

## Supplement

**Table 1.** Predefined ICD-10 codes used to identify patients in each group of the systemic rheumatic diseases under study.

Rheumatoid Arthritis	M05, M05.0, M05.1, M05.2, M05.3, M05.8, M05.9, M06, M06.0, M06.2, M06.3, M06.4, M06.8, M06.9
Ankylosing Spondylitis	M45, M46, M46.0, M46.1, M46.8, M46.9, M07.2
Psoriatic Arthritis	M07, M07.0, M07.1, M07.3, L40.5
Systemic Lupus Erythematosus	M32, M32.0, M32.1, M32.8, M32.9
Systemic Sclerosis	M34, M34.0, M34.1, M34.2, M34.8, M34.9

**Table 2.** ATC5 codes of medications used to identify patients in each group of the systemic rheumatic diseases under study

Medication Class	ATC5 code	Medication
conventional synthetic (cs)DMARDs	A07EC01	sulfasalazine
	L01BA01	methotrexate sc
	L04AX03	methotrexate per os
	L04AX01	azathioprine
	L04AA13	leflunomide
	L04AD01	ciclosporine
	M01CC01	D-penicillamine
	P01BA02	hydroxychloroquine
	L01AA01	cyclophosphamide
	L04AA06	mycophenolic acid
	corticosteroids	H02AB01
H02AB02		dexamethasone
H02AB03		fluocortolone
H02AB04		methylprednisolone
H02AB05		paramethasone
H02AB06		prednisolone
H02AB07		prednisone
H02AB08		triamcinolone
H02AB09		hydrocortisone
H02AB10		cortisone
H02AB11		prednylidene
H02AB12		rimexolone
H02AB13		deflazacort
H02AB14		cloprednol
H02AB15		meprednisone
H02AB17		cortivazol
biologic (b)DMARDs		L04AA24
	L04AC07	tocilizumab
	L04AC03	anakinra
	L04AC05	ustekinumab
	L04AC10	secukinumab
	L01XC02	rituximab
	L04AB04	adalimumab
	L04AB05	certolizumab pegol
	L04AB01	etarnecept
	L04AB06	golimumab
targeted synthetic (ts)DMARDs	L04AB02	infliximab
	L04AA26	belimumab
	L04AA29	tofacitinib
	L04AA44	upadacitinib,
	L04AA37	baricitinib,
advanced vasodilatory therapy	L04AA32	apremilast
	C02KX01	bosentan
	C02KX02	ambrisentan
	C02KX03	sitaxentan

	C02KX04	macitentan
	C02KX05	riociguat
	C02KX52	ambrisentan and tadalafil
	G04BE08	tadalafil
	G04BE03	sildenafil
	G04BE09	vardenafil
	G04BE10	avanafil
	G04BE11	udenafil
	B01AC09	epoprostenol
	B01AC11	iloprost
	B01AC19	beraprost
	B01AC21	treprostinil
	B01AC27	selexipag
antifibrotic therapy	L01XE31	nintedanib
	L04AX05	pirfenidone

**Table 3.** Number of deaths reported between 01-Jan-2015 to 31-Dec-2019, among rheumatoid arthritis (RA), ankylosing spondylitis (AS), psoriatic arthritis (PsA), systemic lupus erythematosus (SLE), and systemic sclerosis (SSc) patients registered in the country-wide electronic prescription database of the e-Government Center for Social Security Services and among age and gender matched subjects from the general population, stratified by age and gender. N: number, M: male, F: female).

Age (years)	Gender	RA				AS				PsA				SLE				SSc			
		patients		general population		patients		general population		patients		general population		patients		general population		patients		general population	
		N	Deaths (%)	N	Deaths (%)	N	Deaths (%)	N	Deaths (%)	N	Deaths (%)	N	Deaths (%)	N	Deaths (%)	N	Deaths (%)	N	Deaths (%)	N	Deaths (%)
<30	M	166	0	830	3 (0.4)	543	2 (0.4)	2,715	8 (0.04)	202	1 (0.5)	1010	2 (0.2)	93	1 (1.1)	465	0	9	0	45	0
	F	586	1 (0.2)	2930	2 (0.1)	351	0	1,755	1 (0.1)	262	0	1,310	0	578	1 (0.2)	2,890	2 (0.1)	50	0	250	0
30-39	M	332	1 (0.3)	1,660	10 (0.6)	1,110	1 (0.1)	5,550	17 (0.3)	779	2 (0.3)	3,895	6 (0.2)	136	3 (2.2)	680	1 (0.2)	22	3 (13.6)	110	2 (1.8)
	F	1,439	4 (0.3)	7,195	15 (0.2)	782	1 (0.1)	3,910	8 (0.2)	773	1 (0.1)	3,865	8 (0.2)	1,351	11 (0.8)	6,755	15 (0.2)	161	4 (2.5)	805	1 (0.1)
40-49	M	823	7 (0.9)	4,115	80 (1.9)	1,489	10 (0.7)	7,445	67 (0.9)	1,440	5 (0.4)	7,200	54 (0.8)	197	5 (2.5)	985	11 (1.1)	55	2 (3.6)	275	1 (0.4)
	F	3,753	19 (0.5)	18,765	169 (0.9)	1,191	1 (0.1)	5,955	33 (0.55)	1,592	2 (0.1)	7,960	42 (0.5)	2,018	26 (1.3)	10,090	55 (0.6)	303	10 (3.3)	1515	14 (0.9)
50-59	M	1,592	62 (3.9)	7,960	356 (4.5)	1,355	27 (2.0)	6,775	205 (3.0)	1,516	28 (1.9)	7,580	200 (2.6)	222	16 (7.2)	1,110	34 (3.1)	80	9 (11.3)	400	14 (3.5)
	F	7,409	82 (1.1)	37,045	643 (1.7)	1,120	7 (0.6)	5,600	69 (1.2)	2,152	16 (0.7)	10,760	151 (1.4)	2,274	60 (2.6)	11,370	176 (1.6)	476	30 (6.3)	2,380	29 (1.2)
60-69	M	2,470	155 (6.3)	12,350	1,233 (10.0)	766	30 (3.9)	3,830	224 (5.9)	1,355	49 (3.6)	6,775	388 (5.7)	237	33 (13.9)	1,185	66 (5.6)	69	14 (20.3)	345	23 (6.7)
	F	9,229	252 (2.7)	46,145	1,822 (4.0)	525	11 (2.1)	2,625	73 (2.8)	1,717	39 (2.3)	8,585	241 (2.8)	1,700	97 (5.7)	8,500	252 (3.0)	560	62 (11.1)	2800	101 (3.6)
70-79	M	2,584	370 (14.3)	12,920	2,218 (17.2)	241	26 (10.8)	1,205	158 (13.1)	719	76 (10.6)	3,595	463 (12.9)	162	36 (22.2)	810	107 (13.2)	31	8 (25.8)	155	12 (7.7)
	F	8,032	717 (8.9)	40,160	4,088 (10.18)	173	15 (8.7)	865	66 (7.6)	874	62 (7.1)	4,370	322 (7.4)	1,015	125 (12.3)	5,075	462 (9.1)	340	75 (22.1)	1700	165 (9.7)
≥80	M	1,127	265 (23.5)	5,635	1,667 (29.6)	40	16 (40.0)	200	49 (24.5)	203	51 (25.1)	1015	257 (25.3)	78	36 (46.2)	390	129 (33.1)	13	5 (38.5)	65	9 (13.9)

	F	3,193	790 (24.7)	15,965	4,615 (28.9)	21	3 (14.3)	105	20 (19.0)	195	44 (22.6)	975	211 (21.6)	379	135 (35.6)	1,895	502 (26.5)	108	39 (36.1)	540	127 (23.5)
Total	-	42,735	2,725 (6.4)	213,675	16,811 (7.9)	9,707	150 (1.5)	48,535	998 (2.0)	13,779	376 (2.7)	68,895	2,345 (3.4)	10,440	585 (5.6)	52,200	1,812 (3.5)	2,277	261 (11.5)	11,385	498 (4.4)

**Table 4.** Three- and five-year survival with 95% Confidence Intervals of patients with systemic rheumatic disease and age and gender matched individuals from the general population, derived from Kaplan-Meier analysis for the entire cohort, for male and female subjects and for subjects <50 years and ≥50 years of age. RA: Rheumatoid Arthritis, AS: Ankylosing Spondylitis, PsA: Psoriatic Arthritis, SLE: Systemic Lupus Erythematosus, SSc Systemic Sclerosis, CI: Confidence Interval.

			Survival (95% CI)				
			Entire cohorts	Males	Females	< 50 years	≥50 years
RA	36 months	patients	94.9% (94.6 to 95.1)	91.7% (91.0 to 92.3)	95.7% (95.5 to 95.9)	99.7% (99.5 to 99.8)	93.9% (93.6 to 94.2)
		general population	92.8% (92.7 to 92.9)	88.1% (87.8 to 88.4)	94.0% (93.9 to 94.2)	99.3% (99.2 to 99.4)	91.5% (91.4 to 91.7)
	60 months	patients	90.2% (89.8 to 90.6)	85.0% (83.8 to 86.1)	91.6% (91.1 to 92.0)	99.2% (98.9 to 99.5)	88.5% (88.0 to 88.9)
		general population	89.0% (88.8 to 89.2)	82.6% (82.0 to 83.2)	90.7% (90.5 to 90.8)	99.0% (98.9 to 99.1)	87.1% (86.9 to 87.3)
AS	36 months	patients	98.9% (98.6 to 99.1)	98.6% (98.2-98.9)	99.2% (98.8 to 99.5)	99.8% (99.6 to 99.9)	97.6% (97.1 to 98.1)
		general population	98.2% (98.1 to 98.3)	97.8% (97.6 to 98.0)	98.8% (98.6 to 98.9)	99.6% (99.5 to 99.7)	96.4% (96.2 to 96.7)
	60 months	patients	97.4% (96.7 to 98.0)	96.7% (95.3 to 97.7)	98.5% (97.9 to 98.9)	99.6% (99.3 to 99.7)	95.0 (93.5 to 96.1)
		general population	96.9% (96.6 to 97.1)	96.2% (95.8 to 96.6)	97.8% (97.5 to 98.1)	99.3% (99.1 to 99.4)	94.1% (93.5 to 94.5)
PsA	36 months	patients	97.8% (97.6 to 98.1)	97.2% (96.7 to 95.9)	98.4% (98.1 to 98.7)	99.9% (99.7 to 99.9)	96.7% (96.2 to 97.1)
		general population	97.0% (96.8 to 97.1)	96.1% (95.8 to 96.3)	97.8% (97.5 to 97.9)	99.6% (99.5 to 99.7)	95.4% (95.2 to 95.6)
	60 months	patients	95.7% (95.2 to 96.1)	94.8% (94.0 to 95.5)	96.4% (95.8 to 97.0)	99.6% (99.1 to 99.8)	93.5% (92.8 to 94.2)
		general population	94.9% (94.7 to 95.2)	93.5% (93.1 to 93.9)	96.1% (95.9 to 96.4)	99.3% (99.2 to 99.5)	92.4% (92.1 to 92.8)
SLE	36 months	patients	96.0% (95.6 to 96.4)	91.6% (89.8 to 93.2)	96.5% (96.1 to 96.9)	99.2% (98.9 to 99.5)	93.6% (93.0 to 94.3)
		general population	97.4% (97.2 to 97.5)	95.1% (94.5 to 95.7)	97.6% (97.5 to 97.8)	99.7% (99.6 to 99.8)	95.7% (95.5 to 95.9)
	60 months	patients	92.6% (92.0 to 93.2)	84.3% (81.4 to 86.8)	93.6% (93.0 to 94.2)	98.6% (98.1 to 98.9)	88.5% (87.5 to 89.4)
		general population	95.5% (95.3 to 95.7)	91.9% (91.0 to 92.8)	95.9% (95.7 to 96.1)	99.5% (99.4 to 99.6)	92.7% (92.4 to 93.1)
SSc	36 months	patients	91.4% (90.1 to 92.6)	89.2% (84.4 to 92.6)	91.7% (90.3 to 92.9)	97.6% (95.9 to 98.7)	89.2% (87.5 to 90.7)
		general population	96.3% (95.9 to 96.7)	95.9% (94.6 to 96.9)	96.4% (95.9 to 96.7)	99.4% (99.0 to 99.7)	95.2% (94.7 to 95.7)

	60 months	patients	83.6% (81.6 to 85.5)	76.5% (68.3 to 82.8)	84.56% (82.5 to 86.4)	95.2% (92.2 to 97.0)	79.6% (77.0 to 81.9)
		general population	94.1% (93.6 to 94.7)	94.4% (92.8 to 95.6)	94.1% (93.5 to 94.7)	99.2% (98.7 to 99.5)	92.3% (91.6 to 93.0)