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Introduction

Hospital readmissions may impose considerable physical and psychological hardships on patients and represent a high, but possibly preventable, cost for insurers and hospitals alike.

Previous research on readmission rates among PLWH has identified the importance of the prevention of advanced HIV disease and improved management of chronic comorbid conditions.

We evaluated hospitalizations on a statewide basis which allowed us to capture readmissions across facilities rather than just within one hospital system or network.

Methods

Retrospective cohort analysis of 18,071 HIV-infected individuals admitted to NYS hospitals in 2012. We used the SPARCS* all-payer database that captures all inpatient admissions to each hospital in New York State. Admissions to psychiatric beds were included in the analysis.

Logistic regression was used to identify risk factors of hospital readmission. To provide a complementary model of hospital readmission, a recursive-partitioning algorithm was used.

* Statewide Planning and Research Cooperative System, NYS DOH

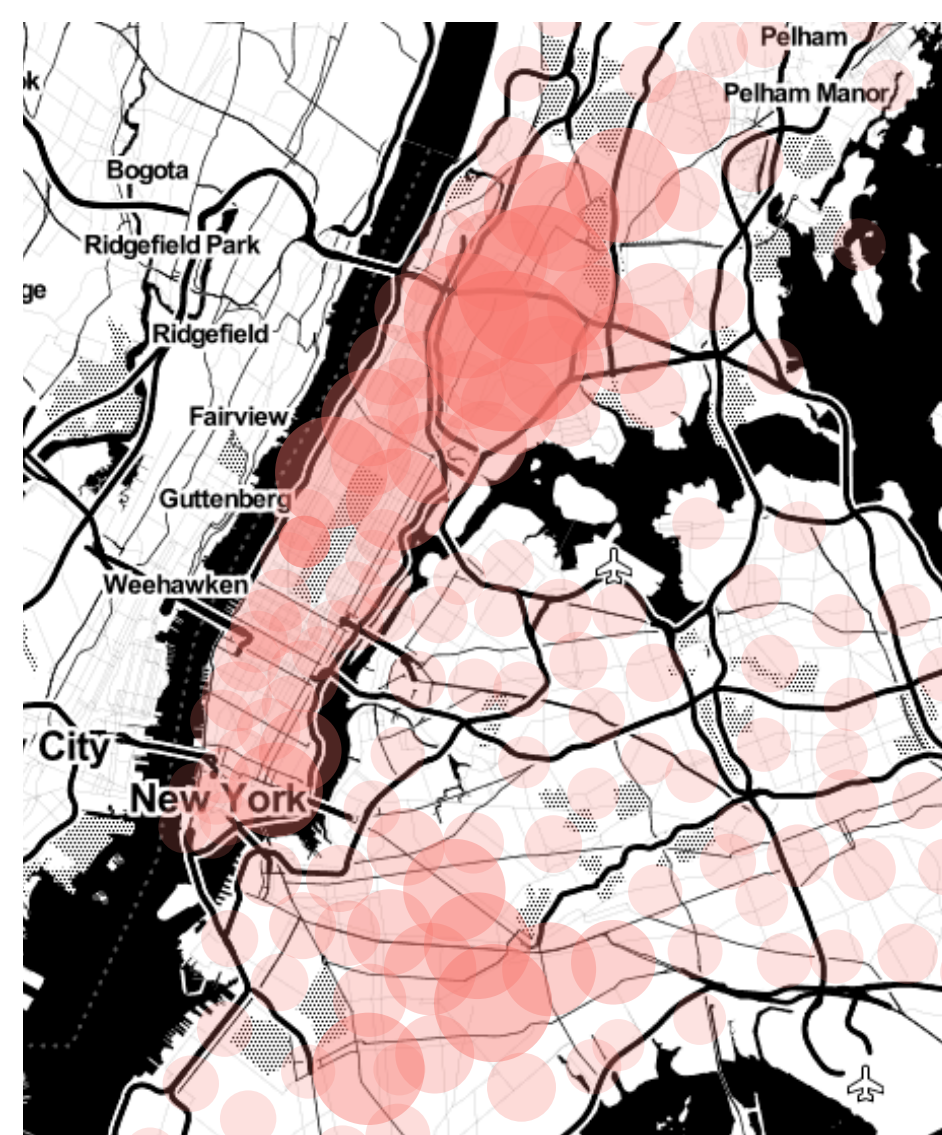
Study Population

18,071 HIV-infected individuals who were admitted to one or more of over 150 hospitals in NY.

87.7% of patients lived in urbanized areas and more than half of all admitted patients were African-American (50.6%). The mean age of the cohort was 48.6 (SD = 12.0) and 56.4% had been diagnosed with AIDS in their lifetime. 24% were unstably housed.

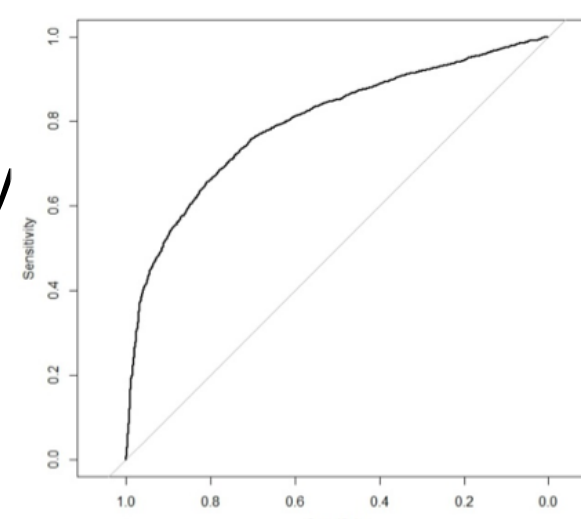
Results

25% of all hospitalized patients were readmitted.



Rates of hospitalization were highest among infected individuals living in the poorest neighborhoods in New York City and readmissions most common in the hospitals treating patients living in these neighborhoods.

Predicting which patients were readmitted at any time during the study period (AUC: 0.81; below) was easier than predicting which individual hospitalizations resulted in readmission (AUC 0.67)



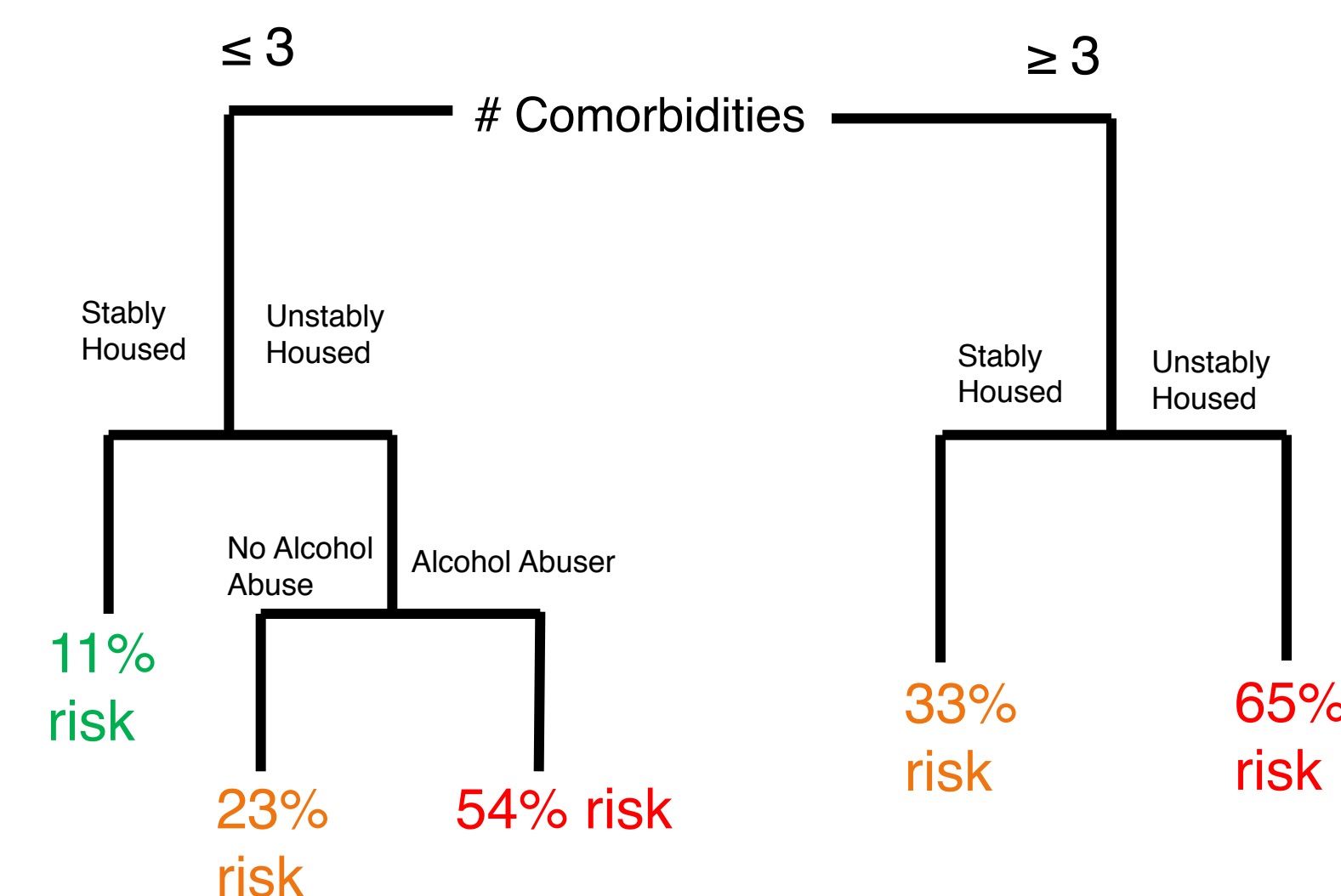
All predictors listed below were independently associated with readmission and included in the final model.

Predictors of Hospital Readmission

	Odds Ratio	Lower Limit	Upper Limit
Age	1.01	1.00	1.01
Housing Instability	2.16	1.80	2.60
Alcoholism	1.55	1.38	1.75
Drug Dependence	1.14	1.02	1.26
Depression	1.86	1.71	2.03
Left AMA	2.8	2.48	3.11
Opportunistic Infection	2.1	1.92	2.28
Diagnosed renal failure	2.24	2.03	2.50
Psychosis	1.27	1.08	1.49
# hospitalizations 2009-2011	1.05	1.04	1.06
Average Length of Stay (log)	1.57	1.48	1.67

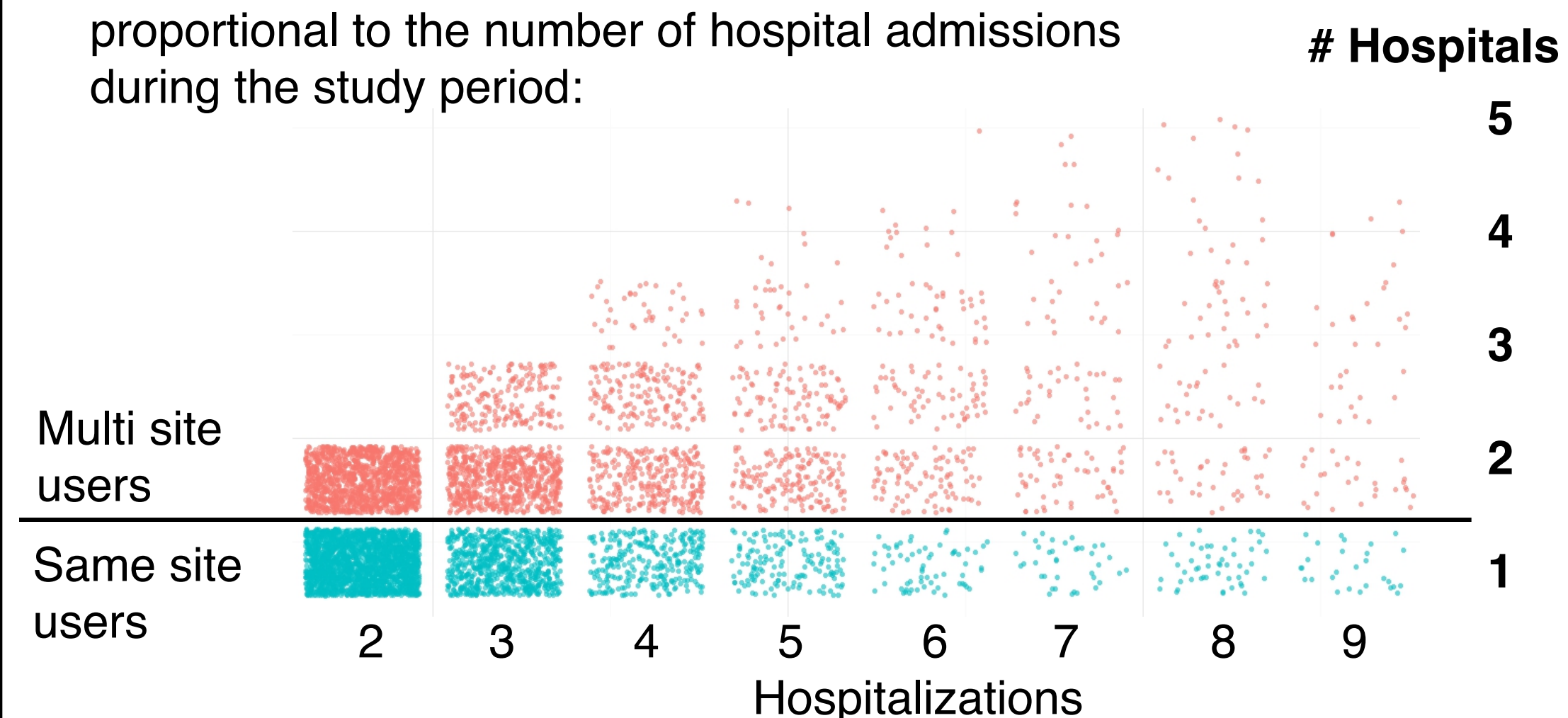
Results continued

A complementary analysis using the machine learning technique Classification and Regression Tree analysis (CaRT) generated a parsimonious model with acceptable discriminatory ability (AUC: 0.74) and posited comorbid conditions, housing stability, and alcoholism as the most important predictors of readmission.



61% of readmissions occurred to a different inpatient hospital than the one at which the initial admission occurred. This phenomenon was significantly more likely to occur in New York City than in smaller urban and suburban areas (OR = 4.5, 95% CI: 2.3 to 6.2).

The likelihood of admission to multiple facilities was proportional to the number of hospital admissions during the study period:



Conclusions

We provide strong evidence that hospitalized PLWH are at high risk of readmission and that a large fraction of readmissions in the population are driven by behavioral health disorders.

We found housing instability, having Medicaid insurance, and the recurrent utilization of inpatient facilities and emergency rooms to be predictive of readmission. Together these factors suggest socioeconomic status may be a latent variable in our analysis.

We demonstrate that PLWH with multiple chronic conditions are at an elevated risk of readmission, which may result from indirect complications of an underlying comorbidity. To improve outcomes, inpatient care and post-discharge care plans should address all comorbidities rather than only the condition that prompted admission.

Hospitals can use our results to target interventions and enhance discharge planning.

The study demonstrates that many readmissions, especially those in urban areas, occur at different facilities than that of the initial hospitalization. Such fragmentation likely compromises the quality of care as critical clinical information is often incompletely transmitted.

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