

THE FLORIDA STROKE REGISTRY

ANNUAL REPORT 2020/21

UNIVERSITY
OF MIAMI



UNIVERSITY OF MIAMI MILLER
SCHOOL OF MEDICINE

DEPARTMENT OF NEUROLOGY | MIAMI, FLORIDA



Funding for the
Florida Stroke Registry
provided by the
FLORIDA DEPARTMENT
OF HEALTH

MESSAGE FROM THE DIRECTOR

The Florida Stroke Registry (FSR)
TRANSFORMING DATA TO ACTION

The Florida Stroke Registry, directed by the University of Miami, in collaboration with various healthcare organizations across the state of Florida, works to improve the quality of stroke care for all Floridians. Results from these efforts has increased the use of timely acute stroke treatments, and reduced disparities in many areas of stroke care. This past year with its unique set of circumstances has re-emphasized the need for continued efforts towards improvement in acute stroke care. During these trying times, it is through the Florida Stroke Registry’s ongoing relationships, with the stroke healthcare community, that we were able to quickly readjust and reassess the implementation of various registry tools and develop new initiatives to address stroke care during a pandemic. Through our collaborative relationship with the Florida stroke centers, we have successfully maintained the quality of stroke care during this period. We expanded our comprehensive state-wide dashboards and data to track and monitor performance, identify gaps or improvements, and transform these data into actions to improve quality of care and reduce health disparities.

Under the Florida Department of Health, we look forward to continuing our work and advancing our mission. As we build upon our accomplishments, we will focus on identifying innovative ways to build a true system of care in Florida and are enthusiastic to join the CDC’s Paul Coverdell Acute Stroke Program. Our goal is to securely maintain the state of Florida’s position in the nation as a leader that has established successful, statewide quality of stroke care through effective, evidence-based interventions and valuable policies.



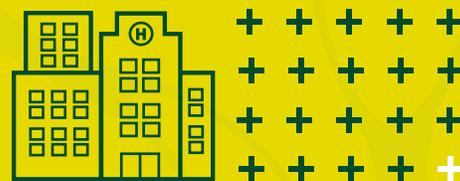
With sincere gratitude,

DR. RALPH L. SACCO, MD, MS
DIRECTOR of the Florida Stroke Registry
Chairman of Neurology,
University of Miami Miller School of Medicine

FSR HIGHLIGHTS 2020-2021

94%

Florida stroke center participation



92%

Door to needle in 60 mins



Health Disparities

reduced and continued focus during the COVID pandemic



Awarded and Recognized as a
**CDC Paul Coverdell
Acute Stroke Program**

THE FLORIDA STROKE REGISTRY'S MISSION

TRANSFORMING DATA INTO ACTION

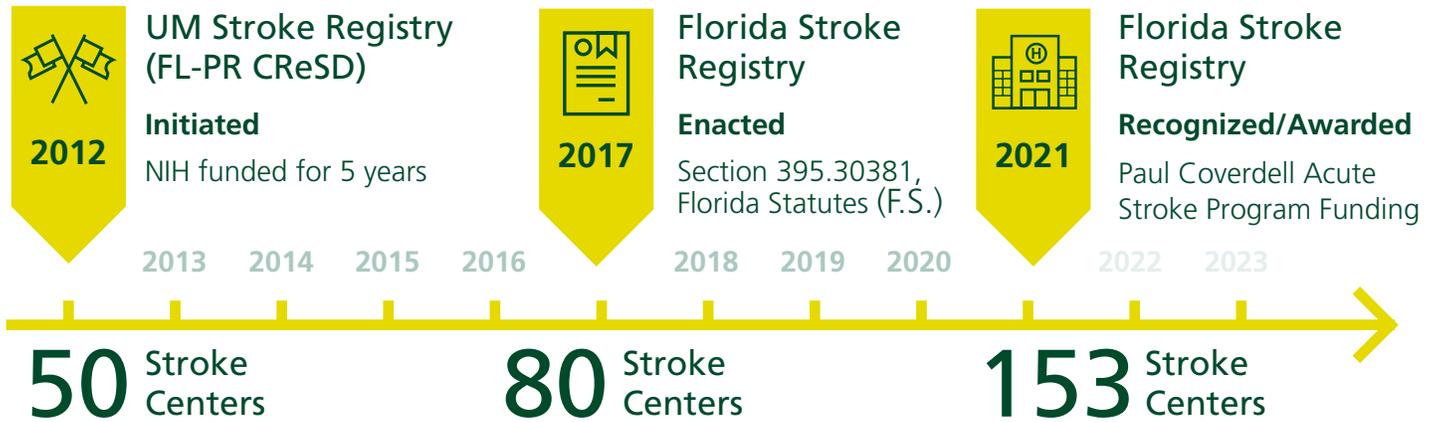
The Florida Stroke Registry has worked to accomplish the mission by:

Tracking and measuring relevant performance and outcome metrics to improve and maintain a high quality of stroke care for all Floridians

Increasing data interoperability to better address gaps in stroke care and disparities through broader scientific and clinical perspectives

Producing evidence-based results to inform the development and/or validation of initiatives, interventions, policy, and guidelines

INTRODUCTION



In its original iteration, the Florida Stroke Registry began at the University of Miami Miller School of Medicine as a National Institute of Health (NIH) grant funded project. Focused on the reduction of health disparities in stroke treatments and outcomes across Florida, during the five years of NIH funding, the registry 1) identified disparities; 2) developed interventions to successfully reduce disparities; and 3) cultivated a committed statewide network of stakeholders including stroke health professionals, researchers, policymakers, and stroke “victors” and their caregivers.

In 2017, the ending of the non-renewable NIH funding encroached upon the registry’s ongoing growth in numbers (increased stakeholders and stroke center participation) and improvements in stroke care. In large part due to the registry’s dedicated stakeholders who

sought to identify funding to maintain the registry’s momentum, a movement developed to amend the Florida stroke act. Successfully accomplishing recognition of the value of a Florida Stroke Registry for Floridians, on July 1, 2017, the state of Florida enacted legislation “Section 395.30381, Florida Statutes (F.S.)” establishing that all Florida stroke centers should participate in the Florida Stroke Registry maintained by the University of Miami’s Department of Neurology.

Today, thanks to Florida Department of Health’s funding and support, along with our ongoing collaboration with the American Heart Association/American Stroke Association, the Florida Stroke Registry’s mission to Transform Data into Actions is strengthened with the participation of 94% of Florida stroke centers and their continued dedication to reduce disparities in stroke care and improve stroke outcomes in Florida.

PROBLEM STATEMENT

African Americans and American Hispanics/Latinos are nearly **x2 more likely to have a first stroke compared to Caucasian Americans**

Northern Manhattan Stroke Study. Sacco RL, Boden-Albala B, Gan R et al. Am J Epidemiol. 1998 Feb 1; 147(3):259-6

Differences in the role of black race and stroke risk factors for first vs recurrent stroke. Neurology, 2016; DOI: 10.1212/WNL.0000000000002376

Stroke as a cause of death is...

#5
in the US

#3
in Florida

www.cdc.gov/nchs/pressroom/states/florida/fl.htm

FLORIDA, within the **southeastern US** is among the states with the highest death rates due to stroke



www.cdc.gov/dhdsp/maps/hds-widget.htm

OVERVIEW OF THE FSR

WHO ARE WE?

The University of Miami (UM) Florida Stroke Registry (FSR) team is composed of members of the Departments of Neurology and Public Health Sciences at the University of Miami Miller School of Medicine including Neurologists, Neuroscientist, Biostatistician, and Epidemiologists. The FSR is led by Project Director Dr Ralph L Sacco, Chairman of Neurology, Olemberg Family Chair in Neurological

PROGRAM/REGISTRY CORE

Ralph L. Sacco, MD MS Program Director
Carolina M. Gutierrez, PhD Research and Advocacy Director
Research Support Specialists
Marti Flothmann Stephanie Rodriguez

Disorders, Miller Professor of Neurology, Epidemiology, and Human Genetics at the Miller School of Medicine, Senior Associate Dean for Clinical and Translational Science at the University of Miami. Through the Program/Registry Core, with the assistance of Dr. Carolina M Gutierrez, all programmatic, administrative, operational, and financial aspects of the FSR are directed.

EDUCATION CORE

Jose G. Romano, MD Director	
Negar Asdaghi, MD	Nicole Sur, MD
Sebastian Koch, MD	Gillian Gordon Perue, MB; BS, DM
Erika Marulanda, MD	

The FSR Educational Core is responsible for the development and dissemination of FSR initiatives including clinical and community stroke education, and is led by Dr Jose G. Romano, Professor of Neurology, Executive Chair for Clinical Affairs in the University of Miami's Department of Neurology, as well as Director of the Vascular Neurology Training Program.

BIostatISTICS CORE

Tatjana Rundek, MD PhD Director	
Scott Brown, PhD	Kefeng Wang, MS
Chuanhui Dong, PhD	Antonio Bustillo, MSPH
Hannah Gardener, ScD	Elisier Nodarse

The FSRs large dataset and the implementation of all analytic processes is under the purview of the Biostatistics Core led by Dr Tatjana Rundek, Professor of Neurology and Public Health Sciences, Executive Chair of Clinical Research, Director of the Clinical Translational Research Division in Neurology.

WHO ARE OUR COLLABORATORS?

The FSR maintains an over-site Advisory Committee composed of members who provide statewide representation through their affiliation with FSR stroke and academic centers. The committee includes leadership from the Department of Health, and the American Heart Association/American Stroke Association (AHA). The voluntary committee provides guidance areas of research focus, along with overview of data collection, data quality, data analysis, and data transparency protocol. The committee also advises on prospective initiatives, interventions, and the appropriate dissemination process within their communities.

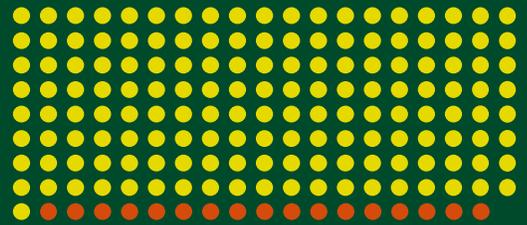
FSR ADVISORY COMMITTEE

Peter Antevy, MD	Nils Mueller-Kronast, MD
Scott Burgin, MD	Brijesh Mehta, MD
Teresita Casanova, MD	Maxim Mokin, MD, PhD
Dianne Foster (AHA)	Terry Neill, MD
Antonio Gandia, MD	Paul Pepe, MD
Ricardo Hanel, MD PhD	Mary Robichaux
Jonathan Harris, MD	David Rose, MD
Wayne Hodges, RN PMD	Charles Sand, MD
Tara Hylton, MPH (DOH)	Kenneth A Schepke, MD
Gerard Job, MD	Jeffery Walker, (AHA)

The FSR's most valued collaborators are the 153 FSR stroke centers, of which 32 have joined in this past fiscal year. FSR stroke centers include 30 comprehensive stroke centers, 106 primary stroke centers, 7 thrombectomy capable stroke centers, and 10 acute stroke centers. All 153 are recognized in the AHCA website, and 80 % are in compliance with the Florida 2019 legislation stating that all stroke centers should be nationally certified.

153

STROKE CENTERS
ALREADY JOINED FSR



32

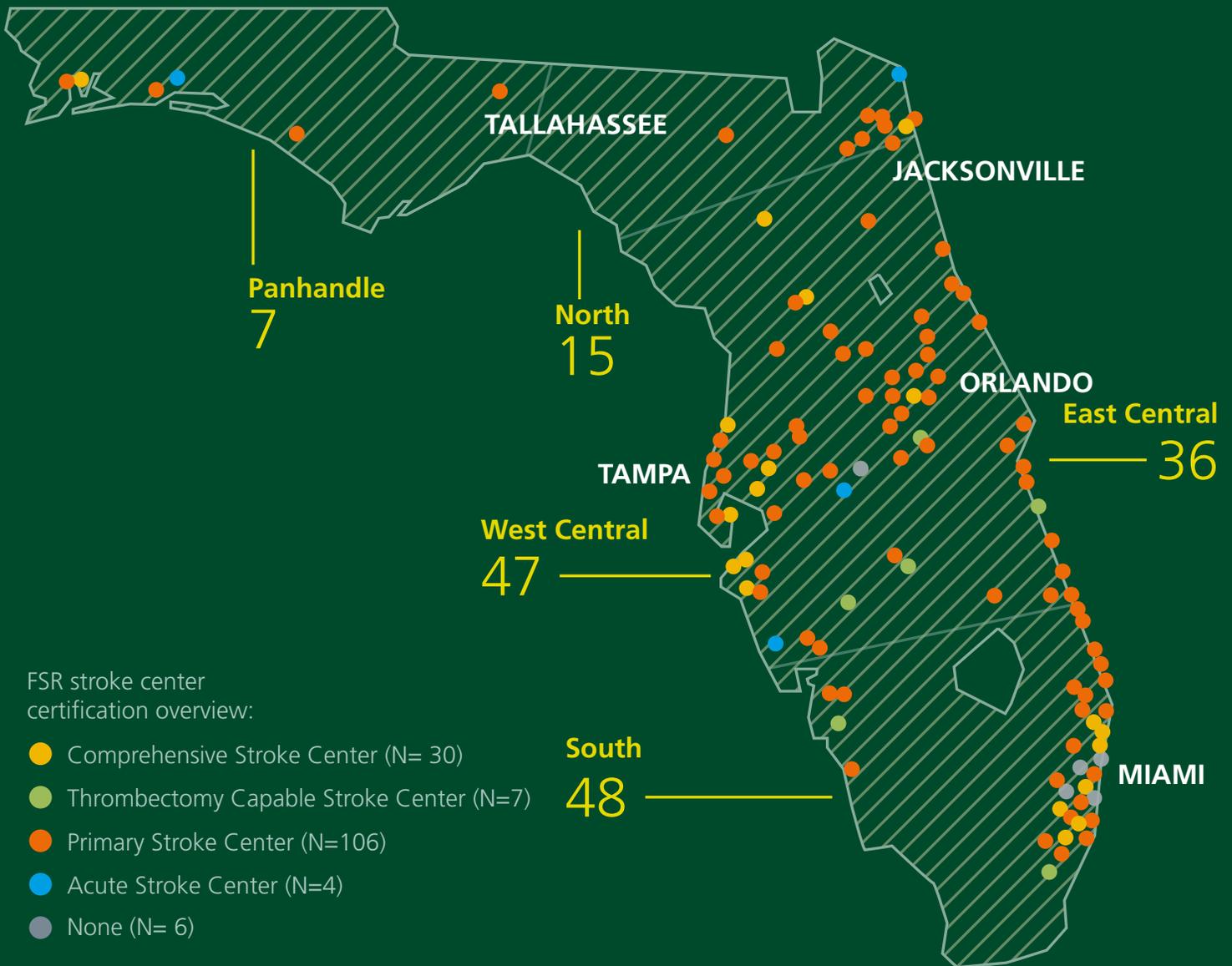
STROKE CENTERS
JOINING THE FSR
IN 2020-2021

170

AHA
GWTG-S

17

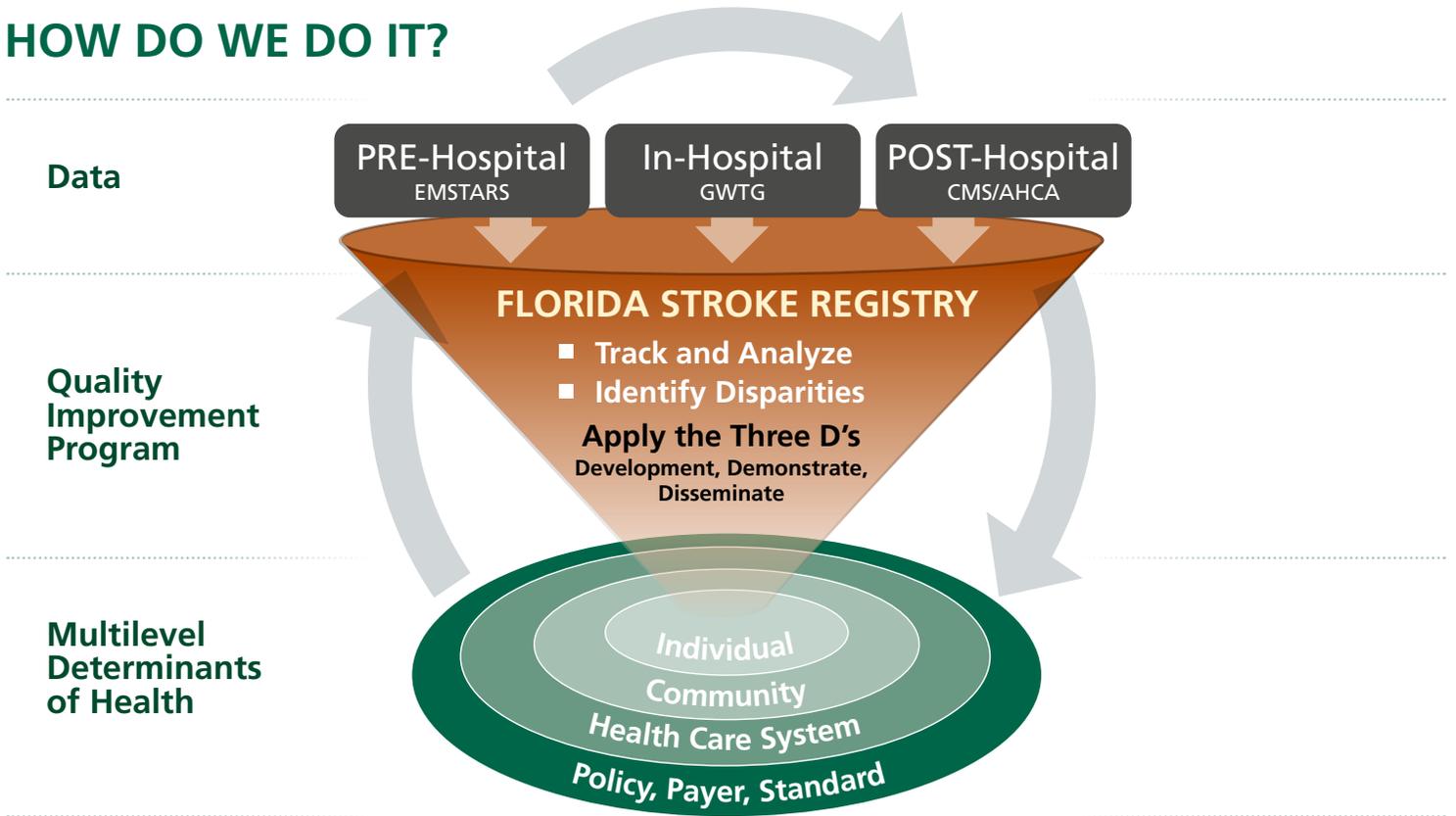
REMAINING
TO JOIN TO
FSR



WHAT DO WE DO?

The Florida Stroke Registry is a Quality Improvement program. We collect and analyze data to inform and develop initiatives, interventions, policy, and clinical guidelines.

HOW DO WE DO IT?



The Florida Stroke Registry's (FSR) Conceptual Model reflects the FSR's function as a Quality Improvement Program. Upon obtaining pre-hospital, in-hospital, and post-hospital stroke-related data, the FSR tracks, measures, and analyses the data to identify gaps or improvements in stroke care. Resulting analyses from the standardized datasets are used by the FSR to develop, demonstrate, and disseminate initiatives and interventions.

This reported year, the Florida Stroke Registry has seen its potential to impact and inform the entire stroke health system of care through increased partnerships and access to data reflecting all phases of stroke care. Our capabilities

to impact the pre-hospital setting have increased through our successful recruitment of new participating counties in the FSR Regional Dashboard initiative (which informs EMS transportation policy). Additionally, through the incorporation of statewide Agency for Healthcare Administration (AHCA) data linked to FSR data, we have gained new insight on stroke related long-term health outcomes at the post hospital setting. Further, as the FSR refines its analytic protocol to include various Social Determinants of Health (SDH) data, we will explore and report on the impacts of SDH at the multiple levels ranging from policy to the individual community member.

WHY DO WE DO IT?

“ To witness progress is remarkable; to be part of progress is unforgettable.”

“ To be at the mercy of one's body is frightening. To stand helpless as a loved one fights for life is terrifying. To be able to stand in the way of death and ask for more time is humbling beyond words.”

“ It's a privilege to work for Floridians through the FSR. It gives me a great purpose.”

STRATEGIES & ACCOMPLISHMENTS

The Florida Stroke Registry, an evidence-based, quality of care program, applies three strategies to accomplish its mission to Transform Data into Action

A DATA TRACKING AND MEASURING

B COMMUNICATION/ENGAGEMENT

C EDUCATION/TRAINING

STRATEGY: DATA TRACKING AND MEASURING

The FSR has been collecting stroke center data for over 9 years, utilizing the compiled data to track and measure stroke performance and outcomes. Annually, the FSR documents and disseminates these results in the form of three types of FSR Dashboards representing statewide, regional, and hospital-specific data on the current state of Florida's quality of stroke care. This past year, expanding its purpose and potential to inform across the stroke system of care, the FSR has begun to incorporate state "outcomes" data within analytic endeavors.

i FSR
DASHBOARDS

ii DATA
LINKAGE

ANNUAL STATEWIDE DASHBOARDS

The statewide reports graphically display aggregate, annual data from Florida FSR stroke centers as compared to stroke performance data from stroke centers nationally.

STRATEGY AND ACCOMPLISHMENTS

Publicly accessible at the website (www.floridastrokecollaboration.org), the dashboards are formatted to provide an overview of FSR stroke hospital performance by race/ethnicity and sex across 12 acute stroke measures and outcomes.

The 2020 Statewide Dashboard, the third of its kind, show that FSR stroke centers perform equally as well as the best stroke centers in the nation when comparing core quality metrics such as treatment with antithrombotics, anticoagulation for atrial fibrillation, and VTE prophylaxis. In this year marked by the coronavirus public health emergency, FSR stroke centers had lower percentages in the delivery of smoking cessation counseling, intensive statin, and overall Defect Free Care. However, FSR sites continue to demonstrate strong quality performance as related to time to treatment when compared to stroke centers nationally. These results, as well as Florida FSR data stratified by race/ethnicity and sex, may be viewed in detail at the FSR website.

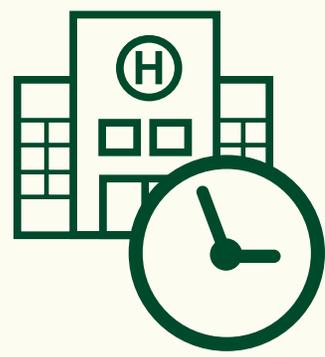


AVAILABLE Annually
ACCESS Open
REPORT Aggregate
STRATIFIED 1. FSR Stroke Centers VS. National Stroke centers
 2. Race/Ethnicity
 3. Sex



12 ACUTE HOSPITAL STROKE MEASURES AND OUTCOMES

1. IV thrombolysis administered arriving to the hospital w/n 3.5hrs of symptom onset and receiving treatment by 4.5hrs of symptom onset
2. Door to needle time within 60 mins
3. Door to needle time within 45 mins
4. Door to CT within 25 mins overall
5. Door to CT within 25 mins among those arriving within 24 hrs
6. Antithrombotic therapy
7. Deep Venous Thrombosis prophylaxis
8. Anticoagulation therapy for atrial fibrillation/flutter
9. Intensive Statin
10. Counseling or medication-for smoking cessation
11. Defect Free Care
12. Modified Rankin Score at discharge (0-2)



92%

OF FSR STROKE CENTERS provide their patients IV Thrombolysis in 60 min

▶ **VIEW THE FULL REPORTS**

ANNUAL HOSPITAL DISPARITIES DASHBOARD

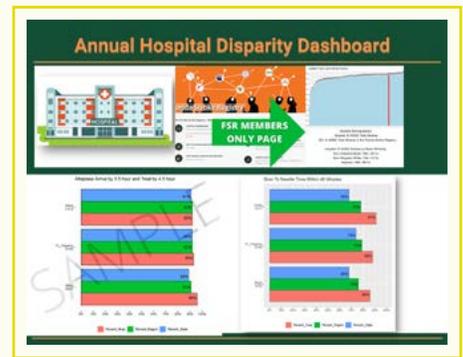
Initially developed under National Institute of Health and Stroke Prevention Intervention Research Program cooperative grant (NIH/NINDS U54 NS081763), the Annual Hospital Disparities Dashboards are hospital-specific and are a self-monitoring tool to track and measure 16 acute stroke care performance measures displayed by race/ethnicity and sex to reduce inequities in the delivery of stroke care.

STRATEGY AND ACCOMPLISHMENTS

The Dashboards have been disseminated yearly to participating FSR hospitals since 2013. Only FSR hospitals may access and view their respective dashboards through the secured login at the Florida Stroke Collaboration website. The utility of the Annual Hospital Disparities Dashboard extends beyond a self-monitoring and a quality improvement tool as hospitals have reported using the Dashboards as visual aids at community outreach meetings to explain to patients and family members stroke risk, outcomes, and prevention in relation to race/ethnicity or sex. We are proud to know that our FSR hospital dashboards have focused hospitals' attention on disparities in acute stroke care previously not recognized and that this intervention has helped hospitals seek opportunities to reduce these disparities in stroke care. The FSR hospital-specific dashboards provide an effective self-monitoring tool resulting in yearly improvements in the use and application of stroke treatment as well as heightened awareness to reduce disparities in care.

Acute Stroke Treatment Among FSR participating hospitals in Florida	2010	2020
Use of thrombolytics (clot busting medication) in stroke	7%	14%
Use of clot busting medication amongst stroke patients arriving in 3.5 hrs. and treated within 4.5 hrs. of stroke onset	69%	90%
Treatment within 60 min. of hospital arrival	19%	92%
Treatment within 45 min. of hospital arrival	6%	75%
Catheter based stroke treatment (clot removal or thrombectomy)	2%	15%
Defect Free Care (overall quality of care)	74%	92%

[▶ VIEW SAMPLE REPORTS](#)



AVAILABLE Annually
ACCESS FSR Hospital Only
REPORT Hospital-Specific
STRATIFIED Race/Ethnicity
 Sex

- [2013](#)
- [2014](#)
- [2015](#)
- [2016](#)
- [2017](#)
- [2018](#)
- [2019](#)
- [2020](#)

16 ACUTE HOSPITAL STROKE MEASURES AND OUTCOMES

1. IV thrombolytic, arrive 3.5 hours and treat by 4.5 hours of symptom onset
2. Early antithrombotic therapy
3. VTE prophylaxis
4. Antithrombotic therapy at discharge
5. Anticoagulation therapy for atrial fibrillation/flutter at discharge
6. Intensive statin
7. Smoking cessation counseling
8. Defect Free Care (DFC; overall quality of care),
9. Door to needle time within 60 min.
10. Door to needle time within 45 min.
11. Door to CT within 25 minutes (all strokes arrive at all times)
12. Door to CT (DTCT) with 25 minutes (arrive within 24 hrs)
13. **Percent EVT among those arriving in 24 hrs** NEW
14. **Median Door to Puncture Time** NEW
15. Modified Rankin Score at discharge (0-2)
16. Able to ambulate independently at discharge

REGIONAL DASHBOARDS

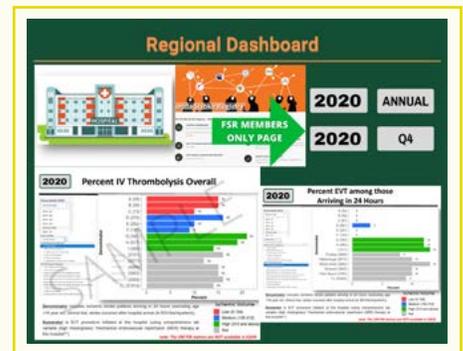
In 2016, a grassroots effort involving multiple FSR Stakeholders (Broward and Palm Beach County EMS Medical Directors, stroke directors and neuro-interventionalists representing local hospitals, and the FSR team at the University of Miami), led to the development of a powerful and informative tool, the Regional Dashboard. Fully implemented on November 2018, the FSR has since produced Quarterly Regional Dashboards, which offer a snapshot of a region's performance measures related to reperfusion therapy.

STRATEGY AND ACCOMPLISHMENTS

The dashboards are only available through a secured login at the Florida Stroke Collaboration website for FSR hospitals within counties/areas participating in the Regional Dashboard initiative (indicated in the image below). Reperfusion data from FSR sites is blinded and displayed side-by-side to compare surrounding hospitals within that same county. The initiative is focused on quality improvement with an additional goal to strengthen collaboration between hospitals and EMS. The FSR encourages the open review of the Regional Dashboards by the multidisciplinary health professionals involved in pre and in-hospital care of stroke professionals within a common meeting ground, such as their local stroke coalition.

This year, the FSR has introduced the Regional Dashboards to the Jacksonville, Orlando, and Sarasota areas. Adding to the groups of participating counties is the newly formed Florida Suncoast Stroke Coalition, which consists of hospitals within four counties including Sarasota.

The FSR continues to actively recruit other area and document existing stroke coalitions where Regional Dashboards may be developed for their use as a quality improvement tool.



AVAILABLE Annually and Quarterly
ACCESS FSR Hospital Only
REPORT County-Specific



16 REPERFUSION STROKE MEASURES AND OUTCOMES

Intravenous Thrombolysis (IVT)

1. IVT overall
2. Median Door to Needle among those receiving IVT
3. IVT Arrive at 3.5hrs and treat at 4.5hrs
4. mRS 0-2 at Discharge among those receiving IVT
5. mRS 0-2 at 90 Days among those receiving IVT
6. Symptomatic intracerebral hemorrhage after IVT

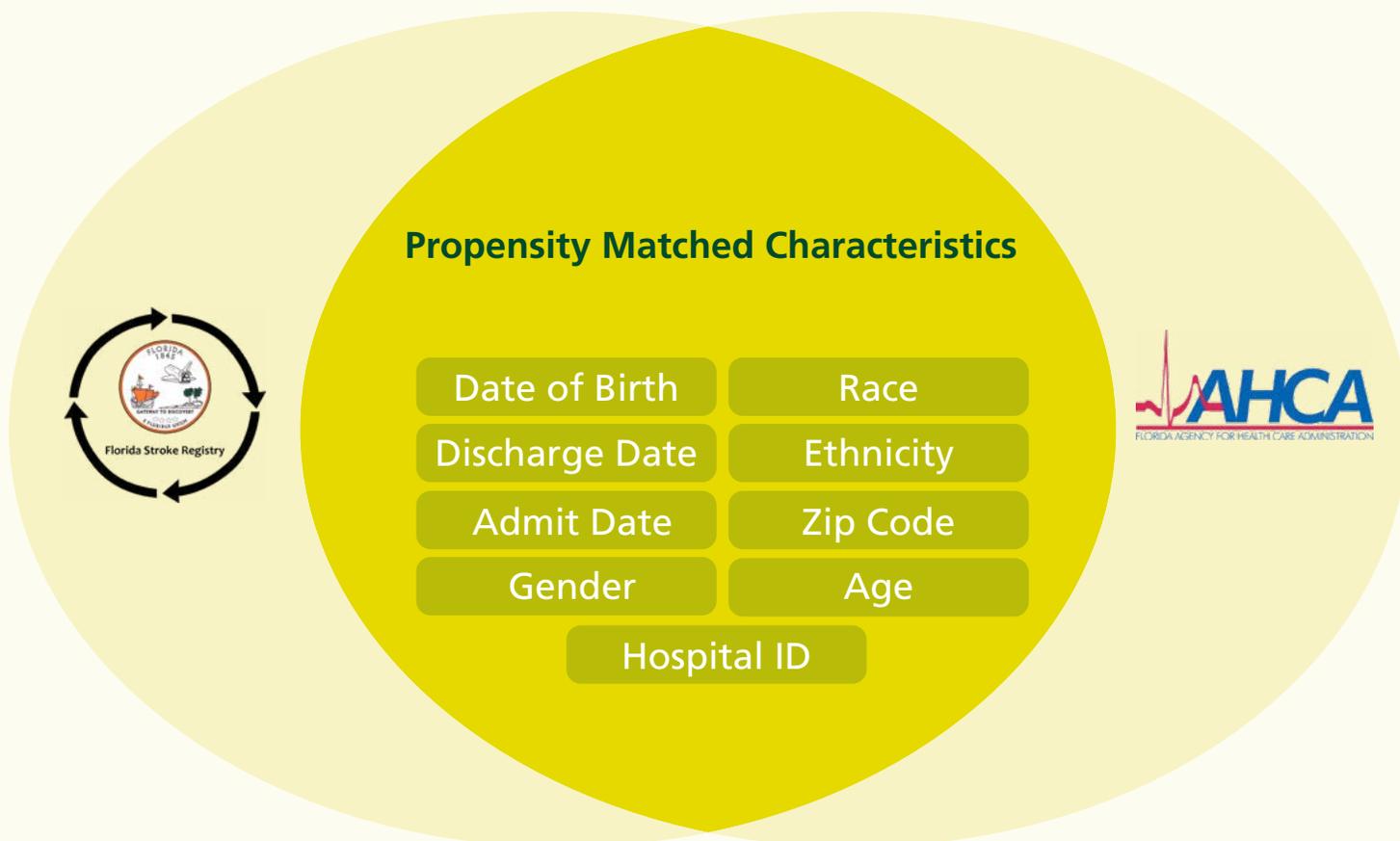
Endovascular Therapy (EVT)

1. EVT arrival in 24 hrs.
2. EVT arrival in 6 hrs.
3. Median Door to Puncture Time
4. Median Door to Puncture Time – arrival in 6 hrs.
5. Median Door to Puncture Time among non-transfer; arrival in 6 hrs.
6. Median Door to Puncture Time - arrival between 6 – 24hrs.
7. Median Door to Puncture Time among non-transfer; arrival between 6 - 24 hrs.
8. mRS 0-2 at discharge
9. mRS 0-2 at 90 Days
10. Symptomatic intracerebral hemorrhage after IA tPA or MER treatment only

[▶ VIEW SAMPLE REPORTS](#)

DATA LINKAGE: Agency for Healthcare Administration

The FSR is comprehensive in its capture of acute-care stroke metrics from participating hospitals, however, the GWTG-Stroke modules are not robust for tracking or measuring other phases of care (i.e., EMS data or long-term patient outcomes). Through the DOH, the FSR has obtained statewide Agency for Healthcare Administration (AHCA) inpatient, ambulatory, and emergency department data from 2017 -2019. The FSR has successfully accomplished propensity matching linking the FSR data (88% among the FSR cases) with this valuable statewide data. Having accomplished a linked dataset, we are now developing analyses to better understand how to improve transitions of care and address disparities.



STRATEGY:

COMMUNICATION AND ENGAGEMENT

The FSR implements an all-encompassing Communication Plan, which establishes, maintains, and encourages engaging contact with (and between) FSR participating stakeholders. Through a variety of active FSR committees, consisting of statewide representation, the Communication Plan builds a path to effectively define and refine FSR initiatives, research, and programmatic direction that is of direct value to its stakeholders.

Communication Plan that maps strategies to engage stakeholders:

i COMMITTEES

ii DASHBOARD
UTILITY SURVEY

iii DIGITAL
CHANNELS

FSR COMMITTEES

As a statewide stroke registry, the FSR is committed to address quality of care stroke needs throughout Florida. The FSR provides a platform to the multiple Florida regions through the inclusion and participation of statewide stroke care leaders in FSR committees. Regional presence and input, particularly through the Advisory Committee, guides the FSR to develop initiatives customized to community needs, and to broadly disseminate FSR information. FSR committees also include the participation of the Department of Health (DOH) and the American Heart Association/American Stroke Association (AHA), providing a state government and national quality improvement perspectives, respectfully.

FSR ADVISORY COMMITTEE
 Composed of University of Miami Florida Stroke Registry (UM FSR) study team, AHA, DOH, and regional representatives (Stroke and EMS Directors) from the major stroke centers and medical institutions in Florida. Their role is to oversee the FSR, review registry data outputs, devise programs to address gaps and disparities, serve as ambassadors to their individual hospitals and regional stroke working groups, and to improve quality of care on stroke with a specific emphasis on reducing stroke disparities.

UM FSR EXECUTIVE COMMITTEE
 Composed of members from the UM FSR study team, the AHA, and DOH. Meeting bi-monthly, the committee meets to review and implement programmatic processes, internal operations, privatization of research analyses, and funding opportunities related to the FSR.

EDUCATION CORE
 Includes the UM FSR team and is led by Dr. Jose G. Romano. The committee is charged with the development of stroke training and education for the health professionals and the community.

BIOSTATS CORE
 Led by Dr. Tatjana Rundek, the committee is composed of UM FSR data managers, analysts, biostatisticians, and epidemiologists. Their role is to develop and implement analytic plans producing evidence-based results.

PATIENT/CAREGIVER COMMITTEE
 Chaired by Dr. Romano, the Florida patient and caregiver group provide patient-centric feedback on FSR educational initiatives, community outreach, and stroke support group initiatives.

PUBLICATION COMMITTEE
 Composed FSR stakeholders invested in academic endeavors, the committee chaired by Dr. Negar Asdaghi, determines feasibility and priority of internal and external research proposals.

DASHBOARD UTILITY SURVEY

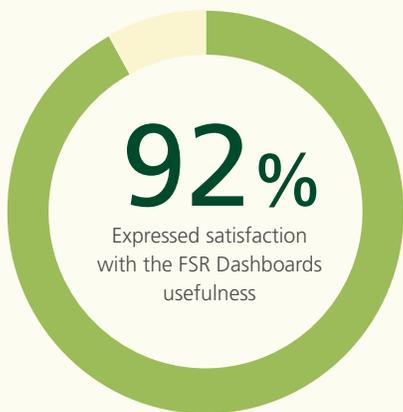
The survey was designed to gauge the use and utility of the FSR Dashboards, as well as to obtain feedback from the end-users on how to improve the reports. Originally, our efforts to collect as much information as possible was represented in the extensive length of the survey (resulting in minimal responses). This year, we refined the survey to increase stakeholder engagement. The ten-minute survey focused on end-user's awareness of the FSR Dashboards; their opinions on the value of the Dashboards; and their habits of sharing the dashboards for quality improvement.

The survey was disseminated by listserv in May 2021 and collected through Survey Monkey at the end of June, 2021. The majority of respondents indicated that they had viewed their dashboards and considered these to be of great value (92%). Only half were aware of the various FSR Dashboards, and less than half shared the reports with others. These areas of deficiency will be addressed in the coming year, and we will continue to disseminate the survey to review improvements and/or new areas of need.

SURVEY TIMELINE



SURVEY MAIN RESULTS AND NEXT STEPS



Next Steps: We will continue to actively collect end-user feedback obtaining guidance to continually improve FSR Dashboards, and to assure the provision of measures that are of relevance to FSR stakeholders.



Next Steps: To increase the awareness of the range and variety of FSR Dashboards, we will not only enhance their promotion, but we will also highlight FSR Dashboard findings, incorporating discussion of these findings within various FSR meetings and calls.



Next Steps: To encourage the use of the FSR Dashboards as a quality improvement tool, we will enhance collaborating efforts with the Quality Assurance Hospital Administrators, as well as develop/implement instructional workshops on the use and value of the FSR Dashboards

DIGITAL PLATFORMS

WEBSITE

The Florida Stroke Registry (FSR) website maintains two sections, an open source/ publicly available section, and a secured/ members only section. This year we have made efforts to update each of the sections monthly and frequently adding new events, resources, and educational items appropriate to each section.

PUBLICLY AVAILABLE SECTION

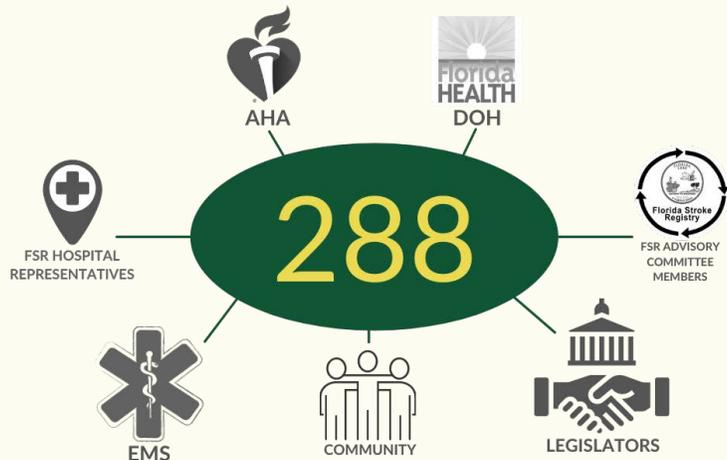
- FSR introductory video
- Map of 153 FSR stroke centers
- 2020 Statewide Dashboard
- FSR publications and infographics
- Statewide stroke/health related events
- Stroke & COVID short videos (FSR at the Front Lines)

SECURED ACCESS SECTION

- 2020 Hospital Disparities Dashboards
- 2020 and Quarterly Regional Dashboards
- 8th Annual FSR Meeting presentations
- Health provider educational resources
- Stroke Coalition resources

LISTSERV

The FSR listserv continues to function as a convenient and effective method to communicate information, and most importantly, solidify the FSR network. Currently consisting of up to 288 members, the FSR listserv include a multidisciplinary group of health professionals, legislators, and community members whose solidarity lies in improving stroke prevention, treatment, rehabilitation, reducing disparities, and withholding Florida’s role as a leader in the nation in stroke policy.



TWITTER [@FLSTROKEREG](https://twitter.com/FLSTROKEREG)

In this fiscal year, the FSR has expanded its reach via Twitter, which has provided an additional avenue for engaging with colleagues in stroke research, staying apprised of upcoming events and current news in neurology, and disseminating information about the FSR e.g., newsletters, meetings, webinar invitations, etc.

IN JUNE 2021

19

TWEETS POSTED

572

PROFILE VISITORS

182

TOTAL FOLLOWERS OF @FLSTROKEREG

6,065

TWEET IMPRESSIONS

STRATEGY: EDUCATION

The FSR is committed to creating educational products for stroke professionals, researchers, stroke victors, and the general community. Through the work of the FSR's Education Core, education and training initiatives are developed by leveraging FSR's evidence-based results with the expertise of our stakeholders and guidance from the FSR Advisory Committee. Reliance on the vast experience and knowledge base of research and health professionals whose hospitals participate in the FSR has consistently provided insight into real-time, emerging developments in the world of stroke care. Collaborations with EMS, AHA, and other agencies have further enhanced the FSR's ability to identify and respond to community and health-system needs related to stroke education and awareness, time sensitive dissemination of public health information, and inspired our team to share information and best practices regarding the intersection of stroke and coronavirus.

i ANNUAL
MEETING

ii FSR AT THE
FRONT LINES

iii VIRTUAL
JOURNAL CLUB

THE 8th ANNUAL FLORIDA STROKE REGISTRY STAKEHOLDER MEETING

The 2020 annual “virtual” meeting was a first of its kind, organized in light of travel restrictions due to the COVID-19 pandemic. The UM FSR team successfully reformatted the usual day-long meeting into three separate virtual sessions (Session I: Acute Stroke Phase of Care; Session II: Prehospital Phase of Care; and Session III: Post-hospital Phase of Care) each conducted one month apart over a three-month period. Reaching 193 RSVPs, each two-hour session documented over 100 attendees! Session presentations featured experts representing state government leadership, EMS, stroke coordinators, stroke interventionalists, as well as members of the UM FSR team. Attendees were offered CME/ CEU credits through the FSRs longstanding and appreciated collaboration with the AHA. The entire meeting is archived at the [members-only section of the website](#).



FSR AT THE FRONT LINES

We have continued the publicly accessible series “Florida Stroke Registry at the Front Lines” originally installed in response for the need of immediate information at the start of the COVID-19 pandemic. The ongoing series continues to offer the latest information related to stroke and COVID such as the urgency of those experiencing a stroke to arrive to hospital early even during the pandemic; observations of a greater number of young people experiencing a stroke and presenting at the hospital; updates on the latest stroke treatments; and the latest proposed policy related to telestroke during the pandemic. This series is archived at the [FSR website](#) and is publicly accessible.



VIRTUAL JOURNAL CLUB

Throughout the year, the FSR has produced a series of summarized overviews of the latest stroke research, known as “Friday Food for Thought”, sent to the FSR listserv. We have recently extended this educational effort to include the “Virtual Journal Club”. Selected research articles featured through the “Friday Food for Thought” series are presented by FSR stakeholders during quarterly zoom calls. We invite all FSR stakeholders to join the journal club and to consider presenting their own stroke research or recommend an article to be presented. The recorded presentation of the [Virtual Journal Club is posted at the website](#) as an educational resource.



RESULTS, DISCUSSION, AND RECOMMENDATIONS

The FSR's first steps towards "Transforming Data into Action" involves the efforts of the FSR Biostatistics Core who manage the growing dataset, develop viable statistical plans, and visualize analytic results. Through these efforts, annually, the FSR quantifies and qualifies stroke center data to provide a road map of the improvements and gaps in stroke care and outcomes. FSR analyses and research findings contribute to the exploration of clinically relevant questions and inform the development of evidence-based interventions, guidelines, and policy. The following section contains 2020 stroke demographics and stroke risk factor descriptives in Florida; summaries of this years published FSR manuscripts demonstrating ongoing disparities in stroke treatment times; and reviews preliminary data, including our successful linkage of state data to the FSR.

i DESCRIPTIVE
DATA

ii FSR
PUBLICATIONS

iii PRELIMINARY
RESULTS

iv RECOMMENDATIONS

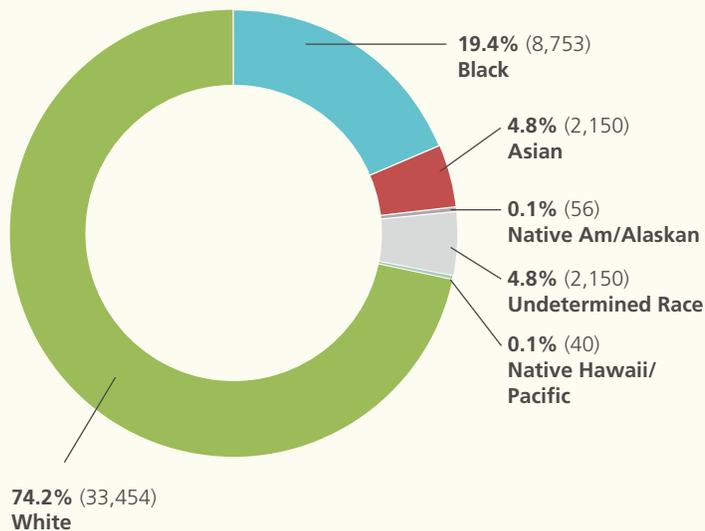
FSR DESCRIPTIVE DATA

Race And Ethnic Demographics: All FSR Strokes In 2020

On April 30, 2021, the UM FSR Biostatistics Core downloaded and collected the final quarter of 2020 stroke center data, completing the entire 2020 dataset which represents a total of 45,024 stroke occurrences in Florida. Detailed below, are all stroke types experienced in 2020 by all races in Florida.

Within the following report, data is reported in relation to Florida’s largest race and ethnic groups. The image below represents any type of stroke experienced in 2020 by the largest race and ethnic groups: 66% non-Hispanic White Floridians (green), 20% non-Hispanic Black Floridians (blue), and 20% Hispanic Floridians (orange).

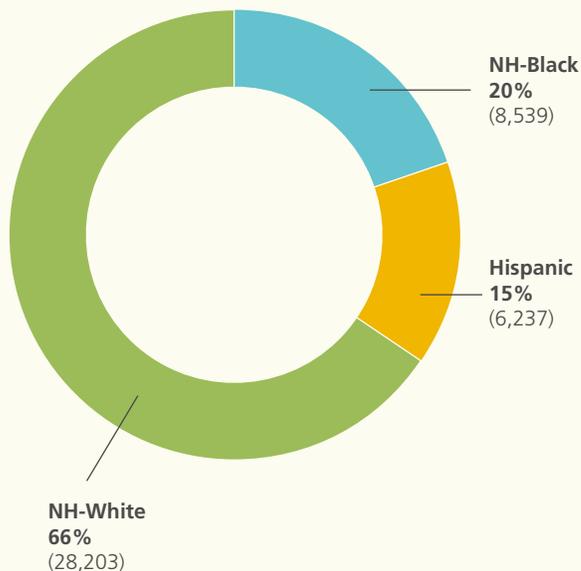
PERCENT DISTRIBUTION OF ALL STROKE BY ALL RACES IN FLORIDA (2020)



*Note: Total “missingness” (n=19) is not included. Therefore, the total N for **All Strokes / All Races = 45,005**, less than the reported Overall All Strokes N = 45,024

As in previous years, the representation of Florida Asians, Native American/Alaskan, and Native Hawaiian is minimal in this year’s dataset. Meaningful analyses for stroke performance measures and outcomes will be difficult to obtain from the negligible representation among these race cohorts. Though we will continue to monitor these cohorts, for this report, we will remove them from further analyses.

PERCENT DISTRIBUTION OF ALL STROKE BY RACE AND ETHNICITY (2020)



*Note: Total “missingness” (n=2,045) is not included. Therefore, the total N for **All Strokes Race/Ethnicity = 42,979** is less than the reported Overall All Strokes N = 45,024

Below is the distribution of all stroke types across Florida by race, ethnicity, and sex for the year of 2020. Ischemic stroke is still the most prevalent, and Intracerebral Hemorrhage (ICH) is consistently the second most common. In comparison to last year, the percent of ischemic strokes has decreased across race ethnicity and sex, while transient ischemic attacks (TIA) have increased. Continued analysis and tracking of this data is necessary to determine if the changes are part of an ongoing trend, or an outcome of the pandemic.

RACE AND ETHNIC DEMOGRAPHICS: ALL FSR STROKES IN 2020

	NH-White	NH-Black	Hispanic	Male	Female
Stroke Type ↓	28,188	8,536	6,237	23,034	21,958
Ischemic Stroke	76%	77%	74%	77%	75%
TIA	8%	5%	6%	6%	8%
Subarachnoid Hemorrhage	4%	4%	5%	3%	5%
Intracerebral Hemorrhage	11%	13%	13%	12%	11%
Stroke not otherwise specified	1%	1%	2%	1%	1%
<i>Missing N =</i>	2,063			32	

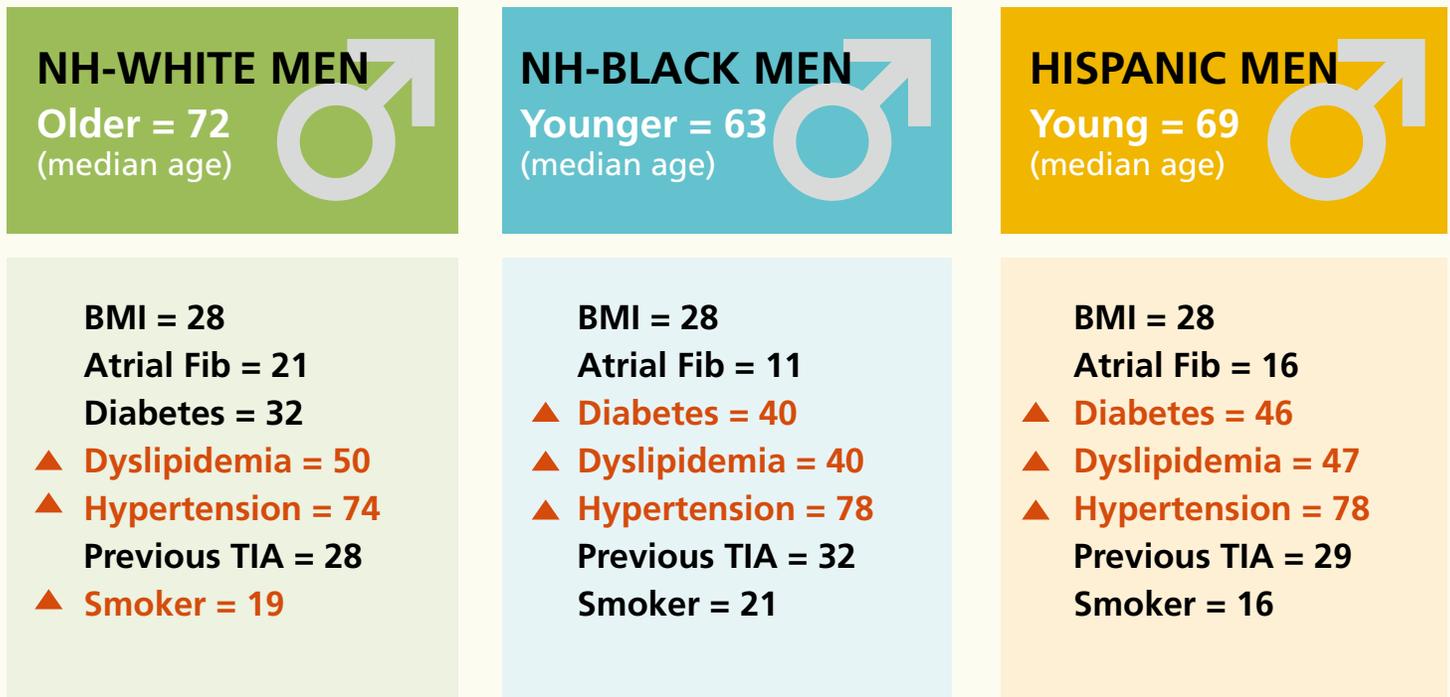
Risk Factors Among Florida Men by Race and Ethnicity

Stroke risk factors are basic indicators of health providing insight to lifestyle modifications that may reduce a person's likelihood to experience a stroke. The FSRs analysis of 2020 stroke center data reveals the distribution of risk factors among race/ethnicity and sex to be very similar to our report from last year. For example, age characteristics among Florida men, experiencing a stroke has not varied since last year. As detailed below, in 2020, Non-Hispanic White (NHW) men are older when they have a stroke compared to NH-Black (NHB) and Hispanic (H). In addition, the overall risk factor propensity across race/ethnicity has not changed since our report last year. We continue to show that NHW men have a higher prevalence of Atrial Fibrillation and Dyslipidemia as compared to NHB

and H men. Further, NHB men continue to have a greater prevalence of hypertension, having a prior stroke, and of being smokers, while H men having higher rates of diabetes and hypertension.

However, strikingly different from last year's report is the increased predominance of these risk factors in men across race/ethnicities. Statistical comparisons within race/ethnicity annual data from 2019 and 2020 reveal that these increases are statistically significant (indicated in red font below). Future studies will explore the trajectory of these increases to determine if the increases are part of an upward trending slope or if the increase is sudden and related to the pandemic and resulting lifestyle changes due to a lengthy self-isolation period.

FSR DATA: RESTRICTED TO ISCHEMIC STROKES IN 2020 AMONG FLORIDA MEN



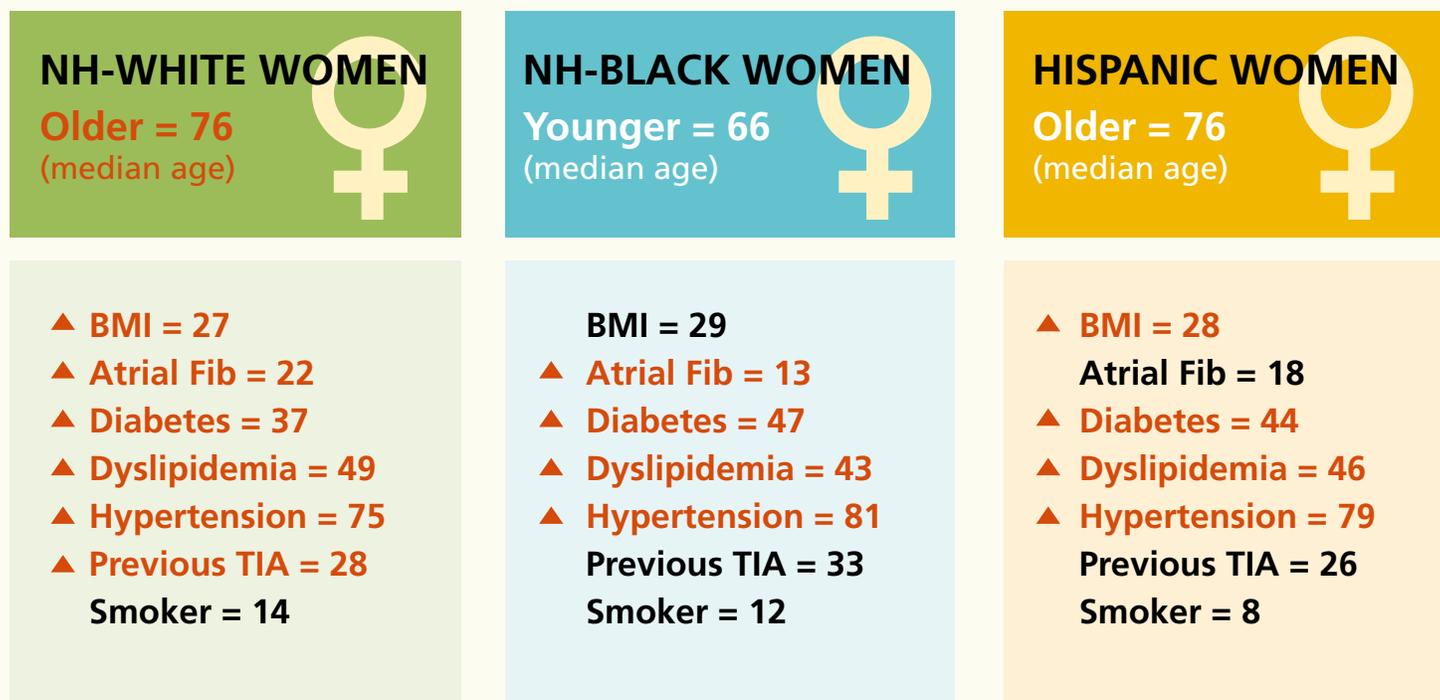
Note: Red font indicates 2020 risk factors that are statistically significantly different when compared to the 2019 report for the SAME race or ethnicity.

Risk Factors Among Florida Women by Race and Ethnicity

Among Florida women experiencing a stroke, both NHW and H females tend to be older, at a median age of 76-year-old, compared to NHB females who had their stroke at younger ages, median age 66. Similar to our report on men, there are no improvements or reductions in stroke risk factors across race/ethnicity for women this year. Our analysis comparing 2019 to 2020 risk factors among women, reveals that NHW women had increases in the prevalence of all risk factors, except smoking which is already highest in NHW compared to NIHB and H women. Likewise, NHB and H women demonstrated a higher percentage of prevalence of dyslipidemia, diabetes, and hypertension. Though these findings are preliminary and require further investigation, they are concerning as they indicate the increased potential for recurring stroke events which could be avoided.

Most recently the American Heart Association/ American Stroke Association has published guidelines to reduce the risk of a second stroke. The recommendations indicate that by determining the cause of the first stroke, health professionals will more easily define strategies to prevent or reduce the likelihood of a second stroke, particularly through lifestyle modifications that will address stroke risk factors such as the ones described in this section. In line with the AHAs secondary prevention recommendations, the FSR's ongoing tracking and measuring of Floridians stroke risk factors may provide clarity on actionable items and interventions that will improve our community's health and outcomes.

FSR DATA: RESTRICTED TO ISCHEMIC STROKES IN 2020 AMONG FLORIDA WOMEN



Note: Red font indicates 2020 risk factors that are statistically significantly different when compared to the 2019 report for the SAME race or ethnicity.

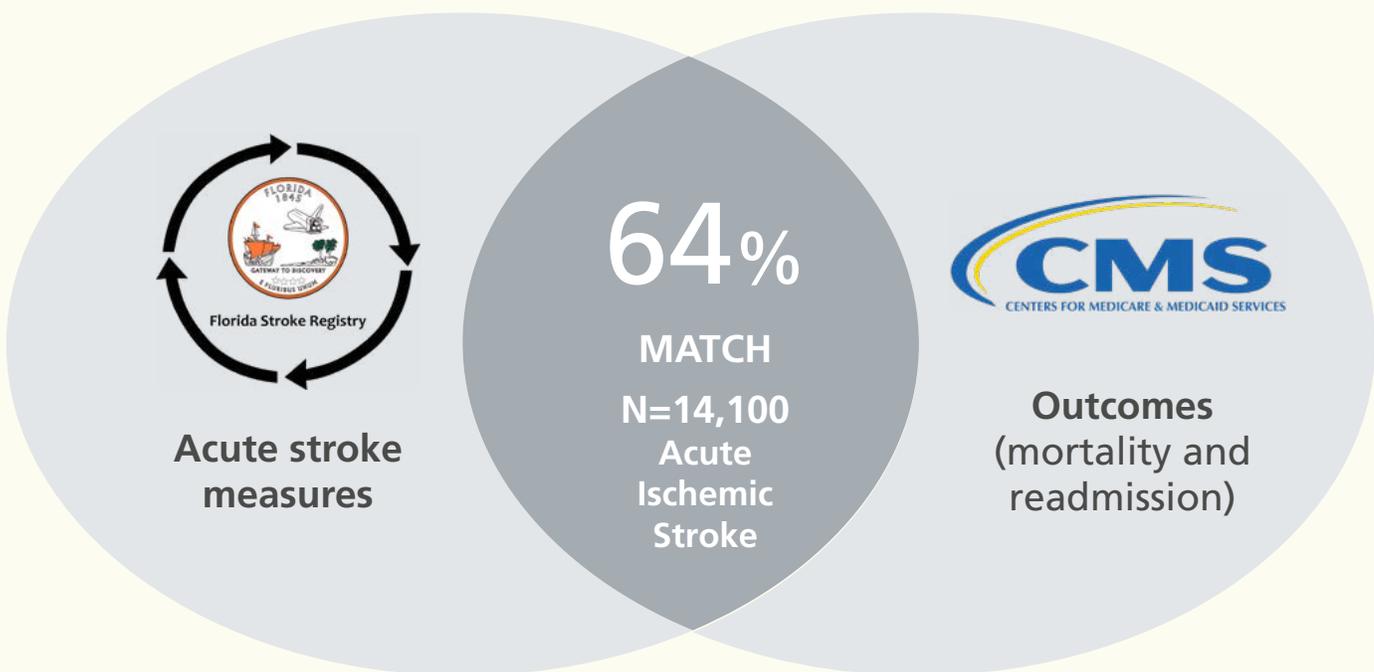
LASTEST PUBLICATIONS

Adherence to Acute Care Measures Affects Mortality in Patients with Ischemic Stroke: The Florida Stroke Registry

Gardener et al, *J Stroke Cerebrovasc Dis.* 2021 Mar;30(3):105586. PMC7880890

OVERVIEW

We explored how race/ethnic disparities in acute stroke care contribute to disparities in long term stroke outcomes. After matching acute stroke data from the FSR with long term outcome data from CMS, we identified two predictors of mortality and readmission: provision of early antithrombotics and statin therapy.



RESULTS

Particularly among Non-Hispanic White patients, early antithrombotics and antithrombotics at discharge **reduced mortality in-hospital, 30-day, 6-month, 1yr**

Particularly among Hispanic and Non-Hispanic Black patients, statin at discharge **reduced mortality 6-month, 1yr**

Among all race/ethnicity, statin at discharge **reduced readmission 30 days**

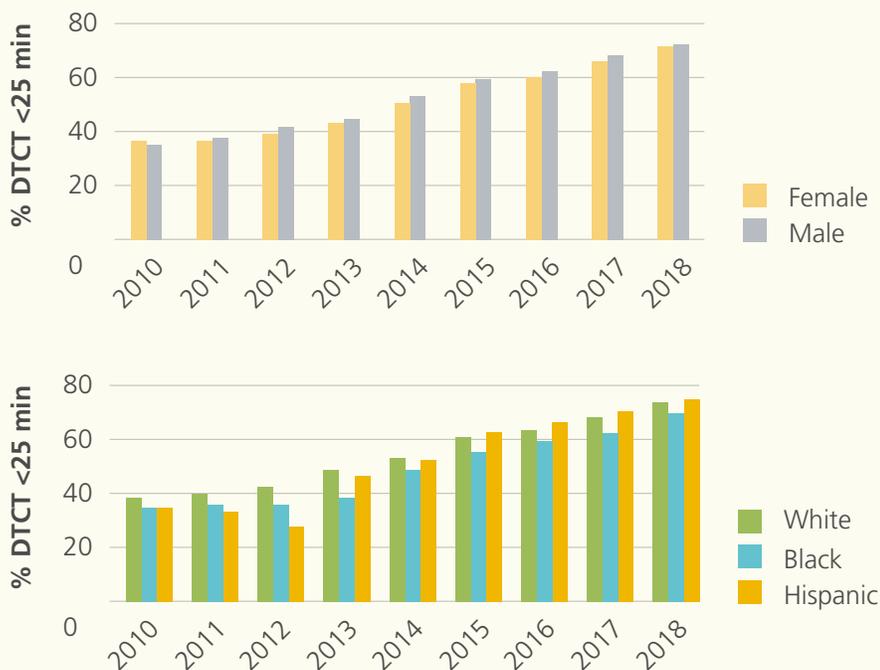
Sex and Race-Ethnic Disparities in Door-to-CT Time in Acute Ischemic Stroke: The Florida Stroke Registry

Polineni et al, J Am Heart Assoc. 2021 Apr 6;10(7):e017543. PMID: 33787282

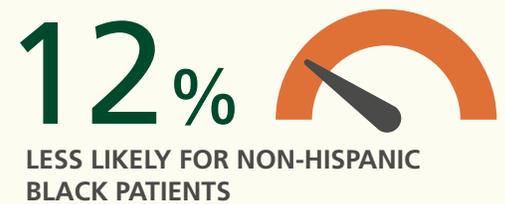
OVERVIEW

We evaluated race-ethnic and sex differences among those patients who arrived at the hospital in the 24 hours since the last time they were well and who received door to CT (DTCT) in 25 minutes. Additionally, we investigated factors contributing to potential differences.

Overall, we found **improvements** in delivery of treatment



However, **disparities remain** among all ischemic strokes



Among those treated with IV Thrombolysis



RESULTS

Door to CT time has **improved over time**

Disparities remain among non-Hispanic Black patients and women, both of which are less likely to receive tDTCT within 25 min

Disparities remain among all women receiving IV thrombolysis who are less likely to receive DTCT within 25 min

FSR PRELIMINARY FINDINGS

TRANSFORMING DATA INTO ACTION (Phase I)

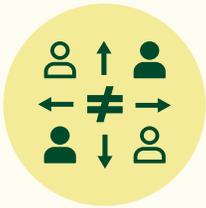
As a cornerstone of the Florida Stroke Registry, a primary goal is to identify and address gaps in care and reduce stroke disparities. In the FSR's first phase of Transforming Data into Action, clinical and research questions are addressed through data analyses providing insight to next steps for exploration or intervention. Below, are our latest findings which build upon ongoing research, or justify the need for new avenues of research.



QUALITY IMPROVEMENT

Among stroke patients with impaired level of consciousness, in-hospital mortality was considerably increased and mostly contributed by the decision to withhold or withdraw life-sustaining treatments (*Alkhachroum et al ISC 2020 poster*)

The premorbid use of antidepressants is not associated with intracerebral hemorrhage (*Siddu et al ISC 2020 poster*)



DISPARITIES IN CARE

Reported disparities in endovascular therapy across age, race/ethnicity, and Florida regions (*Krementz et al., ISC 2020 poster*)

Disparities reported for blood pressure management among Non-Hispanic Black and Hispanic patients (*Gordon-Perue et al., AAN 2020 poster*)

Disparities in outcomes reported among those experiencing in intracerebral hemorrhage (ICH) where Non-Hispanic Black ICH patients were as young as (median age) 60 and were less likely to utilize palliative care, to die in-hospital, or be discharged home (*Bustillo et al., ISC 2020 poster*)

Reported were significant race, ethnic, socioeconomic, and geographical disparities amongst those presenting in the delayed vs early reperfusion time windows with consequential effects on patient outcomes (*Simpkins et al., ISC 2020 poster*)



SOCIAL DETERMINANTS OF HEALTH

Greater stroke disability has been associated with lower education, high unemployment Florida zip codes, and lower social support. Research is ongoing to better understand the mechanisms by which economics, psychosocial, and education influence stroke outcomes (*Bustillo et al ISC 2020 poster*)

RECOMMENDATIONS TO IMPROVE STROKE CARE IN FLORIDA

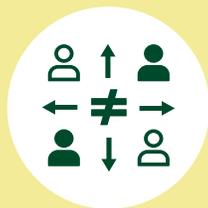
TRANSFORMING DATA INTO ACTION (Phase II)

After preliminary data and findings have been fully explored, FSR evidence-based results are disseminated through peer-reviewed publications. This final phase in Transforming Data into Action involves the valuable, collaborative input and efforts of the FSR Advisory Committee, the Publication Committee, the Biostatistics Core, the AHA, and the FSR stroke centers. The FSR's formal contribution to improving stroke care and informing the development of interventions is documented through these published manuscripts. Below are listed the growing collection of FSR recommendations obtained from FSR publications (the references in bold reflect those published in this reported year and which are featured on pages 26 and 27 of this report).



QUALITY IMPROVEMENT

- Establish a process to track stroke center quality of care as related to center certification type (Marulanda-Londono et al. manuscript in preparation for submission to Stroke)
- Improvements are needed in post discharge transitional care for better secondary prevention strategies after ischemic stroke, particularly among minority populations. (*Gardener et al, 2019* PMID: PMC6939298)
- Reported safety and overall favorable outcomes for endovascular therapy patients with mild stroke (*Asdaghi et al, 2019* PMID: PMC6646058)
- Improve acute stroke care through applied quality improvement programs (*Sacco et al., 2017, PMC5523741; Ciliberti-Vargas et al 2017* PMID: PMC5642916; *Gardener et al, 2019* PMID: PMC6405703)



DISPARITIES IN CARE

- Address persistent disparities in Door to CT time by defining contributing factors occurring before the brain imaging procedure (*Polineni et al, 2021* PMID: PMC8174374); *Oluwole et al 2017* PMID: PMC5639478).
- Antithrombotic use and statin therapy are associated with reduced odds of long-term mortality particularly among Non-Hispanic Black and White stroke patients (*Gardener et al, 2021* PMID: PMC7880890)
- Reduce disparities in Atrial Fibrillation outcomes through improvements in the use of anticoagulants and applied best practices for a system of stroke care (*Dong et al, 2019* PMID: PMC7730022; *Sur et al, 2019* PMID: PMC6538423)
- Address disparities in the use of thrombolysis (*Asdaghi et al, 2018* PMID: PMC5829011; *Asdaghi et al 2016* PMID: PMC5039084)



HEALTH LITERACY

- Reduce the time to treatment through improved public education on stroke symptoms and immediate 9-1-1 activation (*Gardener et al, 2018, PMID: PMC6483889*)
- Reduce the rates of intracerebral hemorrhage by providing public health education on risk factor management (*Bustillo et al, manuscript in preparation*)

SUCCESS STORIES

The FSR aims to provide Florida stroke centers the tools needed to successfully deliver the best quality of stroke care. We proudly present two important success stories that represent FSR's attainment of this aim during the reported period. Along with thirteen FSR stroke centers recognized for demonstrating outstanding performance and improvements, we also announce the recent award from the Centers for Disease and Prevention Control's Paul Coverdell Stroke Award which will help further enhance the impact and reach of the FSR.

i **FSR
HOSPITAL
AWARDS**

ii **PAUL COVERDELL
ACUTE STROKE
AWARD**

FSR HOSPITAL AWARDS

Annually, the FSR identifies stroke centers that have made outstanding improvements in stroke care and excelled in reducing disparities. Reflected through results representing the most recent completed year of data (2019 in this reporting period), the top sites are recognized and awarded during the FSR Annual Stakeholder meeting. Along with a certification of achievement, hospital awardees are acknowledged throughout the year in various FSR communication formats (the website, listserv, newsletter, and the annual report). In 2020, thirteen sites were recognized for their accomplishments in a variety of stroke performance measures (detailed below). At least two of the awardees, accepted the opportunity to create center-specific short videos commemorating their success and stroke team (see the videos by clicking on the images to the right).



AWARD CATEGORIES & FSR STROKE CENTER 2020 WINNERS

MOST IMPROVED DEFECT FREE CARE: A quality of care measure that reflects a patient's completeness of stroke care. Comparison of improvements from 2018 to 2019 were calculated for each of the FSR sites. The top three hospitals demonstrating the greatest improvements include:

-  **1** AdventHealth
Carrollwood
-  **2** Orlando Health
South Lake
-  **3** Baptist Medical Center
Nassau

MOST IMPROVED DOOR TO NEEDLE TIME: This hospital stroke performance measure reflects a hospital's readiness to provide stroke treatments, thereby improving stroke outcomes. We calculated the difference between 2018 and 2019 stroke center performance of time to treatment. The top four most improved include: (3rd place was a tie).

-  **1** Lakewood Ranch
Medical Center
-  **2** Manatee
Memorial Hospital
-  **3** Jupiter Medical /
AdventHealth
Center East Orlando
-  **4** Saint Joseph's
Hospital

MOST COMPLETENESS FOR NIHSS: The "NIHSS" measure represents a stroke severity score and offers insight into the gravity of the stroke. The top three hospitals providing the most complete data for the NIHSS were identified after calculating the difference between 2018 and 2019 data completeness.

-  **1** Saint Joseph's
Hospital North
-  **2** Jackson South
Community Hospital
-  **3** AdventHealth
Apopka

MOST CONSISTENT PERFORMANCE IN REDUCING DISPARITIES: The top three sites demonstrated outstanding performance, accomplishing 100% Defect Free Care with the least disparities, as well as 100% disparity-free hospital stroke performance measures across three years, 2017, 2018, 2019.

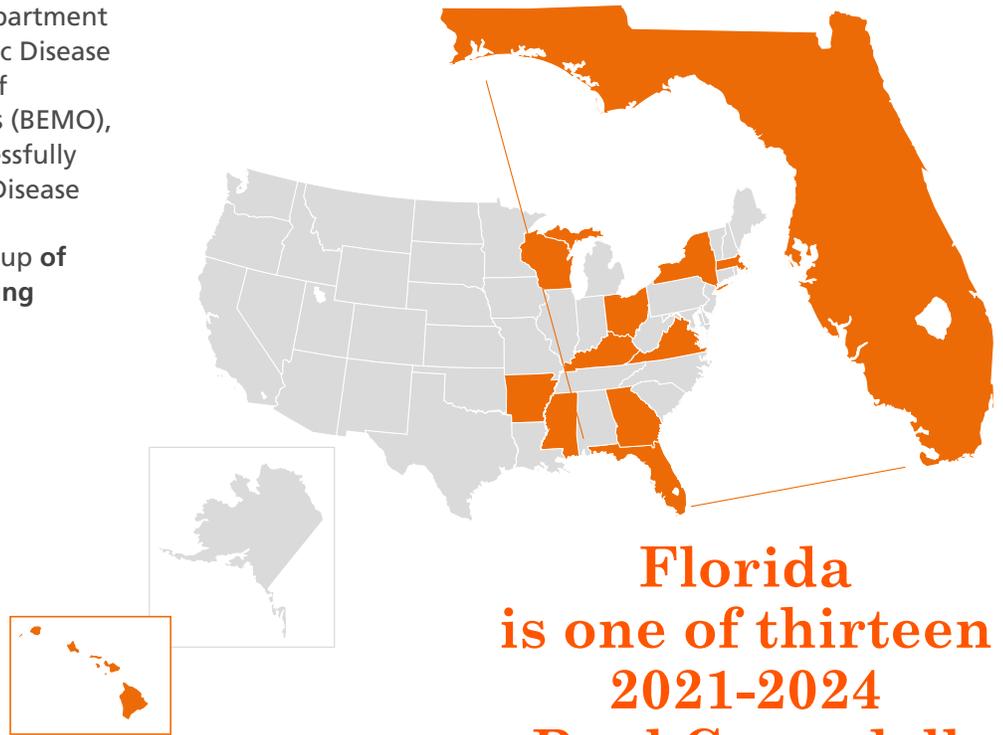
-  **1** Lakewood Ranch
Medical Center
-  **2** North Shore
Medical Center
-  **3** AdventHealth
Palm Coast

**CONGRATULATIONS
TO ALL 2020
WINNERS!**

PAUL COVERDELL ACUTE STROKE PROGRAM

Working closely with the Florida Department of Health (FDOH’s) Bureau of Chronic Disease Prevention (BCDP) and the Bureau of Emergency Management Operations (BEMO), we are proud to announce our successfully funded proposal to the Centers for Disease and Prevention Control. The award represents inclusion into a select group of **states in the US that are accomplishing important work in stroke care.**

Through the prestigious award, the FSR is honored and enthusiastic to be a part of a project that will **sustain the state of Florida’s established position as a leader in the nation in quality stroke care.**



**Florida
is one of thirteen
2021-2024
Paul Coverdell
States**

PROJECT OVERVIEW:

The FSR will collaborate with the DOH’s BCDP and BEMO to improve and strengthen a cohesive system of stroke care in Florida and accomplish the following over the next three years:

1) Implement a Statewide Registry (that):

- Integrates pre-hospital data (FSR)
- Participates in DOH Leadership Team to define team-based approaches (FSR; DOH; BEMO)
- Facilitates the creation of statewide local stroke coalitions (FSR; DOH; BEMO)
- Establishes the systematic use of FSR Regional Dashboards as a quality improvement tool reviewed in local stroke coalitions to improve the quality of stroke care across systems (FSR)

2) Foster Community Linkages (by):

- Encouraging stroke coalitions to recruit community member representation (i.e., Community Health Workers, stroke patient/caregivers) (FSR)
- Developing stroke education for community outreach provided by Community Health Workers (FSR)
- Developing and implementing 911 dispatcher B.E.F.A.S.T training (BEMO)

NEXT STEPS

Thanks to participating Florida stroke centers, the AHA, the University of Miami, and Florida state government leadership, the FSR has garnered a combination of stroke data, research and community networks, and funding that allows the FSR to provide Floridian's research expertise and evidence-based results.

Building upon our past and ongoing accomplishments, we look forward to upcoming endeavors that include increasing the impact of the FSR across the stroke system of care; expanding FSR stakeholder membership, networking, and community outreach; addressing ongoing gaps in the quality of care and identified disparities; and developing interventions that will improve the quality of Florida's overall stroke care.

As we enter our next fiscal year, we are proud to continue to serve the state of Florida, and are grateful to Florida's government leadership; our longstanding AHA collaboration; and to our participating stroke centers all of whom have made the FSRs success a possibility.

