The COVID-19 pandemic generated several crises specific to the Emergency Department (ED) including large drops in ED patient volumes and increased burden of capturing valid pandemic data to measure nationwide effects in emergent ED conditions. Since 2015, the American College of Emergency Physicians (ACEP) has been developing and maturing its Clinical Emergency Data Registry (CEDR) into a big data resource to facilitate data reporting and democratize nationwide emergency medicine analytics. ACEP, in partnership with the Yale School of Medicine, successfully queried, normalized and analyzed ED visits before and during the COVID-19 pandemic elucidating the effects on the occurrence of emergent ED conditions.

This poster presentation is particularly relevant to front-line clinicians and hospitals facing COVID-19-related burdens, as well as public health researchers, informaticists, and specialty societies interested in big data use cases for medical specialties.

### Use of CEDR Big Data for Elucidating COVID-19's Impact on Emergency Care

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#### What is CEDR?

- The American College of Emergency Physicians' (ACEP) Clinical Emergency Data Registry (CEDR) is the first Emergency Medicine specialty-wide registry.
- Captured multiple data streams to calculate quality measure scores for reporting to CMS.
- Accumulated 75+ million visits from 30+ million patients since 2015.
- Leveraging big data to bridge knowledge gaps & democratize analytics relevant to emergency medicine

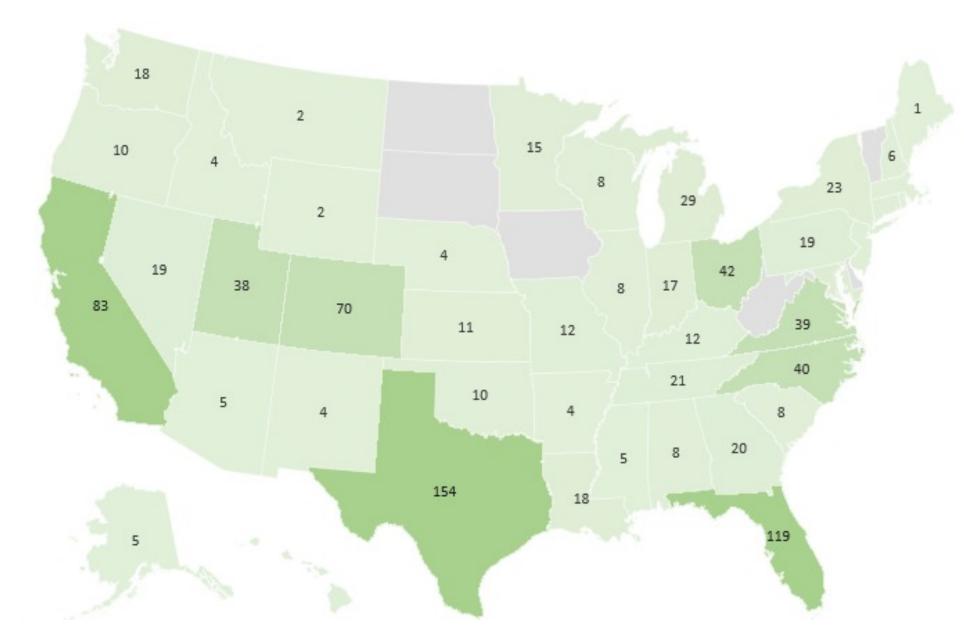


Figure 1. Map of CEDR Participants in 2020. n=990.

\* Janke, AT, Jain, S, Hwang, U, et al. Emergency department visits for emergent conditions among older adults during the COVID-19 pandemic. *J Am Geriatr Soc.* 2021; 1–9. <a href="https://doi.org/10.1111/jgs.17227">https://doi.org/10.1111/jgs.17227</a>
† Venkatesh, AK, Janke, At, Li, S, et al. Emergency Department

† Venkatesh, AK, Janke, At, Li, S, et al. Emergency Departmen Utilization for Emergency Conditions During COVID-19, *Ann Emerg Med.* 2021;1–8.

https://doi.org/10.1016/j.annemergmed.2021.01.011

# American College of Emergency Physicians® ADVANCING EMERGENCY CARE ADVANCING TO THE TOTAL COLLEGE STRY ADVANCING EMERGENCY CARE TO TO THE TOTAL COLLEGE STRY TO THE TOTAL COLLE

### Collecting CEDR Data

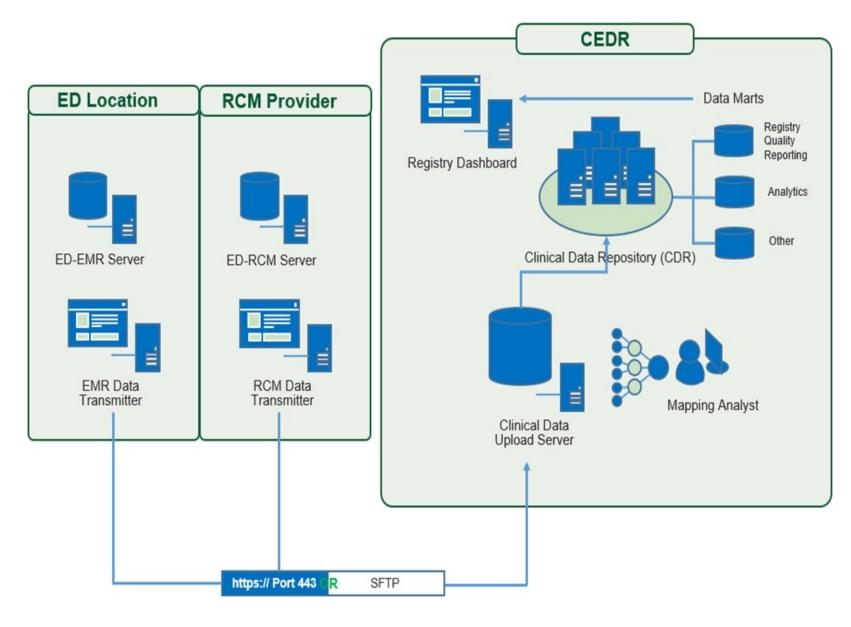


Figure 2. CEDR Data Collection and Warehousing

- Data are collected on a site-by-site basis with site-specific timelines. This can result in a short data lag.
- All data are normalized before being pushed into the Clinical Data Repository to be queried.

## Querying Database for COVID-19 and Emergency Conditions

Queries performed against 164 emergency departments (EDs) in CEDR, across 2019 and 2020. All data are a combinations of revenue cycle management and electronic health record data feeds.

- Site Location
- All Visits
- Diagnoses (ICD-10-CM)
  - AMI, CVA, DVT, stroke, sepsis, fall, hip fracture
- Patient Disposition
- Patient Demographics
- Patient Insurance
  - COVID-19-like Orders

### Use Case: ED Visit Surveillance During the COVID-19 Pandemic

Cleaning Query-level:

- Excluded all inactive data streams.
- Excluded sites where EHR feeds were not normalized or complete.

Additional cleaning at the Yale analytics-level

- Nonparametric Smoothing (LOWESS)
- Poisson Regression Modelling
- Incident Rate Ratios (IRRs)

### Retrospective Findings

#### Nationwide

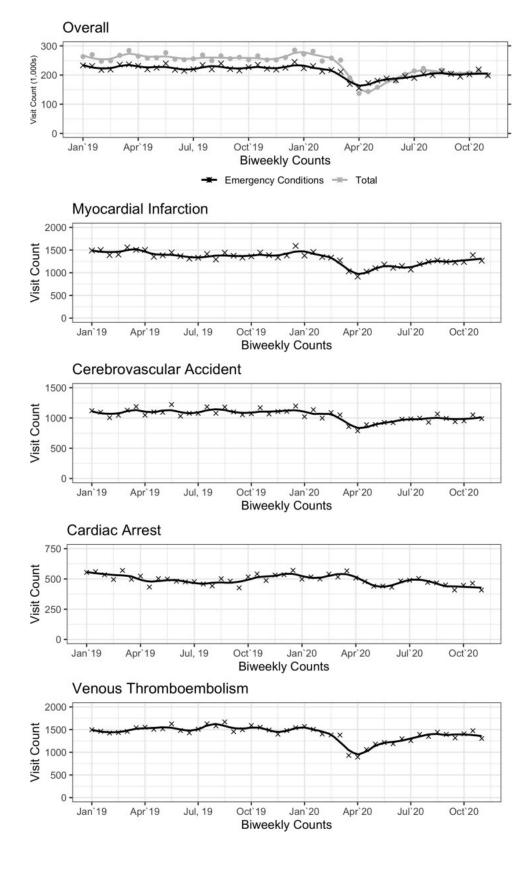


Figure 3. Total and select emergency condition biweekly ED visit counts.<sup>†</sup>

The decline in ED visits for these timesensitive conditions suggests COVID-19 may continue to impede patients from seeking essential care.†

### In Older Adults (40+)

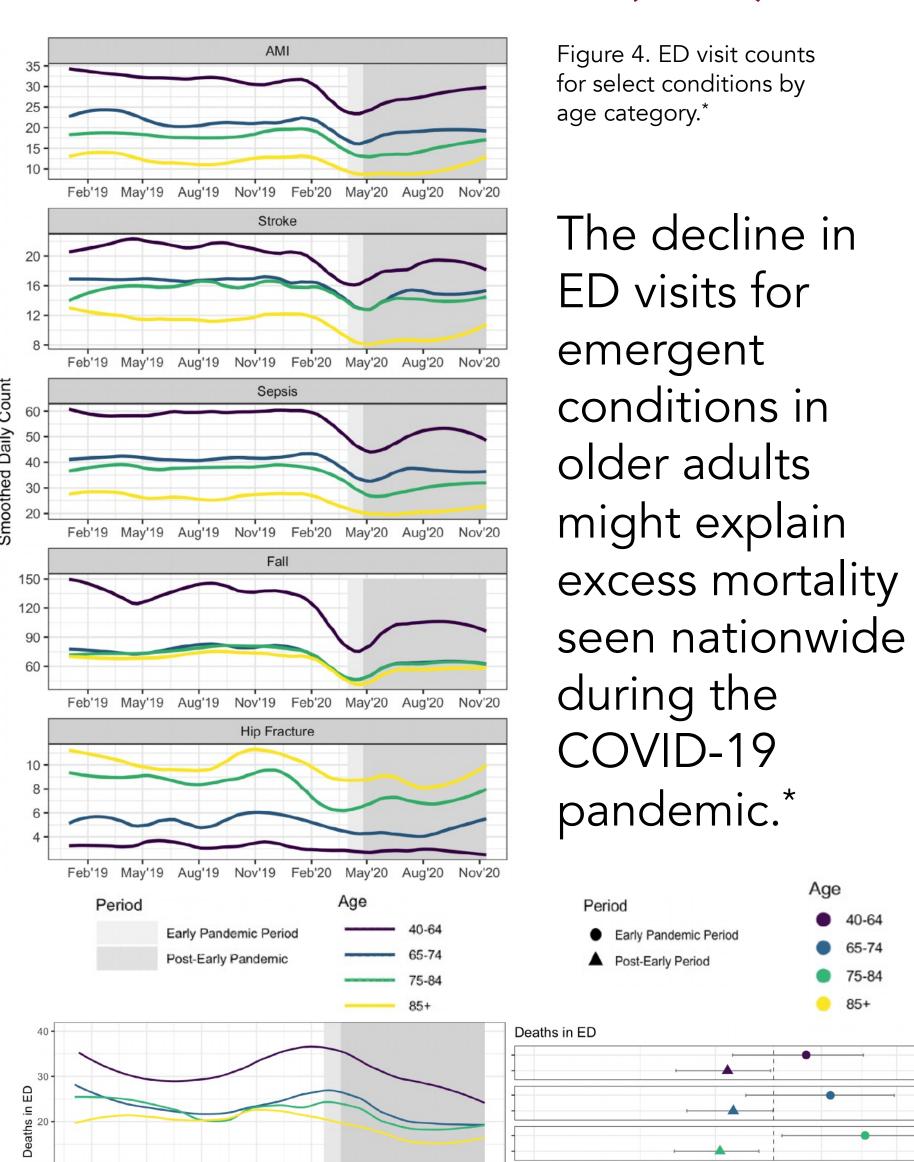


Figure 5. Emergency department (ED) deaths in ED, counts, and incident rate ratios by age. Smoothed daily counts for deaths in ED are reported by age category.\*

Incident Rate Ratios