

1989 [7]			cohort, male	67.6					
Brito-Zeron, 2017 [8]	Spain	2005-2016	Retrospective cohort, both sexes	Mean 55.1	1,239	Sjögren syndrome	O/E 5/2.4	SIR 2.23 (0.96-5.36)	
			Retrospective cohort, female		1,145		O/E 5/1.98	SIR 2.53 (1.05-6.07)	
			Retrospective cohort, male		94		O/E 0/0.26	NR	
Carstensen, 2016 [9]	Australia, Denmark, Finland, Scotland, Sweden	1972-2012	Retrospective cohort, female	<40	1,957,700 PY	Diabetes mellitus, type 1	Case _E 120	HR 1.78 (1.49-2.13)	
			Retrospective cohort, male	<40	1,975,100 PY		Case _E 134	HR 1.23 (1.04-1.46)	
Chang, 2014 [10]	Korea	2000-2002	Retrospective cohort, both sexes	Mean 45.5	107	Dermatomyositis	O/E 1/0.614	SIR 1.629 (0.041-0.976)	
				Mean 47.9	49	Polymyositis	O/E 1/0.473	SIR 2.113 (0.054-11.774)	
				Mean 51	2,104	Rheumatoid arthritis	O/E 15/22.625	SIR 0.663 (0.327-0.998)	
				Mean 35	1,052	Systemic lupus erythematosus	O/E 3/5.027	SIR 0.597 (0.123-1.744)	
				Mean 48.5	274	Systemic sclerosis	O/E 2/2.236	SIR 0.898 (0.109-3.245)	
Chen, 2013 [11]	Taiwan	1997-2010	Nested case-control, both sexes	Mean 41.7	41.7	Graves disease	Case _E /Case _{NE} 5/21 Control _E /Control _{NE} 5,020/20,100	HR 0.94 (0.35-2.51)	
Collin, 1996 [12]	Finland	1970-1992	Retrospective cohort, both sexes	Mean 41.8	383	Celiac disease	O/E 0/0.6	SIR 0.00 (0.00-6.18)	
				Mean 40.4	305	Dermatitis herpetiformis	O/E 2/0.7	SIR 2.86 (0.35-10.30)	
Dreyer, 2011 [13]	Denmark	1951-2006	Retrospective cohort, both sexes (96% female)	Median 33	576	Systemic lupus erythematosus	O/E 0/0.6	NR	

Elfstrom, 2012 [14]	Sweden	1989-2007	Case-cohort, both sexes	Range 0-60	28,882	Celiac disease	Case _E +Case _{NE} 24	HR 1.13 (0.72-1.77)
Eriksson, 1981 [15]	Sweden	1958-1976	Case-control	Mean 63-70	1,834	Pernicious anemia	Case _E /Case _{NE} 19/898 Control _E /Control _{NE} 13/904	OR 1.47 (0.72-2.99)
Goldacre, 2008 [16]	UK	1963-1999	Retrospective cohort, both sexes	NR	424	Primary biliary cirrhosis	O/E 2/0.97	SIR 2.05 (0.25-7.43)
Goldacre, 2008 [17]	UK	1963-1999	Retrospective cohort, both sexes	Range 0-75	1,997	Celiac disease	O/E 8/4.4	ARR 1.83 (0.79-3.62)
					5,127	Crohn disease	O/E 9/9.4	ARR 0.96 (0.44-1.83)
					6,990	Ulcerative colitis	O/E 11/14	ARR 0.78 (0.39-1.41)
Harding, 2015 [18]	Australia	1997-2008	Retrospective cohort, both sexes	Median 21.6	80,676	Diabetes mellitus, type 1	O/E 40/29.2	SIR 1.37 (1.01-1.87)
			Retrospective cohort, female	NR	42,032		O/E 19/9	SIR 2.11 (1.34-3.30)
			Retrospective cohort, male	NR	38,644		O/E 21/20.2	SIR 1.04 (0.68-1.60)
			Retrospective cohort, both sexes	Median 21.6	80,676		O/E 15/NR	SMR 1.02 (0.61-1.69)
			Retrospective cohort, female	NR	42,032		O/E 4/NR	SMR 0.81 (0.30-2.14)
			Retrospective cohort, male	NR	38,644		O/E 11/NR	SMR 1.13 (0.62-2.03)
Hashimoto, 2012 [19]	Japan	1973-2008	Retrospective cohort, both sexes	Mean 46.5	405	Systemic sclerosis	O/E 3/3.57	SIR 0.84 (-0.11-1.79)
			Retrospective cohort, female	NR	376		NR	SIR 0.62 (-0.24-1.48)
			Retrospective cohort, male	NR	29		NR	SIR 2.90 (-2.78-8.58)
Hashimoto, 2015 [20]	Japan	2003-2012	Retrospective cohort, both sexes	Mean 62.7	66,953 PY	Rheumatoid arthritis	O/E 78/93.46	SIR 0.83 (0.65-1.02)

Hemminki, 2012 [21]	Sweden	1964-2008	Retrospective cohort, female	NR	54,634 PY		O/E 36/52.36	SIR 0.69 (0.46-0.91)	
			Retrospective cohort, male	NR	12,319 PY		O/E 42/41.1	SIR 1.02 (0.71-1.33)	
			Retrospective cohort, male	NR	1,594	Addison disease		O/E 9/3.28	SIR 2.74 (1.24-5.23)
					4,262	Amyotrophic lateral sclerosis		O/E 4/4.16	SIR 0.96 (0.25-2.49)
					5,173	Ankylosing spondylitis		O/E 13/14.13	SIR 0.92 (0.49-1.57)
					2,860	Behçet disease		O/E 11/6.62	SIR 1.66 (0.83-2.99)
					4,124	Celiac disease		O/E 0/NR	NR
					16,770	Chronic rheumatic heart disease		O/E 59/42.14	SIR 1.40 (1.07-1.59)
					28,349	Crohn disease		O/E 43/49.42	SIR 0.87 (0.63-1.17)
					20,554	Diabetes mellitus, type 1		O/E 5/1.89	SIR 2.64 (0.83-6.21)
					36,240	Graves disease		O/E 103/78.62	SIR 1.31 (1.07-1.59)
					10,682	Hashimoto		O/E 26/19.4	SIR 1.34 (0.87-1.96)
					1,709	Immune thrombocytopenic purpura		O/E 6/1.97	SIR 3.04 (1.09-6.66)
					3,128	Localized scleroderma		O/E 11/7.05	SIR 1.56 (0.70-2.55)
					12,553	Multiple sclerosis		O/E 12/21.81	SIR 0.55 (0.28-0.97)
					17,974	Myasthenia gravis		O/E 117/84.78	SIR 1.38 (1.14-1.65)
					11,839	Pernicious anemia		O/E 108/26.4	SIR 4.09 (3.36-4.94)
					12,046	Polyarteritis nodose		O/E 35/34.31	SIR 1.02 (0.71-1.42)
					14,745	Polymyalgia rheumatica		O/E 63/43.44	SIR 1.45 (1.11-1.85)
					1,256	Polymyositis/dermatomyositis		O/E 6/2.19	SIR 2.74 (0.99-6.01)
					835	Primary biliary cirrhosis		O/E 2/1.55	SIR 1.29 (0.12-4.75)
		15,592	Psoriasis		O/E 49/38.28	SIR 1.28 (0.94-1.69)			
		3,458	Rheumatic fever		O/E 16/10.66	SIR 1.50 (0.86-2.44)			
		26,937	Rheumatoid arthritis		O/E 60/56.07	SIR 1.07 (0.82-1.38)			
		9,053	Sarcoidosis		O/E/ 31/21.38	SIR 1.45 (0.98-2.06)			
		3,769	Sjögren syndrome		O/E/ 12/8.45	SIR 1.42 (0.73-2.48)			
		5,318	Systemic lupus erythematosus		O/E 10/8.33	SIR 1.20 (0.58-2.21)			
		1,195	Systemic sclerosis		O/E 2/1.51	SIR 1.32 (0.12-4.87)			
		16,363	Ulcerative colitis		O/E 15/17.04	SIR 0.88 (0.49-1.45)			
		945	Wegener granulomatosis		O/E 1/2.22	SIR 0.45 (0.00-2.59)			
Hill, 2001 [22]	Denmark and Finland	1964-1987	Retrospective cohort, both sexes	Mean, female 55.4	618	Dermatomyositis	NR	SIR 3.50 (1.70-7.30)	

			Retrospective cohort, both sexes	male 55.6 Mean, female 57.5 male 56.2	115		Polymyositis	NR	SIR 0.30 (0.04-1.90)
Hirano, 2014 [23]	Japan	1997-2012	Retrospective cohort, both sexes	Mean 65	113		IgG4-RD	O/E 2/NR	SIR 2.17 (0.70-4.99)
Hsing, 1993 [24]	Sweden	1965-1984	Retrospective cohort, both sexes	Mean 73.1	4,517		Pernicious anemia	O/E 102/NR	SIR 2.9 (2.4-3.5)
			Retrospective cohort, female	Mean 73.7	2,496			O/E 49/15.9	SIR 3.1 (2.3-4.1)
			Retrospective cohort, male	Mean 72.5	2,021			O/E 53/19.2	SIR 2.8 (2.0-3.6)
Hsu, 2015 [25]	Taiwan	2000-2004	Retrospective cohort, female	Mean 49.2	Male and female combined		Diabetes mellitus, type 1	O/E 14/10.5	SIR 1.33 (0.73-2.24)
			Retrospective cohort, male	Mean 51.3	14,619			O/E 17/15.8	SIR 1.08 (0.63-1.72)
Ilus, 2014 [26]	Finland	2002-2011	Retrospective cohort, both sexes	Range 15-60	32,439		Celiac disease	O/E 37/41	SIR 0.90 (0.63-1.23)
			Retrospective cohort, female	Range 15-60	21,158			O/E 23/21	SIR 1.12 (0.71-1.67)
			Retrospective cohort, male	Range 15-60	11,281			O/E 14/21	SIR 0.68 (0.37-1.13)
Ji, 2010 [27]	Sweden	1965-2006	Retrospective cohort, both sexes	NR	35,918		Polymyalgia rheumatica/Giant cell arteritis	O/E 139/109.45	SIR 1.27 (1.07-1.50)
Jorgensen, 1951 [28]	Denmark	1930-1942	Retrospective cohort, both sexes	NR	206		Pernicious anemia	O/E 12/3.6	SMR 3.33 (1.81-5.67)
			Retrospective cohort, female	NR	58			O/E 6/0.7	SMR 8.57 (3.47-17.83)
			Retrospective cohort, male	MR	148			O/E 6/2.9	SMR 2.07 (0.84-4.30)
Kandemir,	Turkey	NR	Case-control,	NR	116		Autoimmune thyroid disease	Case _E /Case _{NE} 17/244	OR 3.16 (.14-8.71)

Year [Ref]	Country	Study Period	Study Design	Age Measure	Age Value	Disease	Control _E /Control _{NE}	RR (95% CI)
2005 [29]			both sexes				Control _E /Control _{NE} 44/6	
Kokkola, 1998 [30]	Finland	1986-1995	Retrospective cohort, both sexes	Median	71	Pernicious anemia	O/E 2/0.4	SIR 5.0 (0.6-18.0)
Landgren, 2011 [31]	USA	1969-1996	Retrospective cohort, male	Range	NR	Addison disease	Case _E 11	RR 1.62 (0.84-3.11)
						Amyotrophic lateral sclerosis	Case _E 9	RR 0.91 (0.45-1.81)
						Ankylosing spondylitis	Case _E 21	RR 1.08 (0.69-1.67)
						Autoimmune hemolytic anemia	Case _E 6	RR 1.10 (0.46-2.65)
						Celiac disease	Case _E 0	NR
						Chronic rheumatic heart disease	Case _E 125	RR 1.00 (0.83-1.21)
						Crohn disease	Case _E 8	RR 0.76 (0.38-1.52)
						Discoid lupus erythematosus	Case _E 9	RR 0.95 (0.48-1.90)
						Graves disease	Case _E 12	RR 1.07 (0.61-1.88)
						Immune thrombocytopenic purpura	Case _E 9	RR 0.58 (0.28-1.22)
						Localized scleroderma	Case _E 0	NR
						Multiple sclerosis	Case _E 18	RR 0.71 (0.45-1.13)
						Myasthenia gravis	Case _E 0	NR
						Pernicious anemia	Case _E 68	RR 3.17 (2.47-4.07)
						Polyarteritis nodose	Case _E 0	NR
						Polymyalgia rheumatica	Case _E 0	NR
						Primary biliary cirrhosis	Case _E 23	RR 1.66 (1.10-2.51)
						Psoriasis	Case _E 79	RR 1.11 (0.88-1.41)
						Reactive arthritis	Case _E 0	NR
						Rheumatic fever	Case _E 0	NR
						Rheumatic arthritis	Case _E 120	RR 0.98 (0.82-1.18)
						Sarcoidosis	Case _E 5	RR 0.57 (0.24-1.37)
						Systemic lupus erythematosus	Case _E 8	RR 1.53 (0.73-3.21)
						Systemic sclerosis	Case _E 5	RR 1.04 (0.39-2.77)
						Ulcerative colitis	Case _E 19	RR 1.11 (0.70-1.76)
Lim, 2016 [32]	Singapore	2001-2013	Retrospective cohort, female	NR	929	Rheumatoid arthritis	O/E 3/NR	IRR 1.12 (0.36-3.47)
			Retrospective cohort, male	NR	177	Rheumatoid arthritis	O/E 3/NR	IRR 3.27 (1.05-10.17)
Loof, 1994	Sweden	1958-1988	Prospective	Mean	559	Primary biliary cirrhosis	O/E 1/0.8	SIR 1.3 (0.0-7.2)

[33] Mellemkjaer, 1996 [34]	Denmark	1997-1991	cohort, both sexes	54.2	5,072	Pernicious anemia	O/E 50/21.2	RR 2.4 (1.7-3.1)
			Retrospective cohort, both sexes	NR				
			Retrospective cohort, female	Mean 73				
Mosbech, 1950 [35]	Denmark	1928-1949	Retrospective cohort, male	Mean 71	3,348	Pernicious anemia	O/E 24/NR	RR 2.1 (1.3-3.1)
			Retrospective cohort, both sexes	Mean 71				
			Retrospective cohort, female	Mean 71				
Murphy, 2015 [36]	USA	1992-2005	Retrospective cohort, male	NR	301	Pernicious anemia	O/E 15/5.2	SIR 2.89 (1.74-4.79)
			Nested case-control, both sexes	NR				
			Nested case-control, female	Mean 59.1				
O'Mara, 1985 [37]	USA	1957-1965	Case-control, both sexes	Mean 56.4	122,860	Pernicious anemia	Case _E /Case _{NE} 709/22,151 Control _E /Control _{NE} 1,500/98,500	OR 2.02 (1.84-2.22) cardia OR 1.25 (1.0-1.55) Noncardia OR 2.18 (1.94-2.45)
			Case-control, female	Range 66-99				
			Case-control, male	Range 66-99				
Park, 2014 [38]	Korea	1979-2009	Nested case-control, female		9,808	Diabetes mellitus, type 1	NR	OR 2.20 (1.94-2.49)
			Nested case-control, male					
			Case-control, both sexes					
Park, 2014 [38]	Korea	1979-2009	Case-control, female	NR	13,052	Diabetes mellitus, type 1	Case _E /Case _{NE} 1/311 Control _E /Control _{NE} 12/4,608	OR 1.23 (0.16-9.53)
			Case-control, male	NR				
			Case-control, both sexes	NR				
Park, 2014 [38]	Korea	1979-2009	Case-control, female	NR	2,475	Diabetes mellitus, type 1	Case _E /Case _{NE} 0/103 Control _E /Control _{NE} 8/2,412	OR 1.37 (0.08-23.92)
			Case-control, male	NR				
			Case-control, both sexes	NR				
Park, 2014 [38]	Korea	1979-2009	Case-control, male	NR	2,363	Diabetes mellitus, type 1	Case _E /Case _{NE} 1/208 Control _E /Control _{NE} 4/2,196	OR 2.64 (0.29-23.72)
			Case-control, female	NR				
			Case-control, both sexes	NR				
Park, 2014 [38]	Korea	1979-2009	Retrospective cohort, both sexes (87% female)	Mean 48.6	180	Takayasu arteritis	O/E 1/0.7	SIR 1.4 (0.0-7.9)
			Retrospective cohort, both sexes (87% female)	Mean 48.6				
			Retrospective cohort, both sexes (87% female)	Mean 48.6				

Seo, 2018 [39]	Korea	2002-2013	Nested case-control, both sexes	NR	73,194	Alopecia areata	Case _E /Case _{NE} 39/12,160	OR 0.463 (0.330-0.651)
			Nested case-control, female	NR	NR		Control _E /Control _{NE} NR/NR	
			Nested case-control, male	NR	NR		Case _E /Case _{NE} NR/NR	
Schafer, 1985 [40]	USA	1950-1979	Retrospective cohort, both sexes	Mean 69	152	Pernicious anemia	Control _E /Control _{NE} NR/NR	RR 1.00 (0.02-5.50)
			Retrospective cohort, female	NR	96		O/E 1/1.02	
			Retrospective cohort, male	NR	56		O/E 1/0.49	
Silano, 2007 [41]	Italy	1982-2005	Retrospective cohort, both sexes	Mean 36	1,968	Celiac disease	O/E 0/0.53	RR 0.00 (0.00-6.90)
Stockton, 2001 [42]	Scotland	1982-1996	Retrospective cohort, both sexes	All ages	286	Dermatomyositis	O/E 3/1	SIR 3.0 (1.3-4.9)
Swerdlow, 2005 [43]	UK	1972-2003	Retrospective cohort, both sexes	Range 0-30	23,834	Diabetes mellitus, type 1	O/E 3/NR	NR
Thomas, 2000 [44]	Scotland	1981-1996	Retrospective cohort, female	Mean 63.7	19,543	Rheumatoid arthritis	O/E 7/5.83	SIR 1.20 (0.48-2.47)
			Retrospective cohort, male	Mean 60.7	7,080		O/E 41/58.57	SIR 0.70 (0.50-0.95)
Valent, 2015 [45]	Italy	2002-2014	Retrospective cohort, both sexes	Range 20-94	6,728	Diabetes mellitus, type 1	O/E 36/34.29	SIR 1.05 (0.74-1.46)
Van Daalen, 2017 [46]	Netherlands	1989-2005	Retrospective cohort, both sexes	Mean 55.7	203	ANCA associated vasculitis: granulomatosis with	NR	HR 1.42 (0.64-3.17)
							O/E 1/NR	SIR 2.37 (0.06-13.2)

Vannella, 2010 [47]	Italy	1992-2008	sexes Prospective cohort, both sexes	Median 54	300	polyangiitis & microscopic polyangiitis Pernicious anemia	Case _E 3	HR 0.6 (0.2-2.0)
Viljamaa, 2006 [48]	Finland	1960-2000	Retrospective cohort, both sexes	Median 39	781	Celiac disease	O/E 2/1.2	SIR 1.2 (0.2-4.5)
				Median 38	366	Dermatitis herpetiformis	O/E 3/2.1	SIR 2.1 (0.4-6.3)
Weng, 2012 [49]	Taiwan, China	2000-2008	Retrospective cohort, female	Range 45-64	6,911	Sjögren syndrome	O/E 10/6.4	SIR 1.56 (0.75-2.86)
			Retrospective cohort, male	Range 45-64	941		O/E 0/NR	NR
Yamada, 2011 [50]	Japan	2001-2005	Retrospective cohort, both sexes	Mean 55.9	7,566	Rheumatoid arthritis	O/E 30/25.21	SIR 1.19 (0.80-1.70)
			Retrospective cohort, female	NR	6,189		NR	SIR 1.43 (0.88-2.18)
			Retrospective cohort, male	NR	1,377		NR	SIR 0.86 (0.39-1.64)
Yoo, 2018 [51]	Korea	2000-2017	Retrospective cohort, both sexes	Mean 55.2		Polymyositis/dermatomyositis	O/E 1/2.77	SIR 0.360 (0.009-2.012)
Yu, 2016 [52]	Taiwan	1997-2012	Retrospective cohort, both sexes	Mean 37	1,620	Behçet disease	O/E 0/NR	NR
				Mean 43.6	1,119	Dermatomyositis	NR	SIR 1.88 (0.48-7.52)
				Mean 43.2	2,853	Inflammatory bowel disease	NR	SIR 0.53 (0.13-2.11)
				Mean 3	3,469	Kawasaki disease	O/E 0/NR	NR
				Mean 49	811	Polymyositis	O/E 0/NR	NR
				Mean 56.6	35,182	Rheumatoid arthritis	NR	SIR 0.92 (0.72-1.16)
				Mean 53.5	11,998	Sjögren syndrome	NR	SIR 1.00 (0.63-1.58)
				Mean 35.3	15,623	Systemic lupus erythematosus	NR	SIR 1.88 (1.21-2.91)

Mean	1,814	Systemic sclerosis	NR	SIR 0.70 (0.17-2.79)
50.1				
Mean 43	644	Vasculitis excluding Kawasaki disease	O/E 0/NR	NR

ANCA, antineutrophil cytoplasmic antibody; ARR, adjusted rate ratio; Case_E/Case_{NE}, number of cases in exposed/number of cases in non-exposed; Control_E/Control_{NE}, number of controls in exposed/number of controls in non-exposed; HR, hazard ratio; IgG4-RD, immunoglobulin G4-related disease; IRR, incidence rate ratio; NR, not reported; OR, odds ratio; PY, person-years; RR: relative risk; SIR, standardized incidence rate; SMR, standardized mortality rate.