**Ventilator Requirements Modelling for the 2020 winter season from the CoVID-19 Preparedness Project.**

Andy Lim MBA FACEM GAICD1,2,3

1. Monash Medical Centre Clayton, Victoria, Australia
2. Monash University Clayton, Victoria, Australia
3. Holmesglen Emergency Department P/L, Victoria, Australia

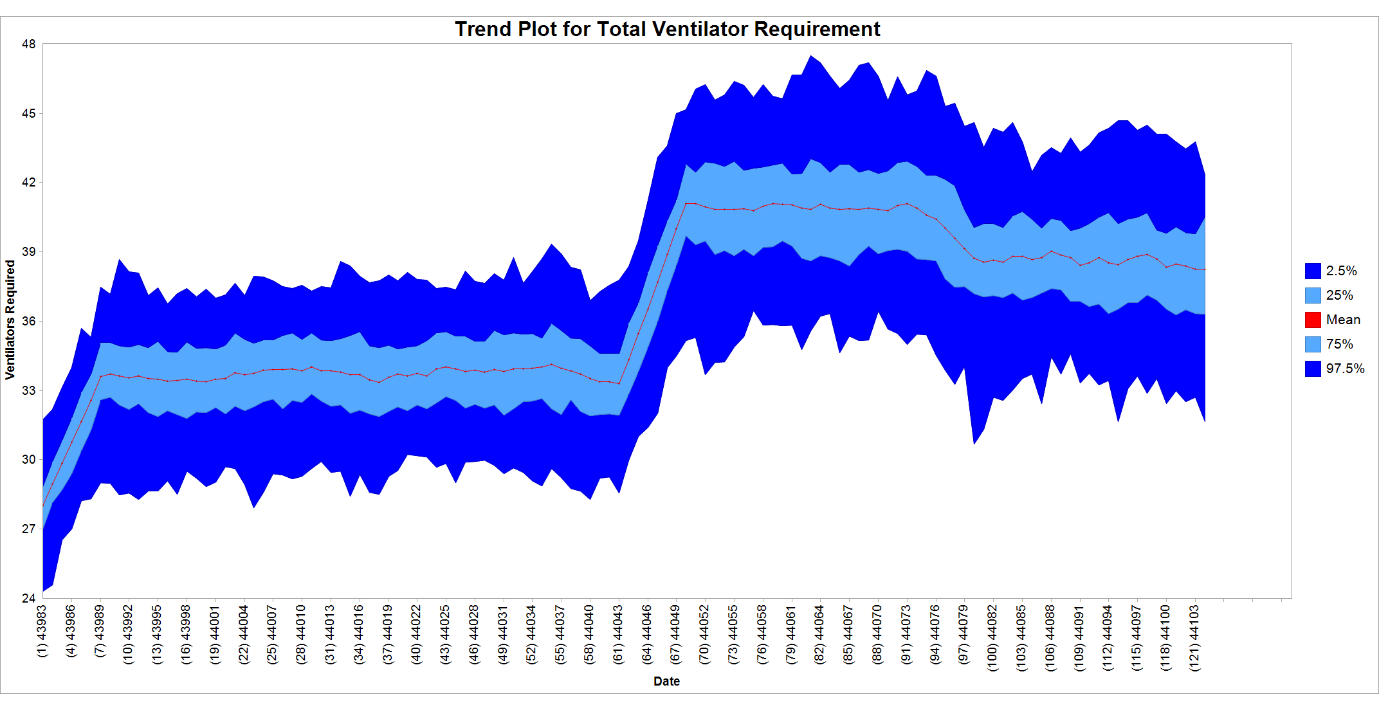
**Objective**

To estimate the ventilator requirements for an Australian metropolitan Emergency Department for the period of June to September 2020. The service sees in excess of 80,000 presentations annually. In the midst of the CoVID-19 pandemic, every critically unwell respiratory patient will be managed as a suspected case, meaning full personal protective equipment, negative pressure rooms if available, and early intubation for invasive ventilation. This represents a significant increase in workload, and this study seeks to estimate a component of this work.

**Methods**

Monthly estimates of patients presenting with urgent and critical respiratory disease1 derived from the CoVID-19 Preparedness Project2 were obtained [mean and standard deviation (sd)]. Daily presentations were estimated by sampling from a normal distribution where mean = monthly presentations ÷ days in the month, and sd = monthly sd ÷ days in the month. Percentage of critical respiratory patients requiring ventilators was estimated based on the Wuhan data, with 37/52 = 71.1% patients requiring this3. Total ventilator requirements were calculated as a trailing sum based on the number of patients requiring ventilation in the last seven days. The simulation was repeated 100 times. The six days simulated prior to the study period were not included in the final data presentation. The model was built with ModelRisk v6.1.5.

**Results**



Based on the experiment’s assumptions, for a hospital that sees in excess of 80,000 presentations annually, forty ventilators would be required to meet the required demand until 1st August 2020, after which 48 ventilators would then be required.

**Conclusion**

Rates of invasive ventilation are expected to increase in the coming winter season. Hospitals should be preparing the infrastructure, equipment and staffing to accommodate an expected surge in demand.

**Funding**

Nil funding.

**References:**

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3. Yang X, Yu Y, Xu J, Shu H, Liu H, Wu Y, et al. Clinical course and outcomes of critically ill patients with SARS-CoV-2 pneumonia in Wuhan, China: a single-centered, retrospective, observational study. *The Lancet Respiratory Medicine*. 2020.