

Supplementary Table 1: Generalized linear regression model (GLM) Predicting Length of Stay

Variables	Coefficients	Std. Err.	p-value	[95% Conf.	Interval]
ISS_1 (FP power 3)*	0.042	0.002	<0.0001	0.039	0.045
ISS_2 (FP power 3)*	-0.019	0.001	<0.0001	-0.021	-0.017
Age					
0 - 5	-0.170	0.063	0.007	-0.295	-0.046
6 - 10	-0.303	0.085	<0.0001	-0.470	-0.137
11 - 15	-0.015	0.067	0.829	-0.147	0.117
16 - 44 (reference)	0.000				
45 - 54	0.071	0.036	0.051	0.000	0.142
55 - 64	0.236	0.033	<0.0001	0.172	0.301
65 - 75	0.384	0.034	<0.0001	0.317	0.450
>75	0.632	0.027	<0.0001	0.579	0.685
Gender					
Female (reference)	0.000				
Male	-0.108	0.023	<0.0001	-0.152	-0.063
Age (by gender interaction)					
0 - 5#Male	0.119	0.079	0.131	-0.035	0.274
6 - 10#Male	0.143	0.101	0.157	-0.055	0.340
11 - 15#Male	-0.220	0.079	0.005	-0.375	-0.065
45 - 54#Male	0.133	0.042	0.001	0.051	0.215
55 - 64#Male	0.082	0.040	0.04	0.004	0.160
65 - 75#Male	0.083	0.042	0.05	0.000	0.166
>75#Male	0.058	0.036	0.101	-0.011	0.128
GCS					
GCS =3	0.808	0.037	<0.0001	0.736	0.880
GCS 4 -5	0.866	0.062	<0.0001	0.744	0.989
GCS 6 -8	0.555	0.038	<0.0001	0.481	0.628
GCS 9 -12	0.348	0.028	<0.0001	0.293	0.403
GCS 13 - 14	0.131	0.017	<0.0001	0.098	0.164
GCS 15 (reference)	0.000				
Intubated	0.451	0.075	<0.0001	0.303	0.598
Comorbidity Index					
0 (minor or None) (reference)	0				
1 - 5	0.156	0.016	<0.0001	0.124	0.189
6 - 10	0.247	0.029	<0.0001	0.191	0.303
>10	0.391	0.039	<0.0001	0.313	0.468
Not recorded	-0.074	0.019	<0.0001	-0.111	-0.038
Time of day/week					
Week day (reference)	0				
Week night	-0.020	0.015	0.175	-0.048	0.009
Weekend day	-0.004	0.019	0.852	-0.041	0.034
Weekend night	-0.031	0.015	0.045	-0.061	-0.001
Constant	2.390	0.022	<0.0001	2.346	2.434

*Fractional polynomials: transformation of ISS into a functional form to correct for non-linearity in the relationship between the continuous variables and outcome.

Supplementary Table 2: Logistic Regression Model Predicting Mortality (Principal Analysis – Weekend versus Weekday)*

Variables	Odds Ratio	Std. Err.	P-value	[95% Conf.	Interval]
ISS_1 (FP power -0.5)	13.62	3.83	<0.0001	7.850753	23.64419
ISS_2 (FP power 0=log)	11.21	1.47	<0.0001	8.674477	14.48415
Age					
0 - 5	0.82	0.24	0.502	0.46	1.46
6 - 10	0.61	0.31	0.338	0.23	1.67
11 - 15	0.47	0.19	0.062	0.21	1.04
16 - 44 (reference)					
45 - 54	1.87	0.32	<0.0001	1.35	2.61
55 - 64	1.77	0.30	0.001	1.26	2.48
65 - 75	4.94	0.70	<0.0001	3.74	6.52
>75	14.24	1.64	<0.0001	11.36	17.85
Gender					
Female (reference)					
Male	0.88	0.09	0.246	0.72	1.09
Age (by gender interaction)					
0 - 5#Male	1.30	0.49	0.489	0.62	2.73
6 - 10#Male	0.81	0.48	0.718	0.25	2.58
11 - 15#Male	2.39	1.10	0.06	0.97	5.91
45 - 54#Male	0.86	0.16	0.423	0.59	1.25
55 - 64#Male	1.58	0.31	0.019	1.08	2.31
65 - 75#Male	1.00	0.17	0.99	0.72	1.39
>75#Male	1.37	0.17	0.011	1.07	1.76
GCS					
GCS =3	55.74	4.00	<0.0001	48.42	64.15
GCS 4 -5	25.26	2.70	<0.0001	20.48	31.14
GCS 6 -8	8.23	0.74	<0.0001	6.90	9.82
GCS 9 -12	4.89	0.39	<0.0001	4.19	5.71
GCS 13 - 14	1.72	0.11	<0.0001	1.52	1.95
GCS 15 (reference)					
Intubated	17.95	2.51	<0.0001	13.65	23.62
Comorbidity Index					
0 (reference)					
1 - 5	1.54	0.09	<0.0001	1.37	1.72
6 - 10	2.30	0.18	<0.0001	1.97	2.69
>10	4.45	0.43	<0.0001	3.69	5.37
Not recorded	2.16	0.14	<0.0001	1.91	2.44
Time of day/week					
Week day (reference)	1.00				
Week night	1.02	0.06	0.727	0.92	1.13
Weekend day	0.97	0.07	0.644	0.84	1.11
Weekend night	0.92	0.05	0.157	0.82	1.03
Constant	0.01	0.00	<0.0001	0.00	0.01

*AUC 0.924

Supplementary Table 3: Mixed Effect Model (with Random Intercept) Predicting Mortality*

Variables	Odds Ratio	Std. Err.	P-value	[95% Conf.	Interval]
ISS_1 (FP power -0.5)	13.38	3.80	<0.0001	7.67	23.34
ISS_2 (FP power 0=log)	11.14	1.47	<0.0001	8.60	14.44
Age					
0 - 5	0.86	0.26	0.609	0.48	1.54
6 - 10	0.67	0.35	0.437	0.24	1.84
11 - 15	0.51	0.21	0.1	0.23	1.14
16 - 44 (reference)					
45 - 54	1.89	0.32	<0.0001	1.36	2.63
55 - 64	1.82	0.32	0.001	1.30	2.56
65 - 75	5.06	0.72	<0.0001	3.83	6.69
>75	14.66	1.70	<0.0001	11.68	18.40
Gender					
Female (reference)					
Male	0.88	0.09	0.226	0.71	1.08
Age (by gender interaction)					
0 - 5#Male	1.39	0.53	0.385	0.66	2.94
6 - 10#Male	0.76	0.46	0.651	0.24	2.47
11 - 15#Male	2.17	1.00	0.093	0.88	5.37
45 - 54#Male	0.86	0.17	0.432	0.59	1.25
55 - 64#Male	1.54	0.30	0.027	1.05	2.27
65 - 75#Male	1.00	0.17	0.996	0.72	1.38
>75#Male	1.37	0.17	0.011	1.07	1.76
GCS					
GCS =3	56.18	4.08	<0.0001	48.72	64.77
GCS 4 -5	25.02	2.69	<0.0001	20.26	30.89
GCS 6 -8	8.19	0.74	<0.0001	6.86	9.79
GCS 9 -12	4.83	0.38	<0.0001	4.13	5.64
GCS 13 - 14	1.72	0.11	<0.0001	1.52	1.95
GCS 15 (reference)					
Intubated	16.57	2.35	<0.0001	12.55	21.89
Comorbidity Index					
0 (reference)					
1 - 5	1.60	0.09	<0.0001	1.43	1.80
6 - 10	2.49	0.20	<0.0001	2.13	2.92
>10	4.92	0.48	<0.0001	4.05	5.96
Not recorded	2.38	0.16	<0.0001	2.09	2.71
Time of day/week					
Week day (reference)	1.00				
Week night	1.03	0.06	0.608	0.92	1.14
Weekend day	0.97	0.07	0.65	0.84	1.12
Weekend night	0.93	0.05	0.211	0.83	1.04
Constant	0.00	0.00	<0.0001	0.00	0.01

*Likelihood ratio test versus logistic model $\chi^2(01) = 76.73; p < 0.0001$

Supplementary Table 4: Logistic Regression Model Predicting Mortality with Wednesday Reference*

Variables	Odds Ratio	Std. Err.	P-value	[95% Conf.	Interval]
ISS_1 (FP power -0.5)	13.67	3.84	0	7.88	23.71
ISS_2 (FP power 0=log)	11.22	1.47	0	8.68	14.49
Age					
0 - 5	0.82	0.24	0.498	0.46	1.46
6 - 10	0.62	0.31	0.343	0.23	1.67
11 - 15	0.46	0.19	0.062	0.21	1.04
16 - 44 (reference)	1.87	0.31	0	1.35	2.60
45 - 54	1.76	0.30	0.001	1.25	2.46
55 - 64	4.91	0.70	0	3.72	6.48
65 - 75	14.20	1.63	0	11.34	17.79
>75					
Gender					
Female (reference)					
Male	0.89	0.09	0.252	0.72	1.09
Age (by gender interaction)					
0 - 5#Male	1.29	0.49	0.501	0.61	2.71
6 - 10#Male	0.80	0.47	0.707	0.25	2.56
11 - 15#Male	2.38	1.10	0.06	0.96	5.90
45 - 54#Male	0.86	0.16	0.415	0.59	1.24
55 - 64#Male	1.58	0.31	0.019	1.08	2.32
65 - 75#Male	1.00	0.17	0.98	0.73	1.39
>75#Male	1.37	0.17	0.012	1.07	1.75
GCS					
GCS =3	55.82	4.01	0	48.50	64.26
GCS 4 -5	25.34	2.71	0	20.54	31.24
GCS 6 -8	8.24	0.74	0	6.91	9.83
GCS 9 -12	4.90	0.39	0	4.20	5.72
GCS 13 - 14	1.72	0.11	0	1.52	1.95
GCS 15 (reference)	1.00				
Intubated	17.99	2.52	0	13.68	23.67
Comorbidity Index					
0 (reference)	1.00				
1 - 5	1.53	0.09	0	1.37	1.72
6 - 10	2.30	0.18	0	1.97	2.69
>10	4.45	0.43	0	3.69	5.37
Not recorded	2.16	0.14	0	1.91	2.44
Day of week					
Monday	0.92	0.07	0.297	0.79	1.08
Tuesday	1.02	0.08	0.813	0.87	1.19
Wednesday (reference)	1.00				
Thursday	1.02	0.08	0.842	0.87	1.19
Friday	0.91	0.07	0.25	0.78	1.07
Saturday	0.89	0.07	0.162	0.76	1.05
Sunday	0.90	0.07	0.169	0.77	1.05
constant	0.01	0.00	0	0.00	0.01

*AUC 0.924