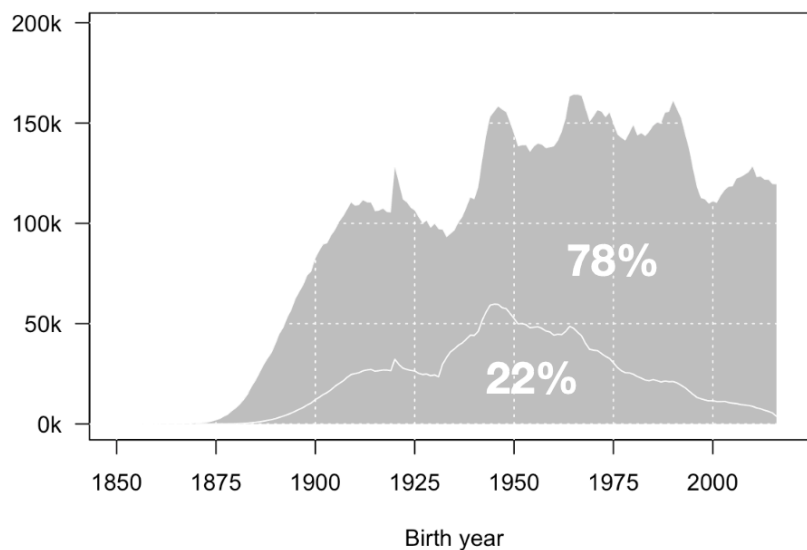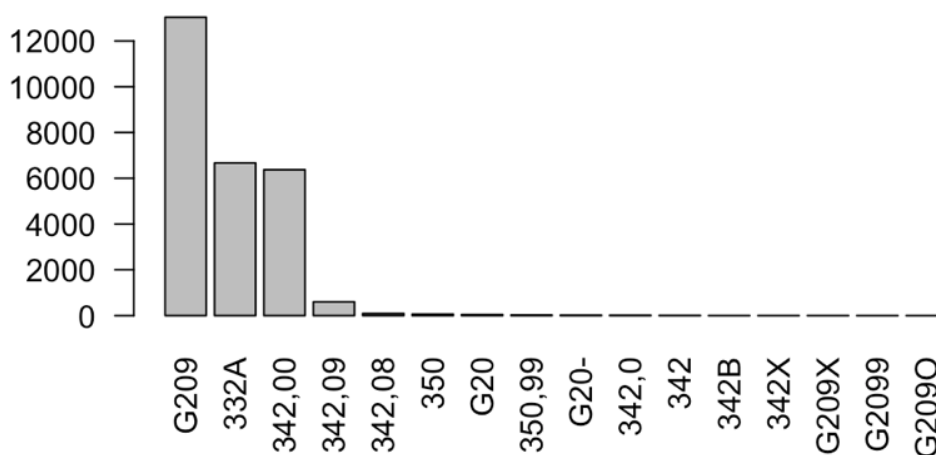# Supplementary Material

**Decreased Risk of Parkinson's Disease After Rheumatoid Arthritis Diagnosis: A Nested Case-Control Study with Matched Cases and Controls**


Supplementary Figure 1. Dataset used in the current study. Grey area represents 16 million people. The area under the lower curve represents our study population (3.6 million/ 22%).


Supplementary Figure 2. The variety and frequencies of ICD codes (ICD revisions 8 to 10) indicating Parkinson's disease diagnosis. All these codes from the medical register comply with the query pattern (e.g., PD code must start with the symbol "G20") described in the Methods section. The y-axis represents number of individuals.
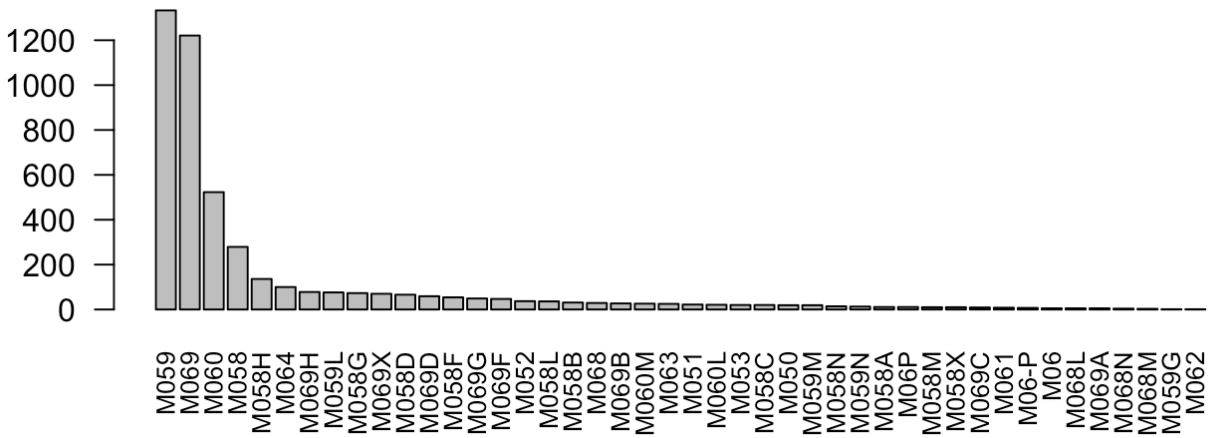
Supplementary Figure 3. The variety and frequencies of ICD codes (ICD revision 10) indicating Rheumatoid arthritis diagnosis. All these codes from the medical register comply with the query pattern (e.g., RA code must start with the symbols "M05" or "M06") described in the Methods section. The y-axis represents number of individuals.
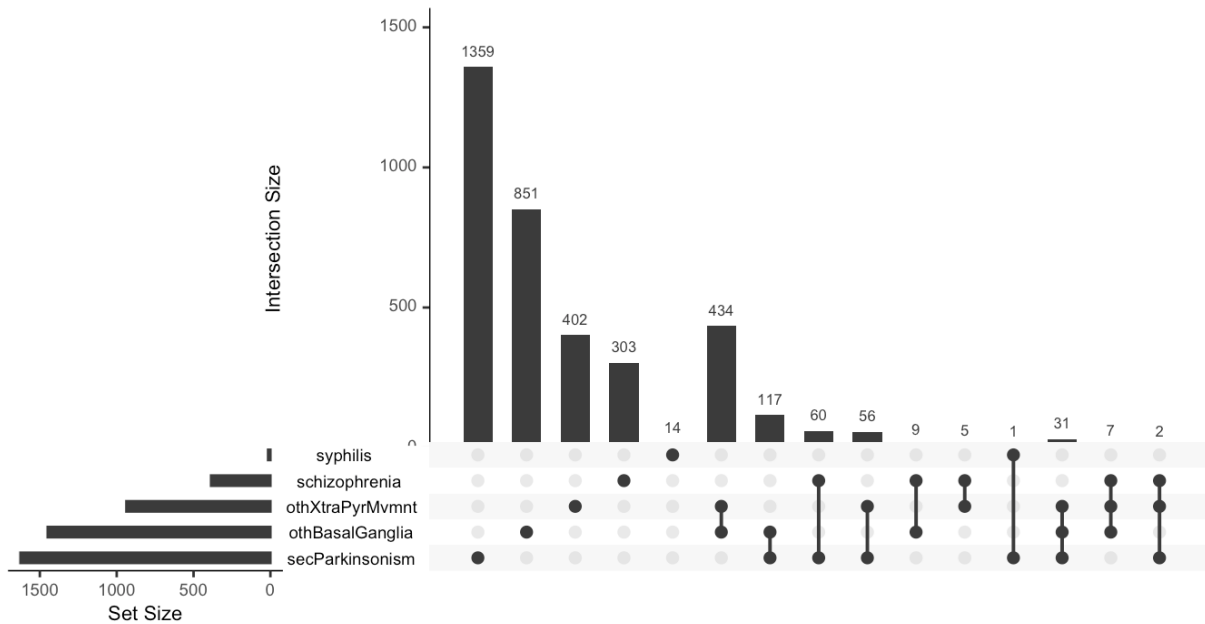

Supplementary Figure 4. Individuals removed from analyses due to being diagnosed with comorbidities that might provoke PD symptoms or could interfere with PD diagnosis.
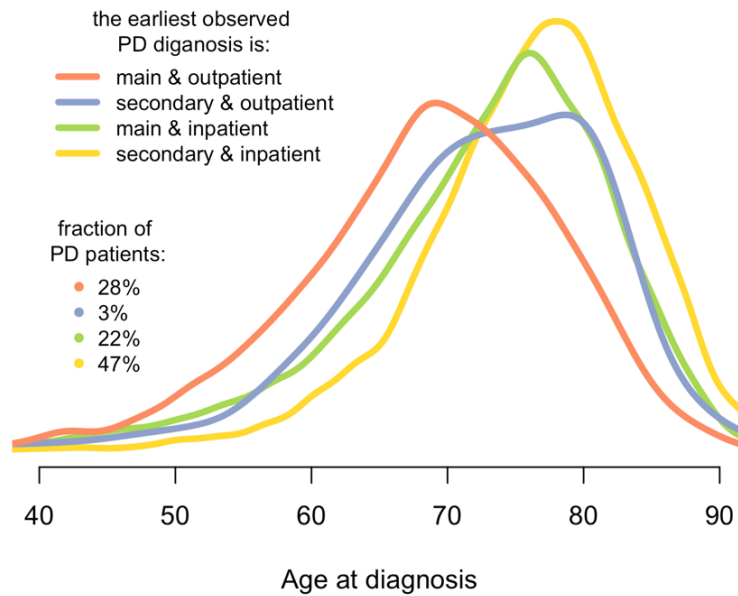
Supplementary Figure 5. Density plot describing how reliability of date of the first PD diagnosis differs in the four types of PD patients. Our conclusion is that the most reliable date of the first PD diagnosis is found in a subgroup of PD patients with their first PD diagnosis recorded in the outpatient register and assigned as the main diagnosis.
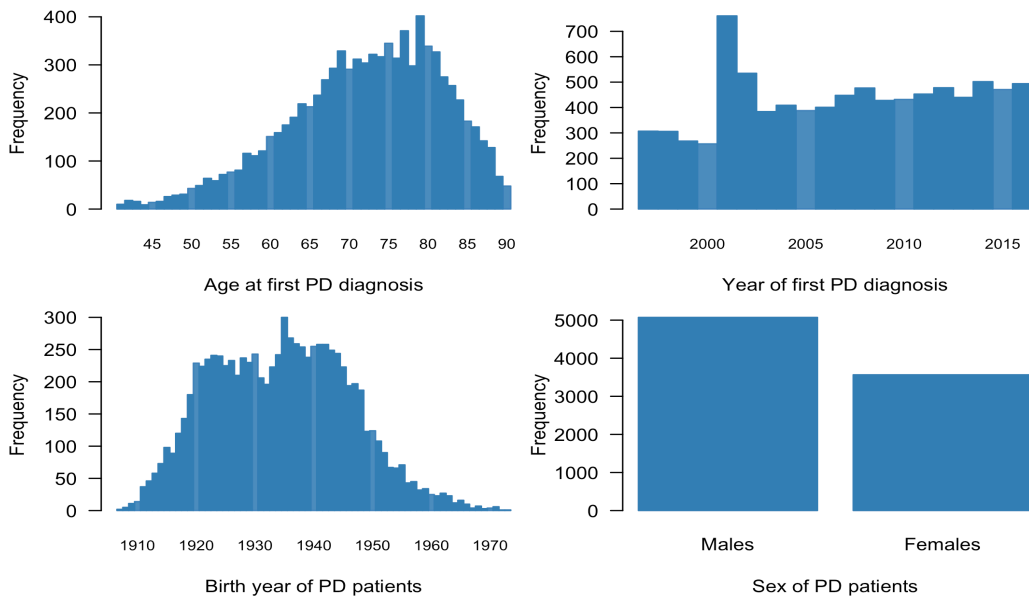
Supplementary Figure 6. Descriptive statistics of PD patients in the inclusive branch of the analyses.
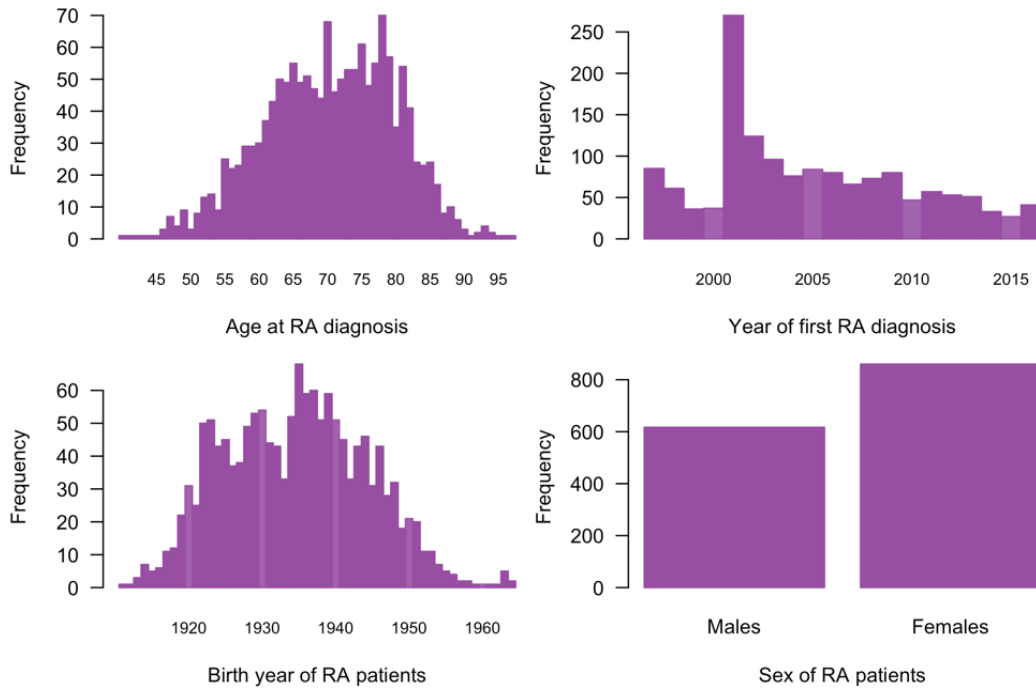
Supplementary Figure 7. Descriptive statistics of RA patients in the inclusive branch of the analyses.
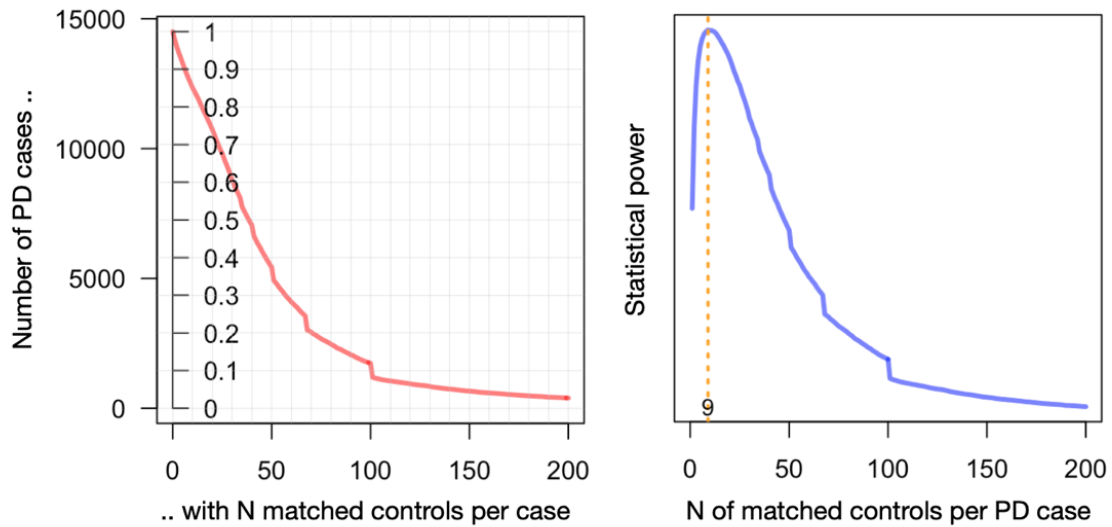
Supplementary Figure 8. PD case-control matching ratio optimization.

Supplementary Table 1. Results from antecedent analyses, inclusive branch (no restrictions on the type of first observed PD diagnosis). Ythr, the minimal number of years separating the first RA diagnosis (antecedent) and the first PD diagnosis; n1, the number of individuals who are PD controls and RA controls; n2, PD controls but RA cases; n3, PD cases but RA controls; n4, individuals who are both PD and RA cases; OR, odds ratio; lower/upper, 95% confidence intervals for OR estimate.

YThr	n1	n2	n3	n4	lower	upper	OR	p
-1	81326	1126	8188	68	0.46	0.77	0.60	0.00002
-2	78340	993	7885	66	0.51	0.85	0.66	0.00070
-3	75721	873	7619	57	0.49	0.85	0.65	0.00106
-4	73192	749	7366	50	0.49	0.88	0.66	0.00365
-5	65762	641	6627	42	0.46	0.89	0.65	0.00605
-6	60556	547	6103	36	0.45	0.92	0.65	0.01132
-7	56808	453	5724	30	0.44	0.95	0.66	0.02597
-8	52828	379	5325	25	0.42	0.98	0.65	0.03740
-9	49055	309	4945	20	0.39	1.01	0.64	0.05453
-10	45136	253	4551	17	0.38	1.09	0.67	0.11203
-11	40762	192	4109	12	0.31	1.11	0.62	0.11348
-12	36124	153	3641	10	0.30	1.23	0.65	0.21951
-13	31949	116	3218	9	0.34	1.52	0.77	0.53561
-14	27741	72	2796	6	0.29	1.89	0.83	0.84388
-15	23331	47	2354	4	0.22	2.31	0,84	1.00000
-16	18647	26	1881	2	0.09	3.05	0.76	1.00000
-17	14348	16	1447	0	0.00	2.57	0.00	0.39053
-18	9460	8	952	0	0.00	5.83	0.00	1.00000
-19	4850	2	490	0	0.00	52.77	0.00	1.00000
-20	9	0	1	0	0.00	Inf	0.00	1.00000

Supplementary Table 2. Results from antecedent analyses, conservative branch (only individuals whose first PD diagnosis is reported in the outpatient registry as the main diagnosis). Ythr, the minimal number of years separating the first RA diagnosis (antecedent) and the first PD diagnosis; n1, the number of individuals who are PD controls and RA controls; n2, PD controls but RA cases; n3, PD cases but RA controls; n4, individuals who are both PD and RA cases; OR, odds ratio; lower/upper, 95% confidence intervals for OR estimate.

Ythr	n1	n2	n3	n4	lower	upper	OR	p
-1	46630	639	4703	35	0.37	0.76	0.54	0.00020
-2	46630	576	4703	33	0.39	0.81	0.57	0.00084
-3	46630	510	4703	28	0.36	0.80	0.54	0.00089
-4	46630	447	4703	24	0.34	0.80	0.53	0.00162
-5	41682	397	4210	19	0.28	0.75	0.47	0.00058
-6	38532	352	3895	17	0.27	0.78	0.48	0.00141
-7	36633	296	3702	15	0.28	0.84	0.50	0.00554
-8	34562	237	3491	12	0.26	0.89	0.50	0.01481
-9	32617	186	3295	10	0.25	1.00	0.53	0.04665
-10	30358	159	3068	8	0.21	1.01	0.50	0.05789
-11	27727	131	2803	5	0.12	0.90	0.38	0.02415
-12	24954	98	2525	4	0.11	1.07	0.40	0.08242
-13	22500	78	2278	3	0.08	1.15	0.38	0.11869
-14	19805	51	2006	1	0.00	1.13	0.19	0.08717
-15	17050	21	1730	0	0.00	1.89	0.00	0.25302
-16	13886	11	1408	0	0.00	3.93	0.00	0.61435
-17	10746	4	1089	0	0.00	14.96	0.00	1.00000
-18	7141	1	722	0	0.00	383.48	0.00	1.00000
-19	3672	0	373	0	0.00	Inf	0.00	1.00000
-20	9	0	1	0	0.00	Inf	0.00	1.00000