

**Table S4.** Predicting patterns of mortality from fecal microbiota during preceding ages using Cox proportional hazard models. Regression coefficients  $\pm$  SEs are given and significant predictions are highlighted in bold font (\*P < 0.05, \*\*P < 0.01, \*\*\*P < 0.001).

Analysis	Age at fecal sampling (weeks)	Age at death (>weeks)			
		2	4	6	8-12
Alpha diversity	1	0.81 $\pm$ 0.14	0.85 $\pm$ 0.13	0.93 $\pm$ 0.17	0.91 $\pm$ 0.27
	2	-	0.79 $\pm$ 0.13	0.91 $\pm$ 0.16	<b>0.57<math>\pm</math>0.25*</b>
	4	-	-	0.91 $\pm$ 0.14	<b>4.02<math>\pm</math>0.59*</b>
	6	-	-	-	0.64 $\pm$ 0.28
Phylogenetic diversity	1	0.92 $\pm$ 0.13	0.94 $\pm$ 0.13	0.97 $\pm$ 0.16	1.05 $\pm$ 0.25
	2	-	1.24 $\pm$ 0.13	<b>1.40<math>\pm</math>0.15*</b>	<b>1.88<math>\pm</math>0.24**</b>
	4	-	-	1.39 $\pm$ 0.18	<b>1.93<math>\pm</math>0.31*</b>
	6	-	-	-	1.27 $\pm$ 0.23
Enterobacteriaceae	1	1.20 $\pm$ 0.15	1.20 $\pm$ 0.15	1.16 $\pm$ 0.19	1.42 $\pm$ 0.32
	2	-	1.04 $\pm$ 0.13	0.93 $\pm$ 0.17	0.60 $\pm$ 0.29
	4	-	-	1.30 $\pm$ 0.15	1.07 $\pm$ 0.25
	6	-	-	-	1.45 $\pm$ 0.27
Peptostreptococcaceae	1	<b>1.72<math>\pm</math>0.13***</b>	<b>1.65<math>\pm</math>0.13***</b>	<b>1.73<math>\pm</math>0.16***</b>	<b>1.72<math>\pm</math>0.26*</b>
	2	-	1.06 $\pm$ 0.13	0.79 $\pm$ 0.19	1.03 $\pm$ 0.30
	4	-	-	1.13 $\pm$ 0.16	0.53 $\pm$ 0.36
	6	-	-	-	1.20 $\pm$ 0.30
Ruminococcaceae	1	0.78 $\pm$ 0.14	0.82 $\pm$ 0.15	0.94 $\pm$ 0.19	1.00 $\pm$ 0.35
	2	-	0.88 $\pm$ 0.14	0.94 $\pm$ 0.17	1.62 $\pm$ 0.36
	4	-	-	1.13 $\pm$ 0.16	1.66 $\pm$ 0.37
	6	-	-	-	1.50 $\pm$ 0.30
Porphyromonadaceae	1	1.08 $\pm$ 0.12	1.14 $\pm$ 0.13	1.10 $\pm$ 0.15	0.97 $\pm$ 0.24
	2	-	0.80 $\pm$ 0.13	0.83 $\pm$ 0.16	0.96 $\pm$ 0.25
	4	-	-	1.15 $\pm$ 0.17	0.80 $\pm$ 0.31
	6	-	-	-	1.41 $\pm$ 0.29
Clostridiaceae	1	0.97 $\pm$ 0.14	0.96 $\pm$ 0.14	0.94 $\pm$ 0.17	0.79 $\pm$ 0.26
	2	-	0.92 $\pm$ 0.14	1.02 $\pm$ 0.16	1.03 $\pm$ 0.30
	4	-	-	0.93 $\pm$ 0.14	1.11 $\pm$ 0.26
	6	-	-	-	0.98 $\pm$ 0.27
Lactobacillaceae	1	1.14 $\pm$ 0.10	1.21 $\pm$ 0.11	1.11 $\pm$ 0.19	1.20 $\pm$ 0.25
	2	-	0.74 $\pm$ 0.14	0.88 $\pm$ 0.17	1.35 $\pm$ 0.27
	4	-	-	0.94 $\pm$ 0.16	0.94 $\pm$ 0.81
	6	-	-	-	1.03 $\pm$ 0.92
Turicibacteraceae	1	0.91 $\pm$ 0.14	0.89 $\pm$ 0.15	0.93 $\pm$ 0.18	1.06 $\pm$ 0.29
	2	-	1.11 $\pm$ 0.14	1.04 $\pm$ 0.17	0.83 $\pm$ 0.31
	4	-	-	0.74 $\pm$ 0.16	1.19 $\pm$ 0.30
	6	-	-	-	0.83 $\pm$ 0.25
S24-7	1	1.22 $\pm$ 0.11	<b>1.24<math>\pm</math>0.11*</b>	<b>1.35<math>\pm</math>0.12*</b>	<b>1.60<math>\pm</math>0.21*</b>
	2	-	0.97 $\pm$ 0.13	0.99 $\pm$ 0.15	0.63 $\pm$ 0.26
	4	-	-	1.17 $\pm$ 0.18	1.29 $\pm$ 0.31
	6	-	-	-	0.99 $\pm$ 0.27
Lachnospiraceae	1	1.04 $\pm$ 0.14	1.06 $\pm$ 0.14	1.12 $\pm$ 0.17	0.92 $\pm$ 0.32
	2	-	1.10 $\pm$ 0.15	0.93 $\pm$ 0.19	0.62 $\pm$ 0.40
	4	-	-	1.00 $\pm$ 0.15	1.38 $\pm$ 0.24
	6	-	-	-	1.46 $\pm$ 0.24