

e-Table 1: Incidence rate ratios of autoimmune diseases in patients with allergic rhinitis/conjunctivitis, atopic eczema and asthma compared to controls with no allergic disease

Outcome events, n (%)	1024 (0.13)	1096 (0.09)	1247 (0.09)	1366 (0.06)	1310 (0.13)	1446 (0.08)
Person-years	5,261,982	6,815,772	8,998,819	10,699,191	7,028,030	9,522,181
Crude IR per 1000 person-years	0.19	0.16	0.14	0.13	0.19	0.15
Follow-up years, median (IQR)	5.58 (2.34-10.33)	3.81 (1.42-8.09)	5.32 (2.19-9.85)	3.52 (1.28-7.43)	5.51 (2.13-10.46)	4.00 (1.46-8.64)
Unadjusted IRR (95% CI)	1.21 (1.11-1.32); p<0.001		1.09 (1.01-1.17); p<0.001		1.23 (1.14-1.32); p<0.001	
Adjusted IRR (95% CI)	1.18 (1.08-1.29); p<0.001		1.13 (1.05-1.22); p<0.001		1.23 (1.14-1.33); p<0.001	
Multiple sclerosis						
Outcome events, n (%)	553 (0.07)	710 (0.06)	679 (0.05)	812 (0.04)	712 (0.07)	908 (0.05)
Person-years	5,267,880	6,816,872	9,003,555	10,701,390	7,035,374	9,524,161
Crude IR per 1000 person-years	0.10	0.10	0.08	0.08	0.10	0.10
Follow-up years, median (IQR)	5.59 (2.35-10.33)	3.81 (1.42-8.09)	5.32 (2.19-9.85)	3.52 (1.28-7.43)	5.51 (2.13-10.46)	4.00 (1.46-8.64)
Unadjusted IRR (95% CI)	1.01 (0.90-1.13); p=0.890		0.99 (0.90-1.10); p=0.906		1.06 (0.96-1.17); p=0.233	
Adjusted IRR (95% CI)	1.03 (0.92-1.15); p=0.649		1.05 (0.95-1.17); p=0.309		1.07 (0.97-1.18); p=0.171	

IR: incidence rate; IRR: incidence rate ratio; IQR: interquartile range; CI: confidence interval.

e-Table 2. Sensitivity analysis: IRRs of AIDs in patients with incident diagnoses of AR/AC, AE and asthma compared to controls with no ADs.

Automimmune disease	Allergic rhinitis/conjunctivitis		Eczema		Asthma	
	Exposed	Unexposed	Exposed	Unexposed	Exposed	Unexposed
SLE						
Outcome events, n (%)	154 (0.06)	132 (0.03)	287 (0.06)	164 (0.02)	86 (0.05)	92 (0.03)
Person-years	1,701,938	2,221,393	2,898,378	3,761,282	1,101,923	1,483,542
Crude IR per 1000 person-years	0.09	0.06	0.10	0.04	0.08	0.06
Follow-up years, median (IQR)	5.60 (2.58-9.59)	3.67 (1.42-7.56)	5.24 (2.35-9.10)	3.52 (1.32-7.11)	5.87 (2.58-10.34)	3.97 (1.49-8.18)
Unadjusted IRR (95% CI)	1.52 (1.21-1.92); p<0.001		2.27 (1.87-2.75); p<0.001		1.26 (0.94-1.69); p=0.125	
Adjusted IRR (95% CI)	1.58 (1.25-1.99); p<0.001		2.40 (1.98-2.91); p<0.001		1.35 (1.00-1.82); p=0.050	
Sjogrens						
Outcome events, n (%)	166 (0.06)	125 (0.03)	174 (0.04)	166 (0.02)	83 (0.05)	72 (0.03)
Person-years	1,702,622	2,222,605	2,900,569	3,762,677	1,102,714	1,484,489
Crude IR per 1000 person-years	0.10	0.06	0.06	0.04	0.08	0.05
Follow-up years, median (IQR)	5.59 (2.58-9.59)	3.67 (1.42-7.56)	5.24 (2.35-9.10)	3.52 (1.32-7.11)	5.88 (2.59-10.34)	3.97 (1.49-8.18)
Unadjusted IRR (95% CI)	1.73 (1.37-2.19); p<0.001		1.36 (1.10-1.68); p=0.005		1.55 (1.13-2.13); p=0.006	
Adjusted IRR (95% CI)	1.86 (1.47-2.35); p<0.001		1.52 (1.22-1.88); p<0.001		1.83 (1.33-2.52); p<0.001	
Vitiligo						
Outcome events, n (%)	431 (0.16)	398 (0.09)	733 (0.15)	539 (0.07)	220 (0.13)	230 (0.08)
Person-years	1,697,699	2,217,853	2,891,844	3,756,071	1,100,534	1,482,456
Crude IR per 1000 person-years	0.25	0.18	0.25	0.14	0.20	0.16
Follow-up years, median (IQR)	5.59 (2.58-9.58)	3.67 (1.42-7.56)	5.23 (2.35-9.10)	3.52 (1.32-7.11)	5.87 (2.58-10.33)	3.97 (1.49-8.18)
Unadjusted IRR (95% CI)	1.41 (1.23-1.62); p<0.001		1.77 (1.58-1.97); p<0.001		1.29 (1.07-1.55); p=0.007	
Adjusted IRR (95% CI)	1.33 (1.16-1.53); p<0.001		1.67 (1.50-1.87); p<0.001		1.15 (0.96-1.39); p=0.138	
Rheumatoid arthritis						
Outcome events, n (%)	711 (0.27)	937 (0.21)	1345 (0.28)	1517 (0.19)	656 (0.40)	665 (0.24)
Person-years	1,692,662	2,207,941	2,880,181	3,736,621	1,094,323	1,474,136

Crude IR per 1000 person-years	0.42	0.42	0.47	0.41	0.60	0.45
Follow-up years, median (IQR)	5.59 (2.58-9.58)	3.66 (1.42-7.55)	5.23 (2.35-9.09)	3.52 (1.32-7.10)	5.86 (2.58-10.33)	3.96 (1.49-8.16)
Unadjusted IRR (95% CI)	0.99 (0.90-1.09); p=0.837		1.15 (1.07-1.24); p<0.001		1.33 (1.19-1.48); p<0.001	
Adjusted IRR (95% CI)	1.11 (1.00-1.22); p=0.042		1.31 (1.22-1.41); p<0.001		1.48 (1.32-1.65); p<0.001	
Psoriasis						
Outcome events, n (%)	2999 (1.16)	2961 (0.67)	9892 (2.14)	4507 (0.57)	1849 (1.16)	1914 (0.69)
Person-years	1,649,818	2,161,177	2,769,326	3,665,273	1,070,007	1,446,990
Crude IR per 1000 person-years	1.82	1.37	3.57	1.23	1.73	1.32
Follow-up years, median (IQR)	5.55 (2.56-9.56)	3.64 (1.41-7.53)	5.11 (2.26-8.97)	3.49 (1.31-7.06)	5.81 (2.55-10.26)	3.93 (1.48-8.13)
Unadjusted IRR (95% CI)	1.33 (1.26-1.40); p<0.001		2.90 (2.80-3.01); p<0.001		1.31 (1.23-1.39); p<0.001	
Adjusted IRR (95% CI)	1.38 (1.32-1.46); p<0.001		3.12 (3.01-3.24); p<0.001		1.31 (1.23-1.40); p<0.001	
Pernicious anaemia						
Outcome events, n (%)	422 (0.16)	440 (0.10)	725 (0.15)	874 (0.11)	327 (0.20)	383 (0.14)
Person-years	1,699,288	2,218,586	2,893,314	3,753,784	1,099,582	1,480,889
Crude IR per 1000 person-years	0.25	0.20	0.25	0.23	0.30	0.26
Follow-up years, median (IQR)	5.59 (2.58-9.58)	3.67 (1.42-7.56)	5.24 (2.35-9.10)	3.52 (1.32-7.11)	5.87 (2.58-10.33)	3.97 (1.49-8.17)
Unadjusted IRR (95% CI)	1.25 (1.10-1.43); p<0.001		1.08 (0.98-1.19); p=0.144		1.15 (0.99-1.33); p=0.064	
Adjusted IRR (95% CI)	1.41 (1.23-1.62); p<0.001		1.23 (1.11-1.35); p<0.001		1.28 (1.10-1.48); p=0.002	
Myasthenia gravis						
Outcome events, n (%)	46 (0.02)	53 (0.01)	70 (0.01)	104 (0.01)	34 (0.02)	33 (0.01)
Person-years	1,703,928	2,223,390	2,902,443	3,763,898	1,103,204	1,485,109
Crude IR per 1000 person-years	0.03	0.02	0.02	0.03	0.03	0.02
Follow-up years, median (IQR)	5.60 (2.58-9.59)	3.67 (1.42-7.56)	5.25 (2.35-9.11)	3.52 (1.32-7.11)	5.88 (2.59-10.34)	3.97 (1.49-8.18)
Unadjusted IRR (95% CI)	1.13 (0.76-1.68); p=0.537		0.87 (0.64-1.18); p=0.379		1.39 (0.86-2.24); p=0.181	
Adjusted IRR (95% CI)	1.30 (0.87-1.93); p=0.202		1.04 (0.76-1.41); p=0.814		1.70 (1.04-2.77); p=0.034	
Inflammatory bowel disease						
Outcome events, n (%)	758 (0.29)	735 (0.16)	1119 (0.24)	1042 (0.13)	476 (0.29)	448 (0.16)
Person-years	1,690,568	2,208,536	2,879,756	3,740,664	1,095,384	1,475,637

Crude IR per 1000 person-years	0.45	0.33	0.39	0.28	0.43	0.30
Follow-up years, median (IQR)	5.59 (2.57-9.58)	3.66 (1.42-7.55)	5.23 (2.35-9.09)	3.52 (1.32-7.10)	5.86 (2.58-10.33)	3.96 (1.49-8.17)
Unadjusted IRR (95% CI)	1.35 (1.22-1.49); p<0.001		1.39 (1.28-1.52); p<0.001		1.43 (1.26-1.63); p<0.001	
Adjusted IRR (95% CI)	1.38 (1.25-1.53); p<0.001		1.46 (1.34-1.59); p<0.001		1.44 (1.26-1.64); p<0.001	
Coeliac disease						
Outcome events, n (%)	439 (0.17)	409 (0.09)	760 (0.16)	724 (0.09)	265 (0.16)	299 (0.11)
Person-years	1,698,808	2,218,504	2,893,873	3,756,389	1,099,974	1,481,891
Crude IR per 1000 person-years	0.26	0.18	0.26	0.19	0.24	0.20
Follow-up years, median (IQR)	5.59 (2.58-9.58)	3.67 (1.42-7.56)	5.24 (2.35-9.10)	3.52 (1.32-7.11)	5.87 (2.58-10.33)	3.97 (1.49-8.18)
Unadjusted IRR (95% CI)	1.40 (1.23-1.60); p<0.001		1.36 (1.23-1.51); p<0.001		1.19 (1.01-1.41); p=0.036	
Adjusted IRR (95% CI)	1.39 (1.21-1.59); p<0.001		1.37 (1.24-1.52); p<0.001		1.26 (1.07-1.49); p=0.007	
Autoimmune thyroid disease						
Outcome events, n (%)	320 (0.12)	323 (0.07)	415 (0.09)	493 (0.06)	175 (0.11)	198 (0.07)
Person-years	1,698,383	2,218,157	2,895,224	3,755,315	1,100,647	1,481,515
Crude IR per 1000 person-years	0.19	0.15	0.14	0.13	0.16	0.13
Follow-up years, median (IQR)	5.59 (2.58-9.59)	3.67 (1.42-7.56)	5.24 (2.35-9.10)	3.52 (1.32-7.11)	5.87 (2.58-10.34)	3.97 (1.49-8.18)
Unadjusted IRR (95% CI)	1.29 (1.11-1.51); p=0.001		1.09 (0.96-1.24); p=0.187		1.19 (0.97-1.46); p=0.094	
Adjusted IRR (95% CI)	1.32 (1.13-1.54); p<0.001		1.14 (1.00-1.30); p=0.055		1.27 (1.03-1.56); p=0.026	
Multiple sclerosis						
Outcome events, n (%)	133 (0.05)	206 (0.05)	229 (0.05)	271 (0.03)	76 (0.05)	117 (0.04)
Person-years	1,700,866	2,218,576	2,896,668	3,757,131	1,101,981	1,482,101
Crude IR per 1000 person-years	0.08	0.09	0.08	0.07	0.07	0.08
Follow-up years, median (IQR)	5.60 (2.58-9.59)	3.67 (1.42-7.56)	5.24 (2.35-9.10)	3.52 (1.32-7.11)	5.88 (2.59-10.34)	3.97 (1.49-8.18)
Unadjusted IRR (95% CI)	0.84 (0.68-1.05); p=0.122		1.10 (0.92-1.31); p=0.307		0.87 (0.65-1.17); p=0.359	
Adjusted IRR (95% CI)	0.89 (0.72-1.12); p=0.323		1.15 (0.96-1.37); p=0.119		0.95 (0.70-1.27); p=0.710	

IR: incidence rate; IRR: incidence rate ratio; IQR: interquartile range; CI: confidence interval.

e-Table 3. Association rules extracted from the male population <30 years of age (in order of lift).

Rule	Antecedent	Consequent	Support	Confidence	Lift
1	{ConjunctivitisRhinitis}	=> {Vitiligo}	0.001	0.004	1.898
2	{Asthma}	=> {IBD}	0.001	0.005	1.745
3	{ConjunctivitisRhinitis}	=> {IBD}	0.001	0.005	1.737
4	{Eczema,ConjunctivitisRhinitis}	=> {Psoriasis}	0.001	0.019	1.736
5	{Asthma,Eczema}	=> {Psoriasis}	0.001	0.019	1.732
6	{Asthma,ConjunctivitisRhinitis}	=> {Psoriasis}	0.001	0.018	1.715
7	{ConjunctivitisRhinitis}	=> {Psoriasis}	0.002	0.017	1.568
8	{Asthma}	=> {Psoriasis}	0.002	0.017	1.544
9	{Eczema}	=> {Vitiligo}	0.001	0.003	1.417
10	{Eczema}	=> {Psoriasis}	0.003	0.014	1.284
11	{Eczema}	=> {Coeliac}	0.001	0.002	1.282
12	{Eczema}	=> {IBD}	0.001	0.003	1.222

e-Table 4. Association rules extracted from the male population ≥30 - 54 years of age (in order of lift).

Rule	Antecedent		Consequent	Support	Confidence	Lift
1	{Eczema}	=>	{Psoriasis}	0.008	0.068	1.688
2	{Eczema,ConjunctivitisRhinitis}	=>	{Psoriasis}	0.002	0.066	1.660
3	{Eczema}	=>	{Vitiligo}	0.001	0.005	1.605
4	{ConjunctivitisRhinitis}	=>	{Vitiligo}	0.001	0.005	1.544
5	{Asthma,Eczema,ConjunctivitisRhinitis}	=>	{Psoriasis}	0.001	0.060	1.493
6	{Asthma,Eczema}	=>	{Psoriasis}	0.002	0.060	1.488
7	{Eczema}	=>	{IBD}	0.001	0.013	1.424
8	{Asthma}	=>	{IBD}	0.002	0.012	1.305
9	{ConjunctivitisRhinitis}	=>	{IBD}	0.001	0.011	1.272
10	{Asthma,ConjunctivitisRhinitis}	=>	{Psoriasis}	0.002	0.048	1.190
11	{ConjunctivitisRhinitis}	=>	{Psoriasis}	0.006	0.047	1.164
12	{Asthma}	=>	{Psoriasis}	0.006	0.045	1.119
13	{Asthma}	=>	{Vitiligo}	0.001	0.004	1.106

e-Table 5. Association rules extracted from the male population over ≥55 years of age (in order of lift).

Rule	Antecedent	Consequent	Support	Confidence	Lift
1	{Eczema}	=> {Psoriasis}	0.012	0.093	1.741
2	{Eczema,ConjunctivitisRhinitis}	=> {Psoriasis}	0.002	0.092	1.720
3	{Asthma,Eczema}	=> {Psoriasis}	0.002	0.090	1.679
4	{Asthma,Eczema,ConjunctivitisRhinitis}	=> {Psoriasis}	0.001	0.088	1.641
5	{Eczema}	=> {Vitiligo}	0.001	0.005	1.572
6	{Eczema}	=> {Coeliac}	0.001	0.006	1.549
7	{Eczema}	=> {IBD}	0.002	0.018	1.370
8	{Eczema}	=> {PerniciousAnaemia}	0.001	0.007	1.347
9	{Asthma}	=> {RheumatoidArthritis}	0.001	0.014	1.345
10	{Asthma}	=> {IBD}	0.002	0.016	1.261
11	{Asthma}	=> {Coeliac}	0.001	0.005	1.244
12	{Asthma,ConjunctivitisRhinitis}	=> {Psoriasis}	0.001	0.066	1.242
13	{Eczema}	=> {RheumatoidArthritis}	0.002	0.013	1.239
14	{Asthma}	=> {PerniciousAnaemia}	0.001	0.007	1.222
15	{ConjunctivitisRhinitis}	=> {IBD}	0.001	0.016	1.220
16	{ConjunctivitisRhinitis}	=> {Psoriasis}	0.006	0.063	1.179
17	{Asthma}	=> {Psoriasis}	0.006	0.060	1.129
18	{ConjunctivitisRhinitis}	=> {PerniciousAnaemia}	0.001	0.006	1.126
19	{ConjunctivitisRhinitis}	=> {RheumatoidArthritis}	0.001	0.011	1.071

e-Table 6. Association rules extracted from the female population <30 years of age (in order of lift).

Rule	Antecedent	Consequent	Support	Confidence	Lift
1	{Asthma,ConjunctivitisRhinitis}	=> {Psoriasis}	0.001	0.029	1.959
2	{Asthma,Eczema}	=> {Psoriasis}	0.001	0.027	1.871
3	{Eczema,ConjunctivitisRhinitis}	=> {Psoriasis}	0.001	0.027	1.823
4	{Asthma}	=> {Psoriasis}	0.003	0.024	1.655
5	{ConjunctivitisRhinitis}	=> {Psoriasis}	0.002	0.024	1.613
6	{Eczema}	=> {Vitiligo}	0.001	0.003	1.594
7	{Eczema}	=> {Psoriasis}	0.005	0.020	1.372
8	{Eczema}	=> {IBD}	0.001	0.003	1.261
9	{Eczema}	=> {Coeliac}	0.001	0.004	1.210

e-Table 7. Association rules extracted from the female population ≥30 - 54 years of age (in order of lift).

Rule	Antecedent	Consequent	Support	Confidence	Lift
1	{Asthma,Eczema}	=> {IBD}	0.001	0.017	1.625
2	{Eczema,ConjunctivitisRhinitis}	=> {Psoriasis}	0.003	0.071	1.574
3	{Eczema,ConjunctivitisRhinitis}	=> {IBD}	0.001	0.017	1.573
4	{Eczema}	=> {Psoriasis}	0.012	0.069	1.530
5	{Asthma,ConjunctivitisRhinitis}	=> {IBD}	0.001	0.015	1.461
6	{Asthma,Eczema}	=> {Psoriasis}	0.003	0.065	1.433
7	{Asthma,Eczema,ConjunctivitisRhinitis}	=> {Psoriasis}	0.001	0.064	1.431
8	{ConjunctivitisRhinitis}	=> {Coeliac}	0.001	0.007	1.417
9	{Eczema}	=> {Vitiligo}	0.001	0.005	1.406
10	{Asthma}	=> {Coeliac}	0.001	0.007	1.357
11	{Eczema}	=> {Coeliac}	0.001	0.007	1.345
12	{Eczema}	=> {IBD}	0.002	0.014	1.338
13	{Eczema}	=> {SLE}	0.001	0.003	1.286
14	{Asthma}	=> {IBD}	0.002	0.013	1.270
15	{Asthma}	=> {RheumatoidArthritis}	0.001	0.008	1.263
16	{ConjunctivitisRhinitis}	=> {IBD}	0.002	0.013	1.257
17	{Asthma}	=> {PerniciousAnaemia}	0.001	0.005	1.250
18	{ConjunctivitisRhinitis}	=> {Vitiligo}	0.001	0.005	1.225
19	{ConjunctivitisRhinitis}	=> {PerniciousAnaemia}	0.001	0.005	1.205
20	{Asthma,ConjunctivitisRhinitis}	=> {Psoriasis}	0.002	0.053	1.177
21	{ConjunctivitisRhinitis}	=> {Psoriasis}	0.008	0.053	1.172
22	{Asthma}	=> {AutoimmuneThyroid}	0.001	0.009	1.169
23	{ConjunctivitisRhinitis}	=> {RheumatoidArthritis}	0.001	0.008	1.165
24	{ConjunctivitisRhinitis}	=> {AutoimmuneThyroid}	0.001	0.009	1.133
25	{Asthma}	=> {Psoriasis}	0.008	0.051	1.127
26	{Asthma}	=> {MS}	0.001	0.005	1.112
27	{Eczema}	=> {PerniciousAnaemia}	0.001	0.004	1.104
28	{Eczema}	=> {AutoimmuneThyroid}	0.001	0.008	1.077
29	{Eczema}	=> {MS}	0.001	0.005	1.064
30	{Eczema}	=> {RheumatoidArthritis}	0.001	0.007	1.049
31	{ConjunctivitisRhinitis}	=> {MS}	0.001	0.005	1.039

e-Table 8. Association rules extracted from the female population ≥55 years of age (in order of lift).

Rule	Antecedent	Consequent	Support	Confidence	Lift
1	{Eczema,ConjunctivitisRhinitis}	=> {Psoriasis}	0.003	0.094	1.825
2	{Asthma,Eczema}	=> {Psoriasis}	0.003	0.092	1.786
3	{Asthma,Eczema,ConjunctivitisRhinitis}	=> {Psoriasis}	0.001	0.091	1.768
4	{Eczema}	=> {Psoriasis}	0.014	0.091	1.766
5	{ConjunctivitisRhinitis}	=> {Sjogrens}	0.001	0.006	1.673
6	{ConjunctivitisRhinitis}	=> {Vitiligo}	0.001	0.006	1.503
7	{Asthma,Eczema}	=> {IBD}	0.001	0.020	1.497
8	{Eczema}	=> {Sjogrens}	0.001	0.005	1.448
9	{Eczema}	=> {Vitiligo}	0.001	0.006	1.388
10	{Eczema,ConjunctivitisRhinitis}	=> {IBD}	0.001	0.018	1.370
11	{Eczema}	=> {SLE}	0.001	0.005	1.357
12	{Asthma}	=> {Sjogrens}	0.001	0.005	1.352
13	{Asthma}	=> {PerniciousAnaemia}	0.002	0.013	1.329
14	{Eczema}	=> {Coeliac}	0.001	0.009	1.323
15	{Asthma,Eczema}	=> {RheumatoidArthritis}	0.001	0.029	1.321
16	{ConjunctivitisRhinitis}	=> {Coeliac}	0.001	0.009	1.318
17	{Asthma}	=> {SLE}	0.001	0.005	1.294
18	{Asthma}	=> {Coeliac}	0.001	0.009	1.285
19	{Asthma}	=> {RheumatoidArthritis}	0.004	0.028	1.280
20	{ConjunctivitisRhinitis}	=> {AutoimmuneThyroid}	0.001	0.012	1.278
21	{Asthma,ConjunctivitisRhinitis}	=> {Psoriasis}	0.002	0.065	1.268
22	{Asthma,ConjunctivitisRhinitis}	=> {IBD}	0.001	0.017	1.252
23	{Eczema,ConjunctivitisRhinitis}	=> {RheumatoidArthritis}	0.001	0.027	1.250
24	{Eczema}	=> {IBD}	0.003	0.016	1.243
25	{Asthma}	=> {Vitiligo}	0.001	0.005	1.230
26	{Asthma}	=> {IBD}	0.002	0.016	1.229
27	{Asthma}	=> {AutoimmuneThyroid}	0.001	0.011	1.191
28	{ConjunctivitisRhinitis}	=> {Psoriasis}	0.007	0.061	1.182
29	{ConjunctivitisRhinitis}	=> {IBD}	0.002	0.015	1.160
30	{ConjunctivitisRhinitis}	=> {SLE}	0.001	0.004	1.155
31	{Asthma}	=> {Psoriasis}	0.008	0.059	1.145
32	{Eczema}	=> {AutoimmuneThyroid}	0.002	0.010	1.144
33	{Asthma,ConjunctivitisRhinitis}	=> {RheumatoidArthritis}	0.001	0.025	1.139
34	{Eczema}	=> {RheumatoidArthritis}	0.004	0.025	1.133
35	{Eczema}	=> {PerniciousAnaemia}	0.002	0.011	1.117
36	{ConjunctivitisRhinitis}	=> {PerniciousAnaemia}	0.001	0.011	1.086
37	{ConjunctivitisRhinitis}	=> {RheumatoidArthritis}	0.003	0.023	1.048
38	{Eczema}	=> {MS}	0.001	0.006	1.020

e-Methods-1: Read code lists used to ascertain allergic diseases and autoimmune disorders

Allergic Rhinitis

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

Allergic Conjunctivitis

medcode	description
F4C0600	Acute atopic conjunctivitis
F4C0611	Acute allergic conjunctivitis
F4C1411	Allergic conjunctivitis
F4C1300	Vernal conjunctivitis
F4A3100	Vernal conjunctivitis of limbus and cornea

Atopic Eczema

medcode	description
M111.00	Atopic dermatitis/eczema
M112.00	Infantile eczema
M113.00	Flexural eczema
M114.00	Allergic (intrinsic) eczema
M12z100	Eczema NOS
M12z300	Hand eczema
M12z400	Erythrodermic eczema
Myu2200	[X]Exacerbation of eczema
M11z.00	Atopic dermatitis NOS
M11..00	Atopic dermatitis and related conditions

Asthma

medcode	description
H33..00	Asthma
H33..11	Bronchial asthma
H330.00	Extrinsic (atopic) asthma
H330.11	Allergic asthma

H330.12	Childhood asthma
H330.13	Hay fever with asthma
H330.14	Pollen asthma
H330000	Extrinsic asthma without status asthmaticus
H330011	Hay fever with asthma
H330100	Extrinsic asthma with status asthmaticus
H330111	Extrinsic asthma with asthma attack
H330z00	Extrinsic asthma NOS
H331.00	Intrinsic asthma
H331.11	Late onset asthma
H331000	Intrinsic asthma without status asthmaticus
H331100	Intrinsic asthma with status asthmaticus
H331111	Intrinsic asthma with asthma attack
H331z00	Intrinsic asthma NOS
H332.00	Mixed asthma
H333.00	Acute exacerbation of asthma
H334.00	Brittle asthma
H335.00	Chronic asthma with fixed airflow obstruction
H33z.00	Asthma unspecified
H33z000	Status asthmaticus NOS
H33z011	Severe asthma attack
H33z100	Asthma attack
H33z111	Asthma attack NOS
H33z200	Late-onset asthma
H33zz00	Asthma NOS
H33zz11	Exercise induced asthma
H33zz12	Allergic asthma NEC
14B4.00	H/O: asthma
H312000	Chronic asthmatic bronchitis
H33z.11	Hyperreactive airways disease
H33zz13	Allergic bronchitis NEC

SLE

medcode	description
F371000	Polyneuropathy in disseminated lupus erythematosus
F396100	Myopathy due to disseminated lupus erythematosus
F4D3300	Eyelid discoid lupus erythematosus
H57y400	Lung disease with systemic lupus erythematosus
K01x400	Nephrotic syndrome in systemic lupus erythematosus
K01x411	Lupus nephritis
K0B4000	Renal tubulo-interstitial disorder in SLE
M154.00	Lupus erythematosus
M154000	Lupus erythematosus chronicus
M154100	Discoid lupus erythematosus
M154200	Lupus erythematosus migrans
M154300	Lupus erythematosus nodularis
M154400	Lupus erythematosus profundus
M154500	Lupus erythematosus tumidus
M154600	Lupus erythematosus unguium mutilans
M154700	Subacute cutaneous lupus erythematosus

M154z00	Lupus erythematosus NOS
Myu7800	[X]Other local lupus erythematosus
N000.00	Systemic lupus erythematosus
N000000	Disseminated lupus erythematosus
N000300	Systemic lupus erythematosus with organ or sys involv
N000400	Systemic lupus erythematosus with pericarditis
N000500	Neonatal lupus erythematosus
N000600	Cerebral lupus
N000611	Systemic lupus erythematosus encephalitis
N000z00	Systemic lupus erythematosus NOS
N000100	Libman-Sacks disease

Sjogren's Syndrome

medcode	description
N002.00	Sicca (Sjogren's) syndrome
F396700	Myopathy due to Sjogren's disease
H57y300	Lung disease with Sjogren's disease

Vitiligo

medcode	description
F4E5311	Vitiligo of eyelid
M295100	Vitiligo

Rheumatoid Arthritis

medcode	Description
N040.00	Rheumatoid arthritis and other inflammatory polyarthropathy
N040000	Inflammatory polyarthropathy
N040100	Other rheumatoid arthritis of spine
N040200	Rheumatoid arthritis of shoulder
N040300	Rheumatoid arthritis of sternoclavicular joint
N040400	Rheumatoid arthritis of acromioclavicular joint
N040500	Rheumatoid arthritis of elbow
N040600	Rheumatoid arthritis of distal radio-ulnar joint
N040700	Rheumatoid arthritis of wrist
N040800	Rheumatoid arthritis of MCP joint
N040900	Rheumatoid arthritis of PIP joint of finger
N040A00	Rheumatoid arthritis of DIP joint of finger
N040B00	Rheumatoid arthritis of hip
N040C00	Rheumatoid arthritis of sacro-iliac joint
N040D00	Rheumatoid arthritis of knee
N040E00	Rheumatoid arthritis of tibio-fibular joint
N040F00	Rheumatoid arthritis of ankle
N040G00	Rheumatoid arthritis of subtalar joint
N040H00	Rheumatoid arthritis of talonavicular joint
N040J00	Rheumatoid arthritis of other tarsal joint
N040K00	Rheumatoid arthritis of 1st MTP joint
N040L00	Rheumatoid arthritis of lesser MTP joint
N040M00	Rheumatoid arthritis of IP joint of toe
N040N00	Rheumatoid vasculitis
N040P00	Seronegative rheumatoid arthritis
N040Q00	Rheumatoid bursitis

N040R00	Rheumatoid nodule
N040S00	Rheumatoid arthritis - multiple joint
N040T00	Flare of rheumatoid arthritis
F371200	Polyneuropathy in rheumatoid arthritis
F396400	Myopathy due to rheumatoid arthritis
G5y8.00	Rheumatoid myocarditis
G5yA.00	Rheumatoid carditis
H570.00	Rheumatoid lung
N040.00	Rheumatoid arthritis
N040000	Rheumatoid arthritis of cervical spine
N041.00	Felty's syndrome
N042.00	Other rheumatoid arthropathy + visceral/systemic involvement
N042000	Rheumatic carditis
N042100	Rheumatoid lung disease
N042200	Rheumatoid nodule
N042z00	Rheumatoid arthropathy + visceral/systemic involvement NOS
N043.00	Juvenile rheumatoid arthritis - Still's disease
N043000	Juvenile rheumatoid arthropathy unspecified
N043100	Acute polyarticular juvenile rheumatoid arthritis
N043200	Pauciarticular juvenile rheumatoid arthritis
N043300	Monarticular juvenile rheumatoid arthritis
N043z00	Juvenile rheumatoid arthritis NOS
N047.00	Seropositive erosive rheumatoid arthritis
N04X.00	Seropositive rheumatoid arthritis, unspecified
N04y000	Rheumatoid lung
N04y011	Caplan's syndrome
N04y012	Fibrosing alveolitis associated with rheumatoid arthritis
Nyu1000	[X]Rheumatoid arthritis+involvement/other organs or systems
Nyu1100	[X]Other seropositive rheumatoid arthritis
Nyu1200	[X]Other specified rheumatoid arthritis
Nyu1G00	[X]Seropositive rheumatoid arthritis, unspecified
H571.00	Rheumatic pneumonia
N04..00	Rheumatoid arthritis and other inflammatory polyarthropathy

Psoriasis

medcode	description
M16..00	Psoriasis and similar disorders
M161.00	Other psoriasis
M161000	Psoriasis unspecified
M161100	Psoriasis annularis
M161200	Psoriasis circinata
M161300	Psoriasis diffusa
M161400	Psoriasis discoidea
M161500	Psoriasis geographica
M161600	Guttate psoriasis
M161700	Psoriasis gyrata
M161800	Psoriasis inveterata
M161900	Psoriasis ostracea
M161A00	Psoriasis palmaris
M161B00	Psoriasis plantaris

M161C00	Psoriasis punctata
M161D00	Pustular psoriasis
M161E00	Psoriasis universalis
M161F00	Psoriasis vulgaris
M161F11	Chronic large plaque psoriasis
M161H00	Erythrodermic psoriasis
M161J00	Flexural psoriasis
M161z00	Psoriasis NOS
M166.00	Palmoplantar pustular psoriasis
M16y.00	Other psoriasis and similar disorders
M16y000	Scalp psoriasis
M16z.00	Psoriasis and similar disorders NOS
Myu3000	[X]Other psoriasis
N045200	Juvenile arthritis in psoriasis
14F2.00	H/O: psoriasis
M160.00	Psoriatic arthropathy
M160.11	Psoriatic arthritis
M160000	Psoriasis spondylitica
M160100	Distal interphalangeal psoriatic arthropathy
M160200	Arthritis mutilans
M160z00	Psoriatic arthropathy NOS

Pernicious Anaemia

medcode	description
D010.00	Pernicious anaemia
F381500	Myasthenic syndrome due to pernicious anaemia
D010.11	Addison's anaemia

Myasthenia Gravis

medcodeq	description
F380.00	Myasthenia gravis
F380000	Persistent neonatal myasthenia gravis
F380100	Juvenile or adult myasthenia gravis
F380z00	Myasthenia gravis NOS

Inflammatory Bowel Disease

medcode	description
J4...12	Inflammatory bowel disease
J40..00	Regional enteritis - Crohn's disease
J40..11	Crohn's disease
J400200	Crohn's disease of the terminal ileum
J400300	Crohn's disease of the ileum unspecified
J400400	Crohn's disease of the ileum NOS
J400500	Exacerbation of Crohn's disease of small intestine
J400z00	Crohn's disease of the small bowel NOS
J401200	Exacerbation of Crohn's disease of large intestine
J401z00	Crohn's disease of the large bowel NOS
J401z11	Crohn's colitis
J40z.11	Crohn's disease NOS
J41..12	Ulcerative colitis and/or proctitis
J410.00	Ulcerative proctocolitis

J410000	Ulcerative ileocolitis
J410100	Ulcerative colitis
J410200	Ulcerative rectosigmoiditis
J410300	Ulcerative proctitis
J410400	Exacerbation of ulcerative colitis
J410z00	Ulcerative proctocolitis NOS
J411.00	Ulcerative (chronic) enterocolitis
J412.00	Ulcerative (chronic) ileocolitis
J413.00	Ulcerative pancolitis
N031000	Arthropathy in ulcerative colitis
N031100	Arthropathy in Crohn's disease
N045300	Juvenile arthritis in Crohn's disease
N045400	Juvenile arthritis in ulcerative colitis
J41y.00	Other idiopathic proctocolitis
Jyu4000	[X]Other Crohn's disease
Jyu4100	[X]Other ulcerative colitis

Coeliac Disease

medcode	description
J690.00	Coeliac disease
J690.11	Coeliac rickets
J690.13	Gluten enteropathy
J690.14	Sprue - nontropical
J690.18	Gluten intolerance
J690100	Acquired coeliac disease
J690z00	Coeliac disease NOS
J690z00	Coeliac disease NOS

Autoimmune Thyroid Disease

medcode	description
C020.11	Basedow's disease
C020.12	Graves' disease
C046.00	Autoimmune myxoedema
C05..00	Thyroiditis
C050.00	Acute thyroiditis
C050000	Acute nonsuppurative thyroiditis
C050z00	Acute thyroiditis NOS
C051.00	Subacute thyroiditis
C051.11	De Quervain's thyroiditis
C052.00	Chronic lymphocytic thyroiditis
C052.11	Autoimmune thyroiditis
C052.12	Hashimoto's disease
C053.00	Chronic fibrous thyroiditis
C053.11	Riedel's thyroiditis
C05y.00	Other and unspecified chronic thyroiditis
C05y400	Chronic thyroiditis with transient thyrotoxicosis
C05z.00	Thyroiditis NOS
Cyu1400	[X]Other chronic thyroiditis
C020000	Toxic diffuse goitre with no crisis
C020100	Toxic diffuse goitre with crisis

C020200	Thyroid-associated dermopathy
C020z00	Toxic diffuse goitre NOS

Multiple Sclerosis

medcode	description
F20..00	Multiple sclerosis
F200.00	Multiple sclerosis of the brain stem
F201.00	Multiple sclerosis of the spinal cord
F202.00	Generalised multiple sclerosis
F203.00	Exacerbation of multiple sclerosis
F206.00	Primary progressive multiple sclerosis
F207.00	Relapsing and remitting multiple sclerosis
F20z.00	Multiple sclerosis NOS
ZRVE.00	Kurtzke multiple sclerosis rating scale
F20..11	Disseminated sclerosis
F205.00	Malignant multiple sclerosis
F208.00	Secondary progressive multiple sclerosis