

Supplementary material

Socioeconomic disadvantage amplifies polygenic risk of overweight: A longitudinal population cohort study spanning childhood and mid-adulthood

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1 Child data: BMI models

1.1 SEIFA predictor

1.1.1 Model details

```
print_mod_text("res/mod_chi_bmi_sei.txt")
```

linear mixed model (estimated using REML and nlminb optimizer) to predict bmi with sex, age_cat, sei and prs (formula: `bmi ~ sex + (age_cat + sei + prs)^2`). The model included waveC as random effects (formula: `~1 + waveC | hcid`).

The model's total explanatory power is substantial (conditional R2 = 0.87) and the part related to the fixed effects alone (marginal R2) is of 0.40

Conditional model:

Groups	Name	Std.Dev.	Corr
hcid	(Intercept)	2.16830	
	waveC	0.57046	0.845
Residual		1.15332	

The model's intercept, corresponding to sex = 0, age_cat = 2-3, sei = 1 and prs = 1, is at 16.64 (95% CI [16.34, 16.94], p < .001).

Parameter	Coefficient	95% CI	z	Fit
(Intercept)	16.64	[16.34, 16.94]	108.62	
sex	-0.38	[-0.53, -0.24]	-5.30	
age cat [4-5]	-0.58	[-0.84, -0.32]	-4.35	
age cat [6-7]	-0.91	[-1.19, -0.62]	-6.21	
age cat [8-9]	-0.05	[-0.38, 0.28]	-0.27	

age cat [10-11]		0.82	[0.45, 1.19]		4.32	
age cat [12-13]		2.42	[1.99, 2.85]		11.05	
age cat [14+]		3.62	[3.13, 4.11]		14.51	
sei [2]		-0.12	[-0.45, 0.22]		-0.68	
sei [3]		-2.73e-03	[-0.34, 0.34]		-0.02	
sei [4]		0.03	[-0.32, 0.38]		0.16	
sei [5]		-8.23e-03	[-0.37, 0.36]		-0.04	
prs [2]		0.32	[-0.06, 0.70]		1.64	
prs [3]		0.28	[-0.09, 0.65]		1.49	
prs [4]		0.45	[0.07, 0.84]		2.32	
prs [5]		0.95	[0.58, 1.32]		5.02	
age cat [4-5] × sei [2]		0.03	[-0.24, 0.31]		0.22	
age cat [6-7] × sei [2]		0.29	[0.01, 0.57]		2.04	
age cat [8-9] × sei [2]		-0.06	[-0.37, 0.24]		-0.41	
age cat [10-11] × sei [2]		0.05	[-0.26, 0.37]		0.33	
age cat [12-13] × sei [2]		-0.31	[-0.66, 0.03]		-1.77	
age cat [14+] × sei [2]		-0.13	[-0.51, 0.24]		-0.70	
age cat [4-5] × sei [3]		-0.08	[-0.35, 0.20]		-0.55	
age cat [6-7] × sei [3]		0.08	[-0.20, 0.36]		0.59	
age cat [8-9] × sei [3]		-0.05	[-0.35, 0.26]		-0.30	
age cat [10-11] × sei [3]		-0.15	[-0.47, 0.18]		-0.89	
age cat [12-13] × sei [3]		-0.35	[-0.70, 0.01]		-1.91	
age cat [14+] × sei [3]		-0.15	[-0.54, 0.24]		-0.77	
age cat [4-5] × sei [4]		-0.06	[-0.34, 0.21]		-0.45	
age cat [6-7] × sei [4]		0.19	[-0.09, 0.48]		1.35	
age cat [8-9] × sei [4]		-0.13	[-0.44, 0.17]		-0.85	
age cat [10-11] × sei [4]		-0.26	[-0.59, 0.06]		-1.59	
age cat [12-13] × sei [4]		-0.44	[-0.81, -0.08]		-2.39	
age cat [14+] × sei [4]		-0.10	[-0.50, 0.30]		-0.50	
age cat [4-5] × sei [5]		0.07	[-0.20, 0.35]		0.54	
age cat [6-7] × sei [5]		0.15	[-0.13, 0.44]		1.07	
age cat [8-9] × sei [5]		-0.06	[-0.37, 0.26]		-0.36	
age cat [10-11] × sei [5]		-0.26	[-0.59, 0.08]		-1.50	
age cat [12-13] × sei [5]		-0.47	[-0.84, -0.09]		-2.42	

age cat [14+] × sei [5]		-0.12		[-0.54, 0.30]		-0.57	
age cat [4-5] × prs [2]		-0.07		[-0.34, 0.20]		-0.52	
age cat [6-7] × prs [2]		-0.04		[-0.35, 0.28]		-0.23	
age cat [8-9] × prs [2]		0.14		[-0.23, 0.51]		0.75	
age cat [10-11] × prs [2]		0.35		[-0.08, 0.79]		1.60	
age cat [12-13] × prs [2]		0.42		[-0.09, 0.93]		1.61	
age cat [14+] × prs [2]		0.39		[-0.19, 0.98]		1.31	
age cat [4-5] × prs [3]		0.04		[-0.23, 0.32]		0.31	
age cat [6-7] × prs [3]		0.34		[0.02, 0.65]		2.11	
age cat [8-9] × prs [3]		0.50		[0.13, 0.87]		2.66	
age cat [10-11] × prs [3]		1.04		[0.60, 1.47]		4.68	
age cat [12-13] × prs [3]		1.23		[0.72, 1.74]		4.71	
age cat [14+] × prs [3]		1.53		[0.94, 2.11]		5.08	
age cat [4-5] × prs [4]		0.01		[-0.26, 0.29]		0.08	
age cat [6-7] × prs [4]		0.40		[0.09, 0.72]		2.50	
age cat [8-9] × prs [4]		0.75		[0.38, 1.12]		3.95	
age cat [10-11] × prs [4]		1.23		[0.79, 1.67]		5.54	
age cat [12-13] × prs [4]		1.50		[0.99, 2.01]		5.77	
age cat [14+] × prs [4]		1.80		[1.21, 2.38]		5.99	
age cat [4-5] × prs [5]		0.23		[-0.04, 0.51]		1.66	
age cat [6-7] × prs [5]		0.68		[0.36, 0.99]		4.21	
age cat [8-9] × prs [5]		1.12		[0.75, 1.49]		5.88	
age cat [10-11] × prs [5]		1.83		[1.39, 2.26]		8.22	
age cat [12-13] × prs [5]		2.32		[1.81, 2.83]		8.89	
age cat [14+] × prs [5]		2.49		[1.90, 3.08]		8.26	
sei [2] × prs [2]		0.07		[-0.31, 0.44]		0.34	
sei [3] × prs [2]		-0.13		[-0.53, 0.27]		-0.65	
sei [4] × prs [2]		0.04		[-0.38, 0.46]		0.17	
sei [5] × prs [2]		-0.22		[-0.67, 0.23]		-0.95	
sei [2] × prs [3]		0.18		[-0.19, 0.56]		0.97	
sei [3] × prs [3]		0.13		[-0.26, 0.53]		0.67	
sei [4] × prs [3]		0.21		[-0.21, 0.63]		0.99	
sei [5] × prs [3]		0.15		[-0.32, 0.61]		0.62	
sei [2] × prs [4]		-0.03		[-0.41, 0.35]		-0.16	

sei [3] × prs [4]		-0.15	[-0.55, 0.26]		-0.72	
sei [4] × prs [4]		-0.17	[-0.59, 0.25]		-0.77	
sei [5] × prs [4]		0.08	[-0.37, 0.54]		0.36	
sei [2] × prs [5]		-0.07	[-0.45, 0.31]		-0.35	
sei [3] × prs [5]		-0.37	[-0.76, 0.03]		-1.83	
sei [4] × prs [5]		-0.47	[-0.88, -0.05]		-2.21	
sei [5] × prs [5]		-0.24	[-0.69, 0.21]		-1.05	
AICc					39804.88	
R2 (conditional)					0.87	
R2 (marginal)					0.40	
Sigma					1.15	

Analysis of Deviance Table (Type III Wald chisquare tests)

Response: bmi

	Chisq	Df	Pr(>Chisq)
(Intercept)	11798.7571	1	< 2.2e-16 ***
sex	28.0737	1	1.168e-07 ***
age_cat	743.1869	6	< 2.2e-16 ***
sei	0.8784	4	0.92764
prs	27.5335	4	1.550e-05 ***
age_cat:sei	36.9306	24	0.04446 *
age_cat:prs	139.0748	24	< 2.2e-16 ***
sei:prs	21.1785	16	0.17175

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

1.1.2 Table and figure by PRS

Table 1: Estimated BMI (95% CI) across childhood by neighbourhood disadvantage (SEIFA) quintile (1=most, 5=least disadvantage), stratified by PRS quintile (1=lowest, 5=highest risk)

sei	prs	2-3	4-5	6-7	8-9	10-11	12-13	14+
1	1	16.4 (15.7, 16.9)	15.9 (15.4, 16.4)	15.6 (15.1, 16.2)	16.6 (15.6, 17.7)	17.6 (16.6, 18.8)	19.4 (18.1, 20.9)	20.0 (18.3, 22.3)
1	2	16.7 (16.2, 17.4)	16.1 (15.5, 16.6)	16.1 (15.5, 16.7)	17.0 (15.8, 18.1)	18.0 (16.2, 19.4)	19.4 (17.6, 21.2)	20.9 (18.7, 22.8)
1	3	16.7 (16.2, 17.2)	16.3 (15.8, 16.7)	16.3 (15.7, 16.9)	17.5 (16.5, 18.4)	18.7 (17.3, 20.1)	20.4 (18.6, 22.0)	22.2 (20.0, 24.0)
1	4	16.8 (15.9, 17.6)	16.5 (15.8, 17.2)	16.2 (15.5, 17.2)	17.9 (16.8, 19.2)	19.1 (17.2, 21.2)	21.0 (19.6, 22.5)	22.9 (21.0, 24.9)
1	5	17.3 (16.6, 18.0)	17.2 (16.5, 18.2)	17.7 (16.6, 19.1)	19.3 (18.0, 20.7)	21.3 (19.7, 23.0)	23.5 (21.4, 25.8)	24.2 (21.8, 27.0)
2	1	16.5 (15.9, 17.2)	15.9 (15.4, 16.6)	16.0 (15.3, 16.7)	16.2 (15.5, 17.3)	17.1 (16.5, 18.1)	18.3 (17.2, 19.4)	19.7 (18.3, 21.6)
2	2	16.7 (16.3, 17.1)	16.1 (15.7, 16.5)	16.0 (15.5, 16.7)	16.9 (16.3, 17.6)	18.1 (17.2, 19.0)	19.2 (18.5, 19.9)	20.6 (19.5, 21.6)
2	3	17.0 (16.2, 17.7)	16.4 (15.8, 17.1)	16.9 (16.3, 17.6)	17.7 (16.9, 18.6)	19.4 (18.3, 21.0)	20.6 (19.5, 22.0)	21.9 (20.2, 23.3)
2	4	17.0 (16.4, 17.5)	16.3 (15.7, 16.9)	17.1 (16.1, 18.0)	17.7 (16.7, 18.7)	19.5 (18.1, 21.1)	21.7 (20.0, 23.6)	23.4 (21.2, 25.5)
2	5	17.0 (16.3, 17.6)	17.0 (16.1, 18.0)	17.5 (16.5, 18.7)	18.4 (17.4, 19.5)	20.8 (19.4, 22.4)	22.2 (20.6, 24.3)	24.5 (22.2, 27.5)
3	1	16.5 (16.0, 17.2)	15.9 (15.4, 16.6)	15.6 (15.0, 16.1)	16.5 (15.8, 17.2)	17.4 (16.2, 18.5)	18.6 (17.4, 19.7)	20.1 (18.6, 21.8)
3	2	16.7 (16.1, 17.3)	15.8 (15.4, 16.3)	15.8 (15.4, 16.2)	16.9 (16.3, 17.6)	18.0 (17.3, 18.8)	19.7 (18.7, 20.8)	21.0 (19.8, 22.5)
3	3	16.9 (16.4, 17.4)	16.4 (16.0, 16.8)	16.5 (15.8, 17.4)	17.1 (16.4, 18.0)	18.4 (17.6, 19.4)	20.1 (18.8, 21.4)	21.9 (20.4, 24.0)
3	4	16.8 (16.1, 17.5)	16.3 (15.4, 17.4)	16.5 (15.9, 17.1)	17.3 (16.6, 18.0)	18.8 (17.6, 20.0)	20.2 (18.7, 21.8)	21.9 (20.7, 23.1)

sei	prs	2-3	4-5	6-7	8-9	10-11	12-13	14+
3	5	17.4 (16.8, 18.1)	16.9 (16.3, 17.6)	17.3 (16.2, 18.5)	18.0 (16.8, 19.1)	19.3 (17.4, 20.8)	21.9 (20.4, 23.9)	22.9 (20.7, 24.9)
4	1	16.5 (15.9, 17.0)	15.9 (15.5, 16.4)	16.1 (15.3, 16.8)	16.6 (15.8, 17.4)	17.0 (16.1, 18.2)	18.7 (17.7, 20.0)	20.6 (19.2, 22.2)
4	2	16.9 (16.4, 17.4)	16.1 (15.6, 16.7)	16.2 (15.7, 16.8)	16.9 (16.1, 17.9)	17.9 (16.9, 18.9)	19.2 (18.1, 20.5)	20.7 (19.2, 22.5)
4	3	17.0 (16.4, 17.6)	16.4 (15.9, 17.1)	16.3 (15.8, 16.9)	17.2 (16.3, 18.4)	18.7 (17.3, 20.5)	19.6 (18.7, 20.6)	21.7 (20.0, 23.9)
4	4	16.8 (16.3, 17.4)	16.1 (15.6, 16.6)	16.4 (15.9, 16.9)	17.6 (16.5, 19.0)	18.7 (17.6, 19.9)	20.1 (18.7, 21.8)	21.6 (20.2, 23.6)
4	5	17.0 (16.5, 17.5)	16.5 (15.9, 17.1)	16.7 (16.1, 17.3)	18.0 (17.1, 18.9)	19.2 (18.3, 20.1)	20.8 (19.4, 22.2)	22.8 (21.3, 24.3)
5	1	16.4 (16.0, 16.8)	15.9 (15.5, 16.4)	15.6 (15.0, 16.2)	16.4 (15.9, 17.0)	17.0 (16.4, 17.6)	18.5 (17.5, 19.4)	19.8 (18.8, 20.8)
5	2	16.5 (15.9, 17.1)	16.1 (15.5, 16.7)	16.0 (15.2, 16.8)	16.5 (15.8, 17.0)	17.5 (16.8, 18.3)	19.2 (18.4, 20.1)	20.6 (19.6, 21.6)
5	3	16.7 (15.9, 17.4)	16.1 (15.3, 16.8)	16.3 (15.6, 17.3)	17.3 (16.2, 19.1)	18.4 (17.2, 20.4)	20.2 (18.1, 23.1)	22.0 (19.7, 25.5)
5	4	16.8 (16.2, 17.3)	16.4 (15.8, 17.2)	16.6 (15.9, 17.4)	17.7 (17.0, 18.6)	18.7 (17.7, 20.0)	20.7 (19.3, 22.4)	22.2 (20.5, 24.5)
5	5	17.1 (16.7, 17.6)	16.6 (16.2, 17.2)	16.7 (16.1, 17.4)	17.7 (16.8, 18.5)	18.7 (17.5, 19.7)	20.7 (19.5, 22.1)	21.9 (20.8, 23.1)

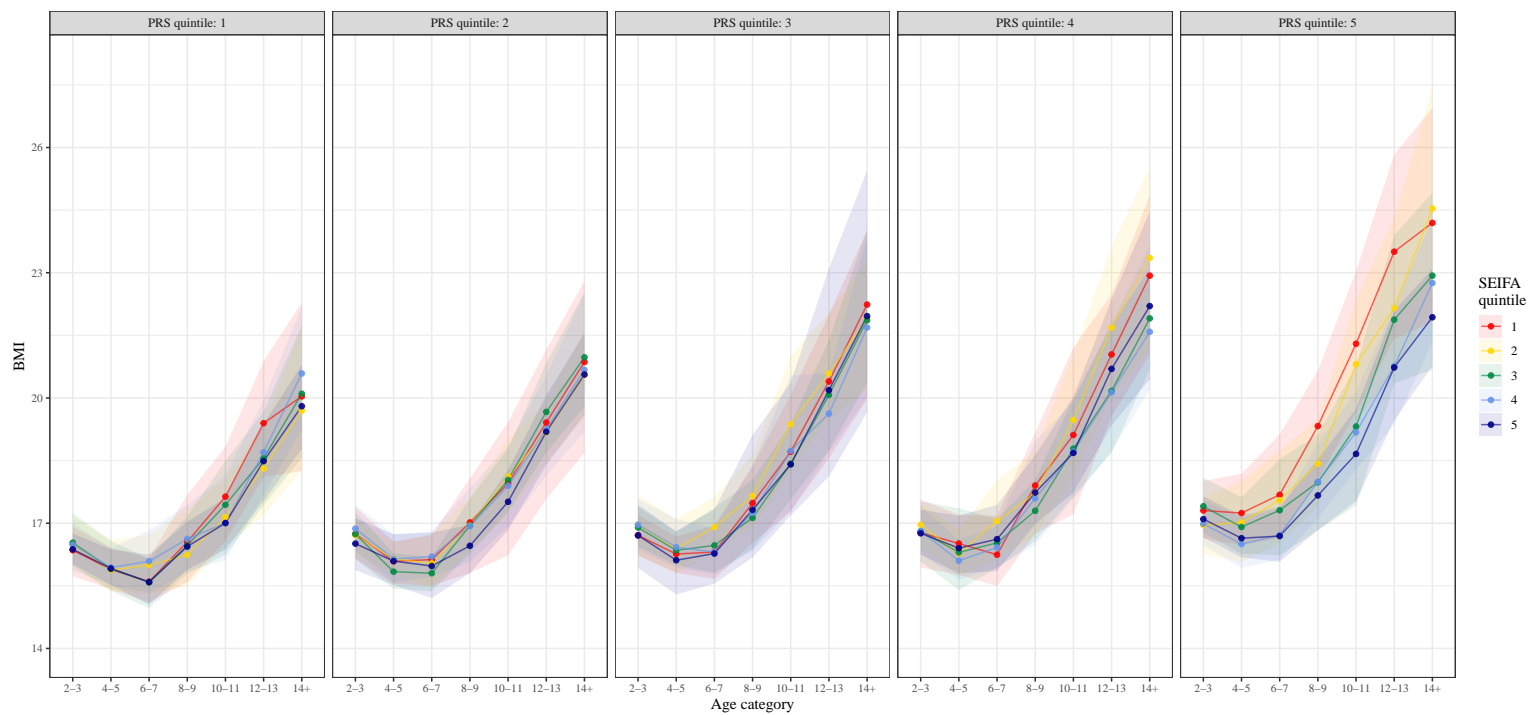


Figure 1: Estimated BMI (95% CI) across childhood by neighbourhood disadvantage (SEIFA) quintile (1=most, 5=least disadvantage), stratified by PRS quintile (1=lowest, 5=highest risk)

1.2 SEP predictor

1.2.1 Model details

```
print_mod_text("res/mod_chi_bmi_sep.txt")
```

linear mixed model (estimated using REML and nlminb optimizer) to predict bmi with sex, age_cat, sep and prs (formula: `bmi ~ sex + (age_cat + sep + prs)^2`). The model included waveC as random effects (formula: `~1 + waveC | hcid`).

The model's total explanatory power is substantial (conditional R2 = 0.87) and the part related to the fixed effects alone (marginal R2) is of 0.40

Conditional model:

Groups	Name	Std.Dev.	Corr
hcid	(Intercept)	2.16876	
	waveC	0.57259	0.848
Residual		1.14785	

The model's intercept, corresponding to sex = 0, age_cat = 2-3, sep = 1 and prs = 1, is at 16.62 (95% CI [16.32, 16.92], p < .001).

Parameter	Coefficient	95% CI	z	Fit
(Intercept)	16.62	[16.32, 16.92]	107.39	
sex	-0.38	[-0.52, -0.24]	-5.26	
age cat [4-5]	-0.60	[-0.86, -0.33]	-4.43	
age cat [6-7]	-0.83	[-1.11, -0.54]	-5.65	
age cat [8-9]	-0.10	[-0.42, 0.23]	-0.58	

age cat [10-11]		0.79	[0.42, 1.17]	4.15	
age cat [12-13]		2.36	[1.93, 2.79]	10.76	
age cat [14+]		3.34	[2.85, 3.83]	13.38	
sep [2]		-0.05	[-0.36, 0.26]	-0.32	
sep [3]		-0.07	[-0.41, 0.27]	-0.42	
sep [4]		0.08	[-0.27, 0.43]	0.44	
sep [5]		0.01	[-0.35, 0.38]	0.07	
prs [2]		0.19	[-0.18, 0.56]	1.02	
prs [3]		0.66	[0.29, 1.04]	3.45	
prs [4]		0.33	[-0.05, 0.70]	1.72	
prs [5]		0.73	[0.35, 1.10]	3.80	
age cat [4-5] × sep [2]		-0.03	[-0.31, 0.25]	-0.22	
age cat [6-7] × sep [2]		0.05	[-0.24, 0.33]	0.32	
age cat [8-9] × sep [2]		0.13	[-0.16, 0.43]	0.89	
age cat [10-11] × sep [2]		0.09	[-0.21, 0.40]	0.59	
age cat [12-13] × sep [2]		-0.21	[-0.53, 0.12]	-1.25	
age cat [14+] × sep [2]		0.33	[-0.01, 0.68]	1.89	
age cat [4-5] × sep [3]		0.12	[-0.16, 0.39]	0.83	
age cat [6-7] × sep [3]		0.02	[-0.26, 0.31]	0.15	
age cat [8-9] × sep [3]		-0.04	[-0.34, 0.26]	-0.26	
age cat [10-11] × sep [3]		-0.14	[-0.45, 0.18]	-0.85	
age cat [12-13] × sep [3]		-0.17	[-0.51, 0.17]	-0.99	
age cat [14+] × sep [3]		0.20	[-0.17, 0.57]	1.07	
age cat [4-5] × sep [4]		0.08	[-0.19, 0.35]	0.58	
age cat [6-7] × sep [4]		0.15	[-0.13, 0.43]	1.04	
age cat [8-9] × sep [4]		-0.03	[-0.33, 0.27]	-0.20	
age cat [10-11] × sep [4]		-0.14	[-0.46, 0.18]	-0.87	
age cat [12-13] × sep [4]		-0.32	[-0.67, 0.03]	-1.81	
age cat [14+] × sep [4]		0.39	[0.00, 0.77]	1.98	
age cat [4-5] × sep [5]		0.01	[-0.26, 0.28]	0.09	
age cat [6-7] × sep [5]		0.08	[-0.20, 0.37]	0.56	
age cat [8-9] × sep [5]		-0.08	[-0.38, 0.23]	-0.49	
age cat [10-11] × sep [5]		-0.22	[-0.56, 0.11]	-1.33	
age cat [12-13] × sep [5]		-0.50	[-0.87, -0.14]	-2.70	

age cat [14+] × sep [5]		-0.03		[-0.43, 0.37]		-0.15	
age cat [4-5] × prs [2]		-0.07		[-0.35, 0.20]		-0.53	
age cat [6-7] × prs [2]		-0.01		[-0.33, 0.30]		-0.07	
age cat [8-9] × prs [2]		0.12		[-0.25, 0.49]		0.64	
age cat [10-11] × prs [2]		0.30		[-0.13, 0.74]		1.36	
age cat [12-13] × prs [2]		0.43		[-0.08, 0.94]		1.64	
age cat [14+] × prs [2]		0.45		[-0.14, 1.04]		1.48	
age cat [4-5] × prs [3]		0.02		[-0.25, 0.29]		0.13	
age cat [6-7] × prs [3]		0.33		[0.02, 0.65]		2.09	
age cat [8-9] × prs [3]		0.49		[0.12, 0.86]		2.59	
age cat [10-11] × prs [3]		1.04		[0.60, 1.47]		4.67	
age cat [12-13] × prs [3]		1.21		[0.70, 1.72]		4.65	
age cat [14+] × prs [3]		1.52		[0.93, 2.11]		5.04	
age cat [4-5] × prs [4]		-4.16e-03		[-0.28, 0.27]		-0.03	
age cat [6-7] × prs [4]		0.42		[0.11, 0.74]		2.64	
age cat [8-9] × prs [4]		0.75		[0.38, 1.12]		3.94	
age cat [10-11] × prs [4]		1.22		[0.79, 1.66]		5.51	
age cat [12-13] × prs [4]		1.49		[0.98, 2.00]		5.71	
age cat [14+] × prs [4]		1.80		[1.21, 2.39]		5.99	
age cat [4-5] × prs [5]		0.20		[-0.07, 0.47]		1.43	
age cat [6-7] × prs [5]		0.67		[0.35, 0.98]		4.14	
age cat [8-9] × prs [5]		1.10		[0.73, 1.48]		5.79	
age cat [10-11] × prs [5]		1.81		[1.37, 2.24]		8.11	
age cat [12-13] × prs [5]		2.27		[1.75, 2.78]		8.66	
age cat [14+] × prs [5]		2.46		[1.87, 3.06]		8.16	
sep [2] × prs [2]		0.10		[-0.22, 0.41]		0.60	
sep [3] × prs [2]		0.18		[-0.20, 0.57]		0.95	
sep [4] × prs [2]		-0.11		[-0.53, 0.31]		-0.52	
sep [5] × prs [2]		0.16		[-0.29, 0.62]		0.70	
sep [2] × prs [3]		-0.25		[-0.59, 0.08]		-1.47	
sep [3] × prs [3]		-0.25		[-0.65, 0.14]		-1.25	
sep [4] × prs [3]		-0.37		[-0.79, 0.05]		-1.75	
sep [5] × prs [3]		-0.36		[-0.82, 0.11]		-1.51	
sep [2] × prs [4]		0.16		[-0.17, 0.48]		0.96	

sep [3] × prs [4]		0.13	[-0.25, 0.51]		0.66	
sep [4] × prs [4]		0.02	[-0.40, 0.43]		0.07	
sep [5] × prs [4]		0.04	[-0.42, 0.50]		0.17	
sep [2] × prs [5]		0.16	[-0.17, 0.49]		0.96	
sep [3] × prs [5]		0.03	[-0.36, 0.42]		0.17	
sep [4] × prs [5]		-0.13	[-0.54, 0.29]		-0.59	
sep [5] × prs [5]		-0.10	[-0.57, 0.37]		-0.42	
AICc					39636.84	
R2 (conditional)					0.87	
R2 (marginal)					0.40	
Sigma					1.15	

Analysis of Deviance Table (Type III Wald chisquare tests)

Response: bmi

	Chisq	Df	Pr(>Chisq)
(Intercept)	11532.7516	1	< 2.2e-16 ***
sex	27.7015	1	1.416e-07 ***
age_cat	675.2613	6	< 2.2e-16 ***
sep	1.0532	4	0.9016273
prs	21.2589	4	0.0002813 ***
age_cat:sep	48.4294	24	0.0022325 **
age_cat:prs	135.4543	24	< 2.2e-16 ***
sep:prs	15.6682	16	0.4763470

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

1.2.2 Table and figure by PRS

Table 2: Estimated BMI (95% CI) across childhood by family disadvantage (SEP) quintile (1=most, 5=least disadvantage), stratified by PRS quintile (1=lowest, 5=highest risk)

sep	prs	2-3	4-5	6-7	8-9	10-11	12-13	14+
1	1	16.6 (16.1, 17.1)	16.1 (15.4, 16.9)	16.1 (15.4, 17.1)	17.2 (16.0, 19.0)	17.8 (16.4, 19.7)	19.5 (17.9, 21.4)	20.2 (17.9, 23.3)
1	2	16.7 (16.3, 17.1)	16.1 (15.6, 16.7)	16.0 (15.3, 16.9)	16.8 (16.1, 17.6)	17.7 (16.7, 18.6)	19.3 (18.3, 20.3)	21.2 (19.8, 22.4)
1	3	17.3 (16.7, 17.8)	16.7 (16.2, 17.4)	17.1 (16.1, 18.3)	18.3 (16.9, 20.0)	19.9 (18.3, 21.7)	21.4 (19.4, 23.5)	23.4 (20.8, 25.7)
1	4	16.9 (16.0, 17.9)	16.4 (15.6, 17.5)	16.7 (15.8, 17.8)	18.0 (17.1, 19.0)	19.7 (18.3, 21.2)	21.5 (19.9, 23.1)	23.0 (21.6, 24.4)
1	5	17.1 (16.5, 17.6)	17.0 (16.3, 17.9)	17.6 (16.6, 18.8)	18.6 (17.2, 19.9)	21.3 (19.6, 23.4)	23.1 (21.1, 25.2)	24.7 (22.2, 27.3)
2	1	16.4 (15.7, 17.1)	16.0 (15.4, 16.4)	15.6 (14.9, 16.1)	16.4 (15.7, 17.2)	17.5 (16.8, 18.3)	18.5 (17.7, 19.5)	20.7 (19.1, 22.9)
2	2	16.7 (16.1, 17.3)	15.9 (15.4, 16.4)	16.0 (15.5, 16.7)	16.8 (15.9, 17.7)	18.0 (17.0, 18.8)	19.3 (18.2, 20.3)	19.9 (18.4, 21.3)
2	3	16.7 (15.9, 17.6)	16.3 (15.5, 17.3)	16.6 (15.9, 17.4)	17.7 (17.0, 18.7)	19.0 (17.7, 20.4)	20.2 (19.1, 21.3)	22.2 (20.0, 24.6)
2	4	16.8 (16.1, 17.4)	16.1 (15.4, 17.0)	16.7 (16.0, 17.4)	17.6 (16.7, 18.5)	18.8 (17.7, 20.2)	20.2 (18.8, 21.7)	21.7 (20.6, 23.0)
2	5	17.6 (16.7, 18.5)	17.3 (16.5, 18.0)	17.8 (16.9, 18.7)	18.9 (17.8, 20.2)	20.2 (18.9, 21.4)	22.4 (20.7, 24.9)	24.0 (21.9, 26.1)
3	1	16.3 (15.6, 17.0)	15.7 (15.1, 16.3)	15.6 (15.0, 16.2)	16.2 (15.6, 16.9)	16.9 (16.2, 17.6)	18.8 (18.0, 19.8)	19.9 (18.8, 21.1)
3	2	16.6 (16.0, 17.3)	16.2 (15.7, 16.6)	15.8 (15.3, 16.2)	16.8 (16.3, 17.3)	17.7 (16.5, 18.9)	19.1 (17.9, 20.3)	20.7 (19.0, 22.2)
3	3	16.8 (16.2, 17.6)	16.4 (15.8, 17.0)	16.4 (15.8, 17.2)	16.8 (15.8, 17.8)	18.6 (17.2, 20.0)	19.7 (18.4, 20.8)	20.8 (19.3, 22.0)
3	4	16.9 (16.4, 17.3)	16.4 (15.9, 16.9)	16.3 (15.7, 17.2)	17.6 (16.7, 18.8)	18.6 (17.6, 19.9)	20.1 (18.6, 22.1)	22.2 (20.1, 24.8)

sep	prs	2-3	4-5	6-7	8-9	10-11	12-13	14+
3	5	17.0 (16.2, 17.8)	16.7 (15.9, 17.4)	16.9 (16.1, 17.6)	18.4 (17.5, 19.6)	19.7 (18.5, 21.2)	21.9 (20.3, 24.3)	22.7 (21.3, 24.4)
4	1	16.6 (16.0, 17.2)	16.0 (15.5, 16.5)	15.6 (15.1, 16.0)	16.4 (15.7, 17.1)	16.9 (16.0, 17.7)	18.1 (16.9, 19.2)	19.8 (18.5, 21.5)
4	2	16.8 (16.3, 17.3)	15.9 (15.5, 16.4)	16.2 (15.6, 17.0)	16.6 (15.6, 17.8)	18.0 (16.7, 19.6)	19.4 (17.9, 21.0)	20.6 (18.7, 22.6)
4	3	16.8 (16.2, 17.4)	16.2 (15.7, 16.8)	16.2 (15.6, 16.8)	17.0 (16.3, 17.8)	18.0 (17.2, 19.0)	19.8 (18.3, 21.4)	22.1 (20.7, 23.5)
4	4	16.9 (16.4, 17.4)	16.5 (16.0, 17.1)	17.0 (16.2, 17.8)	18.0 (16.8, 19.2)	19.2 (18.0, 20.3)	21.6 (20.3, 23.2)	23.0 (20.5, 26.1)
4	5	17.0 (16.5, 17.5)	16.7 (16.3, 17.3)	16.7 (16.1, 17.4)	17.6 (16.8, 18.8)	19.1 (17.8, 20.3)	20.7 (19.5, 22.1)	22.2 (20.6, 23.7)
5	1	16.4 (16.0, 16.7)	15.9 (15.5, 16.2)	15.8 (15.4, 16.3)	16.3 (15.7, 17.0)	17.2 (16.3, 18.2)	18.8 (17.8, 19.8)	19.8 (18.7, 20.8)
5	2	16.9 (16.4, 17.3)	16.2 (15.8, 16.5)	16.0 (15.5, 16.5)	16.9 (16.3, 17.5)	17.8 (17.1, 18.5)	19.3 (18.2, 20.2)	20.9 (19.9, 21.9)
5	3	16.6 (15.8, 17.2)	16.0 (15.4, 16.5)	16.0 (15.5, 16.5)	16.7 (16.0, 17.3)	18.1 (17.3, 18.9)	19.4 (18.4, 20.6)	21.0 (19.8, 22.5)
5	4	16.8 (16.3, 17.3)	16.1 (15.5, 16.7)	16.3 (15.7, 17.2)	17.2 (16.5, 18.2)	18.4 (17.5, 19.6)	20.2 (19.0, 22.0)	21.9 (20.6, 23.1)
5	5	16.9 (16.5, 17.5)	16.4 (15.5, 17.0)	16.6 (15.7, 17.3)	17.6 (16.6, 18.5)	19.0 (17.7, 20.1)	20.5 (18.9, 21.8)	22.4 (21.1, 24.0)

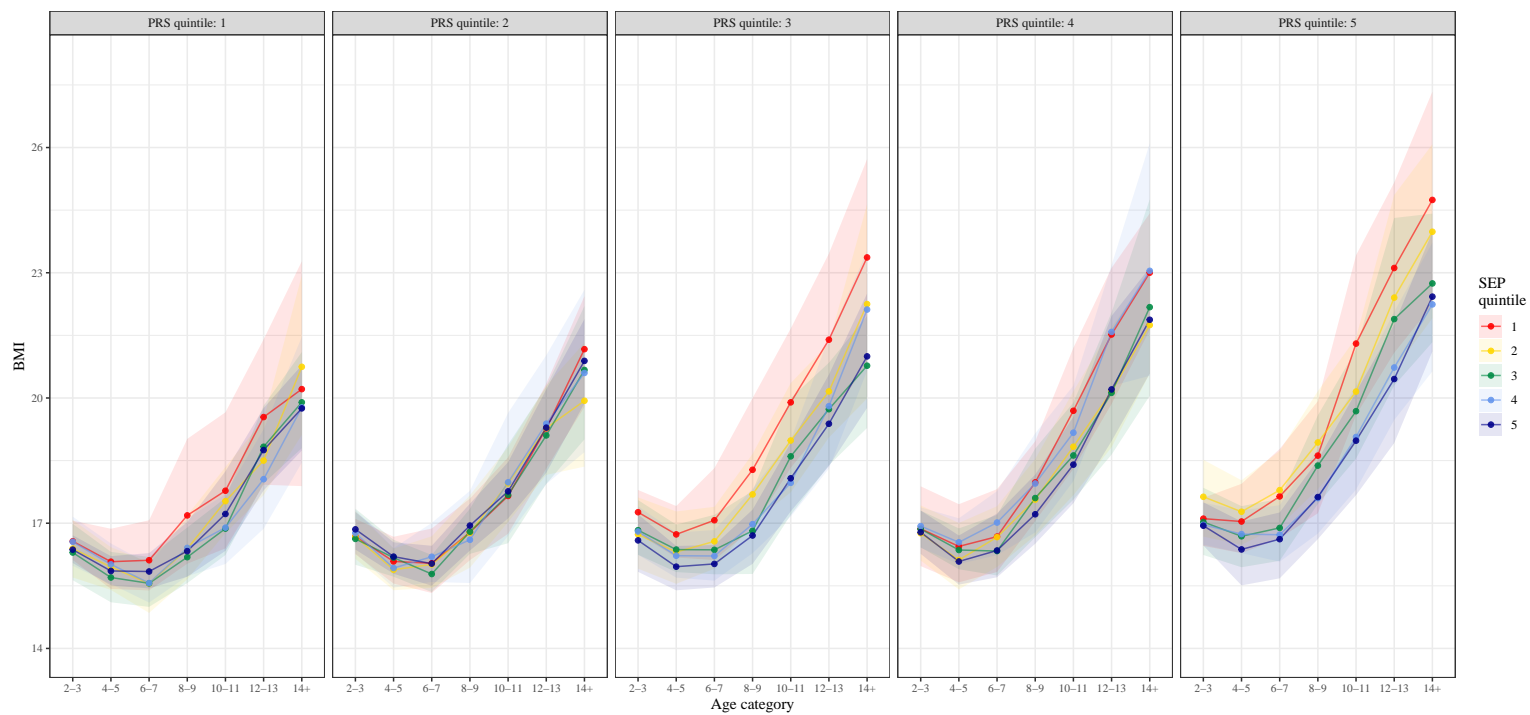


Figure 2: Estimated BMI (95% CI) across childhood by family disadvantage (SEP) quintile (1=most, 5=least disadvantage), stratified by PRS quintile (1=lowest, 5=highest risk)

1.3 Marginal SEIFA and SEP Figures

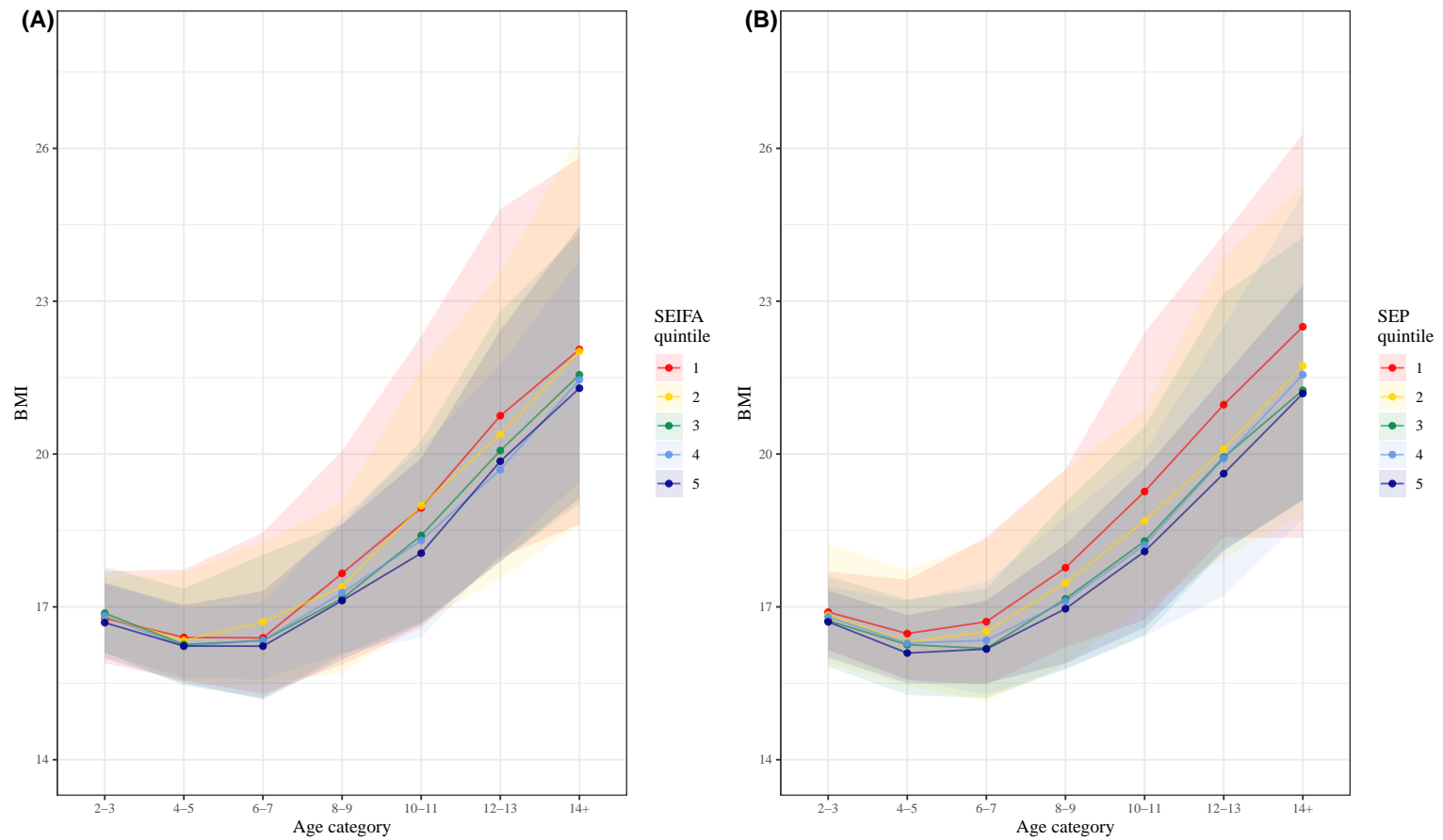


Figure 3: Association of SEIFA neighbourhood disadvantage (Panel A) and SEP family disadvantage (Panel B) with BMI across childhood. In all cases quintile 1 represents the most disadvantage.

2 Child data: Probability of overweight/obese models

2.1 SEIFA predictor

2.1.1 Model details

```
print_mod_text("res/mod_chi_ovo_sei.txt")
```

logistic mixed model (estimated using REML and nlminb optimizer) to predict ovo with sex, age_cat, sei and prs (formula: $\text{ovo} \sim \text{sex} + (\text{age_cat} + \text{sei} + \text{prs})^2$). The model included waveC as random effects (formula: $\sim 1 + \text{waveC} \mid \text{hcid}$).

The model's total explanatory power is substantial (conditional $R^2 = 0.83$) and the part related to the fixed effects alone (marginal R^2) is of 0.08

Conditional model:

Groups Name	Std.Dev.	Corr
hcid (Intercept)	3.77080	
waveC	0.97556	0.758

The model's intercept, corresponding to sex = 0, age_cat = 2-3, sei = 1 and prs = 1, is at -1.86 (95% CI [-2.65, -1.06], $p < .001$).

Parameter	Coefficient	95% CI	z	Fit
(Intercept)	-1.86	[-2.65, -1.06]	-4.58	
sex	-0.15	[-0.46, 0.17]	-0.91	
age cat [4-5]	0.50	[-0.15, 1.15]	1.51	
age cat [6-7]	-1.77	[-2.61, -0.92]	-4.08	
age cat [8-9]	-1.88	[-2.86, -0.89]	-3.73	
age cat [10-11]	-2.05	[-3.16, -0.94]	-3.62	

age cat [12-13]		-2.12	[-3.41, -0.82]	-3.21	
age cat [14+]		-2.26	[-3.77, -0.74]	-2.92	
sei [2]		0.10	[-0.86, 1.05]	0.20	
sei [3]		0.14	[-0.82, 1.10]	0.29	
sei [4]		0.58	[-0.39, 1.54]	1.17	
sei [5]		-0.40	[-1.44, 0.63]	-0.77	
prs [2]		1.07	[0.08, 2.06]	2.12	
prs [3]		0.48	[-0.49, 1.44]	0.96	
prs [4]		1.03	[0.04, 2.02]	2.04	
prs [5]		1.70	[0.76, 2.65]	3.53	
age cat [4-5] × sei [2]		-0.22	[-0.88, 0.44]	-0.65	
age cat [6-7] × sei [2]		0.34	[-0.42, 1.10]	0.87	
age cat [8-9] × sei [2]		-0.13	[-0.96, 0.71]	-0.30	
age cat [10-11] × sei [2]		-0.53	[-1.43, 0.38]	-1.14	
age cat [12-13] × sei [2]		-0.98	[-2.01, 0.05]	-1.86	
age cat [14+] × sei [2]		-0.15	[-1.32, 1.02]	-0.26	
age cat [4-5] × sei [3]		-0.55	[-1.21, 0.12]	-1.62	
age cat [6-7] × sei [3]		-0.10	[-0.87, 0.67]	-0.25	
age cat [8-9] × sei [3]		-0.19	[-1.03, 0.64]	-0.45	
age cat [10-11] × sei [3]		-0.63	[-1.53, 0.28]	-1.36	
age cat [12-13] × sei [3]		-0.73	[-1.78, 0.32]	-1.37	
age cat [14+] × sei [3]		-0.70	[-1.88, 0.49]	-1.15	
age cat [4-5] × sei [4]		-0.64	[-1.29, 0.01]	-1.93	
age cat [6-7] × sei [4]		0.02	[-0.73, 0.78]	0.06	
age cat [8-9] × sei [4]		-0.24	[-1.08, 0.60]	-0.56	
age cat [10-11] × sei [4]		-0.45	[-1.38, 0.47]	-0.96	
age cat [12-13] × sei [4]		-0.68	[-1.76, 0.40]	-1.24	
age cat [14+] × sei [4]		-0.37	[-1.59, 0.85]	-0.60	
age cat [4-5] × sei [5]		0.06	[-0.60, 0.73]	0.18	
age cat [6-7] × sei [5]		0.55	[-0.23, 1.34]	1.38	
age cat [8-9] × sei [5]		-0.29	[-1.18, 0.60]	-0.63	
age cat [10-11] × sei [5]		-0.26	[-1.23, 0.71]	-0.52	
age cat [12-13] × sei [5]		-0.94	[-2.08, 0.21]	-1.61	
age cat [14+] × sei [5]		-0.47	[-1.79, 0.85]	-0.69	

age cat [4-5] × prs [2]		-0.57		[-1.24, 0.10]		-1.68	
age cat [6-7] × prs [2]		-0.31		[-1.20, 0.58]		-0.68	
age cat [8-9] × prs [2]		-0.20		[-1.26, 0.85]		-0.38	
age cat [10-11] × prs [2]		0.10		[-1.11, 1.32]		0.17	
age cat [12-13] × prs [2]		0.23		[-1.20, 1.66]		0.32	
age cat [14+] × prs [2]		-0.46		[-2.11, 1.20]		-0.54	
age cat [4-5] × prs [3]		-0.28		[-0.94, 0.39]		-0.82	
age cat [6-7] × prs [3]		0.51		[-0.36, 1.38]		1.15	
age cat [8-9] × prs [3]		0.69		[-0.33, 1.72]		1.33	
age cat [10-11] × prs [3]		1.14		[-0.04, 2.32]		1.89	
age cat [12-13] × prs [3]		1.82		[0.44, 3.21]		2.58	
age cat [14+] × prs [3]		1.30		[-0.29, 2.89]		1.60	
age cat [4-5] × prs [4]		-0.49		[-1.17, 0.19]		-1.40	
age cat [6-7] × prs [4]		0.73		[-0.13, 1.60]		1.66	
age cat [8-9] × prs [4]		1.21		[0.20, 2.22]		2.34	
age cat [10-11] × prs [4]		1.65		[0.48, 2.82]		2.77	
age cat [12-13] × prs [4]		1.93		[0.55, 3.31]		2.74	
age cat [14+] × prs [4]		2.24		[0.67, 3.81]		2.80	
age cat [4-5] × prs [5]		-0.16		[-0.82, 0.50]		-0.47	
age cat [6-7] × prs [5]		0.94		[0.09, 1.79]		2.16	
age cat [8-9] × prs [5]		1.00		[0.00, 2.01]		1.95	
age cat [10-11] × prs [5]		1.64		[0.48, 2.81]		2.76	
age cat [12-13] × prs [5]		2.16		[0.78, 3.54]		3.07	
age cat [14+] × prs [5]		1.96		[0.38, 3.54]		2.44	
sei [2] × prs [2]		-0.34		[-1.46, 0.78]		-0.60	
sei [3] × prs [2]		-0.46		[-1.62, 0.69]		-0.78	
sei [4] × prs [2]		-0.63		[-1.84, 0.57]		-1.03	
sei [5] × prs [2]		-0.21		[-1.49, 1.07]		-0.32	
sei [2] × prs [3]		0.48		[-0.60, 1.57]		0.88	
sei [3] × prs [3]		0.58		[-0.54, 1.70]		1.01	
sei [4] × prs [3]		-0.03		[-1.19, 1.12]		-0.06	
sei [5] × prs [3]		0.57		[-0.75, 1.88]		0.84	
sei [2] × prs [4]		-0.48		[-1.58, 0.62]		-0.85	
sei [3] × prs [4]		-0.24		[-1.38, 0.90]		-0.41	

sei [4] × prs [4]		-0.69	[-1.86, 0.48]	-1.16	
sei [5] × prs [4]		0.20	[-1.07, 1.48]	0.31	
sei [2] × prs [5]		0.07	[-1.01, 1.15]	0.13	
sei [3] × prs [5]		-0.19	[-1.29, 0.91]	-0.34	
sei [4] × prs [5]		-0.98	[-2.11, 0.16]	-1.69	
sei [5] × prs [5]		-0.02	[-1.26, 1.23]	-0.03	
AICc					8539.37
R2 (conditional)					0.83
R2 (marginal)					0.08
Sigma					1.00
Log_loss					0.18

Analysis of Deviance Table (Type III Wald chisquare tests)

Response: ovo

	Chisq	Df	Pr(>Chisq)
(Intercept)	20.9833	1	4.633e-06 ***
sex	0.8216	1	0.364698
age_cat	45.3877	6	3.919e-08 ***
sei	4.3934	4	0.355379
prs	14.8504	4	0.005022 **
age_cat:sei	20.6700	24	0.658107
age_cat:prs	40.8387	24	0.017349 *
sei:prs	12.7719	16	0.689354

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

2.1.2 Table and figure by PRS

Table 3: Estimated probability of overweight/obese (95% CI) across childhood by neighbourhood disadvantage (SEIFA) quintile (1=most, 5=least disadvantage), stratified by PRS quintile (1=lowest, 5=highest risk)

sei	prs	2-3	4-5	6-7	8-9	10-11	12-13	14+
1	1	0.16 (0.06, 0.27)	0.22 (0.10, 0.35)	0.07 (0.01, 0.17)	0.10 (0.01, 0.22)	0.14 (0.04, 0.28)	0.15 (0.05, 0.29)	0.11 (0.00, 0.28)
1	2	0.34 (0.20, 0.52)	0.32 (0.17, 0.45)	0.16 (0.06, 0.29)	0.16 (0.05, 0.34)	0.17 (0.03, 0.36)	0.17 (0.02, 0.37)	0.17 (0.03, 0.33)
1	3	0.27 (0.15, 0.41)	0.31 (0.18, 0.46)	0.18 (0.06, 0.32)	0.23 (0.10, 0.39)	0.25 (0.10, 0.42)	0.28 (0.09, 0.50)	0.29 (0.11, 0.47)
1	4	0.32 (0.10, 0.63)	0.36 (0.18, 0.55)	0.20 (0.06, 0.37)	0.29 (0.12, 0.48)	0.32 (0.07, 0.61)	0.34 (0.15, 0.54)	0.38 (0.16, 0.66)
1	5	0.45 (0.29, 0.62)	0.54 (0.38, 0.68)	0.42 (0.25, 0.60)	0.44 (0.28, 0.61)	0.50 (0.34, 0.67)	0.54 (0.35, 0.73)	0.49 (0.29, 0.68)
2	1	0.24 (0.12, 0.41)	0.24 (0.11, 0.42)	0.12 (0.03, 0.24)	0.06 (0.01, 0.16)	0.05 (0.01, 0.12)	0.04 (0.00, 0.12)	0.07 (0.00, 0.20)
2	2	0.28 (0.15, 0.42)	0.29 (0.15, 0.48)	0.12 (0.03, 0.27)	0.12 (0.03, 0.24)	0.12 (0.02, 0.23)	0.09 (0.02, 0.17)	0.10 (0.02, 0.20)
2	3	0.36 (0.17, 0.60)	0.32 (0.17, 0.51)	0.26 (0.13, 0.42)	0.24 (0.11, 0.41)	0.26 (0.12, 0.46)	0.33 (0.19, 0.51)	0.32 (0.15, 0.51)
2	4	0.31 (0.17, 0.45)	0.25 (0.13, 0.39)	0.28 (0.13, 0.46)	0.29 (0.13, 0.48)	0.31 (0.11, 0.55)	0.35 (0.18, 0.54)	0.40 (0.17, 0.60)
2	5	0.42 (0.22, 0.60)	0.48 (0.27, 0.68)	0.40 (0.21, 0.62)	0.40 (0.25, 0.55)	0.46 (0.29, 0.64)	0.40 (0.22, 0.59)	0.46 (0.29, 0.64)
3	1	0.23 (0.09, 0.44)	0.23 (0.11, 0.40)	0.08 (0.01, 0.18)	0.09 (0.02, 0.21)	0.08 (0.01, 0.20)	0.09 (0.01, 0.19)	0.11 (0.01, 0.22)
3	2	0.30 (0.15, 0.47)	0.18 (0.07, 0.29)	0.09 (0.02, 0.17)	0.14 (0.03, 0.29)	0.16 (0.06, 0.28)	0.19 (0.08, 0.36)	0.16 (0.05, 0.29)
3	3	0.35 (0.21, 0.51)	0.32 (0.18, 0.49)	0.21 (0.08, 0.35)	0.22 (0.10, 0.39)	0.21 (0.10, 0.37)	0.24 (0.10, 0.43)	0.26 (0.07, 0.53)
3	4	0.29 (0.14, 0.44)	0.27 (0.10, 0.48)	0.23 (0.10, 0.41)	0.21 (0.09, 0.34)	0.25 (0.12, 0.40)	0.26 (0.08, 0.44)	0.30 (0.16, 0.44)

sei	prs	2-3	4-5	6-7	8-9	10-11	12-13	14+
3	5	0.52 (0.37, 0.68)	0.47 (0.32, 0.63)	0.38 (0.19, 0.57)	0.30 (0.12, 0.48)	0.28 (0.08, 0.49)	0.42 (0.26, 0.60)	0.38 (0.20, 0.62)
4	1	0.26 (0.10, 0.41)	0.25 (0.12, 0.37)	0.14 (0.03, 0.30)	0.15 (0.04, 0.28)	0.12 (0.03, 0.26)	0.16 (0.04, 0.30)	0.19 (0.06, 0.37)
4	2	0.33 (0.15, 0.52)	0.22 (0.09, 0.35)	0.12 (0.04, 0.25)	0.14 (0.04, 0.28)	0.14 (0.02, 0.27)	0.15 (0.04, 0.29)	0.13 (0.00, 0.30)
4	3	0.38 (0.24, 0.54)	0.31 (0.19, 0.46)	0.17 (0.05, 0.30)	0.17 (0.04, 0.32)	0.23 (0.07, 0.44)	0.20 (0.07, 0.35)	0.24 (0.07, 0.49)
4	4	0.36 (0.21, 0.54)	0.27 (0.15, 0.42)	0.20 (0.08, 0.33)	0.27 (0.10, 0.46)	0.28 (0.13, 0.45)	0.23 (0.10, 0.38)	0.25 (0.08, 0.47)
4	5	0.39 (0.24, 0.56)	0.36 (0.21, 0.55)	0.26 (0.15, 0.39)	0.30 (0.13, 0.48)	0.31 (0.16, 0.46)	0.29 (0.14, 0.44)	0.32 (0.16, 0.48)
5	1	0.13 (0.05, 0.25)	0.21 (0.09, 0.34)	0.07 (0.01, 0.18)	0.07 (0.01, 0.14)	0.07 (0.00, 0.18)	0.07 (0.01, 0.14)	0.07 (0.00, 0.20)
5	2	0.27 (0.12, 0.45)	0.29 (0.13, 0.51)	0.13 (0.02, 0.29)	0.05 (0.00, 0.10)	0.10 (0.02, 0.20)	0.11 (0.02, 0.21)	0.09 (0.02, 0.21)
5	3	0.24 (0.09, 0.38)	0.27 (0.12, 0.45)	0.19 (0.08, 0.34)	0.18 (0.06, 0.38)	0.18 (0.06, 0.33)	0.23 (0.08, 0.44)	0.25 (0.09, 0.46)
5	4	0.27 (0.10, 0.46)	0.31 (0.13, 0.48)	0.24 (0.11, 0.38)	0.25 (0.08, 0.46)	0.26 (0.13, 0.43)	0.29 (0.13, 0.48)	0.31 (0.15, 0.51)
5	5	0.39 (0.22, 0.60)	0.38 (0.19, 0.60)	0.31 (0.15, 0.48)	0.24 (0.10, 0.39)	0.25 (0.10, 0.41)	0.29 (0.07, 0.53)	0.27 (0.06, 0.49)

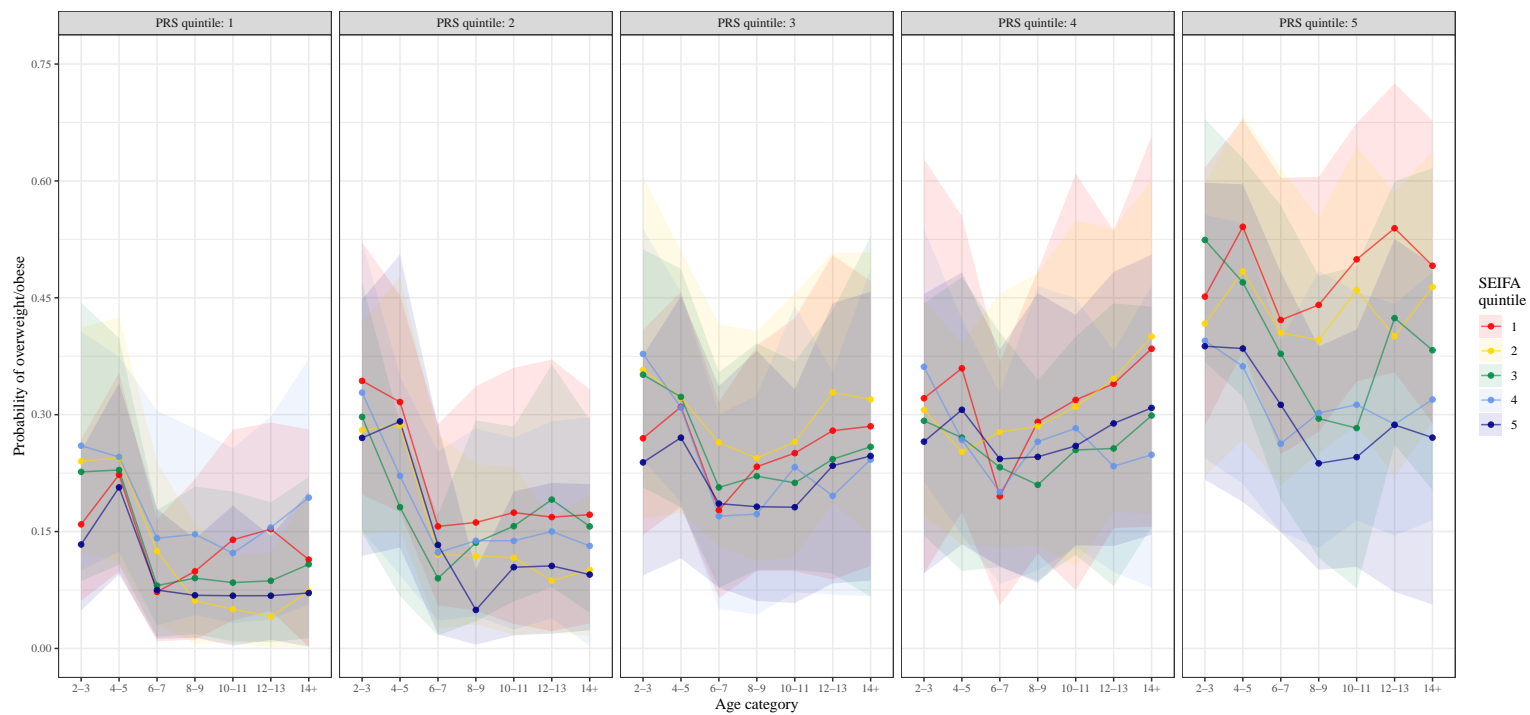


Figure 4: Estimated probability of overweight/obese (95% CI) across childhood by neighbourhood disadvantage (SEIFA) quintile (1=most, 5=least disadvantage), stratified by PRS quintile (1=lowest, 5=highest risk)

2.2 SEP predictor

2.2.1 Model details

```
print_mod_text("res/mod_chi_ovo_sep.txt")
```

logistic mixed model (estimated using REML and nlminb optimizer) to predict ovo with sex, age_cat, sep and prs (formula: $\text{ovo} \sim \text{sex} + (\text{age_cat} + \text{sep} + \text{prs})^2$). The model included waveC as random effects (formula: $\sim 1 + \text{waveC} \mid \text{hcid}$).

The model's total explanatory power is substantial (conditional $R^2 = 0.82$) and the part related to the fixed effects alone (marginal R^2) is of 0.08

Conditional model:

Groups Name	Std.Dev.	Corr
hcid (Intercept)	3.74017	
waveC	0.97417	0.762

The model's intercept, corresponding to sex = 0, age_cat = 2-3, sep = 1 and prs = 1, is at -1.51 (95% CI [-2.29, -0.72], $p < .001$).

Parameter	Coefficient	95% CI	z	Fit
(Intercept)	-1.51	[-2.29, -0.72]	-3.76	
sex	-0.16	[-0.47, 0.16]	-0.97	
age cat [4-5]	0.26	[-0.40, 0.91]	0.77	
age cat [6-7]	-1.81	[-2.63, -0.99]	-4.32	
age cat [8-9]	-2.09	[-3.06, -1.12]	-4.23	
age cat [10-11]	-2.37	[-3.49, -1.25]	-4.15	

age cat [12-13]		-2.39	[-3.67, -1.10]	-3.63	
age cat [14+]		-3.10	[-4.62, -1.58]	-3.99	
sep [2]		-0.27	[-1.15, 0.60]	-0.61	
sep [3]		-0.36	[-1.33, 0.62]	-0.72	
sep [4]		-0.28	[-1.24, 0.69]	-0.56	
sep [5]		-0.47	[-1.47, 0.52]	-0.94	
prs [2]		0.49	[-0.46, 1.45]	1.01	
prs [3]		0.89	[-0.07, 1.84]	1.82	
prs [4]		0.54	[-0.42, 1.51]	1.10	
prs [5]		1.25	[0.29, 2.20]	2.55	
age cat [4-5] × sep [2]		-0.33	[-1.00, 0.35]	-0.95	
age cat [6-7] × sep [2]		0.10	[-0.66, 0.85]	0.25	
age cat [8-9] × sep [2]		0.31	[-0.49, 1.11]	0.77	
age cat [10-11] × sep [2]		-0.05	[-0.91, 0.82]	-0.11	
age cat [12-13] × sep [2]		-0.51	[-1.47, 0.45]	-1.04	
age cat [14+] × sep [2]		0.78	[-0.30, 1.86]	1.42	
age cat [4-5] × sep [3]		-0.29	[-0.96, 0.38]	-0.85	
age cat [6-7] × sep [3]		0.06	[-0.72, 0.83]	0.14	
age cat [8-9] × sep [3]		-0.25	[-1.08, 0.58]	-0.59	
age cat [10-11] × sep [3]		-0.38	[-1.29, 0.52]	-0.83	
age cat [12-13] × sep [3]		-0.29	[-1.29, 0.72]	-0.56	
age cat [14+] × sep [3]		0.03	[-1.10, 1.17]	0.05	
age cat [4-5] × sep [4]		0.14	[-0.52, 0.79]	0.41	
age cat [6-7] × sep [4]		0.45	[-0.30, 1.21]	1.17	
age cat [8-9] × sep [4]		0.06	[-0.78, 0.91]	0.14	
age cat [10-11] × sep [4]		0.11	[-0.80, 1.03]	0.24	
age cat [12-13] × sep [4]		-0.52	[-1.57, 0.52]	-0.99	
age cat [14+] × sep [4]		1.03	[-0.14, 2.20]	1.72	
age cat [4-5] × sep [5]		0.39	[-0.27, 1.04]	1.15	
age cat [6-7] × sep [5]		0.53	[-0.25, 1.30]	1.33	
age cat [8-9] × sep [5]		-0.03	[-0.90, 0.85]	-0.06	
age cat [10-11] × sep [5]		0.16	[-0.79, 1.12]	0.33	
age cat [12-13] × sep [5]		-0.60	[-1.69, 0.49]	-1.07	
age cat [14+] × sep [5]		0.48	[-0.75, 1.71]	0.77	

age cat [4-5] × prs [2]		-0.55		[-1.22, 0.13]		-1.59	
age cat [6-7] × prs [2]		-0.28		[-1.17, 0.61]		-0.62	
age cat [8-9] × prs [2]		-0.18		[-1.24, 0.88]		-0.34	
age cat [10-11] × prs [2]		-0.02		[-1.24, 1.21]		-0.02	
age cat [12-13] × prs [2]		0.29		[-1.14, 1.72]		0.40	
age cat [14+] × prs [2]		-0.20		[-1.86, 1.46]		-0.24	
age cat [4-5] × prs [3]		-0.34		[-1.01, 0.33]		-0.98	
age cat [6-7] × prs [3]		0.50		[-0.37, 1.36]		1.12	
age cat [8-9] × prs [3]		0.64		[-0.38, 1.67]		1.23	
age cat [10-11] × prs [3]		1.09		[-0.09, 2.27]		1.81	
age cat [12-13] × prs [3]		1.78		[0.39, 3.16]		2.51	
age cat [14+] × prs [3]		1.31		[-0.28, 2.90]		1.61	
age cat [4-5] × prs [4]		-0.46		[-1.14, 0.23]		-1.30	
age cat [6-7] × prs [4]		0.75		[-0.11, 1.62]		1.70	
age cat [8-9] × prs [4]		1.27		[0.26, 2.29]		2.46	
age cat [10-11] × prs [4]		1.68		[0.51, 2.85]		2.81	
age cat [12-13] × prs [4]		1.96		[0.58, 3.34]		2.79	
age cat [14+] × prs [4]		2.34		[0.76, 3.91]		2.91	
age cat [4-5] × prs [5]		-0.15		[-0.81, 0.52]		-0.43	
age cat [6-7] × prs [5]		0.87		[0.02, 1.72]		2.02	
age cat [8-9] × prs [5]		1.08		[0.07, 2.09]		2.09	
age cat [10-11] × prs [5]		1.65		[0.49, 2.82]		2.77	
age cat [12-13] × prs [5]		2.08		[0.70, 3.46]		2.96	
age cat [14+] × prs [5]		2.03		[0.45, 3.61]		2.52	
sep [2] × prs [2]		0.24		[-0.75, 1.23]		0.48	
sep [3] × prs [2]		0.35		[-0.80, 1.49]		0.59	
sep [4] × prs [2]		0.07		[-1.14, 1.28]		0.11	
sep [5] × prs [2]		0.53		[-0.71, 1.77]		0.84	
sep [2] × prs [3]		0.22		[-0.77, 1.21]		0.44	
sep [3] × prs [3]		-0.05		[-1.19, 1.10]		-0.08	
sep [4] × prs [3]		-0.02		[-1.19, 1.14]		-0.04	
sep [5] × prs [3]		-0.47		[-1.72, 0.78]		-0.74	
sep [2] × prs [4]		0.52		[-0.47, 1.51]		1.02	
sep [3] × prs [4]		0.46		[-0.66, 1.59]		0.81	

sep [4] × prs [4]		0.21	[-0.93, 1.35]		0.36	
sep [5] × prs [4]		-0.06	[-1.32, 1.19]		-0.10	
sep [2] × prs [5]		0.60	[-0.37, 1.56]		1.22	
sep [3] × prs [5]		0.45	[-0.68, 1.58]		0.78	
sep [4] × prs [5]		-0.08	[-1.23, 1.07]		-0.14	
sep [5] × prs [5]		0.14	[-1.11, 1.40]		0.23	
AICc						8515.38
R2 (conditional)						0.82
R2 (marginal)						0.08
Sigma						1.00
Log_loss						0.18

Analysis of Deviance Table (Type III Wald chisquare tests)

Response: ovo

	Chisq	Df	Pr(>Chisq)
(Intercept)	14.1184	1	0.0001717 ***
sex	0.9505	1	0.3295911
age_cat	44.8281	6	5.063e-08 ***
sep	0.9855	4	0.9119840
prs	7.5741	4	0.1084839
age_cat:sep	24.7681	24	0.4184466
age_cat:prs	39.2668	24	0.0255990 *
sep:prs	8.5371	16	0.9312487

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

2.2.2 Table and figure by PRS

Table 4: Estimated probability of overweight/obese (95% CI) across childhood by family disadvantage (SEP) quintile (1=most, 5=least disadvantage), stratified by PRS quintile (1=lowest, 5=highest risk)

sep	prs	2-3	4-5	6-7	8-9	10-11	12-13	14+
1	1	0.26 (0.10, 0.41)	0.29 (0.13, 0.47)	0.15 (0.05, 0.32)	0.19 (0.04, 0.44)	0.16 (0.03, 0.37)	0.21 (0.06, 0.42)	0.12 (0.00, 0.32)
1	2	0.27 (0.15, 0.42)	0.27 (0.15, 0.42)	0.12 (0.03, 0.24)	0.12 (0.02, 0.25)	0.13 (0.02, 0.27)	0.16 (0.03, 0.32)	0.20 (0.08, 0.32)
1	3	0.42 (0.27, 0.58)	0.41 (0.26, 0.56)	0.28 (0.09, 0.52)	0.33 (0.13, 0.58)	0.36 (0.15, 0.60)	0.36 (0.15, 0.57)	0.37 (0.16, 0.56)
1	4	0.33 (0.13, 0.58)	0.34 (0.15, 0.56)	0.22 (0.06, 0.41)	0.31 (0.15, 0.48)	0.39 (0.21, 0.60)	0.38 (0.21, 0.56)	0.40 (0.25, 0.58)
1	5	0.45 (0.24, 0.67)	0.48 (0.30, 0.66)	0.39 (0.22, 0.58)	0.37 (0.17, 0.55)	0.49 (0.32, 0.66)	0.53 (0.35, 0.72)	0.50 (0.34, 0.69)
2	1	0.19 (0.07, 0.34)	0.23 (0.12, 0.37)	0.06 (0.01, 0.14)	0.05 (0.01, 0.12)	0.10 (0.01, 0.20)	0.04 (0.00, 0.13)	0.17 (0.05, 0.38)
2	2	0.32 (0.19, 0.49)	0.23 (0.09, 0.36)	0.13 (0.05, 0.25)	0.13 (0.03, 0.24)	0.15 (0.06, 0.25)	0.13 (0.02, 0.26)	0.06 (0.00, 0.15)
2	3	0.33 (0.12, 0.56)	0.30 (0.10, 0.58)	0.21 (0.08, 0.37)	0.26 (0.12, 0.46)	0.22 (0.09, 0.37)	0.26 (0.12, 0.42)	0.32 (0.10, 0.55)
2	4	0.31 (0.13, 0.56)	0.27 (0.09, 0.48)	0.29 (0.14, 0.46)	0.29 (0.16, 0.45)	0.27 (0.12, 0.45)	0.25 (0.09, 0.41)	0.30 (0.14, 0.48)
2	5	0.54 (0.31, 0.74)	0.52 (0.37, 0.67)	0.46 (0.30, 0.63)	0.46 (0.29, 0.65)	0.43 (0.26, 0.60)	0.48 (0.30, 0.67)	0.49 (0.26, 0.73)
3	1	0.18 (0.05, 0.36)	0.14 (0.05, 0.30)	0.08 (0.01, 0.22)	0.07 (0.01, 0.18)	0.05 (0.00, 0.12)	0.10 (0.02, 0.21)	0.08 (0.00, 0.22)
3	2	0.29 (0.15, 0.48)	0.23 (0.12, 0.37)	0.09 (0.02, 0.22)	0.11 (0.04, 0.24)	0.11 (0.01, 0.22)	0.13 (0.00, 0.27)	0.12 (0.00, 0.26)
3	3	0.33 (0.19, 0.49)	0.26 (0.10, 0.44)	0.20 (0.07, 0.39)	0.19 (0.06, 0.35)	0.24 (0.08, 0.48)	0.24 (0.08, 0.43)	0.19 (0.07, 0.33)
3	4	0.32 (0.17, 0.47)	0.27 (0.14, 0.40)	0.18 (0.08, 0.33)	0.24 (0.14, 0.38)	0.24 (0.11, 0.40)	0.23 (0.11, 0.38)	0.32 (0.09, 0.62)

sep	prs	2-3	4-5	6-7	8-9	10-11	12-13	14+
3	5	0.40 (0.23, 0.60)	0.39 (0.16, 0.64)	0.33 (0.16, 0.52)	0.33 (0.17, 0.50)	0.32 (0.16, 0.47)	0.38 (0.21, 0.58)	0.33 (0.12, 0.58)
4	1	0.21 (0.09, 0.33)	0.24 (0.11, 0.38)	0.07 (0.01, 0.16)	0.11 (0.03, 0.23)	0.09 (0.01, 0.25)	0.05 (0.00, 0.14)	0.09 (0.00, 0.25)
4	2	0.34 (0.13, 0.63)	0.25 (0.12, 0.39)	0.17 (0.04, 0.39)	0.10 (0.00, 0.28)	0.13 (0.00, 0.37)	0.15 (0.01, 0.36)	0.13 (0.00, 0.31)
4	3	0.32 (0.17, 0.49)	0.33 (0.20, 0.51)	0.21 (0.09, 0.35)	0.17 (0.05, 0.32)	0.16 (0.05, 0.31)	0.24 (0.07, 0.43)	0.30 (0.14, 0.49)
4	4	0.34 (0.20, 0.50)	0.34 (0.20, 0.50)	0.31 (0.16, 0.47)	0.29 (0.12, 0.45)	0.32 (0.18, 0.48)	0.38 (0.21, 0.58)	0.40 (0.15, 0.66)
4	5	0.40 (0.25, 0.60)	0.43 (0.29, 0.61)	0.25 (0.10, 0.40)	0.22 (0.08, 0.38)	0.22 (0.11, 0.36)	0.22 (0.07, 0.42)	0.29 (0.15, 0.43)
5	1	0.16 (0.07, 0.27)	0.25 (0.14, 0.36)	0.10 (0.03, 0.19)	0.06 (0.01, 0.13)	0.09 (0.02, 0.18)	0.12 (0.02, 0.28)	0.10 (0.02, 0.23)
5	2	0.31 (0.18, 0.44)	0.32 (0.19, 0.45)	0.11 (0.04, 0.20)	0.09 (0.02, 0.19)	0.10 (0.03, 0.20)	0.10 (0.02, 0.22)	0.13 (0.04, 0.25)
5	3	0.21 (0.10, 0.35)	0.23 (0.11, 0.37)	0.12 (0.04, 0.22)	0.08 (0.01, 0.17)	0.16 (0.05, 0.28)	0.14 (0.03, 0.26)	0.14 (0.03, 0.29)
5	4	0.25 (0.11, 0.43)	0.23 (0.10, 0.38)	0.18 (0.07, 0.31)	0.17 (0.06, 0.30)	0.21 (0.08, 0.34)	0.22 (0.09, 0.36)	0.23 (0.09, 0.39)
5	5	0.33 (0.13, 0.52)	0.39 (0.11, 0.67)	0.29 (0.13, 0.46)	0.27 (0.13, 0.45)	0.34 (0.17, 0.52)	0.29 (0.11, 0.51)	0.30 (0.09, 0.51)

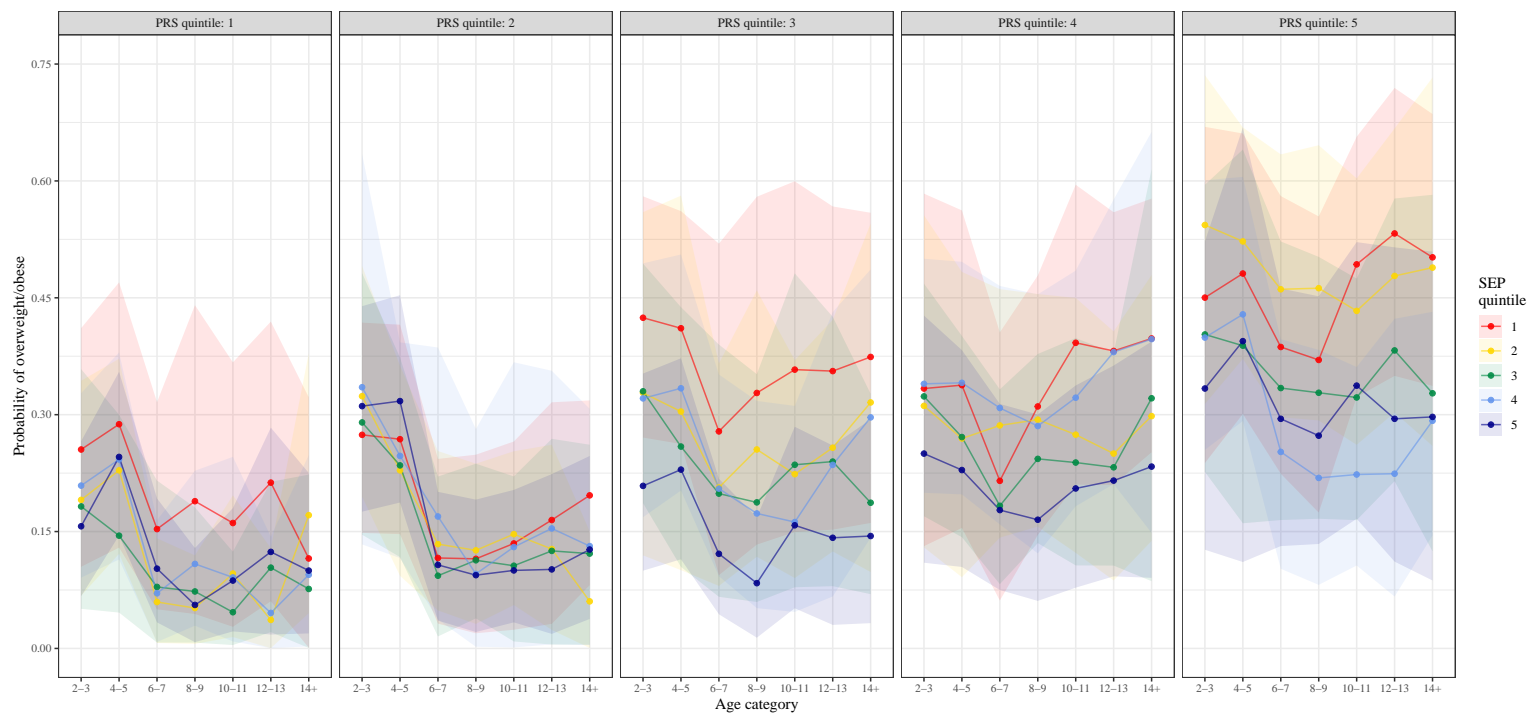


Figure 5: Estimated probability of overweight/obese (95% CI) across childhood by family disadvantage (SEP) quintile (1=most, 5=least disadvantage), stratified by PRS quintile (1=lowest, 5=highest risk)

2.3 Marginal SEIFA and SEP Figures

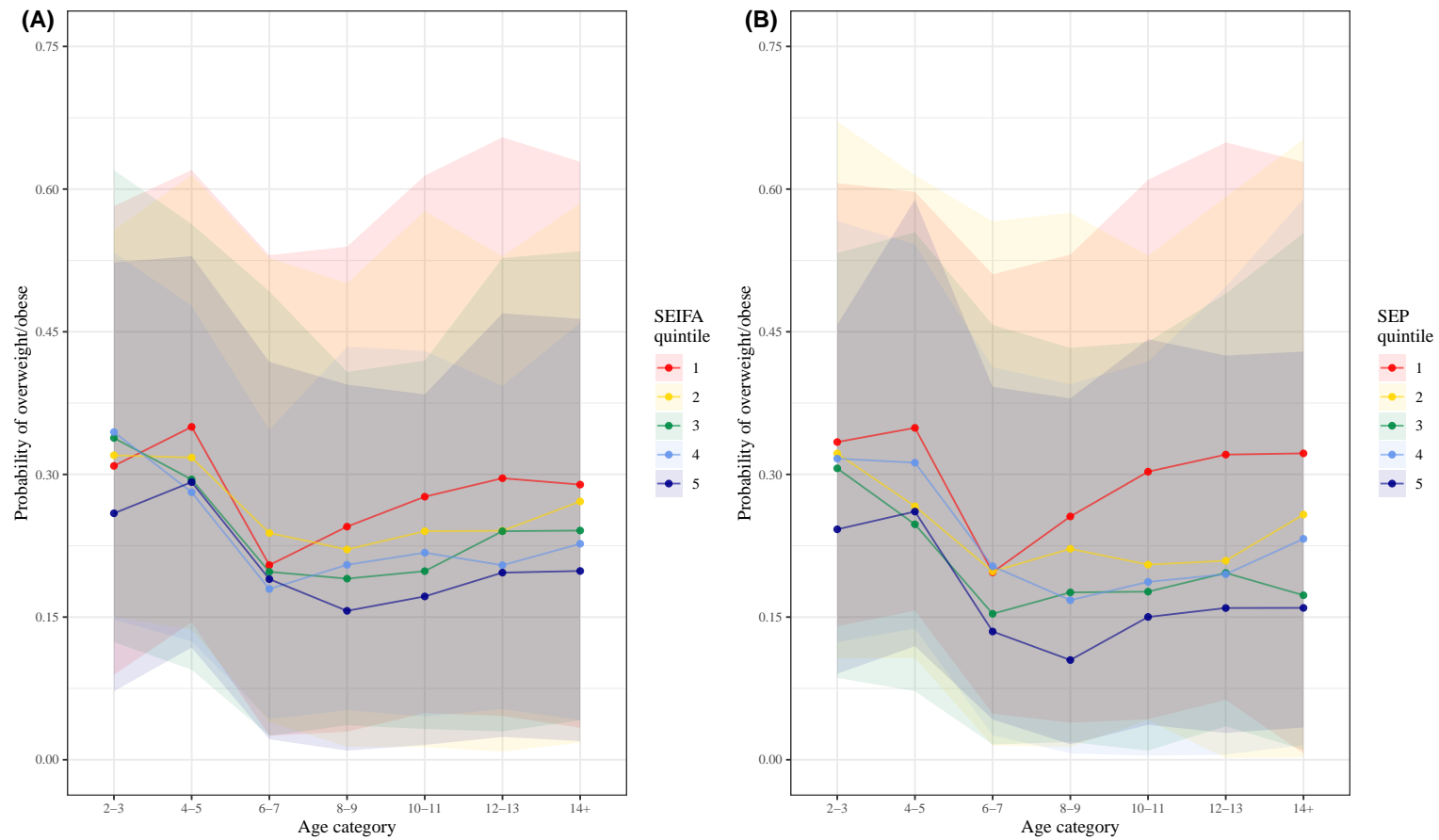


Figure 6: Association of SEIFA neighbourhood disadvantage (Panel A) and SEP family disadvantage (Panel B) with probability of overweight/obese across childhood. In all cases quintile 1 represents the most disadvantage.

3 Adult data: BMI models

3.1 SEIFA predictor

3.1.1 Model details

```
print_mod_text("res/mod_adu_bmi_sei.txt")
```

linear mixed model (estimated using REML and nlminb optimizer) to predict bmi with waveC, sex, age_cat, sei and prs (formula: `bmi ~ waveC + sex + (age_cat + sei + prs)^2`). The model included waveC as random effects (formula: `list(~1 + waveC | hcid, ~1 | personid)`).

The model's total explanatory power is substantial (conditional R2 = 0.85) and the part related to the fixed effects alone (marginal R2) is of 0.09

Conditional model:

Groups	Name	Std.Dev.	Corr
hcid	(Intercept)	2.79920	
	waveC	0.46366	0.651
personid	(Intercept)	3.87316	
Residual		2.13793	

The model's intercept, corresponding to waveC = 0, sex = 0, age_cat = <30, sei = 1 and prs = 1, is at 26.29 (95% CI [25.41, 27.17], $p < .001$).

Parameter	Coefficient	95% CI	z	Fit
(Intercept)	26.29	[25.41, 27.17]	58.64	
waveC	0.40	[0.35, 0.45]	15.66	
sex	-1.54	[-1.89, -1.18]	-8.39	
age cat [30-35]	0.12	[-0.51, 0.76]	0.38	

age cat [35-40]		-0.02	[-0.70, 0.66]	-0.06	
age cat [40-45]		-0.04	[-0.79, 0.71]	-0.11	
age cat [45-50]		-0.47	[-1.31, 0.37]	-1.09	
age cat [50+]		-0.66	[-1.72, 0.41]	-1.21	
sei [2]		-0.18	[-0.86, 0.49]	-0.54	
sei [3]		-0.06	[-0.79, 0.67]	-0.17	
sei [4]		0.31	[-0.50, 1.13]	0.76	
sei [5]		-0.35	[-1.31, 0.60]	-0.72	
prs [2]		1.05	[0.03, 2.07]	2.02	
prs [3]		1.20	[0.17, 2.22]	2.29	
prs [4]		3.32	[2.30, 4.34]	6.40	
prs [5]		3.50	[2.51, 4.50]	6.90	
age cat [30-35] × sei [2]		0.22	[-0.37, 0.82]	0.73	
age cat [35-40] × sei [2]		0.22	[-0.38, 0.82]	0.71	
age cat [40-45] × sei [2]		0.13	[-0.48, 0.75]	0.42	
age cat [45-50] × sei [2]		0.37	[-0.31, 1.05]	1.06	
age cat [50+] × sei [2]		0.78	[-0.11, 1.66]	1.73	
age cat [30-35] × sei [3]		-0.04	[-0.69, 0.61]	-0.13	
age cat [35-40] × sei [3]		9.38e-03	[-0.65, 0.66]	0.03	
age cat [40-45] × sei [3]		-0.11	[-0.78, 0.57]	-0.31	
age cat [45-50] × sei [3]		-0.07	[-0.81, 0.66]	-0.20	
age cat [50+] × sei [3]		-0.32	[-1.24, 0.60]	-0.68	
age cat [30-35] × sei [4]		-0.38	[-1.10, 0.34]	-1.03	
age cat [35-40] × sei [4]		-0.19	[-0.92, 0.53]	-0.52	
age cat [40-45] × sei [4]		-0.26	[-1.00, 0.49]	-0.68	
age cat [45-50] × sei [4]		-0.15	[-0.96, 0.65]	-0.38	
age cat [50+] × sei [4]		-0.28	[-1.26, 0.69]	-0.57	
age cat [30-35] × sei [5]		0.54	[-0.27, 1.34]	1.30	
age cat [35-40] × sei [5]		0.37	[-0.44, 1.19]	0.90	
age cat [40-45] × sei [5]		0.28	[-0.56, 1.12]	0.66	
age cat [45-50] × sei [5]		0.19	[-0.70, 1.08]	0.42	
age cat [50+] × sei [5]		0.40	[-0.66, 1.46]	0.73	
age cat [30-35] × prs [2]		-0.10	[-0.85, 0.66]	-0.25	
age cat [35-40] × prs [2]		-0.24	[-1.03, 0.55]	-0.60	

age cat [40-45] × prs [2]		-0.21		[-1.03, 0.62]		-0.49	
age cat [45-50] × prs [2]		-0.09		[-0.97, 0.79]		-0.21	
age cat [50+] × prs [2]		-0.24		[-1.28, 0.81]		-0.44	
age cat [30-35] × prs [3]		0.19		[-0.55, 0.94]		0.52	
age cat [35-40] × prs [3]		0.51		[-0.27, 1.29]		1.28	
age cat [40-45] × prs [3]		0.46		[-0.36, 1.28]		1.10	
age cat [45-50] × prs [3]		1.02		[0.15, 1.90]		2.29	
age cat [50+] × prs [3]		0.96		[-0.08, 2.00]		1.82	
age cat [30-35] × prs [4]		0.20		[-0.55, 0.95]		0.53	
age cat [35-40] × prs [4]		0.22		[-0.56, 1.01]		0.56	
age cat [40-45] × prs [4]		0.34		[-0.48, 1.16]		0.82	
age cat [45-50] × prs [4]		0.38		[-0.50, 1.27]		0.85	
age cat [50+] × prs [4]		0.20		[-0.85, 1.26]		0.38	
age cat [30-35] × prs [5]		0.09		[-0.63, 0.82]		0.25	
age cat [35-40] × prs [5]		0.16		[-0.60, 0.93]		0.42	
age cat [40-45] × prs [5]		0.12		[-0.69, 0.93]		0.29	
age cat [45-50] × prs [5]		0.66		[-0.21, 1.52]		1.49	
age cat [50+] × prs [5]		0.49		[-0.56, 1.53]		0.91	
sei [2] × prs [2]		0.07		[-0.52, 0.66]		0.24	
sei [3] × prs [2]		0.06		[-0.56, 0.69]		0.19	
sei [4] × prs [2]		-0.27		[-0.96, 0.42]		-0.75	
sei [5] × prs [2]		-0.40		[-1.19, 0.39]		-1.00	
sei [2] × prs [3]		0.08		[-0.50, 0.66]		0.26	
sei [3] × prs [3]		0.08		[-0.54, 0.70]		0.26	
sei [4] × prs [3]		-0.09		[-0.76, 0.58]		-0.27	
sei [5] × prs [3]		-0.17		[-0.95, 0.61]		-0.43	
sei [2] × prs [4]		-0.33		[-0.92, 0.25]		-1.12	
sei [3] × prs [4]		-0.44		[-1.08, 0.20]		-1.34	
sei [4] × prs [4]		-0.70		[-1.39, -0.01]		-2.00	
sei [5] × prs [4]		-0.56		[-1.33, 0.21]		-1.43	
sei [2] × prs [5]		-0.29		[-0.86, 0.27]		-1.01	
sei [3] × prs [5]		-0.03		[-0.65, 0.59]		-0.09	
sei [4] × prs [5]		-0.61		[-1.27, 0.05]		-1.80	
sei [5] × prs [5]		-0.73		[-1.52, 0.06]		-1.82	

AICc					74119.15
R2 (conditional)					0.85
R2 (marginal)					0.09
Sigma					2.14

Analysis of Deviance Table (Type III Wald chisquare tests)

Response: bmi

	Chisq	Df	Pr(>Chisq)
(Intercept)	3439.2266	1	< 2.2e-16 ***
waveC	245.1950	1	< 2.2e-16 ***
sex	70.4312	1	< 2.2e-16 ***
age_cat	5.5204	5	0.3557
sei	2.5208	4	0.6409
prs	72.0817	4	8.248e-15 ***
age_cat:sei	17.1916	20	0.6405
age_cat:prs	23.6838	20	0.2565
sei:prs	13.4923	16	0.6365

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

3.1.2 Table and figure by PRS

Table 5: Estimated BMI (95% CI) across adulthood by neighbourhood disadvantage (SEIFA) quintile (1=most, 5=least disadvantage), stratified by PRS quintile (1=lowest, 5=highest risk)

sei	prs	<30	30-35	35-40	40-45	45-50	50+
1	1	24.4 (22.4, 27.3)	25.3 (23.6, 27.2)	25.5 (24.2, 26.8)	26.1 (24.6, 27.8)	25.7 (23.6, 28.4)	25.8 (22.2, 28.5)
1	2	27.4 (23.2, 32.9)	26.5 (24.2, 30.5)	25.8 (23.9, 28.0)	26.1 (23.9, 28.6)	26.4 (24.6, 28.7)	26.7 (23.1, 30.2)
1	3	26.9 (23.6, 30.8)	28.3 (26.3, 31.5)	28.0 (26.3, 29.8)	29.1 (27.0, 31.8)	27.8 (25.8, 30.3)	28.0 (25.2, 31.3)
1	4	27.1 (23.2, 32.3)	29.4 (26.7, 32.3)	28.7 (26.7, 31.3)	29.5 (27.6, 31.5)	29.1 (26.5, 32.4)	32.6 (25.6, 39.9)

sei	prs	<30	30-35	35-40	40-45	45-50	50+
1	5	28.0 (26.3, 30.5)	29.3 (27.2, 31.6)	30.2 (28.5, 32.0)	30.4 (28.1, 32.1)	31.0 (28.0, 33.9)	30.7 (26.5, 37.1)
2	1	24.3 (20.6, 34.3)	24.7 (23.2, 26.6)	25.1 (24.0, 26.2)	25.7 (24.4, 26.9)	25.7 (23.7, 27.4)	28.5 (25.5, 31.9)
2	2	26.2 (23.6, 29.2)	26.6 (24.3, 28.5)	26.4 (24.7, 28.6)	26.5 (25.3, 27.9)	26.7 (25.0, 28.6)	28.4 (24.9, 33.2)
2	3	27.4 (24.9, 31.4)	26.6 (24.3, 29.5)	26.6 (25.2, 28.0)	26.8 (25.2, 28.5)	26.7 (25.0, 28.9)	27.8 (24.4, 33.2)
2	4	27.5 (24.7, 30.3)	29.9 (27.7, 32.5)	29.2 (27.7, 30.7)	29.0 (27.3, 31.2)	29.5 (27.3, 31.9)	30.1 (25.7, 36.1)
2	5	27.7 (26.1, 30.1)	27.9 (25.9, 30.0)	29.2 (26.5, 33.3)	30.3 (27.8, 33.3)	30.3 (26.7, 33.5)	30.9 (26.5, 35.8)
3	1	25.3 (21.2, 29.0)	25.0 (23.2, 27.0)	24.9 (23.2, 26.6)	25.8 (24.0, 27.6)	25.6 (23.3, 28.4)	25.9 (22.1, 30.4)
3	2	24.7 (22.7, 32.0)	26.1 (24.0, 28.7)	26.2 (23.9, 28.3)	26.2 (24.7, 28.4)	26.1 (23.9, 28.8)	25.3 (23.1, 27.6)
3	3	24.7 (22.4, 27.2)	25.9 (23.3, 30.0)	26.9 (24.7, 29.5)	26.8 (25.2, 28.4)	26.7 (24.7, 28.8)	27.4 (24.5, 30.4)
3	4	28.8 (25.0, 33.0)	28.3 (26.6, 30.1)	28.3 (26.7, 30.1)	29.3 (27.4, 31.0)	28.6 (27.0, 31.2)	27.9 (23.6, 31.8)
3	5	27.3 (25.7, 29.7)	28.4 (26.0, 30.9)	28.7 (27.2, 30.2)	28.4 (26.4, 30.2)	29.6 (27.4, 31.6)	29.5 (24.8, 34.4)
4	1	25.0 (21.3, 30.2)	24.3 (22.5, 26.6)	24.1 (22.9, 25.6)	24.7 (23.1, 26.3)	25.1 (23.3, 27.3)	25.7 (23.6, 28.2)
4	2	26.1 (21.1, 31.0)	26.0 (23.7, 28.7)	26.3 (24.5, 28.3)	26.0 (23.5, 28.5)	25.7 (23.4, 28.3)	25.5 (22.6, 29.6)
4	3	25.8 (22.9, 29.2)	26.3 (24.4, 28.7)	26.8 (25.1, 28.6)	26.6 (24.9, 28.5)	27.0 (25.3, 28.6)	27.2 (24.1, 29.5)
4	4	27.6 (25.1, 31.5)	27.4 (25.0, 30.3)	27.6 (26.2, 29.3)	28.3 (26.7, 30.0)	27.6 (24.7, 30.1)	27.6 (24.1, 29.9)
4	5	26.2 (22.6, 32.7)	28.0 (25.8, 30.5)	27.3 (25.6, 28.7)	27.0 (24.9, 28.9)	28.0 (25.7, 30.2)	27.9 (25.4, 31.2)
5	1	28.5 (22.2, 33.9)	24.9 (22.9, 27.7)	24.5 (23.3, 26.0)	24.7 (23.4, 25.9)	24.1 (22.4, 25.7)	24.6 (21.6, 27.8)
5	2	24.8 (21.3, 27.9)	25.8 (22.9, 28.9)	25.3 (23.1, 27.6)	25.8 (23.5, 28.1)	25.8 (23.6, 27.7)	25.9 (23.5, 27.9)
5	3	25.3 (20.2, 30.6)	26.3 (24.3, 28.3)	26.3 (24.3, 28.8)	26.6 (24.9, 28.5)	26.9 (24.9, 29.4)	25.7 (22.8, 28.8)
5	4	27.8 (21.8, 35.3)	26.5 (24.8, 28.7)	26.4 (24.5, 28.3)	26.9 (25.2, 28.6)	26.8 (24.5, 28.6)	27.1 (24.7, 30.2)
5	5	28.8 (24.5, 35.6)	27.1 (24.7, 29.5)	27.5 (25.3, 29.9)	27.8 (25.8, 30.0)	27.5 (25.1, 30.2)	28.5 (24.5, 33.2)

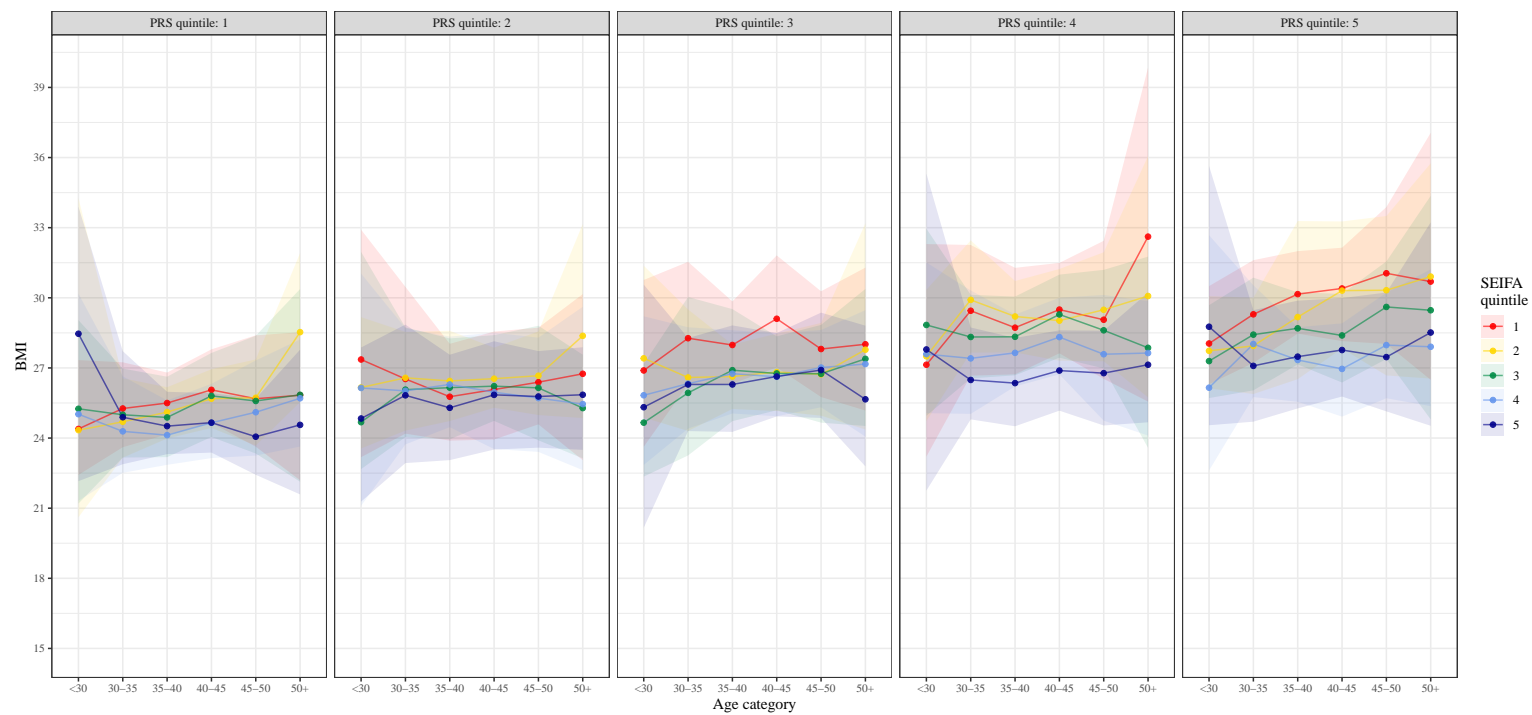


Figure 7: Estimated BMI (95% CI) across adulthood by neighbourhood disadvantage (SEIFA) quintile (1=most, 5=least disadvantage), stratified by PRS quintile (1=lowest, 5=highest risk)

3.2 SEP predictor

3.2.1 Model details

```
print_mod_text("res/mod_adu_bmi_sep.txt")
```

linear mixed model (estimated using REML and nlminb optimizer) to predict bmi with waveC, sex, age_cat, sep and prs (formula: `bmi ~ waveC + sex + (age_cat + sep + prs)^2`). The model included waveC as random effects (formula: `list(~1 + waveC | hcid, ~1 | personid)`).

The model's total explanatory power is substantial (conditional R2 = 0.85) and the part related to the fixed effects alone (marginal R2) is of 0.09

Conditional model:

Groups	Name	Std.Dev.	Corr
hcid	(Intercept)	2.76206	
	waveC	0.46267	0.650
personid	(Intercept)	3.87633	
Residual		2.14040	

The model's intercept, corresponding to waveC = 0, sex = 0, age_cat = <30, sep = 1 and prs = 1, is at 26.26 (95% CI [25.40, 27.11], $p < .001$).

Parameter	Coefficient	95% CI	z	Fit
(Intercept)	26.26	[25.40, 27.11]	60.06	
waveC	0.40	[0.35, 0.45]	15.52	
sex	-1.54	[-1.90, -1.18]	-8.40	
age cat [30-35]	0.10	[-0.52, 0.71]	0.31	

age cat [35-40]		0.15	[-0.52, 0.82]		0.44	
age cat [40-45]		0.21	[-0.53, 0.95]		0.56	
age cat [45-50]		0.11	[-0.72, 0.94]		0.26	
age cat [50+]		-0.18	[-1.21, 0.86]		-0.34	
sep [2]		0.30	[-0.35, 0.94]		0.90	
sep [3]		0.03	[-0.72, 0.79]		0.09	
sep [4]		-0.13	[-1.02, 0.76]		-0.29	
sep [5]		-0.02	[-1.25, 1.20]		-0.04	
prs [2]		1.08	[0.07, 2.08]		2.09	
prs [3]		1.09	[0.09, 2.09]		2.13	
prs [4]		3.02	[2.01, 4.03]		5.87	
prs [5]		3.21	[2.22, 4.21]		6.34	
age cat [30-35] × sep [2]		0.01	[-0.57, 0.59]		0.04	
age cat [35-40] × sep [2]		-0.30	[-0.88, 0.28]		-1.02	
age cat [40-45] × sep [2]		-0.30	[-0.90, 0.29]		-1.01	
age cat [45-50] × sep [2]		-0.71	[-1.35, -0.06]		-2.15	
age cat [50+] × sep [2]		-0.65	[-1.44, 0.15]		-1.59	
age cat [30-35] × sep [3]		0.14	[-0.52, 0.79]		0.41	
age cat [35-40] × sep [3]		-2.18e-03	[-0.67, 0.66]		-6.41e-03	
age cat [40-45] × sep [3]		-0.23	[-0.92, 0.45]		-0.66	
age cat [45-50] × sep [3]		-0.52	[-1.25, 0.22]		-1.38	
age cat [50+] × sep [3]		-0.29	[-1.18, 0.60]		-0.63	
age cat [30-35] × sep [4]		0.15	[-0.58, 0.89]		0.40	
age cat [35-40] × sep [4]		-0.17	[-0.93, 0.59]		-0.44	
age cat [40-45] × sep [4]		-0.40	[-1.18, 0.39]		-0.99	
age cat [45-50] × sep [4]		-0.63	[-1.47, 0.20]		-1.49	
age cat [50+] × sep [4]		-0.35	[-1.34, 0.64]		-0.69	
age cat [30-35] × sep [5]		-0.12	[-1.20, 0.96]		-0.22	
age cat [35-40] × sep [5]		-0.22	[-1.32, 0.87]		-0.40	
age cat [40-45] × sep [5]		-0.42	[-1.55, 0.70]		-0.74	
age cat [45-50] × sep [5]		-0.81	[-1.97, 0.35]		-1.37	
age cat [50+] × sep [5]		-0.77	[-2.05, 0.51]		-1.17	
age cat [30-35] × prs [2]		-0.02	[-0.78, 0.73]		-0.06	
age cat [35-40] × prs [2]		-0.17	[-0.96, 0.62]		-0.42	

age cat [40-45] × prs [2]		-0.13		[-0.96, 0.69]		-0.32	
age cat [45-50] × prs [2]		-0.04		[-0.92, 0.84]		-0.10	
age cat [50+] × prs [2]		-0.21		[-1.26, 0.83]		-0.40	
age cat [30-35] × prs [3]		0.20		[-0.54, 0.95]		0.53	
age cat [35-40] × prs [3]		0.53		[-0.25, 1.32]		1.33	
age cat [40-45] × prs [3]		0.46		[-0.36, 1.29]		1.10	
age cat [45-50] × prs [3]		1.01		[0.13, 1.89]		2.26	
age cat [50+] × prs [3]		0.99		[-0.05, 2.03]		1.86	
age cat [30-35] × prs [4]		0.27		[-0.48, 1.02]		0.71	
age cat [35-40] × prs [4]		0.30		[-0.49, 1.09]		0.75	
age cat [40-45] × prs [4]		0.41		[-0.41, 1.24]		0.98	
age cat [45-50] × prs [4]		0.47		[-0.41, 1.35]		1.04	
age cat [50+] × prs [4]		0.33		[-0.72, 1.39]		0.61	
age cat [30-35] × prs [5]		0.16		[-0.56, 0.89]		0.44	
age cat [35-40] × prs [5]		0.24		[-0.53, 1.01]		0.61	
age cat [40-45] × prs [5]		0.19		[-0.63, 1.00]		0.45	
age cat [45-50] × prs [5]		0.67		[-0.20, 1.54]		1.50	
age cat [50+] × prs [5]		0.52		[-0.53, 1.57]		0.98	
sep [2] × prs [2]		-0.33		[-0.86, 0.20]		-1.21	
sep [3] × prs [2]		-0.30		[-0.95, 0.34]		-0.92	
sep [4] × prs [2]		-0.18		[-0.90, 0.55]		-0.48	
sep [5] × prs [2]		-0.22		[-1.06, 0.63]		-0.50	
sep [2] × prs [3]		0.10		[-0.45, 0.65]		0.37	
sep [3] × prs [3]		0.10		[-0.56, 0.76]		0.30	
sep [4] × prs [3]		0.05		[-0.69, 0.80]		0.14	
sep [5] × prs [3]		0.03		[-0.81, 0.88]		0.08	
sep [2] × prs [4]		-0.25		[-0.81, 0.31]		-0.87	
sep [3] × prs [4]		-0.44		[-1.09, 0.21]		-1.32	
sep [4] × prs [4]		-0.22		[-0.97, 0.52]		-0.59	
sep [5] × prs [4]		-0.06		[-0.91, 0.79]		-0.14	
sep [2] × prs [5]		0.02		[-0.52, 0.56]		0.07	
sep [3] × prs [5]		-0.25		[-0.90, 0.40]		-0.75	
sep [4] × prs [5]		-0.20		[-0.94, 0.53]		-0.54	
sep [5] × prs [5]		-0.27		[-1.13, 0.59]		-0.62	

AICc					73981.67
R2 (conditional)					0.85
R2 (marginal)					0.09
Sigma					2.14

Analysis of Deviance Table (Type III Wald chisquare tests)

Response: bmi

	Chisq	Df	Pr(>Chisq)
(Intercept)	3607.2505	1	< 2.2e-16 ***
waveC	240.7413	1	< 2.2e-16 ***
sex	70.5204	1	< 2.2e-16 ***
age_cat	1.5012	5	0.9129
sep	1.3256	4	0.8570
prs	59.0129	4	4.676e-12 ***
age_cat:sep	17.3163	20	0.6323
age_cat:prs	21.9885	20	0.3411
sep:prs	8.1410	16	0.9446

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

3.2.2 Table and figure by PRS

Table 6: Estimated BMI (95% CI) across adulthood by family disadvantage (SEP) quintile (1=most, 5=least disadvantage), stratified by PRS quintile (1=lowest, 5=highest risk)

sep	prs	<30	30-35	35-40	40-45	45-50	50+
1	1	25.5 (22.4, 31.8)	26.0 (23.8, 29.6)	26.2 (24.8, 27.7)	26.7 (24.5, 29.1)	25.5 (23.7, 27.8)	27.2 (24.4, 31.1)
1	2	27.3 (24.7, 29.9)	26.8 (24.7, 29.7)	27.0 (24.5, 30.0)	27.5 (25.5, 29.9)	26.4 (24.3, 28.2)	26.5 (24.5, 28.7)
1	3	27.5 (24.3, 31.6)	28.2 (25.9, 31.3)	28.5 (26.5, 30.7)	28.5 (26.4, 31.5)	28.7 (26.3, 31.6)	26.9 (20.5, 32.6)
1	4	28.5 (24.5, 33.2)	30.0 (26.5, 34.2)	30.4 (27.9, 33.7)	30.9 (28.4, 33.9)	30.4 (27.6, 33.9)	32.6 (26.2, 40.3)

sep	prs	<30	30-35	35-40	40-45	45-50	50+
1	5	27.7 (26.2, 29.8)	29.7 (27.9, 31.9)	30.7 (29.0, 33.0)	31.3 (29.0, 33.8)	32.2 (29.1, 35.1)	30.9 (25.5, 36.4)
2	1	24.8 (21.8, 27.8)	25.8 (24.3, 27.5)	25.6 (24.3, 26.9)	26.4 (24.4, 28.3)	25.8 (23.4, 27.8)	24.9 (20.8, 28.4)
2	2	26.5 (22.3, 32.8)	27.2 (24.6, 30.4)	26.2 (24.8, 27.9)	26.6 (24.7, 28.9)	26.7 (24.2, 29.3)	25.5 (22.5, 29.5)
2	3	25.9 (23.7, 28.8)	27.3 (25.4, 29.7)	27.4 (25.2, 29.9)	27.9 (26.1, 29.8)	26.7 (24.9, 28.4)	26.3 (22.9, 30.8)
2	4	27.5 (25.4, 30.8)	29.3 (26.6, 31.8)	29.4 (27.5, 32.2)	29.8 (28.0, 31.9)	28.9 (26.9, 31.2)	30.1 (27.8, 33.9)
2	5	28.0 (26.2, 31.4)	28.7 (26.8, 30.8)	29.2 (27.7, 30.6)	29.6 (27.2, 31.8)	29.9 (27.8, 31.8)	29.6 (25.7, 33.7)
3	1	24.9 (22.4, 28.2)	24.3 (23.1, 25.4)	24.6 (23.4, 25.6)	25.0 (23.4, 26.7)	25.4 (23.2, 27.7)	26.1 (23.7, 28.9)
3	2	23.5 (21.1, 26.6)	26.3 (24.2, 28.6)	26.4 (24.4, 28.4)	26.4 (24.4, 28.4)	26.1 (23.6, 28.8)	26.4 (23.9, 29.3)
3	3	26.2 (22.0, 30.5)	26.5 (24.0, 30.5)	27.1 (25.0, 29.4)	27.1 (25.3, 29.4)	27.1 (24.8, 29.6)	27.8 (25.4, 30.3)
3	4	27.8 (24.5, 32.3)	28.8 (26.4, 32.0)	27.6 (26.3, 29.0)	28.1 (26.7, 29.6)	27.8 (25.3, 29.9)	30.2 (25.6, 33.8)
3	5	28.1 (23.8, 32.4)	29.1 (26.8, 32.1)	28.9 (26.7, 31.7)	28.8 (27.0, 30.8)	28.3 (25.5, 30.7)	29.0 (26.1, 31.8)
4	1	23.5 (20.1, 29.0)	23.9 (22.2, 26.3)	24.6 (23.1, 26.4)	25.2 (23.6, 26.8)	24.7 (23.1, 26.2)	25.1 (22.1, 28.3)
4	2	24.4 (21.8, 27.9)	25.7 (23.2, 28.8)	25.6 (23.3, 28.2)	26.1 (23.9, 28.5)	25.9 (23.6, 28.0)	26.8 (23.2, 29.9)
4	3	24.6 (22.3, 26.5)	25.9 (23.9, 27.6)	26.7 (25.1, 28.0)	27.1 (25.6, 28.7)	26.6 (24.8, 28.5)	26.8 (24.5, 29.1)
4	4	26.7 (21.6, 35.5)	26.8 (24.9, 30.1)	27.2 (25.0, 29.7)	28.0 (26.7, 29.2)	28.1 (25.9, 29.8)	28.0 (25.3, 30.3)
4	5	26.8 (25.2, 28.8)	27.4 (25.4, 29.9)	27.5 (25.2, 30.5)	27.1 (25.1, 29.4)	27.4 (25.7, 29.7)	25.6 (21.5, 33.1)
5	1	22.3 (18.1, 26.7)	24.2 (21.8, 26.7)	23.6 (22.3, 24.8)	24.2 (22.9, 25.1)	24.6 (22.9, 26.5)	26.1 (23.2, 30.2)
5	2	26.4 (21.4, 32.9)	25.1 (21.9, 28.8)	25.0 (22.7, 27.6)	24.9 (22.8, 27.1)	25.2 (23.1, 27.4)	25.2 (23.4, 27.5)
5	3	NA	24.4 (22.8, 26.1)	25.1 (23.7, 26.6)	25.5 (24.3, 26.9)	26.6 (25.3, 27.9)	26.2 (23.3, 29.0)
5	4	25.4 (22.4, 27.4)	26.1 (24.0, 28.2)	26.2 (24.4, 28.2)	26.8 (24.9, 28.9)	26.4 (24.9, 27.8)	26.2 (23.4, 30.1)
5	5	24.6 (20.8, 28.0)	25.4 (23.6, 27.0)	26.5 (24.4, 28.4)	27.1 (25.0, 29.1)	27.0 (24.7, 29.5)	27.2 (24.5, 31.2)

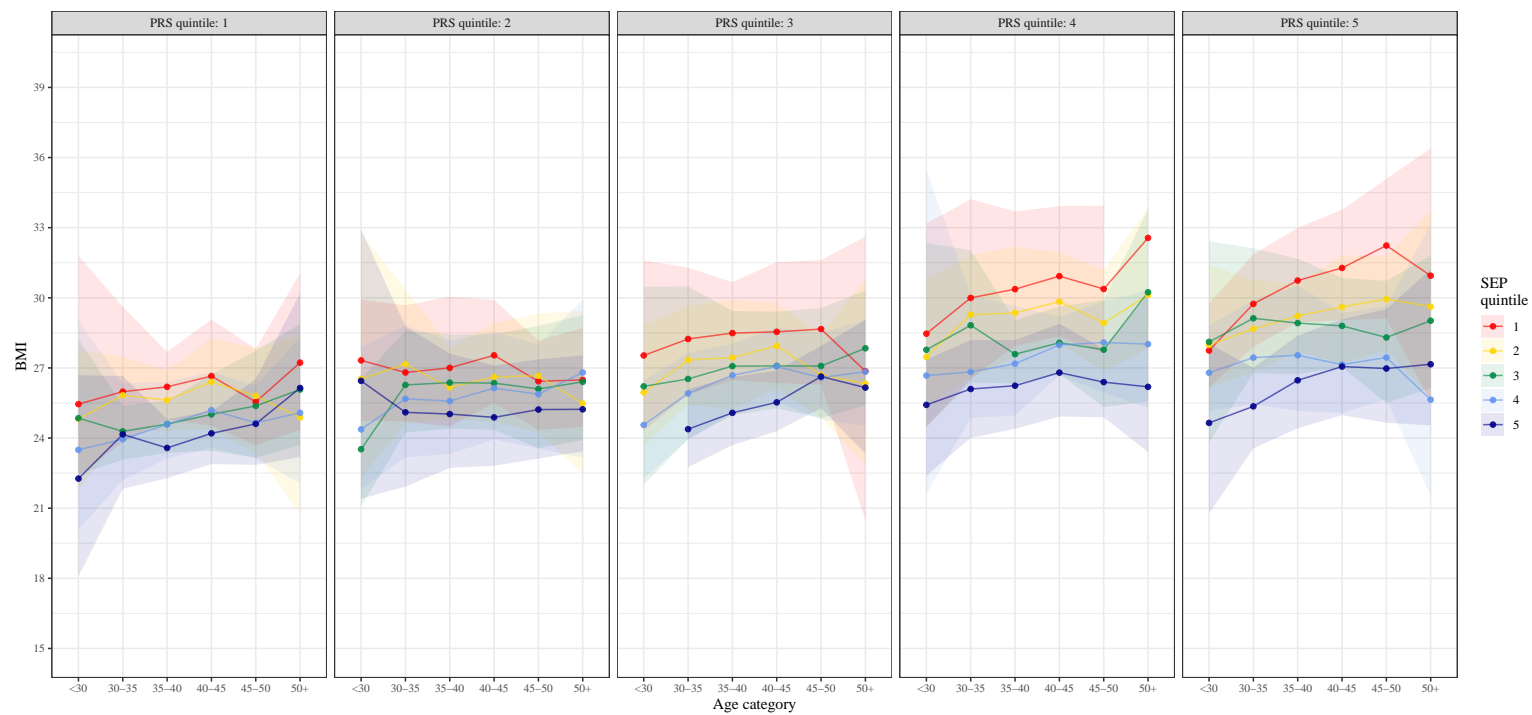


Figure 8: Estimated BMI (95% CI) across adulthood by family disadvantage (SEP) quintile (1=most, 5=least disadvantage), stratified by PRS quintile (1=lowest, 5=highest risk)

3.3 Marginal SEIFA and SEP Figures

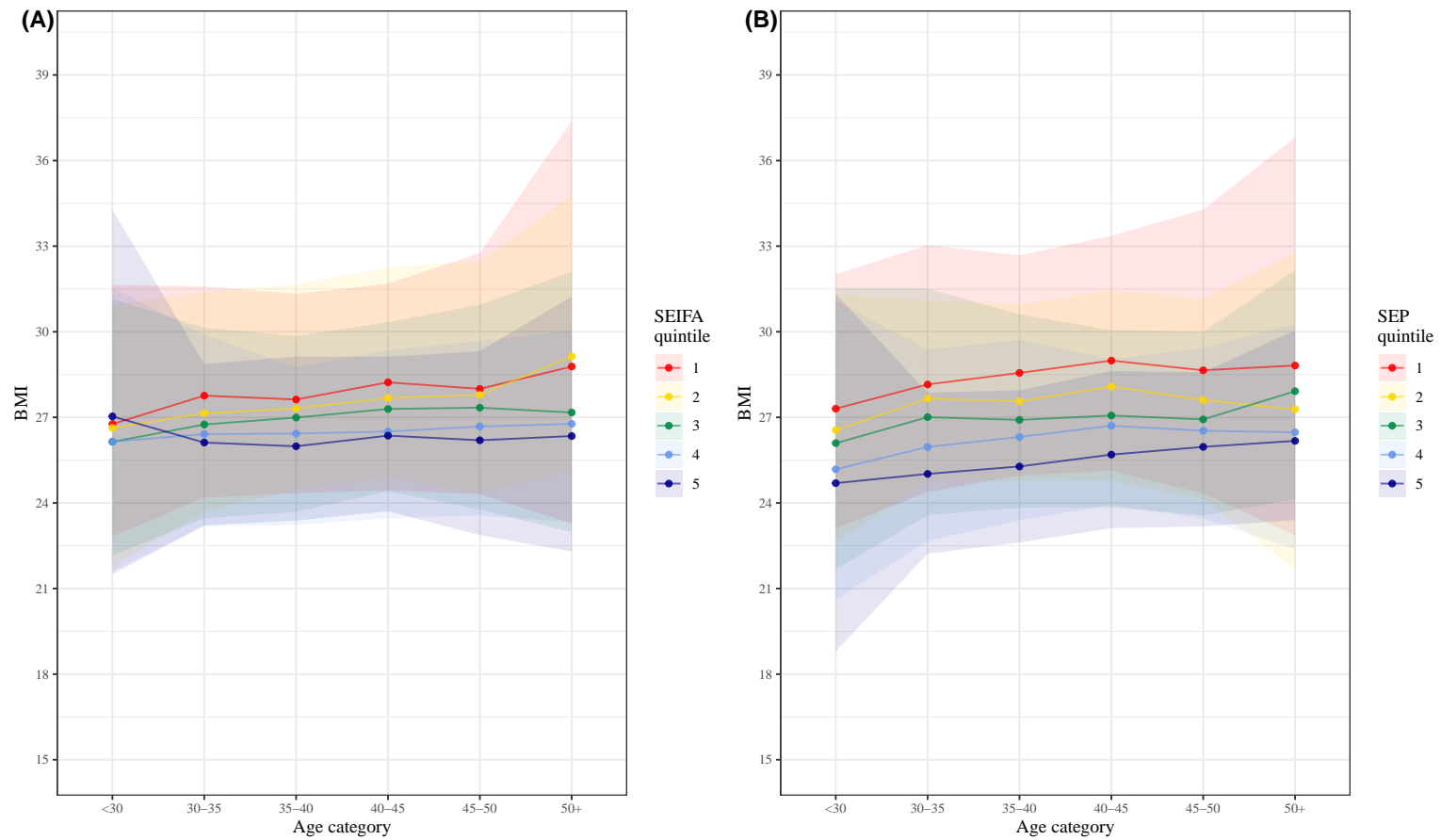


Figure 9: Association of SEIFA neighbourhood disadvantage (Panel A) and SEP family disadvantage (Panel B) with BMI across adulthood. In all cases quintile 1 represents the most disadvantage.

4 Adult data: Probability of overweight/obese models

4.1 SEIFA predictor

4.1.1 Model details

```
print_mod_text("res/mod_adu_ovo_sei.txt")
```

logistic mixed model (estimated using REML and nlminb optimizer) to predict ovo with waveC, sex, age_cat, sei and prs (formula: `ovo ~ waveC + sex + (age_cat + sei + prs)^2`). The model included waveC as random effects (formula: `list(~1 + waveC | hcid, ~1 | personid)`).

The model's total explanatory power is substantial (conditional R2 = 0.91) and the part related to the fixed effects alone (marginal R2) is of 0.07

Conditional model:

Groups	Name	Std.Dev.	Corr
hcid	(Intercept)	3.2539	
	waveC	0.5533	0.650
personid	(Intercept)	4.1629	

The model's intercept, corresponding to waveC = 0, sex = 0, age_cat = <30, sei = 1 and prs = 1, is at 0.94 (95% CI [-0.38, 2.26], p = 0.163).

Parameter	Coefficient	95% CI	z	Fit
(Intercept)	0.94	[-0.38, 2.26]	1.39	
waveC	0.41	[0.33, 0.50]	9.66	
sex	-2.28	[-2.73, -1.83]	-9.93	
age cat [30-35]	-0.11	[-1.14, 0.92]	-0.21	
age cat [35-40]	-0.08	[-1.21, 1.04]	-0.15	

age cat [40-45]		-0.36	[-1.59, 0.87]		-0.57	
age cat [45-50]		-0.30	[-1.68, 1.08]		-0.42	
age cat [50+]		0.04	[-1.74, 1.83]		0.05	
sei [2]		0.19	[-0.91, 1.29]		0.35	
sei [3]		0.44	[-0.80, 1.68]		0.69	
sei [4]		0.74	[-0.54, 2.02]		1.13	
sei [5]		0.14	[-1.44, 1.72]		0.18	
prs [2]		0.94	[-0.60, 2.49]		1.20	
prs [3]		0.70	[-0.89, 2.28]		0.86	
prs [4]		2.28	[0.72, 3.84]		2.86	
prs [5]		3.32	[1.78, 4.87]		4.22	
age cat [30-35] × sei [2]		0.28	[-0.74, 1.30]		0.54	
age cat [35-40] × sei [2]		0.23	[-0.79, 1.26]		0.45	
age cat [40-45] × sei [2]		0.07	[-1.00, 1.14]		0.12	
age cat [45-50] × sei [2]		0.04	[-1.13, 1.20]		0.06	
age cat [50+] × sei [2]		-0.32	[-1.98, 1.34]		-0.37	
age cat [30-35] × sei [3]		-0.09	[-1.21, 1.03]		-0.16	
age cat [35-40] × sei [3]		-0.04	[-1.17, 1.09]		-0.07	
age cat [40-45] × sei [3]		-0.18	[-1.35, 1.00]		-0.30	
age cat [45-50] × sei [3]		-0.63	[-1.91, 0.65]		-0.97	
age cat [50+] × sei [3]		-0.87	[-2.55, 0.80]		-1.02	
age cat [30-35] × sei [4]		-0.79	[-1.95, 0.37]		-1.33	
age cat [35-40] × sei [4]		-0.55	[-1.72, 0.62]		-0.92	
age cat [40-45] × sei [4]		-0.47	[-1.67, 0.74]		-0.76	
age cat [45-50] × sei [4]		-0.56	[-1.87, 0.74]		-0.85	
age cat [50+] × sei [4]		-0.72	[-2.42, 0.98]		-0.83	
age cat [30-35] × sei [5]		0.19	[-1.19, 1.57]		0.27	
age cat [35-40] × sei [5]		0.03	[-1.36, 1.43]		0.05	
age cat [40-45] × sei [5]		-0.31	[-1.75, 1.12]		-0.43	
age cat [45-50] × sei [5]		-0.38	[-1.90, 1.14]		-0.49	
age cat [50+] × sei [5]		-0.34	[-2.23, 1.56]		-0.35	
age cat [30-35] × prs [2]		0.49	[-0.74, 1.72]		0.78	
age cat [35-40] × prs [2]		-0.03	[-1.33, 1.27]		-0.04	
age cat [40-45] × prs [2]		0.19	[-1.18, 1.56]		0.27	

age cat [45-50] × prs [2]		-0.14		[-1.60, 1.33]		-0.18	
age cat [50+] × prs [2]		-0.35		[-2.14, 1.43]		-0.39	
age cat [30-35] × prs [3]		0.74		[-0.54, 2.02]		1.13	
age cat [35-40] × prs [3]		0.68		[-0.68, 2.03]		0.98	
age cat [40-45] × prs [3]		0.92		[-0.50, 2.34]		1.26	
age cat [45-50] × prs [3]		1.58		[0.05, 3.11]		2.03	
age cat [50+] × prs [3]		1.44		[-0.42, 3.30]		1.51	
age cat [30-35] × prs [4]		0.87		[-0.40, 2.14]		1.34	
age cat [35-40] × prs [4]		0.53		[-0.81, 1.88]		0.78	
age cat [40-45] × prs [4]		0.71		[-0.71, 2.13]		0.98	
age cat [45-50] × prs [4]		0.18		[-1.35, 1.71]		0.24	
age cat [50+] × prs [4]		0.89		[-1.06, 2.84]		0.90	
age cat [30-35] × prs [5]		-0.22		[-1.44, 1.00]		-0.35	
age cat [35-40] × prs [5]		-0.35		[-1.67, 0.96]		-0.53	
age cat [40-45] × prs [5]		0.07		[-1.33, 1.46]		0.10	
age cat [45-50] × prs [5]		-0.22		[-1.73, 1.29]		-0.28	
age cat [50+] × prs [5]		-0.70		[-2.57, 1.17]		-0.73	
sei [2] × prs [2]		-0.45		[-1.41, 0.51]		-0.91	
sei [3] × prs [2]		-0.33		[-1.35, 0.68]		-0.64	
sei [4] × prs [2]		-0.27		[-1.39, 0.86]		-0.47	
sei [5] × prs [2]		-0.19		[-1.45, 1.06]		-0.30	
sei [2] × prs [3]		-0.33		[-1.27, 0.61]		-0.68	
sei [3] × prs [3]		0.11		[-0.89, 1.11]		0.22	
sei [4] × prs [3]		3.34e-03		[-1.08, 1.09]		6.05e-03	
sei [5] × prs [3]		-0.17		[-1.46, 1.13]		-0.25	
sei [2] × prs [4]		-0.45		[-1.47, 0.56]		-0.87	
sei [3] × prs [4]		-0.54		[-1.64, 0.56]		-0.96	
sei [4] × prs [4]		-0.78		[-1.95, 0.38]		-1.32	
sei [5] × prs [4]		-1.17		[-2.45, 0.11]		-1.79	
sei [2] × prs [5]		-0.64		[-1.64, 0.37]		-1.24	
sei [3] × prs [5]		-0.77		[-1.85, 0.31]		-1.41	
sei [4] × prs [5]		-0.86		[-2.00, 0.29]		-1.47	
sei [5] × prs [5]		-0.92		[-2.25, 0.41]		-1.35	
AICc						10946.00	

R2 (conditional)					0.91
R2 (marginal)					0.07
Sigma					1.00
Log_loss					0.14

Analysis of Deviance Table (Type III Wald chisquare tests)

Response: ovo

	Chisq	Df	Pr(>Chisq)
(Intercept)	1.9444	1	0.1631882
waveC	93.3288	1	< 2.2e-16 ***
sex	98.5484	1	< 2.2e-16 ***
age_cat	1.1500	5	0.9495836
sei	1.4836	4	0.8295363
prs	22.7287	4	0.0001434 ***
age_cat:sei	9.9731	20	0.9686572
age_cat:prs	22.7022	20	0.3036536
sei:prs	8.6296	16	0.9278803

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

4.1.2 Table and figure by PRS

Table 7: Estimated probability of overweight/obese (95% CI) across adulthood by neighbourhood disadvantage (SEIFA) quintile (1=most, 5=least disadvantage), stratified by PRS quintile (1=lowest, 5=highest risk)

sei	prs	<30	30-35	35-40	40-45	45-50	50+
1	1	0.36 (0.05, 0.66)	0.46 (0.29, 0.69)	0.47 (0.31, 0.68)	0.47 (0.30, 0.68)	0.52 (0.30, 0.80)	0.62 (0.16, 0.92)
1	2	0.48 (0.13, 0.89)	0.48 (0.27, 0.74)	0.45 (0.28, 0.65)	0.52 (0.32, 0.77)	0.61 (0.40, 0.83)	0.71 (0.29, 0.99)
1	3	0.50 (0.11, 0.89)	0.64 (0.44, 0.89)	0.65 (0.50, 0.85)	0.75 (0.57, 0.93)	0.70 (0.43, 0.93)	0.85 (0.50, 1.00)
1	4	0.57 (0.09, 0.95)	0.75 (0.56, 0.98)	0.70 (0.54, 0.88)	0.76 (0.61, 0.91)	0.77 (0.53, 0.97)	0.91 (0.56, 1.00)

sei	prs	<30	30-35	35-40	40-45	45-50	50+
1	5	0.85 (0.58, 1.00)	0.76 (0.61, 0.92)	0.83 (0.64, 0.98)	0.83 (0.61, 0.98)	0.79 (0.59, 0.96)	0.82 (0.52, 1.00)
2	1	0.23 (0.00, 0.64)	0.40 (0.23, 0.59)	0.46 (0.27, 0.68)	0.50 (0.34, 0.69)	0.56 (0.31, 0.81)	0.70 (0.40, 1.00)
2	2	0.54 (0.18, 0.97)	0.65 (0.33, 0.98)	0.60 (0.40, 0.83)	0.59 (0.45, 0.75)	0.55 (0.35, 0.72)	0.63 (0.28, 0.98)
2	3	0.70 (0.30, 0.99)	0.53 (0.31, 0.77)	0.57 (0.39, 0.78)	0.55 (0.39, 0.73)	0.57 (0.34, 0.77)	0.64 (0.27, 0.96)
2	4	0.68 (0.41, 0.97)	0.78 (0.55, 1.00)	0.74 (0.57, 0.90)	0.71 (0.58, 0.88)	0.68 (0.48, 0.88)	0.69 (0.41, 0.96)
2	5	0.82 (0.51, 1.00)	0.70 (0.44, 0.96)	0.72 (0.51, 0.93)	0.78 (0.56, 0.97)	0.78 (0.50, 0.98)	0.87 (0.49, 1.00)
3	1	0.54 (0.07, 0.99)	0.45 (0.21, 0.71)	0.44 (0.21, 0.71)	0.54 (0.29, 0.80)	0.50 (0.23, 0.79)	0.54 (0.11, 0.87)
3	2	0.37 (0.01, 0.99)	0.57 (0.32, 0.88)	0.61 (0.32, 0.93)	0.53 (0.39, 0.76)	0.50 (0.28, 0.77)	0.46 (0.22, 0.74)
3	3	0.46 (0.04, 0.98)	0.55 (0.29, 0.89)	0.63 (0.38, 0.88)	0.65 (0.44, 0.87)	0.61 (0.39, 0.83)	0.61 (0.30, 0.90)
3	4	0.79 (0.40, 0.99)	0.76 (0.58, 0.94)	0.73 (0.53, 0.92)	0.78 (0.52, 0.97)	0.74 (0.47, 0.97)	0.70 (0.32, 0.99)
3	5	0.76 (0.48, 0.98)	0.72 (0.41, 0.96)	0.75 (0.52, 0.96)	0.73 (0.50, 0.93)	0.79 (0.56, 0.98)	0.68 (0.26, 0.99)
4	1	0.45 (0.01, 0.94)	0.35 (0.14, 0.69)	0.35 (0.19, 0.56)	0.39 (0.21, 0.63)	0.39 (0.19, 0.64)	0.49 (0.14, 0.92)
4	2	0.64 (0.01, 0.99)	0.57 (0.25, 0.97)	0.61 (0.34, 0.91)	0.55 (0.24, 0.89)	0.51 (0.24, 0.78)	0.47 (0.17, 0.82)
4	3	0.56 (0.15, 1.00)	0.55 (0.28, 0.89)	0.59 (0.42, 0.79)	0.62 (0.43, 0.84)	0.67 (0.50, 0.88)	0.79 (0.41, 1.00)
4	4	0.76 (0.27, 1.00)	0.66 (0.45, 0.91)	0.74 (0.51, 0.95)	0.73 (0.50, 0.94)	0.62 (0.30, 0.91)	0.78 (0.45, 0.97)
4	5	0.68 (0.17, 1.00)	0.63 (0.43, 0.88)	0.67 (0.43, 0.91)	0.67 (0.41, 0.91)	0.70 (0.46, 0.93)	0.70 (0.43, 0.91)
5	1	0.73 (0.02, 0.99)	0.44 (0.21, 0.77)	0.39 (0.24, 0.58)	0.34 (0.20, 0.52)	0.35 (0.16, 0.59)	0.40 (0.07, 0.78)
5	2	0.59 (0.04, 0.99)	0.56 (0.14, 0.95)	0.52 (0.19, 0.90)	0.53 (0.21, 0.88)	0.55 (0.23, 0.86)	0.57 (0.23, 0.86)
5	3	0.38 (0.00, 0.87)	0.60 (0.39, 0.82)	0.57 (0.34, 0.82)	0.60 (0.41, 0.80)	0.66 (0.42, 0.92)	0.58 (0.19, 1.00)
5	4	0.63 (0.01, 0.99)	0.55 (0.32, 0.84)	0.58 (0.31, 0.90)	0.61 (0.35, 0.88)	0.63 (0.33, 0.90)	0.72 (0.39, 0.98)
5	5	0.77 (0.36, 0.99)	0.68 (0.40, 0.97)	0.65 (0.40, 0.93)	0.65 (0.47, 0.86)	0.56 (0.35, 0.84)	0.48 (0.19, 0.81)

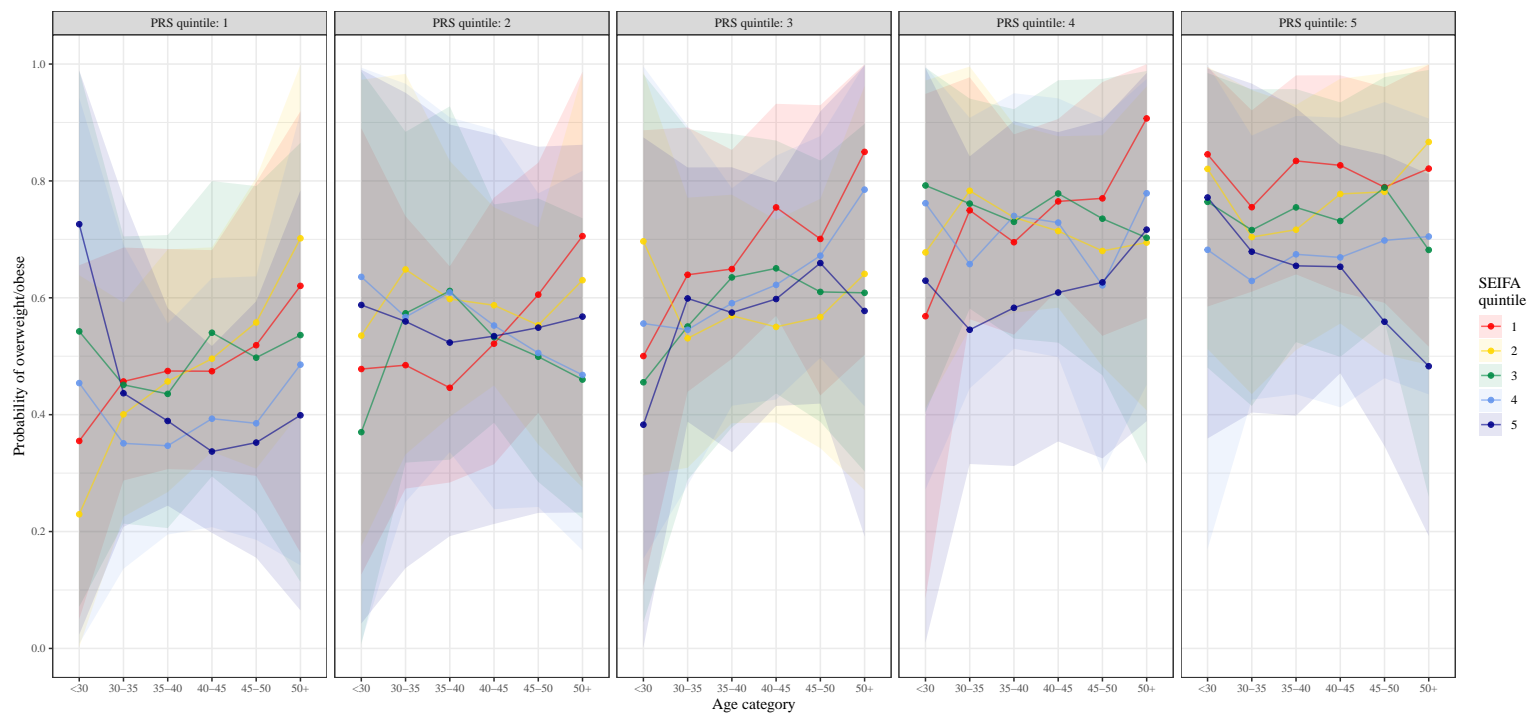


Figure 10: Estimated probability of overweight/obese (95% CI) across adulthood by neighbourhood disadvantage (SEIFA) quintile (1=most, 5=least disadvantage), stratified by PRS quintile (1=lowest, 5=highest risk)

4.2 SEP predictor

4.2.1 Model details

```
print_mod_text("res/mod_adu_ovo_sep.txt")
```

logistic mixed model (estimated using REML and nlminb optimizer) to predict ovo with waveC, sex, age_cat, sep and prs (formula: `ovo ~ waveC + sex + (age_cat + sep + prs)^2`). The model included waveC as random effects (formula: `list(~1 + waveC | hcid, ~1 | personid)`).

The model's total explanatory power is substantial (conditional R² = 0.90) and the part related to the fixed effects alone (marginal R²) is of 0.08

Conditional model:

Groups	Name	Std.Dev.	Corr
hcid	(Intercept)	3.1786	
	waveC	0.5447	0.652
personid	(Intercept)	4.1260	

The model's intercept, corresponding to waveC = 0, sex = 0, age_cat = <30, sep = 1 and prs = 1, is at 1.24 (95% CI [-9.51e-03, 2.50], p = 0.052).

Parameter	Coefficient	95% CI	z	Fit
(Intercept)	1.24	[-0.01, 2.50]	1.95	
waveC	0.41	[0.33, 0.49]	9.62	
sex	-2.30	[-2.74, -1.85]	-10.07	
age cat [30-35]	-0.09	[-1.08, 0.89]	-0.19	
age cat [35-40]	-0.03	[-1.11, 1.04]	-0.06	

age cat [40-45]		-0.14	[-1.34, 1.06]	-0.23	
age cat [45-50]		-0.61	[-1.95, 0.74]	-0.88	
age cat [50+]		-0.92	[-2.64, 0.80]	-1.05	
sep [2]		0.17	[-0.91, 1.26]	0.31	
sep [3]		0.40	[-0.81, 1.61]	0.65	
sep [4]		0.30	[-1.11, 1.70]	0.41	
sep [5]		-0.79	[-2.92, 1.34]	-0.73	
prs [2]		0.50	[-0.99, 1.99]	0.66	
prs [3]		0.20	[-1.35, 1.75]	0.26	
prs [4]		1.72	[0.19, 3.26]	2.20	
prs [5]		2.95	[1.42, 4.49]	3.77	
age cat [30-35] × sep [2]		0.19	[-0.81, 1.20]	0.38	
age cat [35-40] × sep [2]		-0.22	[-1.23, 0.78]	-0.44	
age cat [40-45] × sep [2]		-0.32	[-1.37, 0.73]	-0.60	
age cat [45-50] × sep [2]		-0.03	[-1.16, 1.11]	-0.05	
age cat [50+] × sep [2]		0.33	[-1.12, 1.78]	0.45	
age cat [30-35] × sep [3]		-0.23	[-1.32, 0.85]	-0.42	
age cat [35-40] × sep [3]		-0.17	[-1.27, 0.94]	-0.30	
age cat [40-45] × sep [3]		-0.82	[-1.97, 0.33]	-1.40	
age cat [45-50] × sep [3]		-0.10	[-1.35, 1.15]	-0.16	
age cat [50+] × sep [3]		0.83	[-0.78, 2.43]	1.01	
age cat [30-35] × sep [4]		-0.85	[-2.06, 0.35]	-1.39	
age cat [35-40] × sep [4]		-0.75	[-1.99, 0.49]	-1.19	
age cat [40-45] × sep [4]		-0.69	[-1.98, 0.60]	-1.05	
age cat [45-50] × sep [4]		-0.32	[-1.70, 1.06]	-0.46	
age cat [50+] × sep [4]		0.34	[-1.39, 2.07]	0.38	
age cat [30-35] × sep [5]		0.30	[-1.64, 2.24]	0.31	
age cat [35-40] × sep [5]		0.66	[-1.30, 2.63]	0.66	
age cat [40-45] × sep [5]		-0.03	[-2.04, 1.97]	-0.03	
age cat [45-50] × sep [5]		0.45	[-1.62, 2.52]	0.42	
age cat [50+] × sep [5]		0.82	[-1.47, 3.12]	0.70	
age cat [30-35] × prs [2]		0.65	[-0.56, 1.87]	1.05	
age cat [35-40] × prs [2]		0.12	[-1.17, 1.40]	0.18	
age cat [40-45] × prs [2]		0.38	[-0.98, 1.74]	0.55	

age cat [45-50] × prs [2]		0.01		[-1.44, 1.46]		0.02	
age cat [50+] × prs [2]		-0.14		[-1.90, 1.63]		-0.15	
age cat [30-35] × prs [3]		0.82		[-0.46, 2.09]		1.25	
age cat [35-40] × prs [3]		0.79		[-0.56, 2.14]		1.15	
age cat [40-45] × prs [3]		1.04		[-0.38, 2.46]		1.44	
age cat [45-50] × prs [3]		1.68		[0.15, 3.21]		2.16	
age cat [50+] × prs [3]		1.67		[-0.20, 3.53]		1.75	
age cat [30-35] × prs [4]		0.87		[-0.39, 2.14]		1.35	
age cat [35-40] × prs [4]		0.51		[-0.83, 1.85]		0.74	
age cat [40-45] × prs [4]		0.71		[-0.70, 2.13]		0.99	
age cat [45-50] × prs [4]		0.16		[-1.37, 1.68]		0.20	
age cat [50+] × prs [4]		1.08		[-0.86, 3.02]		1.09	
age cat [30-35] × prs [5]		-0.15		[-1.38, 1.08]		-0.25	
age cat [35-40] × prs [5]		-0.28		[-1.60, 1.05]		-0.41	
age cat [40-45] × prs [5]		0.12		[-1.29, 1.52]		0.16	
age cat [45-50] × prs [5]		-0.18		[-1.70, 1.34]		-0.23	
age cat [50+] × prs [5]		-0.68		[-2.55, 1.18]		-0.72	
sep [2] × prs [2]		0.27		[-0.60, 1.13]		0.61	
sep [3] × prs [2]		-0.20		[-1.25, 0.84]		-0.38	
sep [4] × prs [2]		-0.06		[-1.23, 1.10]		-0.10	
sep [5] × prs [2]		0.06		[-1.28, 1.40]		0.09	
sep [2] × prs [3]		0.13		[-0.80, 1.06]		0.27	
sep [3] × prs [3]		0.23		[-0.87, 1.33]		0.41	
sep [4] × prs [3]		0.60		[-0.62, 1.81]		0.96	
sep [5] × prs [3]		0.50		[-0.86, 1.86]		0.72	
sep [2] × prs [4]		-0.26		[-1.24, 0.73]		-0.51	
sep [3] × prs [4]		9.08e-03		[-1.12, 1.14]		0.02	
sep [4] × prs [4]		0.05		[-1.21, 1.31]		0.08	
sep [5] × prs [4]		-0.08		[-1.50, 1.33]		-0.11	
sep [2] × prs [5]		-0.02		[-1.02, 0.98]		-0.05	
sep [3] × prs [5]		-0.72		[-1.87, 0.43]		-1.22	
sep [4] × prs [5]		-0.50		[-1.78, 0.77]		-0.78	
sep [5] × prs [5]		-0.66		[-2.11, 0.78]		-0.90	
AICc						10905.59	

R2 (conditional)					0.90
R2 (marginal)					0.08
Sigma					1.00
Log_loss					0.14

Analysis of Deviance Table (Type III Wald chisquare tests)

Response: ovo

	Chisq	Df	Pr(>Chisq)
(Intercept)	3.7834	1	0.0517629 .
waveC	92.5672	1	< 2.2e-16 ***
sex	101.4150	1	< 2.2e-16 ***
age_cat	2.5453	5	0.7696644
sep	1.4636	4	0.8330665
prs	19.4993	4	0.0006269 ***
age_cat:sep	22.7124	20	0.3031340
age_cat:prs	24.4162	20	0.2246829
sep:prs	8.5696	16	0.9300766

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

4.2.2 Table and figure by PRS

Table 8: Estimated probability of overweight/obese (95% CI) across adulthood by family disadvantage (SEP) quintile (1=most, 5=least disadvantage), stratified by PRS quintile (1=lowest, 5=highest risk)

sep	prs	<30	30-35	35-40	40-45	45-50	50+
1	1	0.43 (0.14, 0.92)	0.49 (0.30, 0.79)	0.55 (0.39, 0.80)	0.56 (0.32, 0.72)	0.44 (0.21, 0.66)	0.62 (0.19, 0.94)
1	2	0.69 (0.35, 0.98)	0.66 (0.39, 0.97)	0.63 (0.35, 0.98)	0.69 (0.43, 0.95)	0.54 (0.29, 0.75)	0.57 (0.30, 0.81)
1	3	0.63 (0.29, 0.98)	0.63 (0.42, 0.89)	0.65 (0.49, 0.83)	0.71 (0.50, 0.95)	0.71 (0.49, 0.99)	0.53 (0.11, 1.00)
1	4	0.69 (0.38, 0.98)	0.80 (0.59, 0.93)	0.81 (0.67, 0.94)	0.85 (0.68, 0.98)	0.78 (0.54, 0.97)	0.80 (0.40, 1.00)

sep	prs	<30	30-35	35-40	40-45	45-50	50+
1	5	0.85 (0.57, 1.00)	0.82 (0.61, 0.99)	0.87 (0.69, 0.99)	0.88 (0.68, 1.00)	0.83 (0.61, 1.00)	0.70 (0.20, 1.00)
2	1	0.42 (0.14, 0.69)	0.53 (0.33, 0.78)	0.49 (0.32, 0.71)	0.55 (0.30, 0.81)	0.51 (0.26, 0.76)	0.44 (0.02, 0.84)
2	2	0.51 (0.10, 0.98)	0.71 (0.42, 0.99)	0.59 (0.40, 0.82)	0.63 (0.41, 0.87)	0.61 (0.37, 0.86)	0.50 (0.24, 0.79)
2	3	0.47 (0.19, 0.94)	0.69 (0.40, 0.94)	0.66 (0.41, 0.92)	0.69 (0.48, 0.89)	0.62 (0.37, 0.87)	0.60 (0.21, 1.00)
2	4	0.71 (0.29, 0.99)	0.77 (0.52, 0.99)	0.73 (0.59, 0.88)	0.74 (0.57, 0.91)	0.73 (0.47, 0.94)	0.93 (0.75, 1.00)
2	5	0.80 (0.53, 1.00)	0.74 (0.49, 0.96)	0.78 (0.57, 0.96)	0.77 (0.56, 0.97)	0.82 (0.61, 0.99)	0.73 (0.39, 0.97)
3	1	0.44 (0.11, 0.81)	0.40 (0.21, 0.65)	0.42 (0.24, 0.63)	0.43 (0.23, 0.67)	0.52 (0.21, 0.85)	0.56 (0.20, 0.89)
3	2	0.20 (0.00, 0.58)	0.56 (0.32, 0.83)	0.60 (0.34, 0.89)	0.54 (0.30, 0.84)	0.60 (0.27, 0.92)	0.65 (0.27, 0.94)
3	3	0.65 (0.16, 0.99)	0.53 (0.27, 0.80)	0.63 (0.41, 0.88)	0.62 (0.40, 0.85)	0.63 (0.40, 0.86)	0.82 (0.52, 1.00)
3	4	0.74 (0.38, 0.99)	0.79 (0.56, 0.99)	0.71 (0.50, 0.94)	0.72 (0.52, 0.92)	0.69 (0.34, 0.98)	0.81 (0.35, 1.00)
3	5	0.73 (0.28, 1.00)	0.77 (0.55, 0.97)	0.76 (0.51, 0.97)	0.71 (0.52, 0.89)	0.68 (0.40, 0.93)	0.72 (0.42, 0.94)
4	1	0.40 (0.01, 1.00)	0.34 (0.13, 0.61)	0.39 (0.18, 0.65)	0.48 (0.26, 0.73)	0.43 (0.25, 0.66)	0.45 (0.10, 0.78)
4	2	0.46 (0.01, 0.99)	0.52 (0.17, 0.93)	0.51 (0.22, 0.84)	0.56 (0.29, 0.84)	0.49 (0.23, 0.75)	0.63 (0.30, 0.88)
4	3	0.40 (0.08, 0.78)	0.52 (0.31, 0.75)	0.60 (0.41, 0.80)	0.66 (0.51, 0.84)	0.62 (0.42, 0.85)	0.67 (0.27, 0.97)
4	4	0.50 (0.01, 1.00)	0.56 (0.33, 0.84)	0.68 (0.36, 0.97)	0.75 (0.52, 0.96)	0.70 (0.42, 0.95)	0.81 (0.55, 0.99)
4	5	0.76 (0.44, 1.00)	0.64 (0.39, 0.92)	0.62 (0.38, 0.89)	0.70 (0.44, 0.93)	0.65 (0.43, 0.92)	0.50 (0.04, 0.94)
5	1	0.24 (0.00, 0.97)	0.33 (0.10, 0.64)	0.30 (0.14, 0.53)	0.29 (0.16, 0.44)	0.35 (0.18, 0.61)	0.50 (0.22, 0.83)
5	2	0.41 (0.00, 0.98)	0.38 (0.12, 0.75)	0.48 (0.17, 0.82)	0.42 (0.20, 0.67)	0.46 (0.22, 0.68)	0.42 (0.14, 0.80)
5	3	NA	0.39 (0.13, 0.65)	0.47 (0.30, 0.67)	0.52 (0.36, 0.71)	0.66 (0.49, 0.85)	0.66 (0.32, 0.94)
5	4	0.40 (0.04, 0.90)	0.55 (0.30, 0.86)	0.57 (0.36, 0.80)	0.57 (0.34, 0.81)	0.52 (0.33, 0.76)	0.55 (0.20, 0.91)
5	5	0.50 (0.00, 0.99)	0.45 (0.23, 0.70)	0.60 (0.35, 0.87)	0.60 (0.37, 0.85)	0.57 (0.30, 0.87)	0.64 (0.19, 0.99)

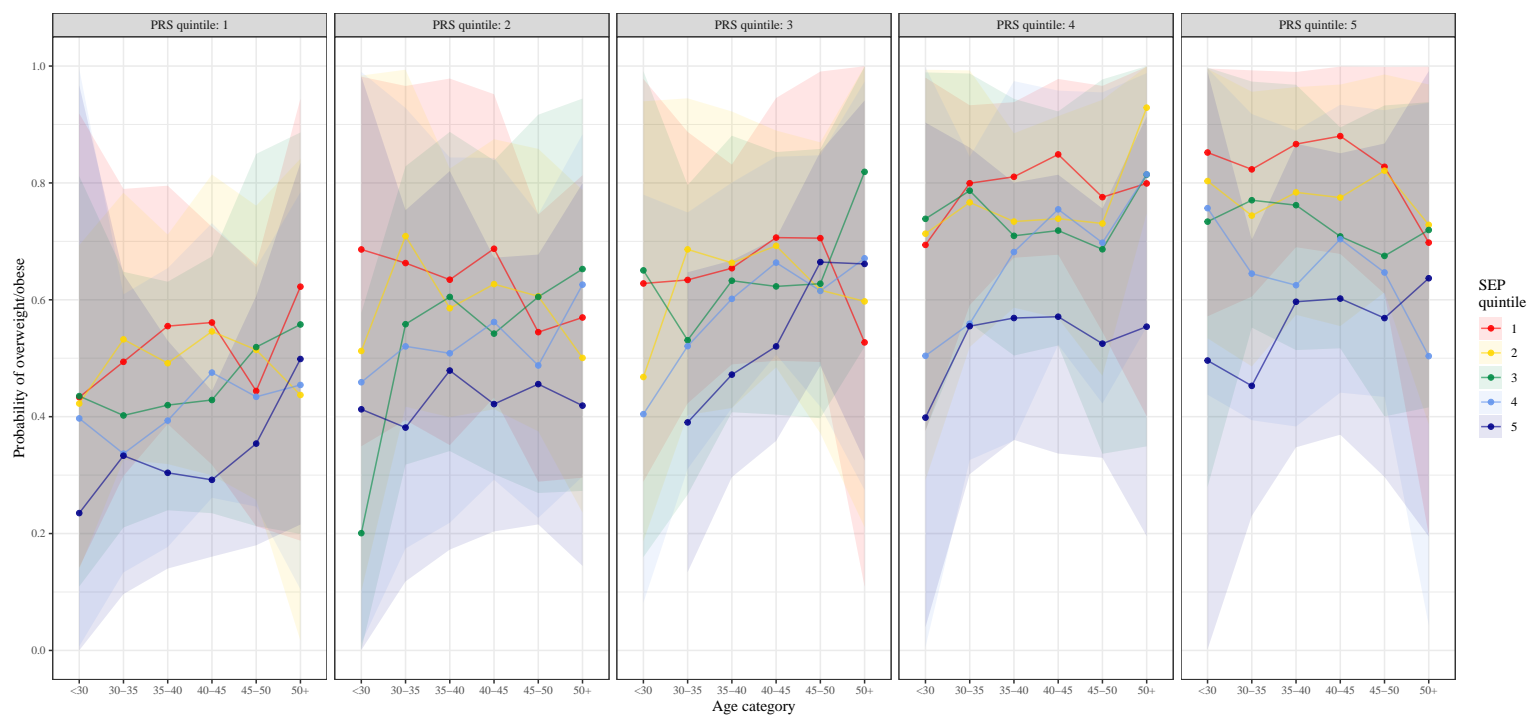


Figure 11: Estimated probability of overweight/obese (95% CI) across adulthood by family disadvantage (SEP) quintile (1=most, 5=least disadvantage), stratified by PRS quintile (1=lowest, 5=highest risk)

4.3 Marginal SEIFA and SEP Figures

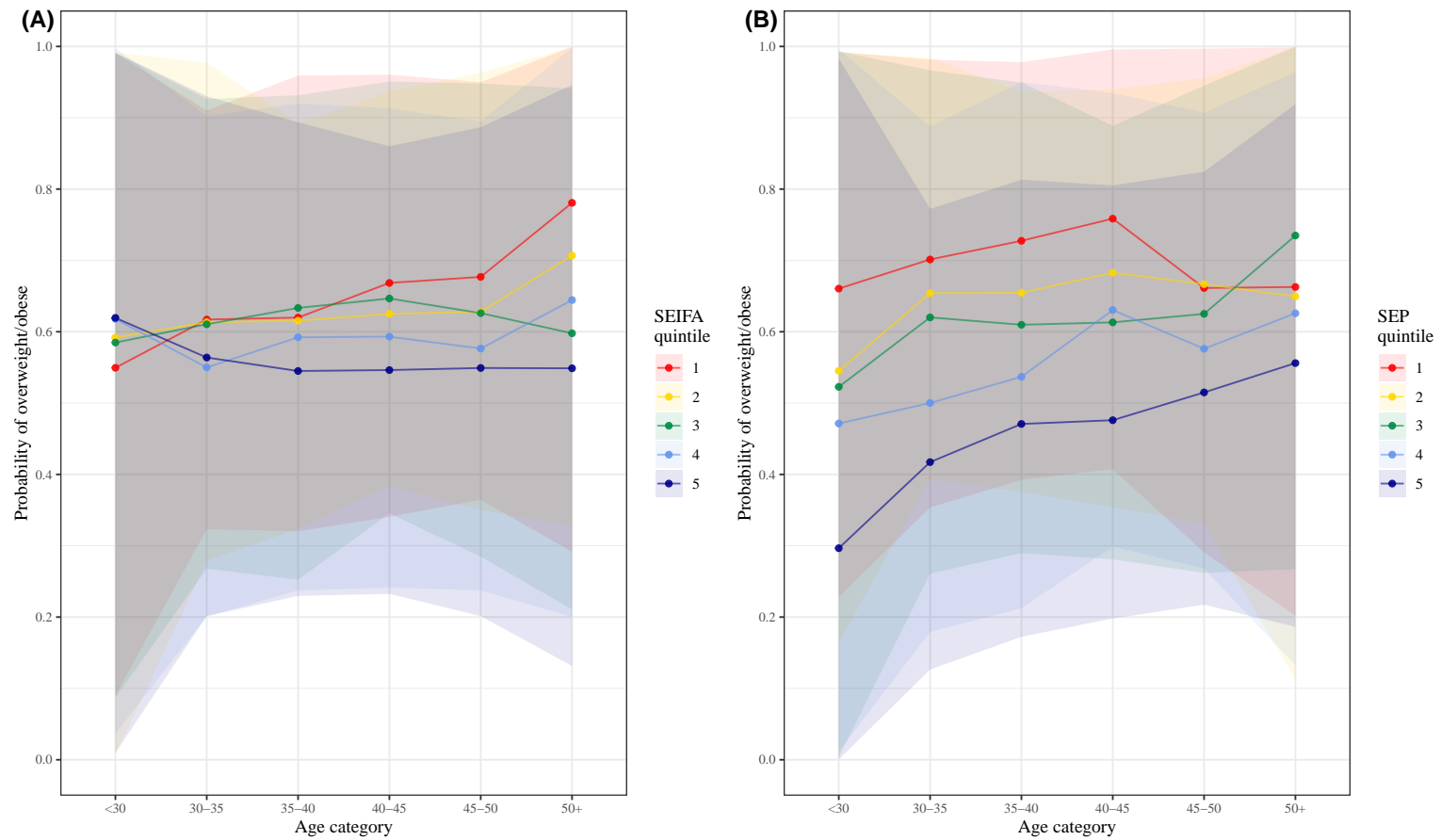


Figure 12: Association of SEIFA neighbourhood disadvantage (Panel A) and SEP family disadvantage (Panel B) with probability of overweight/obese across adulthood. In all cases quintile 1 represents the most disadvantage.

5 Session info

```
format(Sys.time(), '%d-%b-%Y')
```

```
[1] "07-Jun-2023"
```

```
sessionInfo()
```

```
R version 4.2.2 (2022-10-31 ucrt)
Platform: x86_64-w64-mingw32/x64 (64-bit)
Running under: Windows 10 x64 (build 19044)
```

```
Matrix products: default
```

```
locale:
```

```
[1] LC_COLLATE=English_Australia.utf8  LC_CTYPE=English_Australia.utf8
[3] LC_MONETARY=English_Australia.utf8 LC_NUMERIC=C
[5] LC_TIME=English_Australia.utf8
```

```
attached base packages:
```

```
[1] stats      graphics  grDevices  utils      datasets  methods    base
```

```
other attached packages:
```

```
[1] arrow_11.0.0.2 stringi_1.7.12 knitr_1.42      tidyr_1.3.0     ggpubr_0.6.0
[6] ggplot2_3.4.1  forcats_1.0.0  dplyr_1.1.0
```

```
loaded via a namespace (and not attached):
```

```
[1] tidyselect_1.2.0 xfun_0.37      purrr_1.0.1    carData_3.0-5
[5] colorspace_2.1-0 vctrs_0.5.2    generics_0.1.3 htmltools_0.5.4
[9] yaml_2.3.7        utf8_1.2.3     rlang_1.0.6    pillar_1.8.1
```

[13]	glue_1.6.2	withr_2.5.0	bit64_4.0.5	lifecycle_1.0.3
[17]	munsell_0.5.0	ggsignif_0.6.4	gtable_0.3.1	ragg_1.2.5
[21]	evaluate_0.20	labeling_0.4.2	tzdb_0.3.0	fastmap_1.1.0
[25]	fansi_1.0.4	broom_1.0.3	scales_1.2.1	backports_1.4.1
[29]	jsonlite_1.8.4	abind_1.4-5	farver_2.1.1	systemfonts_1.0.4
[33]	bit_4.0.5	textshaping_0.3.6	digest_0.6.31	rstatix_0.7.2
[37]	grid_4.2.2	cowplot_1.1.1	cli_3.6.0	tools_4.2.2
[41]	magrittr_2.0.3	tibble_3.1.8	car_3.1-1	pkgconfig_2.0.3
[45]	assertthat_0.2.1	rmarkdown_2.20	rstudioapi_0.14	R6_2.5.1
[49]	compiler_4.2.2			