

Table S1. Detailed description of the study population used for the stratified over-sampling process

	Stays mapped according to initial event	Stays with events mapped to other group	Total stays with event
Vasopressor	167	73	240
Mechanical ventilation	167	21	218
No event	166	-	-
Total stays	500		

The rule-based algorithm for tagging events

Intubation tag:

A rule-based feature to identify the initiation and the completion of intubation events was developed. The rules were based on physicians' knowledge and were refined with data-based analytics work.

Most hospitals mark the time of intubation and extubation procedures in the EHR. However, these data are partial and are missing for many intubation events. Furthermore, they are entered into the EHR manually, and thus suffer from high latency.

To receive higher coverage and more precise time labels, we used data on supportive respiratory care such as supplementary oxygen, mode of ventilation and ventilatory support, ventilator setting and bedside monitor data (end-tidal CO₂ [EtCO₂] measurements) from the hospital. The rule-based feature determined that an intubation event occurred when there was a direct indication of an intubation event from the EHR, when a combination of ventilation and monitor parameters existed (PEEP, EtCO₂, mandatory respiratory rate), or when certain combinations of O₂ delivery devices and ventilation modes were identified simultaneously (Table S2).

Table S2. O₂ delivery device and ventilation mode combinations

Ventilation mode/ ventilator data	O ₂ delivery device/monitor data			
	Tracheal tube, tracheostomy	Mask, nasal cannula, tent	Ventilator	EtCO ₂ measured
SIMV, ASV, A/C, PRVC, HFOV	Ventilated	Non-invasive ventilation	Ventilated	Ventilated
BIPAP, CPAP, HFNC, PS	Ventilated	Non-invasive ventilation	Non-invasive ventilation	Not ventilated
PEEP, PIP, Mandatory RR present	Ventilated	Non-invasive ventilation	Ventilated	Ventilated

Vasopressor tag:

Identification of a vasopressor/inotrope initiation event occurred when administration of one of the following medications was initiated:

- Dobutamine
- Dopamine
- Epinephrine
- Norepinephrine
- Vasopressin
- Phenylephrine
- Isoproterenol
- Terlipressin

The vasopressor/inotrope event was regarded as “ended” when 4 hours passed since the last known administration of any of the above medications.