

# AUTOMATABLE ELECTRONIC RISK PREDICTION OF MRSA IN SEPSIS: secondary analysis of the ACORN trial

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## INTRODUCTION

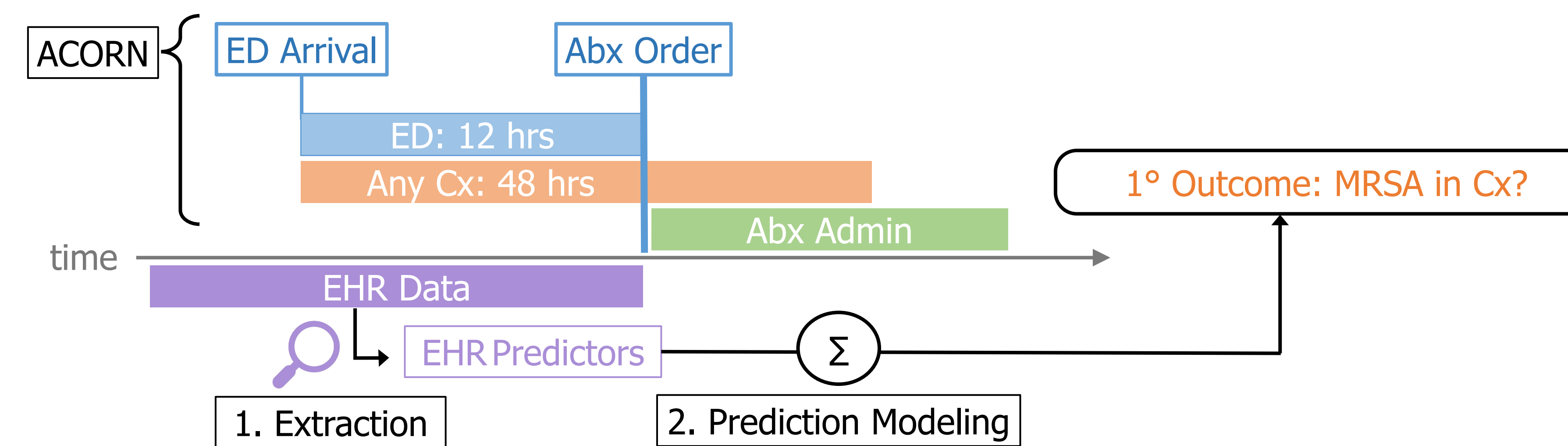
1. Antibiotic coverage for MRSA (methicillin-resistant *staph aureus*) is common (50-70%) in sepsis
2. Overuse & underuse of MRSA coverage are associated with increased mortality in sepsis
3. Risk stratification in clinical decision support has improved outcomes in pneumonia, but manual input limits usability

**Aim:** Derive EHR-based risk prediction model for MRSA

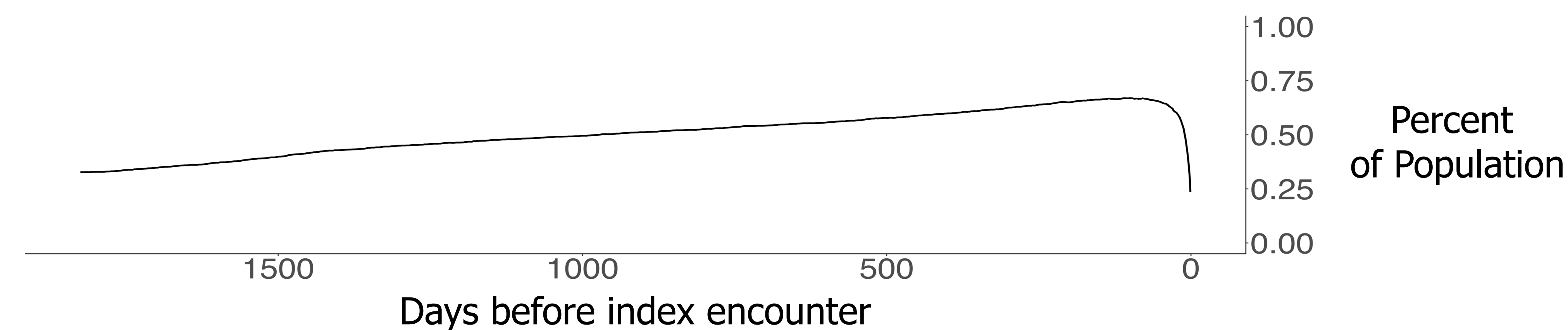
## METHODS

1. Pragmatic selection of target cohort using ACORN trial, a completed RCT.
  - VUMC ED + Culture + Antibiotic
  - Outcome: MRSA in culture
2. Extract potential predictors from structured EHR data (Clarity)
3. Summarize missingness of predictors in EHR data
4. Derive risk model [ongoing]
  - Features *a priori* & PCA (30 dF)
  - Logistic regression
  - Internal validation bootstrap

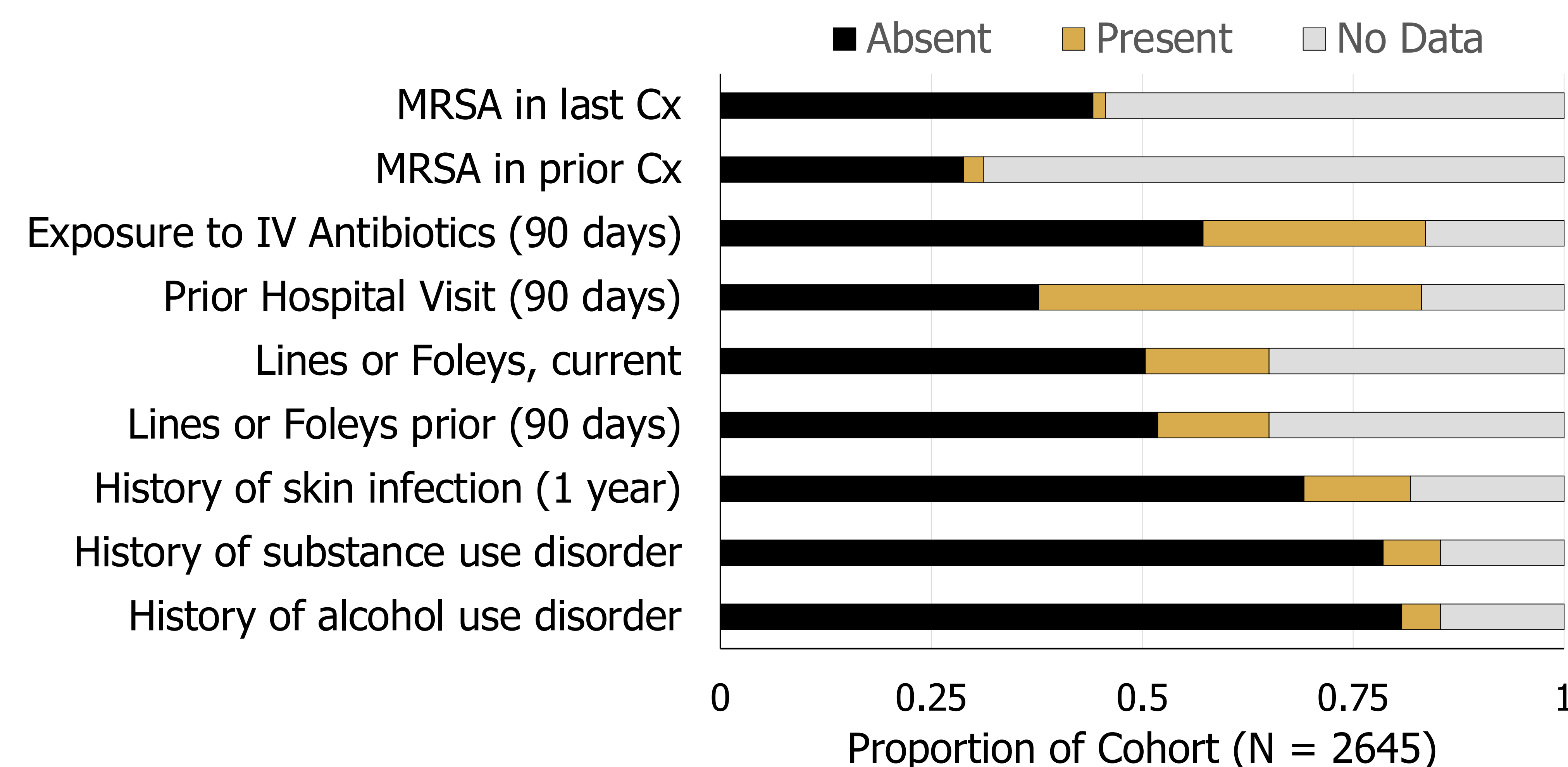
**Figure 1.** Analysis of the ACORN trial to derive a MRSA risk model



**Figure 2.** Density of prior encounters in the ACORN cohort



**Figure 3.** Missingness of key EHR Predictor variables

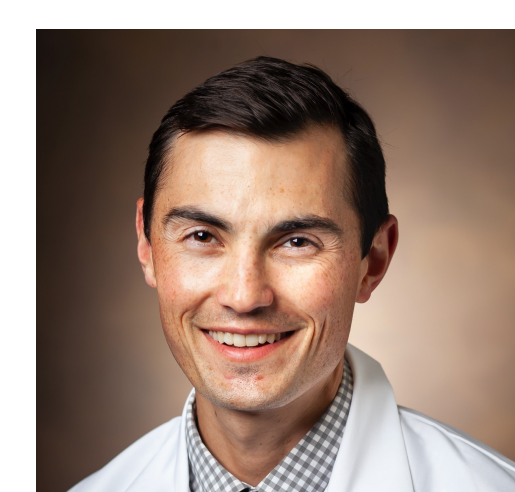


**Table 1.** Demographics

Characteristic	Cohort (N = 2510)
Age, years	58 (43, 69)
Sex	
Female	1071 (42.7)
Male	1439 (57.3)
Race & ethnicity	
Black, non-Hispanic	399 (15.9)
Hispanic	132 (5.3)
White, non-Hispanic	1863 (74.2)
Other	56 (2.2)
Sepsis	1362 (54.3)
Suspected Source	
Intra-abdominal	612 (24.4)
Lung	557 (22.2)
Skin & soft tissue	446 (17.8)
Genitourinary	244 (9.7)
Other	201 (8.0)
Unknown	451 (18.0)
Mechanical Ventilation	205 (8.2)
Vancomycin on enroll	1939 (77.3)
MRSA in Culture	150 (6.0)
≥ 1 Prior Encounter	2332 (92.9)

## DISCUSSION

1. Most patients (93%) have EHR data prior to index encounter
2. Most factors are in EHR, but some have >50% missingness
3. An EHR-based prediction model for MRSA is feasible



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