Supplementary Table S1: Definitions, sources, and formats of reporting for exposure, covariates and outcomes.

Variable	Reporting of variable	ICD10 or surgical procedure codes	Registration period and data source used
Definition of PsA diagnosis	N/A	L405, M070, M071, M072, M073	As registered in the clinical rheumatology registers for the TNFi-treated and for the bDMARD-naïve PsA (disease comparator 1) *or* requiring ≥2 visits with PsA as registered in the patient registers at an internal medicine or rheumatology department in Sweden or Denmark (comparator 2) from 2006 up until 2019 (Sweden, Norway) or 2017 (Finland, Iceland) or 2016 (Denmark).
Demographics and disease related characteristics			
Male, n (%)	n (%)	N/A	Recorded at start of follow-up (window: 8 weeks before until 7 days after) for all study participants in the clinical rheumatology registers (all countries) or/and the prescribed drug register (Sweden and Denmark for the sensitivity analysis). The value closest to the start of follow-up was chosen.
Age (years)	median (SD)	N/A	
Tender joint count (0-28)	median (IQR) [missing]	N/A	
Swollen joint count (0-28)	median (IQR) [missing]	N/A	
HAQ score (0-3)	median (IQR) [missing]	N/A	
DAS28-CRP (0-10)	median (IQR) [missing]	N/A	
CRP (mg/liter)	median (IQR) [missing]	N/A	
Methotrexate and oral steroids	n (%)	N/A	
Dose oral steroids (mg):	median (IQR)	N/A	
Lifestyle factors			
BMI (kg/m^2)	median (IQR) [missing]	N/A	Recorded in the clinical rheumatology registers within 1 year before start of follow-up. The value closest to the follow-up start date was chosen.
Smoking status, n (%)	Current, previous, never, missing, n (%)	N/A	
Comorbidity conditions			
Cardiovascular disease[a]	n (%)	I20-I25, I50, I60-I69	Recorded up to 10 years prior to start of follow-up in the patient registers of each country
COPD	n (%)	J41-J44	
Diabetes mellitus	n (%)	E10-E14	
Hypertension	n (%)	I10-I13, I15	
Inflammatory bowel disease	n (%)	K50-K51	
Uveitis	n (%)	H20, H221	
Urethritis	n (%)	N341, N342, N370	
No. of hospitalizations	median (IQR)		
Hip and/or knee Replacement	n (%)	Surgical codes: Sweden: NGB, 8423-8424, 8426, NFB, 8400-8415, 8419. Denmark: NGB, 8280, 70042, 70043, 70143, 70142, NFB, 70032, 70033. Finland: NGB 10-99, NFB 10-99, NFC 00-99 and NGC 00-99. Norway, Iceland: Not available	Recorded ever prior to the start of follow-up in the patient registers of each country
ICD-10 codes for the haematological malignancies			
All hematological malignancies	N/A	C81-86, C88, C90-96, D45-46, D47.1, D47.3, D47.4 and D47.5	Recorded after start of follow-up in the national cancer registers of each country

Lymphoid malignancies	C81-86, C88 C90-91
Myeloid malignancies	C92-95 D45-D46, D47.1, D47.3, D47.4 and D47.5

[a]Including cerebrovascular disease.

IQR, interquartile range; TNFi, tumor necrosis factor inhibitor; BMI, body mass index; VAS, visual analogue scale; HAQ, Health Assessment Questionnaire; DAS28, Disease Activity Score in 28 joints; CRP, C-reactive protein; COPD, chronic obstructive pulmonary disease.

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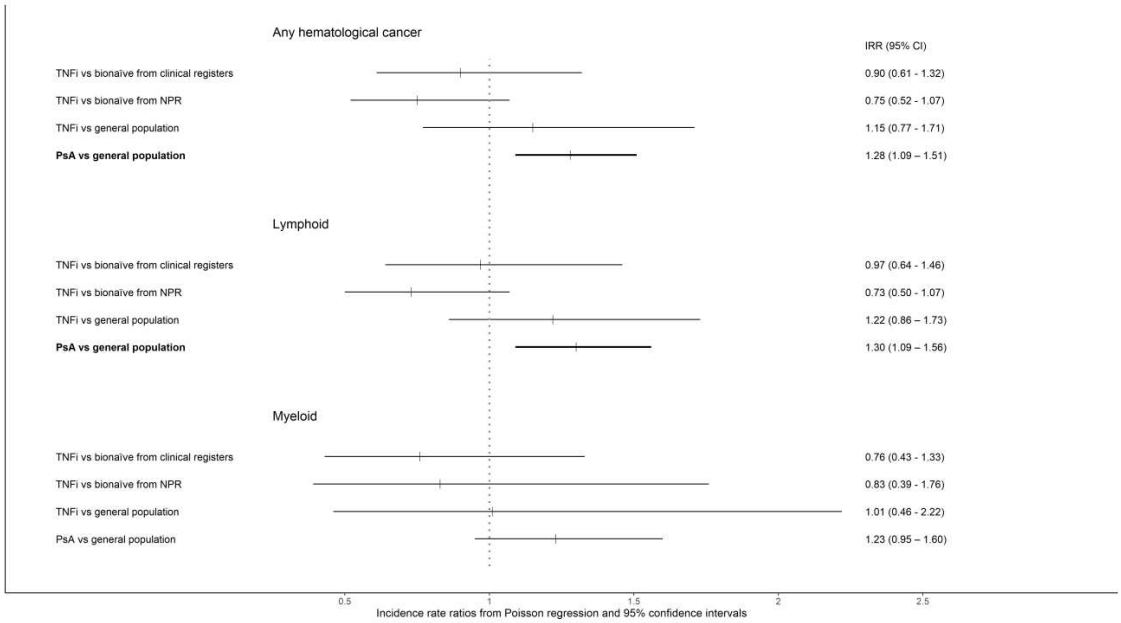
Supplementary Table S2 Incidence rates and Hazard Ratios (HR) of haematological malignancy overall in TNFi-treated versus bDMARD-naïve patients with PsA in Sweden and Denmark using an alternative PsA comparator definition[1]

	Sweden		Denmark	
	TNFi treated PsA	bDMARD naïve PsA[1]	TNFi treated PsA	bDMARD naïve PsA[1]
N. patients with PsA	6505	2948	2444	3448
Person-years	36950	12153	12428	14176
N. haematological malignancies overall	28	12	7	20
Crude incidence rates	75.8 (52.3-109.8)	98.7 (56.1-173.8)	56.3 (22.6 to 116.0)	172.3 (96.4 to 284.2)
Hazard ratio (95 % CI)				
Crude	0.90 (0.46-1.79)		0.54 (0.21 to 1.40)	
Adjusted[2]	0.84 (0.42-1.67)		0.54 (0.21 to 1.40)	

[1] Alternative comparator group is defined as: bDMARD-naive patients with PsA from the NPR switching or adding methotrexate or sulfasalazine during time of follow-up [2]Multivariate Cox regression with 95% Confidence Intervals (CI). Adjusted for sex and calendar period (2006-2010, 2011-end of study period) with age as time scale. The HR gives the ratio of the hazard for the TNFi-treated group with PsA to the alternative comparator group. The TNFi treated and not treated groups are also restricted to start time of follow-up the same starting year.

Supplementary Figure S1 Pooled incidence rate ratios (IRRs)[1] of haematological malignancy overall and by lymphoid and myeloid types, in first ever TNFi-treated versus bDMARD-naïve patients with PsA and versus general population comparators excluding everyone with RA before start of follow up+ censoring those receiving a RA diagnosis according to national patient registers during follow-up[2].



[1]Incidence rate ratio (IRR) and 95% Confidence Intervals (CI) with modified Poisson regression adjusted for age (categories 18- 55, 56-65, 66-70, >70 years), sex and calendar period (2006-2010, 2011- end of follow up) and country. [2]The exclusion of RA was only done for Sweden and Denmark since we did not have information on potential visits with a registered RA diagnosis the national patient register (NPR) in Finland, Iceland or Norway. One event in the bDMARD-naïve PsA group from the national patient registers and one event from the general comparator group 1 (i.e. the compactors to the TNFi group), as well as 6 events in the general comparator group 2 (i.e. the comparators to the all PsA group) had ICD10 code C96 in the cancer registry defined as "other and unspecified tumors in hematopoietic and lymphoid tissue". These are not included among the lymphoid or the myeloid malignancies. TNFi= Tumor Necrosis Factor inhibitor NPR = National patient register DK=Denmark. FI=Finland, ICE=Iceland, NO =Norway, SE=Sweden

Supplementary Table S3 Hazard ratios with 95% confidence intervals (CI) for potential associations between baseline disease activity parameters and haematological, lymphoid, and myeloid malignancies, respectively, in Danish and Swedish patients with PsA from the clinical rheumatology registers.

Parameter	HR 95% CI crude or adjusted for age, sex, and calendar period	Denmark	Sweden	Denmark and Sweden combined
DAS28-CRP (continuous)	Crude, haematological	0.91 (0.67-1.25)	1.02 (0.80-1.31)	0.98 (0.81-1.19)
	Crude, lymphoid	0.99 (0.68-1.44)	0.85 (0.62-1.17)	0.91 (0.71-1.16)
	Crude, myeloid	0.77 (0.44-1.36)	1.43 (0.93-2.18)	1.14 (0.81-1.60)
	Adjusted, haemotological	0.97 (0.72-1.31)	1.01 (0.79-1.29)	0.99 (0.82-1.20)
	Adjusted, lymphoid	1.06 (0.74-1.5)	0.84 (0.62-1.15)	0.93 (0.74-1.17)
	Adjusted, myeloid	0.82 (0.46-1.44)	1.41 (0.93-2.12)	1.16 (0.83-1.63)
DAS28-CRP ≥3.2 vs <3.2	Crude, haematological	0.78 (0.34-1.77)	0.93 (0.48-1.80)	0.87 (0.52-1.45)
	Crude, lymphoid	0.91 (0.33-2.52)	0.94 (0.41-2.14)	0.93 (0.49-1.76)
	Crude, myeloid	0.58 (0.14-2.41)	0.91 (0.30-2.74)	0.77 (0.32-1.84)
	Adjusted, haemotological	0.91 (0.4-2.09)	0.97 (0.50-1.89)	0.95 (0.57-1.59)
	Adjusted, lymphoid	1.11 (0.39-3.11)	0.97 (0.42-2.23)	1.02 (0.53-1.95)
	Adjusted, myeloid	0.66 (0.15-2.79)	0.97 (0.32-2.96)	0.84 (0.35-2.03)
Swollen joint count (of 28). ≥1 vs 0.	Crude, haematological	0.92 (0.42-1.99)	0.71 (0.38-1.32)	0.78 (0.48-1.27)
	Crude, lymphoid	0.95 (0.37-2.42)	0.61 (0.28-1.31)	0.72 (0.40-1.32)
	Crude, myeloid	0.85 (0.21-3.39)	0.94 (0.32-2.76)	0.90 (0.39-2.12)
	Adjusted, haemotological	0.93 (0.43-2.02)	0.68 (0.36-1.28)	0.77 (0.47-1.26)
	Adjusted, lymphoid	0.99 (0.39-2.53)	0.58 (0.27-1.25)	0.72 (0.40-1.30)
	Adjusted, myeloid	0.85 (0.21-3.42)	0.94 (0.32-2.79)	0.91 (0.39-2.13)
Swollen joint count (of 28). ≥3 vs <3.	Crude, haematological	0.85 (0.35-2.02)	1.15 (0.62-2.11)	1.03 (0.63-1.71)
	Crude, lymphoid	1.08 (0.4-2.88)	0.70 (0.31-1.56)	0.83 (0.44-1.55)
	Crude, myeloid	0.39 (0.05-3.15)	2.77 (0.94-8.18)	1.83 (0.70-4.77)
	Adjusted, haemotological	0.77 (0.32-1.85)	1.04 (0.56-1.93)	0.94 (0.57-1.56)
	Adjusted, lymphoid	0.97 (0.36-2.61)	0.61 (0.27-1.38)	0.74 (0.39-1.38)
	Adjusted, myeloid	0.38 (0.05-3.13)	2.65 (0.89-7.87)	1.75 (0.67-4.59)
C-reactive protein ≥10 mg/mL vs <10 mg/ML	Crude, haematological	0.82 (0.36-1.86)	1.29 (0.70-2.38)	1.10 (0.67-1.79)
	Crude, lymphoid	0.89 (0.34-2.36)	0.82 (0.36-1.88)	0.85 (0.45-1.60)
	Crude, myeloid	0.66 (0.14-3.18)	2.63 (0.98-7.08)	1.78 (0.77-4.10)
	Adjusted, haemotological	0.83 (0.36-1.89)	1.20 (0.65-2.22)	1.05 (0.64-1.72)
	Adjusted, lymphoid	0.88 (0.33-2.34)	0.75 (0.33-1.70)	0.80 (0.43-1.50)
	Adjusted, myeloid	0.71 (0.15-3.43)	2.59 (0.96-7.02)	1.79 (0.77-4.15)
HAQ-DI ≥1 vs <1	Crude, haematological	1.51 (0.6-3.83)	1.71 (0.88-3.32)	1.64 (0.96-2.82)
	Crude, lymphoid	2.26 (0.69-7.4)	1.95 (0.84-4.53)	2.05 (1.03-4.07)
	Crude, myeloid	0.76 (0.15-3.93)	1.36 (0.45-4.05)	1.13 (0.46-2.82)
	Adjusted, haemotological	1.51 (0.58-3.93)	1.54 (0.77-3.07)	1.53 (0.87-2.68)
	Adjusted, lymphoid	2.8 (0.83-9.46)	1.75 (0.73-4.18)	2.05 (1.01-4.17)
	Adjusted, myeloid	0.58 (0.11-3.03)	1.25 (0.40-3.86)	0.97 (0.38-2.48)

Supplementary Table S4 Disease activity and functional status at start of follow up in relation to occurrence (yes/no) of haematological cancer in TNFi-treated versus bDMARD-naïve patients with PsA from the clinical rheumatology registers in Sweden and Denmark combined.

	Among PsA patients with haematological malignancy	Among PsA patients without haematological malignancy
Total number	35 (TNFi-treated) and 59 (bDMARD-naïve)	8899 (TNFi-treated) and 16280 (bDMARD-naïve)
Disease activity measures and functional status at start of follow-up	N (%) [N missing (%missing)]	N (%) [N missing (%missing)]
TNFi exposed	19 (82.6 %) [12 (34.3%)]	4218 (76.0 %) [3346 (37.6%)]
bDMARD-naïve	17 (43.6%) [20 (33.9%)]	5375 (50.2 %) [5564 (46.6%)]
Swollen joint count ≥ 1:		
TNFi exposed	18 (75.0%) [11 (31.3%)]	4329 (72.1%) [2892 (32.5%)]
bDMARD-naïve	21 (47.8%) [15 (25.4%)]	6940 (55.5%) [3773 (27.8%)]
Tender joint count ≥ 3:		
TNFi exposed	15 (62.5%) [11 (31.3%)]	2688 (44.7%) [2892 (32.5%)]
bDMARD-naïve	11 (25%) [15 (25.4%)]	3489 (27.9%) [3773 (26.9%)]
CRP (mg/liter) ≥ 10		
TNFi exposed	11 (42.3%) [9 (25.7%)]	2257 (35.0%) [2456 (27.6%)]
bDMARD-naïve	14 (30.4%) 13 (22.0%)]	3506 (27.9%) [3725 (27.0%)]
HAQ ≥ 1		
TNFi exposed	10 (55.6%) 17 (48.6%)]	2508 (47.1%) [3572 (40.1%)]
bDMARD-naïve	16 (45.7%) 24 (40.7%)]	3497 (31.1%) [5053 (34.5%)]
Any indication of inflammation defined as swollen joint count ≥1 and CRP ≥10		
TNFi exposed	9 (45.0%) 15 (42.3%)]	1649 (32.1%) [3760 (42.3%)]
bDMARD-naïve	8 (24.2%) 26 (44.1%)]	2294 (25.1%) [7143 (43.9%)]

DAS28= Disease Activity Score in 28 joints, CRP=C-reactive protein, HAQ=Health Assessment Questionnaire

Supplementary Table S5. Country-specific and pooled hazard ratios for haematological cancer in Cox proportional hazard models when adjusting for baseline presence of comorbidities[1] on Danish and Swedish data.

	Denmark	Sweden	Pooled
TNFi treated vs CRR bDMARD naïve patients	0.68 (0.18 to 2.57)	1.33 (0.79 to 2.22)	1.21 (0.76 to 1.96)
TNFi treated vs NPR bDMARD naïve patients	0.55 (0.15 to 2.00)	0.91 (0.60 to 1.37)	0.87 (0.58 to 1.28)
TNFi treated vs matched controls	2.03 (0.77 to 5.35)	1.26 (0.83 to 1.90)	1.35 (0.92 to 1.98)
PsA patients vs matched controls	1.34 (0.92 to 1.97)	1.28 (1.08 to 1.52)	1.29 (1.11 to 1.51)

[1] Adjusted for baseline presence (yes/no) of chronic obstructive pulmonary disease, cardiovascular disease, diabetes mellitus, and arterial hypertension as separate covariates.

Supplementary Table S6 Number, person-years and crude incidence rates/100 000 person-years of hematological malignancies with respect to type of bDMARD in an *a)* ever exposure model and *b)* a most recent exposure model for Sweden and Denmark combined.

	Adalimumab	**Certolizumab pegol**	**Etanercept**	**Golimumab**	**Infliximab**
Model A *ever* received agent					
Number of malignancies/ number of treated patients	16 / 4302	4 / 910	13 / 4737	4 / 1265	11 / 2231
Person-years	23 459	3384	24 262	6467	12 651
Crude incidence n/100 000 person-years, 95% CI	68.2 (39.0-110.8)	118.2 (32.2-302.6)	53.6 (28.5-91.6)	61.9 (16.9-158.4)	86.9 (43.4-155.6)
Model B most recent agent					
Number of malignancies /numbers of treated patients[1]	12 / 4302	<3 / 910	10 / 4737	<3 / 1265	5 / 2231
Person-years (pyrs)	15 422	1965	16 241	4015	6878
Crude incidence n/100 000 person-years, 95% CI	77.8 (40.2-135.9)	NA	61.6 (29.5-113.2)	NA	72.7 (23.6-169.6)

Models applied:
Model A, ever exposure: Follow-up from start of any bDMARD agent until end of follow-up regardless of starting a second biological and/or discontinuation.
Model B, most recent drug: Follow-up from start of any bDMARD agent until start of a subsequent bDMARD agent ignoring any discontinuation date of the previous bDMARD. CI=confidence intervals. If the number of events is <3, only the person years are shown due to GDPR regulations.