

Targeted Real-Time Early Warning System (TREWScore) Sepsis

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Background

Sepsis is one of the leading causes of death in the United States. More than 1.5 million adults get sepsis each year in the U.S. contributing to prolonged inpatient stays, increase ICU admissions, and high mortality and morbidity. One in three patients who die in a hospital have sepsis and over \$20 billion are spent in annual health care costs.

Sepsis is a life-threatening medical emergency. It is the body's overwhelming response to an infection and can lead to widespread inflammation, resulting in septic shock. Sepsis requires urgent medical attention for early aggressive treatment to decrease mortality. Without treatment, sepsis will lead to tissue damage, organ failure, and death.

Recent studies have shown that there is an association between improving timeliness and efficiency to better clinical outcomes in treating these patients. Early identification and treatment of septic shock has decreased morbidity, mortality, and hospital length of stay.

Objectives

Early detection and intervention for sepsis is linked to improved outcomes. The goal of this project is to create a real-time tool that predicts which patients are at risk for developing septic shock.

Materials and Methods

TREWScore is a predictor tool, to identify patients at high risk of developing septic shock. This learned-based intervention encourages the quick detection of sepsis and thus demands for early aggressive treatment where an algorithm pulls available measurements from the electronic health record (EHR).

Results

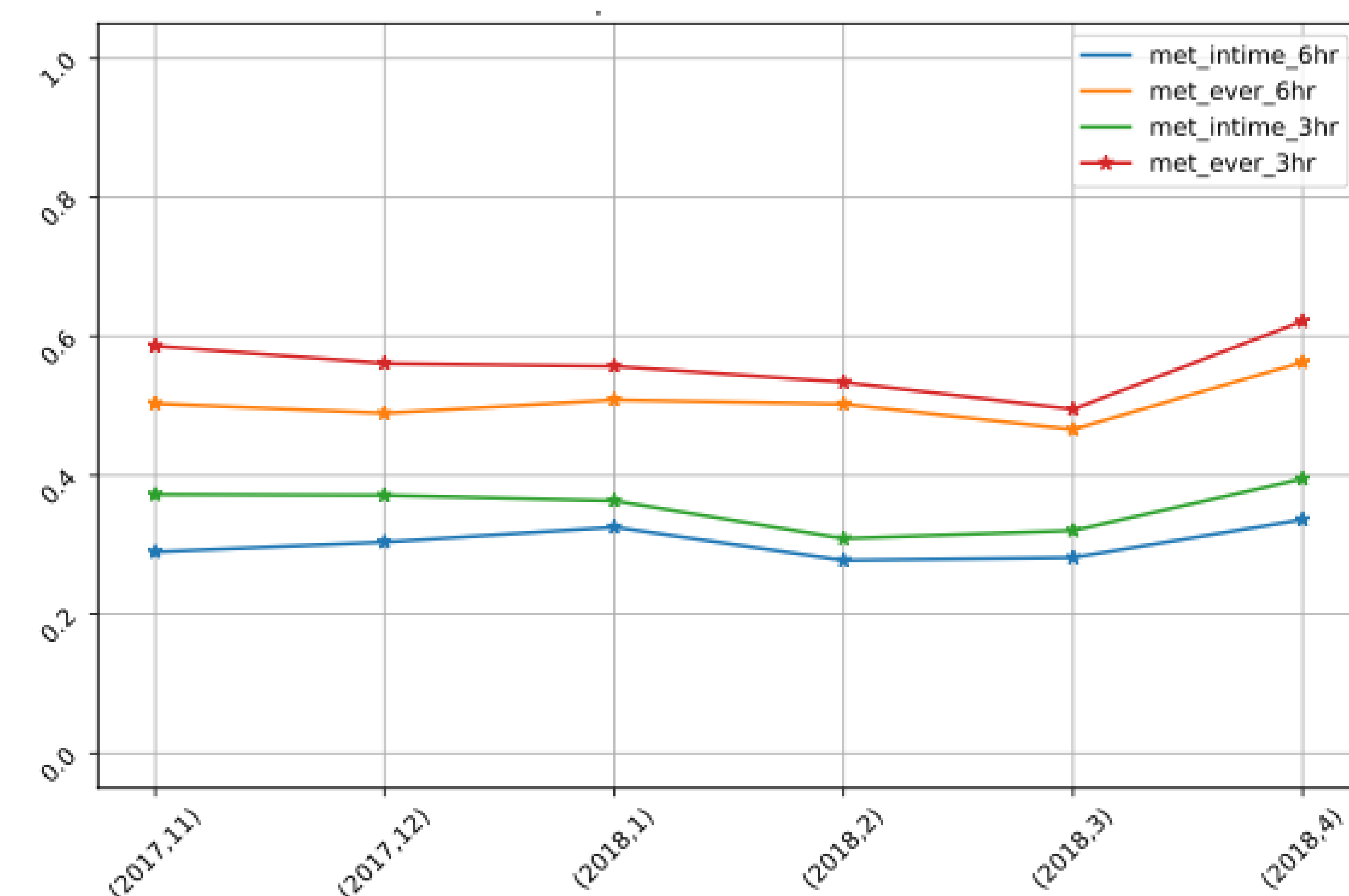


Figure 1-1 – HCGH Compliance Rate During Deployment 2018
Figures 1-1 and 1-2 represent increased adoption when compliance is higher.

Results (cont.)

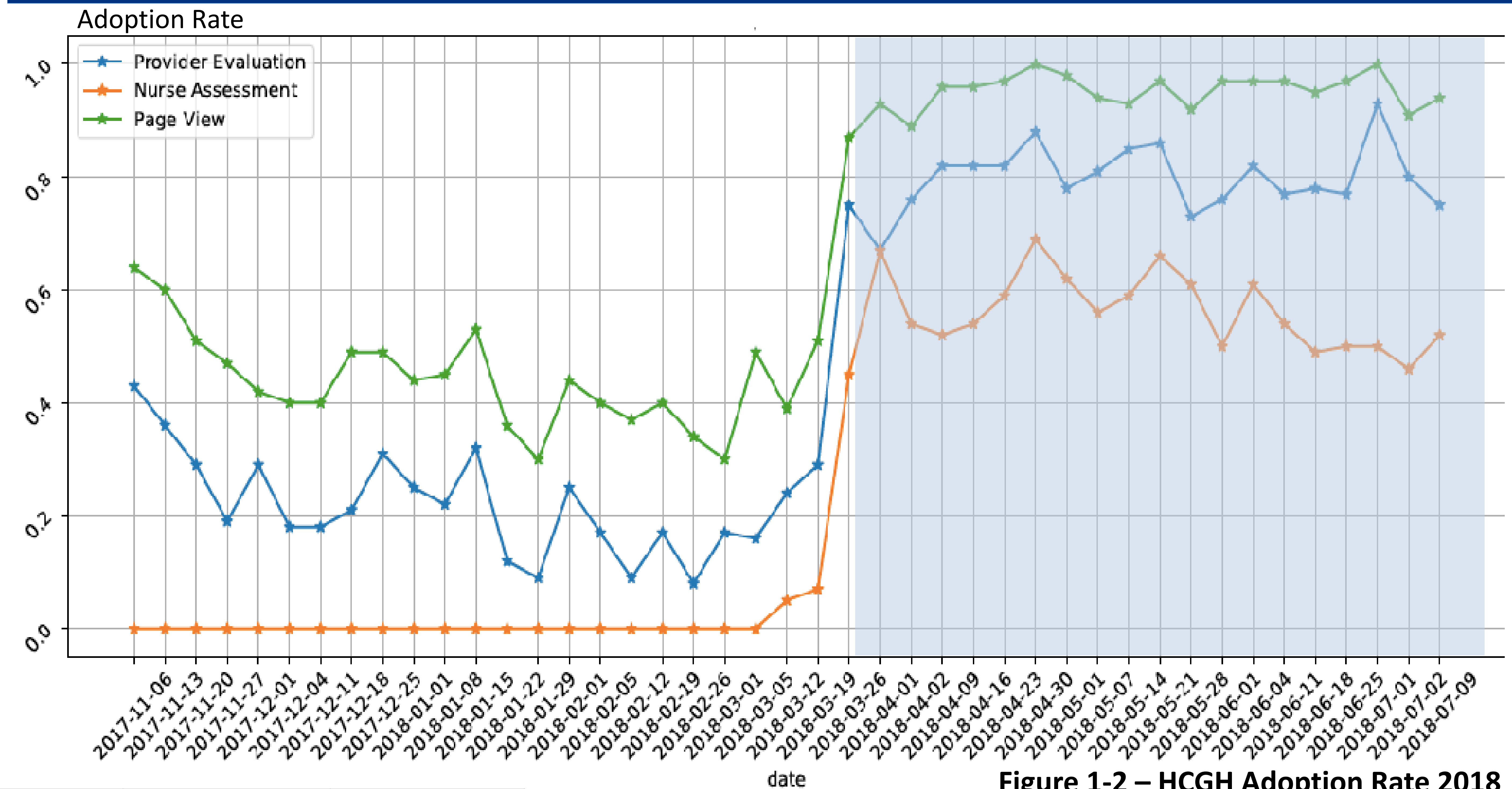


Figure 1-2 – HCGH Adoption Rate 2018

	Nov 14, 2016 - Jul 31, 2017	Nov 14, 2017 - Jul 31, 2018	% Change
Mortality rate (non-palliative only)	5.9%	5.2%	11.8%
ICU admission rate	37.0%	31.8%	13.8%
Avg. number ICU days	2.343	1.885	19.5%
30-day readmission rate	17.1%	11.5%	33.0%
RRT w/in 48hrs of inpatient admit	1.43%	0.35%	75.6%

Table 2. Howard County General Hospital TREWS Deployment Period November 2017 – July 2018

This figure shows mortality in the intervention decreased by 8.5% in the Emergency Department

Conclusion

Overall, clinical outcomes have improved and are associated with timeliness of response. TREWScore learns over time to best detect patients at high-risk of developing septic shock. The long-term combination of TREWS' learning adaptability and integration into workflow saves lives. TREWS identifies sepsis with a sensitivity of 0.85.

References

Available upon request.

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