A Novel Approach to Resource Allocation and the Potential Health Equity Disparities

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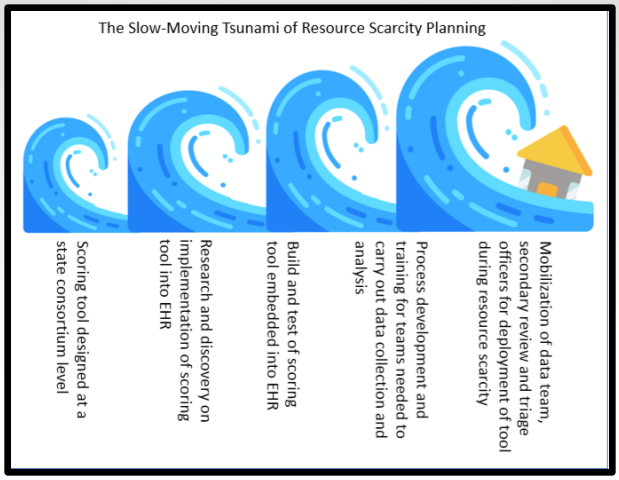
Background

Amidst the backdrop of a global pandemic, healthcare systems were forced with the prospect of difficult decisions around resource allocation during times of potential resource scarcity. We developed a scoring system applied to patients needing care during the time of resource scarcity with the goal of applying a layer of objective decision making to a scenario rife with complexity and ethical questions. The product of this work raised some challenging questions around the broader topic of equity in healthcare and posed the ethical dilemma of potentially adversely affecting our most vulnerable patients who were already suffering greater mortality during the current COVID-19 pandemic.

Discussion

The development of an automated scoring tool that writes data to the EHR is an implementation of CDS that can be utilized during times of resource scarcity. Providers and healthcare organizations must be aware of the potential for algorithmic bias in the application of these types of scoring tools. As shown in our retrospective analysis, discrepancies in scores based on race can negatively impact populations who have likely been historically disparaged by the healthcare systems. In this case, the fact that black patients appear "sicker" than white patients can be attributed to the prevalence of more advanced chronic disease in these demographics which is likely contributed by these marginalized communities' access to affordable, quality healthcare. The application of scoring tools like this can result in further structural racism if conversations around healthcare equity are not introduced.

Methods



RAS Element	Description	Score Contribution	EHR Automation	Manual Component
SOFA	Validated scoring tool use to assess acuity of condition	<7 = 1 point 8-11 = 2 points >11 = 3 points	Calculated in real time based on data associated with encounter	Requests to treatment team for missing elements by data team
Life Stage	Assign points based on comorbid illness that effect short-term survival	No life-limiting comorbidities = 0 points Early to Mid-stage chronic illness = 0 points advanced chronic illness = 2 points terminal chronic illness = 4 points	Score generated via order component placed by admitting provider	Ability to override by members of triage oversight committee and secondary review team
Anticipated Ventilator Need	Assign points based on likely duration of ventilator need	<3 days = 0 points ≥3 days = 1 point	Score generated via order component embedded into BiPAP and Ventilator orders. Standalone order for patients requiring ≥4 Lpm of supplemental O2	Ability to override by members of triage oversight committee and secondary review team. Requests to treatment team for missing data.
Age + COVID Status	Patient age at time of admission and presence of SARS-CoV2 via PCR	COVID+ and ≥65 yo = 1 point COVID+ and ≥80 yo = 3 points	Age at time of admission captured via DOB. Results filter for various COVID PCR tests.	No significant manual input required.

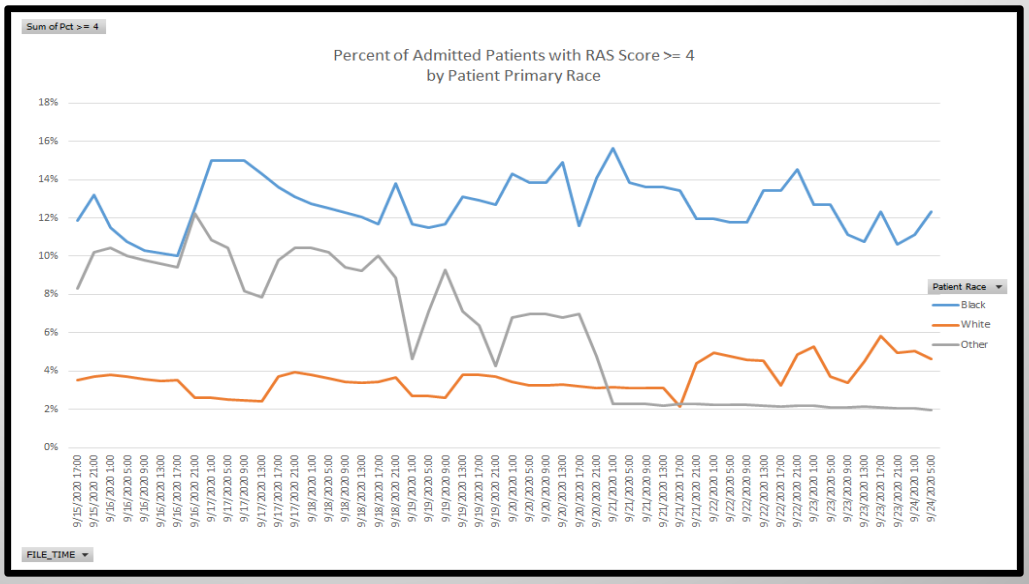
Results

Using this automated scoring tool, we were able to capture a partial or complete Resource Allocation Score (RAS) on every patient admitted to the hospital without substantial intervention. The score was saved to the EHR allowing us to perform retrospective analyses of these scores. Our initial findings showed significant discrepancy in the average RA score for black versus white patients admitted during the time period our initial retrospective analysis took place.

Priority Levels	Score
Green (Highest priority)	1
Yellow	2-4
Red	5-6
Blue (Lower priority)	7-9

Key Takeaways

- Application of automated scoring tools to the EHR can provide meaningful CDS
- Equity lens must be applied to any algorithms impacting patient care



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