hk	All	Intentional dipotassium clorazepate overdose
Xa6Ho	All	Intentional ketazolam overdose
Xa6Hs	All	Intentional medazepam overdose
Xa6Hw	All	Intentional oxazepam overdose
Xa6I0	All	Intentional prazepam overdose
Xa6I4	All	Intentional midazolam overdose
X71Ax	All	Deliberate overdose of diazepam
Xa6IB	All	Intentional lorazepam overdose
X71Az	All	Deliberate overdose of temazepam
X71Aw	All	Deliberate overdose of benzodiazepine
Xa6IL	All	Intentional meprobamate overdose
Xa6IQ	All	Intentional chloral hydrate overdose
Xa6IU	All	Intentional dichloralphenazone overdose
Xa6IY	All	Intentional triclofos sodium overdose
Xa6Ic	All	Intentional buspirone overdose
Xa6Ig	All	Intentional clomethiazole overdose
Xa6Il	All	Intentional sulphiride overdose
Xa6Ip	All	Intentional loxapine overdose
Xa6It	All	Intentional clozapine overdose
Xa6Ix	All	Intentional risperidone overdose
Xa6J1	All	Intentional tetrabenazine overdose
Xa6J6	All	Intentional benperidol overdose
Xa6JA	All	Intentional trifluoperidol overdose
Xa6JE	All	Intentional haloperidol overdose
Xa6JI	All	Intentional droperidol overdose
Xa6JN	All	Intentional pimozide overdose
Xa6JR	All	Intentional fluspirilene overdose
Xa6JW	All	Intentional levomepromazine overdose
Xa6Ja	All	Intentional pericyazine overdose
Xa6Je	All	Intentional fluphenazine decanoate overdose

Xa6Ji	All	Intentional fluphenazine enanthate overdose
Xa6Jm	All	Intentional thiethylperazine overdose
Xa6Jq	All	Intentional chlorpromazine overdose
Xa6Ju	All	Intentional pipotiazine overdose
Xa6Jy	All	Intentional promazine overdose
Xa6K2	All	Intentional thioridazine overdose
Xa6K6	All	Intentional perphenazine overdose
Xa6KA	All	Intentional prochlorperazine overdose
Xa6KE	All	Intentional trifluoperazine overdose
Xa6KJ	All	Intentional chlorprothixene overdose
Xa6KN	All	Intentional flupentixol decanoate overdose
Xa6KR	All	Intentional zuclopenthixol decanoate overdose
Xa6KV	All	Intentional zuclopenthixol overdose
Xa6KZ	All	Intentional flupentixol overdose
Xa6Kd	All	Intentional oxypertine overdose
Xa6Kh	All	Intentional remoxipride overdose
Xa6Kj	All	Intentional overdose of non-barbiturate hypnotic
Xa6Ko	All	Intentional selegiline overdose
Xa6Kt	All	Intentional amfetamine overdose
Xa6Ky	All	Intentional antabuse overdose
Xa6L3	All	Intentional cannabis overdose
Xa6L7	All	Intentional overdose by lysergic acid
Xa6LB	All	Intentional psilocybin overdose
Xa6LF	All	Intentional mescaline overdose
Xa6LJ	All	Intentional overdose of ecstasy
Xa6LN	All	Intentional overdose by cocaine
Xa6LR	All	Intentional overdose by crack cocaine
Xa6LV	All	Intentional caffeine overdose
Xa6Lb	All	Intentional atenolol overdose
Xa6Lf	All	Intentional propranolol overdose
Xa6Lh	All	Intentional overdose of beta-adrenergic blocking drug
Xa6Lm	All	Intentional phenoxybenzamine overdose
Xa6Lq	All	Intentional nicotine overdose
Xa6Lu	All	Intentional overdose by calcium-channel blockers
Xa6Lz	All	Intentional pilocarpine overdose
Xa6M3	All	Intentional acetylcholine overdose
Xa6M7	All	Intentional anticholinesterase overdose
Xa6MD	All	Intentional metaraminol overdose
Xa6MI	All	Intentional salbutamol overdose
Xa6ML	All	Intentional overdose of isoprenaline
Xa6MQ	All	Intentional clonidine overdose
Xa6MV	All	Intentional hyoscine overdose
Xa6MZ	All	Intentional atropine overdose
Xa6Me	All	Intentional acetylcysteine overdose
Xa6Mj	All	Intentional nikethamide overdose

Xa6Mo	All	Intentional chlorphenamine overdose
Xa6Ms	All	Intentional diphenhydramine overdose
Xa6N0	All	Intentional thonzylamine overdose
Xa6N4	All	Intentional tripeleennamine overdose
Xa6N8	All	Intentional hydroxyzine overdose
Xa6ND	All	Intentional aminophylline overdose
Xa6NH	All	Intentional theophylline overdose
Xa6NL	All	Intentional bronchodilator preparations overdose
Xa6NR	All	Intentional dithranol overdose
Xa6NW	All	Intentional gamolenic acid overdose
Xa6Nb	All	Intentional etretinate overdose
Xa6Nf	All	Intentional acitretin overdose
Xa6Nj	All	Intentional tretinoin overdose
Xa6Nn	All	Intentional isotretinoin overdose
Xa6Nt	All	Intentional allopurinol overdose
Xa6Nx	All	Intentional colchicine overdose
Xa6O3	All	Intentional baclofen overdose
Xa6O7	All	Intentional methocarbamol overdose
Xa6OB	All	Intentional gold salt overdose
Xa6OG	All	Intentional papaverine overdose
Xa6OL	All	Intentional prostaglandin overdose
Xa6OS	All	Intentional naloxone overdose
Xa6OW	All	Intentional protamine sulphate overdose
Xa6Oa	All	Intentional alternative medicine overdose
Xa6Oj	All	Intentional flucytosine overdose
Xa6On	All	Intentional griseofulvin overdose
Xa6Or	All	Intentional amphotericin B overdose
Xa6Ov	All	Intentional nystatin overdose
Xa6P0	All	Intentional idoxuridine overdose
Xa6P5	All	Intentional pyrimethamine overdose
Xa6P9	All	Intentional chloroquine overdose
Xa6PD	All	Intentional primaquine overdose
Xa6PH	All	Intentional quinine overdose
Xa6PL	All	Intentional mefloquine overdose
Xa6PP	All	Intentional proguanil overdose
Xa6PU	All	Intentional piperazine overdose
Xa6PY	All	Intentional tiabendazole overdose
Xa6Pe	All	Intentional kanamycin overdose
Xa6Pi	All	Intentional streptomycin overdose
Xa6Pm	All	Intentional gentamicin overdose
Xa6Pq	All	Intentional tobramycin overdose
Xa6Pu	All	Intentional netilmicin overdose
Xa6Pz	All	Intentional erythromycin overdose
Xa6Q3	All	Intentional azithromycin overdose
Xa6Q7	All	Intentional clarithromycin overdose

Xa6QB	All	Intentional sodium fusidate overdose
Xa6QF	All	Intentional spectinomycin overdose
Xa6QJ	All	Intentional vancomycin overdose
Xa6QN	All	Intentional trimethoprim overdose
Xa6QR	All	Intentional nitrofurantoin derivative overdose
Xa6QV	All	Intentional fusidic acid overdose
Xa6QZ	All	Intentional 4-quinolones overdose
Xa6Qe	All	Intentional ampicillin overdose
Xa6Qj	All	Intentional cloxacillin overdose
Xa6Qn	All	Intentional carbenicillin overdose
Xa6Qr	All	Intentional flucloxacillin overdose
Xa6Qx	All	Intentional cefadroxil overdose
Xa6R1	All	Intentional cefalexin overdose
Xa6R5	All	Intentional cephalothin overdose
Xa6R9	All	Intentional cefazolin overdose
Xa6RD	All	Intentional cefradine overdose
Xa6RH	All	Intentional latamoxef overdose
Xa6RM	All	Intentional cefaclor overdose
Xa6RQ	All	Intentional cefuroxime overdose
Xa6RU	All	Intentional cephamandole overdose
Xa6RZ	All	Intentional cefotaxime overdose
Xa6Rd	All	Intentional ceftazidime overdose
Xa6Rh	All	Intentional ceftizoxime overdose
Xa6Rl	All	Intentional cefixime overdose
Xa6Rp	All	Intentional cefodizime overdose
Xa6Rt	All	Intentional cefpodoxime overdose
Xa6Rx	All	Intentional ceftriaxone overdose
Xa6SA	All	Intentional cefpirome overdose
Xa6S1	All	Intentional ceftibuten overdose
Xa6S5	All	Intentional cefsulodin overdose
Xa6SG	All	Intentional doxycycline overdose
Xa6SK	All	Intentional minocycline overdose
Xa6SO	All	Intentional oxytetracycline overdose
Xa6SS	All	Intentional tetracycline overdose
Xa6SW	All	Intentional chloramphenicol overdose
Xa6Sa	All	Intentional co-trimoxazole overdose
Xa6Sf	All	Intentional antimony compound overdose
Xa6Sj	All	Intentional hydroxyquinoline overdose
Xa6Sp	All	Intentional rifampin overdose
Xa6St	All	Intentional isoniazid overdose
Xa6Sx	All	Intentional ethambutol overdose
Xa6T1	All	Intentional antileprotic drug overdose
Xa6T5	All	Intentional pesticide product overdose
Xa6TB	All	Intentional gamma globulin overdose
Xa6TF	All	Intentional vaccine overdose

Xa6TJ	All	Intentional antisera overdose
Xa6TO	All	Intentional glucagon overdose
Xa6TU	All	Intentional carbimazole overdose
Xa6TY	All	Intentional thiouracil overdose
Xa6Td	All	Intentional prednisone overdose
Xa6Th	All	Intentional dexamethasone overdose
Xa6Tl	All	Intentional insulin overdose
Xa6Tr	All	Intentional acetoexamide overdose
Xa6Tv	All	Intentional chlorpropamide overdose
Xa6Tz	All	Intentional overdose by glibenclamide
Xa6U3	All	Intentional tolbutamide overdose
Xa6U8	All	Intentional overdose by metformin
Xa6UD	All	Intentional progestogen overdose
Xa6UI	All	Intentional nandrolone overdose
Xa6UM	All	Intentional oxymetholone overdose
Xa6UQ	All	Intentional methandriol overdose
Xa6UU	All	Intentional oral contraceptive overdose
Xa6UZ	All	Intentional testosterone overdose
Xa6Ud	All	Intentional oestrogen overdose
Xa6Ui	All	Intentional liothyronine overdose
Xa6Xh	All	Intentional streptokinase overdose
Xa6Xl	All	Intentional urokinase overdose
Xa6Um	All	Intentional thyroxin overdose
Xa6Uz	All	Intentional heparin overdose
Xa6V3	All	Intentional coumarin overdose
Xa6V7	All	Intentional warfarin sodium overdose
Xa6VD	All	Intentional ferrous sulphate overdose
Xa6VI	All	Intentional iodide overdose
Xa6VN	All	Intentional vitamin A overdose
Xa6VR	All	Intentional vitamin D overdose
Xa6VV	All	Intentional vitamin K overdose
Xa6Va	All	Intentional nicotinic acid derivative overdose
Xa6Ve	All	Intentional folic acid overdose
Xa6Vi	All	Intentional potassium overdose
Xa6Vo	All	Intentional clofibrate overdose
Xa6Vu	All	Intentional disopyramide overdose
Xa6Vy	All	Intentional quinidine overdose
Xa6W2	All	Intentional procainamide overdose
Xa6W7	All	Intentional bretylium overdose
Xa6WC	All	Intentional amiodarone overdose
Xa6WJ	All	Intentional bendroflumethiazide overdose
Xa6WN	All	Intentional chlorothiazide overdose
Xa6WS	All	Intentional furosemide overdose
Xa6WW	All	Intentional bumetanide overdose
Xa6Wa	All	Intentional etacrynic acid overdose

Xa6We	All	Intentional potassium sparing diuretic overdose
Xa6Wi	All	Intentional osmotic diuretic overdose
Xa6Wn	All	Intentional mersalyl overdose
Xa6Ws	All	Intentional acetazolamide overdose
Xa6Wy	All	Intentional guanethidine overdose
Xa6X2	All	Intentional overdose by angiotensin-converting-enzyme inhibitors
Xa6X5	All	Intentional antihypertensive overdose
Xa6XA	All	Intentional digoxin overdose
Xa6XE	All	Intentional phosphodiesterase inhibitor overdose
Xa6XJ	All	Intentional ergot alkaloid overdose
Xa6XO	All	Intentional diazoxide overdose
Xa6XS	All	Intentional hydralazine overdose
Xa6XW	All	Intentional dipyridamole overdose
Xa6Xh	All	Intentional streptokinase overdose
Xa6Xl	All	Intentional urokinase overdose
Xa6Tl	All	Intentional insulin overdose
Xa6TF	All	Intentional vaccine overdose
Xa6TO	All	Intentional glucagon overdose
Xa6Lq	All	Intentional nicotine overdose
Xa6TJ	All	Intentional antisera overdose
U204.	All	[X]Overdose - SSRI
U2040	All	[X]Intentional self poisoning by and exposure to psychotropic drugs, occurrence at home
U2041	All	[X]Intentional self poisoning by and exposure to psychotropic drugs, occurrence in residential institution
U2042	All	[X]Intentional self poisoning by and exposure to psychotropic drugs, occurrence at school, other institution and public administrative area
U2043	All	[X]Intentional self poisoning by and exposure to psychotropic drugs, occurrence at sports and athletics area
U2044	All	[X]Intentional self poisoning by and exposure to psychotropic drugs, occurrence on street and highway
U2045	All	[X]Intentional self poisoning by and exposure to psychotropic drugs, occurrence at trade and service area
U2046	All	[X]Intentional self poisoning by and exposure to psychotropic drugs, occurrence at industrial and construction area
U2047	All	[X]Intentional self poisoning by and exposure to psychotropic drugs, occurrence on farm
U204y	All	[X]Intentional self poisoning by and exposure to psychotropic drugs, occurrence at other specified place
U204z	All	[X]Intentional self poisoning by and exposure to psychotropic drugs, occurrence at unspecified place
Xa1Py	All	H/O: repeated overdose
U2020	All	[X]Intentional self poisoning by and exposure to sedative hypnotics, occurrence at home
U2021	All	[X]Intentional self poisoning by and exposure to sedative hypnotics, occurrence in residential institution

U2022	All	[X]Intentional self poisoning by and exposure to sedative hypnotics, occurrence at school, other institution and public administrative area
U2023	All	[X]Intentional self poisoning by and exposure to sedative hypnotics, occurrence at sports and athletics area
U2024	All	[X]Intentional self poisoning by and exposure to sedative hypnotics, occurrence on street and highway
U2025	All	[X]Intentional self poisoning by and exposure to sedative hypnotics, occurrence at trade and service area
U2026	All	[X]Intentional self poisoning by and exposure to sedative hypnotics, occurrence at industrial and construction area
U2027	All	[X]Intentional self poisoning by and exposure to sedative hypnotics, occurrence on farm
U202y	All	[X]Intentional self poisoning by and exposure to sedative hypnotics, occurrence at other specified place
U202z	All	[X]Intentional self poisoning by and exposure to sedative hypnotics, occurrence at unspecified place
Xa67B	All	Intentional 5-HT ₃ -receptor antagonist overdose
Xa4kL	All	Intentional paracetamol poisoning
Xa4kP	All	Intentional paracetamol and dextropropoxyphene poisoning
Xa4kV	All	Intentional aspirin poisoning
Xa4kY	All	Intentional salicylic acid salt poisoning
Xa4kb	All	Intentional pentazocine poisoning
Xa4kf	All	Intentional phenazocine poisoning
Xa4kk	All	Intentional dextromoramide poisoning
Xa4ko	All	Intentional dextropropoxyphene poisoning
Xa4ks	All	Intentional dipipanone poisoning
Xa4kv	All	Intentional methadone poisoning
Xa4l0	All	Intentional buprenorphine poisoning
Xa4l3	All	Intentional poisoning by codeine
Xa4l6	All	Intentional heroin poisoning
Xa4l9	All	Intentional poisoning by dihydrocodeine
Xa4lD	All	Intentional nalbuphine poisoning
Xa4lG	All	Intentional morphine poisoning
Xa4lM	All	Intentional alfentanil poisoning
Xa4lQ	All	Intentional fentanyl poisoning
Xa4lT	All	Intentional pethidine poisoning
Xa4lX	All	Intentional phenoperidine poisoning
Xa4lb	All	Intentional meptazinol poisoning
Xa4lf	All	Intentional levorphanol poisoning
Xa4li	All	Intentional narcotic poisoning
Xa4lo	All	Intentional poisoning by combination analgesic
Xa4ls	All	Intentional acemetacin poisoning
Xa4lw	All	Intentional azapropazone poisoning
Xa4m0	All	Intentional diclofenac poisoning
Xa4m4	All	Intentional etodolac poisoning
Xa4m8	All	Intentional felbinac poisoning

Xa4mC	All	Intentional fenbufen poisoning
Xa4mG	All	Intentional fenoprofen poisoning
Xa4mK	All	Intentional flurbiprofen poisoning
Xa4mN	All	Intentional ibuprofen poisoning
Xa4mQ	All	Intentional indometacin poisoning
Xa4mU	All	Intentional ketoprofen poisoning
Xa4mY	All	Intentional ketorolac poisoning
Xa4mc	All	Intentional mefenamic acid poisoning
Xa4mg	All	Intentional nabumetone poisoning
Xa4mj	All	Intentional naproxen poisoning
Xa4mn	All	Intentional nefopam poisoning
Xa4mr	All	Intentional oxyphenbutazone poisoning
Xa4mu	All	Intentional phenylbutazone poisoning
Xa4my	All	Intentional piroxicam poisoning
Xa4n2	All	Intentional sulindac poisoning
Xa4n6	All	Intentional tenoxicam poisoning
Xa4nA	All	Intentional tiaprofenic acid poisoning
Xa4nE	All	Intentional tolmetin poisoning
Xa4nJ	All	Intentional radiopharmaceutical poisoning
Xa4nR	All	Intentional X-ray contrast media poisoning
Xa4nV	All	Intentional magnetic resonance imaging contrast media poisoning
Xa4nN	All	Intentional X-ray diagnostic contrast media poisoning
Xa4nZ	All	Intentional allergen extract vaccine poisoning
Xa4nd	All	Intentional diagnostic dye poisoning
Xa53n	All	Intentional dextromethorphan poisoning
Xa53q	All	Intentional guaifenesin poisoning
Xa53t	All	Intentional terpin hydrate poisoning
Xa53w	All	Intentional poisoning by bronchodilator drug
Xa53z	All	Intentional aminophylline poisoning
Xa542	All	Intentional theophylline poisoning
Xa545	All	Intentional poisoning by herbal asthma mixture
Xa548	All	Intentional anti-common cold drug poisoning
Xa54B	All	Intentional local antipruritic poisoning
Xa54E	All	Intentional local astringent and detergent poisoning
Xa54H	All	Intentional hair treatment poisoning
Xa54L	All	Intentional allopurinol poisoning
Xa54O	All	Intentional colchicine poisoning
Xa54R	All	Intentional probenecid poisoning
Xa54X	All	Intentional gold salt poisoning
Xa54a	All	Intentional antirheumatic poisoning
Xa54v	All	Intentional chelating agent poisoning
Xa54z	All	Intentional alternative medicine poisoning
Xa556	All	Intentional flucytosine poisoning
Xa559	All	Intentional griseofulvin poisoning
Xa55C	All	Intentional amphotericin B poisoning

Xa55F	All	Intentional nystatin poisoning
Xa55I	All	Intentional trichomycin poisoning
Xa55L	All	Intentional idoxuridine poisoning
Xa55x	All	Intentional kanamycin poisoning
Xa560	All	Intentional streptomycin poisoning
Xa564	All	Intentional gentamicin poisoning
Xa568	All	Intentional tobramycin poisoning
Xa56C	All	Intentional netilmicin poisoning
Xa56F	All	Intentional erythromycin poisoning
Xa56J	All	Intentional azithromycin poisoning
Xa56N	All	Intentional clarithromycin poisoning
Xa56Q	All	Intentional oleandomycin poisoning
Xa56T	All	Intentional spiramycin poisoning
Xa56X	All	Intentional sodium fusidate poisoning
Xa56b	All	Intentional spectinomycin poisoning
Xa56f	All	Intentional vancomycin poisoning
Xa56j	All	Intentional trimethoprim poisoning
Xa56m	All	Intentional nitrofurantoin derivative poisoning
Xa56q	All	Intentional fusidic acid poisoning
Xa56u	All	Intentional 4-quinolones poisoning
Xa6QZ	All	Intentional 4-quinolones overdose
Xa56x	All	Intentional ampicillin poisoning
Xa570	All	Intentional cloxacillin poisoning
Xa573	All	Intentional carbenicillin poisoning
Xa576	All	Intentional penicillin G poisoning
Xa57A	All	Intentional flucloxacillin poisoning
Xa57E	All	Intentional piperacillin poisoning
Xa57J	All	Intentional cefadroxil poisoning
Xa57M	All	Intentional cefalexin poisoning
Xa57P	All	Intentional cephalothin poisoning
Xa57T	All	Intentional cefazolin poisoning
Xa57X	All	Intentional cefradine poisoning
Xa57b	All	Intentional latamoxef poisoning
Xa57k	All	Intentional cefuroxime poisoning
Xa57g	All	Intentional cefaclor poisoning
Xa57o	All	Intentional cephmandole poisoning
Xa57t	All	Intentional cefotaxime poisoning
Xa57x	All	Intentional ceftazidime poisoning
Xa581	All	Intentional ceftizoxime poisoning
Xa585	All	Intentional cefixime poisoning
Xa589	All	Intentional cefodizime poisoning
Xa58D	All	Intentional cefpodoxime poisoning
Xa58H	All	Intentional ceftriaxone poisoning
Xa58L	All	Intentional ceftibuten poisoning
Xa58P	All	Intentional cefsulodin poisoning

Xa58U	All	Intentional ceftiofime poisoning
Xa58X	All	Intentional cephaloridine poisoning
Xa58a	All	Intentional sulfadiazine poisoning
Xa58d	All	Intentional sulphafurazole poisoning
Xa58g	All	Intentional sulfamethoxazole poisoning
Xa58j	All	Intentional doxycycline poisoning
Xa58m	All	Intentional minocycline poisoning
Xa58p	All	Intentional oxytetracycline poisoning
Xa58s	All	Intentional tetracycline poisoning
Xa58v	All	Intentional chloramphenicol poisoning
Xa58z	All	Intentional co-trimoxazole poisoning
Xa59F	All	Intentional hydroxyquinoline poisoning
Xa59I	All	Intentional diiodohydroxyquinoline poisoning
Xa59L	All	Intentional rifampin poisoning
Xa59O	All	Intentional isoniazid poisoning
Xa59R	All	Intentional ethambutol poisoning
Xa59U	All	Intentional cycloserine poisoning
Xa59Y	All	Intentional antileprotic drug poisoning
Xa59b	All	Intentional ethionamide poisoning
Xa59e	All	Intentional para-aminosalicylic acid poisoning
Xa59h	All	Intentional sulphone poisoning
Xa59l	All	Intentional pesticide product poisoning

Supplementary table S2.10. Read codes used to identify non-medication based treatments for depression or anxiety.

Counselling		
Read V2 Code	Term ID	Description
67...	11	Counselling/health education
671..	All	Counselling - general
6712.	All	Counselling offered
6714.	All	Counselling carried out
6715.	All	Counselling by other agency
6716.	All	Counselling of benefit
6717.	All	Counselling of no benefit
671Z.	All	Counselling - general NOS
672..	All	Person counselled
6721.	All	Patient counselled
6722.	All	Family counselled
673..	All	Person counselled by
6731.	All	Counselled by a doctor
6732.	All	Counselled by a nurse
6733.	All	Counselled by a health visitor
6735.	All	Counselled by a social worker
6736.	All	Counselled by a counsellor
6737.	All	Counselled by a vol. worker
673Z.	All	Counselled by person NOS
8M8..	All	Counselling requested
9NJ1.	All	In-house counselling
9NJR.	All	In-house counselling first appointment
9NJT.	All	In-house counselling follow-up appointment
Read CTV3 Code	Term ID	Description
X71Ec	All	Counselling
X71Ep	All	Coping strategy counselling
XaEC1	All	Phobia counselling
XaD27	All	Family counselling
6779.	All	Psychological counselling
XaECG	All	Anxiety counselling
XaECF	All	Self-esteem counselling
XaI8j	All	Stress counselling
672..	All	Person counselled
6721.	All	Patient counselled
6722.	All	Family counselled
XE1TI	All	Person counselled by
6715.	All	Counselling by other agency
6731.	All	Counselled by a doctor

6732.	All	Counselled by a nurse
6733.	All	Counselled by a health visitor
6735.	All	Counselled by a social worker
6736.	All	Counselled by a counsellor
6737.	All	Counselled by voluntary worker
673Z.	All	Counselled by person NOS
Xa07L	All	Counselled by member of primary health care team
9N2B.	All	Seen by counsellor
XaAS4	All	Seen by mental health counsellor
XaBT1	All	Refer to counsellor
XaAfj	All	Referral to mental health counsellor
9NJ1.	All	In-house counselling
XaLnp	All	In-house counselling first appointment
XaLnr	All	In-house counselling follow-up appointment
671..	All	Counselling - general
6712.	All	Counselling offered
6714.	All	Counselling carried out
6716.	All	Counselling of benefit
6717.	All	Counselling of no benefit
671Z.	All	Counselling - general NOS
XaAOd	All	Under care of counsellor
XaAOh	All	Under care of mental health counsellor
Cognitive Behavioural Therapy		
Read V2 Code	Term ID	Description
8G13.	All	Cognitive-behaviour therapy
8G130	All	Cognitive behavioural therapy parenting programme
8G131	All	CBTp - cognitive behavioural therapy for psychosis
7L1a.	All	Cognitive behavioural therapy
7L1a0	All	Cognitive behavioural therapy by unidisciplinary team
7L1a1	All	Cognitive behavioural therapy by multidisciplinary team
7L1ay	All	Other specified cognitive behavioural therapy
7L1az	All	Cognitive behavioural therapy NOS
8G510	All	Group cognitive behavioural therapy
8G15.	All	Computerised cognitive behavioural therapy
8HLK.	All	Referral for cognitive behavioural therapy
Read CTV3 Code	Term ID	Description
Ub0qp	All	Cognitive and behavioural therapy
XaABO	All	Cognitive - behaviour therapy
Xad6j	All	Cognitive behavioural therapy for psychosis
Xaaa6	All	Cognitive behavioural therapy parenting programme
XaQC0	All	Guided self help cognitive behavioural therapy
XaKzQ	All	Computerised cognitive behavioural therapy
Xa8I9	All	Generic cognitive behavioural therapy

XaM2I	All	Cognitive behavioural therapy by unidisciplinary team
XaM2J	All	Cognitive behavioural therapy by multidisciplinary team
XaM2K	All	Other specified cognitive behavioural therapy
XaM2L	All	Cognitive behavioural therapy NOS
XaR2j	All	Referral to cognitive behavioural therapist
XaR5D	All	Referral for cognitive behavioural therapy
XaYgB	All	Referral for high intensity cognitive behavioural therapy
Psychotherapy		
Read V2 Code	Term ID	Description
8G...	All	Psychotherapy
8G1..	All	General psychotherapy
8G10.	All	Psychotherapy - behavioural
8G100	All	Behavioural activation therapy
8G101	All	Dialectical behaviour therapy
8G102	All	Behavioural parent training
8G11.	All	Psychotherapy - cognitive
8G12.	All	Psychotherapy - psychodynamic
8G120	All	Short-term psychodynamic therapy
8G121	All	Dynamic interpersonal therapy
8G122	All	Focal psychodynamic therapy
8G14.	All	Cognitive analytic therapy
8G15.	All	Computerised cognitive behavioural therapy
8G16.	All	Interpersonal psychotherapy
8G18.	All	Cognitive stimulation therapy
9NIK.	All	Seen by psychotherapist
9NIK0	All	Seen by trainee psychotherapist
8HHT.	All	Referral to psychotherapist
ZV57D	All	[V]Psychotherapy, not elsewhere classified
ZV673	All	[V]Psychotherapy or other treatment for mental disorder follow-up
8G9Z.	All	Other psychotherapy NOS
8G9..	All	Other psychotherapy
Read CTV3 Code	Term ID	Description
X71bp	All	Psychotherapy
XaaUO	All	Cognitive rehabilitation therapy
XaItc	All	Brief solution focused psychotherapy
Xa8IG	All	Psychoanalytic and psychodynamic therapy
Xa8IJ	All	Long-term exploratory psychotherapy
3841.	All	Psychoanalysis
XaA8V	All	Generic psychoanalysis
XaA8W	All	Independent psychoanalysis
XaA8T	All	Kleinian psychoanalysis
XaA8U	All	Bion-based group psychoanalysis
XaA8X	All	Classical psychoanalysis

XaA8Y	All	Lacanian psychoanalysis
XaA8g	All	Group psychoanalysis
XaA8U	All	Bion-based group psychoanalysis
384Z.	All	Psychological analysis NOS
Xa8IM	All	Jungian-based therapy
Xa8IN	All	Generic Jungian-based therapy
Xa8IP	All	Analytical psychology
Xa8IR	All	Long-term psychodynamic psychotherapy
XaA8Z	All	Developmental psychodynamic psychotherapy
XaA8c	All	Supportive expressive psychodynamic psychotherapy
XaA8d	All	Psychodynamic-interpersonal psychotherapy
XaEVq	All	Psychodynamic psychotherapy
Xad7C	All	Focal psychodynamic therapy
Xa8IR	All	Long-term psychodynamic psychotherapy
XaA8Z	All	Developmental psychodynamic psychotherapy
XaA8c	All	Supportive expressive psychodynamic psychotherapy
XaA8d	All	Psychodynamic-interpersonal psychotherapy
Xa8II	All	Short-term psychodynamic therapy
XaXuc	All	Dynamic interpersonal therapy
XaA9g	All	Specific task orientated psychotherapy
XE0iL	All	Psychotherapy/sociotherapy
8G9Z.	All	Other psychotherapy NOS
8G9..	All	Other psychotherapy

Codes used to identify time off work and unemployment

Supplementary table S3.1. Read codes used to identify unemployment.

Unemployment		
Read V2 Code	Term ID	Description
13J7.	All	Unemployed
13J70	All	Recently unemployed
13J71	All	Chronic unemployment
ZV620	All	[V]Unemployment
13R..	All	Unemployment benefits
13R1.	All	Unemployment benefits
13R2.	All	Redundancy payment
13RZ.	All	Unemployment benefit NOS
13JX.	All	Time off work
13JG.	All	Voluntarily redundant
13J3.	All	Loss of job
13J30	All	Sacked from work
13J8.	All	Redundant
13JJ.	All	Unfit for work
13JJ0	All	Benefit agency reports unfit for work
13JJ1	All	Benefit agency reports unfit for work but fit note no longer required
13Jk.	All	Not in employment, education or training
9DG4.	All	IB 113 DLS incapacity for work form paid
9DG2.	All	IB 113 DLS incapacity for work form sent
9DG3.	All	IB 113 DLS incapacity for work form received
9DG1.	All	IB 113 DLS incapacity for work form completed
9DQ3.	All	ESA113 form paid
9DQ1.	All	ESA113 form sent
9DQ2.	All	ESA113 form received
9DQ0.	All	ESA113 form completed
130D.	All	Employment and support allowance
Read CTV3 Code	Term ID	Description
13J7.	All	Unemployed
13J70	All	Recently unemployed
13J71	All	Chronic unemployment
ZV620	All	[V]Unemployment
XaPhf	All	Benefit agency reports unfit for work
Xabd4	All	Benefit agency reports unfit for work but fit note no longer required
13J8.	All	Redundant
13JG.	All	Voluntarily redundant

Ua2BD	All	Unfit to return to work
Ua2BE	All	Physically unfit for work
U12BF	All	Mentally unfit for work
13JX.	All	Time off work
XaZHu	All	ESA113 form paid
XaZHt	All	ESA113 form sent
XaZHs	All	ESA113 form received
XaZHj	All	ESA113 form completed
XaBhC	All	Employment and support allowance
XacJr	All	Not in employment, education or training
XE0pT	All	Loss of job
Ua0V9	All	Dismissed from job
Ua0VA	All	Unfair dismissal from job
XaCIW	All	IB 113 DLS incapacity for work form paid
XaCIU	All	IB 113 DLS incapacity for work form sent
XaCIV	All	IB 113 DLS incapacity for work form received
XaCIT	All	IB 113 DLS incapacity for work form completed
13JJ.	All	Unfit for work
13J6.	All	Medically retired

Supplementary table S3.2. Read codes used to identify time off work via the issuing of Med 3 (“fit notes”) certificates.

Unemployment		
Read V2 Code	Term ID	Description
9D1..	All	MED3 - doctor's statement
9D11.	All	MED3 issued to patient
9D12.	All	MED3 duplicate issued
9D15.	All	eMED3 (2010) new statement issued, not fit for work
9D17.	All	eMED3 (2010) duplicate issued, not fit for work
9D19.	All	MED3 (2010) issued by hand, not fit for work
9D1C.	All	MED3 (2010) issued to patient
9D1D.	All	MED3 (2010) duplicate issued
9D1E.	All	MED3 (2010) issued - recommend phased return to work
9D1F.	All	MED3 (2010) issued - recommend altered hours
9D1G.	All	MED3 (2010) issued - recommend amended duties
9D1Z.	All	MED3 - NOS
Read CTV3 Code	Term ID	Description
XaBHd	All	MED3 status
XaXf2	All	MED3 (2010) duplicate issued
XaXf1	All	MED3 (2010) issued to patient
XaXf5	All	MED3 (2010) issued - recommend amended duties
XaXf4	All	MED3 (2010) issued - recommend altered hours
XaXf3	All	MED3 (2010) issued - recommend phased return to work
9D11.	All	MED3 issued to patient
XaX1R	All	MED3 (2010) issued by hand, not fit for work
XaX1L	All	eMED3 (2010) duplicate issued, not fit for work
XaX1E	All	eMED3 (2010) new statement issued, not fit for work
9D12.	All	MED3 duplicate issued
9D1Z.	All	MED3 - NOS

Definitions of atopic and autoimmune conditions with Read code lists.

Supplementary table S4.1. The case definitions for included atopic and autoimmune conditions.

Condition	Definition
Atopic conditions	
Atopic dermatitis	Defined using the validated algorithm by Abuabara et al. (2017)(1)
Allergic rhinitis	A diagnosis code for allergic rhinitis (Supplementary table S4.2)
Asthma	Defined using the RCGP RSC asthma algorithm(2)
Gastrointestinal conditions	
Crohn's disease	A diagnosis code for Crohn's and no conflicting code for ulcerative colitis (where conflicted codes occur the most recent diagnosis code is used to define the condition) (Supplementary table S4.3)
Ulcerative colitis	A diagnosis code for ulcerative colitis and no conflicting code for Crohn's disease (where conflicted codes occur the most recent diagnosis code is used to define the condition) (Supplementary table S4.4)
Coeliac disease	A diagnosis code for Coeliac disease (Supplementary table S4.5)
Pernicious anaemia	A diagnosis code for pernicious anaemia (Supplementary table S4.6)
Endocrine conditions	
Type 1 diabetes	Defined using the RCGP RSC diabetes type algorithm(3)
Hashimoto's thyroiditis	Either: <ul style="list-style-type: none"> • A code for Hashimoto's thyroiditis (Supplementary table S4.7) OR • A code for "non-specific hypothyroidism" AND no code for "non-autoimmune hypothyroidism"
Grave's disease	A diagnosis code for Grave's disease (Supplementary table S4.8)
Rheumatological conditions	
Rheumatoid arthritis	Defined using the validated algorithm by Muller et al. (2015)(4)
Psoriatic arthritis	A diagnosis code for psoriatic arthritis (Supplementary table S4.9)
Ankylosing spondylitis	A diagnosis code for ankylosing spondylitis (Supplementary table S4.10)
Systemic lupus erythematosus	A diagnosis code for systemic lupus erythematosus (Supplementary table S4.11)
Polymyalgia rheumatica	A diagnosis code for polymyalgia rheumatica (Supplementary table S4.12)
Sjögren's syndrome	A diagnosis code for Sjögren's syndrome (Supplementary table S4.13)
Dermatological conditions	
Psoriasis	A diagnosis code for psoriasis (Supplementary table S4.14)
Vitiligo	A diagnosis code for vitiligo (Supplementary table S4.15)

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Neurological conditions	
Multiple sclerosis	A diagnosis code for multiple sclerosis (Supplementary table S4.16)

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Supplementary table S4.2. Read codes used to identify allergic rhinitis.

Allergic rhinitis		
Read V2 Code	Term ID	Description
H17..	All	Allergic rhinitis
H170.	All	Allergic rhinitis due to pollens
H171.	All	Allergic rhinitis due to other allergens
H1710	All	Allergy to animal
H1711	All	Dog allergy
H172.	All	Allergic rhinitis due to unspecified allergen
H17z.	All	Allergic rhinitis NOS
14B1.	All	H/O: hay fever
H3300	All	Hay fever with asthma
Read CTV3 Code	Term ID	Description
XE0Y5	All	Allergic rhinitis
Xa0IX	All	Seasonal allergic rhinitis
XE2QI	All	Allergic rhinitis due to pollens
Hyu20	All	[X]Other seasonal allergic rhinitis
X00I8	All	Hay fever - other allergen
X00I9	All	Hay fever - unspecified allergen
X1020	All	Hay fever with asthma
X00IA	All	Perennial allergic rhinitis
X00IB	All	Perennial allergic rhinitis with seasonal variation
H17z.	All	Allergic rhinitis NOS
Hyu21	All	[X]Other allergic rhinitis
XE0Y6	All	Allergic rhinitis due to other allergens
XE0Y7	All	Allergic rhinitis due to unspecified allergen
14B1.	All	H/O: hay fever

Supplementary table S4.3. Read codes used to Crohn's disease.

Crohn's disease		
Read V2 Code	Term ID	Description
J40..	All	Regional enteritis- Crohn's disease
J400.	All	Regional enteritis of the small bowel
J4000	All	Regional enteritis of the duodenum
J4001	All	Regional enteritis of the jejunum
J4002	All	Crohn's disease of the terminal ileum
J4003	All	Crohn's disease of the ileum unspecified
J4004	All	Crohn's disease of the ileum NOS
J4005	All	Exacerbation of Crohn's disease of small intestine
J400z	All	Crohn's disease of the small bowel NOS
J40..	All	Crohn's disease
J4010	All	Regional enteritis of the colon
J4011	All	Regional enteritis of the rectum
J4012	All	Exacerbation of Crohn's disease of large intestine
J401z	All	Crohn's disease of the large bowel NOS
J40z.	All	Crohn's disease NOS
Read CTV3 Code	Term ID	Description
XE2QL	All	Crohn's disease
Xa0lh	All	Regional enteritis
X302r	All	Crohn's jejunitis
X302t	All	Crohn's ileitis
J4003	All	Crohn's disease of the ileum unspecified
J4004	All	Crohn's disease of the ileum NOS
J4002	All	Crohn's disease of terminal ileum
J400.	All	Regional enteritis of small bowel
XaK6C	All	Exacerbation of Crohn's disease of small intestine
J400z	All	Crohn's disease of the small bowel NOS
J401.	All	Regional enteritis of the large bowel
XE0af	All	Crohn's disease of the large bowel NOS
XaK6D	All	Exacerbation of Crohn's disease of large intestine
J40z.	All	Regional enteritis NOS
J4010	All	Crohn's colitis
J4011	All	Crohn's proctitis
X3050	All	Perianal Crohn's disease
Jyu40	All	[X]Other Crohn's disease
J4001	Y30Fy	Regional enteritis of the jejunum

Supplementary table S4.4. Read codes used to identify Ulcerative colitis.

Ulcerative colitis		
Read V2 Code	Term ID	Description
J41..	All	Ulcerative colitis and/or proctitis
J410.	All	Ulcerative proctocolitis
J4100	All	Ulcerative ileocolitis
J4101	All	Ulcerative colitis
J4102	All	Ulcerative rectosigmoiditis
J4103	All	Ulcerative proctitis
J4104	All	Exacerbation of ulcerative colitis
J410z	All	Ulcerative proctocolitis NOS
J411.	All	Ulcerative (chronic) enterocolitis
J412.	All	Ulcerative (chronic) ileocolitis
J413.	All	Ulcerative pancolitis
N0454	All	Juvenile arthritis in ulcerative colitis
N0310	All	Arthropathy in ulcerative colitis
Read CTV3 Code	Term ID	Description
XE0ag	All	Ulcerative colitis
XaZ2j	All	Left sided ulcerative colitis
XaYzX	All	Ulcerative pancolitis
XaK6E	All	Exacerbation of ulcerative colitis
J410.	All	Ulcerative proctocolitis
J4100	All	Ulcerative ileocolitis
J410z	All	Ulcerative proctocolitis NOS
Jyu41	All	[X]Other ulcerative colitis
J4103	Y30D7	Ulcerative proctitis

Supplementary table S4.5. Read codes used to identify Coeliac disease.

Coeliac disease		
Read V2 Code	Term ID	Description
J690.	All	Coeliac disease
J6900	All	Congenital coeliac disease
J6901	All	Acquired coeliac disease
J690z	All	Coeliac disease NOS
6648.	All	Coeliac disease monitoring
66480	All	Coeliac disease annual review
68W4.	All	Coeliac disease autoantibody profile positive
Read CTV3 Code	Term ID	Description
XE0bL	All	Childhood coeliac disease
X3037	All	Adult coeliac disease
J6901	All	Acquired coeliac disease
J690z	All	Coeliac disease NOS
XE0bK	All	Coeliac disease
XaQIX	All	Coeliac disease autoantibody profile positive
XaXGl	All	Coeliac disease monitoring
J6900	All	Congenital coeliac disease
Pernicious anaemia		
Read V2 Code	Term ID	Description
D010.	All	Pernicious anaemia
F3815	All	Myasthenic syndrome due to pernicious anaemia
Read CTV3 Code	Term ID	Description
XE2ro	All	Pernicious anaemia
X20CE	All	Selective malabsorption of cyanocobalamin
X20CC	All	Congenital deficiency of intrinsic factor
X20CD	All	Biermer's congenital pernicious anaemia
F3815	All	Myasthenic syndrome due to pernicious anaemia

Supplementary table S4.6. Read codes used to identify pernicious anaemia.

Pernicious anaemia		
Read V2 Code	Term ID	Description
D010.	All	Pernicious anaemia
F3815	All	Myasthenic syndrome due to pernicious anaemia
Read CTV3 Code	Term ID	Description
XE2ro	All	Pernicious anaemia
X20CE	All	Selective malabsorption of cyanocobalamin
X20CC	All	Congenital deficiency of intrinsic factor
X20CD	All	Biermer's congenital pernicious anaemia
F3815	All	Myasthenic syndrome due to pernicious anaemia

Supplementary table S4.7. Read codes used to identify Hashimoto's thyroiditis.

This will be defined as either a code for Hashimoto's thyroiditis or a non-specific code for hypothyroidism and no codes for any non-autoimmune hypothyroidism.

Hashimoto's thyroiditis		
Read V2 Code	Term ID	Description
C052.	All	Hashimoto's disease
C05y4	All	Chronic thyroiditis with transient thyrotoxicosis
C046.	All	Autoimmune myxoedema
L1815	All	Postpartum thyroiditis
Read CTV3 Code	Term ID	Description
X40G1	All	Thyrotoxicosis due to Hashimoto's thyroiditis
X40Gm	All	Hashitoxicosis - transient
X40Ha	All	Struma lymphomatosis
X40HE	All	Autoimmune hypothyroidism
X40HF	All	Hypothyroidism due to Hashimoto's thyroiditis
X40HG	All	Hypothyroidism due to TSH receptor blocking antibody
X40HW	All	Hashimoto's disease
X40HY	All	Lymphadenoid goitre
X40HZ	All	Lymphocytic thyroiditis - autoimmune
XE10C	All	Autoimmune thyroiditis
X40HW	All	Hashimoto's thyroiditis
X40Gm	All	Hashitoxicosis - transient
X40HY	All	Lymphadenoid goitre
X40HZ	All	Lymphocytic thyroiditis - autoimmune
X40Ha	All	Struma lymphomatosis
X40Dj	All	Postpartum thyroiditis
Non-specific hypothyroidism		
Read V2 Code	Term ID	Description
C04..	All	Acquired hypothyroidism
C045.	All	Acquired atrophy of thyroid
C046.	All	Autoimmune myxoedema
C04y.	All	Other acquired hypothyroidism
C04z.	All	Hypothyroidism NOS
C04z0	All	Premature puberty due to hypothyroidism
C04z1	All	Myxoedema coma
C05y.	All	Other and unspecified chronic thyroiditis
F3953	All	Myopathy due to myxoedema
F1441	All	Cerebellar ataxia due to myxoedema
F11x5	All	Cerebral degeneration due to myxoedema
1432	All	H/O: hypothyroidism
66BB.	All	Hypothyroidism annual review

90j..	All	Hypothyroidism monitoring administration
90j0.	All	Hypothyroidism monitoring first letter
90j1.	All	Hypothyroidism monitoring second letter
90j2.	All	Hypothyroidism monitoring third letter
90j3.	All	Hypothyroidism monitoring verbal invite
90j4.	All	Hypothyroidism monitoring telephone invitation
F3814	All	Myasthenic syndrome due to hypothyroidism
90j4.	All	Hypothyroidism monitoring telephone invitation
Read CTV3 Code	Term ID	Description
X40IQ	All	Hypothyroid
XE108	All	Acquired hypothyroidism
X40HI	All	Compensated hypothyroidism
X005I	All	Myxoedema coma
C04y.	All	Other acquired hypothyroidism
X40HD	All	Hypothyroid goitre, acquired
XE10A	All	Hypothyroidism NOS
Xa3ed	All	Acquired hypothyroidism NOS
XaLUg	All	Hypothyroidism review
XaOjl	All	Hypothyroidism annual review
X40HD	All	Hypothyroid goitre, acquired
XaJul	All	Hypothyroidism monitoring invitation
XaMFm	All	Hypothyroidism monitoring telephone invitation
XaKbz	All	Hypothyroidism monitoring verbal invite
XaJuO	All	Hypothyroidism monitoring third letter
XaJuN	All	Hypothyroidism monitoring second letter
XaJuM	All	Hypothyroidism monitoring first letter
C06y1	All	Thyroid atrophy
X40I1	All	Atrophy of thyroid - acquired
F3953	All	Myxoedema myopathy
F11x5	All	Myxoedema encephalopathy
F1441	All	Myxoedema cerebellar degeneration
PK251	All	Aplasia of thyroid with myxoedema
X00Ao	All	Myxoedema neuropathy
1432.	All	H/O: hypothyroidism
C04z0	All	Premature puberty due to hypothyroidism
C05y.	All	Other and unspecified chronic thyroiditis
Non-autoimmune hypothyroidism		
Read V2 Code	Term ID	Description
C0A..	All	Congenital iodine deficiency syndrome
C0A0.	All	Congenital iodine-deficiency syndrome, neurological type
C0A1.	All	Congenital iodine-deficiency syndrome, myxoedematous type
C0A2.	All	Congenital iodine-deficiency syndrome, mixed type
C0A3.	All	Iodine-deficiency-related diffuse (endemic) goitre

C0A4.	All	Iodine-deficiency-related multinodular (endemic) goitre
C0A5.	All	Subclinical iodine-deficiency hypothyroidism
C0AX.	All	Iodine-deficiency-related (endemic) goitre, unspecified
C03..	All	Congenital hypothyroidism
C030.	All	Pendred's syndrome
C031.	All	Goitrous cretin
C03y.	All	Other specified congenital hypothyroidism
C03y0	All	Congenital hypothyroidism with diffuse goitre
C03y1	All	Congenital hypothyroidism without goitre
C03z.	All	Congenital hypothyroidism NOS
C040.	All	Postsurgical hypothyroidism
C041.	All	Other postablative hypothyroidism
C0410	All	Irradiation hypothyroidism
C041z	All	Postablative hypothyroidism NOS
C042.	All	Iodine hypothyroidism
C043.	All	Other iatrogenic hypothyroidism
C0430	All	Hypothyroidism resulting from para-aminosalicylic acid
C0431	All	Hypothyroidism resulting from phenylbutazone
C0432	All	Hypothyroidism resulting from resorcinol
C043z	All	Iatrogenic hypothyroidism NOS
C044.	All	Postinfectious hypothyroidism
71100	All	Total thyroidectomy
71101	All	Subtotal thyroidectomy
5A11.	All	Thyroid gland ablat - irradiat
5A12.	All	Thyroid tumour/metast irradiat
C1343	All	TSH - thyroid-stimulating hormone deficiency
Q4337	All	Neonatal jaunduce with congenital hypothyroidism
Read CTV3 Code	Term ID	Description
C03..	All	Congenital hypothyroidism
Xa017	All	Congenital hypothyroidism with diffuse goitre
X40H8	All	Congenital hypothyroidism without goitre
PK251	All	Congenital thyroid aplasia
X40HA	All	Congenital thyroid hypoplasia
X40HB	All	Congenital atrophy of thyroid
X40HC	All	Congenital hypothyroidism with ectopic thyroid
C03y.	All	Other specified congenital hypothyroidism
XE107	All	Congenital hypothyroidism NOS
X40I7	All	Congenital iodine deficiency hypothyroidism
X40I8	All	Congenital iodine deficiency syndrome - myxoedematous type
X40I9	All	Congenital iodine deficiency syndrome - mixed type
X40HL	All	Iatrogenic hypothyroidism
X40HM	All	Postablative hypothyroidism
XE109	All	Post-surgical hypothyroidism
C0410	All	Irradiation hypothyroidism

X40HN	All	Radioactive iodine-induced hypothyroidism
C041.	All	Other postablative hypothyroidism
C041z	All	Postablative hypothyroidism NOS
C043.	All	Other iatrogenic hypothyroidism
C043z	All	Iatrogenic hypothyroidism NOS
X40HO	All	Drug-induced hypothyroidism
C0430	All	Hypothyroidism resulting from para-aminosalicylic acid
C0431	All	Hypothyroidism resulting from phenylbutazone
C0432	All	Hypothyroidism resulting from resorcinol
X40HP	All	Post-infectious hypothyroidism
X40IB	All	Subclinical iodine deficiency hypothyroidism
C042.	All	Iodine hypothyroidism
C1343	All	TSH deficiency
X40LB	All	Isolated TSH deficiency
X40LC	All	Idiopathic TSH deficiency
X40Hv	All	Hypothyroidism due to iodide trapping defect
X40Hw	All	Hypothyroidism due to iodide organification defect
X40Hx	All	Hypothyroidism due to coupling defect
X40Hy	All	Hypothyroidism due to deiodase defect
X40Hz	All	Hypothyroidism due to thyroglobulin synthesis defect
Cyu11	All	[X]Other specified hypothyroidism
Xa3ec	All	Hypothyroidism - congenital and acquired
C03..	All	Congenital hypothyroidism
Xa0l7	All	Congenital hypothyroidism with diffuse goitre
X40H8	All	Congenital hypothyroidism without goitre
PK251	All	Congenital thyroid aplasia
X40HA	All	Congenital thyroid hypoplasia
X40HB	All	Congenital atrophy of thyroid
X40HC	All	Congenital hypothyroidism with ectopic thyroid
C03y.	All	Other specified congenital hypothyroidism
XE107	All	Congenital hypothyroidism NOS
X40I7	All	Congenital iodine deficiency hypothyroidism
X40I8	All	Congenital iodine deficiency syndrome - myxoedematous type
X40I9	All	Congenital iodine deficiency syndrome - mixed type
X40HL	All	Iatrogenic hypothyroidism
X40HM	All	Postablative hypothyroidism
XE109	All	Post-surgical hypothyroidism
C0410	All	Irradiation hypothyroidism
X40HN	All	Radioactive iodine-induced hypothyroidism
C041.	All	Other postablative hypothyroidism
C041z	All	Postablative hypothyroidism NOS
C043.	All	Other iatrogenic hypothyroidism
C043z	All	Iatrogenic hypothyroidism NOS
X40HO	All	Drug-induced hypothyroidism
C0430	All	Hypothyroidism resulting from para-aminosalicylic acid

C0431	All	Hypothyroidism resulting from phenylbutazone
C0432	All	Hypothyroidism resulting from resorcinol
X40HP	All	Post-infectious hypothyroidism
X40IB	All	Subclinical iodine deficiency hypothyroidism
C042.	All	Iodine hypothyroidism
C1343	All	TSH deficiency
X40LB	All	Isolated TSH deficiency
X40LC	All	Idiopathic TSH deficiency
X40Hv	All	Hypothyroidism due to iodide trapping defect
X40Hw	All	Hypothyroidism due to iodide organification defect
X40Hx	All	Hypothyroidism due to coupling defect
X40Hy	All	Hypothyroidism due to deiodase defect
X40Hz	All	Hypothyroidism due to thyroglobulin synthesis defect
Cyu11	All	[X]Other specified hypothyroidism
Xa3ec	All	Hypothyroidism - congenital and acquired
Xa08g	All	Transient neonatal hypothyroidism
Q4337	All	Neonatal jaundice with congenital hypothyroidism

Supplementary table S4.8. Read codes used to identify Grave's disease.

Grave's disease		
Read V2 Code	Term ID	Description
66B4.	All	Thyroid eye disease
C020.	All	Graves' disease
C0200	All	Toxic diffuse goitre with no crisis
C0201	All	Toxic diffuse goitre with crisis
C020z	All	Toxic diffuse goitre NOS
F4G2.	All	Endocrine exophthalmos
F4G20	All	Thyrotoxic exophthalmos
F4G21	All	Exophthalmic ophthalmoplegia
F4G2z	All	Endocrine exophthalmos NOS
Read CTV3 Code	Term ID	Description
F4G2.	All	Dysthyroid ophthalmopathy
F4G20	All	Thyrotoxic exophthalmos
F4G21	All	Exophthalmic ophthalmoplegia
F4G2z	All	Endocrine exophthalmos NOS
X400I	All	Graves' disease
X40Gk	All	Thyrotoxicosis due to Graves' disease
X400K	All	Juvenile Graves' disease
X400R	All	Exophthalmic goitre
X40Gk	All	Thyrotoxicosis due to Graves' disease
XS29G	All	Thyroid eye disease
XE105	All	Toxic diffuse goitre
C0200	All	Toxic diffuse goitre with no crisis
C0201	All	Toxic diffuse goitre with crisis
C020z	All	Toxic diffuse goitre NOS

Supplementary table S4.9. Read codes used to identify psoriatic arthritis.

Psoriatic arthritis		
Read V2 Code	Term ID	Description
M160.	All	Psoriatic arthropathy
M1601	All	Distal interphalangeal psoriatic arthropathy
M160z	All	Psoriatic arthropathy NOS
Nyu13	All	[X]Other psoriatic arthropathies
M1600	All	Psoriasis spondylitica
M1602	All	Arthritis mutilans
Read CTV3 Code	Term ID	Description
M160.	All	Psoriatic arthritis
M1600	All	Psoriatic arthritis with spine involvement
X7026	All	Psoriatic arthritis with distal interphalangeal joint involvement
X7027	All	Psoriatic arthritis - destructive type
X7028	All	Psoriatic dactylitis
X701u	All	Juvenile psoriatic arthritis
X701v	All	Juvenile psoriatic arthritis with psoriasis
X701w	All	Juvenile psoriatic arthritis without psoriasis
M160z	All	Psoriatic arthropathy NOS
Nyu13	All	[X]Other psoriatic arthropathies
Ankylosing spondylitis		
Read V2 Code	Term ID	Description
N100.	All	Ankylosing spondylitis
N0450	All	Juvenile ankylosing spondylitis
Read CTV3 Code	Term ID	Description
N100.	All	Ankylosing spondylitis
X7023	All	Ankylosing spondylitis with organ / system involvement
X7024	All	Ankylosing spondylitis with multisystem involvement
X701x	All	Juvenile ankylosing spondylitis

Supplementary table S4.10. Read codes used to identify ankylosing spondylitis.

Ankylosing spondylitis		
Read V2 Code	Term ID	Description
N100.	All	Ankylosing spondylitis
N0450	All	Juvenile ankylosing spondylitis
Read CTV3 Code	Term ID	Description
N100.	All	Ankylosing spondylitis
X7023	All	Ankylosing spondylitis with organ / system involvement
X7024	All	Ankylosing spondylitis with multisystem involvement
X701x	All	Juvenile ankylosing spondylitis

Supplementary table S4.11. Read codes used to identify systemic lupus erythematosus.

Systemic lupus erythematosus		
Read V2 Code	Term ID	Description
N000.	All	Systemic lupus erythematosus
N0000	All	Disseminated lupus erythematosus
N0001	All	Libman-Sacks disease
N0002	All	Drug-induced systemic lupus erythematosus
N0003	All	Systemic lupus erythematosus with organ or system involvement
N0004	All	Systemic lupus erythematosus with pericarditis
N0005	All	Neonatal lupus erythematosus
N0006	All	Cerebral lupus
N000z	All	Systemic lupus erythematosus NOS
K01x4	All	Nephrotic syndrome in systemic lupus erythematosus
Read CTV3 Code	Term ID	Description
N000.	All	Systemic lupus erythematosus
X704X	All	Systemic lupus erythematosus with organ/system involvement
XE0da	All	Lupus nephritis
X30Kn	All	Lupus nephritis - WHO Class I
X30Ko	All	Lupus nephritis - WHO Class II
X30Kp	All	Lupus nephritis - WHO Class III
X30Kq	All	Lupus nephritis - WHO Class IV
X30Kr	All	Lupus nephritis - WHO Class V
X30Ks	All	Lupus nephritis - WHO Class VI
XM197	All	[EDTA] Lupus erythematosus associated with renal failure
X00Dx	All	Cerebral lupus
X704a	All	Lupus panniculitis
N0001	All	Libman-Sacks disease
XaC1J	All	Systemic lupus erythematosus with pericarditis
X704c	All	Systemic lupus erythematosus with multisystem involvement
N0002	All	Drug-induced systemic lupus erythematosus
N000z	All	Systemic lupus erythematosus NOS
Nyu43	All	[X]Other forms of systemic lupus erythematosus
X0046	All	Chorea in systemic lupus erythematosus
H57y4	All	Lung disease with systemic lupus erythematosus
XaBE1	All	Renal tubulo-interstitial disord in systemic lupus erythematosus

Supplementary table S4.12. Read codes used to identify polymyalgia rheumatica.

Polymyalgia rheumatica		
Read V2 Code	Term ID	Description
N20..	All	Polymyalgia rheumatica
N200.	All	Giant cell arteritis with polymyalgia rheumatica
Read CTV3 Code	Term ID	Description
XE1FJ	All	Polymyalgia rheumatica
X705I	All	Giant cell arteritis with polymyalgia rheumatica

Supplementary table S4.13. Read codes used to identify Sjögren's syndrome.

Sjögren's syndrome		
Read V2 Code	Term ID	Description
N002.	All	Sicca (Sjogren's) syndrome
F3967	All	Myopathy due to Sjogren's disease
H57y3	All	Lung disease with Sjogren's disease
Read CTV3 Code	Term ID	Description
Xa0hF	All	Sjogren's syndrome
X705A	All	Primary Sjogren's syndrome
X705B	All	Primary Sjogren's syndrome with organ/system involvement
X705C	All	Primary Sjogren's syndrome with multisystem involvement
X705D	All	Secondary Sjogren's syndrome
X705E	All	Secondary Sjogren's syndrome with organ/system involvement
X705F	All	Secondary Sjogren's syndrome with multisystem involvement
F3967	All	Myopathy due to Sjogren's disease
H57y3	All	Lung disease with Sjogren's disease

Supplementary table S4.14. Read codes used to identify psoriasis.

Psoriasis		
Read V2 Code	Term ID	Description
M16..	All	Psoriasis and similar disorders
M161.	All	Other psoriasis
M1610	All	Psoriasis unspecified
M1611	All	Psoriasis annularis
M1612	All	Psoriasis circinata
M1613	All	Psoriasis diffusa
M1614	All	Psoriasis discoidea
M1615	All	Psoriasis geographica
M1616	All	Guttate psoriasis
M1617	All	Psoriasis gyrata
M1618	All	Psoriasis inveterata
M1619	All	Psoriasis ostracea
M161A	All	Psoriasis palmaris
M161B	All	Psoriasis plantaris
M161C	All	Psoriasis punctata
M161D	All	Pustular psoriasis
M161E	All	Psoriasis universalis
M161F	All	Psoriasis vulgaris
M161G	All	Acrodermatitis continua
M161H	All	Erythrodermic psoriasis
M161J	All	Flexural psoriasis
M161z	All	Psoriasis NOS
M166.	All	Palmoplantar pustular psoriasis
M16y.	All	Other psoriasis and similar disorders
M16y0	All	Scalp psoriasis
M16z.	All	Psoriasis and similar disorders NOS
Myu30	All	[X]Other psoriasis
Read CTV3 Code	Term ID	Description
X506Y	All	Psoriasis
XaY0x	All	Pustular psoriasis
X506p	All	Generalised pustular psoriasis
X506q	All	Acute generalised pustular psoriasis
X506r	All	Generalised pustular psoriasis of pregnancy
X506s	All	Pustular psoriasis in children
X506t	All	Juvenile pustular psoriasis
X506u	All	Infantile pustular psoriasis
X506l	All	Localised pustular psoriasis
X506m	All	Palmoplantar pustular psoriasis
M07y0	All	Acute palmoplantar pustular psoriasis
M161A	All	Psoriasis palmaris

M161B	All	Psoriasis plantaris
X506o	All	Lapiere type of psoriasis
X506v	All	Circinate and annular pustular psoriasis
M1611	All	Psoriasis annularis
M1612	All	Psoriasis circinata
M1614	All	Plaque psoriasis
XaNXa	All	Chronic large plaque psoriasis
M1616	All	Guttate psoriasis
X506Z	All	Flexural psoriasis
X506a	All	Unstable psoriasis
X506b	All	Erythrodermic psoriasis
X506i	All	Scalp psoriasis
M161.	All	Other psoriasis
M1610	All	Psoriasis unspecified
M1613	All	Psoriasis diffusa
M1615	All	Psoriasis geographica
M1617	All	Psoriasis gyrata
M1618	All	Psoriasis inveterata
M161C	All	Psoriasis punctata
M161E	All	Psoriasis universalis
XaNXt	All	Psoriasis vulgaris
M161z	All	Psoriasis NOS
Myu30	All	[X]Other psoriasis

Supplementary table S4.15. Read codes used to identify vitiligo.

Vitiligo		
Read V2 Code	Term ID	Description
M2951	All	Vitiligo
F4E53	All	Vitiligo of eyelid
Read CTV3 Code	Term ID	Description
M2951	All	Vitiligo
F4E53	All	Vitiligo of eyelid
X508z	All	Occupational vitiligo

Supplementary table S4.16. Read codes used to identify multiple sclerosis.

Multiple sclerosis		
Read V2 Code	Term ID	Description
666A.	All	Multiple sclerosis review
9mD..	All	Multiple sclerosis monitoring administration
9mD0.	All	Multiple sclerosis monitoring first letter
9mD1.	All	Multiple sclerosis monitoring second letter
9mD2.	All	Multiple sclerosis monitoring telephone invitation
9mD3.	All	Multiple sclerosis monitoring third letter
F20..	All	Multiple sclerosis
F200.	All	Multiple sclerosis of the brain stem
F201.	All	Multiple sclerosis of the spinal cord
F202.	All	Generalised multiple sclerosis
F203.	All	Exacerbation of multiple sclerosis
F204.	All	Benign multiple sclerosis
F205.	All	Malignant multiple sclerosis
F206.	All	Primary progressive multiple sclerosis
F207.	All	Relapsing and remitting multiple sclerosis
F208.	All	Secondary progressive multiple sclerosis
F20z.	All	Multiple sclerosis NOS
8CS1.	All	Multiple sclerosis care plan agreed
9kG..	All	Specialised services for patients with multiple sclerosis - enhanced services administration
Read CTV3 Code	Term ID	Description
XaKvm	All	Multiple sclerosis review
XaKvn	All	Multiple sclerosis multidisciplinary review
XaX9A	All	Multiple sclerosis monitoring administration
XaX9F	All	Multiple sclerosis monitoring first letter
XaX9H	All	Multiple sclerosis monitoring second letter
XaX9J	All	Multiple sclerosis monitoring telephone invitation
XaX9L	All	Multiple sclerosis monitoring third letter
F20..	All	Multiple sclerosis
XaP1V	All	Secondary progressive multiple sclerosis
XaP1B	All	Relapsing and remitting multiple sclerosis
XaP0r	All	Primary progressive multiple sclerosis
XaP0X	All	Malignant multiple sclerosis
XaOzZ	All	Benign multiple sclerosis
X005c	All	Acute relapsing multiple sclerosis
X005d	All	Chronic progressive multiple sclerosis
X005e	All	Remittent-progressive multiple sclerosis
F200.	All	Multiple sclerosis of the brainstem
F201.	All	Multiple sclerosis of the spinal cord
F202.	All	Generalised multiple sclerosis

F203.	All	Exacerbation of multiple sclerosis
F20z.	All	Multiple sclerosis NOS
XaPSc	All	Management of multiple sclerosis in palliative phase
XaPSb	All	Management of multiple sclerosis in progressive disability phase
XaPSa	All	Management of multiple sclerosis in stable disability phase
XaPSZ	All	Management of multiple sclerosis in early disease phase
XaPSY	All	Management of multiple sclerosis in onset phase
XaXsg	All	Referral to community multiple sclerosis team
XaKA8	All	Specialised services for patients with multiple sclerosis enhanced services administration
XaKzg	All	Multiple sclerosis care plan agreed

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Definitions of common infections with Read code lists.

Supplementary table S5.1. The case definitions for included Upper Respiratory Tract Infections.

Upper Respiratory Tract Infections		
Read V2 Code	Term ID	Description
F51..	All	Nonsuppurative otitis media + eustachian tube disorders
F510.	All	Acute non suppurative otitis media
F5100	All	Acute otitis media with effusion
F5101	All	Acute serous otitis media
F5102	All	Acute mucoid otitis media
F5103	All	Acute sanguinous otitis media
F5104	All	Acute allergic serous otitis media
F5105	All	Acute allergic mucoid otitis media
F5106	All	Acute allergic sanguinous otitis media
F510z	All	Acute nonsuppurative otitis media NOS
F52..	All	Suppurative and unspecified otitis media
F520.	All	Acute suppurative otitis media
F5200	All	Acute suppurative otitis media tympanic membrane intact
F5201	All	Acute suppurative otitis media tympanic membrane ruptured
F5203	All	Acute suppurative otitis media due to disease EC
F520z	All	Acute suppurative otitis media NOS
F526.	All	Acute left otitis media
F527.	All	Acute right otitis media
F528.	All	Acute bilateral otitis media
F52z.	All	Otitis media NOS
H00..	All	Acute nasopharyngitis
H01..	All	Acute sinusitis
H010.	All	Acute maxillary sinusitis
H011.	All	Acute frontal sinusitis
H012.	All	Acute ethmoidal sinusitis
H013.	All	Acute sphenoidal sinusitis
H014.	All	Acute rhinosinusitis
H01y.	All	Other acute sinusitis
H01y0	All	Acute pansinusitis
H01yz	All	Other acute sinusitis NOS
H01z.	All	Acute sinusitis NOS
H02..	All	Acute pharyngitis
H020.	All	Acute gangrenous pharyngitis
H021.	All	Acute phlegmonous pharyngitis
H022.	All	Acute ulcerative pharyngitis

H023.	All	Acute bacterial pharyngitis
H0230	All	Acute pneumococcal pharyngitis
H0231	All	Acute staphylococcal pharyngitis
H023z	All	Acute bacterial pharyngitis NOS
H024.	All	Acute viral pharyngitis
H025.	All	Allergic pharyngitis
H02z.	All	Acute pharyngitis NOS
H03..	All	Acute tonsillitis
H030.	All	Acute erythematous tonsillitis
H031.	All	Acute follicular tonsillitis
H032.	All	Acute ulcerative tonsillitis
H033.	All	Acute catarrhal tonsillitis
H034.	All	Acute gangrenous tonsillitis
H035.	All	Acute bacterial tonsillitis
H0350	All	Acute pneumococcal tonsillitis
H0351	All	Acute staphylococcal tonsillitis
H035z	All	Acute bacterial tonsillitis NOS
H036.	All	Acute viral tonsillitis
H037.	All	Recurrent acute tonsillitis
H03z.	All	Acute tonsillitis NOS
H04..	All	Acute laryngitis and tracheitis
H040.	All	Acute laryngitis
H0400	All	Acute oedematous laryngitis
H0401	All	Acute ulcerative laryngitis
H0402	All	Acute catarrhal laryngitis
H0403	All	Acute phlegmonous laryngitis
H0404	All	Acute haemophilus influenzae laryngitis
H0405	All	Acute pneumococcal laryngitis
H0406	All	Acute suppurative laryngitis
H040w	All	Acute viral laryngitis unspecified
H040x	All	Acute bacterial laryngitis unspecified
H040z	All	Acute laryngitis NOS
H041.	All	Acute tracheitis
H0410	All	Acute tracheitis without obstruction
H0411	All	Acute tracheitis with obstruction
H041z	All	Acute tracheitis NOS
H042.	All	Acute laryngotracheitis
H0420	All	Acute laryngotracheitis without obstruction
H0421	All	Acute laryngotracheitis with obstruction
H042z	All	Acute laryngotracheitis NOS
H043.	All	Acute epiglottitis (non strep)
H0430	All	Acute epiglottitis without obstruction

H0431	All	Acute epiglottitis with obstruction
H0432	All	Acute obstructive laryngitis
H043z	All	Acute epiglottitis NOS
H044.	All	Croup
H04z.	All	Acute laryngitis and tracheitis NOS
H05..	All	Other acute upper respiratory infections
H050.	All	Acute laryngopharyngitis
H051.	All	Acute upper respiratory tract infection
H052.	All	Pharyngotracheitis
H053.	All	Tracheopharyngitis
H054.	All	Recurrent upper respiratory tract infection
H055.	All	Pharyngolaryngitis
H05y.	All	Other upper respiratory infections of multiple sites
H05z.	All	Upper respiratory infection NOS
H0y..	All	Other specified acute respiratory infections
H0z..	All	Acute respiratory infection NOS
Read CTV3 Code	Term ID	Description
A3401	All	Streptococcal laryngitis
A3403	All	Streptococcal tonsillitis
A740.	All	Herpangina
AA12.	All	Vincent's angina - pharyngitis
F51..	All	Non-suppurative otitis media with eustachian tube disorders
F510.	All	Acute non-suppurative otitis media
F5100	All	Acute otitis media: [with effusion] or [secretory]
F5101	All	Acute non-suppurative otitis media - serous
F5102	All	Acute non-suppurative otitis media - mucoid
F5103	All	Acute non-suppurative otitis media - sanguinous
F5104	All	Acute allergic serous otitis media
F5105	All	Acute allergic mucoid otitis media
F5106	All	Acute allergic sanguinous otitis media
F510z	All	Acute non-suppurative otitis media NOS
F52..	All	Suppurative and unspecified otitis media
F520.	All	Acute suppurative otitis media
F5200	All	Acute suppurative otitis media - tympanic membrane intact
F5201	All	Acute suppurative otitis media - tympanic membrane ruptured
F5203	All	Acute suppurative otitis media due to disease EC
F520z	All	Acute suppurative otitis media NOS
F526.	All	Acute left otitis media
F527.	All	Acute right otitis media
F528.	All	Acute bilateral otitis media
F52z.	All	Ear infection &/or otitis media NOS
FyuP0	All	[X]Other acute non-suppurative otitis media
H00..	All	(Acute nasopharyngitis or rhinitis) or (common cold)

H01..	All	Sinusitis (& acute)
H010.	All	Acute maxillary sinusitis
H011.	All	Acute frontal sinusitis
H012.	All	Acute ethmoidal sinusitis
H013.	All	Acute sphenoidal sinusitis
H014.	All	NULL
H01y.	All	Other acute sinusitis
H01y0	All	Acute pansinusitis
H01yz	All	Other acute sinusitis NOS
H01z.	All	Acute sinusitis NOS
H02..	All	Throat: [acute pharyngitis] or [sore NOS (& viral)] or [infection]
H020.	All	Acute gangrenous pharyngitis
H021.	All	Acute phlegmonous pharyngitis
H022.	All	Acute ulcerative pharyngitis
H023.	All	Acute bacterial pharyngitis
H0230	All	Acute pneumococcal pharyngitis
H0231	All	Acute staphylococcal pharyngitis
H023z	All	Acute bacterial pharyngitis NOS
H024.	All	Acute viral pharyngitis
H025.	All	Allergic pharyngitis
H02z.	All	Acute pharyngitis NOS
H03..	All	Tonsillitis (& acute)
H030.	All	Acute erythematous tonsillitis
H031.	All	Acute follicular tonsillitis
H032.	All	Acute ulcerative tonsillitis
H033.	All	Acute catarrhal tonsillitis
H034.	All	Acute gangrenous tonsillitis
H035.	All	Acute bacterial tonsillitis
H0350	All	Acute pneumococcal tonsillitis
H0351	All	Acute staphylococcal tonsillitis
H035z	All	Acute bacterial tonsillitis NOS
H036.	All	Acute viral tonsillitis
H037.	All	Recurrent acute tonsillitis
H03z.	All	Acute tonsillitis NOS
H04..	All	NULL
H040.	All	Acute laryngitis
H0400	All	Acute oedematous laryngitis
H0401	All	Acute ulcerative laryngitis
H0402	All	Acute catarrhal laryngitis
H0403	All	Acute phlegmonous laryngitis
H0404	All	Acute haemophilus influenzae laryngitis
H0405	All	Acute pneumococcal laryngitis

H0406	All	Acute suppurative laryngitis
H040w	All	Acute viral laryngitis unspecified
H040x	All	Acute bacterial laryngitis unspecified
H040z	All	Acute laryngitis NOS
H041.	All	Acute tracheitis
H0410	All	Acute tracheitis without obstruction
H0411	All	Acute tracheitis with obstruction
H041z	All	Acute tracheitis NOS
H042.	All	Laryngotracheitis (& acute)
H0420	All	Acute laryngotracheitis without obstruction
H0421	All	Acute laryngotracheitis with obstruction
H042z	All	Acute laryngotracheitis NOS
H043.	All	Epiglottitis: [viral] or [acute non streptococcal]
H0430	All	Acute epiglottitis without obstruction
H0431	All	Acute epiglottitis with obstruction
H0432	All	NULL
H043z	All	Acute epiglottitis NOS
H044.	All	NULL
H04z.	All	Acute laryngitis and tracheitis NOS
H05..	All	Other acute upper respiratory infections
H050.	All	Acute laryngopharyngitis
H051.	All	NULL
H052.	All	NULL
H053.	All	Tracheopharyngitis
H054.	All	Recurrent upper respiratory tract infection
H055.	All	Pharyngolaryngitis
H05y.	All	Other upper respiratory infections of multiple sites
H05z.	All	Upper respiratory tract infection (& viral) NOS
H0y..	All	Other specified acute respiratory infections
H0z..	All	Acute respiratory infection NOS
X00iq	All	Recurrent acute suppurative otitis media
X00m1	All	Pott's puffy tumour
X00mH	All	Acute herpes simplex pharyngitis
X00mI	All	Acute herpes zoster pharyngitis
X00mJ	All	Enteroviral lymphonodular pharyngitis
X00mL	All	Glandular fever pharyngitis
X00mq	All	Vincent's tonsillitis
X00n1	All	Acute simple laryngitis
X00n2	All	Vincent's laryngitis
X00n4	All	Acute membranous laryngitis
X00n5	All	Acute subglottic laryngitis
X00n6	All	Recurrent allergic croup

X1003	All	Viral upper respiratory tract infection NOS
Xa0IW	All	Acute laryngotracheobronchitis
Xa86D	All	Acute viral laryngotracheitis
XaKyZ	All	Acute obstructive laryngitis
XE0Xo	All	Acute laryngotracheitis
XE0Xq	All	Upper respiratory infection NOS
XE17D	All	Otitis media NOS
XE1A1	All	Suppurative otitis media &/or ([left] or [right]) &/or purulent otitis media
XE2QD	All	Acute otitis media with effusion
XM1QT	All	Acute fibrinous laryngotracheobronchitis

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Supplementary table S5.2. The case definitions for included Lower Respiratory Tract Infections.

Lower Respiratory Tract Infections		
Pneumonia		
Read V2 Code	Term ID	Description
H20..	All	Viral pneumonia
H200.	All	Pneumonia due to adenovirus
H201.	All	Pneumonia due to respiratory syncytial virus
H202.	All	Pneumonia due to parainfluenza virus
H203.	All	Pneumonia due to human metapneumovirus
H20y.	All	Viral pneumonia NEC
H20y0	All	Severe acute respiratory syndrome
H20z.	All	Viral pneumonia NOS
H21..	All	Lobar (pneumococcal) pneumonia
H22..	All	Other bacterial pneumonia
H220.	All	Pneumonia due to klebsiella pneumoniae
H221.	All	Pneumonia due to pseudomonas
H222.	All	Pneumonia due to haemophilus influenzae
H223.	All	Pneumonia due to streptococcus
H2230	All	Pneumonia due to streptococcus, group B
H224.	All	Pneumonia due to staphylococcus
H22y.	All	Pneumonia due to other specified bacteria
H22y0	All	Pneumonia due to escherichia coli
H22y1	All	Pneumonia due to proteus
H22y2	All	Pneumonia - Legionella
H22y3	All	Pneumonia due to Gram negative bacteria
H22yX	All	Pneumonia due to other aerobic gram-negative bacteria
H22yz	All	Pneumonia due to bacteria NOS
H22z.	All	Bacterial pneumonia NOS
H23..	All	Pneumonia due to other specified organisms
H230.	All	Pneumonia due to Eaton's agent
H231.	All	Pneumonia due to mycoplasma pneumoniae
H232.	All	Pneumonia due to pleuropneumonia like organisms
H233.	All	Chlamydial pneumonia
H23z.	All	Pneumonia due to specified organism NOS
H24..	All	Pneumonia with infectious diseases EC
H240.	All	Pneumonia with measles
H241.	All	Pneumonia with cytomegalic inclusion disease
H242.	All	Pneumonia with ornithosis
H243.	All	Pneumonia with whooping cough
H244.	All	Pneumonia with tularaemia
H245.	All	Pneumonia with anthrax
H246.	All	Pneumonia with aspergillosis

H247.	All	Pneumonia with other systemic mycoses
H2470	All	Pneumonia with candidiasis
H2471	All	Pneumonia with coccidioidomycosis
H2472	All	Pneumonia with histoplasmosis
H247z	All	Pneumonia with systemic mycosis NOS
H24y.	All	Pneumonia with other infectious diseases EC
H24y0	All	Pneumonia with actinomycosis
H24y1	All	Pneumonia with nocardiasis
H24y2	All	Pneumonia with pneumocystis carinii
H24y3	All	Pneumonia with Q-fever
H24y4	All	Pneumonia with salmonellosis
H24y5	All	Pneumonia with toxoplasmosis
H24y6	All	Pneumonia with typhoid fever
H24y7	All	Pneumonia with varicella
H24yz	All	Pneumonia with other infectious diseases EC NOS
H24z.	All	Pneumonia with infectious diseases EC NOS
H25..	All	Bronchopneumonia due to unspecified organism
H26..	All	Pneumonia due to unspecified organism
H260.	All	Lobar pneumonia due to unspecified organism
H2600	All	Lung consolidation
H261.	All	Basal pneumonia due to unspecified organism
H262.	All	Postoperative pneumonia
H263.	All	Pneumonitis, unspecified
H28..	All	Atypical pneumonia
Read CTV3 Code	Term ID	Description
H20..	All	Viral pneumonia (& chest infection)
H200.	All	Adenoviral pneumonia
H201.	All	Pneumonia due to respiratory syncytial virus
H202.	All	Parainfluenzal pneumonia
H203.	All	NULL
H20y.	All	Viral pneumonia NEC
H20y0	All	NULL
H20z.	All	Viral pneumonia NOS
H21..	All	Pneumococcal pneumonia (& lobar)
H22..	All	Other bacterial pneumonia
H220.	All	Pneumonia due to Klebsiella pneumoniae
H221.	All	Pseudomonal pneumonia
H222.	All	Haemophilus influenzae pneumonia
H223.	All	Streptococcal pneumonia
H2230	All	Group B streptococcal pneumonia
H224.	All	Staphylococcal pneumonia
H22y.	All	Pneumonia due to other specified bacteria
H22y0	All	Escherichia coli pneumonia
H22y1	All	Proteus pneumonia

H22y2	All	Legionella pneumonia
H22y3	All	NULL
H22yX	All	NULL
H22yz	All	Pneumonia due to bacteria NOS
H22z.	All	Bacterial pneumonia NOS
H23..	All	Pneumonia due to other specified organisms
H230.	All	NULL
H231.	All	NULL
H232.	All	Pneumonia due to pleuropneumonia-like organism
H233.	All	NULL
H23z.	All	Pneumonia due to specified organism NOS
H24..	All	(Pneumonia) or (chest infection) with infectious diseases EC
H240.	All	Measles pneumonia
H241.	All	Cytomegalovirus pneumonia
H242.	All	Ornithosis with pneumonia
H243.	All	Pertussis pneumonia
H244.	All	Tularaemia pneumonia
H245.	All	Anthrax pneumonia
H246.	All	Pneumonia with aspergillosis
H247.	All	Pneumonia with other systemic mycoses
H2470	All	Candidal pneumonia
H2471	All	Pneumonia with coccidioidomycosis
H2472	All	Pneumonia with histoplasmosis
H247z	All	Pneumonia with systemic mycosis NOS
H24y.	All	Pneumonia with other infectious diseases EC
H24y0	All	Actinomycotic pneumonia
H24y1	All	Nocardial pneumonia
H24y2	All	Pneumocystis carinii pneumonia
H24y3	All	Q fever pneumonia
H24y4	All	NULL
H24y5	All	Toxoplasma pneumonia
H24y6	All	Typhoid pneumonia
H24y7	All	Chickenpox pneumonia
H24yz	All	Pneumonia with other infectious diseases EC NOS
H24z.	All	Pneumonia with infectious diseases EC NOS
H25..	All	Bronchopneumonia: [unspecified organism] or [chest infection - unspecified]
H26..	All	Pneumonia due to unspecified organism
H260.	All	Lobar pneumonia due to unspecified organism
H2600	All	NULL
H261.	All	NULL
H262.	All	NULL
H263.	All	NULL
H28..	All	NULL
X100h	All	Giant cell pneumonia
XaBE9	All	Basal pneumonia due to unspecified organism

XaDtI	All	Legionnaire's disease
XEOYJ	All	Bronchopneumonia due to unspecified organism
Acute Bronchitis		
Read V2 Code	Term ID	Description
H06..	All	Acute bronchitis and bronchiolitis
H060.	All	Acute bronchitis
H0600	All	Acute fibrinous bronchitis
H0601	All	Acute membranous bronchitis
H0602	All	Acute pseudomembranous bronchitis
H0603	All	Acute purulent bronchitis
H0604	All	Acute croupous bronchitis
H0605	All	Acute tracheobronchitis
H0606	All	Acute pneumococcal bronchitis
H0607	All	Acute streptococcal bronchitis
H0608	All	Acute haemophilus influenzae bronchitis
H0609	All	Acute neisseria catarrhalis bronchitis
H060A	All	Acute bronchitis due to mycoplasma pneumoniae
H060B	All	Acute bronchitis due to coxsackievirus
H060C	All	Acute bronchitis due to parainfluenza virus
H060D	All	Acute bronchitis due to respiratory syncytial virus
H060E	All	Acute bronchitis due to rhinovirus
H060F	All	Acute bronchitis due to echovirus
H060v	All	Subacute bronchitis unspecified
H060w	All	Acute viral bronchitis unspecified
H060x	All	Acute bacterial bronchitis unspecified
H060z	All	Acute bronchitis NOS
H061.	All	Acute bronchiolitis
H0610	All	Acute capillary bronchiolitis
H0611	All	Acute obliterating bronchiolitis
H0612	All	Acute bronchiolitis with bronchospasm
H0613	All	Acute exudative bronchiolitis
H0614	All	Obliterating fibrous bronchiolitis
H0615	All	Acute bronchiolitis due to respiratory syncytial virus
H0616	All	Acute bronchiolitis due to other specified organisms
H0617	All	Acute bronchiolitis due to human metapneumovirus
H061z	All	Acute bronchiolitis NOS
H062.	All	Acute lower respiratory tract infection
H06z.	All	Acute bronchitis or bronchiolitis NOS
H06z0	All	Chest infection NOS
H06z1	All	Lower resp tract infection
H06z2	All	Recurrent chest infection
H30..	All	Bronchitis unspecified
H300.	All	Tracheobronchitis NOS

H301.	All	Laryngotracheobronchitis
H302.	All	Wheezy bronchitis
H30z.	All	Bronchitis NOS
Read CTV3 Code	Term ID	Description
A33y.	All	Whooping cough - other specified organism
A33yz	All	Other whooping cough NOS
A33z.	All	Whooping cough NOS
Ayu39	All	[X]Whooping cough due to other Bordetella species
Ayu3A	All	[X]Whooping cough, unspecified
H06..	All	Acute bronchitis and bronchiolitis
H060.	All	Acute bronchitis (& wheezy)
H0600	All	Acute fibrinous bronchitis
H0601	All	Acute membranous bronchitis
H0602	All	Acute pseudomembranous bronchitis
H0603	All	Acute purulent bronchitis
H0604	All	Acute croupous bronchitis
H0605	All	Acute tracheobronchitis
H0606	All	Acute pneumococcal bronchitis
H0607	All	Acute streptococcal bronchitis
H0608	All	Acute haemophilus influenzae bronchitis
H0609	All	Acute Neisseria catarrhalis bronchitis
H060A	All	NULL
H060B	All	Acute coxsackievirus bronchitis
H060C	All	Acute parainfluenza virus bronchitis
H060D	All	Acute respiratory syncytial virus bronchitis
H060E	All	Acute bronchitis due to rhinovirus
H060F	All	Acute echovirus bronchitis
H060v	All	Subacute bronchitis unspecified
H060w	All	Acute viral bronchitis unspecified
H060x	All	Acute bacterial bronchitis unspecified
H060z	All	Acute bronchitis NOS
H061.	All	Acute bronchiolitis
H0610	All	Acute capillary bronchiolitis
H0611	All	Acute obliterating bronchiolitis
H0612	All	Acute bronchiolitis with bronchospasm
H0613	All	Acute exudative bronchiolitis
H0614	All	Obliterating fibrous bronchiolitis
H0615	All	Acute bronchiolitis due to respiratory syncytial virus
H0616	All	Acute bronchiolitis due to other specified organisms
H0617	All	NULL
H061z	All	Acute bronchiolitis NOS
H062.	All	NULL

H06z.	All	Acute bronchitis or bronchiolitis NOS
H06z0	All	Chest infection (& NOS)
H06z1	All	Respiratory tract infection (& [acute lower] or [lower])
H06z2	All	NULL
H243.	All	Pertussis pneumonia
H30..	All	Bronchitis: [unspecified (& chest infection)] or [recurrent wheezy]
H300.	All	Tracheobronchitis NOS
H301.	All	Laryngotracheobronchitis
H302.	All	NULL
H30z.	All	Bronchitis NOS
Hyu10	All	[X]Acute bronchitis due to other specified organisms
Hyu11	All	[X]Acute bronchiolitis due to other specified organisms
X1006	All	Chest infection - unspecified bronchitis
X1007	All	Acute bacterial bronchitis
X1009	All	Acute mycoplasmal bronchitis
X100A	All	Acute chlamydial bronchitis
X100B	All	Acute viral bronchitis
X100C	All	Acute viral bronchiolitis
X100D	All	Acute bronchiolitis due to adenovirus
Xa0IW	All	Acute laryngotracheobronchitis
Xa0IZ	All	Asthmatic bronchitis
XaDtB	All	Acute infective bronchitis
XaDth	All	Acute infective tracheobronchitis
XaYYt	All	Acute bronchiolitis due to human metapneumovirus
XE0Qw	All	Whooping cough
XE0Xr	All	Acute bronchitis
XE0YL	All	Bronchitis unspecified
XE0Yt	All	Acute: [bronchitis] or [chest infections] or [tracheobronchitis]
XM1QT	All	Acute fibrinous laryngotracheobronchitis
XM1QX	All	Acute wheezy bronchitis

Supplementary table S5.3. The case definitions for included Pneumonia and Pneumonitis.

Pneumonia and Pneumonitis		
Read V2 Code	Term ID	Description
H20..	All	Viral pneumonia
H200.	All	Pneumonia due to adenovirus
H201.	All	Pneumonia due to respiratory syncytial virus
H202.	All	Pneumonia due to parainfluenza virus
H203.	All	Pneumonia due to human metapneumovirus
H20y.	All	Viral pneumonia NEC
H20y0	All	Severe acute respiratory syndrome
H20z.	All	Viral pneumonia NOS
H21..	All	Lobar (pneumococcal) pneumonia
H22..	All	Other bacterial pneumonia
H220.	All	Pneumonia due to klebsiella pneumoniae
H221.	All	Pneumonia due to pseudomonas
H222.	All	Pneumonia due to haemophilus influenzae
H223.	All	Pneumonia due to streptococcus
H2230	All	Pneumonia due to streptococcus, group B
H224.	All	Pneumonia due to staphylococcus
H22y.	All	Pneumonia due to other specified bacteria
H22y0	All	Pneumonia due to escherichia coli
H22y1	All	Pneumonia due to proteus
H22y2	All	Pneumonia - Legionella
H22y3	All	Pneumonia due to Gram negative bacteria
H22yX	All	Pneumonia due to other aerobic gram-negative bacteria
H22yz	All	Pneumonia due to bacteria NOS
H22z.	All	Bacterial pneumonia NOS
H23..	All	Pneumonia due to other specified organisms
H230.	All	Pneumonia due to Eaton's agent
H231.	All	Pneumonia due to mycoplasma pneumoniae
H232.	All	Pneumonia due to pleuropneumonia like organisms
H233.	All	Chlamydial pneumonia
H23z.	All	Pneumonia due to specified organism NOS
H24..	All	Pneumonia with infectious diseases EC
H240.	All	Pneumonia with measles
H241.	All	Pneumonia with cytomegalic inclusion disease
H242.	All	Pneumonia with ornithosis
H243.	All	Pneumonia with whooping cough
H244.	All	Pneumonia with tularaemia
H245.	All	Pneumonia with anthrax
H246.	All	Pneumonia with aspergillosis
H247.	All	Pneumonia with other systemic mycoses

H2470	All	Pneumonia with candidiasis
H2471	All	Pneumonia with coccidioidomycosis
H2472	All	Pneumonia with histoplasmosis
H247z	All	Pneumonia with systemic mycosis NOS
H24y.	All	Pneumonia with other infectious diseases EC
H24y0	All	Pneumonia with actinomycosis
H24y1	All	Pneumonia with nocardiasis
H24y2	All	Pneumonia with pneumocystis carinii
H24y3	All	Pneumonia with Q-fever
H24y4	All	Pneumonia with salmonellosis
H24y5	All	Pneumonia with toxoplasmosis
H24y6	All	Pneumonia with typhoid fever
H24y7	All	Pneumonia with varicella
H24yz	All	Pneumonia with other infectious diseases EC NOS
H24z.	All	Pneumonia with infectious diseases EC NOS
H25..	All	Bronchopneumonia due to unspecified organism
H26..	All	Pneumonia due to unspecified organism
H260.	All	Lobar pneumonia due to unspecified organism
H2600	All	Lung consolidation
H261.	All	Basal pneumonia due to unspecified organism
H262.	All	Postoperative pneumonia
H263.	All	Pneumonitis, unspecified
H28..	All	Atypical pneumonia
Read CTV3 Code	Term ID	Description
H20..	All	Viral pneumonia (& chest infection)
H200.	All	Adenoviral pneumonia
H201.	All	Pneumonia due to respiratory syncytial virus
H202.	All	Parainfluenzal pneumonia
H203.	All	NULL
H20y.	All	Viral pneumonia NEC
H20y0	All	NULL
H20z.	All	Viral pneumonia NOS
H21..	All	Pneumococcal pneumonia (& lobar)
H22..	All	Other bacterial pneumonia
H220.	All	Pneumonia due to Klebsiella pneumoniae
H221.	All	Pseudomonal pneumonia
H222.	All	Haemophilus influenzae pneumonia
H223.	All	Streptococcal pneumonia
H2230	All	Group B streptococcal pneumonia
H224.	All	Staphylococcal pneumonia
H22y.	All	Pneumonia due to other specified bacteria
H22y0	All	Escherichia coli pneumonia
H22y1	All	Proteus pneumonia
H22y2	All	Legionella pneumonia

H22y3	All	NULL
H22yX	All	NULL
H22yz	All	Pneumonia due to bacteria NOS
H22z.	All	Bacterial pneumonia NOS
H23..	All	Pneumonia due to other specified organisms
H230.	All	NULL
H231.	All	NULL
H232.	All	Pneumonia due to pleuropneumonia-like organism
H233.	All	NULL
H23z.	All	Pneumonia due to specified organism NOS
H24..	All	(Pneumonia) or (chest infection) with infectious diseases EC
H240.	All	Measles pneumonia
H241.	All	Cytomegalovirus pneumonia
H242.	All	Ornithosis with pneumonia
H243.	All	Pertussis pneumonia
H244.	All	Tularaemia pneumonia
H245.	All	Anthrax pneumonia
H246.	All	Pneumonia with aspergillosis
H247.	All	Pneumonia with other systemic mycoses
H2470	All	Candidal pneumonia
H2471	All	Pneumonia with coccidioidomycosis
H2472	All	Pneumonia with histoplasmosis
H247z	All	Pneumonia with systemic mycosis NOS
H24y.	All	Pneumonia with other infectious diseases EC
H24y0	All	Actinomycotic pneumonia
H24y1	All	Nocardial pneumonia
H24y2	All	Pneumocystis carinii pneumonia
H24y3	All	Q fever pneumonia
H24y4	All	NULL
H24y5	All	Toxoplasma pneumonia
H24y6	All	Typhoid pneumonia
H24y7	All	Chickenpox pneumonia
H24yz	All	Pneumonia with other infectious diseases EC NOS
H24z.	All	Pneumonia with infectious diseases EC NOS
H25..	All	Bronchopneumonia: [unspecified organism] or [chest infection - unspecified]
H26..	All	Pneumonia due to unspecified organism
H260.	All	Lobar pneumonia due to unspecified organism
H2600	All	NULL
H261.	All	NULL
H262.	All	NULL
H263.	All	NULL
H28..	All	NULL
X100h	All	Giant cell pneumonia
XaBE9	All	Basal pneumonia due to unspecified organism
XaDtl	All	Legionnaire's disease

XEOYJ	All	Bronchopneumonia due to unspecified organism
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Supplementary table S5.4. The case definitions for included Acute Bronchitis

Acute Bronchitis		
Read V2 Code	Term ID	Description
H06..	All	Acute bronchitis and bronchiolitis
H060.	All	Acute bronchitis
H0600	All	Acute fibrinous bronchitis
H0601	All	Acute membranous bronchitis
H0602	All	Acute pseudomembranous bronchitis
H0603	All	Acute purulent bronchitis
H0604	All	Acute croupous bronchitis
H0605	All	Acute tracheobronchitis
H0606	All	Acute pneumococcal bronchitis
H0607	All	Acute streptococcal bronchitis
H0608	All	Acute haemophilus influenzae bronchitis
H0609	All	Acute neisseria catarrhalis bronchitis
H060A	All	Acute bronchitis due to mycoplasma pneumoniae
H060B	All	Acute bronchitis due to coxsackievirus
H060C	All	Acute bronchitis due to parainfluenza virus
H060D	All	Acute bronchitis due to respiratory syncytial virus
H060E	All	Acute bronchitis due to rhinovirus
H060F	All	Acute bronchitis due to echovirus
H060v	All	Subacute bronchitis unspecified
H060w	All	Acute viral bronchitis unspecified
H060x	All	Acute bacterial bronchitis unspecified
H060z	All	Acute bronchitis NOS
H061.	All	Acute bronchiolitis
H0610	All	Acute capillary bronchiolitis
H0611	All	Acute obliterating bronchiolitis
H0612	All	Acute bronchiolitis with bronchospasm
H0613	All	Acute exudative bronchiolitis
H0614	All	Obliterating fibrous bronchiolitis
H0615	All	Acute bronchiolitis due to respiratory syncytial virus
H0616	All	Acute bronchiolitis due to other specified organisms
H0617	All	Acute bronchiolitis due to human metapneumovirus
H061z	All	Acute bronchiolitis NOS
H062.	All	Acute lower respiratory tract infection
H06z.	All	Acute bronchitis or bronchiolitis NOS
H06z0	All	Chest infection NOS
H06z1	All	Lower resp tract infection
H06z2	All	Recurrent chest infection
H30..	All	Bronchitis unspecified
H300.	All	Tracheobronchitis NOS

H301.	All	Laryngotracheobronchitis
H302.	All	Wheezy bronchitis
H30z.	All	Bronchitis NOS
Read CTV3 Code	Term ID	Description
A33y.	All	Whooping cough - other specified organism
A33yz	All	Other whooping cough NOS
A33z.	All	Whooping cough NOS
Ayu39	All	[X]Whooping cough due to other Bordetella species
Ayu3A	All	[X]Whooping cough, unspecified
H06..	All	Acute bronchitis and bronchiolitis
H060.	All	Acute bronchitis (& wheezy)
H0600	All	Acute fibrinous bronchitis
H0601	All	Acute membranous bronchitis
H0602	All	Acute pseudomembranous bronchitis
H0603	All	Acute purulent bronchitis
H0604	All	Acute croupous bronchitis
H0605	All	Acute tracheobronchitis
H0606	All	Acute pneumococcal bronchitis
H0607	All	Acute streptococcal bronchitis
H0608	All	Acute haemophilus influenzae bronchitis
H0609	All	Acute Neisseria catarrhalis bronchitis
H060A	All	NULL
H060B	All	Acute coxsackievirus bronchitis
H060C	All	Acute parainfluenza virus bronchitis
H060D	All	Acute respiratory syncytial virus bronchitis
H060E	All	Acute bronchitis due to rhinovirus
H060F	All	Acute echovirus bronchitis
H060v	All	Subacute bronchitis unspecified
H060w	All	Acute viral bronchitis unspecified
H060x	All	Acute bacterial bronchitis unspecified
H060z	All	Acute bronchitis NOS
H061.	All	Acute bronchiolitis
H0610	All	Acute capillary bronchiolitis
H0611	All	Acute obliterating bronchiolitis
H0612	All	Acute bronchiolitis with bronchospasm
H0613	All	Acute exudative bronchiolitis
H0614	All	Obliterating fibrous bronchiolitis
H0615	All	Acute bronchiolitis due to respiratory syncytial virus
H0616	All	Acute bronchiolitis due to other specified organisms
H0617	All	NULL
H061z	All	Acute bronchiolitis NOS
H062.	All	NULL

H06z.	All	Acute bronchitis or bronchiolitis NOS
H06z0	All	Chest infection (& NOS)
H06z1	All	Respiratory tract infection (& [acute lower] or [lower])
H06z2	All	NULL
H243.	All	Pertussis pneumonia
H30..	All	Bronchitis: [unspecified (& chest infection)] or [recurrent wheezy]
H300.	All	Tracheobronchitis NOS
H301.	All	Laryngotracheobronchitis
H302.	All	NULL
H30z.	All	Bronchitis NOS
Hyu10	All	[X]Acute bronchitis due to other specified organisms
Hyu11	All	[X]Acute bronchiolitis due to other specified organisms
X1006	All	Chest infection - unspecified bronchitis
X1007	All	Acute bacterial bronchitis
X1009	All	Acute mycoplasmal bronchitis
X100A	All	Acute chlamydial bronchitis
X100B	All	Acute viral bronchitis
X100C	All	Acute viral bronchiolitis
X100D	All	Acute bronchiolitis due to adenovirus
Xa0IW	All	Acute laryngotracheobronchitis
Xa0IZ	All	Asthmatic bronchitis
XaDtB	All	Acute infective bronchitis
XaDth	All	Acute infective tracheobronchitis
XaYYt	All	Acute bronchiolitis due to human metapneumovirus
XE0Qw	All	Whooping cough
XE0Xr	All	Acute bronchitis
XE0YL	All	Bronchitis unspecified
XE0Yt	All	Acute: [bronchitis] or [chest infections] or [tracheobronchitis]
XM1QT	All	Acute fibrinous laryngotracheobronchitis
XM1QX	All	Acute wheezy bronchitis

Supplementary table S5.5. The case definitions for included influenza and cases of influenza-like illness.

Influenza		
Read V2 Code	Term ID	Description
16L..	All	Influenza-like symptoms
H27..	All	Influenza
H270.	All	Influenza with pneumonia
H2700	All	Influenza with bronchopneumonia
H2701	All	Influenza with pneumonia, influenza virus identified
H270z	All	Influenza with pneumonia NOS
H271.	All	Influenza with other respiratory manifestation
H2710	All	Influenza with laryngitis
H2711	All	Influenza with pharyngitis
H271z	All	Influenza with respiratory manifestations NOS
H27y.	All	Influenza with other manifestations
H27y0	All	Influenza with encephalopathy
H27y1	All	Influenza with gastrointestinal tract involvement
H27yz	All	Influenza with other manifestations NOS
H27z.	All	Influenza NOS
H2A..	All	Influenza due to Influenza A virus subtype H1N1
Read CTV3 Code	Term ID	Description
16L..	All	NULL
G5203	All	Acute myocarditis - influenzal
H27..	All	Influenza
H270.	All	Influenzal pneumonia
H2700	All	Influenza with bronchopneumonia
H2701	All	Influenza with pneumonia, influenza virus identified
H270z	All	Influenza with pneumonia NOS
H271.	All	Influenza with other respiratory manifestation
H2710	All	Influenza with laryngitis
H2711	All	Influenza with pharyngitis
H271z	All	Influenza with respiratory manifestations NOS
H27y.	All	Influenza with other manifestations
H27y0	All	Influenza with encephalopathy
H27y1	All	Influenza with gastrointestinal tract involvement
H27yz	All	Influenza with other manifestations NOS
H27z.	All	(Influenza like illness) or (influenza NOS)
H2A..	All	NULL
Hyu04	All	[X]Influenza with other respiratory manifestations, influenza virus identified
Hyu05	All	[X]Influenza with other manifestations, influenza virus identified

Hyu06	All	[X]Influenza with other respiratory manifestations, virus not identified
Hyu07	All	[X]Influenza with other manifestations, virus not identified
XaC1s	All	Encephalitis due to influenza
XaC2H	All	Encephalitis due to influenza-virus identified
XaEGX	All	Encephalitis due to influenza-specific virus not identified
XaeVK	All	Influenza due to zoonotic influenza virus
XaeVL	All	Influenza due to pandemic influenza virus
XaeVM	All	Influenza due to seasonal influenza virus
XaeVN	All	Influenza with pneumonia due to seasonal influenza virus
XaIBK	All	Influenza-like symptoms
XaMih	All	Avian influenza
XaQQp	All	Influenza due to Influenza A virus subtype H1N1
XEOYK	All	Influenza NOS
XEOZJ	All	(Influenza NOS) or (influenza-like illness)
XM0rz	All	Influenza-like illness
XM0s0	All	Flu-like illness NOS

Supplementary table S5.6. The case definitions for included Skin infections.

Skin infections		
Read V2 Code	Term ID	Description
M0...	All	Skin and subcutaneous tissue infections
M00..	All	Carbuncle
M000.	All	Carbuncle of face
M0000	All	Carbuncle of ear
M0001	All	Carbuncle of face (excluding eye)
M0002	All	Carbuncle of nasal septum
M0003	All	Carbuncle of temple region
M000z	All	Carbuncle of face NOS
M001.	All	Carbuncle of neck
M002.	All	Carbuncle of trunk
M0020	All	Carbuncle of chest wall
M0021	All	Carbuncle of breast
M0022	All	Carbuncle of back
M0023	All	Carbuncle of abdominal wall
M0024	All	Carbuncle of umbilicus
M0025	All	Carbuncle of flank
M0026	All	Carbuncle of groin
M0027	All	Carbuncle of perineum
M002z	All	Carbuncle of trunk NOS
M003.	All	Carbuncle of upper arm and forearm
M0030	All	Carbuncle of shoulder
M0031	All	Carbuncle of axilla
M0032	All	Carbuncle of upper arm
M0033	All	Carbuncle of elbow
M0034	All	Carbuncle of forearm
M003z	All	Carbuncle of upper arm and forearm NOS
M004.	All	Carbuncle of hand
M0040	All	Carbuncle of wrist
M0041	All	Carbuncle of thumb
M0042	All	Carbuncle of finger
M004z	All	Carbuncle of hand NOS
M005.	All	Carbuncle of buttock
M0050	All	Carbuncle of anus
M0051	All	Carbuncle of gluteal region
M005z	All	Carbuncle of buttock NOS
M006.	All	Carbuncle of leg (excluding foot)
M0060	All	Carbuncle of hip
M0061	All	Carbuncle of thigh
M0062	All	Carbuncle of knee

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4	M0063	All	Carbuncle of lower leg
5	M0064	All	Carbuncle of ankle
6	M006z	All	Carbuncle of leg (excluding foot) NOS
7	M007.	All	Carbuncle of foot
8			
9	M0070	All	Carbuncle of foot unspecified
10	M0071	All	Carbuncle of heel
11			
12	M0072	All	Carbuncle of toe
13	M007z	All	Carbuncle of foot NOS
14	M00y.	All	Carbuncle of other specified site
15			
16	M00y0	All	Carbuncle of head (excluding face)
17	M00yz	All	Carbuncle of other specified site NOS
18	M00z.	All	Carbuncle NOS
19			
20	M01..	All	Furuncle - boil
21	M010.	All	Boil of face
22			
23	M0100	All	Boil of ear
24	M0101	All	Boil of face (excluding eye)
25	M0102	All	Boil of nasal septum
26	M0103	All	Boil of temple region
27			
28	M0104	All	Boil of external nose
29	M010z	All	Boil of face NOS
30	M011.	All	Boil of neck
31			
32	M012.	All	Boil of trunk
33			
34	M0120	All	Boil of chest wall
35	M0121	All	Boil of breast
36	M0122	All	Boil of back
37	M0123	All	Boil of abdominal wall
38			
39	M0124	All	Boil of umbilicus
40	M0125	All	Boil of flank
41	M0126	All	Boil of groin
42			
43	M0127	All	Boil of perineum
44	M012z	All	Boil of trunk NOS
45	M013.	All	Boil of upper arm and forearm
46			
47	M0130	All	Boil of shoulder
48	M0131	All	Boil of axilla
49	M0132	All	Boil of upper arm
50			
51	M0133	All	Boil of elbow
52	M0134	All	Boil of forearm
53			
54	M013z	All	Boil of upper arm and forearm NOS
55	M014.	All	Boil of hand
56	M0140	All	Boil of wrist
57	M0141	All	Boil of thumb
58			
59	M0142	All	Boil of finger
60			

M014z	All	Boil of hand NOS
M015.	All	Boil of buttock
M0150	All	Boil of anus
M0151	All	Boil of gluteal region
M015z	All	Boil of buttock NOS
M016.	All	Boil of leg (excluding foot)
M0160	All	Boil of hip
M0161	All	Boil of thigh
M0162	All	Boil of knee
M0163	All	Boil of lower leg
M0164	All	Boil of ankle
M016z	All	Boil of leg (excluding foot) NOS
M017.	All	Boil of foot
M0170	All	Boil of foot unspecified
M0171	All	Boil of heel
M0172	All	Boil of toe
M017z	All	Boil of foot NOS
M01y.	All	Boil of other specified site
M01y0	All	Boil of head (excluding face)
M01yz	All	Boil of other specified site NOS
M01z.	All	Boil NOS
M01z0	All	Multiple boils
M02..	All	Cellulitis and abscess of finger and toe
M020.	All	Cellulitis and abscess of finger
M0200	All	Cellulitis and abscess of finger unspecified
M0201	All	Finger pulp abscess
M0202	All	Onychia of finger
M0203	All	Paronychia of finger
M0204	All	Finger web space infection
M0205	All	Pulp space infection of finger/thumb
M020z	All	Cellulitis and abscess of finger NOS
M021.	All	Cellulitis and abscess of toe
M0210	All	Cellulitis and abscess of toe unspecified
M0211	All	Onychia of toe
M0212	All	Paronychia of toe
M0213	All	Pulp space infection of toe
M021z	All	Cellulitis and abscess of toe NOS
M02z.	All	Cellulitis and abscess of digit NOS
M03..	All	Other cellulitis and abscess
M030.	All	Cellulitis and abscess of face
M0300	All	Cellulitis and abscess of cheek (external)
M0301	All	Cellulitis and abscess of nose (external)

M0302	All	Cellulitis and abscess of chin
M0303	All	Cellulitis and abscess of submandibular region
M0304	All	Cellulitis and abscess of forehead
M0305	All	Cellulitis and abscess of temple region
M0306	All	Cellulitis of face
M030z	All	Cellulitis and abscess of face NOS
M031.	All	Cellulitis and abscess of neck
M032.	All	Cellulitis and abscess of trunk
M0320	All	Cellulitis and abscess of chest wall
M0321	All	Cellulitis and abscess of breast
M0322	All	Cellulitis and abscess of back
M0323	All	Cellulitis and abscess of abdominal wall
M0324	All	Cellulitis and abscess of umbilicus
M0325	All	Cellulitis and abscess of flank
M0326	All	Cellulitis and abscess of groin
M0327	All	Cellulitis and abscess of perineum
M0328	All	Cellulitis of trunk
M032z	All	Cellulitis and abscess of trunk NOS
M033.	All	Cellulitis and abscess of arm
M0330	All	Cellulitis and abscess of shoulder
M0331	All	Cellulitis and abscess of axilla
M0332	All	Cellulitis and abscess of upper arm
M0333	All	Cellulitis and abscess of elbow
M0334	All	Cellulitis and abscess of forearm
M033z	All	Cellulitis and abscess of arm NOS
M034.	All	Cellulitis and abscess of hand excluding digits
M0340	All	Cellulitis and abscess of hand unspecified
M0341	All	Cellulitis and abscess of wrist
M034z	All	Cellulitis and abscess of hand NOS
M035.	All	Cellulitis and abscess of buttock
M036.	All	Cellulitis and abscess of leg excluding foot
M0360	All	Cellulitis and abscess of hip
M0361	All	Cellulitis and abscess of thigh
M0362	All	Cellulitis and abscess of knee
M0363	All	Cellulitis and abscess of lower leg
M0364	All	Cellulitis and abscess of ankle
M036z	All	Cellulitis and abscess of leg NOS
M037.	All	Cellulitis and abscess of foot excluding toe
M0370	All	Cellulitis and abscess of foot unspecified
M0371	All	Cellulitis and abscess of heel
M0372	All	Cellulitis in diabetic foot
M037z	All	Cellulitis and abscess of foot NOS

M038.	All	Cellulitis of external ear
M03y.	All	Other specified cellulitis and abscess
M03y0	All	Cellulitis and abscess of head unspecified
M03z.	All	Cellulitis and abscess NOS
M03z0	All	Cellulitis NOS
M03z1	All	Abscess NOS
M03zz	All	Cellulitis and abscess NOS
M04..	All	Acute lymphadenitis
M040.	All	Acute lymphadenitis of trunk
M041.	All	Acute lymphadenitis of upper limb
M042.	All	Acute lymphadenitis of lower limb
M043.	All	Acute lymphadenitis of face, head and neck
M05..	All	Impetigo
M050.	All	Impetigo contagiosa unspecified
M051.	All	Impetigo contagiosa bullosa
M052.	All	Impetigo contagiosa gyrata
M053.	All	Impetigo circinata
M054.	All	Impetigo neonatorum
M055.	All	Impetigo simplex
M056.	All	Impetigo follicularis
M057.	All	Chronic symmetrical impetigo
M05z.	All	Impetigo NOS
M06..	All	Pilonidal sinus/cyst
M060.	All	Pilonidal cyst with abscess
M061.	All	Pilonidal cyst with no abscess
M062.	All	Pilonidal sinus with abscess
M063.	All	Pilonidal sinus without abscess
M06z.	All	Pilonidal sinus/cyst NOS
M07..	All	Other local infections of skin and subcutaneous tissue
M070.	All	Pyoderma
M0700	All	Pyoderma chancriforme
M0701	All	Pyoderma faciale
M0702	All	Pyoderma gangrenosum
M0703	All	Pyoderma ulcerosum tropicalum
M070z	All	Pyoderma NOS
M071.	All	Pyogenic granuloma
M0710	All	Pyogenic granuloma unspecified
M0711	All	Pyogenic progressive granuloma
M0712	All	Granuloma telangiectaticum
M0713	All	Umbilical granuloma
M071z	All	Pyogenic granuloma NOS
M072.	All	Erythrasma

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4	M073.	All Scalp infection
5	M07y.	All Other specified local infection of skin or subcutaneous tissue
6	M07y0	All Pustular bacterid
7	M07y1	All Ecthyma
8	M07y2	All Dermatitis vegetans
9	M07y3	All Perleche
10	M07y4	All Pitted keratolysis
11	M07y5	All Inflammation of scar
12	M07yz	All Other specified local infection of skin and subcutaneous tissue NOS
13	M07z.	All Local infection skin/subcut tissue NOS
14	M07z0	All Infection foot
15	M07z1	All Infection toe
16	M07z2	All Infection finger
17	M08..	All Cutaneous cellulitis
18	M080.	All [X]Cellulitis of finger and toe
19	M081.	All [X]Cellulitis of other parts of limb
20	M082.	All Cellulitis of face
21	M083.	All Cellulitis of trunk
22	M084.	All [X]Cellulitis of breast
23	M085.	All Cellulitis of leg
24	M086.	All Cellulitis of ankle
25	M087.	All Chronic paronychia
26	M088.	All Cellulitis of arm
27	M089.	All Cellulitis of neck
28	M08A.	All Cellulitis of axilla
29	M08B.	All Cellulitis of foot
30	M08C.	All Cellulitis of toe
31	M08y.	All [X]Cellulitis of other sites
32	M09..	All Cutaneous abscess
33	M090.	All [X]Abscess of face
34	M091.	All [X]Abscess of neck
35	M092.	All [X]Abscess of trunk
36	M0920	All [X]Abscess of buttock
37	M0921	All [X]Abdominal wall abscess
38	M0922	All [X]Perineal abscess
39	M093.	All [X]Abscess of buttock
40	M094.	All [X]Abscess of limb
41	M0940	All [X]Abscess of axilla
42	M095.	All Skin abscess
43	M09y.	All [X]Abscess of other site
44	M0y..	All Other specified infections of skin or subcutaneous tissue
45	M0z..	All Skin and subcut tissue infection NOS
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Read CTV3 Code	Term ID	Description
A056.	All	Amoebic ulcer of skin
A05y1	All	Amoebic balanitis
A170.	All	Tuberculosis of skin & subcutaneous tissue (& tuberculous lupus)
A1700	All	Lupus vulgaris
A1702	All	Scrofuloderma
A1703	All	Tuberculosis - lupus NOS
A1706	All	Lichen scrofulosorum
A1707	All	Tuberculosis papulonecrotica
A1708	All	Tuberculosis verrucosa cutis
A170z	All	Tuberculosis of skin and subcutaneous tissue NOS
A171.	All	Tuberculous erythema nodosum
A1710	All	Erythema induratum
A171z	All	Erythema nodosum with tuberculosis NOS
A201.	All	Cutaneous plague
A210.	All	Ulceroglandular tularaemia
A390.	All	(Cutaneous actinomycosis) or (erythrasma) or (trichomycosis axillaris)
A394.	All	Madura foot - actinomycotic
A39z0	All	Maduromycosis NOS
A5320	All	Herpes zoster with dermatitis of eyelid
A540.	All	Eczema herpeticum
A5441	All	Herpes simplex eyelid dermatitis
A546.	All	Herpes simplex whitlow
A781.	All	Warts: [viral] or [verrucae]
A7810	All	Verruca vulgaris
A7811	All	Plantar wart
A7812	All	(Warts: [genital] or [penile] or [venereal]) or (condylomata acuminatum)
A7813	All	Warts: [perianal] or [anal]
A781z	All	Unspecified viral warts
A783.	All	Cat scratch disease
A990.	All	(Chancroid [& bubo]) or (Ducrey's chancre)
A992.	All	(Granuloma inguinale) or (donovanosis) or (pudendal ulcer)
AA22.	All	Other early yaws skin lesions
AA23.	All	(Yaws hyperkeratosis) or (ghoul hand) or (wormeaten soles)
AB0..	All	(Dermatophytosis &/or tinea &/or ringworm) or (skin fungal infection)
AB00.	All	(Dermatophytosis of scalp or beard) or (Kerion)
AB000	All	Scalp ringworm
AB001	All	Dermatophytosis of beard
AB00z	All	Dermatophytosis of scalp or beard NOS
AB02.	All	Dermatophytosis of hand
AB03.	All	(Dermatophytosis of groin & perianal area) or (Dhobie itch) or (tinea cruris)
AB030	All	Dermatophytosis of groin

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4	AB031	All	Dermatophytosis of the perianal area
5	AB03z	All	Dermatophytosis of groin and perianal area NOS
6	AB04.	All	Dermatophytosis of foot (& tinea pedis)
7	AB05.	All	(Dermatophytosis of the body) or (herpes circinatus) or (tinea corporis)
8			(Deep seated dermatophytosis) or (granuloma: [trichophyticum] or
9	AB06.	All	[Majocchi's])
10	AB0y.	All	Other specified dermatophytosis
11	AB0z.	All	Dermatophytosis NOS
12	AB1..	All	Dermatophytosis other and unspecified
13	AB10.	All	Pityriasis versicolor
14	AB11.	All	Nigra: [tinea] or [keratomycosis]
15	AB1y.	All	Other specified dermatomycoses
16	AB1z.	All	Dermatomycosis NOS
17	AB230	All	Candidal: [intertrigo] or [nappy rash] or [submammary]
18	AB231	All	Other skin candidiasis
19	AB233	All	Candidal paronychia
20	AB330	All	Coccidioidal granuloma
21	AB500	All	Cutaneous blastomycosis
22	AB510	All	Mucocutaneous-lymphangitic paracoccidioidomycosis
23	AB620	All	Cutaneous chromomycosis
24	AB622	All	Subcutaneous phaeohyphomycotic abscess and cyst
25	AB64.	All	Mycotic: [mycetomas] or [madura foot]
26	AB640	All	Actinomycotic mycetoma
27	AD30.	All	(Scabies (& [Norwegian])) or (sarcoptic itch)
28			(Infestation: [other arthropod] or [Chigoe] or [sand flea]) or (Jigger
29	AD41.	All	disease) or (Tungiasis)
30	Ayu50	All	[X]Other early skin lesions of yaws
31	AyuH4	All	[X]Other arthropod infestations
32	F4D10	All	Stye
33	F4D4.	All	Infective eyelid dermatitis of types resulting in deformity
34	F4D5.	All	Other eyelid infective dermatitis
35	F4D6.	All	Parasitic eyelid infestation
36			(Acute infective otitis externa) or (abscess external ear) or (cellulitis
37	F5011	All	external ear)
38	F5018	All	Furunculosis of external auditory meatus
39	FyuB4	All	[X]Parasitic infestation of eyelid in diseases classified elsewhere
40	FyuB5	All	[X]Involvement of eyelid in other infectious diseases classified elsewhere
41	G7510	All	Kawasaki's disease
42	G751z	All	Acute febrile mucocutaneous lymph node syndrome NOS
43	J574G	All	Perianal infection
44	K2721	All	Penile boil
45	K2722	All	Penile carbuncle
46	K2723	All	Cellulitis of penis
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4	K2841	All	Boil of scrotum
5	K2842	All	Carbuncle of scrotum
6	K2843	All	Cellulitis of scrotum
7	K4242	All	Furuncle of vulva
8	K42y0	All	Carbuncle of vagina
9	K42y1	All	Carbuncle of labium
10	M0...	All	Infective dermatological disorders
11	M00..	All	Carbuncle
12	M000.	All	Carbuncle of face
13	M0000	All	Carbuncle of ear
14	M0001	All	Carbuncle of face (excluding eye)
15	M0002	All	Carbuncle of nasal septum
16	M0003	All	Carbuncle of temple region
17	M000z	All	Carbuncle of face NOS
18	M001.	All	Carbuncle of neck
19	M002.	All	Carbuncle of trunk
20	M0020	All	Carbuncle of chest wall
21	M0021	All	Carbuncle of breast
22	M0022	All	Carbuncle of back
23	M0023	All	Carbuncle of abdominal wall
24	M0024	All	Carbuncle of umbilicus
25	M0025	All	Carbuncle of flank
26	M0026	All	Carbuncle of groin
27	M0027	All	Carbuncle of perineum
28	M002z	All	Carbuncle of trunk NOS
29	M003.	All	Carbuncle of upper arm and forearm
30	M0030	All	Carbuncle of shoulder
31	M0031	All	Carbuncle of axilla
32	M0032	All	Carbuncle of upper arm
33	M0033	All	Carbuncle of elbow
34	M0034	All	Carbuncle of forearm
35	M003z	All	Carbuncle of upper arm and forearm NOS
36	M004.	All	Carbuncle of hand
37	M0040	All	Carbuncle of wrist
38	M0041	All	Carbuncle of thumb
39	M0042	All	Carbuncle of finger
40	M004z	All	Carbuncle of hand NOS
41	M005.	All	Carbuncle of buttock
42	M0050	All	Carbuncle of anus
43	M0051	All	Carbuncle of gluteal region
44	M005z	All	Carbuncle of buttock NOS
45	M006.	All	Carbuncle of leg (excluding foot)
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M0060	All	Carbuncle of hip
M0061	All	Carbuncle of thigh
M0062	All	Carbuncle of knee
M0063	All	Carbuncle of lower leg
M0064	All	Carbuncle of ankle
M006z	All	Carbuncle of leg (excluding foot) NOS
M007.	All	Carbuncle of foot
M0070	All	Carbuncle of foot unspecified
M0071	All	Carbuncle of heel
M0072	All	Carbuncle of toe
M007z	All	Carbuncle of foot NOS
M00y.	All	Carbuncle of other specified site
M00y0	All	Carbuncle of head (excluding face)
M00yz	All	Carbuncle of other specified site NOS
M00z.	All	Carbuncle NOS
M01..	All	Furuncle
M010.	All	Boil of face
M0100	All	Boil of ear
M0101	All	Boil of face (excluding eye)
M0102	All	Boil of nasal septum
M0103	All	Boil of temple region
M0104	All	Boil of external nose
M010z	All	Boil of face NOS
M011.	All	Boil of neck
M012.	All	Boil of trunk
M0120	All	Boil of chest wall
M0121	All	Boil of breast
M0122	All	Boil of back
M0123	All	Boil of abdominal wall
M0124	All	Boil of umbilicus
M0125	All	Boil of flank
M0126	All	Boil of groin
M0127	All	Boil of perineum
M012z	All	Boil of trunk NOS
M013.	All	Boil of upper arm and forearm
M0130	All	Boil of shoulder
M0131	All	Boil of axilla
M0132	All	Boil of upper arm
M0133	All	Boil of elbow
M0134	All	Boil of forearm
M013z	All	Boil of upper arm and forearm NOS
M014.	All	Boil of hand

M0140	All	Boil of wrist
M0141	All	Boil of thumb
M0142	All	Boil of finger
M014z	All	Boil of hand NOS
M015.	All	Boil of buttock
M0150	All	Boil of anus
M0151	All	Boil of gluteal region
M015z	All	Boil of buttock NOS
M016.	All	Boil of leg (excluding foot)
M0160	All	Boil of hip
M0161	All	Boil of thigh
M0162	All	Boil of knee
M0163	All	Boil of lower leg
M0164	All	Boil of ankle
M016z	All	Boil of leg (excluding foot) NOS
M017.	All	Boil of foot
M0170	All	Boil of foot unspecified
M0171	All	Boil of heel
M0172	All	Boil of toe
M017z	All	Boil of foot NOS
M01y.	All	Boil of other specified site
M01y0	All	Boil of head (excluding face)
M01yz	All	Boil of other specified site NOS
M01z.	All	Boils: [Recurrent] or [multiple sites] or [NOS]
M01z0	All	Multiple boils
M02..	All	Cellulitis and abscess of finger and toe
M020.	All	Cellulitis and abscess of finger
M0200	All	Cellulitis and abscess of finger unspecified
M0201	All	(Finger pulp abscess) or (felon) or (whitlow)
M0202	All	Onychia of finger
M0203	All	Finger: [perionychia] or [paronychia]
M0204	All	Finger web space infection
M0205	All	Pulp space infection of finger/thumb
M020z	All	Cellulitis and abscess of finger NOS
M021.	All	Cellulitis and abscess of toe
M0210	All	Cellulitis and abscess of toe unspecified
M0211	All	Onychia of toe
M0212	All	Paronychial infection of toe
M0213	All	Pulp space infection of toe
M021z	All	Toe: [Perionychia] or [cellulitis and abscess NOS]
M02z.	All	Digit: [paronychial infection] or [infected nailfold] or [cellulitis and abscess of NOS] or [nail infection NOS]

M03..	All	(Skin area excluding digits of hand or foot: [abscess] or [acute lymphangitis of skin] or [cellulitis]) or (other cellulitis and abscess)
M030.	All	Cellulitis and abscess of face
M0300	All	Cellulitis and abscess of cheek (& external)
M0301	All	Cellulitis and abscess of nose (& external)
M0302	All	Cellulitis and abscess of chin
M0303	All	Cellulitis and abscess of submandibular region
M0304	All	Cellulitis and abscess of forehead
M0305	All	Cellulitis and abscess of temple region
M0306	All	Cellulitis of face
M030z	All	Cellulitis and abscess of face NOS
M031.	All	(Cellulitis and abscess of neck) or (cervical abscess)
M032.	All	Cellulitis and abscess of trunk
M0320	All	Cellulitis and abscess of chest wall
M0321	All	Cellulitis and abscess of breast
M0322	All	Cellulitis and abscess of back
M0323	All	Cellulitis and abscess of abdominal wall
M0324	All	Cellulitis and abscess of umbilicus
M0325	All	Cellulitis and abscess of flank
M0326	All	Cellulitis and abscess of groin
M0327	All	Cellulitis and abscess of perineum
M0328	All	Cellulitis of trunk
M032z	All	Cellulitis and abscess of trunk NOS
M033.	All	Cellulitis and abscess of arm
M0330	All	Cellulitis and abscess of shoulder
M0331	All	Cellulitis and abscess of axilla
M0332	All	Cellulitis and abscess of upper arm
M0333	All	Cellulitis and abscess of elbow
M0334	All	Cellulitis and abscess of forearm
M033z	All	Cellulitis and abscess of arm NOS
M034.	All	Cellulitis and abscess of hand (& excluding digits)
M0340	All	Hand: (abscess and/or cellulitis) of (dorsum or palm or unspecified)
M0341	All	Cellulitis and abscess of wrist
M034z	All	Cellulitis and abscess of hand NOS
M035.	All	Cellulitis and abscess of buttock
M036.	All	Cellulitis and abscess of leg (& excluding foot)
M0360	All	Cellulitis and abscess of hip
M0361	All	Cellulitis and abscess of thigh
M0362	All	Cellulitis and abscess of knee
M0363	All	Cellulitis and abscess of lower leg
M0364	All	Cellulitis and abscess of ankle
M036z	All	Cellulitis and abscess of leg NOS
M037.	All	Cellulitis and abscess of foot (& excluding toe)

M0370	All	Cellulitis and abscess of foot unspecified
M0371	All	Cellulitis and abscess of heel
M0372	All	Cellulitis in diabetic foot
M037z	All	Cellulitis and abscess of foot NOS
M038.	All	NULL
M03y.	All	Other specified cellulitis and abscess
M03y0	All	(Cellulitis and abscess of head unspecified) or (abscess of scalp)
M03z.	All	Cellulitis and abscess NOS
M03z0	All	Cellulitis NOS
M03z1	All	Abscess NOS
M03zz	All	(Cellulitis and abscess NOS) or (acute lymphangitis NOS)
M04..	All	Acute: [lymphadenitis] or [abscess lymph node] or [cervical adenitis]
M040.	All	Acute lymphadenitis of trunk
M041.	All	Acute lymphadenitis of upper limb
M042.	All	Acute lymphadenitis of lower limb
M043.	All	Acute lymphadenitis of face, head and neck
M05..	All	Impetigo
M050.	All	Impetigo contagiosa unspecified
M051.	All	[Bullous impetigo] or [impetigo herpetiformis]
M052.	All	Impetigo contagiosa gyrata
M053.	All	Impetigo circinata
M054.	All	Impetigo neonatorum
M055.	All	Impetigo simplex
M056.	All	Impetigo follicularis
M057.	All	Chronic symmetrical impetigo
M05z.	All	Impetigo NOS
M06..	All	Pilonidal sinus/cyst
M060.	All	Pilonidal cyst with abscess
M061.	All	(Pilonidal cyst with no abscess) or (dermal sinus)
M062.	All	Pilonidal sinus with abscess
M063.	All	Pilonidal sinus without abscess
M06z.	All	Pilonidal sinus/cyst NOS
M07..	All	Other local infections of skin and subcutaneous tissue
M070.	All	Pyogenic infection of skin and subcutis
M0700	All	Chancriform pyoderma
M0701	All	Pyoderma faciale
M0702	All	Pyoderma gangrenosum
M0703	All	Pyoderma ulcerosum tropicalum
M070z	All	Pyoderma NOS
M071.	All	Pyogenic granuloma
M0710	All	Pyogenic granuloma unspecified
M0711	All	Pyogenic progressive granuloma

M0712	All	NULL
M0713	All	Umbilical granuloma
M071z	All	Pyogenic granuloma NOS
M072.	All	NULL
M073.	All	Scalp infection
M07y.	All	(Pustular eczema) or (other specified local infection of skin or subcutaneous tissue)
M07y0	All	Acute palmoplantar pustular psoriasis
M07y1	All	Ecthyma
M07y2	All	Dermatitis vegetans
M07y3	All	NULL
M07y4	All	NULL
M07y5	All	Inflammation of scar
M07yz	All	Infection: [toe] or [foot] or [finger] or [other specified local infection of skin and subcutaneous tissue NOS]
M07z.	All	(Septic spots) or (sinus) or (infected skin: [insect bite] or [ulcer] or [dermatitis] or [local infection skin/subcutaneous tissue NOS])
M07z0	All	NULL
M07z1	All	NULL
M07z2	All	NULL
M08..	All	NULL
M080.	All	(Cellulitis: [of thumb] or [[X] of finger and toe]) or (nail bed infection) or (septic thumb)
M081.	All	[X]Cellulitis of other parts limb
M082.	All	NULL
M083.	All	NULL
M084.	All	[X]Cellulitis of breast
M085.	All	NULL
M086.	All	Cellulitis of ankle
M087.	All	Chronic paronychia
M088.	All	NULL
M089.	All	NULL
M08A.	All	NULL
M08B.	All	NULL
M08C.	All	NULL
M08y.	All	[X]Cellulitis of other sites
M09..	All	NULL
M090.	All	Abscess of face
M091.	All	Abscess of neck
M092.	All	Abscess of trunk
M0920	All	NULL
M0921	All	NULL
M0922	All	NULL
M093.	All	Abscess of buttock

M094.	All	Abscess of limb
M0940	All	NULL
M095.	All	NULL
M09y.	All	[X]Abscess of other site
M0y..	All	Other specified infections of skin or subcutaneous tissue
M0z..	All	Infected: [sebaceous cyst] or [skin and subcut tissue NOS]
M102.	All	[Infective eczematoid dermatitis] or [Pustular eczema] or [Septic dermatitis]
M1512	All	Erythema marginatum
M15y0	All	Staphylococcal scalded skin syndrome
M15y6	All	Erythema marginatum in acute rheumatic fever
M161A	All	Psoriasis palmaris
M161B	All	Psoriasis plantaris
M163.	All	Pityriasis rosea
M21y0	All	Acrodermatitis chronica atrophicans
M2440	All	Dissecting cellulitis of scalp
M2441	All	Sycosis barbae
M2442	All	Folliculitis depilans
M2443	All	Pustular folliculitis
M2444	All	Perifolliculitis
M2446	All	Deep bacterial folliculitis
M2447	All	Perifolliculitis of scalp
M244z	All	Folliculitis NOS
Myu0.	All	[X]Infections of the skin and subcutaneous tissue
Myu01	All	[X]Other specified local infections of the skin and subcutaneous tissue
Myu02	All	[X]Impetiginisation of other dermatoses
SP30.	All	Generalised vaccinia
X00hk	All	Cellulitis of external ear
X00hm	All	Cellulitis of pinna
X00hn	All	Abscess of pinna
X00IR	All	Lupus vulgaris of nose
X00YN	All	Cellulitis of eyelid
X00YS	All	Infectious dermatosis of eyelid
X00YT	All	Bacterial dermatitis of eyelid
X00YU	All	Impetigo of eyelid
X00YV	All	Viral dermatitis of eyelid
X00YW	All	Fungal dermatitis of eyelid
X20QY	All	Cancrum oris
X4004	All	Gangrenous balanitis
X400A	All	Mycoplasma balanitis
X400B	All	Chlamydial balanitis
X400w	All	Fournier's gangrene of scrotum
X4087	All	Vulval amoebiasis

X4089	All	Chlamydial Bartholinitis
X408C	All	Vulval warts
X408D	All	Condyloma acuminata of vulva
X5002	All	Viral dermatological disorders
X5003	All	Pox virus infection of skin
X5004	All	Vaccinia
X5005	All	Eczema vaccinatum
X5006	All	Viral exanthem
X5007	All	Infectious mononucleosis exanthem
X500A	All	Dermatosis of suspected viral aetiology
X500b	All	Pseudomonas aeruginosa paronychia
X500B	All	Gianotti-Crosti syndrome
X500E	All	Chlamydial dermatological disorders
X500f	All	Recurrent boils
X500g	All	Boils of multiple sites
X500I	All	Exanthem due to ornithosis
X500J	All	Bacterial dermatological disorders
X500K	All	Non-bullous impetigo
X500L	All	Streptococcal impetigo
X500M	All	Staphylococcal non-bullous impetigo
X500N	All	Secondary impetiginisation
X500O	All	Scalp folliculitis
X500P	All	Staphylococcal folliculitis of scalp
X500q	All	Ecthyma gangrenosum
X500Q	All	Gram-negative folliculitis
X500r	All	Sycosis
X500R	All	Staphylococcal granuloma
X500s	All	Acute sycosis barbae
X500t	All	Sycosis cruris
X500u	All	Lupoid sycosis
X500U	All	Abscess of skin
X500v	All	Lupoid sycosis of beard
X500V	All	Cervical abscess
X500w	All	Folliculitis decalvans
X500W	All	Abscess of skin area excluding digits of hand or foot
X500x	All	Folliculitis keloidalis nuchae
X500X	All	Abscess of dorsum of hand
X500y	All	Chronic folliculitis of legs
X500Y	All	Abscess of palm of hand
X500z	All	Cutaneous cellulitis
X500Z	All	Abscess of scalp
X5010	All	Cellulitis of skin area excluding digits of hand or foot

X5011	All	Cellulitis of dorsum of hand
X5012	All	Cellulitis of palm of hand
X5013	All	Necrotising fasciitis
X5014	All	Necrotising fasciitis of scrotum and perineum
X5015	All	Progressive bacterial synergistic gangrene
X5018	All	Anaerobic cellulitis
X501b	All	Non-pyogenic bacterial infection of skin
X501c	All	Erythrasma
X501d	All	Pitted keratolysis
X501E	All	Cellulitis of leg
X501G	All	Acute lymphangitis NOS
X501H	All	Acute lymphangitis of skin excluding digits of hand or foot
X501I	All	Acute cervical adenitis
X501J	All	Site-specific pyogenic infection of skin and subcutis
X501N	All	Blistering distal dactylitis
X501O	All	Infection of nail
X501Q	All	Infection of toe web
X501r	All	Cutaneous involvement in listeriosis
X501R	All	Staphylococcal intertrigo
X501S	All	Streptococcal intertrigo
X501t	All	Fusobacterium infection of skin
X501U	All	Perianal streptococcal infection of newborn
X501v	All	Tropical ulcer
X501V	All	Botryomycosis
X501w	All	Desert sore
X501W	All	Staphylococcal botryomycosis
X501x	All	Corynebacterium pyogenes infection of skin
X501X	All	Cutaneous botryomycosis
X501Z	All	Dermatitis gangrenosa infantum
X5020	All	Moraxella infection of skin
X5021	All	Staphylococcal scarlatina
X502a	All	Primary cutaneous blastomycosis
X502A	All	Tuberculide
X502B	All	Papular tuberculide
X502E	All	Nodular tuberculide
X502H	All	Cutaneous complication of BCG immunisation
X502I	All	BCG granuloma
X502j	All	Chromomycosis
X502J	All	BCG ulcer
X502I	All	Subcutaneous zygomycosis
X502o	All	Systemic fungal infection affecting skin
X502p	All	Dermatophytide

X502P	All	Pityrosporum infection of skin
X502q	All	Trichophytide
X502Q	All	Pityrosporum folliculitis
X502r	All	Microsporide
X502R	All	Steroid-modified tinea infection
X502s	All	Epidermophytide
X502t	All	Parasitic infestation of skin
X502u	All	Nematode infestation of skin
X502U	All	Cutaneous alternariosis
X502v	All	Streptocerciasis
X502V	All	Scytalidium dimidiatum infection of skin
X502W	All	Scytalidium hyalinum infection of skin
X502Y	All	Systemic mycosis affecting skin
X5031	All	Amoebiasis of skin
X5038	All	Protozoal infestation of skin
X503J	All	Maculae ceruleae - disorder
X509H	All	Nail infection NOS
X509m	All	Erosive pustular dermatosis of the scalp
X50BW	All	Infected skin ulcer
X50Dw	All	Eosinophilic panniculitis
X50FB	All	Eosinophilic cellulitis
X50GV	All	Bullous pyoderma
X70HA	All	Tuberculous chancre
X70HB	All	Acute tuberculous ulcer
X70HC	All	Acute miliary cutaneous tuberculosis
X70HD	All	Cutaneous tuberculous gumma
X70Hy	All	Cutaneous mycobacterium ulcerans infection
X70Hz	All	Cutaneous mycobacterium marinum infection
X70I0	All	Swimming pool granuloma
X70I1	All	Fish tank granuloma
X70IA	All	Cutaneous streptococcal ulcer
X70IS	All	Gas gangrene of skin
X70JO	All	Herpes simplex infection of skin
X70JP	All	Chronic mucocutaneous herpes simplex infection
X70Lc	All	Giant condyloma acuminata
X70LO	All	Facial wart
X70LP	All	Hand wart
X70LQ	All	Periungual wart
X70LR	All	Subungual wart
X70LS	All	Filiform wart
X70LT	All	Digitate wart
X70LU	All	Butcher's wart

X70LV	All	Plane wart
X70LW	All	Mosaic plantar wart
X70LX	All	Myrmecia plantar wart
X70LY	All	Epidermodysplasia verruciformis
X70LZ	All	Anogenital warts
X70N8	All	Cutaneous gonorrhoea
X70N9	All	Gonococcal cellulitis
X70NB	All	Chancroid - anogenital ulcer
X70NC	All	Chancroid - extragenital ulcer
X70Nd	All	Anal warts
X70ND	All	Chancroid - latent infection
X70Nf	All	Penile warts
X70Nt	All	Donovanosis - anogenital ulcer
X70Nu	All	Donovanosis - inguinal lesion
X70Nv	All	Donovanosis - non-genital lesion
X70OR	All	Bacillary angiomatosis
X70Pi	All	Leptospiral rash
X70PJ	All	Penile amoebiasis
X70PL	All	Amoebic abscess of skin
X70Pn	All	Plantar papillomata of yaws
X70Po	All	Palmar papillomata of yaws
X70Pp	All	Macular yaws
X70Pq	All	Maculopapular yaws
X70Pr	All	Micropapular yaws
X70Ps	All	Papular yaws
X70Pt	All	Palmar yaws hyperkeratosis
X70Pu	All	Plantar yaws hyperkeratosis
X70PY	All	Erythema chronicum migrans
X70Qe	All	Cutaneous aspergillosis
X70QJ	All	Fungal dermatosis
X70QK	All	Mycetoma
X70QM	All	Kerion
X70QN	All	Favus
X70QO	All	Tinea faciei
X70Qp	All	Perineal candidiasis
X70QP	All	Tinea cruris
X70QQ	All	Nodular folliculitis
X70Qr	All	Candidiasis of skin
X70QR	All	Trichomyces axillaris
X70Qs	All	Napkin candidiasis
X70QS	All	Tinea imbricata
X70Qt	All	Submammary intertrigo

X70Qu	All	Candidiasis of finger web
X70Rc	All	Cutaneous histoplasmosis
X70Rd	All	Primary cutaneous histoplasmosis
X70RD	All	Cutaneous cryptococcosis
X70Re	All	Disseminated cutaneous histoplasmosis
X70RG	All	Cutaneous coccidioidomycosis
X70Rh	All	Disseminated cutaneous blastomycosis
X70RH	All	Subcutaneous coccidioidomycosis
X70Rj	All	Cutaneous lobomycosis
X70Rk	All	Primary lobomycotic nodule
X70RI	All	Chronic coalescent cutaneous lobomycosis
X70Rw	All	Cutaneous trichosporonosis
X70Rz	All	Cutaneous chromoblastomycosis
X70S0	All	Primary chromoblastomycotic nodule
X70S1	All	Cutaneous chromoblastomycotic abscess
X70S2	All	Lymphocutaneous chromoblastomycosis
X70S5	All	Phaeohyphomycosis of skin
X70S6	All	Phaeohyphomycotic subcutaneous cyst
X70SK	All	Conidiobolomycosis
X70SL	All	Rhinofacial conidiobolomycosis
X70SM	All	Disseminated conidiobolomycosis
X70SO	All	Cutaneous basidiobolomycosis
X70Tk	All	Onchodermatitis
X70Tm	All	Onchocercal subcutaneous nodule
X70Tn	All	Onchocercal depigmentation
X70To	All	Onchocercal lichenification
X70Tp	All	Sowda
X70UA	All	Cutaneous strongyloidiasis
X70UB	All	Strongyloidal ground itch
X70UC	All	Strongyloidal cutaneous larva migrans
X70UD	All	Larva currens
X70UJ	All	Gnathostomal cutaneous larva migrans
X70Ut	All	Scabetic nodule
X70Uu	All	Post-scabetic nodule
X70Uv	All	Crusted scabies
X70Uy	All	Arthropod dermatosis
X70Uz	All	Dermatosis due to mites
X70V0	All	Grocer's itch
X70V1	All	Baker's itch
X70V2	All	Copra itch
X70V3	All	Straw itch
X70V4	All	Grain itch

X70V5	All	Grain-shoveller's itch
X70V6	All	Cotton-seed itch
X70V7	All	Bean itch
X70V8	All	Barley itch
X70V9	All	Demodex folliculitis
X70VA	All	Dermatophagoidal dermatosis
X70VB	All	Animal mite infestation
X70VC	All	Cheyletiella dermatitis
X70VD	All	Dog mite infestation
X70VE	All	Cat mite infestation
X70VF	All	Rabbit mite infestation
X70VG	All	Rat mite infestation
X70VH	All	Mouse mite infestation
X70VI	All	Bird mite infestation
X70VK	All	Fowl mite infestation
X70VL	All	Chiggers infestation
X70VM	All	Dermatoses due to plant mites
X70VN	All	Dermatosis due to bug
X70VQ	All	Flea infestation
X70VR	All	Jiggers infestation
X70VS	All	Tongueworm infection
X70VT	All	Tongueworm cyst
X70VU	All	Tongueworm granuloma
X70VV	All	Halzoun
X75vf	All	Paronychia
X75vg	All	Bacterial paronychia
X75wp	All	Folliculitis of lids
X78Rn	All	Infected sebaceous cyst
X78Rs	All	Warty dyskeratoma
XA00w	All	Infected insect bite
Xa0Aq	All	Neonatal pyoderma
Xa0bE	All	Streptococcal cellulitis
Xa0bF	All	Meleney's gangrene
Xa0bG	All	Cutaneous African histoplasmosis
Xa0bl	All	Larva migrans of skin
Xa0kT	All	Amoebic granuloma of skin
Xa0Qy	All	Complicated donovanosis
Xa0Ws	All	Staphylococcus aureus superficial folliculitis
Xa139	All	Site-specific infective disorders of skin
Xa13A	All	Intertrigo
Xa13C	All	Submammary monilia
Xa1y2	All	Abscess of toe

Xa1ZW	All	Cutaneous disorders of Yaws
Xa2jn	All	Cellulitis of arm
Xa3gD	All	Carbuncle/boil
Xa3gE	All	Cellulitis of toe
Xa3gF	All	Cellulitis of hand excluding finger
Xa3gG	All	Cellulitis of leg, excluding foot
Xa3gH	All	Cellulitis of foot excluding toe
Xa40b	All	Cellulitis - digit NOS
Xa6qC	All	Perineal wart
Xa6qD	All	Female perineal wart
Xa7Ht	All	Cellulitis of heel
Xa7Hw	All	Axillary abscess
Xa7I2	All	Periorbital cellulitis
Xa7Ic	All	Infected nail bed
Xa7Id	All	Cellulitis of scalp
Xa7Iv	All	Infected face
Xa7Iz	All	Infected heel
Xa7m0	All	Infected thumb
Xa7m3	All	Septic finger
Xa7m4	All	Infected hand
Xa7nf	All	Intertrigo of abdominal skin fold
Xa7Ni	All	Infection toe
Xa7Nj	All	Infection foot
Xa7Nk	All	Infection finger
Xa7yw	All	Abscess of finger
Xa82g	All	Perineal abscess
Xa83I	All	Cellulitis of elbow
Xa83m	All	Abscess of elbow
Xa83W	All	Abscess of foot
Xa85W	All	Loin abscess
Xa86C	All	Cellulitis of abdominal wall
Xa89z	All	Boil of lower limb
Xa8A1	All	Carbuncle of upper limb
Xa8A4	All	Carbuncle of lower limb
Xa97f	All	Anogenital human papilloma virus infection
Xa97i	All	Early yaws skin lesion
Xa97k	All	Tinea pedis
Xa97I	All	Ringworm of body
Xa9CU	All	Pilonidal abscess
Xa9CY	All	Hidradenitis suppurativa
Xa9zj	All	Abscess of ankle
Xaa9L	All	Recurrent genital warts

XaB64	All	Cellulitis - anus or rectum
XaB65	All	Perianal cellulitis
XaBDy	All	Cellulitis of axilla
XaBEE	All	Cellulitis of neck
XaBj5	All	Abscess of back
XaBkZ	All	Groin abscess
XaBmh	All	Cellulitis of skin of back
XaBsM	All	Infection of big toe
XaBXe	All	Abdominal wall abscess
XaBXh	All	Abscess of big toe
XaBXi	All	Abscess of cheek
XaBXj	All	Abscess of thigh
XaBXk	All	Abscess of forehead
XaDbx	All	Toxocara larva migrans of skin
XaEGL	All	Hand warts
XaEJd	All	Prepatellar abscess
XaF8F	All	Preseptal cellulitis
XaFCr	All	Cellulitis of thigh
XaI8d	All	Abscess of lower limb
XaI8e	All	Abscess of upper limb
XaINT	All	Blind boil
XaLWv	All	Nasal furuncle
XaMgL	All	[X]Vulval warts
XaMgM	All	[X]Perineal warts
XaR2I	All	Recurrent cellulitis
XaY4a	All	Pustular eczema
XaY4o	All	Infected eczema
XaY4Z	All	Infective eczematoid dermatitis
XaYO5	All	Cellulitis of thumb
XaYOq	All	Bullous impetigo
XaYRx	All	Bullous staphylococcal impetigo
XE0aH	All	Angular cheilitis
XE0eV	All	Carbuncle of vulva
XE0RS	All	Human papilloma virus infection of skin
XE0RT	All	Genital warts
XE0RU	All	Perianal warts
XE0S1	All	Chancroid
XE0S2	All	Donovanosis
XE0S7	All	Yaws hyperkeratosis
XE0S9	All	Dermatophytosis
XE0SA	All	Dermatophytosis of scalp or beard
XE0SC	All	Dermatophytosis of groin and perianal area

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	XE0SD	All	Dermatophytosis of the body
	XE0Se	All	Scabies
	XE0SE	All	Deep seated dermatophytosis
	XE0SF	All	Tinea nigra
	XE0Sg	All	Other arthropod infestation
	XE0SK	All	Candida intertrigo
	XE0SP	All	Eumycetoma
	XE0TC	All	(Actinomycosis (& [infections]) or (erythrasma)
	XE0Te	All	Viral warts (& [condyloma acuminatum])
	XE0Tg	All	Other viral warts
	XE0UC	All	(Tinea: [groin/perianal] or [cruris]) or (Dhobie itch)
	XE16h	All	Abscess of eyelid
	XE1Aa	All	Cellulitis and abscess of leg
	XE1Ab	All	Cellulitis and abscess of foot excluding toe
	XE1Ac	All	Cellulitis and abscess of head unspecified
	XE1Ad	All	Acute lymphadenitis
	XE1Ae	All	Pilonidal cyst with no abscess
	XE1Ag	All	Other specified local infection of skin or subcutaneous tissue
	XE1Ai	All	Other specified local infection of skin and subcutaneous tissue NOS
	XE1Aj	All	Local infection skin/subcut tissue NOS
	XE1Ak	All	[X]Cellulitis of finger and toe
	XE1Al	All	Skin and subcut tissue infection NOS
	XE1AO	All	Boil of upper limb
	XE1AP	All	Boil NOS
	XE1AQ	All	Finger pulp abscess
	XE1AR	All	Paronychia of finger
	XE1AS	All	Cellulitis and abscess of toe NOS
	XE1AT	All	Cellulitis and abscess of digit NOS
	XE1AU	All	Other cellulitis and abscess
	XE1AV	All	Cellulitis and abscess of cheek (external)
	XE1AW	All	Cellulitis and abscess of nose (external)
	XE1AX	All	Cellulitis and abscess of neck
	XE1AY	All	Cellulitis and abscess of hand excluding digits
	XE1AZ	All	Cellulitis and abscess of hand unspecified
	XE1Bc	All	(Carbuncle) &/or (boil) or (furuncle)
	XE1Be	All	Boil: (face) or (external auditory) or (external ear)
	XE1Bg	All	(Boil - upper arm and forearm) or (axillary furunculosis)
	XE1Bi	All	(Cellulitis &/or abscess finger/toe) or (felon - whitlow)
	XE1BJ	All	Superficial folliculitis
	XE1Bk	All	(Cellulitis - finger-paronychia) or (paronychia)
	XE1Bm	All	(Cellulitis/abscess: [NOS] or [other]) or (abscess NOS)
	XE1Bo	All	(Cellulitis/abscess - face) or (cellulitis - lips)

XE1Bq	All	Cellulitis -hand (& -excl. finger)
XE1Bs	All	Cellulitis (&/or abscess): [buttock] or [perirectal]
XE1Bu	All	Cellulitis - foot (& - excl. toe)
XE1Bw	All	(Impetigo) or (pemphigus neonatorum)
XE1By	All	(Pilonidal: [sinus &/or cyst] or [abscess]) or (dimple - parasacral)
XE1C0	All	(Skin infection, localised NOS) or (pyoderma) or (pyogenic granuloma)
XE1C2	All	(Skin infections NOS) or (perleche)
XE1Cq	All	Folliculitis
XE2RI	All	Toe: [cellulitis] or [paronychia]
XE2uC	All	Tuberculosis of skin and subcutaneous tissue
XE2uM	All	Dermatophytosis of foot
XE2v1	All	Multiple yaws papillomata
XE2xh	All	Phthiriasis pubis
XM0pU	All	Tinea kerion of beard
XM0tp	All	Cellulitis of hand
XM0tr	All	Cellulitis of foot
XM1PT	All	Superficial bacterial infection of skin
XM1R0	All	Acute abscess lymph node
XSBpB	All	Abscess of hand

Supplementary table S5.7. The case definitions for included Urinary tract infection.

Urinary tract infection		
Read V2 Code	Term ID	Description
K15..	All	Cystitis
K150.	All	Acute cystitis
K151.	All	Chronic interstitial cystitis
K1510	All	Hunner's ulcer
K1511	All	Panmural fibrosis of bladder
K1512	All	Submucous cystitis
K151z	All	Chronic interstitial cystitis NOS
K152.	All	Other chronic cystitis
K1520	All	Subacute cystitis
K152y	All	Chronic cystitis unspecified
K152z	All	Other chronic cystitis NOS
K153.	All	Trigonitis
K1530	All	Acute trigonitis
K1531	All	Chronic trigonitis
K1532	All	Urethrotigonitis
K153z	All	Trigonitis NOS
K154.	All	Cystitis in diseases EC
K1540	All	Cystitis in actinomycosis
K1541	All	Cystitis in amoebiasis
K1542	All	Cystitis in bilharziasis
K1543	All	Cystitis in echinococcus infestation
K1544	All	Cystitis in diphtheria
K1545	All	Cystitis in gonorrhoea
K1546	All	Cystitis in moniliasis
K1547	All	Cystitis in trichomoniasis
K1548	All	Cystitis in tuberculosis
K154z	All	Cystitis in diseases EC NOS
K155.	All	Recurrent cystitis
K15y.	All	Other specified cystitis
K15y0	All	Cystitis cystica
K15y1	All	Irradiation cystitis
K15y2	All	Abscess of bladder
K15y3	All	Malakoplakia of bladder
K15yz	All	Other cystitis NOS
K15z.	All	Cystitis NOS
K190.	All	Urinary tract infection, site not specified
K1900	All	Bacteriuria, site not specified
K1901	All	Pyuria, site not specified

K1902	All	Post operative urinary tract infection
K1903	All	Recurrent urinary tract infection
K1904	All	Chronic urinary tract infection
K1905	All	Urinary tract infection
K1906	All	Urosepsis
K190X	All	Persistent proteinuria, unspecified
K190z	All	Urinary tract infection, site not specified NOS
Read CTV3 Code	Term ID	Description
A32y3	All	Diphtheritic cystitis
A9811	All	Acute gonococcal cystitis
A9831	All	Chronic gonococcal cystitis
K15..	All	Inflammation of bladder
K150.	All	NULL
K151.	All	Chronic interstitial cystitis
K1510	All	Hunner's ulcer
K1511	All	Panmural fibrosis of bladder
K1512	All	Submucous cystitis
K151z	All	Chronic interstitial cystitis NOS
K152.	All	Other chronic cystitis
K1520	All	Subacute cystitis
K152y	All	Chronic cystitis unspecified
K152z	All	Other chronic cystitis NOS
K153.	All	(Trigonitis) or (follicular cystitis)
K1530	All	Acute trigonitis
K1531	All	Chronic trigonitis
K1532	All	Urethrotrigonitis
K153z	All	Trigonitis NOS
K154.	All	Cystitis in diseases EC
K1540	All	Actinomycotic cystitis
K1541	All	Amoebic cystitis
K1542	All	Schistosomiasis of bladder
K1543	All	Echinococcal cystitis
K1544	All	NULL
K1545	All	Gonococcal cystitis
K1546	All	Monilial cystitis
K1547	All	Trichomonal cystitis
K1548	All	Tuberculous cystitis
K154z	All	Cystitis in diseases EC NOS
K155.	All	Recurrent cystitis
K15y.	All	Other specified cystitis
K15y0	All	Cystitis cystica
K15y1	All	Irradiation cystitis

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4	K15y2	All	Pyocystis
5	K15y3	All	NULL
6	K15yz	All	Other cystitis NOS
7	K15z.	All	Cystitis NOS
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9	K1632	All	Diverticulitis of bladder
10	K190.	All	Urinary tract infection: [site not specified] or [recurrent]
11	K1900	All	Bacteriuria: [site not specified] or [asymptomatic]
12	K1901	All	Pyuria
13	K1902	All	Postoperative urinary tract infection
14	K1903	All	Recurrent urinary tract infection
15	K1904	All	Chronic urinary tract infection
16	K1905	All	NULL
17	K1906	All	NULL
18	K190X	All	NULL
19	K190z	All	Urinary tract infection, site not specified NOS
20	Kyu50	All	[X]Other chronic cystitis
21	Kyu51	All	[X]Other cystitis
22	X30Na	All	Recurrent cystitis - culture-negative
23	X30Nb	All	Chronic cystitis - culture negative
24	X30Nc	All	Chronic nonspecific cystitis
25	X30Nd	All	Acute radiation cystitis
26	X30Ne	All	Chronic radiation cystitis
27	X30Nf	All	Chemical cystitis
28	X30Ng	All	Leukoplakia of bladder
29	X30Nh	All	Malakoplakia of bladder
30	X30NV	All	Infective cystitis
31	X30NX	All	Chronic infective cystitis
32	X30NY	All	Non-infective cystitis
33	X30NZ	All	Acute cystitis - culture-negative
34	X30Pa	All	Recurrent infective cystitis
35	X30PZ	All	Acute culture positive cystitis
36	Xa0t3	All	Amyloid of bladder
37	Xa8EJ	All	Acute cystitis
38	Xa8EK	All	Chronic cystitis
39	XaA05	All	Bullous cystitis
40	XaB66	All	Acute infective cystitis
41	XaY6b	All	Follicular cystitis
42	XE0dq	All	Trigonitis
43	XE0fX	All	Acute cystitis (& [recurrent])
44	XE0fZ	All	(Cystitis NOS) or (trigonitis)
45	XM0sZ	All	Acute recurrent cystitis
46	XM10v	All	Infected diverticulum of bladder
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XM1Ox	All	Cystitis of pregnancy
XM1Us	All	Sterile pyuria

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Supplementary table S5.8. The case definitions for included Genital infections.

Genital infections		
Read V2 Code	Term ID	Description
AB21.	All	Candidal vulvovaginitis
AB210	All	Candidiasis of vulva
AB211	All	Candidiasis of vagina
AB21z	All	Candidal vulvovaginitis NOS
AB22.	All	Other urogenital candidiasis
AB220	All	Candidal balanitis
AB221	All	Perianal candidiasis
AB22z	All	Other urogenital candida NOS
K17..	All	Urethritis due to non venereal causes
K170.	All	Urethral and periurethral abscess
K1700	All	Urethral abscess unspecified
K1701	All	Bulbourethral gland abscess
K1702	All	Urethral gland abscess
K1703	All	Periurethral cellulitis
K1704	All	Periurethral abscess
K170z	All	Urethral abscess NOS
K172.	All	Candidal urethritis
K17y2	All	Skene's glands adenitis
K17y3	All	Cowperitis
K17y4	All	Urethral meatitis
K17y6	All	Verumontanitis
K17y7	All	Utriculus masculinus
K17yz	All	Other urethritis NOS
K17z.	All	Urethritis due to non venereal cause NOS
Read CTV3 Code	Term ID	Description
AB21.	All	Candidal vulvovaginitis
XE0SH	All	Candidal vulvovaginitis NOS
X407o	All	Streptococcal vulvovaginitis
X407r	All	Chlamydial vulvovaginitis
K4212	All	Vulvovaginitis unspecified
K4216	All	Vulvovaginitis in diseases EC
Xa16P	All	Infective vulvitis
X4087	All	Vulval amoebiasis
AB210	All	Candidiasis of vulva
X407h	All	Infective vaginitis
AB211	All	Vaginal candidiasis
Xa0Er	All	Trichomonal vaginitis
X407i	All	Bacterial vaginosis
X4080	All	Vaginal vault infection
AB22.	All	Other urogenital candidiasis
AB22z	All	Other urogenital candida NOS

XaBjl	All	Infective balanitis
X4007	All	Bacterial balanitis
X4008	All	Anaerobic balanitis
X400A	All	Mycoplasma balanitis
XE0SI	All	Candidal balanitis
A05y1	All	Amoebic balanitis
X70Qk	All	Anogenital candidiasis
XE0SJ	All	Perianal candidiasis
X70Qo	All	Anal candidiasis
X70Qj	All	Candida infection of genital region
X407N	All	Candidiasis of cervix
X70Qn	All	Penile candidiasis
XE0SI	All	Candidal balanitis
X30Oy	All	Infective urethritis
XE0dt	All	Non-venereal urethritis
X30P3	All	Tuberculous urethritis
X30P6	All	Urethral abscess
K1700	All	Urethral abscess unspecified
K170z	All	Urethral abscess NOS
K17y2	All	Skene's glands adenitis
K17y3	All	Cowperitis
K17y4	All	Urethral meatitis
X30PD	All	Male accessory gland infection
K17y6	All	Verumontanitis
K17yz	All	Other urethritis NOS
K1703	All	Periurethral cellulitis
K1704	All	Periurethral abscess

Supplementary table S5.9. The case definitions for included Gastrointestinal infection.

Gastrointestinal infection		
Read V2 Code	Term ID	Description
19G..	All	Diarrhoea and vomiting
1J8..	All	Suspected food poisoning
A0...	All	Intestinal infectious diseases
A00..	All	Cholera
A000.	All	Cholera - <i>Vibrio cholerae</i>
A001.	All	Cholera - <i>Vibrio cholerae</i> El Tor
A00z.	All	Cholera NOS
A01..	All	Typhoid and paratyphoid fevers
A010.	All	Typhoid fever
A011.	All	Paratyphoid fever A
A012.	All	Paratyphoid fever B
A013.	All	Paratyphoid fever C
A01z.	All	Paratyphoid fever NOS
A02..	All	Other salmonella infections
A020.	All	<i>Salmonella</i> gastroenteritis
A021.	All	<i>Salmonella</i> septicaemia
A022.	All	Localised salmonella infection
A0220	All	Local salmonella infection unspecified
A0221	All	<i>Salmonella</i> meningitis
A0222	All	<i>Salmonella</i> pneumonia
A0223	All	<i>Salmonella</i> arthritis
A0224	All	<i>Salmonella</i> osteomyelitis
A022z	All	Other local salmonella infection
A023.	All	<i>Salmonella</i> sepsis
A02y.	All	Other specified salmonella infection
A02z.	All	<i>Salmonella</i> infection NOS
A03..	All	Shigellosis
A030.	All	<i>Shigella dysenteriae</i> (group A)
A031.	All	<i>Shigella flexneri</i> (group B)
A032.	All	<i>Shigella boydii</i> (group C)
A033.	All	<i>Shigella sonnei</i> (group D)
A03y.	All	Other specified shigella infection
A03z.	All	Shigellosis NOS
A04..	All	Other bacterial food poisoning
A040.	All	Staphylococcal food poisoning
A041.	All	Botulism
A042.	All	<i>Clostridium perfringens</i> food poisoning
A043.	All	Other clostridia causing food poisoning
A044.	All	<i>Vibrio parahaemolyticus</i> food poisoning
A04y.	All	Other specified bacterial food poisoning

A04y0	All	Foodborne Bacillus cereus intoxication
A04z.	All	Food poisoning NOS
A05..	All	Amoebiasis
A050.	All	Acute amoebic dysentery
A051.	All	Chronic intestinal amoebiasis
A052.	All	Amoebic nondysenteric colitis
A053.	All	Amoebic liver abscess
A054.	All	Amoebic lung abscess
A055.	All	Amoebic brain abscess
A056.	All	Amoebic skin ulceration
A05y.	All	Amoebic infection of other sites
A05y0	All	Amoebic appendicitis
A05y1	All	Amoebic balanitis
A05y2	All	Amoeboma
A05yz	All	Amoebic infection of other sites NOS
A05z.	All	Amoebiasis NOS
A06..	All	Other protozoal intestinal diseases
A060.	All	Balantidiasis
A061.	All	Giardiasis - Lambliasis
A062.	All	Coccidiosis
A063.	All	Intestinal trichomoniasis
A064.	All	Cryptosporidiosis
A06y.	All	Other specified protozoal intestinal diseases
A06z.	All	Protozoal intestinal diseases NOS
A07..	All	Intestinal infection due to other organisms
A070.	All	Escherichia coli gastrointestinal tract infection
A0700	All	Enteropathogenic Escherichia coli infection
A0701	All	Enterotoxigenic Escherichia coli infection
A0702	All	Enteroinvasive Escherichia coli infection
A0703	All	Enterohaemorrhagic Escherichia coli infection
A071.	All	Arizona paracolon gastrointestinal tract infection
A072.	All	Aerobacter aerogenes gastrointestinal tract infection
A073.	All	Proteus gastrointestinal tract infection
A0730	All	Proteus mirabilis gastrointestinal tract infection
A0731	All	Proteus morganii gastrointestinal tract infection
A073z	All	Proteus gastrointestinal tract infection NOS
A074.	All	Other specified gastrointestinal tract bacterial infection
A0740	All	Staphylococcal gastrointestinal tract infection
A0741	All	Pseudomonas gastrointestinal tract infection
A0743	All	Campylobacter gastrointestinal tract infection
A0744	All	Enteritis due to Yersinia enterocolitica
A0745	All	Helicobacter pylori gastrointestinal tract infection
A074y	All	Other specified other gastrointestinal infection
A074z	All	Other specified gastrointestinal tract infections NOS
A075.	All	Unspecified bacterial enteritis

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4	A076.	All	Enteritis due to specified virus
5	A0760	All	Enteritis due to adenovirus
6	A0761	All	Enteritis due to enterovirus
7	A0762	All	Enteritis due to rotavirus
8	A0763	All	Enteritis due to norovirus
9	A076z	All	Enteritis due to specified virus NOS
10	A07y.	All	Gastrointestinal tract infection due to specified organism NEC
11	A07y0	All	Viral gastroenteritis
12	A07y1	All	Infantile viral gastroenteritis
13	A07z.	All	Gastrointestinal tract infection due to specified organism NOS
14	A08..	All	Ill-defined intestinal tract infections
15	A080.	All	Infectious colitis, enteritis and gastroenteritis
16	A0801	All	Infectious colitis
17	A0802	All	Infectious enteritis
18	A0803	All	Infectious gastroenteritis
19	A0804	All	Catarrhal dysentery
20	A0805	All	Haemorrhagic dysentery
21	A080z	All	Infectious colitis, enteritis and gastroenteritis NOS
22	A081.	All	Colitis, enteritis and gastroenteritis presumed infectious
23	A0810	All	Colitis - presumed infectious origin
24	A0811	All	Enteritis - presumed infectious origin
25	A0812	All	Gastroenteritis - presumed infectious origin
26	A081z	All	Colitis, enteritis and gastroenteritis presumed infectious origin NOS
27	A082.	All	Infectious diarrhoea
28	A0820	All	Dysenteric diarrhoea
29	A0821	All	Epidemic diarrhoea
30	A082z	All	Infectious diarrhoea NOS
31	A083.	All	Diarrhoea of presumed infectious origin
32	A08z.	All	Ill defined gastrointestinal tract infections NOS
33	A0y..	All	Other specified infectious diseases of intestinal tract
34	A0z..	All	Intestinal tract infectious disease NOS
35	A3Ay2	All	Clostridium difficile infection
36	A78y1	All	Epidemic vomiting syndrome
37	Ayu00	All	[X]Cholera, unspecified
38	Ayu04	All	[X]Other shigellosis
39	Ayu05	All	[X]Shigellosis, unspecified
40	Ayu07	All	[X]Bacterial intestinal infection, unspecified
41	Ayu0F	All	[X]Viral intestinal infection, unspecified
42	Ayu0H	All	[X]Diarrhoea and gastroenteritis of presumed infectious origin
43	J43..	All	Other non-infective inflammatory gastroenteritis and colitis
44	J43z.	All	Other non-infective gastroenteritis and colitis NOS
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Read CTV3 Code	Term ID	Description
19G..	All	NULL
1J8..	All	NULL
A0...	All	(Intestinal infectious diseases) or (food poisoning [& (bacterial)]) or (infective vomiting)
A00..	All	(Cholera) or (Vibrio cholerae)
A000.	All	Cholera - Vibrio cholerae
A001.	All	Cholera - Vibrio cholerae O1 El Tor biotype
A00z.	All	Cholera NOS
A01..	All	Typhoid and paratyphoid fevers
A010.	All	Fever: [typhoid] or [enteric]
A011.	All	Paratyphoid A
A012.	All	Paratyphoid B
A013.	All	Paratyphoid C
A01z.	All	Paratyphoid fever NOS
A02..	All	Other salmonella infections
A020.	All	Salmonellosis (& [gastroenteritis] or [food poisoning])
A021.	All	Salmonella septicaemia
A022.	All	Localised salmonella infection
A0220	All	Local salmonella infection unspecified
A0221	All	NULL
A0222	All	Salmonella pneumonia
A0223	All	Salmonella arthritis
A0224	All	Salmonella osteomyelitis
A022z	All	Other local salmonella infection
A023.	All	NULL
A02y.	All	Other specified salmonella infection
A02z.	All	Salmonella infection NOS
A03..	All	Shigellosis
A030.	All	(Shigella dysenteriae - group A) or (bacillary dysentery)
A031.	All	Shigella flexneri (group B)
A032.	All	Shigella boydii (group C)
A033.	All	Shigella sonnei: [group D] or [bacillary dysentery]
A03y.	All	Other specified shigella infection
A03z.	All	Shigellosis NOS
A04..	All	Other bacterial food poisoning
A040.	All	Staphylococcal food poisoning
A041.	All	NULL
A042.	All	Clostridium perfringens food poisoning
A043.	All	Other Clostridia causing food poisoning
A044.	All	Vibrio parahaemolyticus food poisoning
A04y.	All	Other specified bacterial food poisoning
A04y0	All	NULL
A04z.	All	Food poisoning NOS
A05..	All	Amoebiasis

A050.	All	Acute amoebic dysentery
A051.	All	Chronic intestinal amoebiasis
A052.	All	Amoebic nondysenteric colitis
A053.	All	Amoebic liver abscess
A054.	All	Amoebic lung abscess
A055.	All	Amoebic brain abscess
A056.	All	Amoebic ulcer of skin
A05y.	All	Amoebic infection of other sites
A05y0	All	Amoebic appendicitis
A05y1	All	Amoebic balanitis
A05y2	All	Amoeboma
A05yz	All	Amoebic infection of other sites NOS
A05z.	All	Amoebiasis NOS
A06..	All	Other protozoal intestinal diseases
A060.	All	Balantidiasis
A061.	All	Giardiasis: [lambliasis] or [colitis]
A062.	All	Coccidiosis (& [intestinal])
A063.	All	Trichomonas hominis infection
A064.	All	NULL
A06y.	All	Other specified protozoal intestinal diseases
A06z.	All	Protozoal intestinal diseases NOS
A07..	All	Intestinal infection due to other organisms
A070.	All	Escherichia coli gastrointestinal tract infection
A0700	All	NULL
A0701	All	NULL
A0702	All	NULL
A0703	All	NULL
A071.	All	Arizona paracolon gastrointestinal tract infection
A072.	All	Aerobacter aerogenes gastrointestinal tract infection
A073.	All	Proteus gastrointestinal tract infection
A0730	All	Proteus mirabilis gastrointestinal tract infection
A0731	All	Morganella morganii gastrointestinal tract infection
A073z	All	Proteus gastrointestinal tract infection NOS
A074.	All	Other specified gastrointestinal tract bacterial infection
A0740	All	Staphylococcal: [GIT infection] or [diarrhoea] or [toxin diarrhoea]
A0741	All	Pseudomonas: [GIT infection] or [pyocyanea diarrhoea]
A0743	All	(Campylobacter GIT infection (& [diarrhoea] or [enteritis]) or (helicobacter gastritis)
A0744	All	NULL
A0745	All	NULL
A074y	All	Other specified other gastrointestinal infection
A074z	All	Other specified gastrointestinal tract infections NOS
A075.	All	Unspecified bacterial enteritis

A076.	All	(Specified virus enteritis) or (viral: [diarrhoea] or [vomiting])
A0760	All	Enteritis due to adenovirus
A0761	All	Enteritis due to enterovirus
A0762	All	Enteritis due to rotavirus
A0763	All	NULL
A076z	All	Enteritis due to specified virus NOS
A07y.	All	Gastrointestinal tract infection due to specified organism NEC
A07y0	All	Viral gastroenteritis
A07y1	All	NULL
A07z.	All	Gastrointestinal tract infection due to specified organism NOS
A08..	All	(Ill-defined GIT infections) or (gastric flu)
A080.	All	Infectious colitis, enteritis and gastroenteritis
A0801	All	Infective colitis
A0802	All	Infective enteritis
A0803	All	Infectious gastroenteritis
A0804	All	Catarrhal dysentery
A0805	All	Haemorrhagic dysentery
A080z	All	Infectious colitis, enteritis and gastroenteritis NOS
A081.	All	Colitis and enteritis (& [gastroenteritis]) presumed infectious
A0810	All	Colitis - presumed infectious origin
A0811	All	Enteritis - presumed infectious origin
A0812	All	Gastroenteritis - presumed infectious origin
A081z	All	Colitis, enteritis and gastroenteritis presumed infectious origin NOS
A082.	All	Diarrhoea: [infectious] or [travellers]
A0820	All	Dysenteric diarrhoea
A0821	All	(Epidemic diarrhoea) or (viral gastroenteritis)
A082z	All	Infectious diarrhoea NOS
A083.	All	(Infectious diarrhoea: [presumed] or [? & vomiting]) or (infantile gastroenteritis)
A08z.	All	Ill-defined gastrointestinal tract infections NOS
A0y..	All	Other specified infectious diseases of intestinal tract
A0z..	All	Intestinal tract infectious disease NOS
A3Ay2	All	Clostridium difficile infection
A78y1	All	Epidemic vomiting syndrome
Ayu00	All	[X]Cholera, unspecified
Ayu04	All	[X]Other shigellosis
Ayu05	All	[X]Shigellosis, unspecified
Ayu07	All	[X]Bacterial intestinal infection, unspecified
Ayu0F	All	[X]Viral intestinal infection, unspecified
Ayu0H	All	[X]Diarrhoea and gastroenteritis of presumed infectious origin

H24y6	All	Typhoid pneumonia
J43..	All	(Gastroenteriti) or (enterocolitis) or (other non-infective inflammatory gastroenteritis and colitis)
J43z.	All	(Chronic diarrhoea) or (other non-infective gastroenteritis and colitis NOS)
X301R	All	Helicobacter gastritis
X303g	All	Colitis,enteritis ? infectious
X303I	All	Amoebic colitis
X303n	All	Fulminant amoebic colitis
X303q	All	Cytomegaloviral colitis
X30Bc	All	Prototheca diarrhoea
X30Bd	All	Food poisoning
X30BN	All	Gastroenteritis
X30BP	All	Vomiting - infective
X30BR	All	Adenoviral gastroenteritis
X30BS	All	Rotavirus gastroenteritis
X30BT	All	Norwalk virus gastroenteritis
X30BU	All	Small round structured virus gastroenteritis
X30BX	All	Dysentery
X70Ft	All	Infantile gastroenteritis
X70Fv	All	Bacterial food poisoning
X70Fw	All	Bacillus cereus food poisoning
X70Ge	All	Asymptomatic amoebic infection
X70Gf	All	Symptomatic non-invasive amoebic infection
X70Gg	All	Amoebic toxic megacolon
X70Gi	All	Amoebic perianal ulceration
X70GJ	All	Cholera - Vibrio cholerae O1 Classical biotype
X70GK	All	Cholera - non-O1 group vibrio
X70GL	All	Cholera - O139 group Vibrio cholerae
X70GN	All	Enterotoxigenic Escherichia coli gastrointestinal tract infection
X70GO	All	Travellers' diarrhoea
X70Gp	All	Cryptosporidiosis
X70GP	All	Enteropathogenic Escherichia coli gastrointestinal tract infection
X70GQ	All	Verotoxigenic Escherichia coli gastrointestinal tract infection
X70GR	All	Enteroinvasive Escherichia coli gastrointestinal tract infection
X70GS	All	Enteroadherent Escherichia coli gastrointestinal tract infection
X70GZ	All	Yersinia enterocolitis
X73Mv	All	Vibrio cholerae
Xa01t	All	Recurrent salmonella septicaemia
Xa2Vc	All	Astrovirus gastroenteritis
Xa2Vd	All	Calicivirus gastroenteritis

Xa3dy	All	Specific gastrointestinal infectious disease
Xa8ES	All	Acute infective gastroenteritis
Xa8I7	All	Salmonella food poisoning
Xa97W	All	Cholera - O1 group <i>Vibrio cholerae</i>
Xa97X	All	<i>Staphylococcus aureus</i> food poisoning
XaB5z	All	Enterocolitis
XaBE5	All	<i>Helicobacter pylori</i> gastrointestinal tract infection
XaBLu	All	Infantile viral gastroenteritis
XaDbT	All	Fungal gastroenteritis
XalnX	All	Suspected food poisoning
XaREr	All	Enteritis due to norovirus
XaYaf	All	Sepsis due to <i>Salmonella</i>
XE0aj	All	Other non-infective inflammatory gastroenteritis and colitis
XE0an	All	Other non-infective gastroenteritis and colitis NOS
XE0Qc	All	Cholera
XE0Qd	All	Typhoid fever
XE0Qe	All	<i>Salmonella</i> gastroenteritis
XE0Qf	All	<i>Shigella dysenteriae</i> (group A)
XE0Qg	All	<i>Shigella sonnei</i> (group D)
XE0Qi	All	Intestinal coccidiosis
XE0Qj	All	Staphylococcal gastrointestinal tract infection
XE0Qk	All	<i>Pseudomonas</i> gastrointestinal tract infection
XE0Ql	All	<i>Campylobacter</i> gastrointestinal tract infection
XE0Qm	All	Enteritis due to specified virus
XE0Qn	All	Ill-defined intestinal tract infections
XE0Qo	All	Colitis, enteritis and gastroenteritis presumed infectious
XE0Qp	All	Epidemic diarrhoea
XE0Qq	All	Diarrhoea of presumed infectious origin
XE0Sm	All	(Intestinal infectious diseases) or (unspecified enteritis)
XE0Ss	All	(Bacillary dysentery) or (shigellosis)
XE0Su	All	Giardiasis (& [colitis])
XE0Sw	All	(OS GIT infections) or (botulism) or (<i>Campylobacter</i> enteritis)
XE0Sy	All	Viral: [ill-defined GIT infections (& diarrhoea)] or [gastroenteritis]
XE0T0	All	(Gastroenteritis (& [viral NOS])) or (vomiting: [viral] or [& diarrhoea infection]) or (gastric flu)
XE0T2	All	Infectious: [intestinal disease NOS] or [diarrhoea NOS]
XM0pJ	All	Bacterial gastroenteritis
XM0pK	All	Bacillary dysentery

Supplementary table S5.10. The case definitions for included Herpes simplex.

Herpes simplex		
Read V2 Code	Term ID	Description
A54..	All	Herpes simplex
A540.	All	Eczema herpeticum - Kaposi's varicelliform eruption
A541.	All	Genital herpes simplex
A5410	All	Genital herpes unspecified
A5411	All	Herpetic vulvovaginitis
A5412	All	Herpetic ulceration of vulva
A5413	All	Herpetic infection of penis
A5414	All	Herpesviral infection of perianal skin and rectum
A5415	All	Anogenital herpesviral infection
A5416	All	Genital herpes simplex type 1
A5417	All	Genital herpes simplex type 2
A5418	All	Recurrent genital herpes simplex type 1
A5419	All	Recurrent genital herpes simplex type 2
A541z	All	Genital herpes simplex NOS
A542.	All	Herpetic gingivostomatitis
A543.	All	Herpetic meningoencephalitis
A544.	All	Ophthalmic herpes simplex
A5440	All	Unspecified ophthalmic herpes
A5441	All	Herpes simplex eyelid dermatitis
A5442	All	Herpes simplex dendritic keratitis
A5443	All	Herpes simplex disciform keratitis
A5444	All	Herpes simplex iridocyclitis
A5445	All	Herpes simplex ophthalmicus
A544z	All	Ophthalmic herpes simplex NOS
A545.	All	Herpes simplex septicaemia
A546.	All	Herpes simplex whitlow
A548.	All	[X] Herpes labialis
A54x.	All	Herpes simplex with other specified complication
A54x0	All	Visceral herpes simplex
A54x1	All	Herpes simplex meningitis
A54x2	All	Herpes simplex otitis externa
A54x3	All	Herpesviral vesicular dermatitis
A54x4	All	Herpes simplex pneumonia
A54xz	All	Herpes simplex with other specified complication NOS
A54y.	All	Herpes simplex with unspecified complication
A54z.	All	Herpes simplex no complication NOS
Read CTV3 Code	Term ID	Description
A54..	All	(Herpes simplex [& viral infection]) or (scumpox)
A540.	All	Eczema herpeticum
A541.	All	Genital herpes
A5410	All	Genital herpes unspecified (& [simplex group])

A5411	All	Herpetic vulvovaginitis
A5412	All	Herpetic ulceration of vulva
A5413	All	Herpetic infection of penis
A5414	All	Herpesviral infection of perianal skin and rectum
A5415	All	Anogenital herpesviral infection
A5416	All	NULL
A5417	All	NULL
A5418	All	NULL
A5419	All	NULL
A541z	All	Genital herpes simplex NOS
A542.	All	Herpetic: [gingivostomatitis] or [cold sore] or [stomatitis]
A543.	All	(Herpetic meningoencephalitis) or (Simian B disease)
A544.	All	Ophthalmic herpes simplex
A5440	All	Unspecified ophthalmic herpes (& [simplex group])
A5441	All	Herpes simplex eyelid dermatitis
A5442	All	Herpes simplex dendritic keratitis
A5443	All	Herpes simplex disciform keratitis
A5444	All	Herpes simplex iridocyclitis
A5445	All	NULL
A544z	All	Ophthalmic herpes simplex NOS
A545.	All	Herpes simplex septicaemia
A546.	All	Herpes simplex whitlow
A548.	All	NULL
A54x.	All	Herpes simplex with other specified complication
A54x0	All	Visceral herpes simplex
A54x1	All	NULL
A54x2	All	NULL
A54x3	All	Herpesviral vesicular dermatitis
A54x4	All	NULL
A54xz	All	Herpes simplex with other specified complication NOS
A54y.	All	Herpes simplex with unspecified complication
A54z.	All	Herpes: [simplex, no complication NOS] or [labialis]
Ayu4G	All	[X]Anogenital herpes viral infection, unspecified
F5015	All	Herpes simplex otitis externa
X100g	All	Herpes simplex pneumonia
X70Ja	All	Herpes simiae infection
X70JU	All	Primary anogenital herpes
X70JV	All	Recurrent anogenital herpes
XaPEC	All	Genital herpes simplex type 1 infection
XaPED	All	Genital herpes simplex type 2 infection
XaPER	All	Recurrent genital herpes simplex type 1 infection
XaPES	All	Recurrent genital herpes simplex type 2 infection
XEORB	All	Herpes simplex infection
XEORC	All	Herpetic gingivostomatitis
XEORD	All	Herpes simplex encephalitis

XE0RE	All	Herpes simplex no complication NOS
XE0TO	All	(Herpes simplex (& [type 1] or [type 2])) or (scrumpox)
XE2vG	All	Genital herpes unspecified
XE2vH	All	Unspecified ophthalmic herpes
XM02r	All	Herpes labialis

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Supplementary table S5.11. The case definitions for included Herpes zoster.

Herpes zoster		
Read V2 Code	Term ID	Description
A53..	All	Herpes zoster
A530.	All	Herpes zoster with meningitis
A531.	All	Herpes zoster with other central nervous system complication
A5310	All	Herpes zoster with other central nervous system complications
A5311	All	Geniculate herpes zoster
A5312	All	Postherpetic trigeminal neuralgia
A5313	All	Postherpetic polyneuropathy
A5314	All	Zoster encephalitis
A5315	All	Postzoster neuralgia
A531z	All	Herpes zoster with other central nervous system complication NOS
A532.	All	Herpes zoster with ophthalmic complication
A5320	All	Herpes zoster with dermatitis of eyelid
A5321	All	Herpes zoster with keratoconjunctivitis
A5322	All	Herpes zoster iridocyclitis
A5323	All	Ophthalmic herpes zoster infection
A5324	All	Herpes zoster ophthalmicus
A532z	All	Herpes zoster with other ophthalmic complication
A53x.	All	Herpes zoster with other specified complication
A53x0	All	Herpes zoster otitis externa
A53x1	All	Disseminated zoster
A53xz	All	Herpes zoster with other specified complication NOS
A53y.	All	Herpes zoster with unspecified complication
A53z.	All	Herpes zoster NOS
Read CTV3 Code	Term ID	Description
A53..	All	Herpes zoster [organism] or [infection - shingles]
A530.	All	NULL
A531.	All	(Herpes zoster with other CNS complication) or (postherpetic neuralgia)
A5310	All	NULL
A5311	All	(Geniculate herpes zoster) or (Ramsey Hunt syndrome)
A5312	All	NULL
A5313	All	Post-herpetic polyneuropathy
A5314	All	NULL
A5315	All	NULL
A531z	All	Herpes zoster with other central nervous system complication NOS
A532.	All	Herpes zoster with ophthalmic complication
A5320	All	Herpes zoster with dermatitis of eyelid
A5321	All	Herpes zoster with keratoconjunctivitis
A5322	All	Herpes zoster iridocyclitis
A5323	All	Ophthalmic herpes zoster infection
A5324	All	NULL

A53z	All	Herpes zoster with other ophthalmic complication
A53x.	All	Herpes zoster with other specified complication
A53x0	All	NULL
A53x1	All	Disseminated zoster
A53xz	All	Herpes zoster with other specified complication NOS
A53y.	All	Herpes zoster with unspecified complication
A53z.	All	Herpes zoster NOS

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Supplementary table S5.12. The case definitions for included Meningitis.

Herpes zoster		
Read V2 Code	Term ID	Description
F00..	All	Bacterial meningitis
F000.	All	Haemophilus meningitis
F001.	All	Pneumococcal meningitis
F002.	All	Streptococcal meningitis
F003.	All	Staphylococcal meningitis
F004.	All	Meningitis - tuberculous
F005.	All	Meningitis - meningococcal
F007.	All	Meningitis in other bacterial disease classified elsewhere
F0070	All	Meningitis due to gonococcus
F0071	All	Meningitis due to listeriosis
F0072	All	Meningitis due to neurosyphilis
F0073	All	Meningitis due to salmonella
F0074	All	Meningitis due to congenital syphilis
F0075	All	Meningitis due to secondary syphilis
F0076	All	Meningitis due to typhoid fever
F0077	All	Meningitis due to actinomycosis
F0078	All	Meningitis due to pertussis
F007z	All	Unspecified meningitis in bacterial disease EC
F00y.	All	Other specified bacterial meningitis
F00y0	All	Meningitis due to aerobacter aerogenes
F00y1	All	Meningitis due to bacillus pyocyaneus
F00y2	All	Meningitis due to escherichia coli
F00y3	All	Meningitis due to Friedlander bacillus
F00y4	All	Meningitis due to klebsiella pneumoniae
F00y5	All	Meningitis due to proteus morgani
F00y6	All	Meningitis due to pseudomonas
F00yz	All	Other specified bacterial meningitis NOS
F00z.	All	Bacterial meningitis NOS
F01..	All	Meningitis due to other organisms
F010.	All	Meningitis due to fungal organisms
F0100	All	Meningitis due to cryptococcus
F010z	All	Other fungal meningitis
F011.	All	Meningitis due to viral organisms EC
F0110	All	Meningitis due to coxsackie virus
F0111	All	Meningitis due to ECHO virus
F0112	All	Meningitis due to herpes zoster virus
F0113	All	Meningitis due to herpes simplex virus
F0114	All	Meningitis due to mumps virus
F0115	All	Meningitis due to lymphocytic choriomeningitis virus
F0116	All	Meningitis due to adenovirus
F0117	All	Varicella meningitis

F011y	All	Other viral meningitis
F011z	All	Meningitis - viral NOS
F012.	All	Meningitis due to trypanosomiasis
F013.	All	Meningitis due to sarcoidosis
F01y.	All	Other non-bacterial meningitis
F01y0	All	Meningitis due to leptospira
F01yz	All	Other non-bacterial meningitis NOS
F01z.	All	Meningitis due to organism NOS
F02..	All	Meningitis of unspecified cause
F020.	All	Nonpyogenic meningitis
F02z.	All	Unspecified meningitis
F03X.	All	Bacterial meningoencephalitis and meningomyelitis, not elsewhere classified
A543.	00	Herpetic meningoencephalitis
AD00.	00	Toxoplasma meningoencephalitis
A1303	00	Tuberculous meningoencephalitis
A1302	00	Tuberculous leptomeningitis
Read CTV3 Code	Term ID	Description
X000H	All	Meningitis
XaDmS	All	Infective meningitis
F00..	All	Bacterial meningitis
F0077	All	Actinomycotic meningitis
F00y0	All	Aerobacter meningitis
F00y2	All	Escherichia coli meningitis
F0070	All	Gonococcal meningitis
F000.	All	Haemophilus meningitis
F00y4	All	Klebsiella meningitis
F00y3	All	Meningitis due to Friedlander bacillus
F0071	All	Listeria meningitis
X000R	All	Meningitis in Lyme disease
F005.	All	Meningococcal meningitis
F0078	All	Meningitis due to pertussis
A206.	All	Plague meningitis
F001.	All	Pneumococcal meningitis
Xa9B4	All	Proteus meningitis
F00y6	All	Pseudomonas meningitis
F00y1	All	Meningitis due to bacillus pyocyaneus
F0073	All	Salmonella meningitis
F0076	All	Meningitis due to typhoid fever
F003.	All	Staphylococcal meningitis
X000P	All	Staphylococcus aureus meningitis
X000Q	All	Staphylococcus epidermidis meningitis
F002.	All	Streptococcal meningitis
Xa7pz	All	Syphilitic meningitis
F0074	All	Congenital syphilitic meningitis

X000T	All	Late congenital syphilitic meningitis
F0075	All	Secondary syphilitic meningitis
A9180	All	Acute secondary syphilitic meningitis
F004.	All	Tuberculous meningitis
A1300	All	Tuberculosis of cerebral meninges
A1301	All	Tuberculosis of spinal meninges
A1302	All	Tuberculous leptomeningitis
A130z	All	Tuberculous meningitis NOS
AA0y0	All	Leptospiral meningitis
F007.	All	Meningitis in other bacterial disease classified elsewhere
F0072	All	Meningitis due to neurosyphilis
F007z	All	Unspecified meningitis in bacterial disease EC
F00y.	All	Other specified bacterial meningitis
F00yz	All	Other specified bacterial meningitis NOS
F00y5	All	Morganella morganii meningitis
F00z.	All	Bacterial meningitis NOS
Fyu00	All	[X]Other bacterial meningitis
Xa9B5	All	Viral meningitis
A4z1.	All	Adenoviral meningitis
A4z0.	All	Lymphocytic choriomeningitis
F0114	All	Mumps meningitis
X000M	All	Postmeasles meningitis
F0112	All	Meningitis due to herpes zoster virus
F0113	All	Herpes simplex meningitis
A42..	All	Enteroviral meningitis
F0110	All	Coxsackie viral meningitis
X000J	All	Coxsackie A viral meningitis
X000K	All	Coxsackie B viral meningitis
F0111	All	Echovirus meningitis
X000L	All	Chronic echovirus meningoencephalitis
A42y.	All	Other specified viral meningitis
Ayu8C	All	[X]Other viral meningitis
Ayu8D	All	[X]Viral meningitis, unspecified
F011.	All	Meningitis due to viral organisms EC
F011y	All	Other viral meningitis
Fyu01	All	[X]Meningitis in viral diseases classified elsewhere
XE0R7	All	Viral meningitis NOS
XE15A	All	Meningitis - viral NOS
F010.	All	Fungal meningitis
AB2y2	All	Candidal meningitis
F0100	All	Cryptococcal meningitis
AB32.	All	Coccidioidal meningitis
F010z	All	Other fungal meningitis
Fyu02	All	[X]Meningitis in mycoses classified elsewhere

X000V	All	Parasitic meningitis
F012.	All	Meningitis due to trypanosomiasis
F01..	All	Meningitis due to other organisms
F01y.	All	Other non-bacterial meningitis
F01yz	All	Other non-bacterial meningitis NOS
F01z.	All	Meningitis due to organism NOS
Fyu03	All	[X]Meningitis in other specified infectious and parasitic diseases classified elsewhere
F02..	All	Meningitis of unspecified cause
F020.	All	Non-pyogenic meningitis
F02z.	All	Unspecified meningitis
Fyu04	All	[X]Meningitis due to other specified causes
X001F	All	Listeria meningoencephalitis
XE0RD	All	Herpetic meningoencephalitis
F0334	Y71kx	Toxoplasma meningoencephalitis
A1303	All	Tuberculous meningoencephalitis
X001N	Y00Ck	PAM - Primary amoebic meningoencephalitis
Fyu05	YMACn	[X]Bacterial meningoencephalitis and meningomyelitis, not elsewhere classified

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