



Exploratory Analyses of Factors Associated with Discharge Home after Acute Spinal Cord Injury Inpatient Rehabilitation



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Abstract

Research Objective(s): To examine the influence of focal demographic and injury characteristics typically associated with health disparities (race/ethnicity, sex at birth, and insurance status) on rates of discharge home after acute inpatient rehabilitation (AIR) among individuals with traumatic spinal cord injury (tSCI).

Design: Retrospective review with a query from the Uniform Data System (UDS) from 2008-2020 that included race, Hispanic ethnicity, age, sex at birth, zip code, insurance, time from injury, Case Mix Group (CMG), diagnosis, length of stay, functional independence measure (FIM) total score, and discharge setting.

Setting: Acute Inpatient Rehabilitation

Participants: Eight hundred and fifty-nine adults with tSCI admitted to AIR from 2008-2020.

Main Outcome Measure(s): Discharge disposition (i.e., home vs. alternate setting)

Results: Discharge to home rates were similar among males (81.7%) and females (82.4%; $p=.85$). Discharge to home rates were also not significantly different among non-Hispanic white compared to individuals of other race/ethnicity (80.6% vs. 81.1%, $p=.52$). Several logistic regression models were conducted to explore the influence of focal predictors on rates of discharge home; sex at birth and race/ethnicity were not significantly associated with disposition. In the insurance model, worker's compensation (odds ratio [OR]: 0.44, $p=.026$) and CMG D membership (OR: 0.50, $p=.024$) were associated with lower odds of discharge home, while greater total FIM at discharge (OR: 1.06, $p<.001$) and longer length of AIR (OR: 1.06, $p<.001$) were associated with increased probability of discharge home. Within the sex at birth model, greater total FIM at discharge (OR: 1.06, $p<.001$), longer length of AIR (OR: 1.01, $p<.001$), as well as CMG B assignment (OR: 1.92, $p=.044$) were found to significantly increase the probability of discharge to home. Conversely, CMG D assignment (OR: 0.49, $p=.019$) was associated with decreased probability of discharge home. The race/ethnicity model similarly suggested greater FIM at discharge (OR: 1.06, $p<.001$) and longer length of AIR (OR: 1.06, $p<.001$) were associated with increased probability of being discharged home; conversely, older age at admission (OR: 0.99, $p=.021$) and CMG D membership (OR: 0.48, $p=.018$) were associated with lower odds of discharge home.

Conclusions: Although sex and race/ethnicity were not significant factors associated with disposition location in this cohort, worker's compensation insurance was associated with lower rate of discharge to home. This study also identified several factors (i.e., length of AIR stay, FIM total score, CMG, and age) were significantly related to the discharge location for individuals with tSCI. Further work should be done to better understand disparities in rehabilitation outcomes, including the influence of worker's compensation as a rehab payor.

Participant Characteristics

Participant Characteristics	Descriptive Statistics
Sociodemographics	
Male sex, n (%)	671 (78.1)
Age at admission, mean (SD)	44.5 (19.5)
Regional Median Home Income (RMHI), median [IQR]	\$66,041 [\$49,345; \$85,864]
Type of insurance	
Government, n (%)	359 (41.8)
Commercial, n (%)	391 (45.5)
Workers' compensation, n (%)	82 (9.5)
No insurance, n (%)	21 (2.4)
Race/Ethnicity	
White Non-Hispanic, n (%)	417 (48.5)
Hispanic, n (%)	171 (19.9)
Asian Non-Hispanic, n (%)	136 (15.8)
Black, n (%)	52 (6.1)
Unknown, n (%)	83 (9.7)
Injury Characteristics	
FIM admission, median [IQR]	49 [45, 62]
FIM discharge, median [IQR]	77.5 [56.0, 98.3]
CMG	
A (no comorbidities), n (%)	379 (44.1)
D, n (%)	100 (11.6)
C, n (%)	217 (25.3)
B (most severe), n (%)	163 (19.0)
Length of stay (days), median [IQR]	26 [17, 35]
Discharge to home, n (%)	703 (81.8)

Table 1: Descriptive Statistics of Participant Characteristics

RESULTS

Table 2. Logistic Model Predicting Discharge to Home: Sex at Birth

	Logit	Odds Ratio	Logit Standard Error	p-value
RMHI	-0.004	1.00	0.004	0.272
FIM Total	0.061	1.06	0.006	<.001
Age	-0.010	0.99	0.006	0.117
CMG-D	-0.717	0.49	0.306	0.019
CMG-C	0.253	1.29	0.304	0.405
CMG-B	0.651	1.92	0.323	0.044
Sex at Birth	0.297	1.35	0.239	0.214
Days from injury	0.016	1.02	0.012	0.176
Length of Stay	0.057	1.01	0.012	<.001

Table 2: CMG reference is CMG A and Sex at birth reference is Male. Discharge Location is coded 0 (other location) and 1 (home). Positive logit means greater odds of discharge to home; negative logit is lower odds of discharge home.

Table 3. Logistic Model Predicting Discharge to Home: Race/Ethnicity

	Logit	Odds Ratio	Logit Standard Error	p-value
RMHI	-0.006	0.99	0.004	0.118
FIM Total	0.062	1.06	0.006	<.001
Age	-0.015	0.99	0.007	0.021
CMG-D	-0.742	0.48	0.314	0.018
CMG-C	0.203	1.23	0.306	0.507
CMG-B	0.608	1.84	0.331	0.066
Hispanic	-0.414	0.66	0.273	0.129
Asian/PI NH	0.562	1.75	0.324	0.083
Black NH	-0.804	0.45	0.439	0.067
Unkown R/E	0.513	1.67	0.533	0.335
Days from injury	0.019	1.02	0.016	0.230
Length of Stay	0.058	1.06	0.012	<.001

Table 3: CMG reference is CMG A and Race/Ethnicity reference is Non-Hispanic (NH) White. Discharge Location is coded 0 (other location) and 1 (home). Positive logit means greater odds of discharge to home; negative logit is lower odds of discharge home.

Table 4. Logistic Model Predicting Discharge to Home: Insurance Status

	Logit	Odds Ratio	Logit Standard Error	p-value
RMHI	-0.005	1.00	0.004	0.221
FIM Total	0.062	1.06	0.006	<.001
Age	-0.010	0.99	0.006	0.126
CMG-D	-0.695	0.50	0.309	0.024
CMG-C	0.203	1.23	0.307	0.509
CMG-B	0.593	1.81	0.333	0.075
Government Insurance	0.075	1.08	0.229	0.742
Worker's Comp.	-0.824	0.44	0.371	0.026
No Insurance	-0.225	0.80	0.852	0.792
Days from injury	0.023	1.02	0.020	0.254
Length of Stay	0.058	1.06	0.012	<.001

Table 4: CMG reference is CMG A and Insurance reference is Commercial. Discharge Location is coded 0 (other location) and 1 (home). Positive logit means greater odds of discharge to home; negative logit is lower odds of discharge home.

- Logistic regression models were conducted to explore factors associated with discharge home.
- Race/ethnic status and sex-at-birth were not found to be significant factors associated with a discharge to home. However, worker's compensation insurance status was associated with decreased odds of discharge home.
- Higher FIM at discharge and longer length of AIR stay were generally associated with discharge home. Compared to individuals with CMG A designation, those assigned CMG D were less likely to be discharged home while those assigned CMG B were more likely to be discharged to a home setting.

RESULTS (cont.)

Figure 1: Disposition

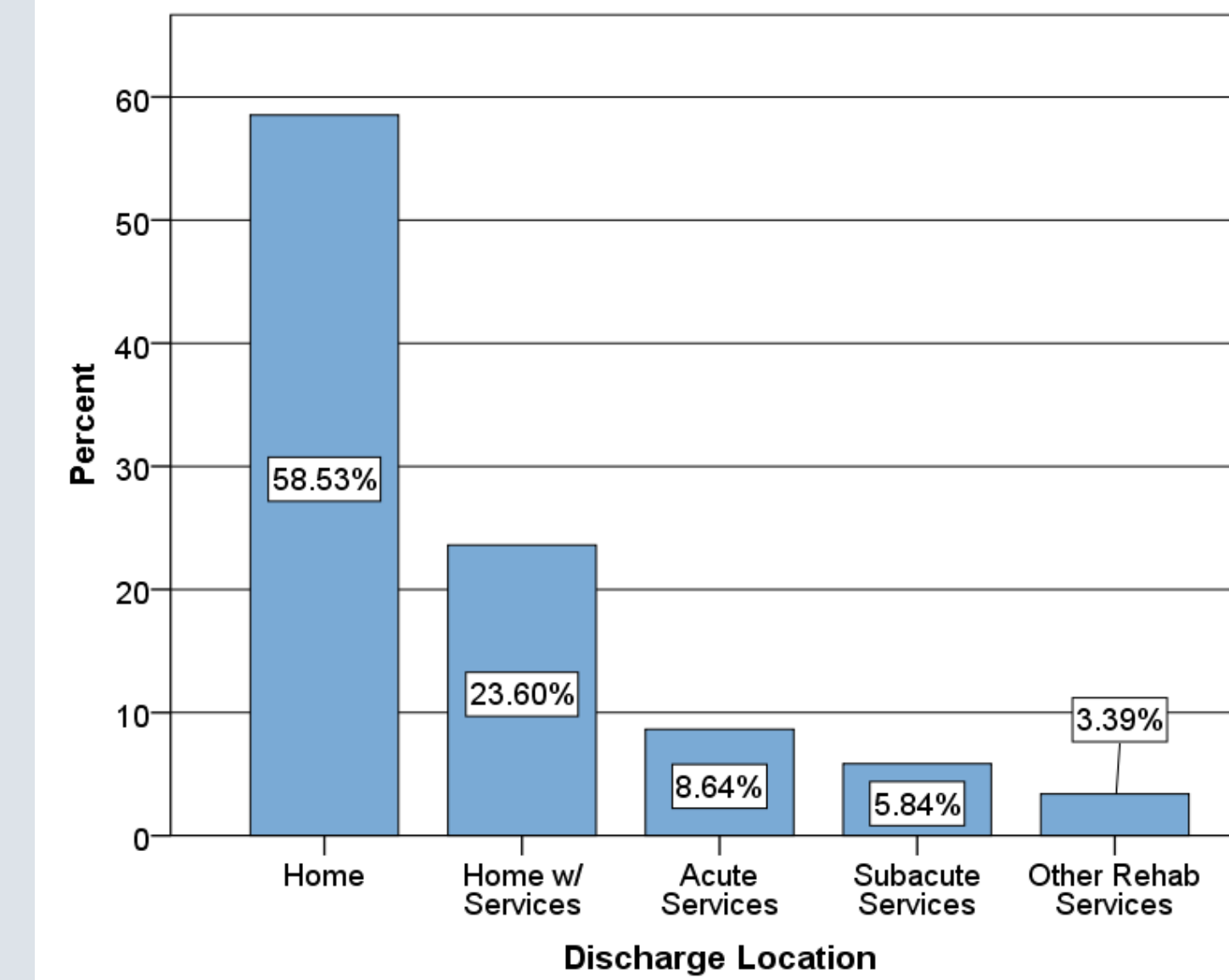


Figure 2: Disposition by Sex at Birth

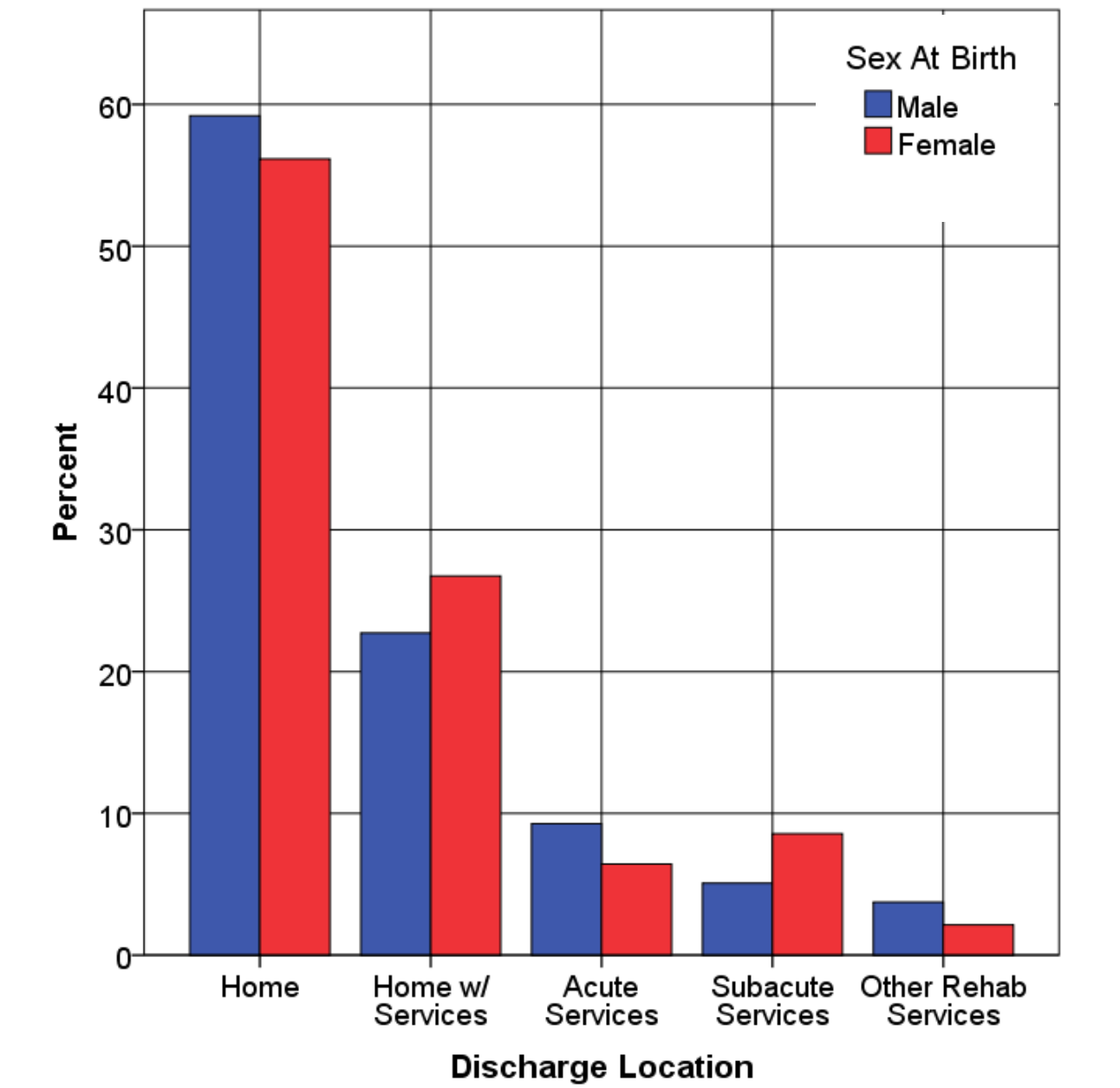


Figure 3: Disposition by Racial/Ethnic Group

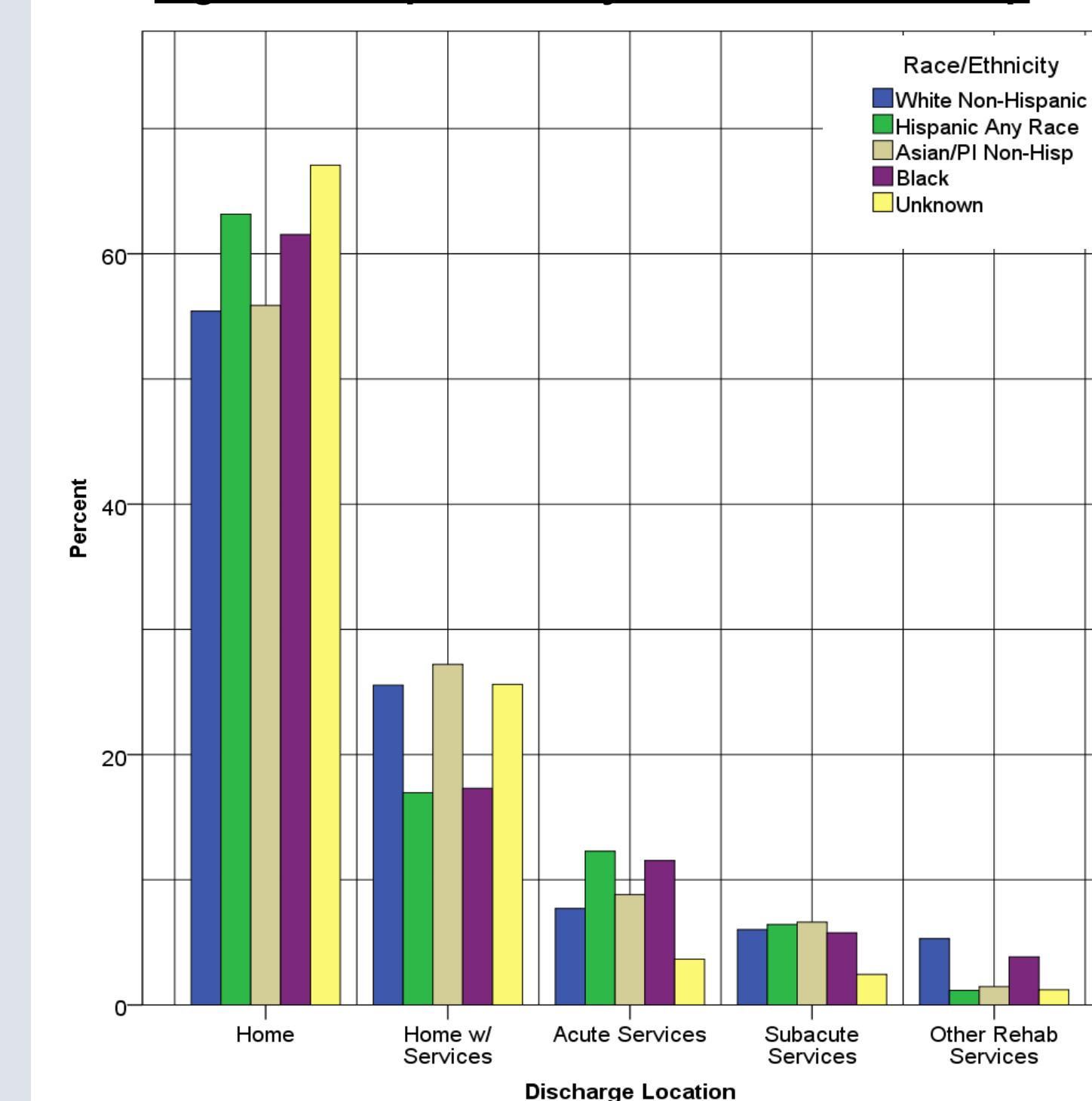
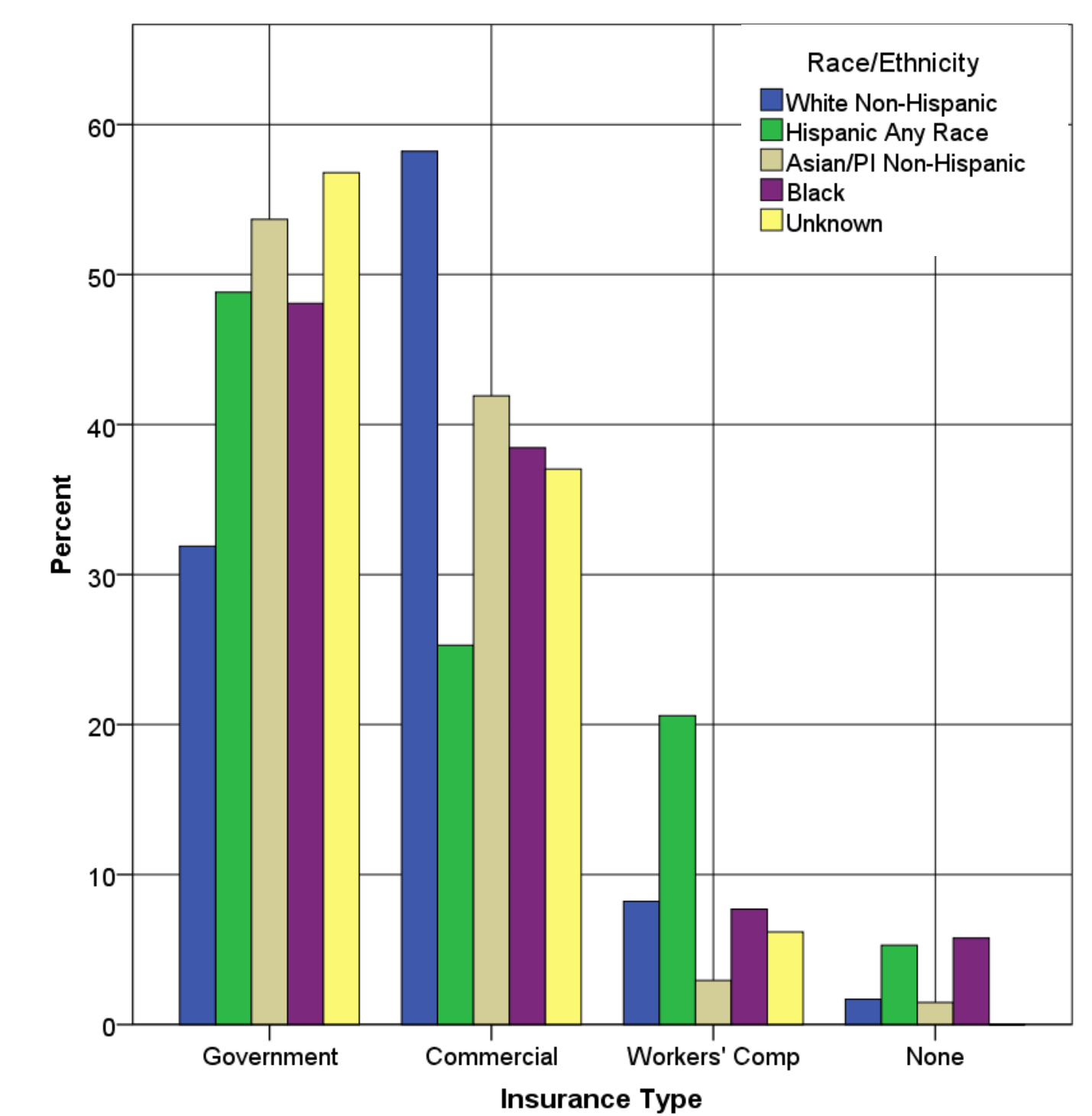


Figure 4: Insurance by Racial/Ethnic Group



CONCLUSIONS

- Disparities in AIR outcomes have been noted in the literature¹⁻⁵.
- High rates of discharge to home were observed. Accounting for several covariates, sex and ethnicity were not associated with differences in discharge to home rates. Worker's compensation was associated with lower rates of discharge home.
- This study identified length of stay, FIM total, CMG, and age as significant factors associated with discharge disposition.
- Further work should be done to better understand disparities in rehab outcomes, including the influence of worker's compensation.

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