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## INTRODUCTION

Social determinants of health (SDH) are major, yet understudied, contributors to stroke incidence and disparities.

We aimed to provide preliminary findings on the effects of SDH on stroke severity and disability. Individual-level and ZIP/neighborhood-level SDH measures

### Transitions of Stroke Care Disparities Study (TCS-D)

- Prospective, multi-center observational stroke study in Florida.
- Aims to identify race/ethnic and sex disparities in hospital-to-home transition of stroke care.
- Determine the contribution of SDH in these disparities.
- Incorporate these results in educational initiatives and interventions.

## METHODS

### DATA COLLECTION:

- 344 patients discharged 2018-2020 from 8 stroke centers throughout Florida.
- Demographics, clinical characteristics, and individual-level SDH collected by trained interviewers.
- Publicly-available ZIP-code level SDH obtained through contracted data company.

### OUTCOMES:

- Stroke Severity upon admission: NIHSS (0-4; 5-14; ≥15)
- Stroke disability at discharge: modified Rankin Scale (mRS) (0-1; 2-5).

### SDH Measures Studied:

- **Individual-level SDH:** language, birth country, # years in USA, education, employment status, difficulty paying for basics/medical care, living alone vs. with spouse, children, etc., social support.
- **ZIP-level SDH:** % completed High school or above, % completed Bachelors degree or above, % unemployed, % living below poverty.

### STATISTICAL ANALYSES:

- Chi-squared tests and Kruskal-Wallis tests were used to determine whether stroke severity and disability varied by demographics, clinical characteristics, and SDH.

## FUNDING

NIMHD: R01MD012467

## RESULTS

### Descriptive Statistics

| Variable              | Level                        | Baseline mRS     |              |              |         | Admission NIHSS  |                    |                    |                    | P-Value |
|-----------------------|------------------------------|------------------|--------------|--------------|---------|------------------|--------------------|--------------------|--------------------|---------|
|                       |                              | Overall<br>N=343 | 0-1<br>N=239 | 2-5<br>N=104 | P-Value | Overall<br>N=260 | NIHSS 0-4<br>N=191 | NIHSS 5-14<br>N=59 | NIHSS ≥ 15<br>N=10 |         |
| Age (Median, IQR)     |                              | 62 (53, 72)      | 61 (52, 71)  | 63 (54, 77)  | 0.025   | 62 (53, 72)      | 61 (53, 71)        | 65 (54, 78)        | 66 (59, 72)        | 0.067   |
| Race/Ethnicity        | Non-Hispanic White           | 103 (38.7%)      | 73 (40.3%)   | 30 (35.3%)   | 0.202   | 102 (39.8%)      | 77 (41.0%)         | 20 (34.5%)         | 5 (50.0%)          | 0.604   |
|                       | Non-Hispanic Black           | 67 (25.2%)       | 43 (23.8%)   | 24 (28.2%)   |         | 61 (23.8%)       | 44 (23.4%)         | 15 (25.9%)         | 2 (20.0%)          |         |
|                       | Hispanic                     | 94 (35.3%)       | 65 (35.9%)   | 29 (34.1%)   |         | 92 (35.9%)       | 67 (35.6%)         | 22 (37.9%)         | 3 (30.0%)          |         |
|                       | Other Race                   | 2 (0.8%)         | 0 (0.00%)    | 2 (2.4%)     |         | 1 (0.4%)         | 0 (0.00%)          | 1 (1.7%)           | 0 (0.00%)          |         |
| Gender                | Male                         | 157 (58.1%)      | 113 (61.1%)  | 44 (51.8%)   | 0.15    | 153 (58.8%)      | 119 (62.3%)        | 27 (45.8%)         | 7 (70.0%)          | 0.06    |
|                       | Female                       | 113 (41.9%)      | 72 (38.9%)   | 41 (48.2%)   |         | 107 (41.2%)      | 72 (37.7%)         | 32 (54.2%)         | 3 (30.0%)          |         |
| Stroke Type           | ICH                          | 35 (10.2%)       | 21 (8.8%)    | 14 (13.6%)   | 0.179   | 24 (9.2%)        | 18 (9.4%)          | 4 (6.8%)           | 2 (20.0%)          | 0.403   |
|                       | Ischemic                     | 307 (89.8%)      | 218 (91.2%)  | 89 (86.4%)   |         | 236 (90.8%)      | 173 (90.6%)        | 55 (93.2%)         | 8 (80.0%)          |         |
| TOAST Classification  | Cardioembolism               | 75 (24.4%)       | 54 (24.8%)   | 21 (23.6%)   | 0.255   | 58 (24.6%)       | 44 (25.4%)         | 13 (23.6%)         | 1 (12.5%)          | 0.758   |
|                       | Large Artery Atherosclerosis | 38 (12.4%)       | 24 (11.0%)   | 14 (15.7%)   |         | 32 (13.6%)       | 24 (13.9%)         | 7 (12.7%)          | 1 (12.5%)          |         |
|                       | Other determined cause       | 48 (15.6%)       | 40 (18.3%)   | 8 (9.0%)     |         | 33 (14.0%)       | 24 (13.9%)         | 8 (14.5%)          | 1 (12.5%)          |         |
|                       | Small Artery Occlusion       | 67 (21.8%)       | 47 (21.6%)   | 20 (22.5%)   |         | 48 (20.3%)       | 36 (20.8%)         | 12 (21.8%)         | 0 (0.00%)          |         |
|                       | Stroke of undetermined cause | 79 (25.7%)       | 53 (24.3%)   | 26 (29.2%)   |         | 65 (27.5%)       | 45 (26.0%)         | 15 (27.3%)         | 5 (62.5%)          |         |
| Onset-to-Arrival Time | Within 4.5 hrs               | 79 (47.0%)       | 57 (49.6%)   | 22 (41.5%)   | 0.331   | 79 (47.0%)       | 51 (42.9%)         | 24 (58.5%)         | 4 (50.0%)          | 0.199   |
|                       | Greater than 4.5 hrs         | 89 (53.0%)       | 58 (50.4%)   | 31 (58.5%)   |         | 89 (53.0%)       | 68 (57.1%)         | 17 (41.5%)         | 4 (50.0%)          |         |

### Baseline mRS and Admission NIHSS by Individual-Level and ZIP-Level SDH

| Variable                         | Level                    | Baseline mRS     |                |                |         | Admission NIHSS  |                    |                    |                    | P-Value |
|----------------------------------|--------------------------|------------------|----------------|----------------|---------|------------------|--------------------|--------------------|--------------------|---------|
|                                  |                          | Overall<br>N=343 | 0-1<br>N=239   | 2-5<br>N=104   | P-Value | Overall<br>N=260 | NIHSS 0-4<br>N=191 | NIHSS 5-14<br>N=59 | NIHSS ≥ 15<br>N=10 |         |
| Language Spoken at Home          | English                  | 247 (72.0%)      | 178 (74.5%)    | 69 (66.3%)     | 0.005   | 183 (70.4%)      | 141 (73.8%)        | 37 (62.7%)         | 5 (50.0%)          | 0.177   |
|                                  | Spanish                  | 89 (25.9%)       | 60 (25.1%)     | 29 (27.9%)     |         | 72 (27.7%)       | 46 (24.1%)         | 21 (35.6%)         | 5 (50.0%)          |         |
|                                  | Haitian Creole/Other     | 7 (2.0%)         | 1 (0.4%)       | 6 (5.8%)       |         | 5 (1.9%)         | 4 (2.1%)           | 1 (1.7%)           | 0 (0.00%)          |         |
| Level of Education               | Less than High School    | 53 (15.5%)       | 28 (11.7%)     | 25 (24.0%)     | 0.005   | 40 (15.4%)       | 21 (11.0%)         | 17 (28.8%)         | 2 (20.0%)          | 0.02    |
|                                  | Completed High School    | 122 (35.6%)      | 83 (34.7%)     | 39 (37.5%)     |         | 86 (33.1%)       | 68 (35.6%)         | 16 (27.1%)         | 2 (20.0%)          |         |
|                                  | Some college or more     | 168 (49.0%)      | 128 (53.6%)    | 40 (38.5%)     |         | 134 (51.5%)      | 102 (53.4%)        | 26 (44.1%)         | 6 (60.0%)          |         |
| Living Arrangement               | Live Alone               | 78 (22.7%)       | 56 (23.4%)     | 22 (21.2%)     | 0.001   | 60 (23.1%)       | 46 (24.1%)         | 14 (23.7%)         | 0 (0.00%)          | 0.004   |
|                                  | Live with Spouse/Partner | 177 (51.6%)      | 133 (55.6%)    | 44 (42.3%)     |         | 135 (51.9%)      | 106 (55.5%)        | 22 (37.3%)         | 7 (70.0%)          |         |
|                                  | Live with Sibling        | 8 (2.3%)         | 7 (2.9%)       | 1 (1.0%)       |         | 6 (2.3%)         | 6 (3.1%)           | 0 (0.00%)          | 0 (0.00%)          |         |
|                                  | Live with Children       | 47 (13.7%)       | 21 (8.8%)      | 26 (25.0%)     |         | 33 (12.7%)       | 15 (7.9%)          | 16 (27.1%)         | 2 (20.0%)          |         |
|                                  | Live with Other          | 33 (9.6%)        | 22 (9.2%)      | 11 (10.6%)     |         | 26 (10.0%)       | 18 (9.4%)          | 7 (11.9%)          | 1 (10.0%)          |         |
| Social Support                   | 0-2 people               | 55 (16.0%)       | 31 (13.0%)     | 24 (23.1%)     | 0.019   | 39 (15.0%)       | 30 (15.7%)         | 9 (15.3%)          | 0 (0.00%)          | 0.398   |
|                                  | 2-3 or more people       | 288 (84.0%)      | 208 (87.0%)    | 80 (76.9%)     |         | 221 (85.0%)      | 161 (84.3%)        | 50 (84.7%)         | 10 (100.0%)        |         |
| Percent Unemployed (Median, IQR) |                          | 6 (4.5, 8.6)     | 5.8 (4.4, 8.6) | 6.1 (4.5, 8.6) | 0.453   | 5.9 (4.5, 8.6)   | 5.5 (4.4, 7.7)     | 6.5 (4.7, 10.6)    | 6.9 (6.2, 11.5)    | 0.031   |

## DISCLOSURES

No disclosures.

## DISCUSSION

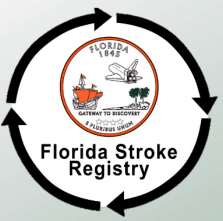
- Higher education completion was protective for stroke severity and disability at discharge. May be explained by better health literacy and understanding of cardiovascular disease symptoms.<sup>1</sup>
- Greater disability and severity among LWC compared to LWP parallels findings of decreased social support on disability. Finding underscores importance of close social connectedness.
- Greater disability among Haitian-Creole speakers may reflect race/ethnic disparities in ambulation at discharge.<sup>2</sup>
- Those living in ZIPs with higher unemployment may be exposed to detrimental, though yet unknown, neighborhood-specific characteristics leading to greater stroke severity.<sup>3</sup>
- Results invite more controlled and aptly powered analyses to assess the individual contribution of SES on stroke severity and disability.
- Raises questions concerning lasting effects of SDH on post-discharge recovery and readmission rates.

## SUMMARY

**Greater disadvantage economically, psychosocially, and educationally is associated with greater stroke disability and severity, both at the individual and neighborhood level. More data are necessary to understand the mechanisms by which these SDH influence these outcomes.**

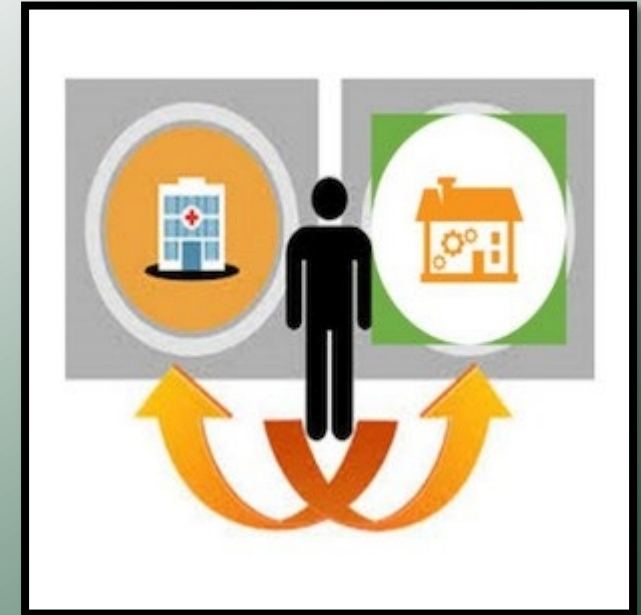
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1. Lewis, M. W., Khodneva, Y., Redmond, N., Durant, R. W., Judd, S. E., Wilkinson, L. L., ... & Safford, M. M. (2015). The impact of the combination of income and education on the incidence of coronary heart disease in the prospective Reasons for Geographic and Racial Differences in Stroke (REGARDS) cohort study. *BMC public health*, 15(1), 1-10. <https://doi.org/10.1186/s12889-015-2630-4>
2. Skolarus, L. E., Feng, C., & Burke, J. F. (2020). Exploring Factors Contributing to Race Differences in Poststroke Disability. *Stroke*, 51(6), 1813-1819.
3. Brown AF, Liang L, Vassar SD, et al. Neighborhood socioeconomic disadvantage and mortality after stroke. *Neurology*. 2013;80(6):520-527. doi: 10.1212/WNL.0b013e31828154ae.



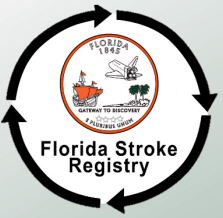
# INTRODUCTION

- **Social determinants of health (SDH) are major, yet understudied, contributors to stroke incidence and disparities.**
- **We aimed to provide preliminary findings on the effects of SDH on stroke severity and disability.**
  - Individual-level and ZIP/neighborhood-level SDH measures
- **Transitions of Stroke Care Disparities Study (TCSD-S)**
  - Prospective, multi-center observational stroke study in Florida.
  - Aims to identify race/ethnic and sex disparities in hospital-to-home transition of stroke care.
  - Determine the contribution of SDH in these disparities.
  - Incorporate these results in educational initiatives and interventions.





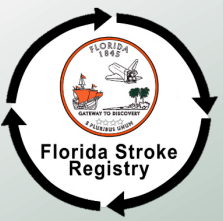
# METHODS



- **DATA COLLECTION:**
  - 344 patients discharged 2018-2020 from 8 stroke centers throughout Florida.
  - Demographics, clinical characteristics, and individual-level SDH collected by trained interviewers.
  - Publicly-available ZIP-code level SDH obtained through contracted data company.
- **OUTCOMES:**
  - **Stroke Severity upon admission:** NIHSS (0-4; 5-14;  $\geq 15$ ) obtained from Get With the Guidelines-Stroke.
  - **Stroke disability at discharge:** modified Rankin Scale (mRS) (0-1; 2-5).
- **SDH Measures Studied:**
  - **Individual-level SDH:** language, birth country, # years in USA, education, employment status, difficulty paying for basics/medical care, living arrangement (lives alone vs. with spouse, children, etc.), social support.
  - **ZIP-level SDH:** % completed high school or above, % completed Bachelors degree or above, % unemployed, % living below poverty.
- **STATISTICAL ANALYSES:**
  - Chi-squared tests and Kruskal-Wallis tests were used to determine whether stroke severity and disability varied by demographics, clinical characteristics, and SDH.



# RESULTS

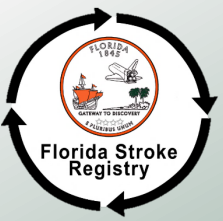


**TABLE 1. Descriptive Statistics.**  
Baseline mRS and Admission NIHSS by Demographics and Stroke Characteristics

| Variable                     | Level                        | Baseline mRS |             |             | P-Value      | Admission NIHSS |             |             |             | P-Value |
|------------------------------|------------------------------|--------------|-------------|-------------|--------------|-----------------|-------------|-------------|-------------|---------|
|                              |                              | Overall      | 0-1         | 2-5         |              | Overall         | NIHSS 0-4   | NIHSS 5-14  | NIHSS ≥ 15  |         |
|                              |                              | N=343        | N=239       | N=104       |              | N=260           | N=191       | N=59        | N=10        |         |
| <b>Age (Median, IQR)</b>     |                              | 62 (53, 72)  | 61 (52, 71) | 63 (54, 77) | <b>0.025</b> | 62 (53, 72)     | 61 (53, 71) | 65 (54, 78) | 66 (59, 72) | 0.067   |
| <b>Race/Ethnicity</b>        | Non-Hispanic White           | 103 (38.7%)  | 73 (40.3%)  | 30 (35.3%)  | 0.202        | 102 (39.8%)     | 77 (41.0%)  | 20 (34.5%)  | 5 (50.0%)   | 0.604   |
|                              | Non-Hispanic Black           | 67 (25.2%)   | 43 (23.8%)  | 24 (28.2%)  |              | 61 (23.8%)      | 44 (23.4%)  | 15 (25.9%)  | 2 (20.0%)   |         |
|                              | Hispanic                     | 94 (35.3%)   | 65 (35.9%)  | 29 (34.1%)  |              | 92 (35.9%)      | 67 (35.6%)  | 22 (37.9%)  | 3 (30.0%)   |         |
|                              | Other Race                   | 2 (0.8%)     | 0 (0.00%)   | 2 (2.4%)    |              | 1 (0.4%)        | 0 (0.00%)   | 1 (1.7%)    | 0 (0.00%)   |         |
| <b>Gender</b>                | Male                         | 157 (58.1%)  | 113 (61.1%) | 44 (51.8%)  | 0.15         | 153 (58.8%)     | 119 (62.3%) | 27 (45.8%)  | 7 (70.0%)   | 0.06    |
|                              | Female                       | 113 (41.9%)  | 72 (38.9%)  | 41 (48.2%)  |              | 107 (41.2%)     | 72 (37.7%)  | 32 (54.2%)  | 3 (30.0%)   |         |
| <b>Stroke Type</b>           | ICH                          | 35 (10.2%)   | 21 (8.8%)   | 14 (13.6%)  | 0.179        | 24 (9.2%)       | 18 (9.4%)   | 4 (6.8%)    | 2 (20.0%)   | 0.403   |
|                              | Ischemic                     | 307 (89.8%)  | 218 (91.2%) | 89 (86.4%)  |              | 236 (90.8%)     | 173 (90.6%) | 55 (93.2%)  | 8 (80.0%)   |         |
| <b>TOAST Classification</b>  | Cardioembolism               | 75 (24.4%)   | 54 (24.8%)  | 21 (23.6%)  | 0.255        | 58 (24.6%)      | 44 (25.4%)  | 13 (23.6%)  | 1 (12.5%)   | 0.758   |
|                              | Large Artery Atherosclerosis | 38 (12.4%)   | 24 (11.0%)  | 14 (15.7%)  |              | 32 (13.6%)      | 24 (13.9%)  | 7 (12.7%)   | 1 (12.5%)   |         |
|                              | Other determined cause       | 48 (15.6%)   | 40 (18.3%)  | 8 (9.0%)    |              | 33 (14.0%)      | 24 (13.9%)  | 8 (14.5%)   | 1 (12.5%)   |         |
|                              | Small Artery Occlusion       | 67 (21.8%)   | 47 (21.6%)  | 20 (22.5%)  |              | 48 (20.3%)      | 36 (20.8%)  | 12 (21.8%)  | 0 (0.00%)   |         |
|                              | Stroke of undetermined cause | 79 (25.7%)   | 53 (24.3%)  | 26 (29.2%)  |              | 65 (27.5%)      | 45 (26.0%)  | 15 (27.3%)  | 5 (62.5%)   |         |
| <b>Onset-to-Arrival Time</b> | Within 4.5 hrs               | 79 (47.0%)   | 57 (49.6%)  | 22 (41.5%)  | 0.331        | 79 (47.0%)      | 51 (42.9%)  | 24 (58.5%)  | 4 (50.0%)   | 0.199   |
|                              | Greater than 4.5 hrs         | 89 (53.0%)   | 58 (50.4%)  | 31 (58.5%)  |              | 89 (53.0%)      | 68 (57.1%)  | 17 (41.5%)  | 4 (50.0%)   |         |



# RESULTS



**TABLE 2.**  
Baseline mRS and Admission NIHSS by Individual-Level SDH

| Variable                       | Level                    | Baseline mRS |             |            | P-Value      | Admission NIHSS |             |            |             | P-Value      |
|--------------------------------|--------------------------|--------------|-------------|------------|--------------|-----------------|-------------|------------|-------------|--------------|
|                                |                          | Overall      | 0-1         | 2-5        |              | Overall         | NIHSS 0-4   | NIHSS 5-14 | NIHSS ≥ 15  |              |
|                                |                          | N=343        | N=239       | N=104      |              | N=260           | N=191       | N=59       | N=10        |              |
| <b>Language Spoken at Home</b> | English                  | 247 (72.0%)  | 178 (74.5%) | 69 (66.3%) | <b>0.005</b> | 183 (70.4%)     | 141 (73.8%) | 37 (62.7%) | 5 (50.0%)   | 0.177        |
|                                | Spanish                  | 89 (25.9%)   | 60 (25.1%)  | 29 (27.9%) |              | 72 (27.7%)      | 46 (24.1%)  | 21 (35.6%) | 5 (50.0%)   |              |
|                                | Haitian Creole/Other     | 7 (2.0%)     | 1 (0.4%)    | 6 (5.8%)   |              | 5 (1.9%)        | 4 (2.1%)    | 1 (1.7%)   | 0 (0.00%)   |              |
| <b>Level of Education</b>      | Less than High School    | 53 (15.5%)   | 28 (11.7%)  | 25 (24.0%) | <b>0.005</b> | 40 (15.4%)      | 21 (11.0%)  | 17 (28.8%) | 2 (20.0%)   | <b>0.02</b>  |
|                                | Completed High School    | 122 (35.6%)  | 83 (34.7%)  | 39 (37.5%) |              | 86 (33.1%)      | 68 (35.6%)  | 16 (27.1%) | 2 (20.0%)   |              |
|                                | Some college or more     | 168 (49.0%)  | 128 (53.6%) | 40 (38.5%) |              | 134 (51.5%)     | 102 (53.4%) | 26 (44.1%) | 6 (60.0%)   |              |
| <b>Living Arrangement</b>      | Live Alone               | 78 (22.7%)   | 56 (23.4%)  | 22 (21.2%) | <b>0.001</b> | 60 (23.1%)      | 46 (24.1%)  | 14 (23.7%) | 0 (0.00%)   | <b>0.004</b> |
|                                | Live with Spouse/Partner | 177 (51.6%)  | 133 (55.6%) | 44 (42.3%) |              | 135 (51.9%)     | 106 (55.5%) | 22 (37.3%) | 7 (70.0%)   |              |
|                                | Live with Sibling        | 8 (2.3%)     | 7 (2.9%)    | 1 (1.0%)   |              | 6 (2.3%)        | 6 (3.1%)    | 0 (0.00%)  | 0 (0.00%)   |              |
|                                | Live with Children       | 47 (13.7%)   | 21 (8.8%)   | 26 (25.0%) |              | 33 (12.7%)      | 15 (7.9%)   | 16 (27.1%) | 2 (20.0%)   |              |
|                                | Live with Other          | 33 (9.6%)    | 22 (9.2%)   | 11 (10.6%) |              | 26 (10.0%)      | 18 (9.4%)   | 7 (11.9%)  | 1 (10.0%)   |              |
| <b>Social Support</b>          | 0-2 people               | 55 (16.0%)   | 31 (13.0%)  | 24 (23.1%) | <b>0.019</b> | 39 (15.0%)      | 30 (15.7%)  | 9 (15.3%)  | 0 (0.00%)   | 0.398        |
|                                | 2-3 or more people       | 288 (84.0%)  | 208 (87.0%) | 80 (76.9%) |              | 221 (85.0%)     | 161 (84.3%) | 50 (84.7%) | 10 (100.0%) |              |

# RESULTS

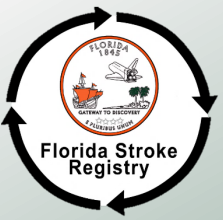
**TABLE 3.**  
Baseline mRS and Admission NIHSS by ZIP-Level SDH

| Variable  | Baseline mRS      |                   |                   |         | P-Value           | Admission NIHSS    |                   |                   |              | P-Value |
|---|-------------------|-------------------|-------------------|---------|-------------------|--------------------|-------------------|-------------------|--------------|---------|
|   | Overall           | 0-1               | 2-5               | Overall |                   | NIHSS 0-4          | NIHSS 5-14        | NIHSS ≥ 15        |              |         |
|   | N=343             | N=239             | N=104             |         |                   | N=260              | N=191             | N=59              | N=10         |         |
| <b>Percent Completed High School or Above (Median, IQR)</b> | 83.1 (75.7, 91.3) | 83.3 (75.7, 91.8) | 81.3 (75.2, 91)   | 0.438   | 83.3 (75.2, 91.2) | 85.5 (77.65, 91.8) | 78.8 (71, 90.1)   | 88.1 (78.5, 92.0) | 0.06         |         |
| <b>Percent Completed Bachelors or Above (Median, IQR)</b>   | 23.9 (14.8, 35.5) | 25.0 (14.6, 37.0) | 23.2 (15.1, 33.3) | 0.915   | 26 (14.8, 35.4)   | 27.1 (15.9, 37.5)  | 18.4 (11.5, 33.2) | 27.7 (14.1, 33.5) | 0.118        |         |
| <b>Percent Unemployed (Median, IQR)</b>                     | 6 (4.5, 8.6)      | 5.8 (4.4, 8.6)    | 6.1 (4.5, 8.6)    | 0.453   | 5.9 (4.5, 8.6)    | 5.5 (4.4, 7.7)     | 6.5 (4.7, 10.6)   | 6.9 (6.2, 11.5)   | <b>0.031</b> |         |
| <b>Percent Below Poverty (Median, IQR)</b>                  | 16.6 (11.6, 25.3) | 16.4 (11.1, 25.3) | 17.6 (12.2, 26.4) | 0.342   | 16 (10.7, 25.7)   | 15.3 (10.4, 24.5)  | 21.0 (13.1, 29.0) | 19.1 (11.1, 23.9) | 0.061        |         |

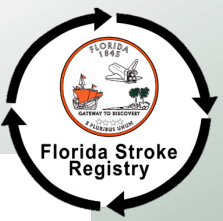




# DISCUSSION



- Higher education completion was protective for stroke severity and disability at discharge. May be explained by better health literacy and understanding of cardiovascular disease symptoms.<sup>1</sup>
- Greater disability and severity among LWC compared to LWP parallels findings of decreased social support on disability. Underscore importance of close social connectedness.
- Greater disability among Haitian-Creole speakers may reflect race/ethnic disparities in ambulation both before and after stroke.<sup>2</sup>
- Those living in ZIPs with higher unemployment may be exposed to detrimental, though yet unknown, neighborhood-specific characteristics leading to greater stroke severity.<sup>3</sup>
- Results invite more controlled and aptly powered analyses to assess the individual contribution of SES on stroke severity and disability.
- Raise questions concerning lasting effects of SDH on post-discharge recovery and readmission rates.



## REFERENCES

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## AUTHOR DISCLOSURES

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