

Suppl. Table S1. Month and season of birth in the study population.

Age (yr)	Male		Female		Total	
	n	%	n	%	n	%
0-5	82869	1.01	60956	0.68	143825	0.83
6-10	47476	0.58	41282	0.46	88758	0.51
11-15	106109	1.29	89108	0.99	195217	1.13
16-20	181694	2.21	170242	1.89	351936	2.04
21-25	214936	2.61	236603	2.62	451539	2.62
26-30	325284	3.95	325048	3.60	650332	3.77
31-35	458499	5.57	428486	4.75	886985	5.14
36-40	633939	7.71	553417	6.13	1187356	6.88
41-45	809113	9.84	716532	7.94	1525645	8.85
46-50	1021962	12.43	1005521	11.14	2027483	11.76
51-55	1061525	12.91	1129034	12.51	2190559	12.70
56-60	909536	11.06	956230	10.60	1865766	10.82
61-65	768354	9.34	871464	9.66	1639818	9.51
66-70	677678	8.24	860977	9.54	1538655	8.92
71-75	484842	5.89	706069	7.83	1190911	6.90
76-80	265156	3.22	470778	5.22	735934	4.27
81-85	120925	1.47	256560	2.84	377485	2.19
86-90	43546	0.53	106776	1.18	150322	0.87
91-95	9647	0.12	31009	0.34	40656	0.24
96-100	1446	0.02	5814	0.06	7260	0.04
100 over	134	0.00	882	0.01	1016	0.01
Total	8224670	100	9022788	100	17247458	100

Suppl. Table S2. Gender, birth month distribution, and number of patients with each disease of the study population.

	Patients (n=17,247,458)
Gender	
male	8,224,670 (47.7)
female	9,022,788 (52.3)
Birth month	
January	1,707,381 (9.9)
February	1,668,689 (9.7)
March	1,681,851 (9.8)
April	1,386,627 (8.0)
May	1,396,315 (8.1)
June	1,178,493 (6.8)
July	1,275,835 (7.4)
August	1,398,419 (8.1)
September	1,367,832 (7.9)
October	1,411,430 (8.2)
November	1,311,739 (7.6)
December	1,462,847 (8.5)
Disease	
Crohn's disease	20,061 (0.1)
Ulcerative colitis	44,353 (0.3)
Rheumatoid arthritis	113,130 (0.7)
Sjögren's syndrome	17,454 (0.1)
Polymyalgia rheumatica	5,271 (0.0)
Ankylosing spondylitis	43,471 (0.3)
Gout	978,264 (5.7)
Fibromyalgia	359,954 (2.1)

Suppl. Table S3. Summary of trend and seasonality tests for month of birth.

	Month												Cosinor tests		
	January	February	March	April	May	June	July	August	September	October	November	December	Walter-Elwood	amplitude	cos sin (p-value)
overall	n=1707381	n=1668689	n=1681851	n=1386627	n=1396315	n=1178493	n=1275835	n=1398419	n=1367832	n=1411430	n=1311739	n=1462847			
Crohn's disease	2082(0.122)	2011(0.121)	1703(0.101)	1587(0.114)	1568(0.112)	1439(0.122)	1528(0.120)	1598(0.114)	1570(0.115)	1687(0.120)	1651(0.126)	1637(0.112)	0.009	229.81	<0.001
Ulcerative colitis	4485(0.263)	4486(0.269)	4244(0.252)	3419(0.247)	3468(0.248)	2988(0.254)	3277(0.257)	3561(0.255)	3525(0.258)	3672(0.260)	3478(0.265)	3750(0.256)	<0.001	540.77	<0.001
Rheumatoid arthritis	11111(0.651)	11095(0.665)	11359(0.675)	9095(0.656)	9215(0.660)	7530(0.639)	8432(0.661)	9080(0.649)	8873(0.649)	9187(0.651)	8582(0.654)	9571(0.654)	0.027	1477.42	<0.001
Sjögren's syndrome	1739(0.102)	1753(0.105)	1766(0.105)	1431(0.103)	1430(0.102)	1219(0.103)	1309(0.103)	1390(0.099)	1382(0.101)	1363(0.097)	1232(0.094)	1440(0.098)	0.002	237.43	<0.001
Polymyalgia rheumatica	1739(0.102)	1753(0.105)	1766(0.105)	1431(0.103)	1430(0.102)	1219(0.103)	1309(0.103)	1390(0.099)	1382(0.101)	1363(0.097)	1232(0.094)	1440(0.098)	0.002	62.04	<0.001
Ankylosing spondylitis	4507(0.264)	4453(0.267)	3912(0.233)	3490(0.252)	3587(0.257)	2961(0.251)	3246(0.254)	3327(0.238)	3388(0.248)	3506(0.248)	3431(0.262)	3663(0.250)	<0.001	426.93	<0.001
Gout	97771(5.726)	93610(5.610)	93480(5.558)	77387(5.581)	79508(5.694)	69388(5.888)	75483(5.916)	80635(5.766)	77216(5.645)	79129(5.606)	73782(5.625)	80875(5.529)	<0.001	10205.53	<0.001
Fibromyalgia	35222(2.063)	35071(2.102)	34951(2.078)	29037(2.094)	29244(2.094)	25132(2.133)	26656(2.089)	29422(2.104)	28225(2.063)	29150(2.065)	27646(2.108)	30198(2.064)	0.006	4241.27	<0.001
Male	n=825041	n=786346	n=781367	n=654670	n=662251	n=569464	n=618076	n=671987	n=656677	n=676744	n=631877	n=690170			
Crohn's disease	1412(0.171)	1334(0.170)	1090(0.139)	1047(0.160)	1035(0.156)	990(0.174)	1019(0.165)	1081(0.161)	1068(0.163)	1090(0.161)	1113(0.176)	1111(0.161)	0.048	147.31	<0.001
Ulcerative colitis	2557(0.310)	2480(0.315)	2350(0.301)	1931(0.295)	1974(0.298)	1739(0.305)	1850(0.299)	2021(0.301)	2006(0.305)	2069(0.306)	1979(0.313)	2095(0.304)	0.123	309.62	<0.001
Rheumatoid arthritis	2322(0.281)	2080(0.265)	2199(0.281)	1806(0.276)	1829(0.276)	1550(0.272)	1613(0.261)	1801(0.268)	1873(0.285)	1827(0.270)	1718(0.272)	1925(0.279)	0.497	275.32	<0.001
Sjögren's syndrome	178(0.022)	154(0.020)	149(0.019)	140(0.021)	131(0.020)	119(0.021)	116(0.019)	128(0.019)	133(0.020)	125(0.018)	133(0.021)	127(0.018)	0.83	20.82	<0.001
Polymyalgia rheumatica	163(0.020)	134(0.017)	175(0.022)	140(0.021)	131(0.020)	116(0.020)	122(0.020)	147(0.022)	123(0.019)	137(0.020)	119(0.019)	146(0.021)	0.746	16.62	0.004
Ankylosing spondylitis	3399(0.412)	3253(0.414)	2852(0.365)	2593(0.396)	2640(0.399)	2265(0.398)	2432(0.393)	2505(0.373)	2504(0.381)	2629(0.388)	2514(0.398)	2690(0.390)	0.061	420.03	<0.001
Gout	79052(9.582)	74924(9.528)	73854(9.452)	61838(9.446)	63968(9.659)	56034(9.840)	61070(9.881)	65103(9.688)	62290(9.486)	63713(9.415)	59642(9.439)	64832(9.394)	<0.001	7806.22	<0.001
Fibromyalgia	12224(1.482)	11794(1.500)	11506(1.473)	9795(1.496)	9919(1.498)	8740(1.535)	9189(1.487)	10077(1.500)	9579(1.459)	10117(1.495)	9597(1.519)	10258(1.486)	<0.001	30745.85	<0.001
Female	n=882340	n=882343	n=900484	n=731957	n=734064	n=609029	n=657759	n=726432	n=711155	n=734686	n=679862	n=772677			
Crohn's disease	670(0.076)	677(0.077)	613(0.068)	540(0.074)	533(0.073)	449(0.074)	509(0.077)	517(0.071)	502(0.071)	597(0.081)	538(0.079)	526(0.068)	0.459	83.55	<0.001
Ulcerative colitis	1928(0.219)	2006(0.227)	1894(0.210)	1488(0.203)	1494(0.204)	1249(0.205)	1427(0.217)	1540(0.212)	1519(0.214)	1603(0.218)	1499(0.220)	1655(0.214)	0.007	283.62	<0.001
Rheumatoid arthritis	8789(0.996)	9015(1.022)	9160(1.017)	7289(0.996)	7386(1.006)	5980(0.982)	6819(1.037)	7279(1.002)	7000(0.984)	7360(1.002)	6864(1.010)	7646(0.990)	0.602	12044.68	<0.001
Sjögren's syndrome	1561(0.177)	1599(0.181)	1617(0.180)	1291(0.176)	1299(0.177)	1100(0.181)	1193(0.181)	1262(0.174)	1249(0.176)	1238(0.169)	1099(0.162)	1313(0.170)	0.011	217.07	<0.001
Polymyalgia rheumatica	338(0.038)	352(0.040)	386(0.043)	292(0.040)	343(0.047)	246(0.040)	276(0.042)	320(0.044)	266(0.037)	279(0.038)	239(0.035)	281(0.036)	0.001	47.13	0.001
Ankylosing spondylitis	1108(0.126)	1200(0.136)	1060(0.118)	897(0.123)	947(0.129)	696(0.114)	814(0.124)	822(0.113)	884(0.124)	877(0.119)	917(0.135)	973(0.126)	0.008	188.21	<0.001
Gout	18719(2.122)	18686(2.118)	19626(2.179)	15549(2.124)	15540(2.117)	13354(2.193)	14413(2.191)	15532(2.138)	14926(2.099)	15416(2.098)	14140(2.080)	16043(2.076)	<0.001	2422.73	<0.001
Fibromyalgia	22998(2.606)	23277(2.638)	23445(2.604)	19242(2.629)	19325(2.633)	16392(2.691)	17467(2.656)	19345(2.663)	18646(2.622)	19033(2.591)	18049(2.655)	19940(2.581)	0.001	2910.00	<0.001