Addressing uncertainty: An evidence-based, data-driven, decision matrix for healthcare operations during the COVID-19 pandemic

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Introduction: Uncertainty and continuously changing guidance for COVID-19 response has taken a toll on the mental health of all individuals. Growing uncertainty within a healthcare system can create stress and confusion that may affect patient care. Our objective was to design an evidence-based, data-driven, decision matrix for healthcare operations that adapts COVID-19 mitigation measures in a predictable fashion according to the CDC community risk level and wastewater positivity data.

Methods: A multidisciplinary team reviewed mitigation measures, published and internal data on the value and yield of these measures, and different operational aspects of a major healthcare system that are affected by COVID-19. The team also reviewed publicly available community risk metrics to then create a decision matrix that adjusts mitigation measures and operational aspects in a predictable fashion according to COVID-19 risk in the community.

Results: When COVID-19 rates were low during the pandemic, the yield of temperature and symptom screening was 0.19% people screening out and the yield of pre-procedure testing was 0.17% patients testing positive. Taking that into account, as well as regulatory requirements, published literature and public health guidance, the matrix was created with adaptations for inpatient, outpatient, and long-term care sites.

The decision matrix was then posted online with a qualification that the enterprise COVID-19 status would only change with sustained changes (> 2 weeks) in CDC community risk level or wastewater positivity. The COVID-19 status is inserted in all enterprise communications for operational awareness. The response to the COVID-19 decision matrix was overwhelmingly positive by staff and visitors, with no safety or operational problems in the first month of implementation.

Since implementation of the matrix, adjustments were made. Initially this was due to a quick change from Low to Medium risk levels. After reassigning staff utilized for entry screening stations, allowing more visitors for patients and minimizing requirements of universal PPE, the multidisciplinary team re-reviewed mitigation measures. In addition, despite CDC community risk level increasing, hospitalizations were not substantial.

Adjustments Made Post-Implementation

Low Risk Level –

- Risk Level Activation – Remove CDC Community Risk Level definition; Strict reference to Wastewater Positivity; Increase threshold

Medium & High Risk Levels –

- Matrix Risk Level Activation – Remove CDC Community Risk Level definition; Strict reference to Wastewater Positivity; Increase thresholds
- Incident Command Calls – Remove from matrix; complete as needed
- ED Staff PPE – Drop requirement to recommendation except for universal masking by staff and patients
- Daily Screening – Limit to high-risk patient care areas; include but not limited to ICU, Oncology, Transplant, L&D, Pediatrics
- Visitation – Low risk visitation allowed for Medium risk; Medium risk visitation allowed for High risk; Standardize visitation hours

Discussion: An evidence-based, data-driven, decision matrix provides predictable mitigation measures and operational responses to changes in the COVID-19 community risk levels and alleviates workforce uncertainty. It is important to modify based on evidence-based methods to accommodate the safety of staff, visitors and hospital operations.

References
1. Centers for Disease Control and Prevention. (n.d.). *Coronavirus disease 2019 (covid-19)*. Centers for Disease Control and Prevention. Retrieved September 20, 2022, from https://www.cdc.gov/coronavirus/2019-nCoV/index.html
2. Centers for Disease Control and Prevention. (n.d.). *Covid-19 by County*. Centers for Disease Control and Prevention. Retrieved September 20, 2022, from https://www.cdc.gov/coronavirus/2019-ncov/your-health/covid-by-county.html
3. City of Houston sars-COV-2 wastewater monitoring dashboard. CoV. (n.d.). Retrieved September 20, 2022, from https://covidwwtp.spatialstudieslab.org/
4. Eddy DM. Variations in physician practice: the role of uncertainty. *Health Aff (Millwood)* 1984; 3: 74–89
5. Schwarze ML and Taylor LJ. Managing Uncertainty — Harnessing the Power of Scenario Planning. *N Engl J Med* 2017; 377: 206–208

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