

Alleviating Bias In Trauma Patient Disposition Using Intepretable Machine Learning



Understanding the Problem 80,000 Difficulty **Heterogeneity** Alleviating of Prediction Of Problem **Bias** Penetrating Trauma Patients Blunt Trauma Patients Penetrating Trauma Patients 60000 400000 50000 800,000 300000 40000 30000 200000 20000 100000 10000 Post Acute Care Home Post Acute Care **Blunt Trauma Patients** labe

Objectives To Acheive



More On Alleviating Bias

CLINICAL ARTICLE

Racial and ethnic disparities in discharge to rehabilitation

INS

25

20

15

10

5

0

following traumatic brain injury

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Percentage Of Patients Sent To Post Acute Care White Patients Black/African American Patients



1. Patient subpopulation restricted to white and black/african american patients with **penetrating** trauma injuries

MGH

1811

- 2. Post Acute Care referring to trauma rehabilitation centers
- 3. About 21.3% of white patients go to post acute care, whereas only 12% of black/african american patients do

[1.2485491430340205]

0.8499560261796425

[0.6943729170161362]

0.5699586510388394

[0.4709393814371482]

-0.2954444030700134

0.35176743080032785

-0.459858018719167371

-0 47151780583665454

[-0.47524147327862876]

[-0.8741469675194106]

Exploratory Data Analysis



Methods & Considerations



post acute care

Head_severity_5.0 eddisp_Intensive Care Unit (ICU) Head_severity_4.0 Face_severity_3.0 Head_severity_0.0 Spine_severity_5.0 Face_severity_4.0 rtension medication Head_severity_3.0 urrent smoke Neck_severity_4.0 pulse1 gcstot1_3 Lower Extremity severity 3. Head_severity_4.0 per Extremity severity gender_Male Head_severity_0.0 gender Female Spine_severity_0.0 method of injury Penetrating - Stab Wound method of injury Penetrating - Gunshot Wound Head_severity_1.0 Neck_severity_0.0 Upper_Extremity_severity_1.0 Pelvis Perineum severity 4.0 -1.0-0.5 0.0 0.5 1.0 1.5 2.0 2.5

Shapley plots and feature coefficients to identify pertinent features in trauma patient disposition. Also used to inform weighted severity metric for the fairness adjustment model, where we rank the relative importance of varying severities of different injuries



Final Model Results

percentages are markedly higher