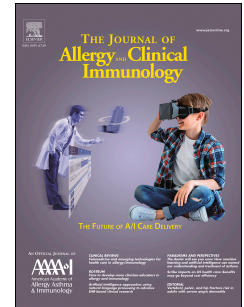


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Atopic dermatitis and risk of autoimmune conditions: population-based cohort study

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Supplementary material for: Atopic dermatitis and risk of autoimmune conditions: population-based cohort study

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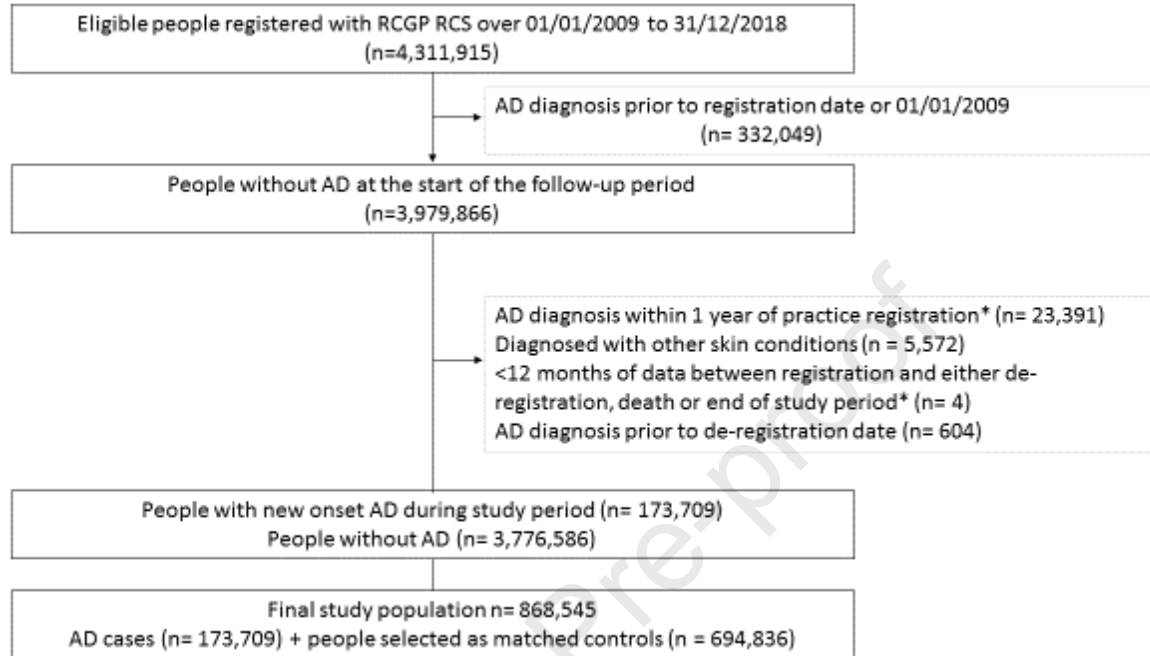
Phone: +44 20 7188 6399.

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Competing interests: S. de Lusignan is Director of RCGP RSC, he had received funding for projects from Astra Zeneca, Eli Lilly, GSK, Seqirus, Daiichi Sankyo and Takeda – all through his Universities and none related to this study. Claire Feeney is an employee of Pfizer Ltd. J. Dennis and A. McGovern are employees of Momentum Data who were paid consultants to Pfizer in connection with the development of this manuscript. C. Flohr is chief investigator of the UK National Institute for Health Research-funded TREAT (ISRCTN15837754) and SOFTER (ClinicalTrials.gov: NCT03270566) trials and the UK-Irish Atopic Eczema Systemic Therapy Register (A-STAR; ISRCTN11210918) and is a principal investigator in the European Union Horizon 2020-funded BIOMAP Consortium (<http://www.biomap-imi.eu/>). His department has also received funding from Sanofi-Genzyme. All other authors have no competing interests to declare.

Supplementary Methods

sFlowchart: Derivation of final study population.



* Not applicable if less than one year old

Recorded sociodemographic characteristics and patient clinical characteristics:

All characteristics were identified based on the latest information recorded in the primary care record before entry to the cohort. Ethnicity was extracted from the primary care record and grouped into major ethnic groups: white, black, Asian, mixed, and others.(1) Socioeconomic status was defined using the official national deprivation measure; index of multiple deprivation (IMD).(2) This was calculated at the point of data extraction, using patient postcode, with the resultant scores stratified by deprivation quintile according to the national distribution. Consultation history was defined as the number of primary care visits in the year prior to cohort entry. Patient-level clinical characteristics comprised BMI, smoking status, alcohol use, and common comorbidities (type 2 diabetes, hypertension, atrial fibrillation, angina, acute myocardial infarction, stroke, heart failure, chronic liver disease, dementia, chronic obstructive pulmonary disease, chronic kidney disease stages 3-5, malignancy, hyperlipidemia, peripheral arterial disease and depression). We used the missing indicator variable method where BMI, alcohol or smoking use were not recorded, as missing data were considered likely not to be missing at random, meaning multiple imputation approaches are likely to lack validity.(3)

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Supplementary code lists for Atopic dermatitis and all autoimmune conditions

Atopic Dermatitis		
Read V2 Code	Term ID	Description
M12z1	All	Eczema NOS
M111.	All	Atopic dermatitis/eczema
M112.	All	Infantile eczema
M113.	All	Flexural eczema
M114.	All	Allergic (intrinsic) eczema
Read CTV3 Code	Term ID	Description
X505K	Y50CT	Eczema
X505M	All	Constitutional eczema
M111.	All	Atopic dermatitis
M113.	All	Flexural atopic dermatitis
M112.	All	Infantile eczema

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

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
J410.	Y30CS	Ulcerative proctocolitis
J4103	Y30D7	Ulcerative proctitis

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
XaXGI	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
SNOMED CT ID	Term ID	Description
84027009	NA	Pernicious anemia (disorder)
234362006	NA	Biermer's congenital pernicious anemia (disorder)
234361004	NA	Congenital deficiency of intrinsic factor (disorder)
44910003	NA	Megaloblastic anemia due to decreased intake of vitamin B>12< (disorder)
234363001	NA	Selective malabsorption of cyanocobalamin (disorder)
193213003	NA	Myasthenic syndrome due to pernicious anemia (disorder)

Type 1 diabetes		
Read V2 Code	Term ID	Description
66An.	All	Diabetes type 1 review
C10E.	All	Type 1 diabetes mellitus
C10E0	All	Type 1 diabetes mellitus with renal complications
C10E1	All	Type 1 diabetes mellitus with ophthalmic complications
C10E2	All	Type 1 diabetes mellitus with neurological complications
C10E3	All	Type 1 diabetes mellitus with multiple complications
C10E4	All	Unstable type 1 diabetes mellitus
C10E5	All	Type 1 diabetes mellitus with ulcer
C10E6	All	Type 1 diabetes mellitus with gangrene
C10E7	All	Type 1 diabetes mellitus with retinopathy
C10E8	All	Type 1 diabetes mellitus - poor control
C10E9	All	Type 1 diabetes mellitus maturity onset
C10EA	All	Type 1 diabetes mellitus without complication
C10EB	All	Type 1 diabetes mellitus with mononeuropathy
C10EC	All	Type 1 diabetes mellitus with polyneuropathy
C10ED	All	Type 1 diabetes mellitus with nephropathy
C10EE	All	Type 1 diabetes mellitus with hypoglycaemic coma
C10EF	All	Type 1 diabetes mellitus with diabetic cataract
C10EG	All	Type 1 diabetes mellitus with peripheral angiopathy
C10EH	All	Type 1 diabetes mellitus with arthropathy
C10EJ	All	Type 1 diabetes mellitus with neuropathic arthropathy
C10EK	All	Type 1 diabetes mellitus with persistent proteinuria
C10EL	All	Type 1 diabetes mellitus with persistent microalbuminuria
C10EM	All	Type 1 diabetes mellitus with ketoacidosis
C10EN	All	Type 1 diabetes mellitus with ketoacidotic coma
C10EP	All	Type 1 diabetes mellitus with exudative maculopathy
C10EQ	All	Type 1 diabetes mellitus with gastroparesis
C10ER	All	Latent autoimmune diabetes mellitus in adult
66An.	All	Diabetes type 1 review
Read CTV3 Code	Term ID	Description
C1010	All	Type 1 diabetes mellitus with ketoacidosis
C1030	All	Type 1 diabetes mellitus with ketoacidotic coma
C1080	All	Type I diabetes mellitus with renal complications
C1081	All	Type I diabetes mellitus with ophthalmic complications
C1082	All	Type I diabetes mellitus with neurological complications
C1083	All	Type I diabetes mellitus with multiple complications
C1085	All	Type I diabetes mellitus with ulcer
C1086	All	Type I diabetes mellitus with gangrene
C1087	All	Type I diabetes mellitus with retinopathy
C1088	All	Type I diabetes mellitus - poor control
C1089	All	Type I diabetes mellitus maturity onset
L1805	All	Pre-existing diabetes mellitus, insulin-dependent
X40J4	All	Type I diabetes mellitus
X40JY	All	Insulin-dependent diabetes mellitus secretory diarrhoea syndrome
Xa4g7	All	Unstable type I diabetes mellitus
Xaage	All	Type I diabetes mellitus in remission
XaELP	All	Type I diabetes mellitus without complication
XaEnn	All	Type I diabetes mellitus with mononeuropathy
XaEno	All	Type I diabetes mellitus with polyneuropathy
XaF04	All	Type I diabetes mellitus with nephropathy
XaFm8	All	Type I diabetes mellitus with diabetic cataract
XaFmK	All	Type I diabetes mellitus with peripheral angiopathy
XaFmL	All	Type I diabetes mellitus with arthropathy
XaFmM	All	Type I diabetes mellitus with neuropathic arthropathy
XaFWG	All	Type I diabetes mellitus with hypoglycaemic coma
XalzM	All	Type 1 diabetes mellitus with persistent proteinuria
XalzN	All	Type 1 diabetes mellitus with persistent microalbuminuria
XaJSr	All	Type 1 diabetes mellitus with exudative maculopathy
XaKyW	All	Type 1 diabetes mellitus with gastroparesis
XaMhJ	All	Diabetes type 1 review
XaX49	All	Referral to type I diabetes structured education programme
XaXZv	All	H/O: diabetes mellitus type 1

Autoimmune hypothyroidism (A code for Hashimotos Thyroiditis or a code for Non-specific Hypothyroidism AND no code for Non-autoimmune Hypothyroidism)		
Hashimotos 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
X40GI	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
SNOMED CT ID	Term ID	Description
21983002	NA	Hashimoto thyroiditis (disorder)
66944004	NA	Autoimmune thyroiditis (disorder)
52772002	NA	Postpartum thyroiditis (disorder)
237519003	NA	Autoimmune hypothyroidism (disorder)
237520009	NA	Hypothyroidism due to Hashimoto's thyroiditis (disorder)
237521008	NA	Hypothyroidism due to thyroid stimulating hormone receptor blocking antibody (disorder)
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
SNOMED CT ID	Term ID	Description
111566002	NA	Acquired hypothyroidism (disorder)
237523006	NA	Compensated hypothyroidism (disorder)
237518006	NA	Hypothyroid goiter, acquired (disorder)
102871000119101	NA	Hypothyroidism due to thyroiditis (disorder)
83664006	NA	Idiopathic atrophic hypothyroidism (disorder)
43153006	NA	Myxedema (disorder)
43507005	NA	Adult myxedema (disorder)
10718002	NA	Juvenile myxedema (disorder)
4641009	NA	Myxedema heart disease (disorder)
64491003	NA	Myxedematous form of cretinism (disorder)
83986005	NA	Severe hypothyroidism (disorder)
82598004	NA	Secondary hypothyroidism (disorder)
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 jaundice with congenital hypothyroidism
Read CTV3 Code	Term ID	Description

C03..	All	Congenital hypothyroidism
Xa0I7	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
Xa0I7	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
SNOMED CT ID	Term ID	Description
722940002	NA	Acquired central hypothyroidism (disorder)
70225006	NA	Hypothyroidism caused by iodide excess (disorder)
40539002	NA	Hypothyroidism following radioiodine therapy (disorder)
190282003	NA	Hypothyroidism resulting from para-aminosalicylic acid (disorder)
190283008	NA	Hypothyroidism resulting from phenylbutazone (disorder)
49830003	NA	Hypothyroidism caused by food stuff (disorder)
39444001	NA	Hypothyroidism due to fibrous invasive thyroiditis (disorder)
30229009	NA	Hypothyroidism due to infiltrative disease (disorder)
60733007	NA	Hypothyroidism due to amyloidosis (disorder)
42785009	NA	Hypothyroidism due to cystinosis (disorder)
78574007	NA	Hypothyroidism due to sarcoidosis (disorder)
63115005	NA	Hypothyroidism due to scleroderma (disorder)
190284002	NA	Hypothyroidism resulting from resorcinol (disorder)
88273006	NA	Iatrogenic hypothyroidism (disorder)
237527007	NA	Postablative hypothyroidism (disorder)
190279008	NA	Iodine hypothyroidism (disorder)
237567008	NA	Subclinical iodine deficiency hypothyroidism (disorder)
190277005	NA	Irradiation hypothyroidism (disorder)
14779006	NA	Hypothyroidism following external radiotherapy (disorder)
237528002	NA	Post-infectious hypothyroidism (disorder)
27059002	NA	Postoperative hypothyroidism (disorder)
237527007	NA	Postablative hypothyroidism (disorder)
26692000	NA	Central hypothyroidism (disorder)
722940002	NA	Acquired central hypothyroidism (disorder)
722938007	NA	Congenital central hypothyroidism (disorder)
725462002	NA	Congenital central hypothyroidism due to thyrotropin-releasing hormone receptor deficiency (disorder)
37429009	NA	Hypothalamic hypothyroidism (disorder)
190268003	NA	Congenital hypothyroidism (disorder)
55838005	NA	Athyrotic hypothyroidism sequence (disorder)
722375007	NA	Bamforth Lazarus syndrome (disorder)
722938007	NA	Congenital central hypothyroidism (disorder)
725462002	NA	Congenital central hypothyroidism due to thyrotropin-releasing hormone receptor deficiency (disorder)
718690009	NA	Congenital hypothyroidism due to absence of thyroid gland (disorder)
722939004	NA	Congenital hypothyroidism due to iodine deficiency (disorder)
717333002	NA	Congenital hypothyroidism due to transplacental passage of maternal thyroid stimulating hormone binding inhibitory antibody (disorder)
278503003	NA	Congenital hypothyroidism with diffuse goiter (disorder)
237515009	NA	Congenital hypothyroidism without goiter (disorder)
93359004	NA	Congenital malposition of the thyroid gland (disorder)
75065003	NA	Endemic cretinism (disorder)
237565000	NA	Congenital iodine deficiency syndrome - mixed type (disorder)
237566004	NA	Congenital iodine deficiency syndrome - neurological type (disorder)
440092001	NA	Endemic congenital iodine deficiency syndrome of myxedematous type (disorder)
718183003	NA	Familial thyroid dysmorphogenesis (disorder)
56041007	NA	Hypothyroidism due to defect in thyroid hormone synthesis (disorder)
237556007	NA	Hypothyroidism due to iodide organification defect (disorder)
718194004	NA	Hypothyroidism due to mutation in transcription factor of pituitary development (disorder)
717334008	NA	Idiopathic congenital hypothyroidism (disorder)
52724003	NA	Iodide oxidation defect (disorder)
22558005	NA	Iodide transport defect (disorder)
17885001	NA	Iodotyrosine deiodination defect (disorder)
23536000	NA	Iodotyrosyl coupling defect (disorder)
64491003	NA	Myxedematous form of cretinism (disorder)

722051004	NA	Obesity, colitis, hypothyroidism, cardiac hypertrophy, developmental delay syndrome (disorder)
763890006	NA	Short stature with delayed bone age due to thyroid hormone metabolism deficiency (disorder)
84781002	NA	Sporadic cretinism (disorder)
63127008	NA	Thyroglobulin synthesis defect (disorder)
50375007	NA	Thyroid hormone responsiveness defect (disorder)
718193005	NA	Peripheral resistance to thyroid hormone (disorder)
237559000	NA	Thyroid hormone resistance syndrome (disorder)
237560005	NA	Generalized thyroid hormone resistance (disorder)
111567006	NA	Refetoff syndrome (disorder)
360348000	NA	Pituitary thyroid hormone resistance (disorder)
360353005	NA	Thyrotoxicosis due to pituitary thyroid hormone resistance (disorder)
216693007	NA	Hypothyroid dwarfism (disorder)
237555006	NA	Hypothyroidism due to iodide trapping defect (disorder)
10809101000119100	NA	Hypothyroidism in childbirth (disorder)
428165003	NA	Hypothyroidism in pregnancy (disorder)
405629002	NA	Infant hypothyroidism (disorder)
698577000	NA	Infant hypothyroidism caused by maternal drug (disorder)
276566003	NA	Transient neonatal hypothyroidism (disorder)
716338001	NA	Muscular pseudohypertrophy and hypothyroidism syndrome (disorder)
37429009	NA	Hypothalamic hypothyroidism (disorder)
237695004	NA	Idiopathic thyroid stimulating hormone deficiency (disorder)
89261000	NA	Isolated thyrotropin deficiency (disorder)
276630006	NA	Transient hypothyrotropinemia (disorder)

Graves' 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
X40OK	All	Juvenile Graves' disease
X40OR	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

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

Rheumatoid arthritis		
Read V2 Code	Term ID	Description
N040.	All	Rheumatoid arthritis
N0400	All	Rheumatoid arthritis of cervical spine
N0401	All	Other rheumatoid arthritis of spine
N0402	All	Rheumatoid arthritis of shoulder
N0403	All	Rheumatoid arthritis of sternoclavicular joint
N0404	All	Rheumatoid arthritis of acromioclavicular joint
N0405	All	Rheumatoid arthritis of elbow
N0406	All	Rheumatoid arthritis of distal radio-ulnar joint
N0407	All	Rheumatoid arthritis of wrist
N0408	All	Rheumatoid arthritis of metacarpophalangeal joint
N0409	All	Rheumatoid arthritis of proximal interphalangeal joint of finger
N040A	All	Rheumatoid arthritis of distal interphalangeal joint of finger
N040B	All	Rheumatoid arthritis of hip
N040C	All	Rheumatoid arthritis of sacro-iliac joint
N040D	All	Rheumatoid arthritis of knee
N040E	All	Rheumatoid arthritis of tibio-fibular joint
N040F	All	Rheumatoid arthritis of ankle
N040G	All	Rheumatoid arthritis of subtalar joint
N040H	All	Rheumatoid arthritis of talonavicular joint
N040J	All	Rheumatoid arthritis of other tarsal joint
N040K	All	Rheumatoid arthritis of 1st metatarsophalangeal joint
N040L	All	Rheumatoid arthritis of lesser metatarsophalangeal joint
N040M	All	Rheumatoid arthritis of interphalangeal joint of toe
N040N	All	Rheumatoid vasculitis
N040P	All	Seronegative rheumatoid arthritis
N040Q	All	Rheumatoid bursitis
N040R	All	Rheumatoid nodule
N040S	All	Rheumatoid arthritis - multiple joint
N040T	All	Flare of rheumatoid arthritis
H570.	All	Rheumatoid lung
G5yA.	All	Rheumatoid carditis
N041.	All	Felty's syndrome
N042.	All	Other rheumatoid arthropathy with visceral or systemic involvement
N0420	All	Rheumatic carditis
N0422	All	Rheumatoid nodule
N042z	All	Rheumatoid arthropathy with visceral or systemic involvement NOS
N043.	All	Juvenile rheumatoid arthritis - Still's disease
N0430	All	Juvenile rheumatoid arthropathy unspecified
N0431	All	Acute polyarticular juvenile rheumatoid arthritis
N0432	All	Pauciarticular juvenile rheumatoid arthritis
N0433	All	Monarticular juvenile rheumatoid arthritis
N043z	All	Juvenile rheumatoid arthritis NOS

N047.	All	Seropositive erosive rheumatoid arthritis
N04X.	All	Seropositive rheumatoid arthritis, unspecified
N04y0	All	Rheumatoid lung
66HB0	All	Rheumatoid arthritis annual review
66HC.	All	Rheumatic disorder annual review invitation
66HZ.	All	Rheumatol.dis. monitoring NOS
F3964	All	Myopathy due to rheumatoid arthritis
Nyu10	All	[X]Rheumatoid arthritis with involvement of other organs or systems
Nyu11	All	[X]Other seropositive rheumatoid arthritis
Nyu12	All	[X]Other specified rheumatoid arthritis
Read CTV3 Code	Term ID	Description
N040.	All	Rheumatoid arthritis
X701h	All	Seropositive rheumatoid arthritis
XaBMO	All	Seropositive erosive rheumatoid arthritis
Nyu11	All	[X]Other seropositive rheumatoid arthritis
Nyu1G	All	[X]Seropositive rheumatoid arthritis, unspecified
X701i	All	Seronegative rheumatoid arthritis
N041.	All	Felty's syndrome
X701j	All	Rheumatoid arthritis with organ / system involvement
N0421	All	Rheumatoid lung
X701k	All	Fibrosing alveolitis associated with rheumatoid arthritis
X701l	All	Rheumatoid vasculitis
X705t	All	Nailfold rheumatoid vasculitis
X705u	All	Systemic rheumatoid vasculitis
X705v	All	Necrotising rheumatoid vasculitis
G5yA.	All	Rheumatoid carditis
N042z	All	Rheumatoid arthropathy with visceral or systemic involvement NOS
Nyu10	All	[X]Rheumatoid arthritis with involvement of other organs or systems
X701m	All	Rheumatoid arthritis with multisystem involvement
N0408	All	Rheumatoid arthritis of metacarpophalangeal joint
N040B	All	Rheumatoid arthritis of hip
N040D	All	Rheumatoid arthritis of knee
N040C	All	Rheumatoid arthritis of sacroiliac joint
N040M	All	Rheumatoid arthritis of interphalangeal joint of toe
N040L	All	Rheumatoid arthritis of lesser metatarsophalangeal joint
N040G	All	Rheumatoid arthritis of subtalar joint
N040G	All	Rheumatoid arthritis of subtalar joint
N040A	All	Rheumatoid arthritis of distal interphalangeal joint of finger
N0407	All	Rheumatoid arthritis of wrist
N0404	All	Rheumatoid arthritis of acromioclavicular joint
N0402	All	Rheumatoid arthritis of shoulder
Xa3gL	All	Rheumatoid arthritis - multiple joint
N040F	All	Rheumatoid arthritis of ankle
N0400	All	Rheumatoid arthritis of cervical spine
N0409	All	Rheumatoid arthritis of proximal interphalangeal joint of finger
N0405	All	Rheumatoid arthritis of elbow
N040E	All	Rheumatoid arthritis of tibiofibular joint
N040K	All	Rheumatoid arthritis of first metatarsophalangeal joint
N0401	All	Other rheumatoid arthritis of spine
N0403	All	Rheumatoid arthritis of sternoclavicular joint
N0406	All	Rheumatoid arthritis of distal radioulnar joint
N040H	All	Rheumatoid arthritis of talonavicular joint
N040J	All	Rheumatoid arthritis of other tarsal joint
N040T	All	Flare of rheumatoid arthritis
N042.	All	Other rheumatoid arthropathy with visceral or systemic involvement
Nyu12	All	[X]Other specified rheumatoid arthritis
Xa3gM	All	Rheumatoid arthritis - hand joint
Xa3gN	All	Rheumatoid arthritis - ankle/foot
Xa3gO	All	Rheumatoid arthritis - other joint
Xa3gP	All	Rheumatoid arthritis NOS
XM1XV	All	Rheumatoid arthritis monitoring
XaZdB	All	Rheumatoid arthritis annual review
F3964	All	Myopathy due to rheumatoid arthritis

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

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

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
SNOMED CT ID	Term ID	Description
83901003	NA	Sjögren's syndrome (disorder)
724782005	NA	Demyelination of central nervous system co-occurrent and due to Sjogren disease (disorder)
78946008	NA	Keratoconjunctivitis sicca, in Sjögren's syndrome (disorder)
196137000	NA	Lung disease with Sjögren's disease (disorder)
126766000	NA	Lymphoepithelial sialadenitis of Sjögren's syndrome (disorder)
762303003	NA	Pediatric onset Sjögren syndrome (disorder)
239912009	NA	Primary Sjögren's syndrome (disorder)
239914005	NA	Primary Sjögren's syndrome with multisystem involvement (disorder)
239913004	NA	Primary Sjögren's syndrome with organ/system involvement (disorder)
239915006	NA	Secondary Sjögren's syndrome (disorder)
239917003	NA	Secondary Sjögren's syndrome with multisystem involvement (disorder)
239916007	NA	Secondary Sjögren's syndrome with organ/system involvement (disorder)

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
SNOMED CT ID	Term ID	Description
56727007	NA	Vitiligo (disorder)
87666009	NA	Vitiligo of eyelid (disorder)
721539008	NA	Vitiligo of eyelid and periorcular area (disorder)

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

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

Cumulative incidence (%)

5
4
3
2
1
0

0

2

4

6

8

10

Years

AD cases

Matched controls

Number at risk

AD cases 163563

121530

82323

49953

23402

71

Matched controls 628692

428268

279725

165906

76427

262

