2016 Data Summary
Georgia Coverdell Acute Stroke Registry

DISEASE BURDEN

- In 2014, about 21,795 Georgians were hospitalized for acute stroke or transient ischemic attack in 130 Georgia hospitals.
- The total hospital charge from 23,727 stroke hospitalizations was over $1.1 billion, with a median charge around $29,500.
- Based on the 2015 Georgia Coverdell Acute Stroke Registry and Georgia death data, mortality from stroke and its complications is estimated to be:
  - 8.8% at 30 days post-incident
  - 20.3% at 1 year post-incident

PROGRAM OVERVIEW

- The Georgia Coverdell Acute Stroke Registry (GCASR) is named in honor of the late Senator Paul Coverdell of Georgia who died of a massive stroke in 2000.
- GCASR is funded by the Centers for Disease Control and Prevention (CDC) as part of the Paul Coverdell National Acute Stroke Registry.
- GCASR is a partnership between the Georgia Department of Public Health (DPH) Epidemiology, DPH Office of EMS, Emory University, American Heart Association, American Stroke Association, Georgia Medical Care Foundation, Georgia Hospital Association, CDC, and the participating hospitals, rehabilitation centers, and EMS agencies in Georgia.

GOALS OF THE GCASR

- Reduce fatalities and disability due to stroke and the incidence of recurrent stroke in Georgia by:
  1. Monitoring and improving the quality of pre-hospital, in-hospital, and post-discharge care of stroke patients
  2. Encouraging collaboration among EMS providers, hospitals, rehabilitation facilities, home health services, and other institutions in Georgia concerned with stroke care quality improvement

PARTICIPATION

- Hospitals, rehabilitation facilities, home health services, and EMS agencies join GCASR voluntarily.
- In Georgia, currently, 15 EMS agencies and 65 hospitals participate in GCASR, of which 44 are Joint Commission or Det Norske Veritas certified comprehensive or primary stroke centers and 7 are Georgia DPH designated remote treatment stroke centers.
- Based on the 2014 hospital discharge data, GCASR-participating hospitals serve about 88 percent of stroke admissions in Georgia.

DATA COLLECTION

- Data on stroke patient characteristics and care received are collected by participating hospitals for patients admitted with acute stroke or transient ischemic attack.
- Data on EMS performance are obtained through the Georgia EMS Information System (GEMSIS).
- The purpose of data collection is to measure and monitor the quality of pre-hospital and in-hospital stroke care delivery.

QUALITY IMPROVEMENT ACTIVITIES

Hospitals and EMS agencies participating in GCASR receive:

- Individualized stroke care quality improvement consultation
- Regular educational conference calls and newsletters to share best practices among participating hospitals and EMS providers
- Regular trainings to enhance skills and exchange best practices
- Organized mentorship among the participating facilities
- Acute Stroke Life Support training
- Quality improvement efforts focused currently on thrombolytic treatment for eligible stroke patients and door-to-needle time
- Development of tools to strengthen EMS-hospital communication

2016 GCASR Data Summary

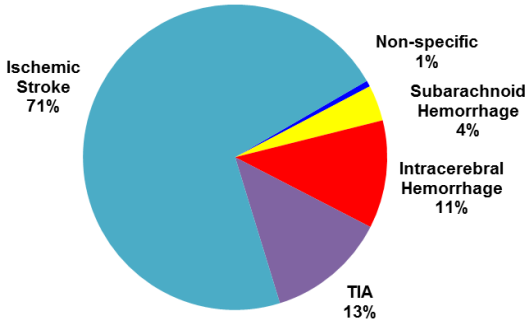
QUALITY INDICATORS

- Quality of care received by stroke patients is measured by indicators representing care processes that have been included in clinical recommendations.
- Quality indicator calculations include identification of patients for whom a care process would have been recommended, and a determination of how many of those patients received the recommended care.
- The 13 GCASR in-hospital care quality indicators are:
  1. Administration of tissue plasminogen activator
  2. Dysphagia screening
  3. Administration of antithrombotic medication within 48 hours
  4. Deep vein thrombosis (DVT) prophylaxis
  5. Prescription for lipid lowering medication
  6. Delivery of stroke education
  7. Smoking cessation counseling or treatment
  8. Rehabilitation assessment
  9. Prescription for antithrombotic medication at discharge
  10. Prescription for anticoagulant medication for patients with atrial fibrillation
  11. NIH stroke scale score recorded
  12. Door to image time
  13. Intravenous Alteplase within 60 minutes of hospital arrival
- Defect-free care is defined as the delivery of care meeting all quality indicators for which a patient is eligible
- Based on GEMSIS data, three performance measures are used to monitor the quality of pre-hospital care:
  1. On-scene time < 15 minutes
  2. Transports with a stroke screen completed and recorded
  3. Transports with a blood glucose checked and recorded

STROKE REGISTRY & GEMSIS DATA

- Analysis included data from 76,820 stroke patients' admissions to GCASR-participating hospitals during 2011 to 2015 and 3,158 presumable stroke patients transported by 15 EMS agencies from the field in 2015.
- In 2015, among patients transported by EMS with provider impression of stroke/cerebrovascular accident or transient ischemic attack:
  - 34.6% had pre-hospital stroke assessment done
  - 64.9% had their blood sugar measured
  - the median 911 call to hospital arrival time was 40 minutes
  - the median on-scene time was 16 minutes, and 41.8% had an on-scene time less than 15 minutes

Figure 1. Types of Stroke, GCASR Admissions, 2015 (n=18,310)



- In 2015, among acute stroke admissions in GCASR facilities:
  - Ischemic stroke and transient ischemic attack accounted for 84 percent of the admissions (Figure 1).
  - Forty-seven percent of stroke admissions were for patients brought to the hospital by EMS, 36 percent by private transportation, and 16 percent were transferred from one healthcare facility to another.
  - Hospitals received pre-notification on 58 percent of the stroke admissions brought by EMS.
  - A third of the total GCASR admissions (32 percent) previously had a stroke (27 percent) and/or TIA (9 percent).
  - Eighty percent of stroke admissions had a history of hypertension of which 78 percent were on antihypertensive medication during the week prior to admission for acute stroke.

2016 GCASR Data Summary

- 206 GCASR patients were newly diagnosed with diabetes during admission for acute stroke.
- About 54 percent of all stroke admissions resulted in discharge to home.

Table 1. Most frequent co-morbidities among stroke patients, GCASR, 2015 (n=18,310)

Co-morbidity	Number	Percent
Hypertension	14,554	80%
Dyslipidemia	7,358	40%
Diabetes mellitus	6,652	36%
CAD/prior MI	4,090	22%
Atrial fibrillation/flutter	2,290	14%
Obesity/Overweight	4,718	26%
Smoking	3,866	21%

- For ischemic stroke patients, prompt thrombolytic treatment, if eligible, is critical for a better functional outcome.
  - In 2015, among ischemic stroke patients admitted to GCASR-hospitals with symptom onset time noted, 33 percent (2,253/6,733) arrived at the emergency department within 2 hours from the last time they were known to be well.
  - Among these, 64 percent (1,438/2,253) had their brain image taken within 25 minutes of hospital arrival and 39 percent (869/2,253) were eligible, without contraindications, for Alteplase.
  - Among the Alteplase-eligible patients, 91 percent (787/869) received intravenous thrombolytic treatment within 3 hours after symptom onset.
  - Among eligible patients treated with a thrombolytic agent, 41 percent (325/787) and 68 percent (534/787) received intravenous Alteplase within 45 minutes and within an hour of arrival at the emergency department, respectively.
  - In 2015, among GCASR hospitals, the median time to receive Alteplase for ischemic stroke patients arriving within two hours of symptom onset was 51 minutes.

Figure 2. Percentage of ischemic stroke patients receiving intravenous Alteplase treatment, GCASR, 2011-2015 (n=52,086)

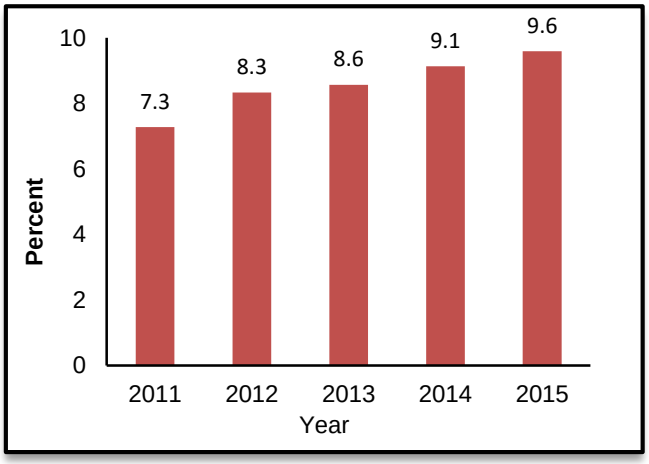
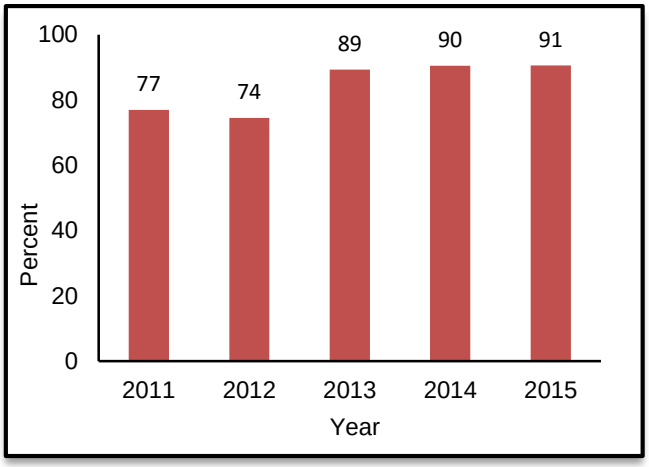


Figure 3. Percentage of eligible ischemic stroke patients receiving intravenous Alteplase treatment, GCASR, 2011-2015, (n=3,508)



IMPROVEMENTS OVER TIME (GCASR HOSPITALS)

- Overall, intravenous Alteplase administration among ischemic stroke patients increased from 7.3 percent in 2011 to 9.6 percent in 2015 (Figure 2), and among eligible ischemic stroke patients, Alteplase administration increased from 77 percent in 2011 to 91 percent in 2015 (Figure 3).
- The percentage of patients who received defect-free care increased from 72 percent in 2011 to 78 percent in 2015 (Figure 4), indicating improvement in all ten performance measures on aggregate.
- The percentage of those who received intravenous Alteplase within 60 minutes of their arrival increased from 40 percent to 68 percent (Figure 5).
- The median times to take a brain image and administer Alteplase intravenously (door-to-needle time) were shortened from 26 and 67 minutes in 2011 to 15 and 51 minutes in 2015, a reduction of 42 and 24 percent, respectively (Figures 6 & 7).
- No improvement was documented in hospital pre-notification by EMS and in reducing the time elapsed from symptom onset to hospital arrival (Figure 8 & 9)

Figure 4. Percentage of acute stroke patients who received defect-free care, GCASR, 2011-2015 (n=60,610)

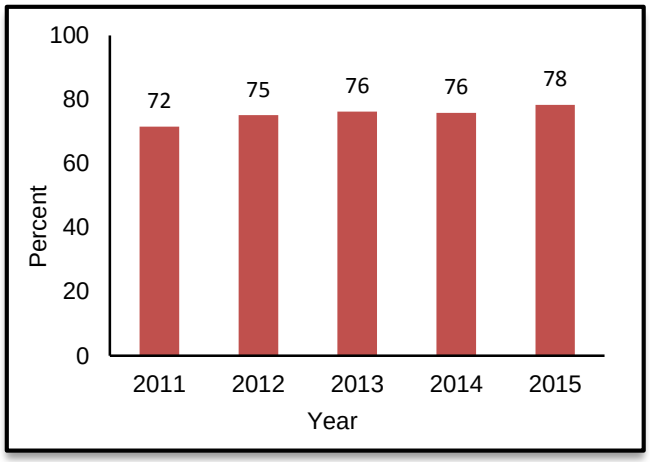


Figure 5. Percentage of ischemic stroke patients treated with intravenous Alteplase within 60 minutes of hospital arrival, GCASR, 2011-2015 (n=2,984)

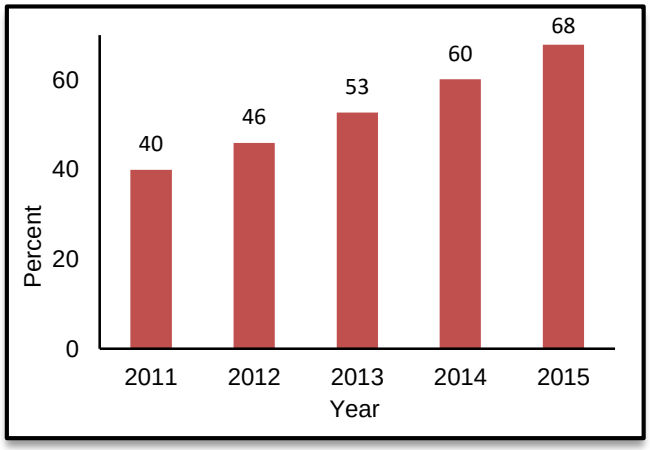


Figure 6. Trend in median door-to-imaging time among ischemic stroke patients who arrived at a hospital within 120 minutes of symptom onset, GCASR, 2011-2015 (n=8,397)

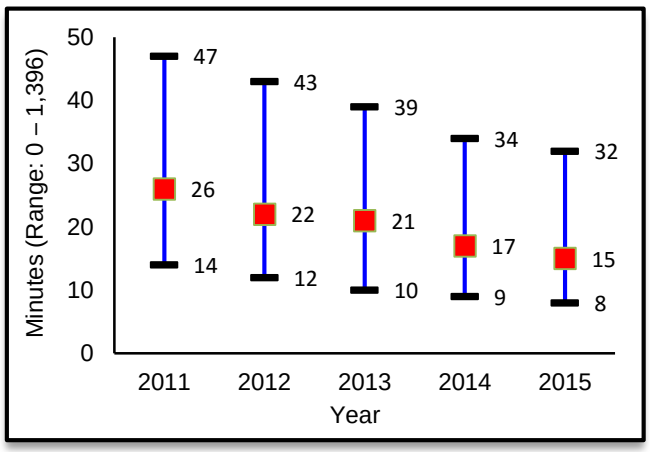


Figure 7. Trend in median door-to-needle time among eligible ischemic stroke patients treated with intravenous Alteplase, GCASR, 2011-2015 (n=2,976)

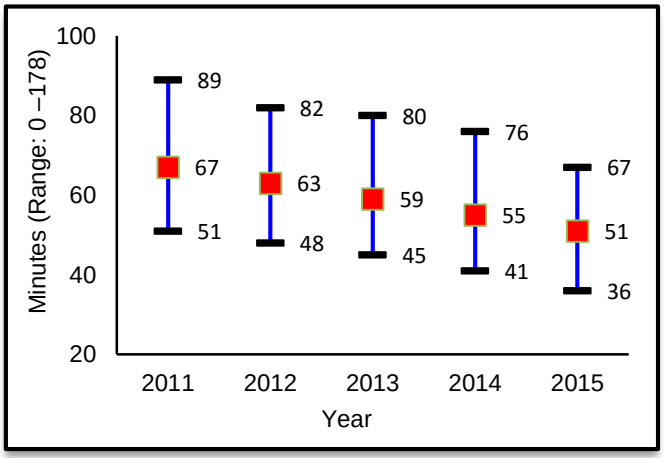
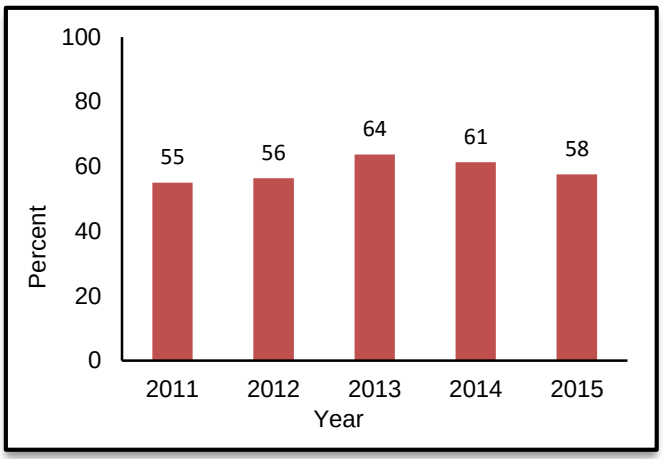
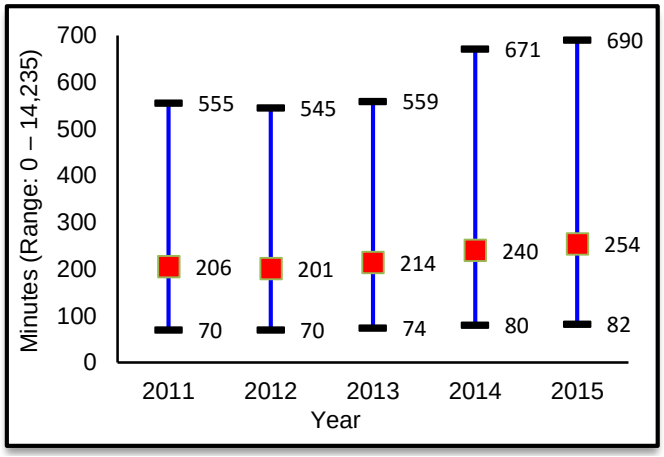


Figure 8. Percentage of stroke patients transported by EMS with hospital pre-notification, GCASR, 2011-2015 (n=34,134)



FOR MORE INFORMATION ON GCASR, PLEASE VISIT
http://dph.georgia.gov/georgia-coverdell-acute-stroke-registry

Figure 9. Trend in median symptom onset to hospital arrival time among acute ischemic stroke patients, GCASR, 2011-2015 (n=25,208)



DEFINITIONS

- Stroke: brain tissue death; can be the result of a thrombus (blocked artery) or a hemorrhage (ruptured artery) which prevents blood flow to the brain
- Transient ischemic attack: temporary blockage of cerebral blood flow that causes a short-lived neurological deficit
- Deep Vein Thrombosis (DVT): blood clot located in a large vein; a potential complication of stroke
- Dysphagia: problems swallowing; a potential complication of stroke that can lead to pneumonia
- Antithrombotic: medication administered to prevent platelets or clotting factors in the blood from forming a blood clot
- Anticoagulation: administration of medications to prevent clotting of the blood
- Tissue plasminogen activator (Alteplase): a thrombolytic medication administered to eligible acute ischemic stroke patients to reestablish blood supply to the brain

Georgia Coverdell Acute Stroke Registry Participating Hospitals (n=65), November 2016