Supplementary table S1. Data sources

Swedish Rheumatology Quality Register (SRQ)	A nationwide longitudinal clinically integrated register operated by The Swedish Society for Rheumatology, started in 1996. Patients with RA and other rheumatologic diseases are registered in the SRQ and it covers 89 000 patients. SRQ contains information about disease activity and additional information such as treatment and smoking status. SRQ covers 90% of all patients with RA treated with b/tsDMARDs in Sweden.
Swedish Patient Register (NPR)	A national register maintained by The National Board of Health and Welfare. Hospital discharges from inpatient care and patients visits in non-primary outpatient care, have been registered, since 1964 and 2001 respectively. Diagnoses are coded according to the Swedish version of the International Classification of Disease (ICD).
Longitudinal database for insurance and labor market-studies (LISA)	A national register maintained by Statistics Sweden. It contains information about sick leave, parental leave and employment status in Sweden from 1990
Prescribed Drug Register (PDR)	A national register maintained by The National Board of Health and Welfare. It contains information about all drugs dispensed on prescription in Sweden and is linked to the personal identification number since 2005.
Swedish population register	A national register maintained by Swedish Tax agency. Contains information such as home district, civil status and migration data.
Cause of Death Register	The Cause of Death Register is a national register containing information on date and cause of death (underlying and contributory) for all deceased residents, including deaths among Swedish residents who died abroad. The register was started in 1952, and the data is considered complete since 1961. From that year and onward, cause of death is missing for less than 0.5% of deceased individuals, and in 2002, a validation study estimated that only 3.3% had any errors at the three-digit level of the ICD-coded underlying cause of death
Cancer register	A national register started in 1958. The coverage of the cancer register is estimated to more than 95%; the register contains data on date of diagnosis and type of incident cancers.

Supplementary Table S2. Definitions of cancer outcomes

Outcome definition	ICD10 codes from Cancer Register and Cause of Death Register
Malignant melanomas	ICD10: C43
Skin cancer NMSC (basal cell carcinoma and squamous cell carcinoma)	SCC = ICD7: 191 and snomed10: 80703 (Cancer register only) and basal cell cancers identified using the basal cell cancer registry. For a history of cancer where NMSC was removed ICD7=191 was used to identify NMSC
Invasive prostate cancer	ICD10: C61
Invasive testicular cancer	ICD10: C62
Invasive female breast cancer	ICD10: C50
All invasive hematopoietic cancer (leukemias, immunoproliferative-, myeloproliferative-, lymphoproliferative disease and lymphomas)	ICD10: C81, C82, C83, C84, C85, C90, C91, C92, C93, C94, C95
Malignant lymphomas	Non-Hodgkin lymphoma: C82, C83, C84, C85, C86, C88, C914. Hodgkin lymphoma C81. Chronic lymphocytic leukemia (CLL) C911, C913, C916
Invasive renal cancer	ICD10: C64
Invasive lung and pleura cancer	ICD10: C34, C38
Invasive colorectal cancer	ICD10: C18, C19, C20, C21
Invasive ovarian cancer	ICD10: C56
Invasive cervixcancer	ICD10: C53
Invasive urinary tract cancer	ICD10: C66, C67, C68
Invasive CNS cancer	ICD10: C70, C71
Invasive uterine cancer	ICD10: C54
Invasive ear, nose and throat cancer	ICD10: C09. C30, C31, C32, C33
Invasive digestive tract cancer (esophagus, ileum, jejunum, ventricle)	ICD10: C15, C16, C17,
Invasive pancreas cancer	ICD10: C25
Invasive liver and gallbladder cancer	ICD10: C22, C23, C24

Supplementary Table S3. Variable definitions including ATC and ICD codes used for comorbidities and drugs

Variable	Description
Baseline characteristics	
Age	Age at cohort entry (categorized according to quartiles for analysis)
Female	Indicator for sex of individual
Comorbidities	
History of cancer	History of cancer recorded within 5 years prior to cohort entry. Non-benign cancers excluding non-melanoma skin cancer (ICD7=191). Data retrieved from the Cancer Register. Indicator variable (Y/N).
History of diabetes	History of diabetes recorded in the 5 years recorded prior to cohort entry. Defined as a record in the National Patient Register (inpatient and outpatient components, ICD10: E10-E14) or dispensation of treatment (ATC: A10) in the Prescribed Drug Register. Indicator variable (Y/N).
History of heart failure	History of heart failure recorded in the 5 years recorded prior to cohort entry. Defined as record in National Patient Register (inpatient component, ICD10: I50). Indicator variable (Y/N).
History of ischemic heart disease	History of ischemic heart disease recorded in the 5 years recorded prior to cohort entry. Defined as record in National Patient Register (inpatient component, ICD10: I20-I25). Indicator variable (Y/N).
History of hospitalized infections	History of infections recorded in the 5 years prior to cohort entry. Defined as recorded in National Patient Register (inpatient component, ICD10: A00-B99, D73.3, E06.0, E32.1, G00-G02, G04.2, G05-G07, H00.0, H44.0, H60.0-H60.3, H66-H67, H70, I30.1, I40.0, J00-J22, J32, J34.0, J36, J38.3, J39.0-J39.1, J44.0, J85, J86, K04.4, K04.6, K04.7, K10.2, K11.3, K12.2, K14.0, K57.0, K57.2, K57.4, K57.8, K61, K63.0, K65.0, K65.1, K65.2, K65.9, L00-L08, L30.3, M00-M01, M46.2-M46.5, M60.0, M65.0, M71.0, M71.1, M72.6, M86, N10, N11, N12, N13.6, N15.1, N15.9, N30.0 N30.8, N34.0, N41.2, N43.1, N45.2, N45.3, N45.4, N48.2, N61, N70, N73, N75.1). Indicator variable (Y/N).
History of lung disease	History of lung disease other than infectious pneumonia recorded in the 5 years recorded prior to cohort entry. Defined as record in National Patient Register (inpatient and outpatient components, ICD10: J40-J94). Indicator variable (Y/N).
History of kidney failure	History of kidney failure recorded in the 5 years recorded prior to cohort entry. Defined as record in National Patient Register (inpatient and outpatient components, ICD10:N17-N19). Indicator variable (Y/N).
History of joint surgery	History of joint surgery recorded in the 10 years prior to cohort entry. Defined as record in National Patient Register (inpatient and outpatient components, operational codes: NGB, NFB, NBB, NHB, NHC,

	NHE, NHF, NHG, 8423, 8424, 8426, 8419, 8437, 8436, 8420, 8421, 8422, 8400-8415). Indicator variable (Y/N).
History of VTE	I80-I82 and I26. Defined as record in National Patient Register (inpatient and outpatient components), in the 5 years prior to treatment initiation/cohort entry.
History of Stroke	I50-I69. Defined as record in National Patient Register (inpatient and outpatient components), in the 5 years prior to treatment initiation/cohort entry.
History of NMSC	ICD7 191. Defined as any previous diagnosis of NMSC in the Swedish Cancer Register (both benign and non-benign NMSC).
Socioeconomics	
Education	Highest education achieved as recorded in the year prior to cohort entry. Data obtained from the Longitudinal integrated database for health insurance and labor market studies (LISA). Categorized into <12 years or ≥12 years.
Civil status	Civil status recorded in the year prior to cohort entry. Categorized into married/partner, or single.
Disease-related	
Disease duration	Calculated as the difference between the disease debut date and cohort entry. Categorized as <5 years and ≥5 years in statistical analyses
Seropositivity	Indicator for seropositive disease (versus seronegative/unknown). Calculated using RF and ACPA values in the SRQ diagnoses.
DAS28CRP	Taken from the visit closest to cohort entry within -60 and +15 days. Categorized into quartiles.
Smoker	Taken from SRQ visit information using a window of -5 years to +30 days of cohort entry. Indicator variable: smoker or non-smoker.
CRP	Taken from the visit closest to cohort entry within -60 and +15 days. Categorized as: <5, 5-9, 10-19, ≥20.
Number of previous biologics	Calculated using all available b/tsDMARD (biological/targeted synthetic disease modifying anti rheumatic drugs) information from the SRQ, since its inception in 1999. Categorized into 0, 1-2 and ≥3 for inclusion in statistical analyses.
Treatment-related	
b/tsDMARDs	Etanercept: L04AB01, Adalimumab: L04AB04, Certolizumab pegol: L04AB05, Infliximab: L04AB02, Golimumab: L04AB06, Rituximab: L01XC02, Abatacept: L04AA24, Tocilizumab: L04AC07, Baracitinib: L04AA37, Tofacitinib: L04AA29, Upadacitinib L04AA44, Sarilumab L04AC14
csDMARD	Sulfasalazine: A07EC01, Leflunomide: L04AA13, Cyclosporine: L04AD01, Azathioprine: L04AX01, Methotrexate: L04AX03, L01BA01, Hydroxychloroquine and Chloroquine P01BA01, P01BA02

Concomitant steroid use	Dispensation of steroids (ATC: H02AB06) recorded in the Prescribed Drug Register in the 183 days prior to cohort entry.
Concomitant methotrexate use	Concomitant methotrexate use defined as dispensation of recorded in the Prescribed Drug Register within the 183 days prior to cohort entry where the dispensation occurs after the order date of the treatment defining the exposure cohort (ATC code: L04AX03)
Concomitant csDMARD use	Concomitant csDMARD use defined as dispensation of csDMARD recorded in the Prescribed Drug Register within the 90 days prior to cohort entry (ATC codes: L04AX01, A07EC01, L04AD01, P01BA01, M01CB01, L04AA06, L01AA01, P01BA02, L04AA13, M01CB03) Note methotrexate is not included here.
Prednisolone treatment prior 1 year	Total milligrams of prednisolone dispensed during a 1 year look back. Dispensations recorded in the prescribed drug register (ATC H02AB06)
Prednisolone treatment prior 1 year categorized	Daily prednisolone (defined as above divided by 365.25) categorized into 0, 1-5,6-10, ≥10
Lipid lowering drug use	Dispensation of ATC C10A, C10B recorded in 183 days prior to cohort entry.

Supplementary table S4. Inclusion criteria for the cardiovascular risk factor enriched subset of the RA treatment cohorts

Patients aged 50 or older at treatment initiation

At least one cardiovascular disease risk (CVD) factor:

1. Hypertension diagnosis in the past 5 years (National Patient Register)
2. Dispensation of a lipid-lowering drug in the past 183 days (Prescribed Drug Register ATC=C10A, C10B)
3. History of diabetes in the past 5 years (both National Patient Register and Prescribed Drug Register)
4. History of CVD in the past 5 years (ICD10 I20-I25)
   Family history of CVD ever. For female first-degree relatives: events that occur at age 65 or younger. For male first-degree relatives: events that occur at age 55 or younger (Total Population Register for selecting relatives, CVD from inpatient records with ICD10 I20-I25, plus main cause of death I00-I99)

No hospitalised infection recorded in the previous 6 months (inpatient component of the National Patient Register)

No previous cancer diagnosis ever (Swedish Cancer Register)

Supplementary table S5. Baseline characteristics of the study cohorts of Swedish patients with psoriatic arthritis by treatment status

	JAKis				Non-TNFi	TNFi	General population
	Tofacitinib	**Baricitinib**	**Upadacitinib**	**All JAKis**			
Individuals	305	83	7	379	185	4186	21 285
Age years, median (IQR)	52 (45–61)	54 (47–63)	48 (41–54)	52 (45–61)	54 (45–62)	50 (41–59)	49 (41–59)
Female, %	71%	70%	71%	71%	71%	55%	54%
Median follow-up, years	1.49	1.98	0.40	1.52	2.25	2.44	2.56
Total person time at risk, years	426	156	3	585	418	12623	54005
Disease-related							
Disease duration years, median (IQR)	12.2 (6.5–19.1)	13.9 (7.8–18.4)	16.8 (11.3–19.8)	12.7 (6.8–19.0)	12.4 (6.5–19.4)	8.2 (3.6–15.5)	
Seropositivity, %	0%	0%	0%	0%	0%	0%	
DAS28CRP, median (IQR)	4.2 (3.75.0)	4.0 (3.0–4.5)	4.3 (4.3–4.7)	4.1 (3.5–4.9)	4.2 (3.4–5.1)	3.8 (3.0–4.5)	
DAS28CRP missing, %	48%	52%	29%	49%	54%	51%	
CRP <5, %	50%	55%	80%	52%	47%	58%	
CRP5-9, %	15%	14%	0%	15%	17%	18%	
CRP 10-19, %	17%	14%	0%	16%	17%	14%	
CRP ≥20, %	18%	18%	20%	18%	19%	10%	
CRP missing, %	33%	39%	29%	34%	42%	38%	
Smoker, %	57%	62%	80%	58%	59%	55%	
Smoking missing, %	14%	18%	29%	15%	20%	38%	
0 previous b/tsDMARDs	7%	8%	(n/a)	7%	11%	65%	
1-2 previous b/tsDMARDs	41%	35%	29%	40%	41%	30%	
3+ previous b/tsDMARDs	52%	57%	71%	53%	48%	5%	
Treatment-related							

Concomitant steroid use, %	43%	49%	43%	45%	53%	34%	2%
Concomitant methotrexate use, %	36%	40%	43%	37%	39%	50%	0%
Prednisolone use mg prior 1 year, %	2.7 (1.4–5.5)	3.5 (1.4–5.6)	4.2 (2.8–5.6)	2.7 (1.4–5.5)	4.1 (1.4–7.0)	2.7 (1.4–4.2)	1.4 (0.7–4.1)
Comorbidities (previous 5 years), %							
History of diabetes type 1 and 2	14%	11%	0%	13%	12%	8%	6%
History of ischemic heart disease	5%	4%	14%	5%	7%	2%	1%
History of hospitalized infections	13%	15%	0%	13%	13%	6%	2%
History of Chronic obstructive pulmonary disease	8%	7%	0%	8%	9%	5%	2%
History of kidney failure	2%	1%	0%	2%	7%	1%	1%
History of heart failure	1%	4%	0%	1%	1%	1%	1%
History of stroke	4%	8%	29%	5%	4%	2%	2%
History of VTE	2%	2%	0%	2%	4%	2%	1%
History of joint surgery	5%	8%	14%	6%	9%	3%	1%
History of hypertension	13%	7%	29%	12%	13%	7%	4%
History of NMSC	1%	2.4%	0%	1.3%	0.5%	0.5%	0.4%
Drug dispensations (previous 6 months), %							
Lipid lowering	13%	12%	0%	13%	17%	11%	9%

Other measures of comorbidities/health							
Hospital days in the previous year	6 (4–11)	15 (6–18)	. (.-.)	7 (4–15)	8 (3–18)	5 (3–11)	4 (2–12)
Sick leave in the previous year, %	23%	23%	0%	23%	19%	20%	8%
Disability pension in the previous year, %	2%	1%	0%	2%	0%	1%	0%
Socioeconomics							
Education >12 years, %	35%	28%	43%	33%	33%	34%	40%
Married/partner, %	50%	55%	71%	51%	46%	49%	46%

Abbreviations: RA, rheumatoid arthritis; CRP, C-reactive protein, VTE, venous thromboembolism; NMSC, non-melanoma skin cancer; b/tsDMARD, biologic/targeted synthetic disease modifying anti-rheumatic drug; TNFi, Tumor necrosis factor inhibitor; JAKi, Janus kinase inhibitor, DAS28CRP, disease activity score 28 C-reactive protein; IQR, interquartile range (25^{th} percentile – 75^{th} percentile).

Supplementary table S6. Hazard Ratios (HR1-4), events, crude and standardized incidence rates, for all cancers other than NMSC and for cancer sites where at least five incident events were observed in the JAK cohort, in Swedish patients with RA treated with JAKi, non-TNFi bDMARDs, or TNFi

Cohort	Events	Crude incidence rate	Standardized incidence rate	HR1*	HR2*	HR3*	HR4*
All cancers other than NMSC							
JAKi	38	9.5	8.3	0.93 (0.64 to 1.35)	0.84 (0.57 to 1.25)	0.65 (0.34 to 1.23)	0.94 (0.65 to 1.38)
Tofacitinib	8	10.1	11.2	1.13 (0.55 to 2.33)	0.95 (0.44 to 2.08)	1.04 (0.35 to 3.10)	1.08 (0.52 to 2.24)
Baricitinib	30	9.4	8.0	0.90 (0.60 to 1.35)	0.82 (0.54 to 1.26)	0.56 (0.27 to 1.16)	0.92 (0.61 to 1.38)
Non-TNFi bDMARD*	141	12.8	10.5	1.17 (0.93 to 1.47)	1.09 (0.86 to 1.38)	1.29 (0.89 to 1.85)	1.12 (0.88 to 1.43)
TNFi	213	10.1	10.1	1.0 (Reference)	1.0 (Reference)	1.0 (Reference)	1.0 (Reference)
General population	1245	9.7	9.2	0.86 (0.73 to 1.01)	0.90 (0.76 to 1.07)	n/a	n/a
NMSC							
All JAKi	59	14.9	12.9	1.41 (1.03 to 1.92)	1.39 (1.02 to 1.90)	1.56 (0.96 to 2.56)	1.39 (1.01 to 1.91)
- Tofacitinib	11	14.1	14.9	-	-	-	-
- Baricitinib	48	15.2	12.5	-	-	-	-
Non-TNFi bDMARD*	126	11.4	9.0	1.03 (0.81 to 1.31)	1.03 (0.81 to 1.32)	1.22 (0.83 to 1.79)	1.00 (0.78 to 1.28)
TNFi	189	9.0	9.0	1.0 (Reference)	1.0 (Reference)	1.0 (Reference)	1.0 (Reference)
General population	852	6.6	6.2	0.71 (0.59 to 0.85)	0.71 (0.59 to 0.86)	n/a	n/a
Breast cancer							
All JAKi	7	1.7	1.6	0.68 (0.28 to 1.65)	0.67 (0.27 to 1.66)	0.85 (0.22 to 3.27)	0.73 (0.29 to 1.86)
- Tofacitinib	1	1.3	-	-	-	-	-
- Baricitinib	6	1.9	1.7	-	-	-	-
Non-TNFi bDMARD*	23	2.1	1.9	0.87 (0.50 to 1.52)	0.79 (0.44 to 1.43)	1.09 (0.45 to 2.65)	0.88 (0.48 to 1.61)

TNFi	42	2.0	2.0	1.0 (Reference)	1.0 (Reference)	1.0 (Reference)	1.0 (Reference)
General population	262	2.0	2.0	1.07 (0.72 to 1.59)	1.12 (0.75 to 1.68)	n/a	n/a
All Hematopoetic							
All JAKi	6	1.5	1.5	1.76 (0.67 to 4.60)	1.74 (0.66 to 4.61)	1.29 (0.28 to 6.04)	1.90 (0.70 to 5.16)
- Tofacitinib	1	1.3	-	-	-	-	-
- Baricitinib	5	1.6	1.6	-	-	-	-
Non-TNFi bDMARD*	12	1.1	0.9	1.03 (0.51 to 2.10)	1.03 (0.51 to 2.08)	1.13 (0.38 to 3.37)	1.04 (0.48 to 2.25)
TNFi	22	1.0	1.0	1.0 (Reference)	1.0 (Reference)	1.0 (Reference)	1.0 (Reference)
General population	99	0.8	0.7	0.66 (0.39 to 1.11)	0.69 (0.40 to 1.17)	n/a	n/a
Lung cancer							
All JAKi	7	1.7	1.5	1.58 (0.70 to 3.53)	0.84 (0.31-2.27)	0.46 (0.05 to 4.36)	1.15 (0.57 to 2.32)
- Tofacitinib	2	2.5	-	-	-	-	-
- Baricitinib	5	1.6	1.2	-	-	-	-
Non-TNFi bDMARD*	11	1.0	0.7	0.68 (0.34 to 1.36)	0.54 (0.27-1.10)	0.80 (0.32 to 1.97)	0.59 (0.31 to 1.15)
TNFi	30	1.4	1.4	1.0 (Reference)	1.0 (Reference)	1.0 (Reference)	1.0 (Reference)
General population	111	0.9	0.8	0.53 (0.34 to 0.83)	0.57 (0.35-0.93)	n/a	n/a

Abbreviations: TNFi; tumor necrosis factor inhibitor, JAKi; janus kinas inhibitor, *Non-TNFI bDMARD includes rituximab, abatacept, tocilizumab.
Incidence rates presented per 1,000 person-years.

***** HR1: adjusted for age, sex, line of therapy (for these variables, there was no missingness)
*****HR2: as HR1 but adjusted for comorbidities and SES (for these variables, there was no missingness)
*****HR3: as HR2 but additionally adjusted for disease-related factors, complete case approach
*****HR4: as HR3 but with missing categories included for those variables with missing information
n/a presented where analyses not performed (due to disease-related factors not being available for the general population comparator)

Supplementary table S7. Number of incident BCC and SCC events contributing to the NMSC outcome, by cohort

Cohort	NMSC events	BCC events	SCC events
JAKi	59	51	8
Tofacitinib	11	11	0
Baricitinib	48	40	8
Non-TNFi bDMARD*	126	108	19
TNFi	189	158	31
General population	852	776	76

Abbreviations: NMSC; non-melanoma skin cancer, BCC; basal cell carcinoma (BCC), SCC; squamous cell carcinomas, TNFi; tumor necrosis factor inhibitor, JAKi; janus kinas inhibitor, *Non-TNFI bDMARD includes rituximab, abatacept, tocilizumab

Supplementary table S8. Distribution of events across cohort and history of NMSC

Cohort	Events overall	Events, history of NMSC (% of overall)
All cancers other than NMSC		
All JAKi	38	2 (5)
-Tofacitnib	8	0 (0)
- Baricitinib	30	2 (7)
Non-TNFi bDMARD †	141	6 (4)
TNFi	213	7 (3)
General population	1245	30 (2)
NMSC		
All JAKi	59	7 (12)
-Tofacitnib	11	0 (0)
- Baricitinib	48	7 (15)
Non-TNFi bDMARD †	126	20 (16)
TNFi	189	24 (13)
General population	852	74 (9)

Abbreviations: NMSC; non-melanoma skin cancer, BCC; basal cell carcinoma (BCC), SCC; squamous cell carcinomas, TNFi; tumor necrosis factor inhibitor, JAKi; janus kinas inhibitor, *Non-TNFI bDMARD includes rituximab, abatacept, tocilizumab

Supplementary table S9. Hazard Ratios (HR1-4) for all cancers other than NMSC, and NMSC, in patients with RA treated with; JAKis, non-TNFis and TNFis by time since treatment initiation

	HR1*	HR2*	HR3*	HR4*
All cancers other than NMSC				
0-1 year				
JAKi	1.01 (0.60 to 1.67)	0.85 (0.48 to 1.48)	0.62 (0.26 to 1.50)	0.96 (0.58 to 1.59)
Non-TNFi	1.19 (0.83 to 1.72)	1.09 (0.74 to 1.59)	1.34 (0.78 to 2.30)	1.11 (0.77 to 1.61)
TNFi	1.0 (Reference)	1.0 (Reference)	1.0 (Reference)	1.0 (Reference)
1-2 years				
JAKi	0.67 (0.32 to 1.42)	0.66 (0.31 to 1.40)	0.32 (0.07 to 1.40)	0.67 (0.32 to 1.43)
Non-TNFi	1.26 (0.82 to 1.95)	1.16 (0.74 to 1.81)	1.21 (0.62 to 2.38)	1.25 (0.80 to 1.96)
TNFi	1.0 (Reference)	1.0 (Reference)	1.0 (Reference)	1.0 (Reference)
2 or more years				
JAKi	1.35 (0.67 to 2.71)	1.30 (0.64 to 2.62)	1.20 (0.44 to 3.30)	1.36 (0.67 to 2.75)
Non-TNFi	1.05 (0.73 to 1.50)	1.00 (0.70 to 1.43)	1.30 (0.78 to 2.15)	1.06 (0.74 to 1.53)
TNFi	1.0 (Reference)	1.0 (Reference)	1.0 (Reference)	1.0 (Reference)
NMSC				
0-1 year				
JAKi	1.09 (0.69 to 1.73)	1.11 (0.70 to 1.77)	1.24 (0.64 to 2.41)	1.12 (0.70 to 1.78)
Non-TNFi	0.85 (0.57 to 1.25)	0.85 (0.57 to 1.27)	1.06 (0.60 to 1.86)	0.85 (0.57 to 1.26)
TNFi	1.0 (Reference)	1.0 (Reference)	1.0 (Reference)	1.0 (Reference)
1-2 years				
JAKi	1.44 (0.84 to 2.45)	1.39 (0.81 to 2.39)	2.55 (1.13 to 5.78)	1.48 (0.87 to 2.51)
Non-TNFi	1.42 (0.95 to 2.14)	1.47 (0.98 to 2.22)	1.89 (0.95 to 3.75)	1.43 (0.95 to 2.15)
TNFi	1.0 (Reference)	1.0 (Reference)	1.0 (Reference)	1.0 (Reference)
2 or more years				

JAKi	2.11 (1.15 to 3.87)	2.08 (1.14 to 3.82)	1.29 (0.42 to 3.91)	2.12 (1.15 to 3.89)
Non-TNFi	0.86 (0.57 to 1.30)	0.87 (0.58 to 1.32)	1.03 (0.56 to 1.91)	0.86 (0.57 to 1.31)
TNFi	1.0 (Reference)	1.0 (Reference)	1.0 (Reference)	1.0 (Reference)

Abbreviations: TNFi; tumor necrosis factor inhibitor, JAKi; janus kinase inhibitor, Non-TNFI includes rituximab, abatacept, tocilizumab.

* HR1: adjusted for age, sex, line of therapy (for these variables, there was no missingness)
*HR2: as HR1 but adjusted for comorbidities and SES (for these variables, there was no missingness)
*HR3: as HR2 but additionally adjusted for disease-related factors, complete case approach
*HR4: as HR3 but with missing categories included for those variables with missing information

Supplementary table S10. Events, crude and standardized rates and fully adjusted hazard ratio (HR) estimated from Cox proportional hazards models for all cancers other than NMSC and for NMSC, in patients with RA initiating treatment with a JAKi, a non-TNFi or TNFi by previous number of b/tsDMARDs

	Events	Crude incidence rate per 1,000 person-years	Standardized incidence rate per 1,000 person-years	Fully adjusted HR*
All cancers other than NMSC				
0 previous b/tsDMARDs				
JAKi	7	14.8	13.0	1.05 (0.48 to 2.31)
Non-TNFi	41	18.0	11.8	1.12 (0.76 to 1.65)
TNFi	143	10.7	10.7	1.0 (Reference)
1-2 previous b/tsDMARDs				
JAKi	10	7.06	6.1	0.79 (0.40 to 1.56)
Non-TNFi	67	12.3	10.1	1.32 (0.91 to 1.91)
TNFi	58	8.6	8.6	1.0 (Reference)
3 or more previous b/tsDMARDs				
JAKi	21	10.0	9.0	1.11 (0.51 to 2.39)
Non-TNFi	33	9.9	8.3	1.04 (0.51 to 2.09)
TNFi	12	9.6	89.6	1.0 (Reference)
NMSC				

0 previous b/tsDMARDs				
JAKi	6	12.7	6.0	0.99 (0.44 to 2.23)
Non-TNFi	34	15.0	10.0	1.23 (0.82 to 1.85)
TNFi	117	8.8	8.8	1.0 (Reference)
1-2 previous b/tsDMARDs				
JAKi	17	12.1	11.4	1.10 (0.63 to 1.91)
Non-TNFi	62	11.4	9.2	0.91 (0.63 to 1.30)
TNFi	63	9.7	9.7	1.0 (Reference)
3 or more previous b/tsDMARDs				
JAKi	36	17.3	16.0	2.49 (1.15 to 5.43)
Non-TNFi	30	9.0	8.7	1.24 (0.58 to 2.64)
TNFi	9	7.2	7.2	1.0 (Reference)

Abbreviations: TNFi; tumor necrosis factor inhibitor, JAKi; janus kinase inhibitor, Non-TNFI includes rituximab, abatacept, and tocilizumab. Fully adjusted HR: adjusted for age, sex, line of therapy, for comorbidities, SES, disease-related factors and with missing categories included for those variables with missing information. Estimated from a proportional hazards Cox regression model. Standardized incidence rate standardized to the age- and sex- distribution in the TNFi cohort.

Supplementary table S11. Fully adjusted hazard ratios estimated from Cox proportional hazards models comparing the rate of site-specific cancer for JAKi and non-TNFi, versus TNFi in patients with RA for both the main analysis, and when applying a 90-day latency period

Cohort	**Main analysis:** start of follow-up immediately after initiating treatment	**Latency period:** Start of follow up 90 days after initiating treatment
	Fully adjusted HR*	**Fully adjusted HR***
All cancers		
JAKi	0.94 (0.65 to 1.38)	0.84 (0.55 to 1.27)
Non-TNFi	1.12 (0.88 to 1.43)	1.12 (0.87 to 1.45)
TNFi	1.0 (Reference)	1.0 (Reference)
NMSC		
JAKi	1.39 (1.01 to 1.91)	1.38 (0.98 to 1.94)
Non-TNFi	1.00 (0.78 to 1.28)	1.01 (0.78 to 1.31)
TNFi	1.0 (Reference)	1.0 (Reference)
Breast cancer		
JAKi	0.73 (0.29 to 1.86)	0.55 (0.18 to 1.67)
Non-TNFi	0.88 (0.48 to 1.61)	0.86 (0.46 to 1.60)
TNFi	1.0 (Reference)	1.0 (Reference)
All Hematopoetic		
JAKi	1.90 (0.70 to 5.16)	1.65 (0.52 to 5.26)
Non-TNFi	1.04 (0.48 to 2.25)	0.99 (0.45 to 2.15)
TNFi	1.0 (Reference)	1.0 (Reference)
Lung cancer		
JAKi	1.15 (0.57 to 2.32)	0.99 (0.41 to 2.35)
Non-TNFi	0.59 (0.31 to 1.15)	0.55 (0.27 to 1.09)
TNFi	1.0 (Reference)	1.0 (Reference)

Abbreviations: TNFi; tumor necrosis factor inhibitor, JAKi; janus kinase inhibitor, Non-TNFI includes rituximab, abatacept, and tocilizumab.

Fully adjusted HR: adjusted for age, sex, line of therapy, for comorbidities, SES, disease-related factors and with missing categories included for those variables with missing information. Estimated from proportional hazards Cox regression models.

Supplementary Table S12. Alternative definition of follow-up from the main analysis "ever-exposed" to a "on-drug". Number of events, crude and standardized incidence rates and hazard ratios (HR), for all cancers other than NMSC and NMSC in Swedish patients with RA treated with JAKi, non-TNFi bDMARDs, or TNFi. Also, fully adjusted HR for ever-exposed analysis (fully presented in Table 2)

Cohort	Events	Crude incidence rate per 1,000 person-years	Standardized incidence rate per 1,000 person-years	On-drug analysis Fully adjusted HR*	Ever-exposed analysis Fully adjusted HR* presented in Table 2.
All cancers other than NMSC					
All JAKi	27	9.9	8.5	1.01 (0.64 to 1.58)	0.94 (0.65 to 1.38)
- Tofacitinib	4	8.7	10.4	0.99 (0.36 to 2.73)	1.08 (0.52 to 2.24)
- Baricitinib	23	10.1	8.7	1.01 (0.64 to 1.62)	0.92 (0.61 to 1.38)
Non-TNFi bDMARD †	95	14.0	11.0	1.20 (0.89 to 1.62)	1.12 (0.88 to 1.43)
TNFi	139	10.0	10.0	1.0 (Reference)	1.0 (Reference)
General population	1245	9.7	9.4	n/a	n/a
NMSC					
All JAKi	41	15.1	13.2	1.35 (0.91 to 1.99)	1.39 (1.01 to 1.91)
- Tofacitinib	6	13.3	13.0	1.32 (0.56 to 3.12)	1.56 (0.83 to 2.92)
- Baricitinib	35	15.6	13.0	1.36 (0.90 to 2.04)	1.37 (0.97 to 1.92)
Non-TNFi bDMARD †	74	10.9	8.0	0.83 (0.61 to 1.14)	1.00 (0.78 to 1.28)
TNFi	129	9.4	9.4	1.0 (Reference)	1.0 (Reference)
General population	852	6.6	6.4	n/a	n/a

Abbreviations: TNFi; tumor necrosis factor inhibitor, JAKi; janus kinas inhibitor, † Non-TNFI bDMARD includes rituximab, abatacept, tocilizumab. n/a: analyses not performed

*****Fully adjusted HR: adjusted for age, sex, line of therapy, for comorbidities, SES, disease-related factors and with missing categories included for those variables with missing information. Estimated from Cox proportional hazards models. Standardized incidence rate standardized to the age- and sex- distribution in the TNFi cohort. - is displayed when too few events (<5) were observed

Supplementary Table 13. Fully adjusted HR (presented in Table 2) and fully adjusted HR after multiple imputation for all cancers other than NMSC in Swedish patients with RA treated with JAKi, non-TNFi bDMARDs, or TNFi.

Cohort	Fully adjusted HR* presented in Table 2	Fully adjusted HR after multiple imputation**
All cancers other than NMSC		
All JAKi	0.94 (0.65 to 1.38)	0.93 (0.64 to 1.36)
- Tofacitinib	1.08 (0.52 to 2.24)	1.09 (0.52 to 2.29)
- Baricitinib	0.92 (0.61 to 1.38)	0.91 (0.60 to 1.36)
Non-TNFi bDMARD †	1.12 (0.88 to 1.43)	1.11 (0.87 to 1.42)
TNFi	1.0 (Reference)	1.0 (Reference)
General population	n/a	n/a

Abbreviations: TNFi; tumor necrosis factor inhibitor, JAKi; janus kinas inhibitor, † Non-TNFI bDMARD includes rituximab, abatacept, tocilizumab. n/a: analyses not performed

*****Fully adjusted HR: adjusted for age, sex, line of therapy, for comorbidities, SES, disease-related factors and with missing categories included for those variables with missing information. Estimated from Cox proportional hazards models. Standardized incidence rate standardized to the age- and sex- distribution in the TNFi cohort. - is displayed when too few events (<5) were observed

**multiple imputation using chained equations performed with 30 repetitions for variables with missing information (DAS28CRP, CRP using multinomial logistic regression; disease duration, smoking, civil status and education using logistic regression). Imputation models were adjusted for all covariates included in the analysis model plus the event indicator and the Nelson-Aalen estimate of the cumulative hazard.

Supplementary Table 14. Fully adjusted HR (presented in Table 2) and fully adjusted HR after sensitivity analysis restricting the follow-up to Feb 2020 (COVID Pandemic), for all cancers other than NMSC in Swedish patients with RA treated with JAKi, non-TNFi bDMARDs, or TNFi.

Cohort	Fully adjusted HR* presented in Table 2	Fully adjusted HR * after sensitivity analysis
All cancers other than NMSC		
All JAKi	0.94 (0.65 to 1.38)	0.78 (0.48 to 1.26)
- Tofacitinib	1.08 (0.52 to 2.24)	0.92 (0.37 to 2.33)
- Baricitinib	0.92 (0.61 to 1.38)	0.74 (0.44 to 1.26)
Non-TNFi bDMARD †	1.12 (0.88 to 1.43)	1.14 (0.86 to 1.51)
TNFi	1.0 (Reference)	1.0 (Reference)
General population	n/a	n/a

Abbreviations: TNFi; tumor necrosis factor inhibitor, JAKi; janus kinas inhibitor, † Non-TNFI bDMARD includes rituximab, abatacept, tocilizumab. n/a: analyses not performed

*****Fully adjusted HR: adjusted for age, sex, line of therapy, for comorbidities, SES, disease-related factors and with missing categories included for those variables with missing information. Estimated from Cox proportional hazards models. Standardized incidence rate standardized to the age- and sex- distribution in the TNFi cohort. - is displayed when too few events (<5) were observed

Supplementary Table S15. Events, crude and standardized rates and fully adjusted hazard ratio (HR) estimated from Cox proportional hazards models for cancers other than NMSC in a cardiovascular risk-factor enriched subset (defined in supplementary Table S4)

Cohort	Events	Crude incidence rate	Standardized incidence rate	HR1*	HR2*	HR3*	HR4*
All JAKi	17	15.5	14.7	1.04 (0.59 to 1.84)	1.01 (0.56 to 1.82)	0.60 (0.20 to 1.82)	1.03 (0.58 to 1.82)
- Tofacitinib	3	14.2	-	-	-	-	-
- Baricitinib	14	15.8	13.9	1.01 (0.55 to 1.86)	0.98 (0.52 to 1.84)	0.37 (0.09 to 1.56)	1.01 (0.55 to 1.85)
Non-TNFi	61	19.7	18.2	1.16 (0.81 to 1.66)	1.05 (0.73 to 1.52)	1.33 (0.74 to 2.41)	1.12 (0.76 to 1.63)
TNFi	79	17.5	17.5	1.0 (Reference)	1.0 (Reference)	1.0 (Reference)	1.0 (Reference)

Abbreviations: TNFi; tumor necrosis factor inhibitor, JAKi; janus kinase inhibitor, Non-TNFI includes rituximab, abatacept, or tocilizumab.
Incidence rates presented per 1,000 person-years.
*HR1: adjusted for age, sex, line of therapy (for these variables, there was no missingness)
*HR2: as HR1 but adjusted for comorbidities and SES (for these variables, there was no missingness)
*HR3: as HR2 but additionally adjusted for disease-related factors, complete case approach
*HR4: as HR3 but with missing categories included for those variables with missing information

- Is displayed when too few events (<5) were observed

Supplementary table S16. Hazard Ratios (HR1-4), events, crude and standardized incidence rates and hazard ratios (HR) for all cancers other than NMSC and NMSC in Swedish patients with PsA treated with JAKi

Cohort	Events	Crude incidence rate	Standardized incidence rate	HR1*	HR2*	HR3*	HR4*
All cancers other than NMSC							
JAKi	5	8.6	7.3	1.64 (0.61 to 4.37)	1.69 (0.63 to 4.49)	1.11 (0.14 to 8.64)	1.88 (0.68 to 5.16)
Non-TNFi	2	4.8	-	-	-	-	-
TNFi	73	5.8	5.8	1.0 (Reference)	1.0 (Reference)	1.0 (Reference)	1.0 (Reference)
Gen population	317	5.9	6.0	0.87 (0.66 to 1.16)	0.93 (0.70 to 1.23)	n/a	n/a
NMSC							
JAKi	8	13.9	11.7	2.27 (0.98 to 5.25)	2.40 (1.02 to 5.63)	1.82 (0.52 to 6.40)	2.05 (0.79 to 5.31)
Non-TNFi	2	4.8	-	-	-	-	-
TNFi	73	5.8	5.8	1.0 (Reference)	1.0 (Reference)	1.0 (Reference)	1.0 (Reference)
Gen population	209	3.9	3.9	0.70 (0.51 to 0.96)	0.70 (0.51 to 0.97)	n/a	n/a

Abbreviations: TNFi; tumor necrosis factor inhibitor, JAKi; janus kinas inhibitor, Non-TNFI includes rituximab, abatacept, and tocilizumab.
Incidence rates presented per 1,000 person-years.
*HR1: adjusted for age, sex, line of therapy (for these variables, there was no missingness)
*HR2: as HR1 but adjusted for comorbidities and SES (for these variables, there was no missingness)
*HR3: as HR2 but additionally adjusted for disease-related factors, complete case approach
*HR4: as HR3 but with missing categories included for those variables with missing information
n/a presented where analyses not performed (due to disease-related factors not being available for the general population comparator)

- Is displayed when too few events (<5) were observed