

# Male sex adversely impacts survival and myeloid malignancy risk in MGUS: a real-world population-based study

Eve Roman,<sup>1\*</sup> Timothy Bagguley,<sup>1\*</sup> Simon Crouch,<sup>1</sup> Alexandra Smith,<sup>1</sup> Daniel Painter,<sup>1</sup> Debra Howell,<sup>1</sup> Russell Patmore,<sup>2</sup> Reuben Tooze,<sup>3</sup> Catherine Cargo,<sup>3</sup> Ruth De Tute,<sup>3</sup> Andrew Rawstron,<sup>3</sup> Gordon Cook,<sup>4</sup> Christopher Parrish<sup>5</sup> and Frances Seymour<sup>5</sup>

<sup>1</sup>Epidemiology and Cancer Statistics Group, Department of Health Sciences, University of York, York; <sup>2</sup>Queen's Center for Oncology and Hematology, Castle Hill Hospital, Cottingham; <sup>3</sup>Hematological Malignancy Diagnostic Service, St. James's Institute of Oncology, Leeds; <sup>4</sup>NIHR Leeds BRC and CRUK Clinical Trials Unit, Leeds Institute of Clinical Trial Research, Leeds and <sup>5</sup>Department of Hematology, Leeds Cancer Center, St James's University Hospital, Leeds, UK

*\*ER and TB contributed equally as first authors.*


**Correspondence:** E. Roman  
[eve.roman@york.ac.uk](mailto:eve.roman@york.ac.uk)

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## Supplementary Results

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Supplementary Table 1: Baseline patient characteristics distributed by year of diagnosis: MGUS diagnoses 2005-2019, followed-up to July 2023

	2005-19 (Total)		Year of MGUS diagnosis; last date of follow-up = 31 <sup>st</sup> July 2023					
	Males	Females	2005-9		2010-14		2015-19	
			Males	Females	Males	Females	Males	Females
<b>Total diagnoses</b>	2454	2197	615	499	835	784	1004	916
<b>Age at diagnosis</b>								
Median, years (IQR)	73.4 (65.5 - 79.8)	73.0 (63.8 - 80.1)	72.8 (63.1 - 78.8)	72.1 (61.7 - 79.3)	72.5 (65.0 - 79.6)	72.9 (63.0 - 80.1)	74.5 (67.2 - 81.0)	73.8 (66.4 - 80.5)
<b>Paraprotein type</b>								
IgM	405 (16.5)	367 (16.7)	65 (10.6)	65 (13.0)	147 (17.6)	135 (17.2)	193 (19.2)	167 (18.3)
Non-IgM	2049 (83.5)	1830 (83.3)	550 (89.4)	434 (87.0)	688 (82.4)	649 (82.8)	811 (80.8)	747 (81.7)
IgG	1570 (64.0)	1463 (66.6)	433 (70.4)	326 (65.3)	534 (64.0)	530 (67.6)	603 (60.1)	607 (66.4)
IgA	322 (13.1)	252 (11.5)	72 (11.7)	67 (13.4)	108 (12.9)	79 (10.1)	142 (14.1)	106 (11.6)
Other <sup>1</sup>	82 (3.3)	68 (3.1)	26 (4.2)	30 (6.0)	20 (2.4)	22 (2.8)	36 (3.6)	16 (1.8)
Light chain	75 (3.1)	47 (2.1)	19 (3.1)	11 (2.2)	26 (3.1)	18 (2.3)	30 (3.0)	18 (2.0)
<b>sFLC (kappa/lambda)</b>								
Normal (0.26-1.65)	831 (61.2)	772 (64.5)	58 (54.2)	46 (54.8)	298 (59.4)	257 (60.2)	475 (63.5)	469 (68.4)
Abnormal (<0.26 or >1.65)	526 (38.8)	425 (35.5)	49 (45.8)	38 (45.2)	204 (40.6)	170 (39.8)	273 (36.5)	217 (31.6)
Missing	1097	1000	508	415	333	357	256	228
<b>Paraprotein concentration g/dl</b>								
< 1.5	2089 (90.9)	1908 (91.9)	482 (84.7)	405 (88.2)	725 (92.5)	678 (91.9)	882 (93.3)	825 (93.9)
≥ 1.5	209 (9.1)	168 (8.1)	87 (15.3)	54 (11.8)	59 (7.5)	60 (8.1)	63 (6.7)	54 (6.1)
Median (IQR)	0.50 (0.20 - 0.90)	0.40 (0.10 - 0.80)	0.69 (0.30 - 1.20)	0.60 (0.23 - 1.07)	0.50 (0.10 - 0.87)	0.40 (0.10 - 0.80)	0.40 (0.10 - 0.70)	0.30 (0.10 - 0.70)
Missing	67	53	24	21	21	20	22	12
<b>Risk stratification score<sup>2</sup></b>								
0	531 (42.0)	510 (45.1)	41 (43.6)	23 (32.4)	198 (42.4)	163 (40.6)	292 (41.5)	324 (49.2)
1	522 (41.3)	453 (40.1)	36 (38.3)	36 (50.7)	185 (39.6)	172 (42.9)	301 (42.8)	245 (37.2)
2-3	211 (16.7)	167 (14.8)	17 (18.1)	12 (16.9)	84 (18.0)	66 (16.5)	110 (15.6)	89 (13.5)
Missing	1101	997	499	407	338	357	264	233

<sup>1</sup>IgD (n=5), IgE (n=3), IgA & IgG (n=13), IgA & IgM (n=2), IgG & IgM (n=34), non-secretory (n=37), not known (n=56); <sup>2</sup>Mayo clinic score: non-IgG isotype=1, M-protein ≥ 1.5 g/dl = 1, abnormal sFLC = 1

**Supplementary Table 2A (Total):** Baseline characteristics and subsequent haematological malignancy frequencies (first only) >90 days after MGUS diagnosis; stratified by M-protein isotype

MALES + FEMALES	All subtypes	IgM	Non-IgM				
			Total	IgG	IgA	Other <sup>1</sup>	Light chain only
<b>Total MGUS</b>	4651	772	3879	3033	574	150	122
<b>Males (%)</b>	2454 (52.8)	405 (52.5)	2049 (52.8)	1570 (51.8)	322 (56.1)	82 (54.7)	75 (61.5)
<b>Mean age at diagnosis, years (SD)</b>	71.7 (11.5)	71.8 (10.8)	71.7 (11.6)	71.6 (11.6)	71.2 (11.8)	73.1 (11.9)	73.4 (9.8)
<b>Paraprotein concentration g/dl</b>							
< 1.5	3994 (91.4)	745 (98.3)	3249 (90.0)	2667 (88.9)	533 (95.2)	49 (96.1)	
≥ 1.5	376 (8.6)	13 (1.7)	363 (10.0)	334 (11.1)	27 (4.8)	2 (3.9)	
Median (IQR)	0.41 (0.13 - 0.88)	0.30 (0.01 - 0.50)	0.50 (0.20 - 0.90)	0.50 (0.20 - 1.00)	0.50 (0.12 - 0.80)	0.30 (0.01 - 0.40)	
Missing	122	14	108	32	14	62	
<b>Risk stratification score</b>							
0	1041 (43.5)	0 (0.0)	1041 (28.0)	1041 (60.0)	0 (0.0)	0 (0.0)	
1	975 (40.7)	185 (68.0)	790 (21.2)	570 (32.9)	205 (56.6)	15 (57.7)	
2-3	378 (15.8)	87 (32.0)	291 (7.8)	123 (7.1)	157 (43.4)	11 (42.3)	
Missing <sup>5</sup>	2098	500	1598	1299	212	87	
<b>Total blood cancers &gt;90 days after MGUS</b>	332 (7.1%)	37 (4.8%)	295 (7.6%)	221 (7.3%)	56 (9.8%)	9 (6.0%)	9 (7.4%)
<b>Lymphoid diagnoses (% total blood cancers)</b>	292 (88.0)	33 (89.2)	259 (87.8)	199 (90.0)	45 (80.4)	8 (88.9)	7 (77.8)
Myeloma	240 (72.3)	1 (2.7)	239 (81.0)	181 (81.9)	44 (78.6)	7 (77.8) <sup>2</sup>	7 (77.8)
Lymphoplasmacytic lymphoma (LPL)	27 (8.1)	22 (59.5)	5 (1.7)	3 (1.4)	1 (1.8)	1 (11.1) <sup>3</sup>	-
Large B-cell lymphomas (LBCL)	6 (1.8)	1 (2.7)	5 (1.7)	5 (2.3)	-	-	-
Chronic lymphocytic leukaemia (CLL)	5 (1.5)	3 (8.1)	2 (0.7)	2 (0.9)	-	-	-
Follicular lymphoma (FL)	4(1.2)	3 (8.1)	1 (0.3)	1 (0.5)	-	-	-
Post-transplant lymphoproliferative disorder	4(1.2)	2 (5.4)	2 (0.7)	2 (0.9)	-	-	-
Other lymphoid	6 (1.8)	1 (2.7)	5 (1.7)	5 (2.3)	-	-	-
<b>Myeloid diagnoses (% total blood cancers)</b>	40 (12.0)	4 (10.8)	36 (12.2)	22 (10.0)	11 (19.6)	1 (11.1)	2 (22.2)
Myelodysplastic syndromes (MDS)	16 (4.8)	2 (5.4)	14 (4.7)	8 (3.6)	5 (8.9)	1 (11.1) <sup>4</sup>	-
Acute myeloid leukaemia (AML)	10 (3.0)	1 (2.7)	9 (3.1)	6 (2.7)	2 (3.6)	-	1 (11.1)
Chronic myeloproliferative neoplasms	5 (1.5)	-	5 (1.7)	2 (0.9)	2 (3.6)	-	1 (11.1)
Chronic myelomonocytic leukaemia	4 (1.2)	-	4 (1.4)	4 (1.8)	-	-	-
Other myeloid	5 (1.5)	1 (2.7)	4 (1.4)	2 (0.9)	2 (3.6)	-	-

<sup>1</sup>IgD (n=5), IgE (n=3), IgA & IgG (n=13), IgA & IgM (n=2), IgG & IgM (n=34), non-secretory (n=37), not known (n=56); <sup>2</sup>IgA & IgM (n=1), not known (n=6); <sup>3</sup>not known (n=1); <sup>4</sup> non-secretory (n=1); <sup>5</sup> Excludes light chain only and non-secretory

**Supplementary Table 2B (Males):** Baseline characteristics and subsequent haematological malignancy frequencies (first only) >90 days after MGUS diagnosis; stratified by M-protein isotype

MALES	All subtypes	IgM	Non-IgM				
			Total	IgG	IgA	Other <sup>1</sup>	Light chain only
<b>Total MGUS</b>	2454	405	2049	1570	322	82	75
<b>Mean age at diagnosis, years (SD)</b>	71.9 (11.2)	71.8 (10.3)	72.0 (11.4)	71.9 (11.5)	71.4 (11.1)	73.4 (11.0)	73.6 (10.4)
<b>Paraprotein concentration g/dl</b>							
< 1.5	2089 (90.9)	389 (98.0)	1700 (89.5)	1363 (87.9)	302 (96.8)	35 (94.6)	
≥ 1.5	208 (9.1)	8 (2.0)	200 (10.5)	188 (12.1)	10 (3.2)	2 (5.4)	
Median (IQR)	0.50 (0.20 - 0.90)	0.30 (0.01 - 0.58)	0.50 (0.20 - 1.00)	0.50 (0.20 - 1.02)	0.49 (0.10 - 0.73)	0.30 (0.01 - 0.60)	
Missing	68	8	60	19	10	31	
<b>Risk stratification score</b>							
0	531 (42.0)	0 (0.0)	531 (27.1)	531 (59.0)	0 (0.0)	0 (0.0)	
1	522 (41.3)	97 (66.9)	425 (21.7)	304 (33.8)	109 (54.8)	12 (60.0)	
2-3	211 (16.7)	48 (33.1)	163 (8.3)	65 (7.2)	90 (45.2)	8 (40.0)	
Missing <sup>5</sup>	1101	260	841	670	123	48	
<b>Total blood cancers &gt;90 days after MGUS</b>	215 (8.8)	26 (6.4)	189 (9.2)	137 (8.7)	39 (12.1)	6 (7.3)	7 (9.3)
<b>Lymphoid diagnoses (% total blood cancers)</b>	181 (84.2)	22 (84.6)	159 (84.1)	120 (87.6)	29 (74.4)	5 (83.3)	5 (71.4)
Myeloma	145 (67.4)	1 (3.8)	144 (76.2)	107 (78.1)	28 (71.8)	4 (66.7) <sup>2</sup>	5 (71.4)
Lymphoplasmacytic lymphoma (LPL)	16 (7.4)	13 (50.0)	3 (1.6)	1 (0.7)	1 (2.6)	1 (16.7) <sup>3</sup>	-
Large B-cell lymphomas (LBCL)	4 (1.9)	-	4 (2.1)	4 (2.9)	-	-	-
Chronic lymphocytic leukaemia (CLL)	4 (1.9)	3 (11.5)	1 (0.5)	1 (0.7)	-	-	-
Follicular lymphoma (FL)	3 (1.4)	2 (7.7)	1 (0.5)	1 (0.7)	-	-	-
Post-transplant lymphoproliferative disorder	4 (1.9)	2 (7.7)	2 (1.1)	2 (1.5)	-	-	-
Other lymphoid	5 (2.3)	1 (3.8)	4 (2.1)	4 (2.9)	-	-	-
<b>Myeloid diagnoses (% total blood cancers)</b>	34 (15.8)	4 (15.4)	30 (15.9)	17 (12.4)	10 (25.6)	1 (16.7)	2 (28.6)
Myelodysplastic syndromes (MDS)	14 (6.5)	2 (7.7)	12 (6.3)	7 (5.1)	4 (10.3)	1 (16.7) <sup>4</sup>	-
Acute myeloid leukaemia (AML)	8 (3.7)	1 (3.8)	7 (3.7)	4 (2.9)	2 (5.1)	-	1 (14.3)
Chronic myeloproliferative neoplasms	4 (1.9)	-	4 (2.1)	1 (0.7)	2 (5.1)	-	1 (14.3)
Chronic myelomonocytic leukaemia	4 (1.9)	-	4 (2.1)	4 (2.9)	-	-	-
Other myeloid	4 (1.9)	1 (3.8)	3 (1.6)	1 (0.7)	2 (5.1)	-	-

<sup>1</sup> IgA & IgG (n=9), IgA & IgM (n=1), IgD (n=3), IgE (n=3), IgG & IgM= (n=22), Non-secretory= (n=14), Not known (n=30); <sup>2</sup> IgA & IgM (n=1), not known (n=3); <sup>3</sup> not known (n=1); <sup>4</sup> non-secretory (n=1); <sup>5</sup> Excludes light chain only and non-secretory

**Supplementary Table 2C (Females):** Baseline characteristics and subsequent haematological malignancy frequencies (first only) >90 days after MGUS diagnosis; stratified by M-protein isotype

FEMALES	All subtypes	IgM	Non-IgM				Light chain only
			Total	IgG	IgA	Other <sup>1</sup>	
<b>Total MGUS</b>	2197	367	1830	1463	252	68	47
<b>Mean age at diagnosis, years (SD)</b>	71.5 (11.8)	71.9 (11.3)	71.4 (11.9)	71.3 (11.8)	70.9 (12.7)	72.7 (13.1)	73.3 (8.9)
<b>Paraprotein concentration g/dl</b>							
< 1.5	1905 (91.9)	356 (98.6)	1549 (90.5)	1304 (89.9)	231 (93.1)	14 (100.0)	
≥ 1.5	168 (8.1)	5 (1.4)	163 (9.5)	146 (10.1)	17 (6.9)	0 (0.0)	
Median (IQR)	0.40 (0.10 - 0.80)	0.20 (0.01 - 0.50)	0.50 (0.20 - 0.90)	0.50 (0.20 - 0.90)	0.50 (0.20 - 0.80)	0.10 (0.01 - 0.30)	
Missing	54	6	48	13	4	31	
<b>Risk stratification score</b>							
0	510 (45.1)	0 (0.0)	510 (50.8)	510 (61.2)	0 (0.0)	0 (0.0)	
1	453 (40.1)	88 (69.3)	365 (36.4)	266 (31.9)	96 (58.9)	3 (50.0)	
2-3	167 (14.8)	39 (30.7)	128 (12.8)	58 (7.0)	67 (41.1)	3 (50.0)	
Missing <sup>3</sup>	997	240	757	629	89	39	
<b>Total blood cancers &gt;90 days after MGUS</b>	117 (5.3)	11 (3.0)	106 (5.8)	84 (5.8)	17 (6.7)	3 (4.4)	2 (4.3)
<b>Lymphoid diagnoses (% total blood cancers)</b>							
Myeloma	95 (81.2)	-	95 (89.6)	74 (88.1)	16 (94.1)	3 (100.0) <sup>2</sup>	2 (100.0)
Lymphoplasmacytic lymphoma (LPL)	11 (9.4)	9 (81.8)	2 (1.9)	2 (2.4)	-	-	-
Large B-cell lymphomas (LBCL)	2 (1.7)	1 (9.1)	1 (0.9)	1 (1.2)	-	-	-
Chronic lymphocytic leukaemia (CLL)	1 (0.9)	-	1 (0.9)	1 (1.2)	-	-	-
Follicular lymphoma (FL)	1 (0.9)	1 (9.1)	-	-	-	-	-
Post-transplant lymphoproliferative disorder	-	-	-	-	-	-	-
Other lymphoid	1 (0.9)	-	1 (0.9)	1 (1.2)	-	-	-
<b>Myeloid diagnoses (% total blood cancers)</b>							
Myelodysplastic syndromes (MDS)	2 (1.7)	-	2 (1.9)	1 (1.2)	1 (5.9)	-	-
Acute myeloid leukaemia (AML)	2 (1.7)	-	2 (1.9)	2 (2.4)	-	-	-
Chronic myeloproliferative neoplasms	1 (0.9)	-	1 (0.9)	1 (1.2)	-	-	-
Chronic myelomonocytic leukaemia	-	-	-	-	-	-	-
Other myeloid	1 (0.9)	-	1 (0.9)	1 (1.2)	-	-	-

<sup>1</sup> IgA & IgG (n=4), IgA & IgM (n=1), IgD (n=2), IgG & IgM (n=12), Non-secretory (n=23), Not known (n=26); <sup>2</sup> not known (n=3); <sup>3</sup> Excludes light chain only and non-secretory

**Supplementary Table 3: 5-year overall survival by patient diagnostic/prognostic characteristics: MGUS diagnoses 2005-2019, followed-up to July 2023**

	<b>5-year OS, % (95% CI)</b>		
	<b>Both sexes</b>	<b>Males</b>	<b>Females</b>
<b>Total diagnoses</b>	71.0 (69.7-72.3)	66.0 (64.1-67.9)	76.6 (74.7-78.4)
<b>Paraprotein</b>			
IgM	73.3 (70.0-76.4)	70.8 (66.0-75.1)	76.1 (71.3-80.2)
Non-IgM	70.6 (69.1-72.0)	65.1 (62.9-67.1)	76.7 (74.7-78.6)
IgG	71.4 (69.7-73.0)	65.5 (63.0-67.8)	77.7 (75.4-79.8)
IgA	71.0 (67.0-74.6)	68.1 (62.6-72.9)	74.9 (68.8-79.9)
Light chain only	59.7 (50.3-67.9)	51.5 (39.5-62.2)	73.2 (57.6-83.8)
Other subtypes <sup>1</sup>	61.4 (53.1-68.8)	58.1 (46.7-68.0)	65.4 (52.7-75.5)
<b>Paraprotein concentration g/dl</b>			
< 1.5	71.8 (70.4-73.2)	67.1 (65.0-69.2)	77.0 (75.0-78.8)
≥ 1.5	70.2 (65.2-74.6)	62.6 (55.6-68.9)	79.6 (72.6-85.1)
Missing	60.3 (51.1-68.4)	57.4 (44.8-68.1)	64.2 (49.8-75.4)
<b>Serum free light chain (kappa/lambda)</b>			
Normal (0.26-1.65)	72.1 (69.7-74.3)	67.0 (63.6-70.2)	77.6 (74.3-80.5)
Abnormal (<0.26 or >1.65)	71.6 (68.5-74.4)	67.6 (63.3-71.5)	76.6 (72.0-80.5)
Missing	70.0 (68.0-72.0)	64.6 (61.6-67.4)	75.9 (73.1-78.5)
<b>Risk stratification score<sup>3</sup></b>			
0	72.3 (69.4-75.1)	68.8 (64.5-72.7)	76.0 (71.9-79.6)
1	73.2 (70.2-76.0)	67.3 (63.0-71.3)	80.1 (75.9-83.6)
2-3	71.1 (66.1-75.5)	68.9 (62.0-74.7)	73.8 (66.1-80.0)
Missing	70.2 (68.1-72.1)	64.5 (61.6-67.3)	76.4 (73.6-78.9)

<sup>1</sup>IgD (n=5), IgE (n=3), IgA & IgG (n=13), IgA & IgM (n=2), IgG & IgM (n=34), non-secretory (n=37), not known (n=56); <sup>2</sup>Tests exclude missing; <sup>3</sup>Mayo clinic score: non-IgG isotype=1, M-protein ≥ 1.5 g/dl = 1, abnormal sFLC = 1; <sup>4</sup>Income domain

**Supplementary Table 4:** Standardized Incidence Ratios (95% Confidence Intervals) comparing the numbers of blood cancers diagnosed in MGUS patients (first transition, n=332)<sup>1</sup> in the HMRN region to the numbers expected on the basis of national rates (all diagnoses) Observed (O) and Expected (E<sup>2</sup>)

Diagnosis	All			Male			Female		
	O <sup>1</sup>	E <sup>2</sup>	Relative risk	O <sup>1</sup>	E <sup>2</sup>	Relative risk	O <sup>1</sup>	E <sup>2</sup>	Relative risk
<b>All</b>	332	-	-	215	-	-	117	-	-
Myeloma <sup>3</sup>	240	8.8	27.3 (24.0-30.9)	145	5.4	27.0 (22.8, 31.5)	95	3.4	27.9 (22.6, 33.8)
Non-Hodgkin lymphoma	40	19.0	2.1 (1.5-2.8)	25	11.0	2.3 (1.5, 3.3)	15	8.0	1.9 (1.0, 3.0)
Hodgkin lymphoma	1	1.3	0.8 (0.0-3.0)	1	0.8	1.3 (0.0, 5.1)	0	0.5	-
Chronic lymphocytic leukaemia	5	5.6	0.9 (0.3-1.9)	4	3.7	1.1 (0.3, 2.4)	1	1.9	0.5 (0.0, 2.0)
Acute lymphoblastic leukaemia	0	0.2	-	0	0.1	-	0	0.1	-
Acute myeloid leukaemia <sup>4</sup>	10	4.1	2.4 (1.2-4.2)	8	2.6	3.1 (1.3, 5.7)	2	1.6	1.3 (0.1, 3.7)
Chronic myeloid leukaemia	1	0.8	1.2 (0.0-4.9)	1	0.5	2.2 (0.0, 8.6)	0	0.3	-
Other <sup>5</sup>	35	-	-	31	-	-	4	-	-

<sup>1</sup>Followed up to 01/08/2023 for progression, excluding progressions within 90 days of MGUS diagnosis ; <sup>2</sup>Rates used are from Cancer Research UK, UK 2016-2018 <https://www.cancerresearchuk.org/health-professional/cancer-statistics/statistics-by-cancer-type>; <sup>3</sup>includes plasmacytoma; <sup>4</sup>includes acute promyelocytic leukaemia; <sup>5</sup> n=16 myelodysplastic syndromes, n=5 chronic myeloproliferative neoplasms, n=4 chronic myelomonocytic leukaemia, n=4 post-transplant lymphoproliferative disorder, n=2 myelodysplastic / myeloproliferative neoplasms, n=2 myelofibrosis, n=1 hairy cell leukaemia, n=1 T-cell large granular lymphocytic leukaemia

**Supplementary Table 5:** Standardized Incidence Ratios (95% Confidence Intervals) comparing the numbers of blood cancers diagnosed in MGUS patients (all transitions, n=343)<sup>1</sup> in the HMRN region to the numbers expected on the basis of national rates (all diagnoses) Observed (O) and Expected (E<sup>2</sup>)

Diagnosis	All			Male			Female		
	O <sup>1</sup>	E <sup>2</sup>	Relative risk	O <sup>1</sup>	E <sup>2</sup>	Relative risk	O <sup>1</sup>	E <sup>2</sup>	Relative risk
<b>All</b>	343	-	-	225	-	-	118	-	-
Myeloma <sup>3</sup>	240	8.8	27.3 (24.0, 30.9)	145	5.4	27.0 (22.8, 31.5)	95	3.4	27.9 (22.6, 33.8)
Non-Hodgkin lymphoma	43	19.0	2.3 (1.6, 3.0)	28	11.0	2.5 (1.7, 3.6)	15	8.0	1.9 (1.0, 3.0)
Hodgkin lymphoma	2	1.3	1.5 (0.1, 4.4)	2	0.8	2.6 (0.2, 7.4)	0	0.5	-
Chronic lymphocytic leukaemia	8	5.6	1.4 (0.6, 2.6)	6	3.7	1.6 (0.6, 3.2)	2	1.9	1.0 (0.1, 3.0)
Acute lymphoblastic leukaemia	0	0.2	-	0	0.1	-	0	0.1	-
Acute myeloid leukaemia <sup>4</sup>	12	4.1	2.9 (1.5, 4.8)	10	2.6	3.9 (1.9, 6.7)	2	1.6	1.3 (0.1, 3.7)
Chronic myeloid leukaemia	1	0.8	1.2 (0.0, 4.9)	1	0.5	2.2 (0.0, 8.6)	0	0.3	-
Other <sup>5</sup>	37	-	-	33	-	-	4	-	-

<sup>1</sup>Followed up to 01/08/2023 for progression, excluding progressions within 90 days of MGUS diagnosis ; <sup>2</sup>Rates used are from Cancer Research UK, UK 2016-2018 <https://www.cancerresearchuk.org/health-professional/cancer-statistics/statistics-by-cancer-type>; <sup>3</sup>includes plasmacytoma; <sup>4</sup>includes acute promyelocytic leukaemia; <sup>5</sup> n=18 myelodysplastic syndromes, n=5 chronic myeloproliferative neoplasms, n=4 chronic myelomonocytic leukaemia, n=4 post-transplant lymphoproliferative disorder, n=2 myelodysplastic / myeloproliferative neoplasms, n=2 myelofibrosis, n=1 hairy cell leukaemia, n=1 T-cell large granular lymphocytic leukaemia

Supplementary Figure 1: Multi-state model structure and number of events associated with each transition

