Evaluation of socioeconomic features in patients undergoing endovascular thrombectomy

A 5- year single institution review

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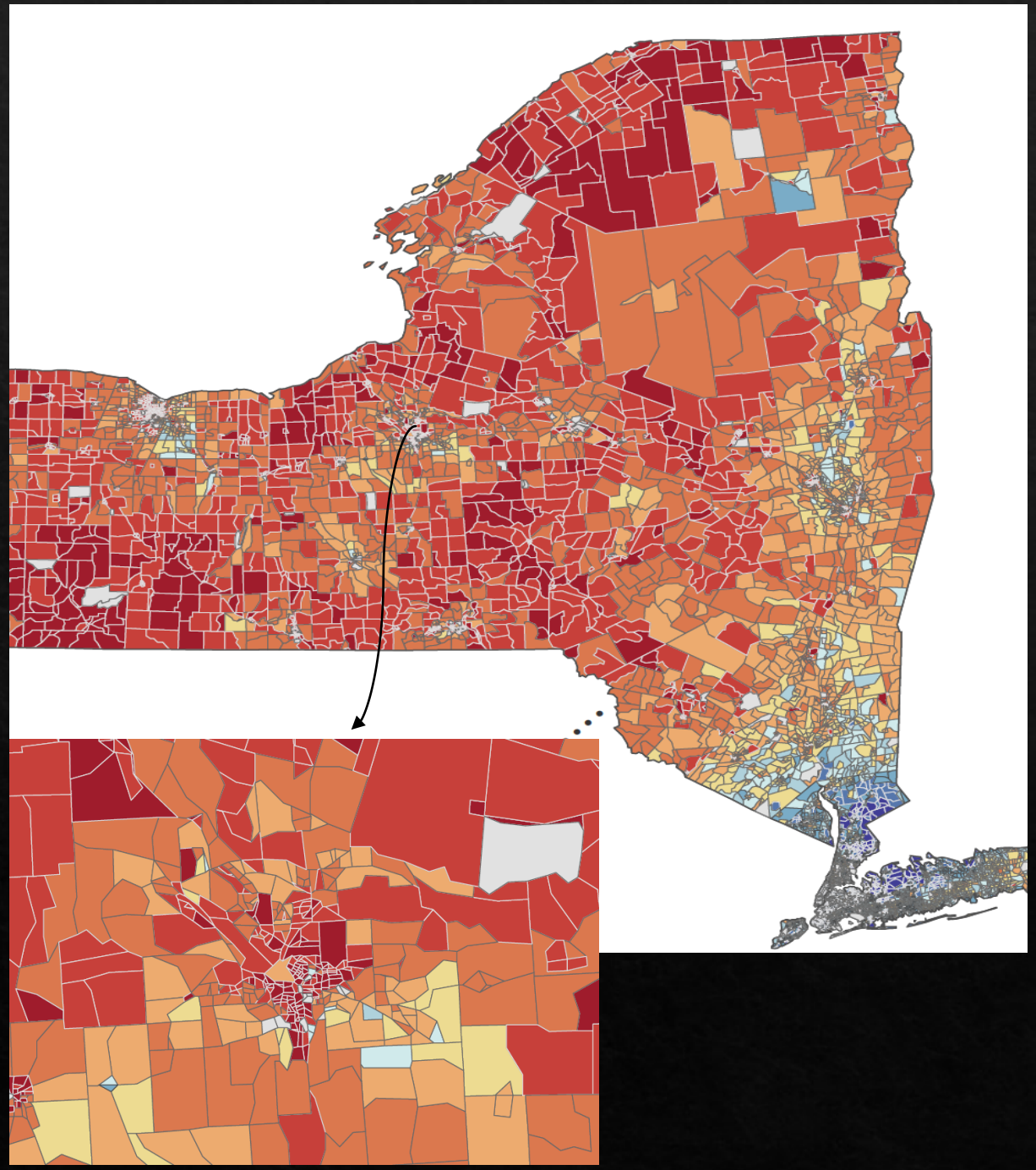


Objectives

- We aimed to determine if disparities had an impact on the outcome of endovascular thrombectomy treatments in a single center site.
- Area Deprivation Index (ADI) was used to classify a patient's neighborhood socioeconomic status (10 is highest level of disadvantage).
  - 17 census variables designed to describe socioeconomic disadvantage based on income, education, household characteristics, and housing
- Distance, Median Household Income, Gender, Race, Insurance
- Access and Quality

Stroke Dataset

- We conducted a retrospective observational analysis over 5-year study period at a comprehensive stroke center between 2016 and 2021
- Chi-square and independent sample t-test analysis were used to determine if an association exists between patient specific factors and stroke care services.
- Dataset:
  - Get with the Guidelines
  - 2016 to 2021
  - Populations included
    - Ischemic Stroke- TIA, SVO, MVO, LVO
    - Hemorrhagic Stroke: SAH and Intracerebral Hemorrhage
- Stroke team the primary source of data collection
- Primary: TICI, NIHSS post thrombectomy
- 2nd Outcome measures: mRS (0 to 6), comfort measures, Rehab and Disposition

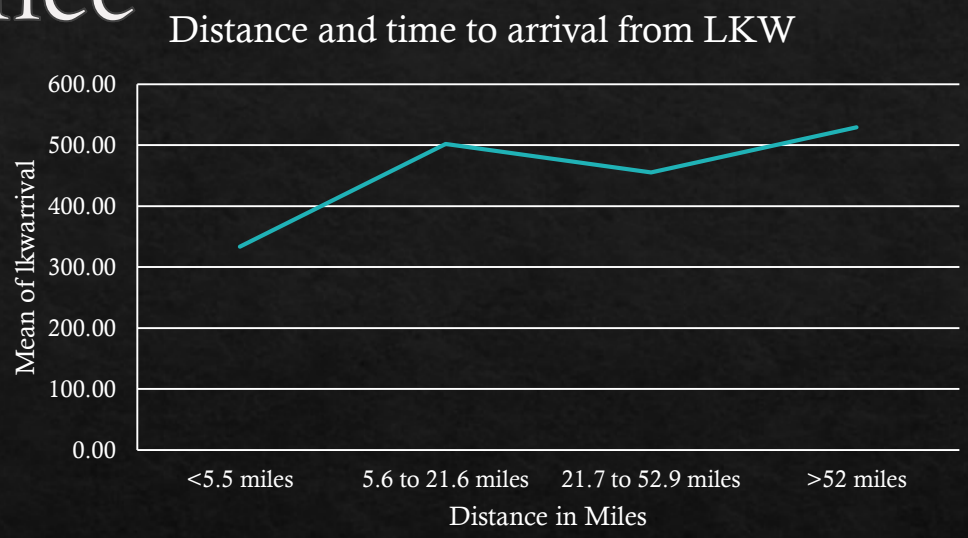
Individual-level variables	N(%)	Mean(std dev)
Age	306	70.51
Gender		
Male	145(47.4)	
Female	161(52.6)	
Race/Ethnicity		
White	276(90.2)	
Black or African-American	24(7.8)	
Asian	4(1.3)	
Asian Indian	1(0.3)	
Other/UTD	1(0.3)	
Median Household Income		58,914.49 (16,266.02)
<$30,000	3(1)	
$30,000-$59,999	154(52.9)	
$60,000-$99,999	128(44)	
>$100,000	6(2.1)	
ADI		8.77(1.02)
<9	118(40.1)	
>9	176(59.9)	
Insurance Status		
Medicare	207(67.6)	
Non-Medicare	99(32.4)	
BMI		
<18.5	8(2.6)	
18.5-24.99	87(28.7)	
25-29.99	91(30)	
≥30	117(38.6)	
HbA1c		
<5	20(7.4)	
5-7.49	222(82.2)	
7.5-9.99	20(7.4)	
≥10	8(3)	
Smoking Status		
Smoker	48(15.7)	
Non-Smoker	258(84.3)	

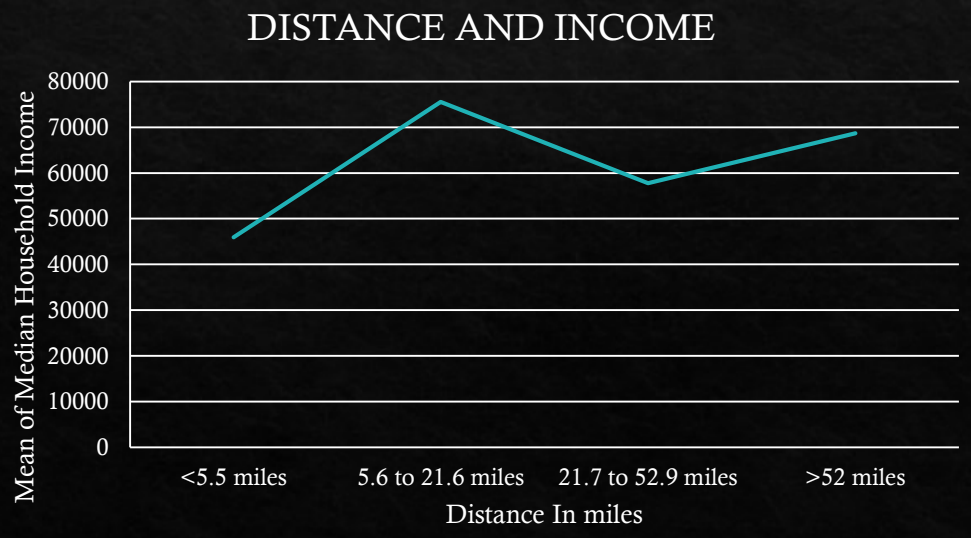
EVT

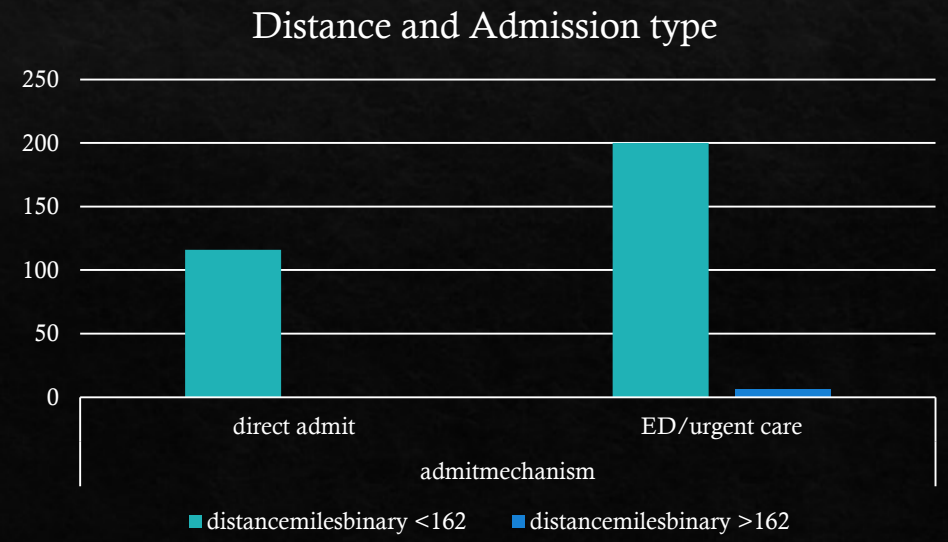
- 3555 subjects over the 5-year cohort with an ischemic stroke
- 635 subjects were diagnosed with acute large artery atherosclerosis.
- 1398 diagnosed with a Cryptogenic Stroke
- 346 with a thrombectomy between 12/2015 and 12/2021
  - 192 (55.5%) Cardioembolic
  - 86 (24.9%) Large artery atherosclerosis
  - 25 (7.2%) Cryptogenic
  - 24 (6.9%) Other
  - 6 (1.7%) Small Vessel

Distance

- Average 161.8 miles
- No impact on mRS or TICI score

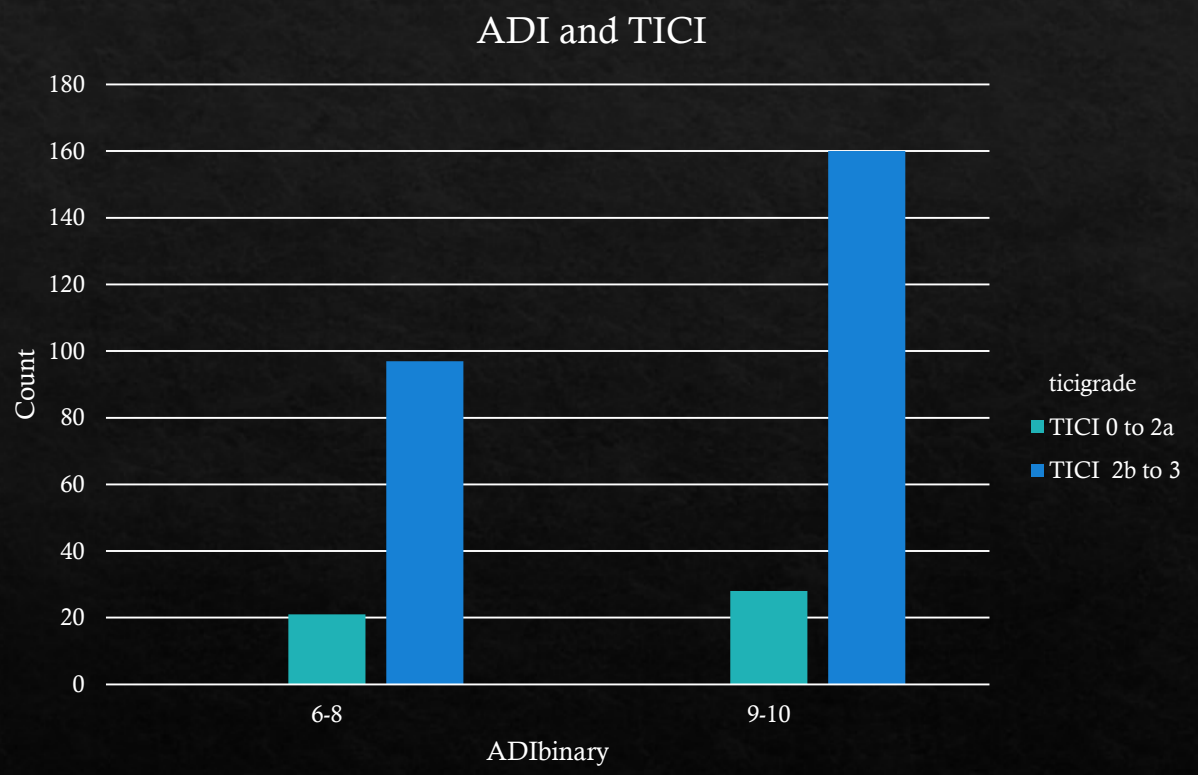






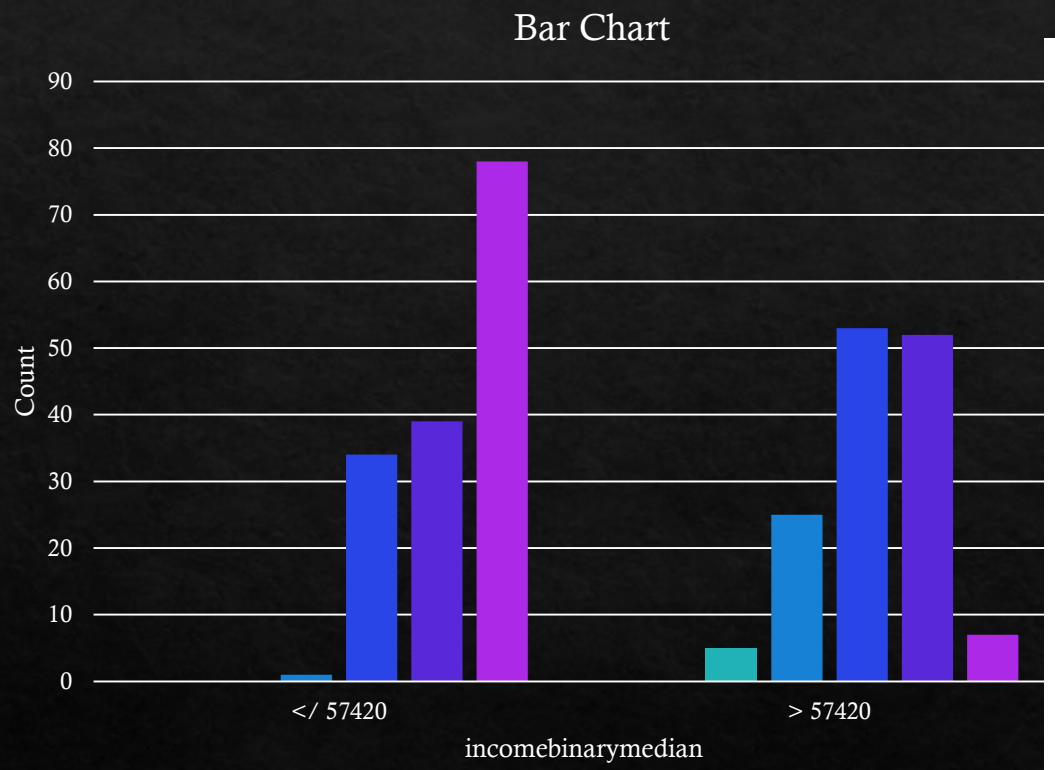
ADI

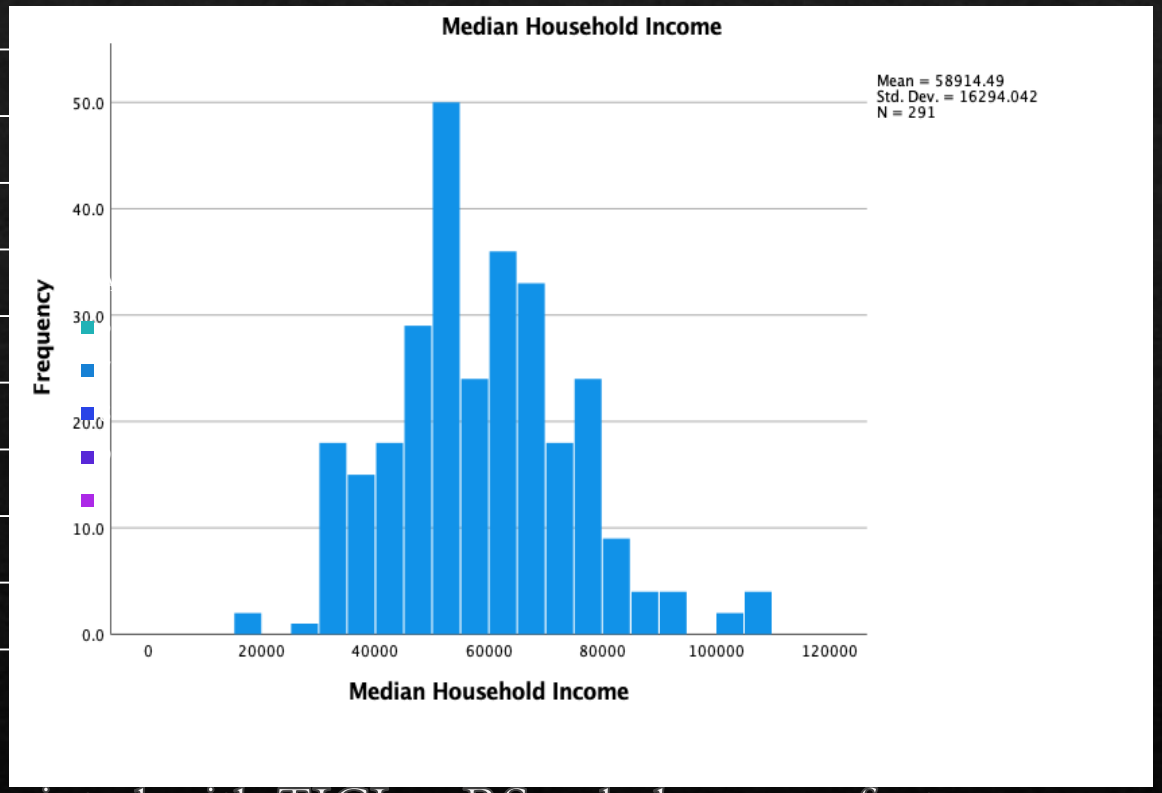
	ADI		
	6-8	**8-10**	p-value
Age	*73.9*	*68.4*	*<0.05*
Labs			
BMI	29.6	29.6	>0.05
HbA1C	6.2	6.1	>0.05
LDL	82	81.3	>0.05
Median Household Income	*69826.8*	*51417.7*	*<0.05*
Distance (miles)	*347.7*	*37.4*	*<0.05*
NIHSS admission	16.0	15.5	>0.05
NIHSS following EVT	17.6	15.9	>0.05
LKW to door	511.4	400.6	>0.05
LKW and CT Completion (mins)	410.0	325.7	>0.05
LKW and arterial puncture (mins)	780.3	507.3	>0.05
LKW and firstpass (mins)	906.2	874.6	>0.05



ADI not associated with mRS, TICI, **rehab disposition, comfort measures or LOS**

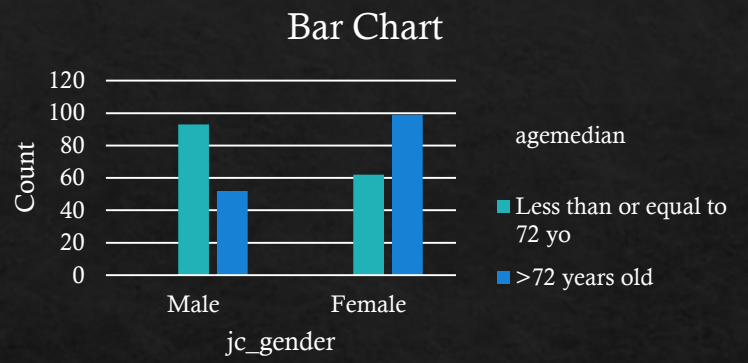
Income

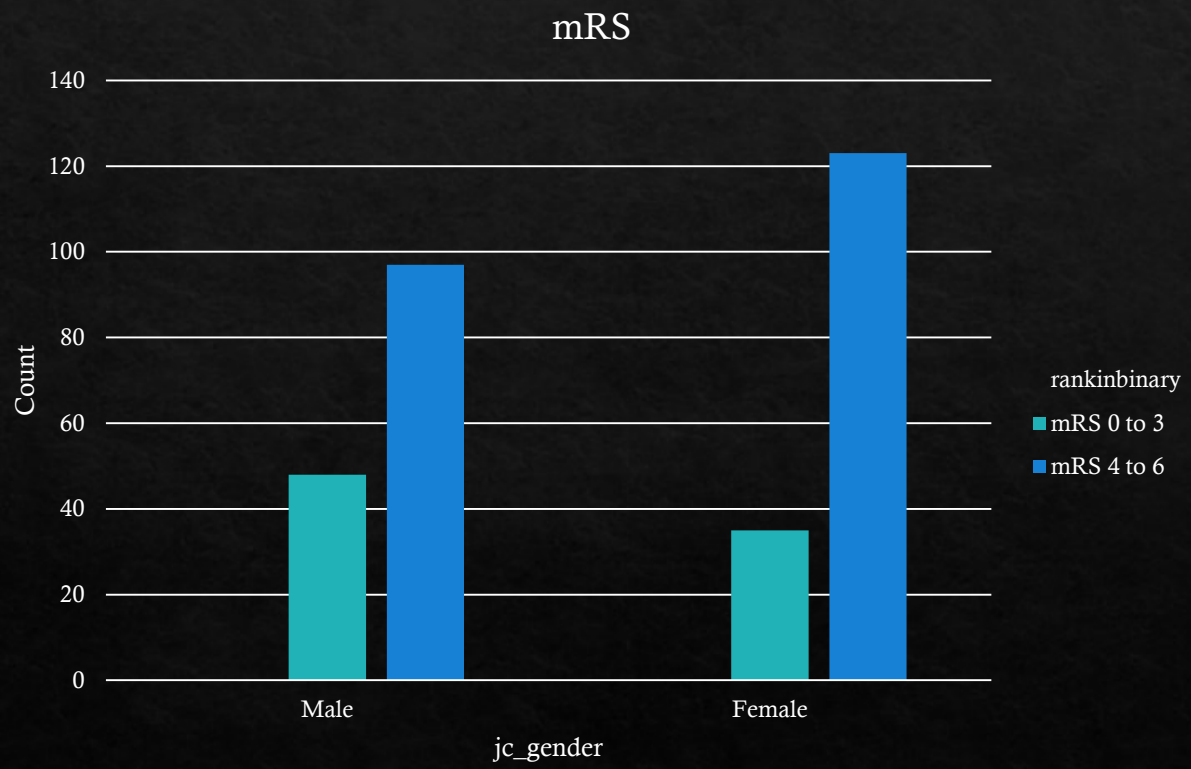




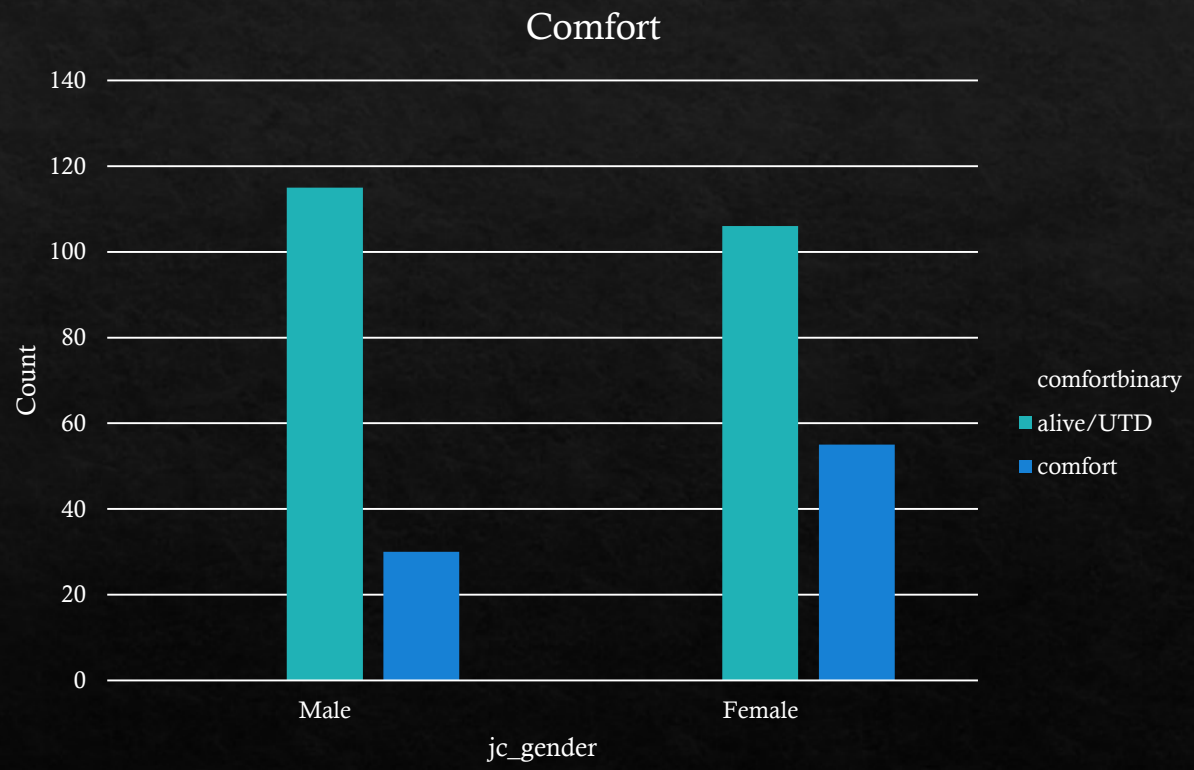
- Income as a binary variable not associated with TICI, mRS, rehab or comfort measures, or LOS
- Wasn't associated with time intervals

Gender





P<0.05



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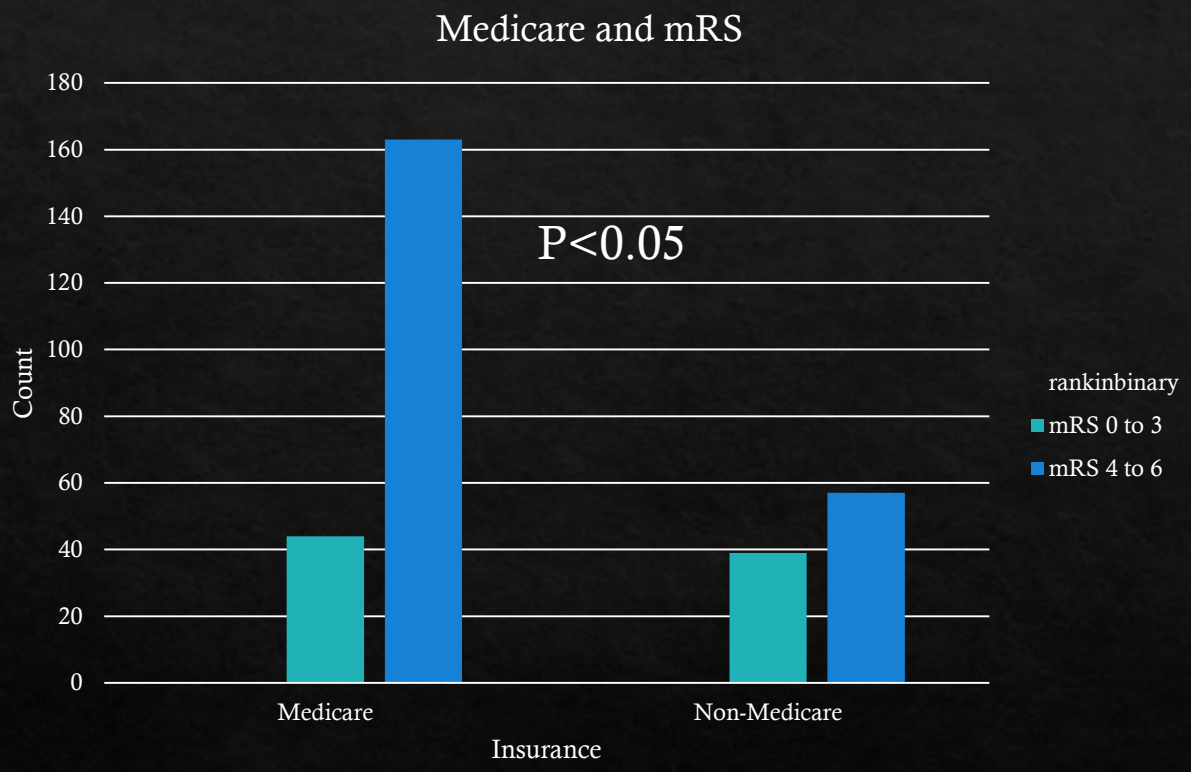
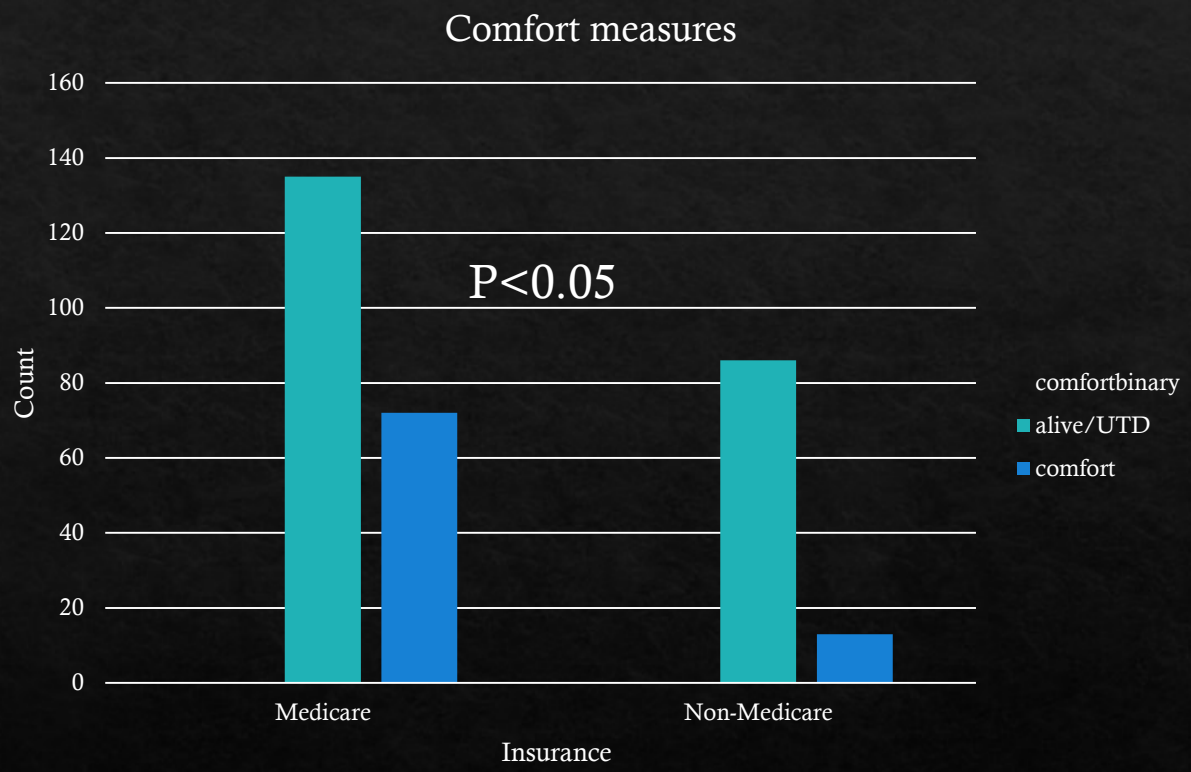
Insurance





Rehab and TICI not associated

timing

LKW → 441.3 min →

88.8min → CT

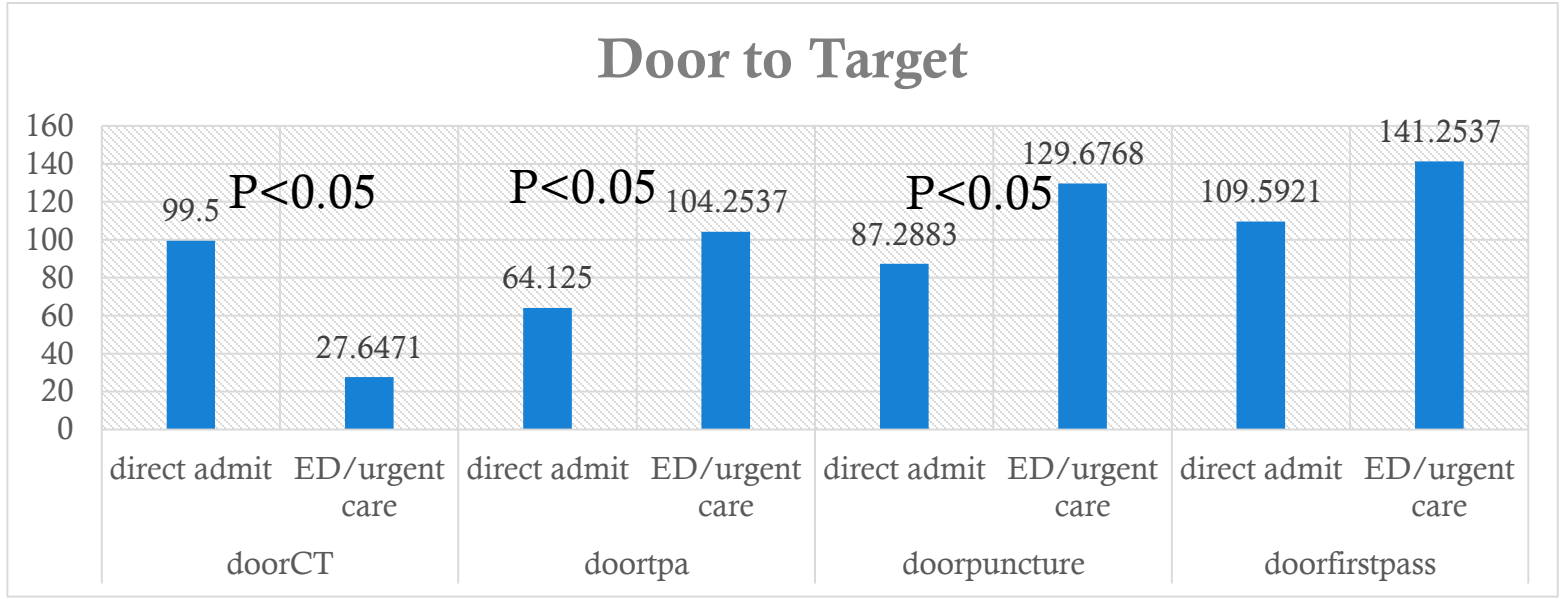
112.9min → Arterial Puncture

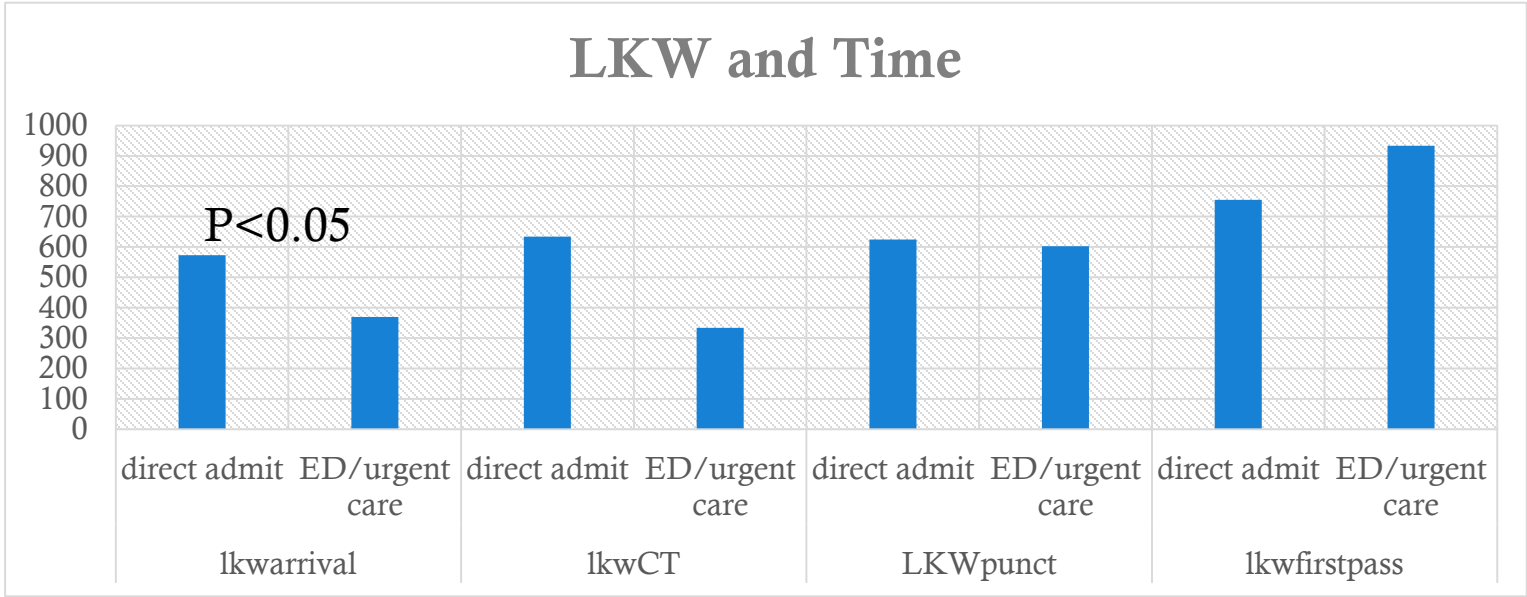
128.0 min → First pass (n=215)

Excluded inpatient cases

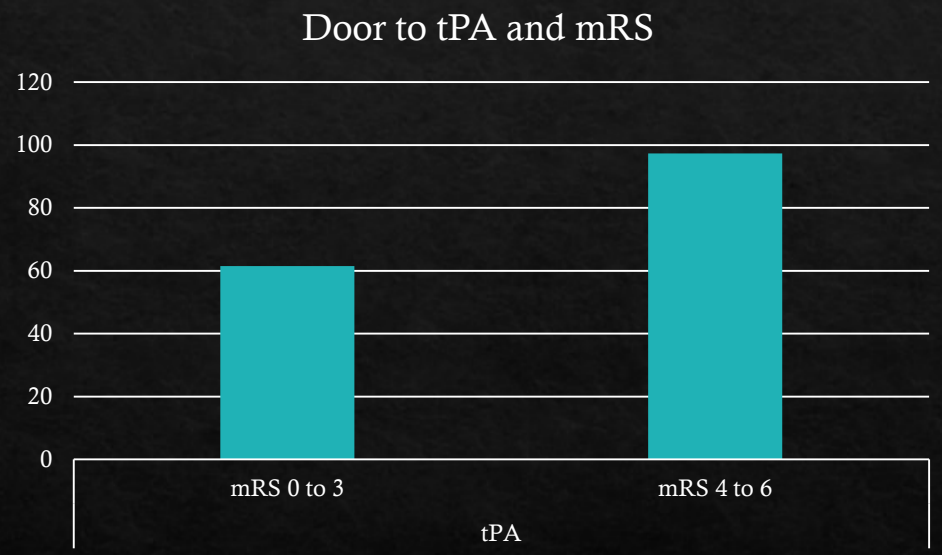
No statistical differences in time parameters for ADI, income or insurance
Lower 50% of income had relationship with direct admission
Higher 50% of income “ “ “ “ with ER

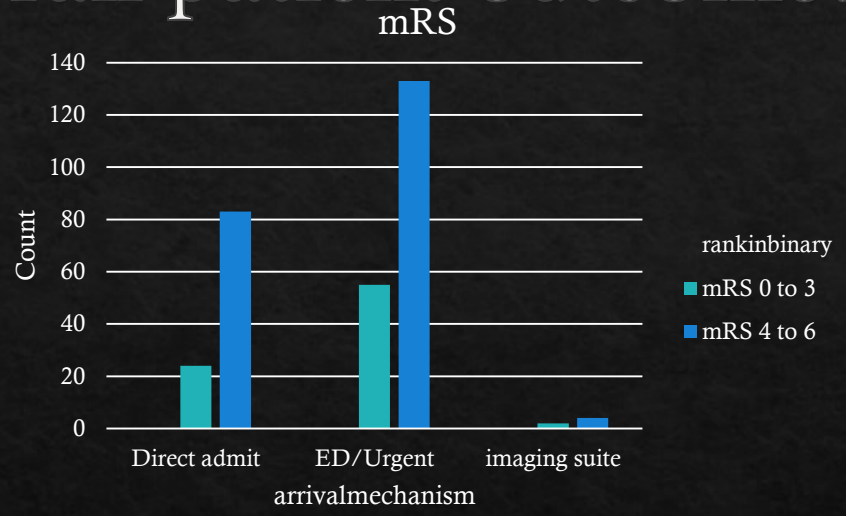
Time

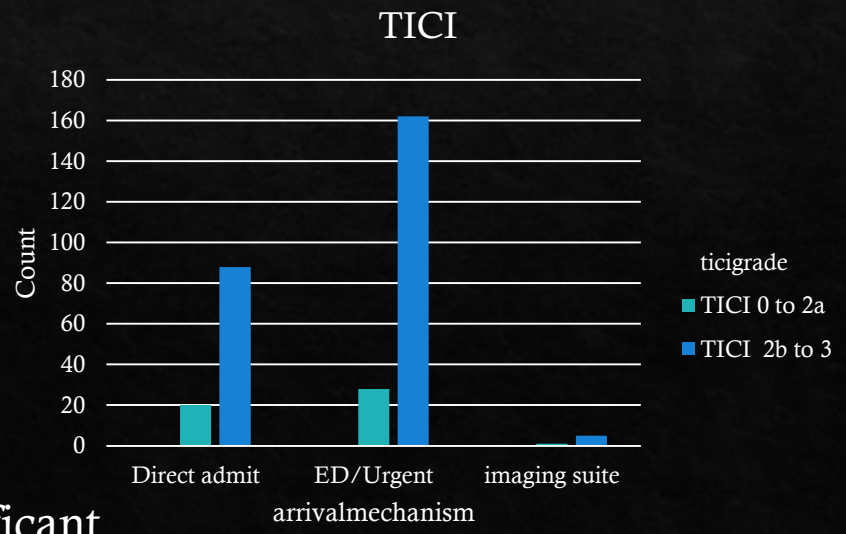

Door to Target
160
140
120
100
80
60
40
20
0
99.5
P<0.05
27.6471
64.125
P<0.05
104.2537
87.2883
P<0.05
129.6768
109.5921
141.2537
direct admit
ED/urgent care
doorCT
doortpa
doorpuncture
doorfirstpass


LKW and Time
1000
900
800
700
600
500
400
300
200
100
0
P<0.05
direct admit
ED/urgent care
lkwarrival
lkwCT
LKWpunct
lkwfirstpass

How does it influence the overall patient outcome?







Absolute terms appear different, but not statistically significant

TICI

	TICI 0 to 2a	TICI 2b to 3	p-value
Age	70.6	70.5	<0.05
Labs			
BMI	**31.3**	**28.5**	**<0.05**
HbA1C	6.3	6.1	>0.05
LDL	88.5	80.4	>0.05
ADI	8.5	8.8	>0.05
Median Household Income	60,849.6	58541.8	>0.05
NIHSS admission	14.7	15.9	>0.05
NIHSS following EVT	16.2	16.5	>0.05
Distance (in miles)	37.4	202.2	>0.05
Time LKW and CT Completion (mins)	292.4	413.9	>0.05
Time between LKW and arterial puncture (mins)	408.5	613.7	>0.05
Time between LKW and firstpass (mins)	474.2	690.0	>0.05
Time b/w firstpass/arterial puncture(mins)	24.6	41.7	>0.05

Conclusions

- We describe limited patient socioeconomic and stroke care factors associated with EVT outcome in a comprehensive stroke center with a largely socioeconomic disadvantaged population.
- Further in-depth analysis is required to elucidate the barriers to access and quality of care
- Study the discrepancy in # of patients with ischemic stroke (N=3470) who may be have otherwise been candidates for EVT is needed but didn't meet criteria
- Personal interests: Looking into SAH/ICH populations

Thank you!

Upstate Stroke team!