

Access to Outside Records Correlated with Reduced Risk of Having a Code Blue Event in the Emergency Department

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Key Findings:

- In patients with a higher level of acuity in the emergency department, the presence of outside records is correlated with a 34-63% reduced risk of a code blue event depending on the patient's age.
- The risk is reduced more with age for all but the most acute cases, ranging from no reduction in risk for patients under age 17 to a 51% reduction for patients over age 65.

When patients arrive at an emergency department (ED) seeking care, they are triaged to determine their acuity level, often using the Emergency Severity Index (ESI).¹ This index helps determine the order of care among patients, with level 1 denoting the most critical cases and level 5 representing the least critical.² Existing research has shown that health information exchange (HIE) through platforms like Epic's Care Everywhere has had a significant impact on various ED outcomes such as visit length, imaging, admission rates, and charges.³ The presence of Care Everywhere documents in a patient's chart indicates that the patient has a record at another organization, including organizations that use other electronic health records and federal agencies, that has been sent to the organization where the patient is receiving care. We sought to understand whether the presence of Care Everywhere documents in the patient's chart correlates with a reduced risk of code blue events in the ED. Code blue events are a medical emergency where a patient requires immediate resuscitation, often due to cardiac or respiratory arrest.

We studied 95 million ED visits between January 1, 2017, and October 1, 2023, with an ESI level of 1, 2, or 3. Of those, 82 million had Care Everywhere documents present. We excluded patients with an unknown ESI or an ESI level 4 or 5 as there are likely more variables for the cause of the code blue.

We found that patients aged 34 and older with an ESI level of 1, 2, or 3 had a reduced risk of code blue events when Care Everywhere documents were present. For younger patients aged 18 to 33, there was a reduced risk of code blue events for ESI levels 1 and 2, while those under 18 years of age had a reduced risk for level 1.

Code Blue Event Risk with Care Everywhere Data by Age and ESI Level

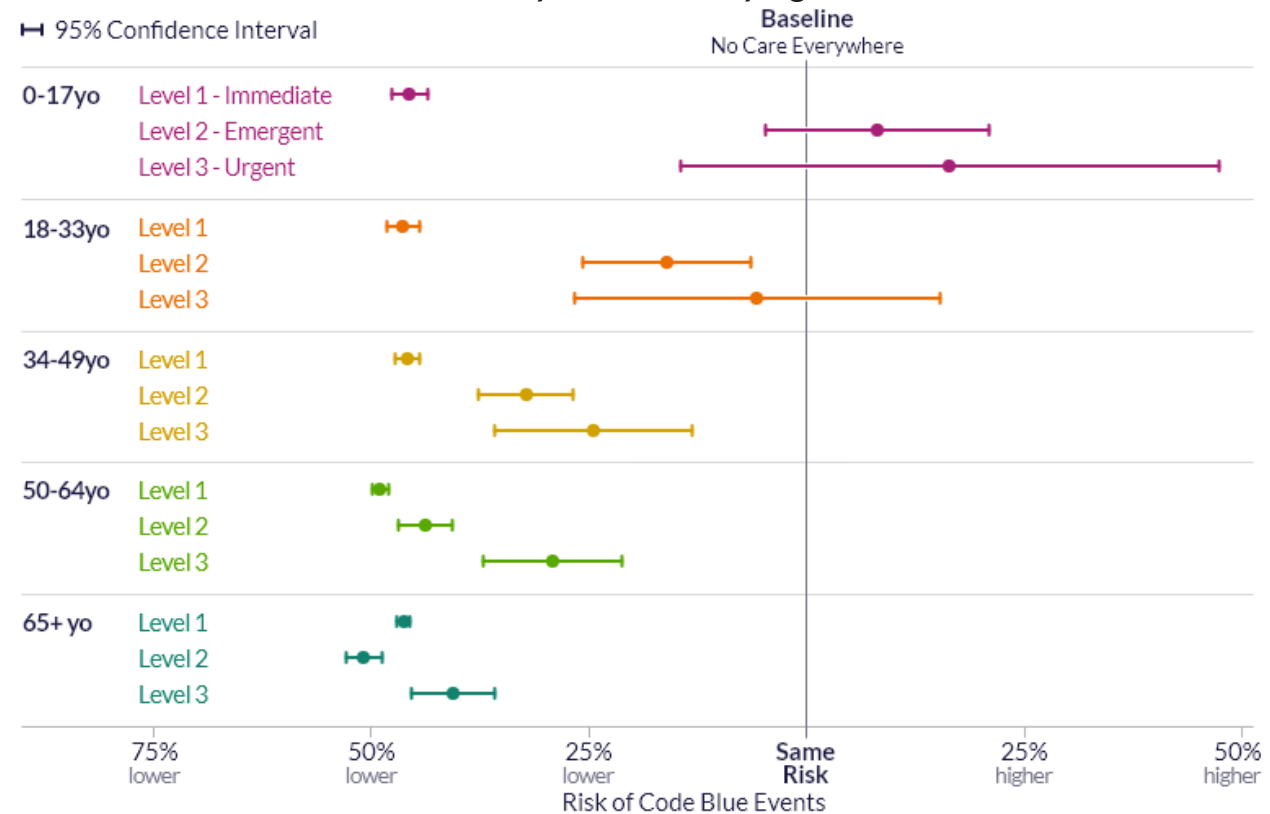


Figure 1. The relative risk of a patient having a code blue event with Care Everywhere data by age group.

We conducted sensitivity analyses to account for variables such as care received in the prior year and the volume of visits prior to the ED visit and found comparable results. In addition, we studied only patients with a minimum of five years of data in Cosmos.

These data come from Cosmos, a collaboration of 236 Epic health systems representing more than 227 million patient records from 1,301 hospitals and more than 28,600 clinics from all 50 states and Lebanon. This study was completed by two teams that worked independently, each composed of a clinician and research scientists. The two teams came to similar conclusions. Graphics by Brian Olson.

References

1. ENA's Triage Offerings. ENA University. <https://www.ena.org/enau/educational-offerings/triage>. Accessed January 2, 2024.
2. McHugh M, Tanabe P, McClelland M, Khare RK. More patients are triaged using the Emergency Severity Index than any other triage acuity system in the United States. *Acad Emerg Med*. 2012;19(1):106-109. doi:10.1111/j.1553-2712.2011.01240.x
3. Everson J, Kocher KE, Adler-Milstein J. Health information exchange associated with improved emergency department care through faster accessing of patient information from outside organizations. *J Am Med Inform Assoc*. 2017;24(e1):e103-e110. doi:10.1093/jamia/ocw116

Data Definitions

Term	Definition
Study period	1/1/2017 to 10/1/2023
Study population	Patients with an ED encounter during the study period with their latest address within the United States.
Emergency Severity Index (ESI) Level	Level 1 - Immediate, life-saving intervention required Level 2 - High risk of deterioration Level 3 - Stable, with multiple types of resources required Level 4 - Stable, with only one type of resource required Level 5 - Stable, with no resources required
Outcome	Patients who had a code blue event, identified by the documentation of a Code Start event when a patient is first non-responsive.

Table 1: Code Blue Event Risk with Care Everywhere Data by Age and ESI Level

Age Group	ESI Level 1 Relative Risk	Margin of Error	ESI Level 2 Relative Risk	Margin of Error	ESI Level 3 Relative Risk	Margin of Error
0-18yo	0.54	0.02	1.08	0.13	1.16	0.31
18-34yo	0.54	0.02	0.84	0.10	0.94	0.21
34-50yo	0.54	0.01	0.68	0.06	0.76	0.11
50-65yo	0.51	0.01	0.56	0.03	0.71	0.08
65+yo	0.54	0.01	0.49	0.02	0.59	0.05