

Supplemental Table # 2. Incidence rate ratio for procedures and respiratory interventions over time for the entire VPS population. Data is analyzed using multilevel mixed effects negative binomial regression model controlling for unit level effects. The model controls for unit level effects addressing the issue that observations in the same ICU are correlated because they share common cluster-level random effects. HFOV = High Frequency Oscillatory Ventilation, BiPAP = Bilevel Positive Airway Pressure, CPAP = Continuous Positive Airway Pressure, HFNO = High Flow Nasal Oxygen. Year is treated as a categorical value in the model and the baseline value is 2009. Data is presented as the interval rate ratio (95% CI of IRR) and p-value. This model does not control for initial severity of illness as measured by PRISM III.

Year	Model # 1 Conventional Mechanic Ventilation		Model # 2 HFOV		Model # 3 BiPAP / CPAP		Model # 4 HFNO	
	IRR	P value	IRR	P value	IRR	P value	IRR	P Value
2009	Reference		reference		reference		reference	
2010	1.04 (0.94 – 1.14)	0.487	0.79 (0.66 – 0.95)	0.10	0.88 (0.70 – 1.09)	0.243	1.10 (0.85 – 1.42)	0.481
2011	0.96 (0.87 – 1.06)	0.458	0.72 (0.60 – 0.86)	< 0.001	0.85 (0.68 – 1.06)	0.155	1.37 (1.06 – 1.78)	0.018
2012	0.96 (0.87 – 1.06)	0.409	0.66 (0.56 – 0.79)	< 0.001	0.95 (0.76 – 1.18)	0.624	1.59 (1.23 – 2.05)	< 0.001
2013	0.94 (0.86 – 1.04)	0.219	0.65 (0.55 – 0.78)	< 0.001	1.07 (0.86 – 1.33)	0.563	1.83 (1.42 – 2.37)	< 0.001
2014	0.87 (0.79 – 0.96)	0.006	0.56 (0.47 – 0.66)	< 0.001	1.08 (0.87 – 1.34)	0.483	1.75 (1.36 – 2.26)	< 0.001
2015	0.82 (0.75 – 0.91)	< 0.001	0.54 (0.45 – 0.64)	< 0.001	1.25 (1.00 – 1.55)	0.045	1.97 (1.53 – 2.54)	< 0.001
2016	0.81 (0.74 – 0.89)	< 0.001	0.55 (0.46 – 0.66)	< 0.001	1.26 (1.02 – 1.56)	0.030	1.95 (1.52 – 2.51)	< 0.001
2017	0.76 (0.69 – 0.84)	< 0.001	0.52 (0.44 – 0.63)	< 0.001	1.72 (1.39 – 2.13)	< 0.001	2.46 (1.91 – 3.17)	< 0.001