Comparing Responses to COVID-19 Across Institutions: Conceptualization of an Emergency Response Maturity Model

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Abstract. The impact of Covid-19 on hospitals was profound, with many lower-resourced hospitals' information technology resources inadequate to efficiently meet the new needs. We interviewed 52 personnel at all levels in two New York City hospitals to understand their issues in emergency response. The large differences in IT resources show the need for a schema to classify hospital IT readiness for emergency response. Here we propose a set of concepts and model, inspired by the Health Information Management Systems Society (HIMSS) maturity model. The schema is designed to permit evaluation of hospital IT emergency readiness, permitting remediation of IT resources where necessary.

Keywords. Health IT, Emergency Preparedness, Maturity Model, COVID-19, Resilience

1. Introduction

Hospitals with fewer resources were often in neighborhoods with the most vulnerable patients and highest rates of infection, morbidity and mortality. In the US, 'safety net' hospitals (SNH) are a special designation of hospital which welcomes all patients' regardless of ability to pay. We studied a state-funded New York City hospital which was designated a COVID-19-only hospital, comparing it with a large networked hospital (LNH). The differences between the two institutions led us to propose a health IT emergency response maturity scale inspired by the HIMSS 7-level maturity model[1].

2. Methods

We conducted 52 sixty-minute zoom interviews with stakeholders including hospital leadership, clinical directors, IT staff, and others focused on decisions, tasks, and overall experience of organization resilience during COVID-19. The interviews were recorded,

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transcribed, and coded using MAXQDA™ qualitative analysis software and the Systems Engineering Initiative for Patient Safety (SEIPS)[2] schema. Data were mapped and analyzed for technologies used, automation and manual work, needs met and unmet.

3. Results

Experts identified the most significant emergent concepts and rankings describing practical needs, iterating over two cycles. In contrast to the LNH, the SNH had minimal electronic interconnection with other local hospitals. The staff overcame many technical and logistical lacks by sheer dedication, innovation, staff repurposing and clinical service change, which were critical to resilience. The proposed health IT emergency response maturity levels can be characterized in terms of three levels: 1) basic data integration, 2) information technology and 3) resilience capacity.

4. Discussion

The finding of major disparities in health IT resources and their critical role in controlling pandemics necessitates means of evaluating institutional readiness and health IT. We therefore propose an **'Emergency response maturity scale'** [HITERMS] for Health IT, akin to the Health Information Management Systems Society (HIMSS) technology maturity scale. This is a preliminary formulation based on empirical data and expert consultation. Our next step is to conduct a Delphi experiment with experts, IT personnel and management.

5. Conclusion

Health IT resource assessment is critical for future emergency preparedness, and the recent pandemic revealed many sharp disparities among institutions; these affect the entire ability of a society to respond adequately. A preparedness scale specifically addressing health IT disparities should be useful in conveying the extent of the problem and beginning to address these resource needs.

Acknowledgments

References

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