

Tracing the Last Mile

Following sepsis patients from first encounter to final outcome — mapping every turn, every pathway, every point where the journey could have gone differently.

7,225

PATIENTS

647

DEATHS

9.0%

FATALITY RATE

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Tracing the Last Mile

Introduction

The Sepsis Equation

Explorative data analysis

The Mortality Pathway

Patient journey mapping

The Numbers Don't Lie

Stats & recommendations

The Sepsis Equation

Cumulative ED Deaths by Condition

Bar chart race — watch conditions accumulate over time.



Mar 2022

Fatality rates are climbing

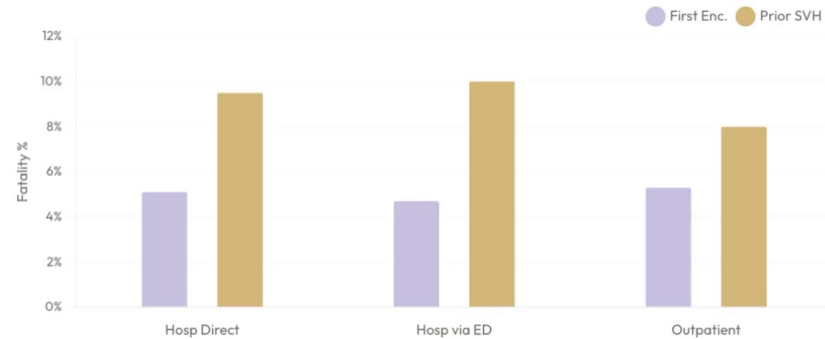
Volume stable while fatality tripled from ~4% to 20% since 2022.



Finding: Fatality rising independent of volume — systemic issue.

Prior SVH dies at 2x the rate

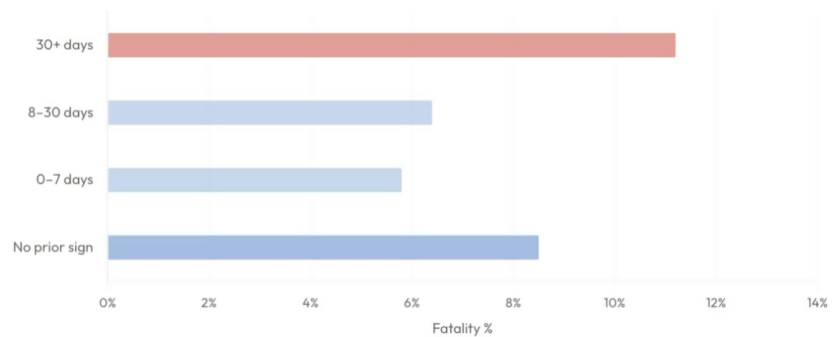
Prior SVH: 8–10% fatality. First encounter: 4.6–5.3%.



Finding: Prior encounter history is a strong mortality predictor.

Late detection doubles fatality

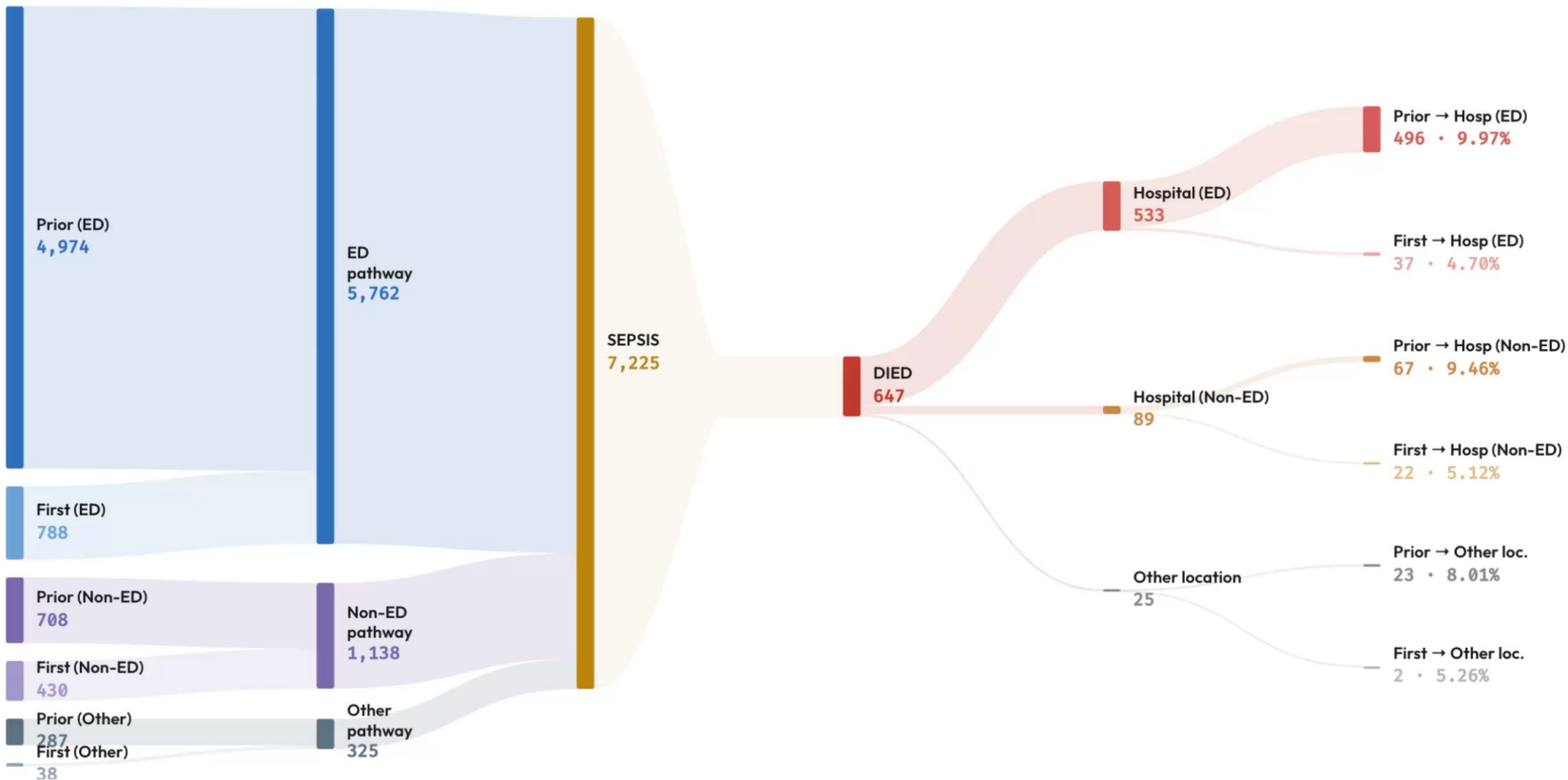
30+ days: 11.2%. Early (0–7 days): 5.8%.



Finding: Early detection halves fatality. Better screening needed.

The Mortality Pathway

Tracing 647 deaths to their source



The Numbers Don't Lie

HYPOTHESES

H_0 Null

No association between patient classification and sepsis survival.

H_a Alternative

Association between patient classification and sepsis survival.

CONDITIONS

- ✓ Representative census · $n = 7,225$
- ✓ Independent observations
- ✓ Large groups · $n_1 = 5,762$ · $n_2 = 1,138$
- ✓ Min expected freq $E = 112 > 5$

Reject H_0 · $p < 0.001$

95% confident prior SVH patients have **2.13x higher odds** of fatal sepsis. Current screening protocols **fail to catch sepsis early** in existing accounts.

PEARSON'S CHI-SQUARED TEST

30.55

χ^2 STATISTIC

< 0.001

P-VALUE

1

DF

0.05

α LEVEL

ODDS RATIO

586 / 5,383

PRIOR SVH

0.1089

61 / 1,195

FIRST ENCOUNTER

0.0511

2.13x

PRIOR SVH → 2.13x HIGHER ODDS OF DEATH

RECOMMENDATIONS

- 1 **Enforce CMS SEP-1 compliance** — lactate, blood cultures, and broad-spectrum antibiotics within 3 hours. Every hour of delay increases mortality by 4–9%.
- 2 **Automated sepsis screening** for all returning patients at admission — Prior SVH accounts have 2.13x higher odds of death yet aren't flagged.
- 3 **Early diagnosis protocols** — sepsis must be caught within 0–7 days of first signs. Late detection (30+ days) doubles fatality.
- 4 **ED-specific sepsis pathways** — 82.4% of deaths occur in ED hospitals. Deploy FDA-cleared screening tools where volume is highest.
- 5 **Quarterly fatality audits** — fatality rate has quadrupled since 2022 while volume stayed flat. This demands an immediate operational review.

ALSO VALIDATED

Same Chi-Squared test applied to two more conditions — consistent pattern:

Ulcers

Prior SVH patients admitted with ulcers face significantly higher complication and mortality rates.

Kidney Failure

Returning kidney failure patients show the same gap — existing records don't translate to earlier intervention.

The pattern is **not unique to sepsis** — it's a systemic screening failure across conditions.