

Body mass index and lifetime healthcare utilization

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Table S1: Estimated BMI- and age-specific survival probabilities for males.

	Estimated survival probabilities by BMI category				
Age	Underweight	Normal	Overweight	Obese I	Obese II and III
18	1.000000000	1.000000000	1.000000000	1.000000000	1.000000000
19	0.999566370	0.999605791	0.999523007	0.999294365	0.999183987
20	0.999081770	0.999165228	0.998989970	0.998506004	0.998272407
21	0.998731280	0.998846574	0.998604466	0.997935989	0.997613382
22	0.998194112	0.998358183	0.998013656	0.997062567	0.996603661
23	0.997614505	0.997831181	0.997376204	0.996120458	0.995514685
24	0.997151275	0.997409971	0.996866773	0.995367785	0.994644804
25	0.996592687	0.996902033	0.996252502	0.994460436	0.993596287
26	0.995963933	0.996330260	0.995561108	0.993439470	0.992416642
27	0.995486640	0.995896199	0.995036299	0.992664754	0.991521664
28	0.994873405	0.995338483	0.994362045	0.991669682	0.990372263
29	0.994230923	0.994754135	0.993655678	0.990627555	0.989168699
30	0.982992013	0.993137409	0.993753274	0.992385159	0.988291143
31	0.981617543	0.992579716	0.993245458	0.991766589	0.987342142
32	0.980043656	0.991940574	0.992663449	0.991057722	0.986254976
33	0.978214892	0.991197215	0.991986499	0.990233328	0.984991118
34	0.976098365	0.990335923	0.991202100	0.989278224	0.983527531
35	0.974389275	0.989639530	0.990567828	0.988506053	0.982344885
36	0.972556439	0.988891931	0.989886874	0.987677169	0.981075914
37	0.970848685	0.988194566	0.989251634	0.986904045	0.979892845
38	0.969185213	0.987514569	0.988632175	0.986150234	0.978739819
39	0.967245801	0.986720958	0.987909172	0.985270543	0.977394803
40	0.965828024	0.986140106	0.987379959	0.984626744	0.976410933
41	0.962689812	0.984853274	0.986207470	0.983200553	0.974232160
42	0.959959120	0.983731362	0.985185127	0.981957321	0.972334381
43	0.957413861	0.982683857	0.984230488	0.980796686	0.970563899
44	0.954540076	0.981499264	0.983150812	0.979484314	0.968563229
45	0.951290507	0.980157358	0.981927623	0.977997856	0.966298813
46	0.948009171	0.978799563	0.980689798	0.976494024	0.964009813
47	0.944879059	0.977501662	0.979506427	0.975056747	0.961823937
48	0.940601184	0.975724324	0.977885732	0.973088836	0.958833434
49	0.936410906	0.973978642	0.976293643	0.971156364	0.955899994
50	0.930908878	0.971680343	0.974197220	0.968612644	0.952042852
51	0.925651073	0.969476294	0.972186339	0.966173873	0.948350096
52	0.919656576	0.966954885	0.969885444	0.963384643	0.944132443
53	0.913351243	0.964292387	0.967455228	0.960440183	0.939687031
54	0.904610343	0.960586197	0.964071532	0.956342746	0.933511158
55	0.896745054	0.957231988	0.961008127	0.952636021	0.927937127
56	0.887761569	0.953380809	0.957489729	0.948381737	0.921553152
57	0.878175253	0.949246314	0.953711124	0.943816512	0.914719190
58	0.868130119	0.944885635	0.949724241	0.939003845	0.907533655
59	0.857064197	0.940048562	0.945299964	0.933668116	0.899589234
60	0.844040539	0.934311750	0.940050302	0.927343476	0.890201502

61	0.830636305	0.928352781	0.934594334	0.920778352	0.880492742
62	0.814621341	0.921164439	0.928008963	0.912864394	0.868834379
63	0.798711387	0.913939220	0.921385160	0.904916664	0.857181133
64	0.782293042	0.906394251	0.914463301	0.896624427	0.845080478
65	0.763464869	0.897633194	0.906419765	0.887004475	0.831112500
66	0.744778573	0.888809840	0.898311917	0.877326520	0.817142682
67	0.723678834	0.878697319	0.889011143	0.866246646	0.801244606
68	0.701629160	0.867945146	0.879111818	0.854480846	0.784479042
69	0.674995043	0.854713204	0.866915835	0.840021234	0.764028313
70	0.647413430	0.840687000	0.853969762	0.824719770	0.742588288
71	0.618460116	0.825587883	0.840012471	0.808278074	0.719781641
72	0.587744804	0.809121159	0.824765941	0.790383240	0.695232248
73	0.556455565	0.791822182	0.808719491	0.771626060	0.669814746
74	0.523811649	0.773166975	0.791380984	0.751446938	0.642829696
75	0.486718956	0.751178902	0.770900468	0.727725819	0.611568476
76	0.450890580	0.728971749	0.750161402	0.703845492	0.580651949
77	0.413260457	0.704538803	0.727281127	0.677659716	0.547372423
78	0.373270491	0.677158847	0.701561092	0.648427450	0.510997100
79	0.333591054	0.648249848	0.674305892	0.617699975	0.473692959
80	0.296650187	0.619420437	0.647016636	0.587207414	0.437669420
81	0.255622936	0.585016038	0.614313810	0.551004548	0.396100306
82	0.217297252	0.549790429	0.580653166	0.514177330	0.355316098
83	0.178782356	0.510654799	0.543040567	0.473550676	0.312066095
84	0.142204845	0.468696530	0.502437036	0.430361037	0.268219806
85	0.110928220	0.427296765	0.462051191	0.388165932	0.227706928
86	0.081470384	0.381725712	0.417208574	0.342214415	0.186179808
87	0.059421616	0.340236362	0.375943766	0.300928065	0.151576796
88	0.041333765	0.298643013	0.334121511	0.260093415	0.119890462
89	0.026634713	0.255991211	0.290697408	0.218861134	0.090610819
90	0.016237528	0.215858967	0.249225794	0.180775603	0.066319866
91	0.008842395	0.176377180	0.207743660	0.144073622	0.045577110
92	0.004475908	0.141398344	0.170252220	0.112358207	0.030120799
93	0.002060037	0.110747844	0.136668606	0.085323540	0.018955873
94	0.000799034	0.083522274	0.106094635	0.062040829	0.010987281
95	0.000304154	0.062747444	0.082080332	0.044911682	0.006314004

Table S2: Estimated BMI- and age-specific survival probabilities for females.

	Estimated survival probabilities by BMI category				
Age	Underweight	Normal	Overweight	Obese I	Obese II and III
18	1.000000000	1.000000000	1.000000000	1.000000000	1.000000000
19	0.999766992	0.999773779	0.999751157	0.999624473	0.999504576
20	0.999592979	0.999604833	0.999565320	0.999344064	0.999134683
21	0.999447993	0.999464068	0.999410485	0.999110456	0.998826553
22	0.999303963	0.999324231	0.999256673	0.998878409	0.998520506
23	0.999076728	0.999103610	0.999014006	0.998512341	0.998037735
24	0.998856090	0.998889392	0.998778387	0.998156950	0.997569098
25	0.998615871	0.998656162	0.998521863	0.997770072	0.997058999
26	0.998380382	0.998427523	0.998270394	0.997390868	0.996559081
27	0.998066471	0.998122741	0.997935186	0.996885455	0.995892857
28	0.997618168	0.997687471	0.997456479	0.996163802	0.994941744
29	0.997403453	0.997478995	0.997227208	0.995818260	0.994486438
30	0.995230343	0.997035045	0.997212717	0.996472606	0.994609739
31	0.994776168	0.996752437	0.996947018	0.996136493	0.994096643
32	0.994272620	0.996439053	0.996652380	0.995763796	0.993527804
33	0.993721320	0.996095885	0.996329732	0.995355703	0.992905062
34	0.993263190	0.995810652	0.996061551	0.995016528	0.992387602
35	0.992893452	0.995580412	0.995845071	0.994742761	0.991970005
36	0.992291884	0.995205756	0.995492801	0.994297296	0.991290605
37	0.991499038	0.994711859	0.995028403	0.993710095	0.990395248
38	0.990788672	0.994269208	0.994612179	0.993183870	0.989593120
39	0.990080358	0.993827716	0.994197033	0.992659068	0.988793383
40	0.989253811	0.993312390	0.993712447	0.992046551	0.987860240
41	0.988193756	0.992651269	0.993090743	0.991260820	0.986663605
42	0.987156385	0.992004033	0.992482072	0.990491688	0.985492740
43	0.986475268	0.991578901	0.992082255	0.989986552	0.984724079
44	0.985602564	0.991034045	0.991569830	0.989339215	0.983739296
45	0.984144228	0.990123254	0.990713224	0.988257227	0.982093859
46	0.982694181	0.989217132	0.989860962	0.987180974	0.980458090
47	0.980470276	0.987826656	0.988553064	0.985529714	0.977949832
48	0.979048549	0.986936970	0.987716144	0.984473449	0.976346793
49	0.977557213	0.986003212	0.986837718	0.983365050	0.974665588
50	0.975314483	0.984598176	0.985515866	0.981697531	0.972137827
51	0.972870304	0.983065602	0.984073904	0.979879141	0.969383841
52	0.970015554	0.981273884	0.982387962	0.977753907	0.966168298
53	0.967583144	0.979745535	0.980949683	0.975941696	0.963429523
54	0.964442504	0.977770307	0.979090686	0.973600300	0.959894474
55	0.960610561	0.975357327	0.976819422	0.970741101	0.955583140
56	0.955869214	0.972367182	0.974004472	0.967199669	0.950251407
57	0.950853512	0.969198069	0.971020491	0.963448467	0.944614807
58	0.946235853	0.966274624	0.968267285	0.959990205	0.939429092
59	0.941099742	0.963016935	0.965198742	0.956138767	0.933664820
60	0.935718875	0.959596946	0.961976669	0.952098049	0.927630156

61	0.929459359	0.955609835	0.958219490	0.947390464	0.920615349
62	0.922072018	0.950892329	0.953772924	0.941824917	0.912343902
63	0.914173243	0.945832913	0.949002666	0.935861624	0.903509056
64	0.906786369	0.941085897	0.944525517	0.930272228	0.895256087
65	0.898340616	0.935641663	0.939389233	0.923868033	0.885830115
66	0.889896572	0.930179141	0.934233896	0.917449430	0.876417605
67	0.880093202	0.923814461	0.928225017	0.909979113	0.865503391
68	0.869535622	0.916931195	0.921723856	0.901910698	0.853766583
69	0.857172083	0.908833409	0.914072151	0.892432189	0.840043867
70	0.843127270	0.899584163	0.905327743	0.881624216	0.824484375
71	0.828284360	0.889747634	0.896022371	0.870152443	0.808076442
72	0.810636268	0.877972679	0.884875856	0.856448842	0.788613152
73	0.793491721	0.866439339	0.873949274	0.843060632	0.769758891
74	0.775562880	0.854279660	0.862420105	0.828981052	0.750097691
75	0.755275348	0.840399758	0.849248671	0.812953105	0.727916975
76	0.732495280	0.824655951	0.834293666	0.794829847	0.703098388
77	0.708300802	0.807737588	0.818204544	0.775425157	0.676845744
78	0.680765204	0.788233699	0.799633315	0.753144000	0.647100879
79	0.651902725	0.767476661	0.779839517	0.729542729	0.616087165
80	0.616977793	0.741938356	0.755446811	0.700654256	0.578775860
81	0.581581123	0.715499977	0.730142253	0.670943225	0.541239791
82	0.543024842	0.686037545	0.701880813	0.638066262	0.500677725
83	0.502511649	0.654246941	0.671307526	0.602880768	0.458451664
84	0.460762500	0.620485784	0.638744483	0.565859269	0.415394982
85	0.419853896	0.586268661	0.605633911	0.528725669	0.373703792
86	0.375150023	0.547496700	0.567984419	0.487115599	0.328723738
87	0.327798795	0.504574507	0.526127749	0.441671302	0.281820497
88	0.282052870	0.460837961	0.483259254	0.396113231	0.237361143
89	0.237137363	0.415256509	0.438328062	0.349489587	0.194632321
90	0.192429263	0.366629584	0.390079154	0.300788174	0.153151561
91	0.150691748	0.317237529	0.340681060	0.252567052	0.115600483
92	0.113978075	0.269231360	0.292220511	0.207085409	0.083762648
93	0.082655997	0.223276757	0.245334647	0.165022449	0.057741578
94	0.057043840	0.180304376	0.200950013	0.127227315	0.037515767
95	0.038628511	0.144150811	0.163074305	0.096869382	0.023824927

Table S3: Results of hurdle regressions on primary care consultations; adjusted for gender, age, education, marital status, geographical region, smoking status, and study period.

Variables	Logit OR (SE)	GLM IRR (SE)
Underweight	0.91 (0.12)	1.16 (0.13)
Overweight	1.23 (0.05)***	1.14 (0.03)***
Category I obesity	1.67 (0.12)***	1.42 (0.06)***
Category II/III obesity	2.41 (0.41)***	2.20 (0.17)***
Female	1.67 (0.06)***	1.31 (0.03)***
Age	0.98 (0.01)***	1.00 (0.00)
Age^2	1.00 (0.00)***	1.00 (0.00)*
Study period 2005-2006	0.78 (0.03)***	1.08 (0.04)*
Study period 2008-2009	1.69 (0.08)***	1.04 (0.04)
Study period 2012-2013	1.64 (0.12)***	0.97 (0.05)
Study period 2015-2016 ¹	95.94 (22.26)***	1.05 (0.04)
Higher education. long	0.77 (0.06)***	0.72 (0.04)***
Higher education. short	0.94 (0.05)	0.75 (0.03)***
Upper secondary education	0.99 (0.05)	0.84 (0.03)***
Divorced /separated	1.06 (0.07)	1.31 (0.06)***
Unmarried	0.94 (0.05)	1.09 (0.04)***
Widow/widower	1.01 (0.10)	1.00 (0.05)
Mid-North Norway	0.94 (0.04)	0.89 (0.03)***
Southern Norway	0.88 (0.04)**	0.99 (0.04)
Western Norway	0.90 (0.04)**	0.96 (0.03)
Smoking daily	1.17 (0.05)***	1.25 (0.04)***
Smoking occasionally	1.07 (0.06)	0.96 (0.04)
Constant	2.21 (0.34)***	1.84 (0.21)***
Number of observations	26,419	21,613

*** p<0.01. ** p<0.05. * p<0.1.

¹The values for study year 2015-2016 are high in the logit regression because there were few zero observations.

Table S4: Results of hurdle regressions on primary care consultations among males; adjusted for, age, education, marital status, geographical region, smoking status, and study period.

Variables	Logit OR (SE)	GLM IRR (SE)
Underweight	0.60 (0.17)*	0.88 (0.24)
Overweight	1.14 (0.06)***	1.12 (0.05)**
Category I obesity	1.57 (0.14)***	1.52 (0.10)***
Category II/III obesity	2.22 (0.49)***	2.45 (0.24)***
Age	0.98 (0.01)***	0.99 (0.19)
Age^2	1.00 (0.00)***	1.01 (0.01)
Study period 2005-2006	0.74 (0.04)***	1.00 (0.00)
Study period 2008-2009	1.47 (0.09)***	1.06 (0.07)
Study period 2012-2013	1.59 (0.15)***	1.02 (0.06)
Study period 2015-2016 ¹	82.63 (24.19)***	0.94 (0.08)
Higher education. long	0.67 (0.06)***	1.01 (0.06)
Higher education. short	0.83 (0.07)**	0.62 (0.05)***
Upper secondary education	0.96 (0.06)	0.68 (0.04)***
Divorced /separated	0.97 (0.09)	0.84 (0.04)***
Unmarried	0.82 (0.05)***	1.30 (0.10)***
Widow/widower	0.84 (0.15)	1.14 (0.06)**
Mid-North Norway	0.90 (0.05)*	1.11 (0.12)
Southern Norway	0.93 (0.06)	0.90 (0.05)**
Western Norway	0.91 (0.06)	0.96 (0.06)
Smoking daily	1.09 (0.06)	0.91 (0.05)*
Smoking occasionally	1.06 (0.08)	1.24 (0.07)***
Constant	3.08 (0.63)***	0.98 (0.07)
Number of observations	13,155	10,294

*** p<0.01. ** p<0.05. * p<0.1.

¹The values for study period 2015-2016 are high in the logit regression because there were few zero observations.

Table S5: Results of hurdle regressions on primary care consultations among females; adjusted for, age, education, marital status, geographical region, smoking status, and study period.

Variables	Logit OR (SE)	GLM IRR (SE)
Underweight	1.02 (0.15)	1.19 (0.14)
Overweight	1.39 (0.09)***	1.20 (0.04)***
Category I obesity	1.81 (0.22)***	1.35 (0.06)***
Category II/III obesity	2.74 (0.73)***	2.03 (0.23)***
Age	1.00 (0.01)	1.00 (0.00)
Age^2	1.00 (0.00)	1.00 (0.00)
Study period 2005-2006	0.83 (0.05)***	1.09 (0.05)*
Study period 2008-2009	2.05 (0.15)***	1.05 (0.04)
Study period 2012-2013	1.70 (0.19)***	0.98 (0.07)
Study period 2015-2016 ¹	117.67 (44.83)***	1.07 (0.04)
Higher education. long	0.86 (0.11)	0.76 (0.06)***
Higher education. short	1.02 (0.09)	0.77 (0.03)***
Upper secondary education	1.02 (0.07)	0.83 (0.03)***
Divorced /separated	1.20 (0.11)*	1.32 (0.07)***
Unmarried	1.17 (0.09)	1.09 (0.05)**
Widow/widower	1.40 (0.18)***	1.11 (0.06)*
Mid-North Norway	0.98 (0.07)	0.87 (0.03)***
Southern Norway	0.84 (0.06)**	1.01 (0.04)
Western Norway	0.90 (0.06)	0.99 (0.04)
Smoking daily	1.24 (0.08)***	1.26 (0.05)***
Smoking occasionally	1.09 (0.09)	0.96 (0.05)
Constant	2.20 (0.53)***	3.24 (0.43)***
Number of observations	13,264	11,319

*** p<0.01. ** p<0.05. * p<0.1.

¹The values for study period 2015-2016 are high in the logit regression because there were few zero observations.

Table S6: Results of hurdle regressions on secondary care consultations; adjusted for gender, age, education, marital status, geographical region, smoking status, and study period.

Variables	Logit OR (SE)	GLM IRR (SE)
Underweight	1.06 (0.14)	1.98 (0.59)**
Overweight	1.12 (0.04)***	1.11 (0.09)
Category I obesity	1.38 (0.08)***	1.05 (0.11)
Category II/III obesity	1.40 (0.17)***	1.50 (0.20)***
Female	1.62 (0.06)***	0.82 (0.06)**
Age	0.99 (0.01)**	0.98 (0.01)
Age^2	1.00 (0.00)***	1.00 (0.00)
Study period 2012	1.19 (0.07)***	1.31 (0.17)**
Study period 2015	1.10 (0.04)**	1.72 (0.13)***
Higher education. long	1.09 (0.08)	0.78 (0.11)*
Higher education. short	1.14 (0.06)**	0.75 (0.08)***
Upper secondary education	1.08 (0.05)	0.85 (0.08)
Divorced /separated	1.19 (0.08)***	1.35 (0.16)**
Unmarried	0.92 (0.04)*	1.04 (0.10)
Widow/widower	0.77 (0.07)***	1.08 (0.21)
Mid-North Norway	0.95 (0.04)	0.94 (0.08)
Southern Norway	0.93 (0.05)	1.01 (0.10)
Western Norway	0.94 (0.05)	0.96 (0.11)
Smoking daily	1.06 (0.05)	1.10 (0.11)
Smoking occasionally	1.08 (0.07)	1.25 (0.19)
Constant	0.49 (0.08)***	0.00 (0.00)***
Number of observations	14,261	6,376

*** p<0.01. ** p<0.05. * p<0.1.

Table S7: Results of hurdle regressions on secondary care consultations among males; adjusted for age, education, marital status, geographical region, smoking status, and study period.

Variables	Logit OR (SE)	GLM IRR (SE)
Underweight	1.32 (0.41)	0.56 (0.25)
Overweight	1.12 (0.06)**	1.04 (0.11)
Category I obesity	1.41 (0.12)***	1.05 (0.17)
Category II/III obesity	1.87 (0.31)***	1.51 (0.33)*
Female	0.98 (0.01)**	1.00 (0.02)
Age	1.00 (0.00)***	1.00 (0.00)
Age^2	1.22 (0.10)**	1.35 (0.25)
Study period 2012-2013	1.13 (0.06)**	1.69 (0.17)***
Study period 2015-2016	0.98 (0.10)	0.78 (0.16)
Higher education. long	1.02 (0.08)	0.72 (0.13)*
Higher education. short	1.03 (0.07)	0.87 (0.11)
Upper secondary education	1.21 (0.12)*	1.31 (0.22)
Divorced /separated	1.00 (0.07)	1.24 (0.18)
Unmarried	0.87 (0.13)	1.78 (0.68)
Widow/widower	0.94 (0.06)	0.83 (0.10)
Mid-North Norway	0.97 (0.07)	1.01 (0.15)
Southern Norway	0.99 (0.07)	0.75 (0.10)**
Western Norway	1.05 (0.07)	1.24 (0.19)
Smoking daily	1.09 (0.10)	1.29 (0.30)
Smoking occasionally	0.45 (0.10)***	0.00 (0.00)***
Constant	1.32 (0.41)	0.56 (0.25)
Number of observations	7,094	2,780

*** p<0.01. ** p<0.05. * p<0.1.

Table S8: Results of hurdle regressions on secondary care consultations among females; adjusted for age, education, marital status, geographical region, smoking status, and study period.

Variables	Logit OR (SE)	GLM IRR (SE)
Underweight	1.02 (0.15)	2.44 (0.79)***
Overweight	1.16 (0.06)***	1.14 (0.11)
Category I obesity	1.36 (0.12)***	1.00 (0.13)
Category II/III obesity	1.11 (0.18)	1.48 (0.24)**
Age	0.99 (0.01)	0.97 (0.02)*
Age^2	1.00 (0.00)*	1.00 (0.00)
Study period 2012-2013	1.16 (0.10)*	1.27 (0.19)
Study period 2015-2016	1.06 (0.06)	1.69 (0.16)***
Higher education. long	1.17 (0.12)	0.69 (0.12)**
Higher education. short	1.20 (0.08)***	0.72 (0.09)**
Upper secondary education	1.12 (0.07)*	0.78 (0.10)*
Divorced /separated	1.19 (0.10)**	1.38 (0.22)**
Unmarried	0.85 (0.06)**	0.97 (0.12)
Widow/widower	0.85 (0.09)	0.80 (0.15)
Mid-North Norway	0.96 (0.06)	1.01 (0.12)
Southern Norway	0.90 (0.07)	0.95 (0.12)
Western Norway	0.90 (0.06)	1.11 (0.16)
Smoking daily	1.06 (0.07)	0.98 (0.12)
Smoking occasionally	1.09 (0.09)	1.19 (0.20)
Constant	0.81 (0.17)	0.00 (0.00)***
Number of observations	7,167	3,596

*** p<0.01. ** p<0.05. * p<0.1.