

1 *Tables*

2 Supplementary table 1 – Proportion of long term conditions in participants with and without RA. P value  
 3 determined using  $\chi^2$  testing.

<b>Condition</b>	<b>Prevalence in RA participants (%)</b>	<b>Prevalence in non-RA participants (%)</b>	<b>p value</b>
<b>Hypertension</b>	<b>35.6</b>	<b>26.4</b>	<b>&lt;0.01</b>
<b>Asthma</b>	<b>15.4</b>	<b>11.6</b>	<b>&lt;0.01</b>
<b>Dyspepsia</b>	<b>11.3</b>	<b>7.7</b>	<b>&lt;0.01</b>
<b>Thyroid disorder</b>	<b>9.5</b>	<b>5.8</b>	<b>&lt;0.01</b>
<b>Cancer</b>	<b>8.7</b>	<b>7.7</b>	<b>&lt;0.01</b>
<b>Coronary heart disease</b>	<b>8.2</b>	<b>4.5</b>	<b>&lt;0.01</b>
<b>Diabetes</b>	<b>7.6</b>	<b>5.0</b>	<b>&lt;0.01</b>
<b>Depression</b>	<b>7.0</b>	<b>5.6</b>	<b>&lt;0.01</b>
<b>Osteoporosis</b>	<b>4.9</b>	<b>1.5</b>	<b>&lt;0.01</b>
<b>Chronic obstructive pulmonary disease</b>	<b>4.4</b>	<b>1.6</b>	<b>&lt;0.01</b>
Psoriasis/eczema	4.1	3.5	0.03
<b>IBS</b>	<b>3.3</b>	<b>2.3</b>	<b>&lt;0.01</b>
Migraine	3.2	2.9	0.04
<b>Stroke/TIA</b>	<b>3.1</b>	<b>1.7</b>	<b>&lt;0.01</b>
<b>Diverticular disease</b>	<b>2.2</b>	<b>1.1</b>	<b>&lt;0.01</b>
Anxiety	1.7	1.8	0.47
<b>IBD</b>	<b>1.4</b>	<b>0.8</b>	<b>&lt;0.01</b>
Prostate disease	1.3	1.6	0.06
<b>Pernicious anaemia</b>	<b>1.2</b>	<b>0.3</b>	<b>&lt;0.01</b>
Glaucoma	1.2	1.1	0.26
Epilepsy	1.2	0.8	0.38
Endometriosis	0.9	0.8	0.39
Atrial fibrillation	0.9	0.7	0.14
<b>Peripheral vascular disease</b>	<b>0.9</b>	<b>0.3</b>	<b>&lt;0.01</b>
<b>Chronic bronchitis</b>	<b>0.8</b>	<b>0.3</b>	<b>&lt;0.01</b>
Chronic sinusitis	0.8	0.6	0.34
<b>Meniere's disease</b>	<b>0.7</b>	<b>0.3</b>	<b>&lt;0.01</b>
Chronic kidney disease	0.5	0.3	0.01
<b>Chronic liver disease</b>	<b>0.4</b>	<b>0.2</b>	<b>&lt;0.01</b>
Schizophrenia	0.4	0.4	0.68
Chronic fatigue syndrome	0.4	0.4	0.42
Alcohol problems	0.4	0.2	0.02
Viral hepatitis	0.3	0.3	0.91
Heart failure	0.3	0.2	0.18
Polycystic ovary syndrome	0.2	0.1	0.08
Multiple sclerosis	0.2	0.4	0.03
Parkinson's disease	0.1	0.2	0.71
Constipation	0.1	0.1	0.81
Dementia	0.1	0.02	0.17
Anorexia/bulimia	0.1	0.1	0.80

	Psychoactive substance misuse	0-03	0-02	0-30
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33 Supplementary table 2 –Medications, primary care read codes and hospitalisation codes used for RA self-report  
 34 verification

<b>Medications</b>	<b>Primary care read codes</b>	<b>Hospitalisation ICD-10 codes</b>
Depomedrone	I4G1	M05
Triamcinilone	F3712	M06
Methylprednisolone	F3964	
Prednisolone	G5yA.	
Prednisone	G5y8.	
Auranofin	H570.	
Azathioprine	N04..	
Hydroxychloroquine	N040.	
leflunomide	N0400	
Methotrexate	N0401	
Myocrisin	N0402	
Penicillamine	N0403	
Sulfasalazine	N0404	
Abatacept	N0405	
Adalimumab	N0406	
Certolizumab	N0407	
Etanercept	N0408	
Golimumab	N0409	
Infliximab	N040A	
Rituximab	N040B	
Tocilizumab	N040C	
	N040D	
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60 Supplementary table 3 – Proportion of rheumatoid arthritis related hospitalisation, medication or primary care  
61 read code in participants who self-report rheumatoid arthritis.

<i>Rheumatoid arthritis self-report</i>	<i>Any rheumatoid arthritis hospitalisation, medication or primary care read code</i>		<b><i>Total</i></b>
	No	Yes	
No	141152 74.4 %	48634 25.6 %	189786 100 %
Yes	513 12.2 %	3683 87.8 %	4196 100 %
<b><i>Total</i></b>	141665 73 %	52317 27 %	193982 100 %

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86 Supplementary table 4 – Demographic factors, lifestyle factors, number of long-term conditions and rheumatoid  
 87 factor status in patients with and without RA. Unless indicated,  $p < 0.01$ . Chi squared test used for categorical  
 88 variables, Kruskal-Wallis test used for continuous variables. SD = standard deviation. RA defined here as RA  
 89 self-report plus hospitalisation, medication or primary care read code related to rheumatoid arthritis.

	<b>Participants with RA (%) (N=3683)</b>	<b>Participants without RA (%) (N=498857)</b>
<b>Mean Age (years (SD)); missing values = 0 (0%)</b>	59.2 (7.1)	56.5 (8.1)
<b>Age (years); missing values = 0 (0%)</b>		
37-49	413 11.2 %	117470 23.5 %
50-59	1161 31.5 %	165992 33.3 %
60-73	2109 57.3 %	215388 43.2 %
<b>Sex; missing values = 0 (0%)</b>		
Female	2672 72.5 %	270729 54.3 %
Male	1011 27.5 %	228121 45.7 %
<b>Townsend score; missing values = 623 (0.12%)</b>		
0-20	672 18.3 %	99991 20.1 %
20-40	666 18.1 %	99430 20 %
40-60	735 20 %	99663 20 %
60-80	760 20.7 %	99615 20 %
80-100	847 23 %	99531 20 %
<b>Smoking status; missing values = 2950 (0.59%)</b>		
Never	1679 46 %	271857 54.8 %
Current or Previous	1973 54 %	224074 45.2 %
<b>Frequency of alcohol intake; missing values = 1502 (0.30%)</b>		
Never or special occasions only	1218 33.1 %	97442 19.6 %
One to three times a month	453 12.3 %	55405 11.1 %
One to four times a week	1504 40.9 %	243237 48.9 %
Daily or almost daily	504 13.7 %	101268 20.4 %
<b>BMI (kg/m<sup>2</sup>); missing values = 5820 (1.15%)</b>		
underweight <18.5	34 0.9 %	2592 0.5 %

normal weight 18.5-24.9	1084 30 %	156353 31.7 %
overweight 25-29.9	1425 39.5 %	212799 43.2 %
obese $\geq 30$ s	1067 29.6 %	121359 24.6 %
<b>Physical activity; missing values = 7156 (1.42 %)</b>		
none	595 16.6 %	32254 6.6 %
low	286 8 %	18652 3.8 %
medium	2596 72.4 %	390922 79.5 %
high	107 3 %	49965 10.2 %
<b>Number of long-term conditions; missing values = 1845 (0.36 %)</b>		
0	922 25.2 %	174293 35.1 %
1	1103 30.1 %	163244 32.8 %
2-3	1255 34.3 %	135091 27.2 %
$\geq 4$	379 10.4 %	24401 4.9 %
<b>Rheumatoid Factor (IU/ml); missing values = 33,066 (6.6 %)</b>		
<20	1801 52.4 %	449067 96.4 %
$\geq 20$	1639 47.6 %	16960 3.6 %

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103 Supplementary Table 5 – Relationship between long term conditions and all-cause mortality in participants with  
 104 and without RA using age-adjusted multivariate Cox's proportional hazards regression analysis. Unless otherwise  
 105 shown, Cox's proportional hazards  $p < 0.01$ . RA defined here as RA self-report plus hospitalisation, medication  
 106 or primary care read code related to rheumatoid arthritis.

<b>Risk of all-cause mortality</b>			
<b>Comorbidity status (reference: No RA and no other long-term conditions)</b>		<b>Adjusted for sex, Townsend score, alcohol status, smoking status, BMI, physical activity and rheumatoid factor status HR (95% CI)</b>	<b>Number of deaths (%)</b>
<b>No other long-term conditions</b>	<b>RA</b>	1.50 (1.09 – 2.07)	44 (4.8%)
<b>1 other long-term condition</b>	<b>No RA</b>	1.39 (1.33 - 1.46)	5810 (3.6%)
	<b>RA</b>	1.42 (1.07 - 1.88)	66 (5.9%)
<b>2-3 other long-term conditions</b>	<b>No RA</b>	1.83 (1.75 - 1.91)	7966 (5.9%)
	<b>RA</b>	2.75 (2.29 - 3.30)	142 (11.3%)
<b>≥4 other long-term conditions</b>	<b>No RA</b>	2.70 (2.55 - 2.86)	2461 (10.8%)
	<b>RA</b>	2.98 (2.19 - 4.04)	54 (14.2%)

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126 Supplementary Table 6 – Relationship between long term conditions and major adverse cardiovascular events in  
 127 participants with and without RA using age-adjusted multivariate Cox’s proportional hazards regression analysis.  
 128 Unless otherwise shown, Cox’s proportional hazards  $p < 0.01$ . RA defined here as RA self-report plus  
 129 hospitalisation, medication or primary care read code related to rheumatoid arthritis.

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**Risk of MACE**

<b>Comorbidity status (reference: No RA and no other long-term conditions)</b>	<b>Adjusted for sex, Townsend score, alcohol status, smoking status, BMI, physical activity and rheumatoid factor status HR (95% CI)</b>	<b>Number of MACE (%)</b>
<b>No other long-term conditions</b>	<b>RA</b> 1.63 (1.13 - 2.36)	32 (3.5%)
<b>1 other long-term condition</b>	<b>No RA</b> 1.24 (1.18 - 1.30)	4530 (2.8%)
	<b>RA</b> 1.95 (1.46 - 2.59)	60 (5.4%)
<b>2-3 other long-term conditions</b>	<b>No RA</b> 1.66 (1.58 - 1.74)	6244 (4.6%)
	<b>RA</b> 2.50 (2.00 - 3.12)	95 (7.6%)
<b>≥4 other long-term conditions</b>	<b>No RA</b> 2.38 (2.23 - 2.54)	2007 (8.2%)
	<b>RA</b> 3.30 (2.36 - 4.61)	46 (12.1%)

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149 Supplementary Table 7 – Table 4 Risk of all-cause mortality for individual index conditions in patients with RA  
 150 and no index condition, RA with index condition, RA with no index condition or RA and index condition. Age-  
 151 adjusted Cox's proportional hazards models were adjusted for sex, Townsend score, smoking status, alcohol  
 152 intake frequency, BMI, physical activity level and level of rheumatoid factor. Unless otherwise shown, Cox's  
 153 proportional hazards  $p < 0.01$ . Index conditions labelled \* have interaction term  $p > 0.01$ . RA defined here as RA  
 154 self-report plus hospitalisation, medication or primary care read code related to rheumatoid arthritis.

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Index condition	Risk of all-cause mortality			
	No RA, no index condition HR, (95% CI), p	No RA, with index condition HR, (95% CI), p	RA, no index condition HR, (95% CI), p	RA and index condition HR, (95% CI), p
Hypertension	1	1.24 1.20-1.28	1.27 1.07-1.52	1.69 1.41-2.02
Coronary heart disease	1	1.58 1.50-1.65	1.30 1.13-1.50	2.08 1.55-2.79
Diabetes	1	1.68 1.60-1.76	1.37 1.20-1.57	1.76 1.22-2.54
Asthma	1	1.10 1.05-1.15	1.32 1.14-1.52	1.48 1.10-2.00
Dyspepsia	1	1.02 0.97-1.07	1.31 1.15-1.50	1.46 1.04-2.06
Cancer	1	2.50 2.41-2.60	1.43 1.25-1.65	2.72 1.99-3.70
Depression	1	1.28 1.20-1.35	1.32 1.16-1.51	1.79 1.17-2.75
Thyroid disorder	1	1.05 0.99-1.12	1.36 1.19-1.55	1.14 0.76-1.72
COPD	1	2.12 1.98-2.26	1.32 1.15-1.50	2.53 1.77-3.63
Epilepsy	1	1.62 1.43-1.84	1.33 1.17-1.51	2.15 0.80-5.72
Migraine	1	0.85 0.76-0.94	1.33 1.17-1.51	1.02 0.38-2.71
Psoriasis /Eczema	1	1.06 0.94-1.14	1.30 1.14-1.49	2.08 1.23-3.50
Prostate disease	1	0.83 0.75-0.90	1.32 1.16-1.51	1.33 0.55-3.19
Osteoporosis	1	1.27 1.16-1.40	1.29 1.13-1.48	2.09 1.38-3.14
Atrial fibrillation	1	1.40 1.25-1.58	1.34 1.18-1.52	0.99 0.25-3.98
Anxiety	1	1.23 1.11-1.36	1.34 1.18-1.53	0.72 0.18-2.89
Inflammatory bowel disease	1	1.38 1.21-1.58	1.35 1.18-1.53	0.63 0.16-2.51
Heart failure	1	2.71 2.25-3.28	1.32 1.16-1.51	4.34 1.39-13.43

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160 Supplementary Table 8 – Risk of MACE for individual index conditions in patients with RA and no index  
 161 condition, RA with index condition, RA with no index condition or RA and index condition. Age-adjusted Cox's  
 162 proportional hazards models were adjusted for sex, Townsend score, smoking status, alcohol intake frequency,  
 163 BMI, physical activity level and level of rheumatoid factor. Unless otherwise shown,  $p < 0.01$ . Index conditions  
 164 labelled \* have interaction term  $p > 0.01$ . RA defined here as RA self-report plus hospitalisation, medication or  
 165 primary care read code related to rheumatoid arthritis.

Index condition	Risk of MACE			
	No RA, no index condition HR, (95% CI), p	No RA, with index condition HR, (95% CI), p	RA, no index condition HR, (95% CI), p	RA and index condition HR, (95% CI), p
Hypertension	1	1.49 1.44-1.55	1.55 1.26-1.90	2.26 1.85-2.76
Coronary heart disease	1	1.89 1.80-1.98	1.60 1.37-1.88	2.31 1.65-3.22
Diabetes	1	1.66 1.58-1.75	1.62 1.39-1.90	1.66 1.58-1.75
Asthma	1	1.12 1.06-1.17	1.57 1.34-1.84	1.67 1.19-2.36
Dyspepsia	1	1.14 1.08-1.20	1.55 1.33-1.82	1.80 1.23-2.64
Cancer	1	1.11 1.05-1.17	1.59 1.37-1.85	1.42 0.87-2.33 p=0.16
Depression	1	1.25 1.17-1.34	1.53 1.31-1.78	2.38 1.52-3.74
Thyroid disorder	1	1.14 1.06-1.23	1.50 1.28-1.75	2.32 1.59-3.36
COPD	1	1.50 1.38-1.63	1.58 1.36-1.84	1.81 1.09-3.00
Epilepsy	1	1.50 1.31-1.74	1.56 1.35-1.81	1.74 0.44-6.97 p=0.43
Migraine	1	1.00 0.90-1.12 p=0.96	1.54 1.33-1.79	2.41 1.08-5.37
Psoriasis /Eczema	1	1.05 0.96-1.14 p=0.29	1.56 1.34-1.80	1.72 0.86-3.44 p=0.12
Prostate disease	1	0.91 0.83-1.00 p=0.05	1.53 1.32-1.78	2.53 1.20-5.31 p=0.01
Osteoporosis*	1	1.27 1.12-1.43	1.48 1.28-1.73	3.15 2.03-4.90
Atrial fibrillation	1	1.72 1.53-1.93	1.56 1.35-1.81	2.78 1.04-7.43 p=0.04
Anxiety	1	1.29 1.15-1.44	1.56 1.35-1.81	2.29 0.86-6.10 p=0.09
Inflammatory bowel disease	1	1.09 0.92-1.29 p=0.30	1.57 1.36-1.82	0.90 0.23-3.63 p=0.89
Heart failure	1	2.67 2.18-3.28	1.57 1.35-1.81	1.71 1.35-12.17 p=0.59

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