NASEM Workshop July 21st : Data Systems Panel

Minimizing Harm in Disasters

The Role of Near-Real-Time Data

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No disclosures

Clinical Epidemiology Section, NIH Clinical Center: What We Do

- Goal: Improve outcomes in disasters through data science
- Rapidly assess data sources, quality and signals
- Tackle questions unable to be addressed in RCTs
- Inform providers, federal agencies, and emergency operations

Modifying Care Standards in Disasters Comes at a Cost

- Medication errors
- Provider fatigue
- Scanty documentation
- Implicit triage
- Practicing outside scope
- Makeshift care settings

Photo Credit: Scott Ball / San Antonio Report; Reuters

ORIGINAL RESEARCH

Annals of Internal Medicine

Association Between Caseload Surge and COVID-19 Survival in 558 U.S. Hospitals, March to August 2020

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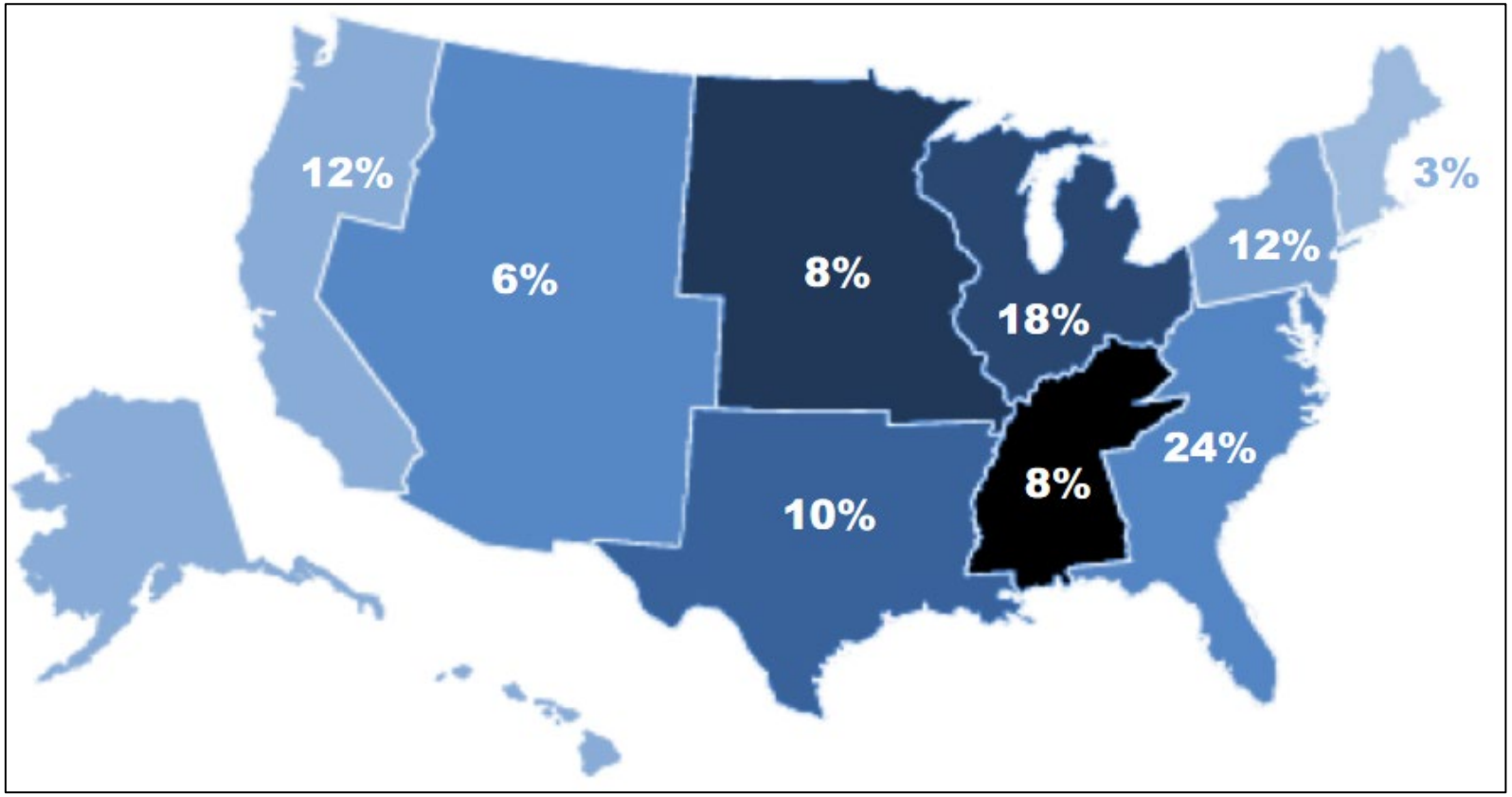
Ann Intern Med. 2021 Sep;174(9):1240-1251

How Risky is Hospital Overcrowding?

PINC-AI (Premier™)Healthcare Database
Special COVID-19 Release

- Near real time data from over 900 U.S. inpatient and outpatient care centers

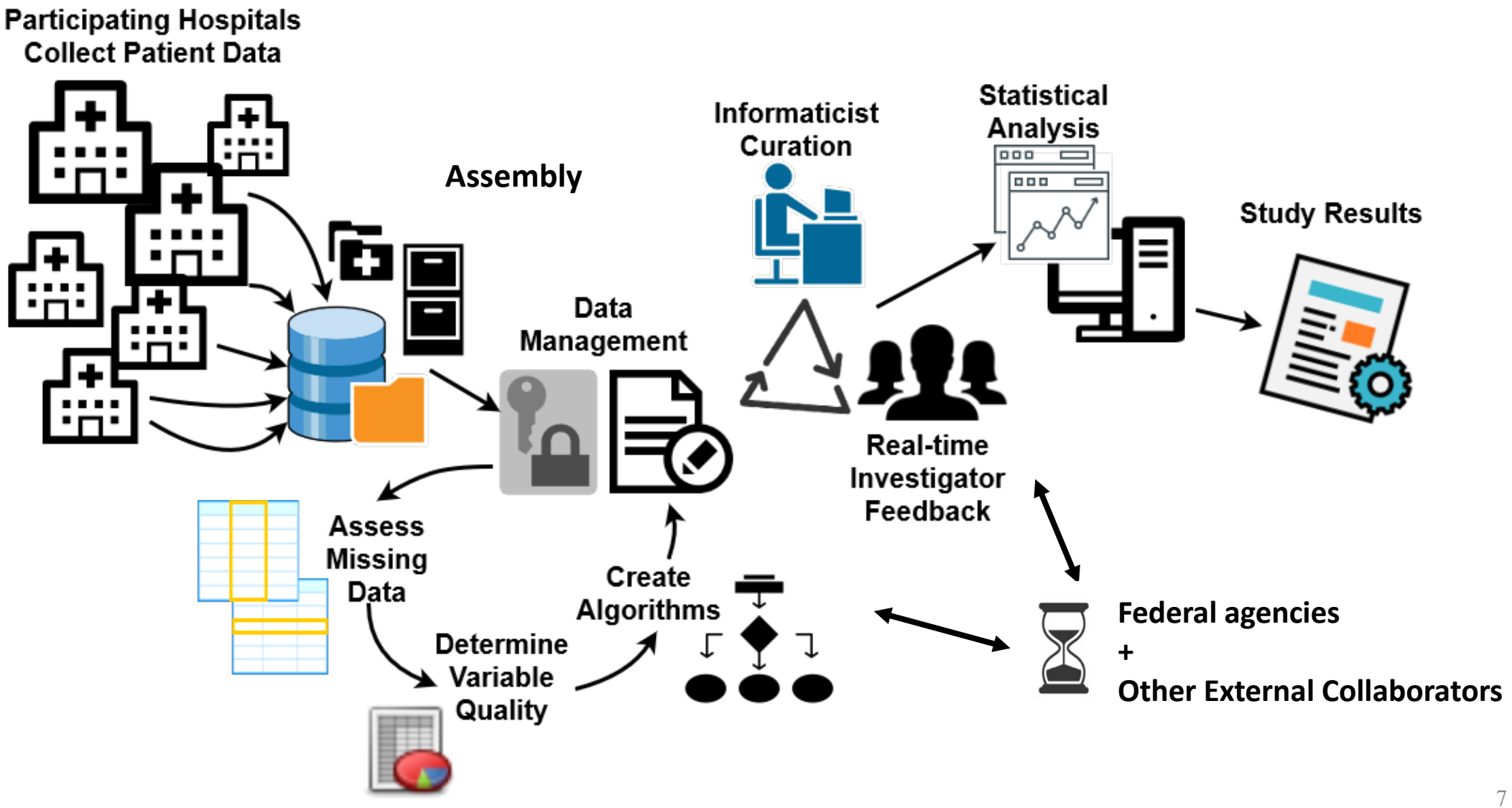


Patient Demographics
Billing Codes
Diagnosis Codes
Procedure Codes
Microbiology Results*
Laboratory Results*
Vitals*

** Select hospitals reporting Clinical Data*

Data Source: Premierinc.com

Rapid Access, Curation and Analysis



Performance of COVID-19 ICD Code vs PCR

Table. Accuracy of the *ICD-10-CM* COVID-19–Specific Diagnosis Code in Capturing Inpatient Discharges Displaying PCR-Confirmed COVID-19 From 150 Hospitals Between April 1, 2020, and May 31, 2020

	SARS-CoV-2 PCR test result		
	Positive	Negative	Total
No. of patients by use of *ICD-10-CM* code U07.1			
Code used[a]	4866	451	5317
Code not used	99	46 5491	46 590
Total No. of patients	4965	46 942	51 907

Sensitivity: 98.01%

Positive Predictive Value: 91.52%

Specificity: 99.04%

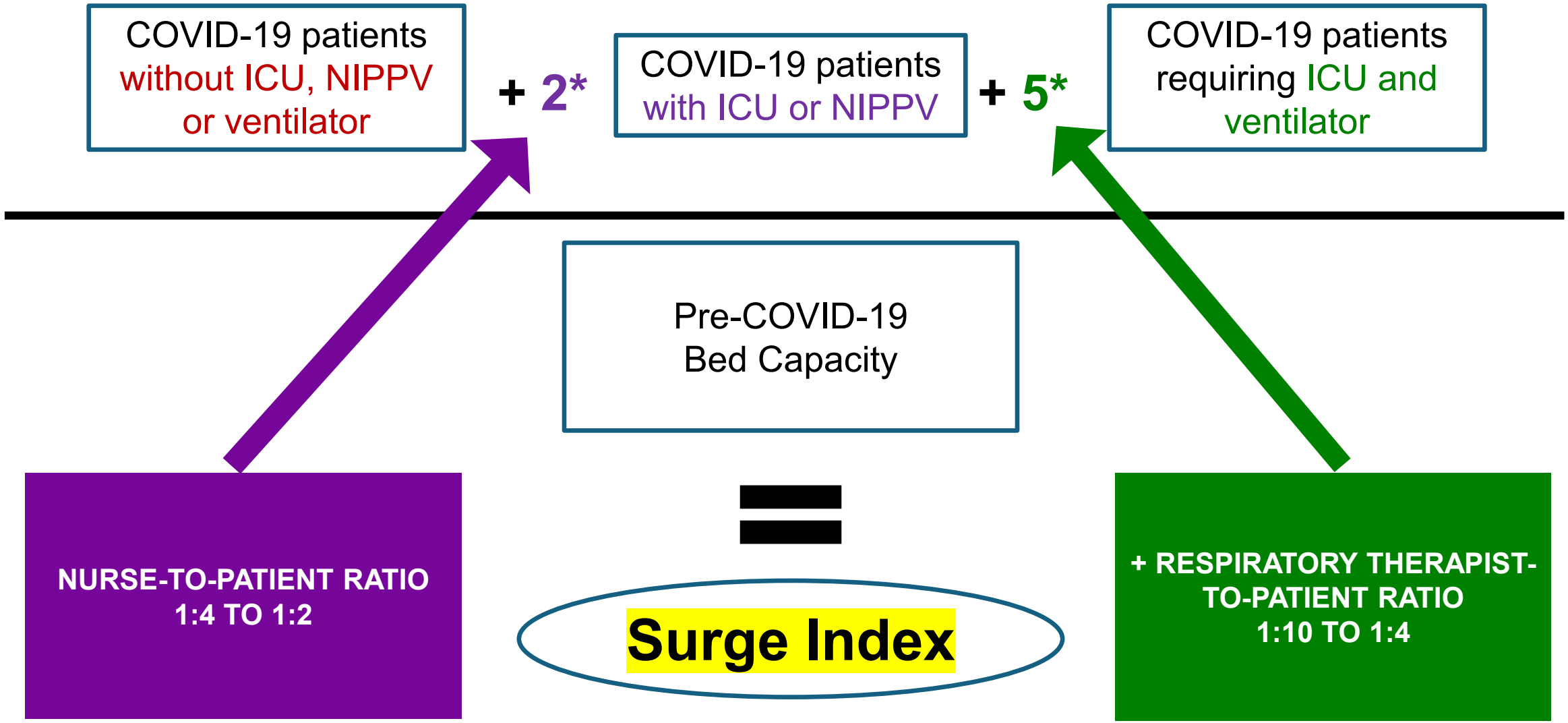
Negative Predictive Value: 99.79%

Kadri. JAMA. 2020

Data: Balancing Recency with Reliability

2020 Admission Month	Number of Inpatient Encounters		% Change from previous version
	Accessed September 18, 2020	Accessed November 9, 2020	
January	607,314	658,697	9%
February	559,103	607,232	9%
March	510,774	553,108	8%
April	407,376	434,347	7%
May	448,040	489,050	9%
June	457,379	530,799	16%
July	325,250	533,579	64%
August	92,309	480,099	420%
September	--	319,348	--
October	--	67,077	--

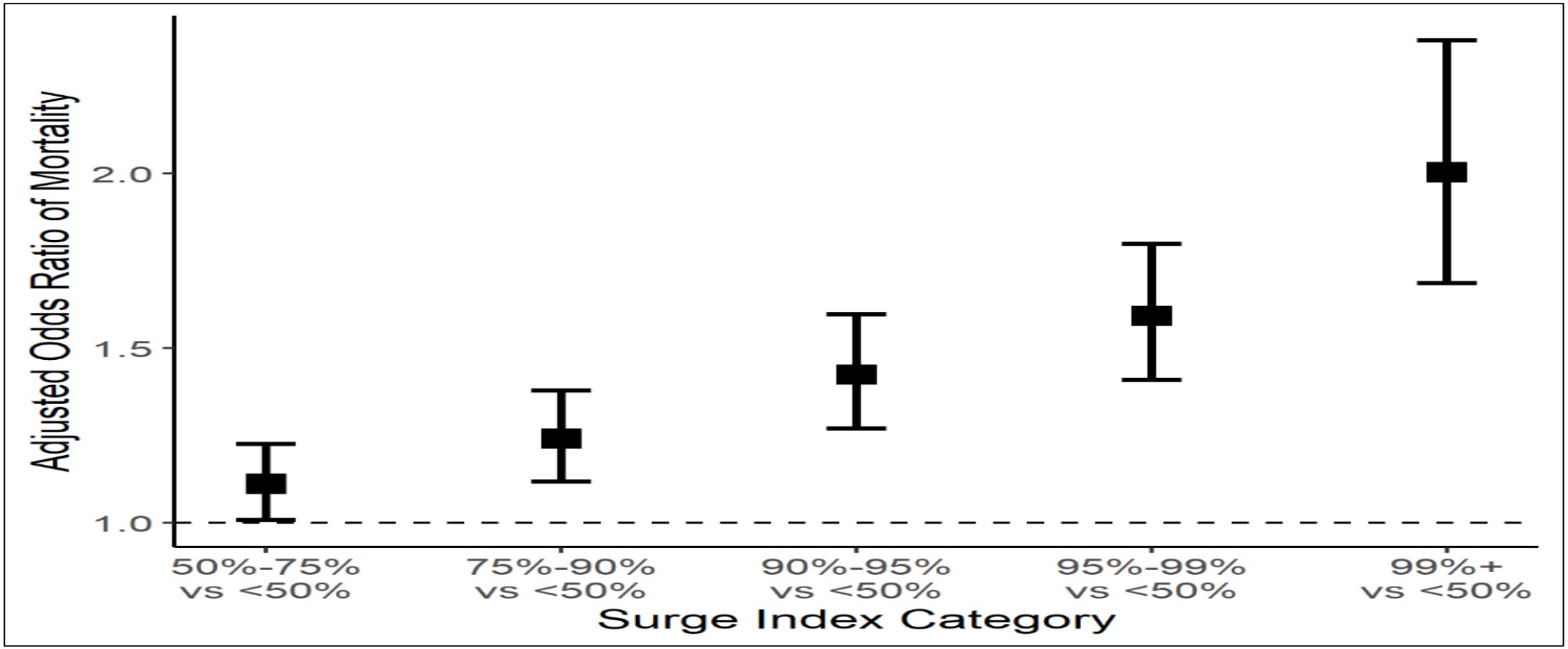
Capturing "Strain" from Hospital Overcrowding



Robust Risk Adjustment

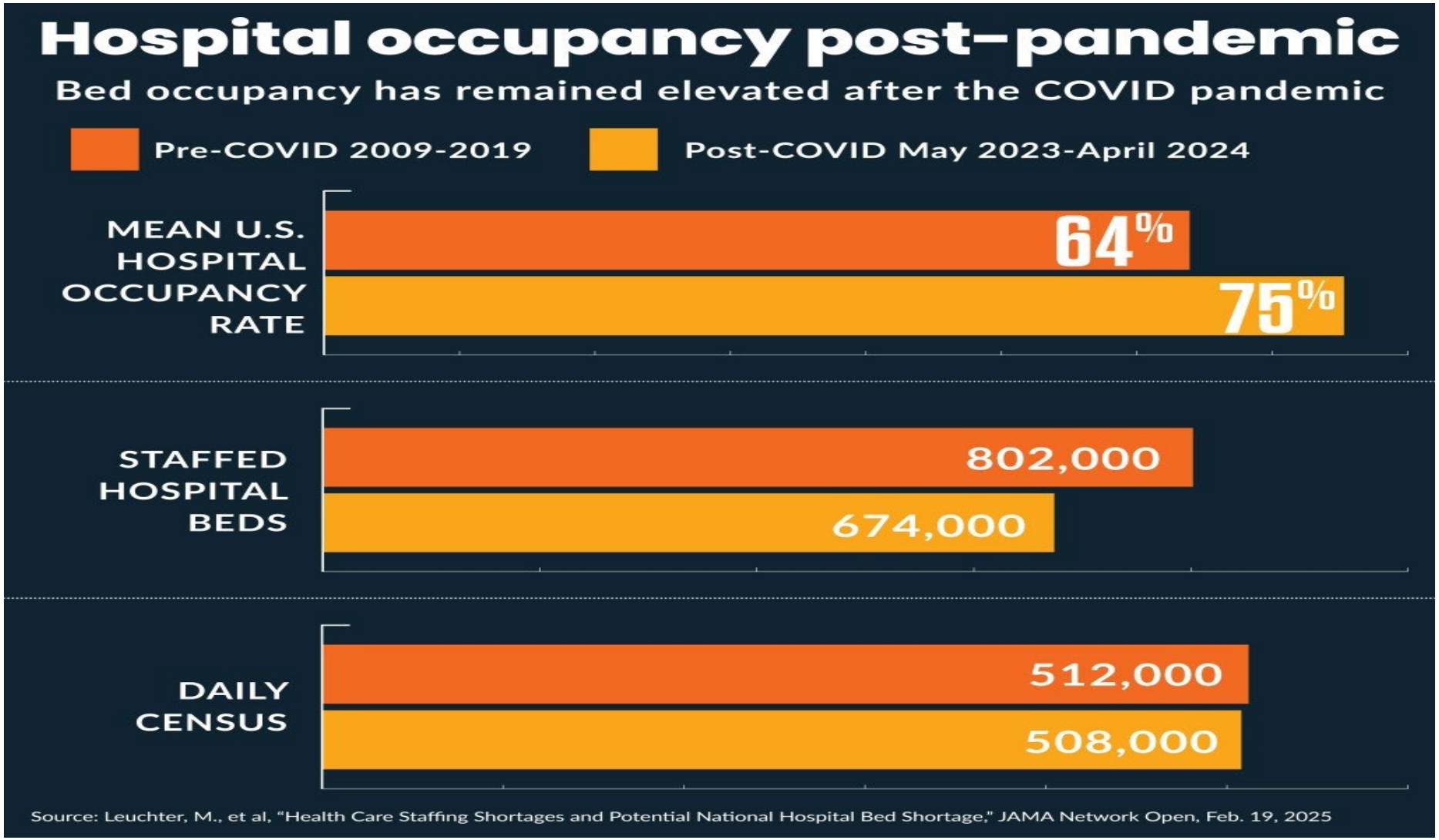
Patient Level	Hospital Level
Surge Index Category	Urban Location
Age	Teaching Hospital Status
Gender	Bed Range
Race/Ethnicity	Census Region
Admission Source	COVID-19 Specific Technologic Capacity
Admission Type	Remdesivir Available During Hospital Month
Primary Payer	%COVID-19 Admissions admitted to ICU on Admission
COVID-19 High Risk Comorbidities	%COVID-19 Admissions Mechanically Ventilated upon admission
Severity of COVID-19 Acute Respiratory Failure	Ratio of Patients Mechanically Ventilated in 2019 v 2020
Vasopressor dependent shock	Ratio of Patients per Attending-of-record
Hepatic, Hematologic, Metabolic, Neurologic, and Renal AOFS	%overall admission SARS-CoV-2 PCR-Tested upon admission
Medications: Remdesivir, Corticosteroids, HCQ, Azithromycin	Proportion of overall encounters Medicaid
Dn Not Resuscitate Present on Admission	Proportion of overall encounters Uninsured
Admission Month	

1 in every 4 COVID-19 Deaths Associated with Hospital Overcrowding



Kadri. Ann Internal Med. 2021

We are Not at a Good Baseline for Disasters



Data Sources: HHS, AHA

Jaklevic 2025. Association of Health Care Journalists.
Leuchter 2025. JAMA Open Network

Multidisciplinary and Iterative Teamwork is Critical

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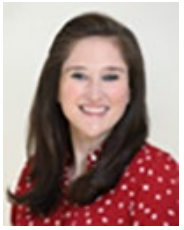

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Summary and Conclusions

- Large scale and prolonged healthcare emergencies can severely strain already stressed US healthcare systems
- Near-real-time healthcare data can offer critical solutions for emergency operations
- Rapid data access, robust analytical infrastructure, and multidisciplinary teams are critical to optimally utilizing these data in disasters