

Supplementary Tables

Supplementary Table 1: Model adequacy of the selected group-based BMI trajectory model

Trajectories	Number of participants	Average posterior probability of assignment	Odds of correct classification	Observed probability	Probability based on the posterior probability
TR 1	5748	0.89	32.79	0.19	0.20
TR 2	11229	0.85	9.11	0.38	0.37
TR 3	8130	0.84	14.17	0.27	0.27
TR 4	933	0.82	137.12	0.03	0.03
TR 5	2893	0.87	62.34	0.10	0.10
TR 6	948	0.94	495.30	0.03	0.03

* 95% CI around each trajectory is narrow based on visual assessment.

Supplementary Tables

Supplementary Table 2. Hazard Ratios for Cause-Specific Mortality According to BMI Trajectory Groups in the Melbourne Collaborative Cohort Study, Overall and in Never-Smokers

BMI trajectory groups	Overall ^a n=(29,881)				Never-smokers ^b n=(17,475)			
	Person-years	Deaths	HR	(95% CI)	Person-years	Deaths	HR	(95% CI)
Obesity-related cancer mortality								
TR1 Lower-normal stable	56,674	109	1.00		35,448	64	1.00	
TR2 Higher-normal stable	112,461	285	1.18	(0.94, 1.48)	65,946	152	1.20	(0.90, 1.62)
TR3 Normal to overweight	82,615	206	1.24	(0.97, 1.57)	46,090	104	1.29	(0.94, 1.78)
TR4 Borderline obesity chronic	9,470	37	1.82	(1.24, 2.68)	4,968	17	1.92	(1.11, 3.32)
TR5 Normal to class I obesity	29,501	76	1.49	(1.10, 2.01)	17,918	43	1.53	(1.02, 2.28)
TR6 Overweight to class II obesity	9,793	33	2.33	(1.56, 3.47)	6,165	18	2.13	(1.24, 3.65)
CVD mortality								
TR1 Lower-normal stable	56,674	234	1.00		35,448	124	1.00	
TR2 Higher-normal stable	112,461	505	0.88	(0.69, 1.13)	65,946	218	0.82	(0.66, 1.03)
TR3 Normal to overweight	82,615	349	0.85	(0.64, 1.12)	46,090	145	0.88	(0.69, 1.13)
TR4 Borderline obesity chronic	9,470	68	1.28	(0.80, 2.03)	4,968	24	1.11	(0.71, 1.74)
TR5 Normal to class I obesity	29,501	138	1.09	(0.77, 1.54)	17,918	64	1.27	(0.93, 1.73)
TR6 Overweight to class II obesity	9,793	43	2.27	(1.34, 3.87)	6,165	23	1.62	(1.02, 2.56)
Other-cause mortality								
TR1 Lower-normal stable	56,674	822	1.00		35,448	418	1.00	
TR2 Higher-normal stable	112,461	1,722	0.88	(0.81, 0.96)	65,946	852	0.97	(0.86, 1.09)
TR3 Normal to overweight	82,615	1,276	0.99	(0.90, 1.09)	46,090	574	1.04	(0.91, 1.18)
TR4 Borderline obesity chronic	9,470	175	1.07	(0.90, 1.28)	4,968	79	1.12	(0.87, 1.44)
TR5 Normal to class I obesity	29,501	389	1.05	(0.92, 1.19)	17,918	211	1.18	(0.99, 1.40)
TR6 Overweight to class II obesity	9,793	111	1.13	(0.92, 1.40)	6,165	66	1.33	(1.01, 1.73)

^a Adjusted for age, birth cohort, height, sex, country of birth, SEIFA, highest level of education, smoking status at latest BMI assessment, baseline MDS, alcohol drinking status and physical activity score. ^b Adjusted for age, birth cohort, height, sex, country of birth, SEIFA, highest level of education, baseline MDS, alcohol drinking status and physical activity score.

Supplementary Tables

Supplementary Table 3. Hazard Ratios for Cause-Specific Mortality According to BMI Trajectory Groups in the Melbourne Collaborative Cohort Study, Overall and in Never-Smokers, Excluding Participants Who Did Not Attend 2003-07 Data Collection

BMI trajectory groups	Overall ^a n=(21,903)				Never-smokers ^b n=(13,253)			
	Person-years	Deaths	HR	(95% CI)	Person-years	Deaths	HR	(95% CI)
Obesity-related cancer mortality								
TR1 Lower-normal stable	39,926	47	1.00		26,075	29	1.00	
TR2 Higher-normal stable	72,279	130	1.37	(0.98, 1.93)	43,771	65	1.21	(0.78, 1.88)
TR3 Normal to overweight	49,305	80	1.26	(0.87, 1.83)	28,430	42	1.23	(0.76, 2.00)
TR4 Borderline obesity chronic	4,992	19	2.74	(1.57, 4.75)	2,733	12	3.41	(1.69, 6.85)
TR5 Normal to class I obesity	16,787	28	1.46	(0.90, 2.36)	10,462	16	1.36	(0.73, 2.55)
TR6 Overweight to class II obesity	5,258	13	2.58	(1.37, 4.86)	3,510	8	2.26	(1.01, 5.07)
CVD mortality								
TR1 Lower-normal stable	39,926	128	1.00		26,075	68	1.00	
TR2 Higher-normal stable	72,279	208	0.74	(0.59, 0.93)	43,771	97	0.75	(0.55, 1.03)
TR3 Normal to overweight	49,305	140	0.82	(0.64, 1.05)	28,430	72	0.94	(0.67, 1.32)
TR4 Borderline obesity chronic	4,992	27	1.36	(0.89, 2.09)	2,733	14	1.44	(0.79, 2.61)
TR5 Normal to class I obesity	16,787	56	1.32	(0.96, 1.83)	10,462	29	1.23	(0.79, 1.93)
TR6 Overweight to class II obesity	5,258	17	1.55	(0.92, 2.60)	3,510	9	1.43	(0.70, 2.93)
Other-cause mortality								
TR1 Lower-normal stable	39,926	483	1.00		26,075	263	1.00	
TR2 Higher-normal stable	72,279	950	0.91	(0.82, 1.03)	43,771	472	0.94	(0.80, 1.09)
TR3 Normal to overweight	49,305	687	1.10	(0.97, 1.24)	28,430	327	1.14	(0.96, 1.36)
TR4 Borderline obesity chronic	4,992	78	1.08	(0.84, 1.40)	2,733	39	1.03	(0.72, 1.47)
TR5 Normal to class I obesity	16,787	198	1.18	(0.99, 1.41)	10,462	121	1.31	(1.05, 1.65)
TR6 Overweight to class II obesity	5,258	53	1.10	(0.81, 1.48)	3,510	33	1.41	(0.97, 2.05)

^a Adjusted for age, birth cohort, height, sex, country of birth, SEIFA, highest level of education, smoking status at latest BMI assessment, baseline MDS, alcohol drinking status and physical activity score. ^b Adjusted for age, birth cohort, height, sex, country of birth, SEIFA, highest level of education, baseline MDS, alcohol drinking status and physical activity score.

Supplementary Tables

Supplementary Table 4. Comparison of Model Fit, Models Using BMI Trajectories and Models Using Last Measured BMI

Model		Trajectories ^a				Last measured BMI ^b			
		ll	df	AIC	BIC	ll	df	AIC	BIC
All-cause	Overall	-36,836	20	73,711	73,877	-36,842	20	73,724	73,890
	Never smokers	-19,284	20	38,607	38,763	-19,289	20	38,618	38,774
Obesity-related cancer	Overall	-4,650	22	9,343	9,526	-4,653	22	9,350	9,533
	Never smokers	-2,779	23	5,603	5,782	-2,780	23	5,606	5,785
CVD	Overall	-984	20	2,007	2,173	-984	20	2,007	2,174
	Never smokers	-4,389	25	8,828	9,022	-4,392	25	8,833	9,027
Other-cause	Overall	-16,883	15	33,795	33,920	-16,886	15	33,803	33,928
	Never smokers	-10,431	16	20,893	21,018	-10,433	16	20,898	21,023

Abbreviations: CVD, cardiovascular diseases; ll, log likelihood; df, degree of freedom; AIC, Akaike information criterion; BIC, Bayesian information criterion.

^a Adjusted for age, birth cohort, height, sex, country of birth, SEIFA, highest level of education, smoking status at latest BMI assessment, baseline MDS, alcohol drinking status, and physical activity score. ^b The last BMI measurements were categorised into 6 groups: underweight (BMI < 18.5 kg/m²), lower normal (BMI ≥ 18.5 kg/m² and < 23 kg/m²), higher normal (BMI ≥ 23 kg/m² and < 25 kg/m²), overweight (BMI ≥ 25 kg/m² and < 30 kg/m²), class I obesity (BMI ≥ 30 kg/m² and < 35 kg/m²), and class II obesity (BMI ≥ 35 kg/m²).