

Supplementary table 1. Exposure-adjusted event rates per 1,000 patient-years

	Monoclonal anti-TNF antibodies	Soluble TNF-receptor fusion protein	T-cell co-stimulation modulator	B-cell targeted therapies	IL-6 inhibitors	JAK inhibitors	csDMARDs
Patient-years	12207	8850	4028	6523	8544	2692	20114
Herpes zoster							
No. events	114	76	33	67	70	54	139
Event rate (95% CI)	9.3 (7.7-11.2)	8.6 (6.8-10.7)	8.2 (5.6-11.5)	10.3 (8.0-13.0)	8.2 (6.4-10.4)	20.1 (15.1-26.2)	6.9 (5.8-8.2)
Herpes zoster infection neurological							
No. events	0	0	0	0	0	0	2
Event rate (95% CI)	-	-	-	-	-	-	0.1 (0.0-0.4)
Herpes ophthalmic							
No. events	0	0	1	0	3	3	0
Event rate (95% CI)	-	-	0,2 (0,0-1,4)	-	0,4 (0,1-1,0)	1,1 (0,2-3,2)	-
Herpes zoster oticus							
No. events	0	0	0	0	1	0	0
Event rate (95% CI)	-	-	-	-	0,1 (0,0-0,7)	-	-
Herpes zoster disseminated							
No. events	0	0	0	0	0	0	1
Event rate (95% CI)	-	-	-	-	-	-	0,0 (0,0-0,3)
Herpes zoster meningitis							
No. events	0	0	0	0	1	1	0
Event rate (95% CI)	-	-	-	-	0,1 (0,0-0,7)	0,4 (0,0-2,1)	-
Herpes zoster cutaneous disseminated							
No. events	0	0	0	0	0	0	0
Event rate (95% CI)	-	-	-	-	-	-	-

Abbreviations: CI: confidence interval; csDMARDs: conventional synthetic disease-modifying anti-rheumatic drugs; IL: interleukin; JAK: Janus kinase; No.: number; TNF: tumour necrosis factor.

Supplementary table 2 Characteristics at baseline of patients with recurrent events (N=22)

	Monoclonal anti-TNF antibodies N=4	Soluble TNF receptor fusion protein N=5	T-cell co-stimulation modulator N=1	B-cell targeted therapies N=4	IL-6 inhibitors N=2	JAK inhibitors N=1	csDMARDs N=5
Age, mean (SD), y	58.0 (9.2)	59.8 (10.9)	64.0 (.)	48.5 (7.2)	74.5 (6.4)	68.0 (.)	57.6 (19.1)
Women, No. (%)	2 (50.0)	5 (100.0)	1 (100.0)	4 (100.0)	2 (100.0)	1 (100.0)	4 (80.0)
Rheumatoid factor- positive, No. (%)	3 (75.0)	3 (60.0)	0 (0.0)	4 (100.0)	1 (100.0)	1 (100.0)	3 (60.0)
ACPA positive, No. (%)	2 (66.7)	4 (80.0)	0 (0.0)	1 (100.0)	1 (50.0)	1 (100.0)	1 (20.0)
FFbH score, mean (SD)	64.8 (15.0)	71.7 (16.7)	19.4 (.)	67.6 (12.5)	69.4 (15.7)	100.0 (.)	66.4 (22.0)
Disease duration, median (IQR), y	6.5 (3.5-23.0)	13.0 (7.0-15.0)	15.0 (15.0-15.0)	10.5 (5.5-13.5)	5.5 (2.0-9.0)	5.0 (5.0-5.0)	1.0 (1.0-4.0)
DAS28, mean (SD)	5.2 (1.6)	3.6 (1.4)	4.3 (.)	5.5 (1.7)	4.2 (.)	3.9 (.)	4.2 (2.1)
CRP, median (IQR), mg/L	23.3 (11.6-27.4)	6.2 (2.0-8.0)	8.0 (8.0-8.0)	9.1 (5.6-9.2)	14.6 (10.0-19.1)	3.0 (3.0-3.0)	20.7 (2.0-21.0)
CDAI, median (IQR)	22.0 (22.0-54.0)	13.5 (11.0-16.0)	23.0 (23.0-23.0)	-	30.0 (30.0-30.0)	13.0 (13.0-13.0)	8.0 (6.0-27.0)
Previous csDMARD therapies, mean (SD)	2.8 (1.3)	2.4 (0.5)	3.0 (.)	3.0 (0.8)	2.0 (0.0)	2.0 (.)	1.6 (0.9)
Previous b/tsDMARD therapies, mean (SD)	0.3 (0.5)	0.4 (0.5)	4.0 (.)	1.3 (0.5)	1.0 (1.4)	0.0 (.)	0.0 (0.0)
Glucocorticoids, No. (%)	4 (100.0)	3 (60.0)	1 (100.0)	1 (25.0)	2 (100.0)	1 (100.0)	3 (60.0)
Glucocorticoids, ≥10 mg, No. (%)	2 (50.0)	1 (20.0)	1 (100.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Comorbidities, mean (SD)	1.8 (2.1)	1.2 (1.1)	9.0 (.)	2.0 (0.8)	2.0 (1.4)	1.0 (.)	1.0 (1.4)
Osteoporosis, No. (%)	1 (25.0)	0 (0.0)	1 (100.0)	0 (0.0)	1 (50.0)	1 (100.0)	1 (20.0)
Hypertension, No. (%)	1 (25.0)	3 (60.0)	1 (100.0)	2 (50.0)	1 (50.0)	0 (0.0)	1 (20.0)
Coronary heart disease, No. (%)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	1 (50.0)	0 (0.0)	0 (0.0)
Diabetes, No. (%)	0 (0.0)	0 (0.0)	0 (0.0)	1 (25.0)	0 (0.0)	0 (0.0)	0 (0.0)
Malignant neoplasia, No. (%)	1 (25.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Mental illness / depression, No. (%)	0 (0.0)	0 (0.0)	1 (100.0)	1 (25.0)	0 (0.0)	0 (0.0)	0 (0.0)

Abbreviations: ACPA: Anti-citrullinated protein antibodies; b/cs/tsDMARDs: biological/conventional synthetic/targeted synthetic disease-modifying anti-rheumatic drugs; CDAI: Clinical Disease Activity Index; CRP: C-reactive protein; DAS28: Disease Activity Score of 28 joints using the erythrocyte sedimentation rate; FFbH: Hannover Functional Status Questionnaire; IL: interleukin; IQR: interquartile range; JAK: Janus kinase; No.: number; SD: standard deviation; TNF: tumour necrosis factor, y: years.

Supplementary table 3 Exposure-adjusted event rates of recurrent herpes zoster (N=22)

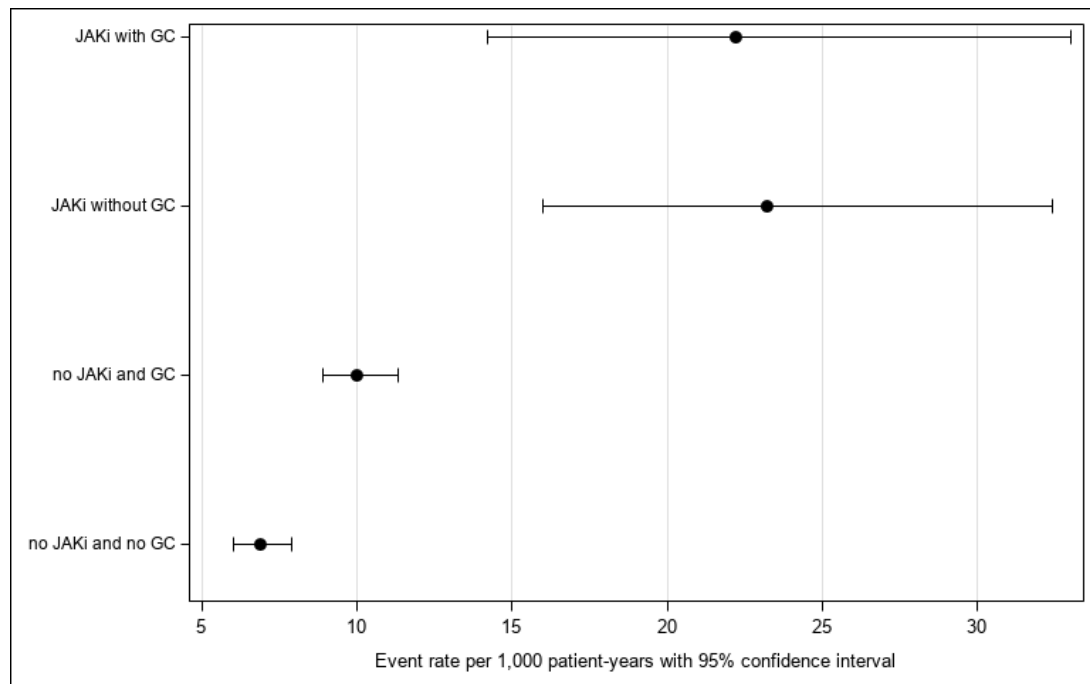
	Monoclonal anti-TNF antibodies	Soluble TNF-receptor fusion protein	T-cell co-stimulation modulator	B-cell targeted therapies	IL-6 inhibitors	JAK inhibitors	csDMARDs
Patient-years	27	18	2	22	17	6	48
No. events	11	7	0	8	7	5	12
Event rate (95% CI)	0.40 (0.20-0.72)	0.38 (0.15-0.78)	0 (-.22-13.3)	0.36 (0.16-0.71)	0.42 (0.17-0.87)	0.90 (0.29-2.09)	0.25 (0.13-0.44)

Supplementary table 4 Risk of herpes zoster: Andersen-Gill model with inverse probability weights calculated using the Clinical Disease Activity Index (CDAI) as a measure for disease activity.

	Andersen-Gill model with inverse probability weights	
	Adjusted HR (95% CI)	p-value
Female sex	1.13 (0.85-1.50)	0.3982
Age per 10 years	1.25 (1.14-1.37)	<0.0001
Glucocorticoids, 5-10 vs 0 mg/d	1.45 (1.16-1.82)	0.0011
Glucocorticoids, >10 vs 0 mg/d	4.48 (2.53-7.92)	<0.0001
csDMARD treatment	<i>Reference</i>	
Monoclonal anti-TNF antibodies	1.60 (1.14-2.22)	0.0059
Soluble TNF receptor fusion protein	1.24 (0.88-1.75)	0.2272
T-cell co-stimulation modulator	1.44 (0.85-2.45)	0.1734
B-cell targeted therapy	1.51 (0.99-2.30)	0.0548
IL-6 inhibitors	1.39 (0.95-2.01)	0.0872
JAK inhibitors	3.55 (2.30-5.47)	<0.0001

p-values <0.05 are shown in bold. Inverse probability weights were estimated using the variables age, sex, disease duration, CDAI, FFbH, previous treatment with b/tsDMARDs, and osteoporosis. Abbreviations: CDAI: Clinical Disease Activity Index; CI: confidence interval; csDMARDs: conventional synthetic disease-modifying anti-rheumatic drugs; HR: hazard ratio; IL: interleukin; JAK: Janus kinase; TNF: tumour necrosis factor.

Figure S1 Event rate of herpes zoster stratified by use of Janus kinase inhibitors and/or glucocorticoids



JAKi: Janus kinase inhibitor; GC: glucocorticoid

Figure S2 Exposure-adjusted incidence rates of all herpes zoster per 1,000 patient-years

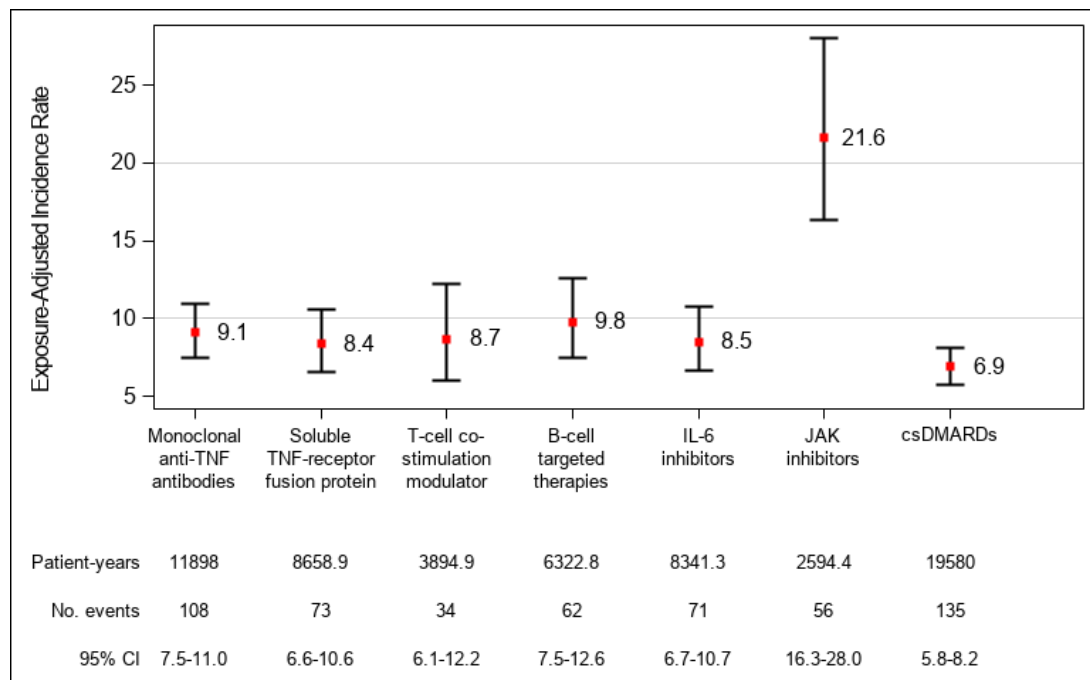


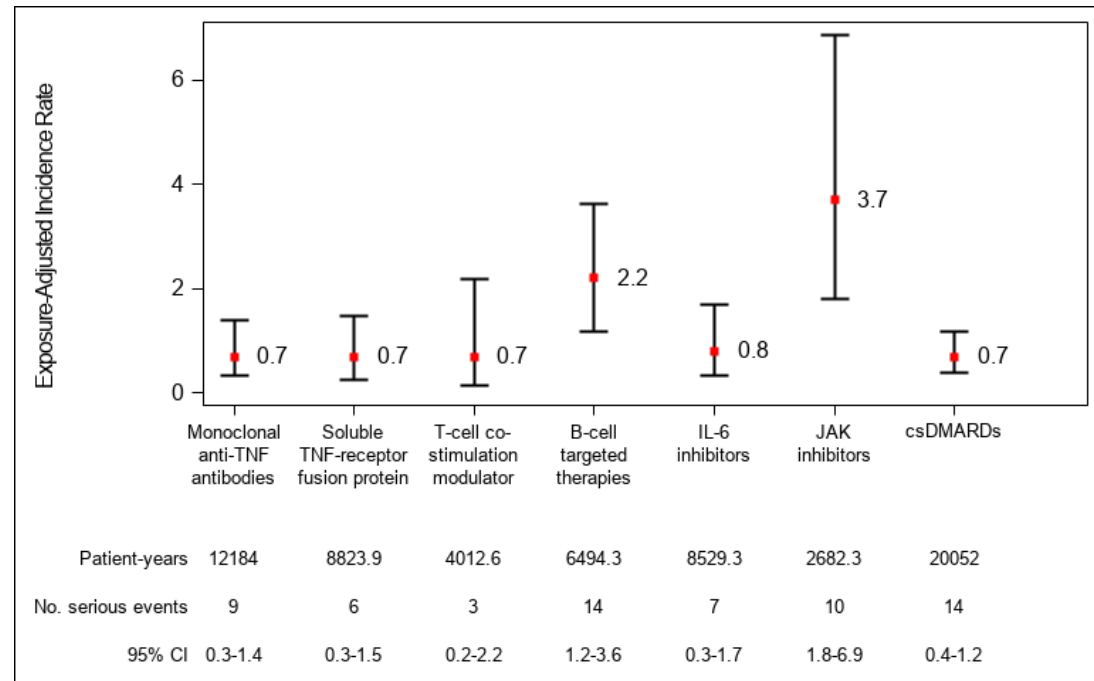
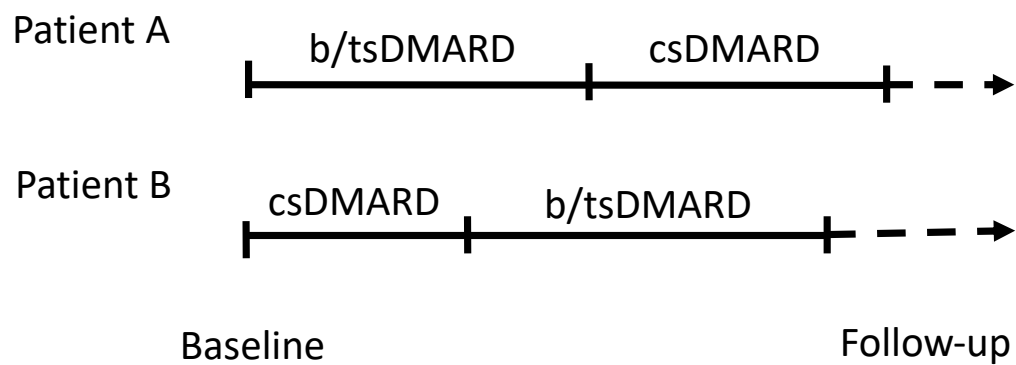
Figure S3 Exposure-adjusted incidence rates of serious herpes zoster per 1,000 patient-years**Figure S4** Schematic representation of the design of the subsample

Figure S5 Patterns of first three treatment switches or (transient) interruptions in RA patients (N=5,974)