

**Supplementary Table 1.** Results from the primary and sensitivity analysis of joint longitudinal and survival outcomes for the association between serial ROX values and HFNC failure

	Primary analysis		Sensitivity analysis	
	Coefficient	95% CI	Coefficient	95% CI
<b>Longitudinal analysis</b>				
Time	0.086***	0.062 to 0.111	0.086***	0.061 to 0.110
Age	-0.004	-0.022 to 0.015	-0.004	-0.022 to 0.015
Sex	-0.484	-0.982 to 0.014	-0.491	-0.984 to 0.003
Ethnicity	-0.016	-0.178 to 0.146	-0.012	-0.173 to 0.149
BMI	-0.019	-0.275 to 0.236	-0.017	-0.271 to 0.237
Current smoker	0.278	-0.669 to 1.225	0.282	-0.658 to 1.221
Respiratory disease	0.225	-0.516 to 0.966	0.237	-0.499 to 0.973
CVD	0.302	-0.202 to 0.806	0.312	-0.189 to 0.813
DM	0.139	-0.380 to 0.658	0.14	-0.376 to 0.656
CKD	0.29	-0.581 to 1.160	0.288	-0.578 to 1.154
<b>Survival analysis</b>				
ROX	-1.100***	-1.592 to -0.608	-1.839***	-2.757 to -0.921
Age	0.003	-0.022 to 0.027	-0.024	-0.060 to 0.012
Sex	-0.039	-0.725 to 0.648	-0.098	-1.083 to 0.887
Ethnicity	0.271*	0.042 to 0.499	0.366*	0.014 to 0.719
BMI	-0.104	-0.445 to 0.237	-0.530*	-1.051 to -0.010
Current smoker	0.005	-1.336 to 1.346	-0.049	-1.898 to 1.799
Respiratory disease	0.13	-0.804 to 1.063	-0.024	-1.425 to 1.377
CVD	0.126	-0.530 to 0.783	-0.065	-1.065 to 0.936
DM	0.195	-0.485 to 0.875	0.433	-0.581 to 1.447
CKD	0.571	-0.513 to 1.654	0.879	-0.866 to 2.625
N	502	-	502	
AIC	2,358.02	-	2,167.38	
Log likelihood	-1,154.012	-	-1,058.689	

ROX: respiratory rate oxygenation index; HFNC: high-flow nasal cannula oxygen; CI: confidence interval; BMI: body mass index; CVD DM CKD AIC

\*P<0.05, \*\*\*P<0.001.