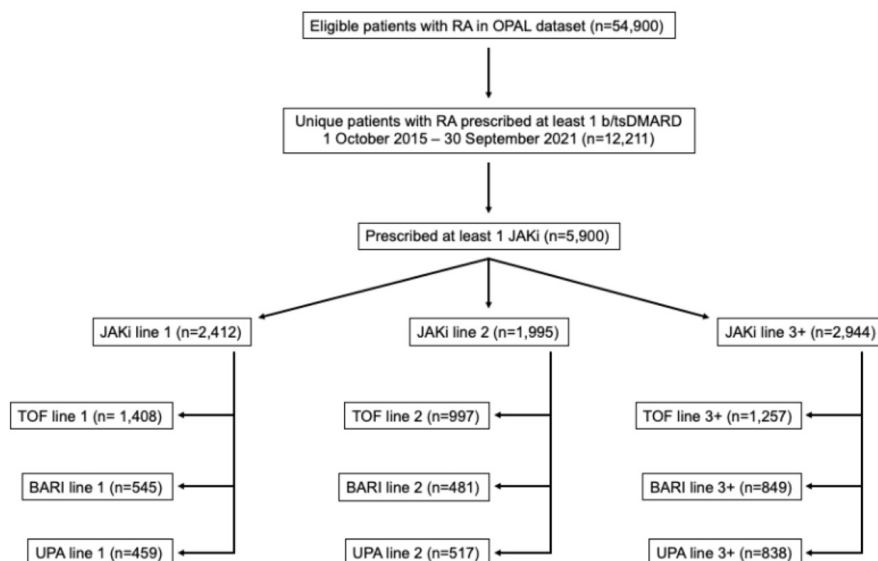


Supplementary Fig. S1. Distribution of the difference in time (months) of the non-missing baseline DAS28CRP timepoint used as the baseline DAS28CRP value, showing these differences are clustered around 0. 87.5% of timepoints contributing a non-missing DAS28CRP were the baseline timepoint, while 96.0% were within 2 weeks either side of baseline.



Supplementary Fig. S2. Flow diagram to illustrate the inclusion and exclusion of patients. Note that patients may have been prescribed with more than one b/tsDMARD and more than one JAKi. Patients were not excluded if they had missing data.

Supplementary Table S1. List of pre-existing comorbidities and ICD10 codes used.

Category	Condition	ICD10 Code	Category	Condition	ICD10 Code
Cardiac	Unstable angina	I20.0	Melanoma	Melanoma in situ of other and unspecified parts of face	D03.3
Cardiac	Angina pectoris with documented spasm	I20.1	Melanoma	Melanoma in situ of scalp and neck	D03.4
Cardiac	Other forms of angina pectoris	I20.8	Melanoma	Melanoma in situ of trunk	D03.5
Cardiac	Angina	I20.9	Melanoma	Melanoma in situ of upper limb, including shoulder	D03.6
Cardiac	Anterior STEMI (ST-elevation myocardial infarct)	I21.0	Melanoma	Melanoma in situ of lower limb, including hip	D03.7
Cardiac	Inferior STEMI (ST-elevation myocardial infarct)	I21.1	Melanoma	Melanoma in situ of other sites	D03.8
Cardiac	Acute ST-elevation myocardial infarct (STEMI)	I21.3	Melanoma	Melanoma in situ	D03.9
Cardiac	Acute non ST-elevation myocardial infarction (NSTEMI)	I21.4	Melanoma	Malignant melanoma of lip	C43.0
Cardiac	Acute myocardial infarction	I21.9	Melanoma	Malignant melanoma of eyelid, including canthus	C43.1
Cardiac	Subsequent myocardial infarction of inferior wall	I22.1	Melanoma	Malignant melanoma of ear and external auricular canal	C43.2
Cardiac	Subsequent myocardial infarction	I22.9	Melanoma	Malignant melanoma of other and unspecified parts of face	C43.3
Cardiac	Acute coronary syndrome	I24.9	Melanoma	Malignant melanoma of scalp and neck	C43.4
Cardiac	Atherosclerotic cardiovascular disease	I25.0	Melanoma	Malignant melanoma of trunk	C43.5
Cardiac	Atherosclerotic heart disease	I25.10	Melanoma	Malignant melanoma of upper limb, including shoulder	C43.6
Cardiac	Atherosclerotic heart disease, of autologous bypass graft	I25.12	Melanoma	Malignant melanoma of lower limb, including hip	C43.7
Cardiac	Old myocardial infarction	I25.2	Melanoma	Malignant melanoma of skin	C43.9
Cardiac	Ischaemic cardiomyopathy	I25.5	Melanoma	Metastatic melanoma	C43.9
Cardiac	Silent myocardial ischaemia	I25.6	Lung cancer	Cancer of upper lobe, bronchus or lung	C34.1
Cardiac	Other chronic ischaemic heart disease	I25.8	Lung cancer	Cancer of lower lobe, bronchus or lung	C34.3
Cardiac	Coronary artery disease	I25.9	Lung cancer	Lung cancer	C34.9
Cardiac	Coronary artery bypass graft/s	Z95.1	Lung cancer	Non small cell lung cancer	C34.9
Cardiac	Coronary artery angioplasty and stent/s	Z95.5	Lung cancer	Non small cell lung cancer - local	C34.9
Hypertension	Essential hypertension	I10	Lung cancer	Non small cell lung cancer - locally advanced	C34.9
Hypertension	Hypertension	I10	Lung cancer	Non small cell lung cancer - metastatic	C34.9
Hypertension	Isolated systolic hypertension	I10	Lung cancer	Small cell lung cancer - extensive disease	C34.9
Hypertension	Malignant hypertension	I10	Lung cancer	Small cell lung cancer - limited disease	C34.9
Hypertension	Hypertensive heart disease with heart failure	I11.0	Breast cancer	Breast cancer	C50.9
Hypertension	Hypertensive heart disease	I11.9	Breast cancer	Breast cancer - chest wall recurrence	C50.9
Hypertension	Hypertensive heart disease without heart failure	I11.9	Breast cancer	Breast cancer - early	C50.9
Hypertension	Hypertensive renal disease with renal failure	I12.0	Breast cancer	Breast cancer - locally advanced	C50.9
Hypertension	Hypertensive renal disease without renal failure	I12.9	Breast cancer	Breast cancer - metastatic	C50.9
Hypertension	Renovascular hypertension	I15.0	Breast cancer	Breast cancer - recurrence within breast	C50.9
Hypertension	Hypertension secondary to other renal disorders	I15.1	Breast cancer	Mammary Paget's disease	C50.9
Hypertension	Hypertension (secondary to endocrine disorder)	I15.2	Breast cancer	Lobular carcinoma in-situ of breast (LCIS)	D05.0
Hypertension	Other secondary hypertension	I15.8	Breast cancer	Ductal carcinoma in-situ of breast (DCIS)	D05.1
Hypertension	Secondary hypertension	I15.9	Breast cancer	Other carcinoma in situ of breast	D05.7
Non-melanoma	Basal cell carcinoma lip	C44.0	Breast cancer	Carcinoma in situ of breast	D05.9
Non-melanoma	Squamous cell carcinoma lip	C44.0	Bowel cancer	Previous history of bowel cancer	Z85.0
Non-melanoma	Basal cell carcinoma eyelid	C44.1	Bowel cancer	Bowel cancer	C26.0
Non-melanoma	Squamous cell carcinoma eyelid	C44.1	Bowel cancer	Cancer of caecum	C18.0
Non-melanoma	Basal cell carcinoma ear	C44.2	Bowel cancer	Cancer of appendix	C18.1
Non-melanoma	Squamous cell carcinoma auricle	C44.2	Bowel cancer	Cancer of ascending colon	C18.2
Non-melanoma	Squamous cell carcinoma external auditory canal	C44.2	Bowel cancer	Cancer of hepatic flexure	C18.3
Non-melanoma	Basal cell carcinoma face	C44.3	Bowel cancer	Cancer of transverse colon	C18.4
Non-melanoma	Squamous cell carcinoma face	C44.3	Bowel cancer	Cancer of sigmoid colon	C18.7
Non-melanoma	Basal cell carcinoma - scalp and neck region	C44.4	Bowel cancer	Overlapping malignant lesion of colon	C18.8
Non-melanoma	Squamous cell carcinoma - scalp and neck region	C44.4	Bowel cancer	Cancer of colon	C18.9
Non-melanoma	Basal cell carcinoma trunk	C44.5	Bowel cancer	Colon cancer - early	C18.9
Non-melanoma	Squamous cell carcinoma trunk	C44.5	Bowel cancer	Colon cancer - metastatic	C18.9
Non-melanoma	Basal cell carcinoma upper limb	C44.6	Bowel cancer	Cancer of rectosigmoid junction	C19
Non-melanoma	Squamous cell carcinoma upper limb	C44.6	Bowel cancer	Rectal cancer	C20
Non-melanoma	Basal cell carcinoma lower limb	C44.7	Bowel cancer	Rectal cancer - early	C20
Non-melanoma	Squamous cell carcinoma lower limb	C44.7	Bowel cancer	Rectal cancer - locally advanced	C20
Non-melanoma	Basal cell carcinoma skin (ICD10 overlapping region)	C44.8	Bowel cancer	Rectal cancer - metastatic	C20
Non-melanoma	Basal cell carcinoma skin	C44.9	Lymphoma	Nodular lymphocyte-predominant Hodgkin lymphoma	C81.0
Non-melanoma	Bowen's disease	C44.9	Lymphoma	Classical Hodgkin lymphoma	C81.1
Non-melanoma	Dermatofibrosarcoma protuberans	C44.9	Lymphoma	Hodgkin lymphoma, nodular sclerosis	C81.1
Non-melanoma	Merkel cell carcinoma	C44.9	Lymphoma	Hodgkin lymphoma, nodular sclerosis, grade 1	C81.1
Non-melanoma	Multiple BCCs	C44.9	Lymphoma	Lymphocyte-rich classical Hodgkin lymphoma	C81.1
Non-melanoma	Multiple BCCs and SCCs	C44.9	Lymphoma	Mixed cellularity Hodgkin lymphoma	C81.2
Non-melanoma	Multiple SCCs	C44.9	Lymphoma	Lymphocyte depletion Hodgkin lymphoma	C81.3
Non-melanoma	Nodular-ulcerative basal cell carcinoma	C44.9	Lymphoma	Other Hodgkin disease	C81.7
Non-melanoma	Non melanoma skin cancer	C44.9	Lymphoma	Classical Hodgkin lymphoma	C81.9
Non-melanoma	Pigmented basal cell carcinoma	C44.9	Lymphoma	Other types of follicular non-Hodgkin lymphoma	C82.7
Non-melanoma	Squamous cell carcinoma (SCC) skin	C44.9	Lymphoma	Follicular lymphoma, grade 1	C82.9
Non-melanoma	Squamous cell carcinoma skin - recurrent	C44.9	Lymphoma	Follicular lymphoma, grade 2	C82.9
Non-melanoma	Superficial basal cell carcinoma	C44.9	Lymphoma	Follicular lymphoma, grade 3	C82.9
Melanoma	Multiple melanomas	C43	Lymphoma	Follicular non-Hodgkin lymphoma	C82.9
Melanoma	Melanoma of eye (uvea)	C69.3	Lymphoma	Small cell (diffuse) non-Hodgkin lymphoma	C83.0
Melanoma	Melanoma in situ of lip	D03.0	Lymphoma	Small lymphocytic lymphoma	C83.0

Category	Condition	ICD10 Code	Category	Condition	ICD10 Code
Lymphoma	Mixed small and large cell (diffuse) non-Hodgkin lymphoma	C83.2	Other Cancer		C26.9
Lymphoma	Diffuse large B-cell lymphoma	C83.3	Other Cancer		C30.0
Lymphoma	Transformed follicular lymphoma	C83.3	Other Cancer		C30.1
Lymphoma	Burkitt lymphoma / Burkitt cell leukaemia	C83.7	Other Cancer		C31.0
Lymphoma	Mantle cell lymphoma	C83.8	Other Cancer		C31.1
Lymphoma	Mediastinal large B-cell lymphoma	C83.8	Other Cancer		C31.9
Lymphoma	Mycosis fungoides	C84.0	Other Cancer		C32.1
Lymphoma	Sezary syndrome	C84.1	Other Cancer		C32.9
Lymphoma	Subcutaneous panniculitis-like T-cell lymphoma	C84.4	Other Cancer		C40.2
Lymphoma	Anaplastic large cell lymphoma, T/null cell, primary systemic type	C84.5	Other Cancer		C41.9
Lymphoma	Anaplastic large cell lymphoma, T/null cell primary cutaneous type	C84.5	Other Cancer		C45.0
Lymphoma	Angioimmunoblastic T-cell lymphoma	C84.5	Other Cancer		C45.1
Lymphoma	Extranodal NK/T cell lymphoma, nasal type	C84.5	Other Cancer		C45.9
Lymphoma	Hepatosplenic gamma-delta cell lymphoma	C84.5	Other Cancer		C46.9
Lymphoma	Peripheral T-cell lymphoma, not otherwise characterised	C84.5	Other Cancer		C48.2
Lymphoma	Extranodal marginal zone B-cell lymphoma of mucosa-associated lymphoid tissue	C85.1	Other Cancer		C49.1
Lymphoma	Nodal marginal zone B-cell lymphoma	C85.1	Other Cancer		C49.9
Lymphoma	Lymphoplasmocytic lymphoma	C85.7	Other Cancer		C51.1
Lymphoma	Splenic marginal zone B-cell lymphoma	C85.7	Other Cancer		C51.9
Lymphoma	Lymphoma	C85.9	Other Cancer		C52
Lymphoma	Non-Hodgkin lymphoma	C85.9	Other Cancer		C53.0
Other Cancer	All other C codes	C00.9	Other Cancer		C53.9
Other Cancer		C01	Other Cancer		C54.1
Other Cancer		C02.0	Other Cancer		C54.2
Other Cancer		C02.1	Other Cancer		C54.3
Other Cancer		C02.3	Other Cancer		C54.9
Other Cancer		C02.9	Other Cancer		C55
Other Cancer		C04.9	Other Cancer		C56
Other Cancer		C05.0	Other Cancer		C57.0
Other Cancer		C05.1	Other Cancer		C58
Other Cancer		C05.9	Other Cancer		C60.1
Other Cancer		C06.9	Other Cancer		C61
Other Cancer		C07	Other Cancer		C62.9
Other Cancer		C08.0	Other Cancer		C64
Other Cancer		C08.8	Other Cancer		C65
Other Cancer		C08.9	Other Cancer		C66
Other Cancer		C09.0	Other Cancer		C67.3
Other Cancer		C09.9	Other Cancer		C67.4
Other Cancer		C10.2	Other Cancer		C67.6
Other Cancer		C10.9	Other Cancer		C67.8
Other Cancer		C11.1	Other Cancer		C67.9
Other Cancer		C11.9	Other Cancer		C68.0
Other Cancer		C12	Other Cancer		C68.9
Other Cancer		C13.9	Other Cancer		C69.2
Other Cancer		C14.0	Other Cancer		C69.6
Other Cancer		C14.2	Other Cancer		C69.9
Other Cancer		C14.8	Other Cancer		C70.1
Other Cancer		C15.1	Other Cancer		C70.9
Other Cancer		C15.4	Other Cancer		C71.3
Other Cancer		C15.5	Other Cancer		C71.9
Other Cancer		C15.9	Other Cancer		C72.0
Other Cancer		C16.1	Other Cancer		C72.9
Other Cancer		C16.2	Other Cancer		C73
Other Cancer		C16.3	Other Cancer		C74.0
Other Cancer		C16.9	Other Cancer		C74.1
Other Cancer		C17.0	Other Cancer		C74.9
Other Cancer		C21.0	Other Cancer		C75.0
Other Cancer		C21.1	Other Cancer		C76.2
Other Cancer		C22.0	Other Cancer		C76.7
Other Cancer		C22.1	Other Cancer		C77.0
Other Cancer		C22.7	Other Cancer		C77.2
Other Cancer		C22.9	Other Cancer		C77.3
Other Cancer		C23	Other Cancer		C77.4
Other Cancer		C24.0	Other Cancer		C77.5
Other Cancer		C24.9	Other Cancer		C77.9
Other Cancer		C25.0	Other Cancer		C78.0
Other Cancer		C25.4	Other Cancer		C78.1
Other Cancer		C25.7	Other Cancer		C78.2
Other Cancer		C25.9	Other Cancer		C78.3
Other Cancer			Other Cancer		C78.7
Other Cancer			Other Cancer		C79.0
Other Cancer			Other Cancer		C79.2

Category	Condition	ICD10 Code	Category	Condition	ICD10 Code
Other Cancer		C79.3	All Cancer	All C codes together	^C
Other Cancer		C79.5	All Cancer	All D codes together	^D
Other Cancer		C79.6	Historical shingles (varicella-zoster)	Zoster encephalitis	B02.0
Other Cancer		C79.7	Historical shingles (varicella-zoster)	Zoster meningitis	B02.1
Other Cancer		C79.8	Historical shingles (varicella-zoster)	Zoster with other nervous system involvement	B02.2
Other Cancer		C79.81	Historical shingles (varicella-zoster)	Zoster ocular disease	B02.3
Other Cancer		C79.88	Historical shingles (varicella-zoster)	Disseminated zoster	B02.7
Other Cancer		C80	Historical shingles (varicella-zoster)	H. Zoster (shingles)	B02.8
Other Cancer		C88.00	Historical shingles (varicella-zoster)	Ramsay Hunt syndrome (herpes zoster oticus)	B02.8
Other Cancer		C88.20	Historical shingles (varicella-zoster)	Zoster without complication	B02.9
Other Cancer		C90.00	Historical shingles (varicella-zoster)	Deep vein thrombosis, lower limb/s	I80.2
Other Cancer		C90.20	Historical shingles (varicella-zoster)	Cerebral venous sinus thrombosis	I80.8
Other Cancer		C91.0	Historical shingles (varicella-zoster)	Deep vein thrombosis (DVT) pelvis	I80.8
Other Cancer		C91.00	Historical shingles (varicella-zoster)	Deep vein thrombosis (DVT) upper limb	I80.8
Other Cancer		C91.10	Historical shingles (varicella-zoster)	Internal jugular vein thrombosis	I80.8
Other Cancer		C91.1.3	Historical shingles (varicella-zoster)	Thrombosis of inferior vena cava	I82.2
Other Cancer		C91.3	Historical shingles (varicella-zoster)	Renal vein thrombosis	I82.3
Other Cancer		C91.40	Historical shingles (varicella-zoster)	Splenic vein thrombosis	I82.8
Other Cancer		C91.7	Historical shingles (varicella-zoster)	Venous thromboembolism	I82.9
Other Cancer		C92.0	Venous thromboembolism	Intracardiac thrombosis	I51.3
Other Cancer		C92.00	Venous thromboembolism	Left atrial thrombus	I51.3
Other Cancer		C92.10	Venous thromboembolism	Right atrial thrombus	I51.3
Other Cancer		C92.10	Venous thromboembolism	Mesenteric vein thrombosis	K55.0
Other Cancer		C92.40	Venous thromboembolism	Pulmonary embolism with mention of acute cor pulmonale	I26.0
Other Cancer		C92.50	Venous thromboembolism	Pulmonary embolism	I26.9
Other Cancer		C92.7	Venous thromboembolism		
Other Cancer		C92.70	Venous thromboembolism		
Other Cancer		C93.10	Venous thromboembolism		
Other Cancer		C94.4	Venous thromboembolism		
Other Cancer		C94.7	Venous thromboembolism		
Other Cancer		C95.9	Venous thromboembolism		
Other Cancer		C96.2	Venous thromboembolism		
Other Cancer		C96.9	Venous thromboembolism		

Supplementary Table S2. Median and 25th centile drug survival time for patients who initiate JAKi as first-line, second-line and third-line or later.

Line of therapy for JAKi	Survival estimate	TOF	BARI	UPA
Line 1		n=1,408	n=545	n=459
	Median survival (months)	34.9 (30.8, 40.7)	33.6 (25.7, NR)	NR (NR, NR)
	25 th centile survival (months)	9.2 (8.2, 10.5)	10.1 (9.2, 14.1)	NR (12.9, NR)
Line 2		n=997	n=481	n=517
	Median survival (months)	21.4 (18.2, 24.8)	24.8 (20.1, NA)	NA (16.1, NA)
	25 th centile survival (months)	6.9 (5.5, 8)	8.1 (6.6, 9.6)	8.8 (6.7, NA)
Line 3+		n=1,257	n=849	n=838
	Median survival (months)	21.1 (18.5, 24.4)	20.5 (17.5, 21.8)	18.8 (18.8, NA)
	25 th centile survival (months)	6.6 (5.6, 7.9)	5.7 (4.9, 6.9)	7 (6, 9)

^aMedian and 25th centile survival times are presented along with 95% confidence intervals. Not reached (NR) indicates insufficient patients have stopped treatment to estimate the parameter.

Supplementary Table S3. Switches from JAKi that occurred after January 2020.

Line of therapy for JAKi	Mechanism of action for drug switched to	BARI	TOF	UPA
Line 1		n=118	n=204	n=57
	JAKi, n (%)	62 (52.5%)	102 (50%)	9 (15.8%)
	TNFi, n (%)	44 (37.3%)	80 (39.2%)	40 (70.2%)
	Other b/tsDMARD, n (%)	12 (10.2%)	22 (10.8%)	8 (14.0%)
Line 2		n=117	n=160	n=85
	JAKi, n (%)	47 (40.2%)	75 (46.9%)	20 (23.5%)
	TNFi, n (%)	42 (35.9%)	57 (35.6%)	33 (38.8%)
	Other b/tsDMARD, n (%)	28 (23.9%)	28 (23.9%)	32 (37.6%)
Line 3+		n=231	n=208	n=169
	JAKi, n (%)	123 (53.2%)	129 (62.0%)	44 (26.0%)
	TNFi, n (%)	63 (27.3%)	39 (18.8%)	72 (42.6%)
	Other b/tsDMARD, n (%)	45 (19.5%)	40 (19.2%)	53 (31.4%)