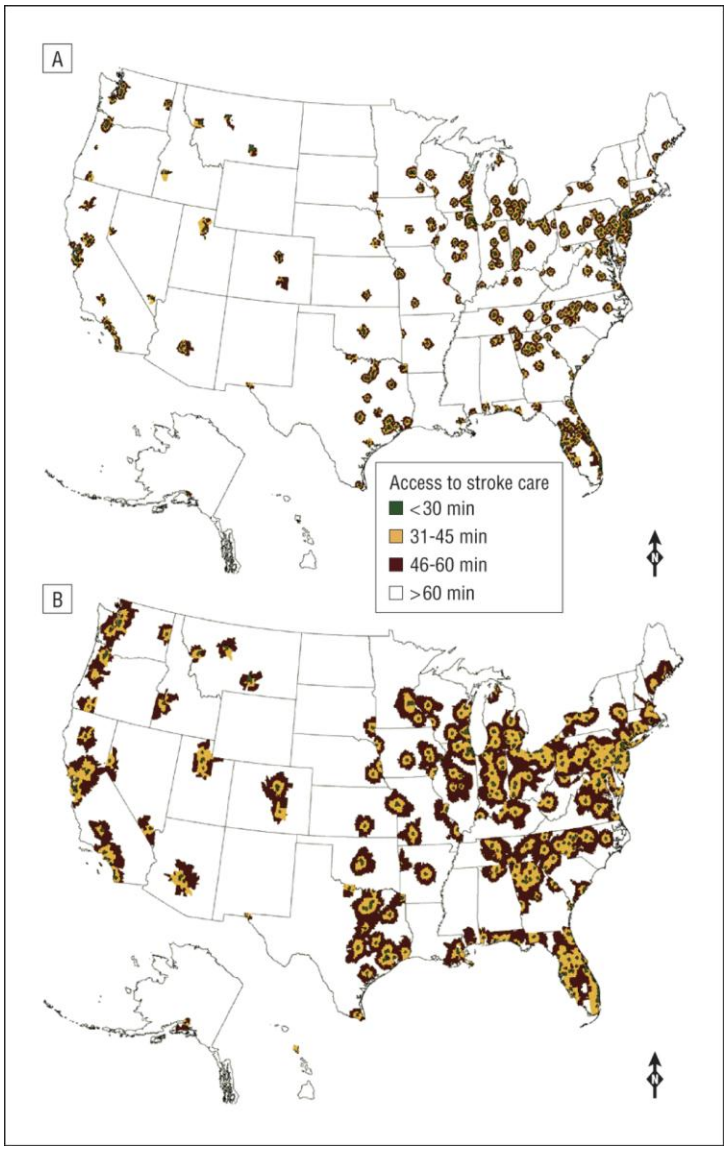
Acute Stroke Care and Thrombolysis at Critical Access Hospitals in Illinois

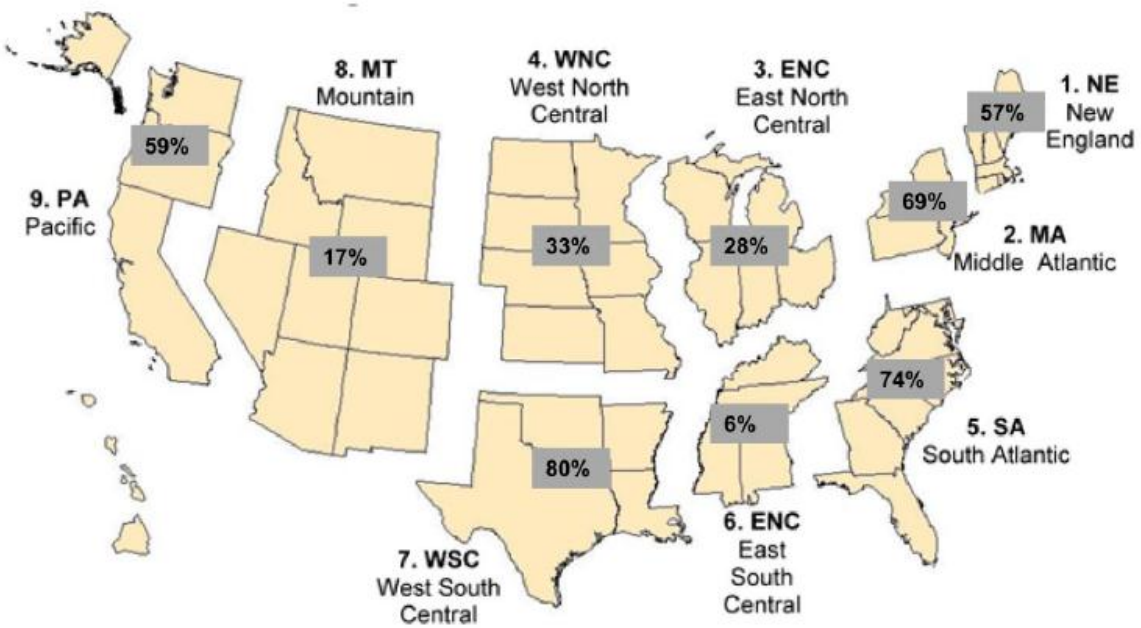
Shyam Prabhakaran, MD, MS; Peggy L. Jones; Robin Hamann, RN, BS; Kathleen O'Neill, MHA; Michelle Gardner, MBA
for the Illinois Critical Access Hospital Network (ICAHN)

Background

- Critical access hospitals (CAH) are the first point of stroke care in many rural regions of the United States (US)
  - 20% of US population is rural
- Over 1300 CAH in US (20% of all hospitals and 80% of small rural hospitals)
  - Defined as having maximum 25 beds
  - Open 24-hr for emergency services
  - Average LOS < 96 hours
  - > 35 miles from nearest acute care hospital
  - Receive cost-based (+1%) reimbursement
- **Key safety net for many Americans**

Rural Assistance Center (www.raconline.com)

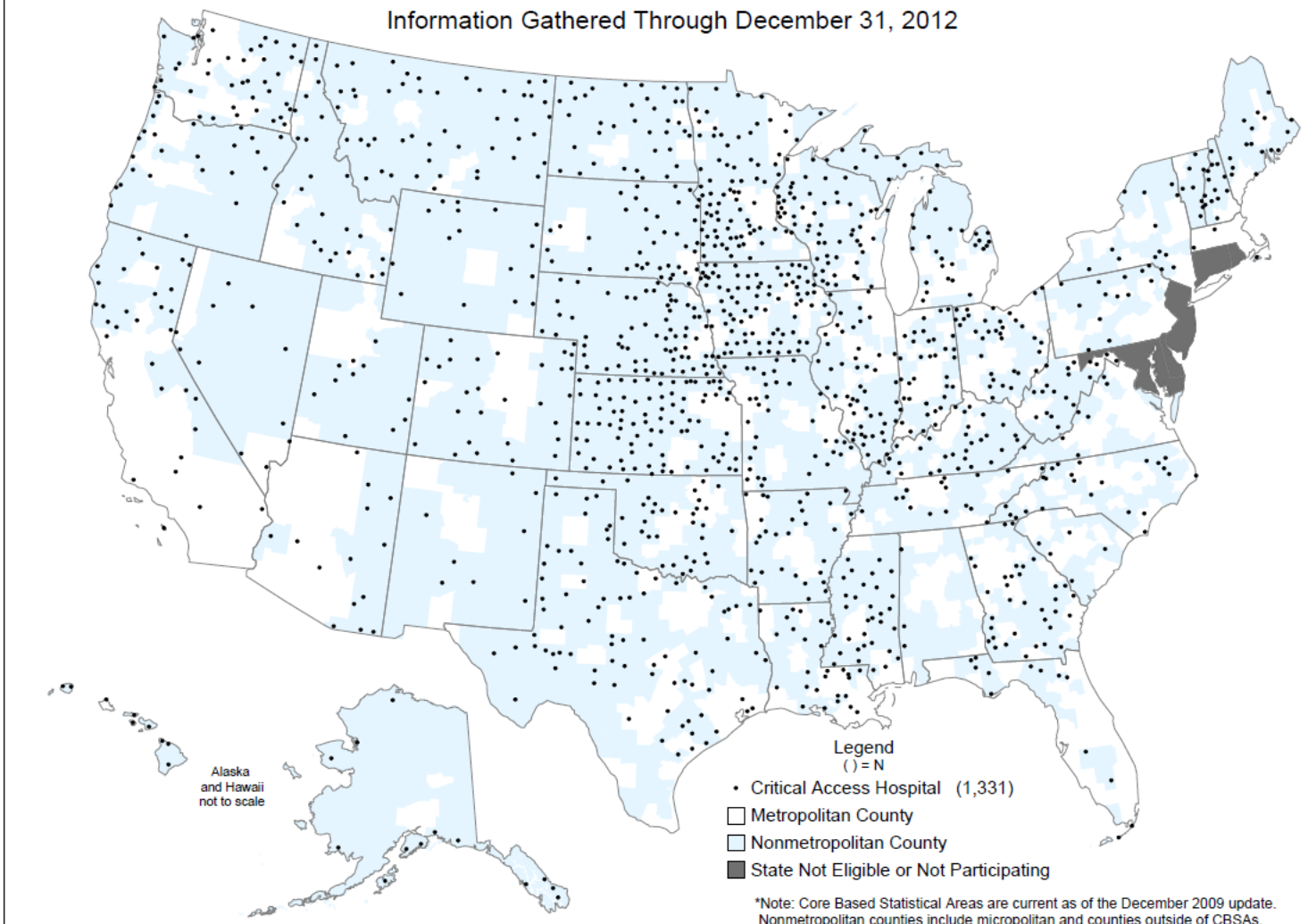




Albright KC, Arch Neurol 2010; Song S, Stroke 2012

Location of Critical Access Hospitals

Information Gathered Through December 31, 2012



*Note: Core Based Statistical Areas are current as of the December 2009 update. Nonmetropolitan counties include micropolitan and counties outside of CBSAs.

Produced By: North Carolina Rural Health Research and Policy Analysis Center, Cecil G. Sheps Center for Health Services Research, University of North Carolina at Chapel Hill.

Sources: US Census Bureau, 2009; CMS Regional Office, ORHP, and State Offices Coordinating with MRHFP, 2012.

Illinois Critical Access Hospital Network (ICAHN)

- ICAHN is a not-for-profit 501(c)3 corporation
  - Established in 2003
  - 51 member hospitals
  - Governed by a board of directors
  - Shares resources, education, and best practices
  - Promotes efficiency
  - Compete for grant funding
- Quality improvement program to address acute stroke care began in 2009 (funded by Telligen)
- Goal to prepare for emergent (acute) stroke ready hospital designation

ICAHN Stroke Initiative

Components of initiative

- Overview of Stroke Systems of Care
- Preparation for Emergent Stroke Ready state designation
- Performance improvement focused on acute stroke measures
  - tPA administration
  - Understanding and using NIH Stroke Scale
  - Developing transfer protocols
- Participation in Get With The Guidelines Stroke Registry
- Participation in national AHA Target Stroke initiative
- Recognition for commitment to quality stroke care
- Monthly team calls
- AHA accredited continuing education
- Community education and awareness
  - Pact to Act FAST

Objective

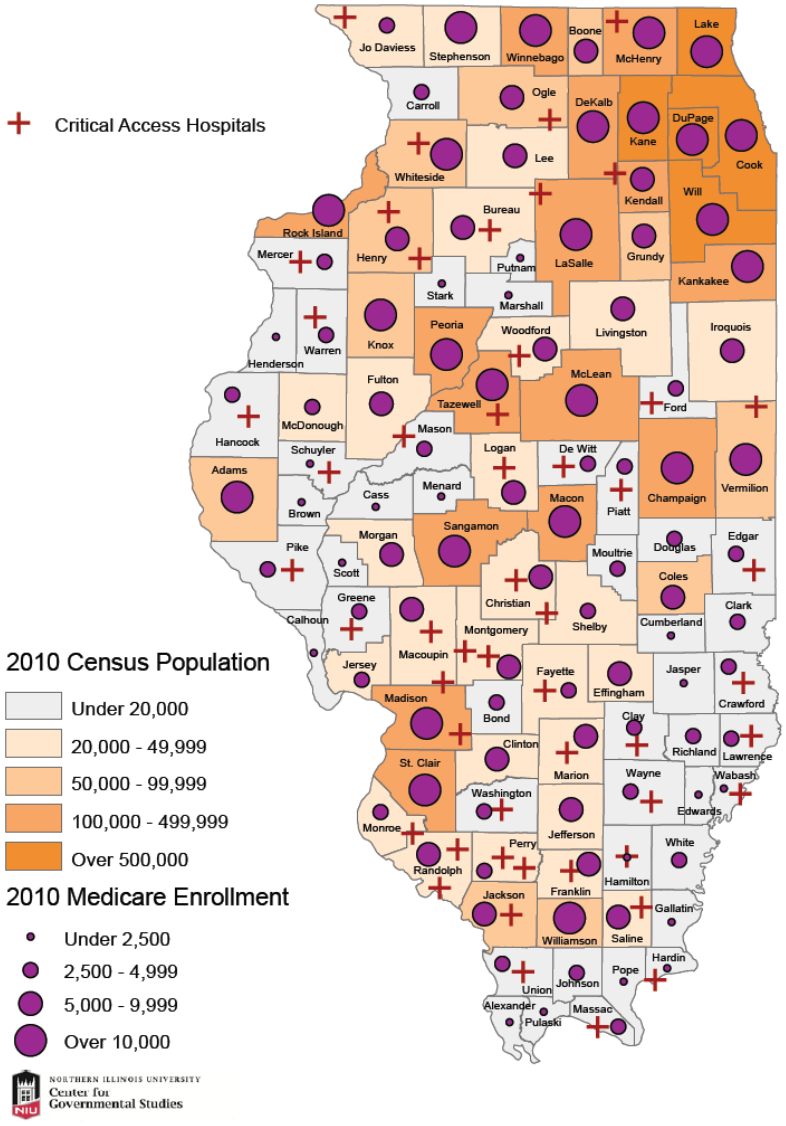
- We evaluated the performance on several metrics in acute stroke care at 26 of 51 GWTG-Stroke participating CAH in Illinois between 2009 and 2011.

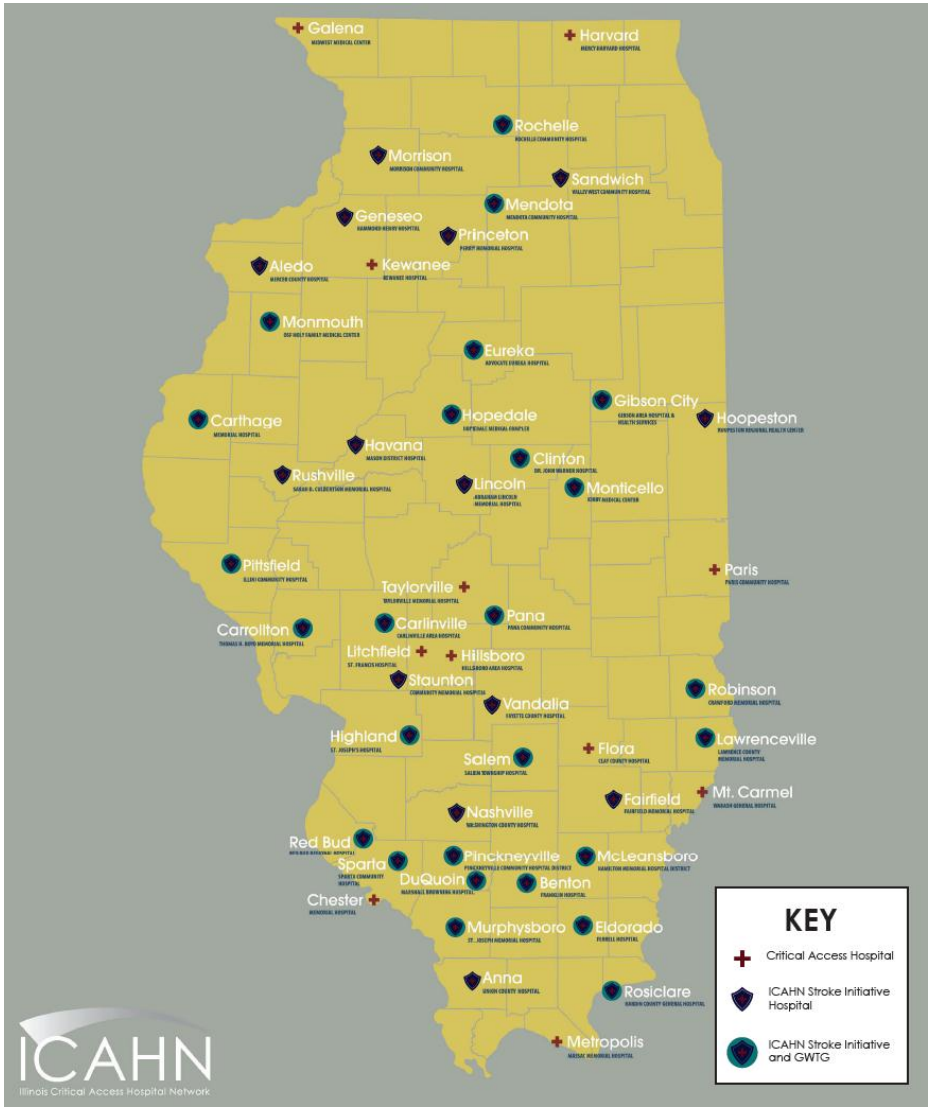
Methods

- 26 CAH participated by using Get With The Guidelines-Stroke (GWTG-S) for data collection
- Data aggregated from each site using GWTG-S
  - Included demographics, diagnosis, mode of arrival, times, EMS pre-notification, treatments, and discharge outcomes
- Assessed change over 3 years in:
  - % receiving tPA
  - Door-to-imaging time
  - % total stroke patients admitted versus transferred
- Statistics included Fisher's Exact tests for proportions and Mann-Whitney tests for median values of continuous variables
- P-value < 0.05 considered significant

American Heart Association | American Stroke Association.

GET WITH THE GUIDELINES.

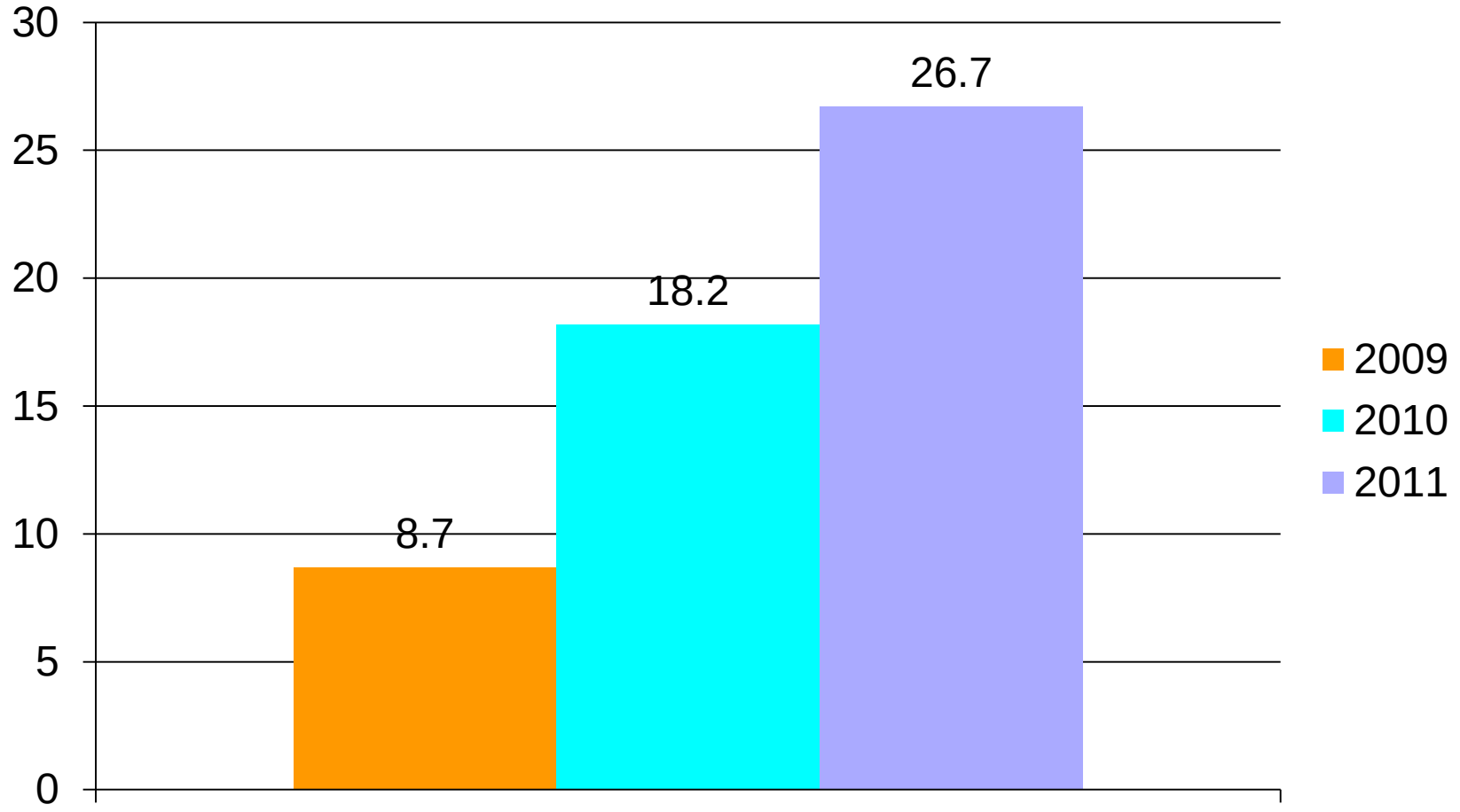




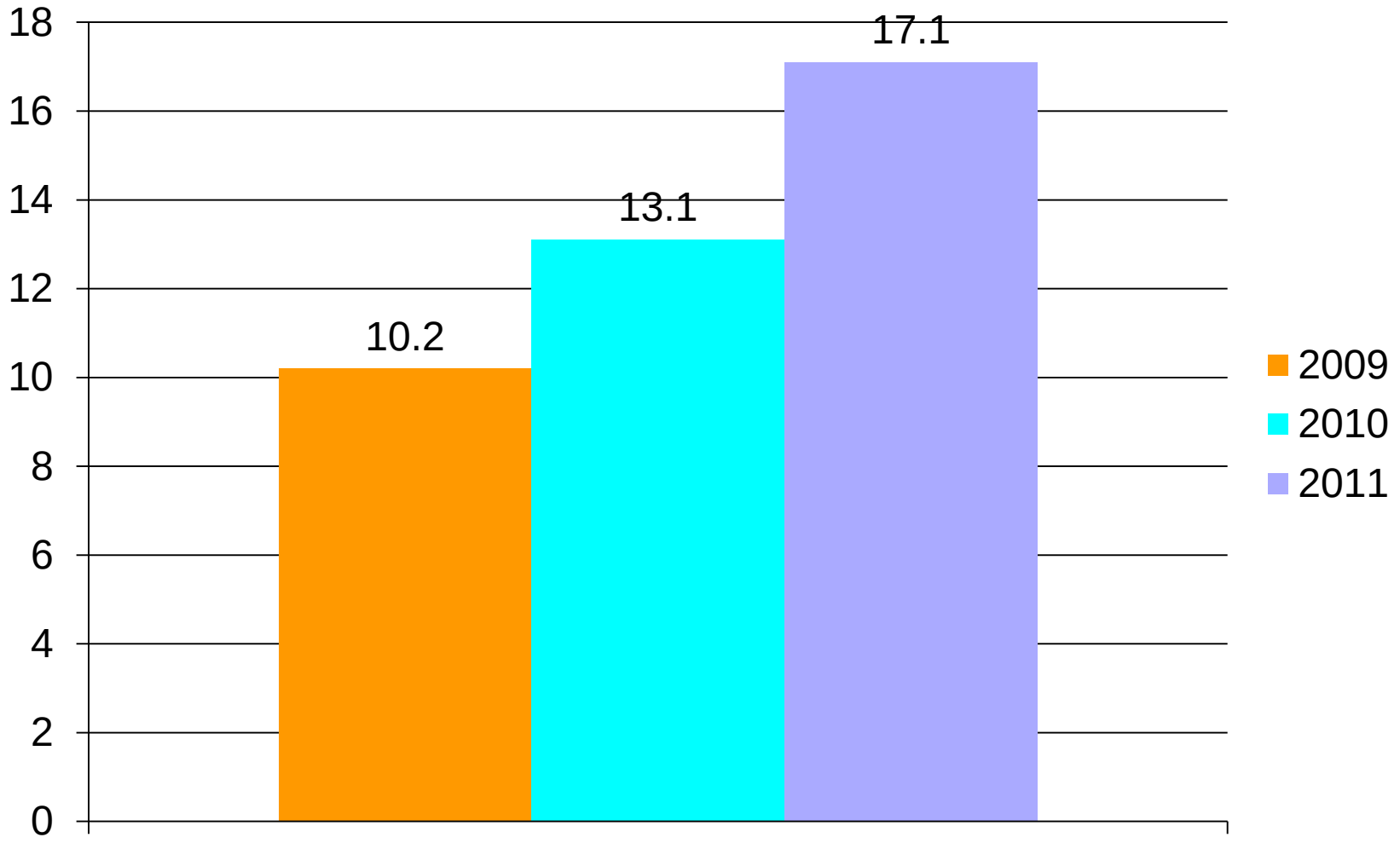
	2009 (n=158)	2010 (n=364)	2011 (n=441)
Hospitals included	10	20	26
Mean age, years (SD)	75 (14.3)	75.2 (14.6)	73.2 (15.9)
Female, n (%)	85 (53.8)	210 (57.7)	254 (57.6)
White, n (%)	153 (96.8)	342 (95.6)	411 (93.2)
Diagnosis, n (%)			
Ischemic stroke	44 (27.8)	108 (29.7)	137 (31.1)
Intracerebral hemorrhage	20 (12.7)	26 (7.1)	34 (7.7)
Subarachnoid hemorrhage	5 (3.2)	11 (3.0)	5 (1.1)
Transient ischemic attack	59 (37.3)	126 (34.6)	161 (36.5)
Undetermined	30 (19.0)	93 (25.5)	104 (23.6)
Hypertension, n (%)	109 (69.0)	273 (75.0)	321 (72.8)
Diabetes mellitus, n (%)	35 (22.2)	104 (28.6)	141 (32.0)
Dyslipidemia, n (%)	29 (18.4)	110 (30.2)	141 (32.0)
Coronary artery disease, n (%)	44 (27.8)	118 (32.4)	146 (33.1)
Atrial fibrillation/flutter, n (%)	23 (14.6)	56 (15.4)	66 (15.0)
Prior stroke, n (%)	41 (25.9)	84 (23.1)	99 (22.4)
Current smoking, n (%)	19 (12.0)	36 (9.9)	52 (11.8)

	2009 (n=158)	2010 (n=364)	2011 (n=441)
Mode of arrival, n (%)			
EMS from scene	71 (44.9)	149 (40.9)	169 (38.3)
Private transport	66 (41.8)	171 (47.0)	193 (43.8)
Other/Unknown	21 (13.3)	44 (12.1)	79 (17.9)
Median onset to ED arrival (minutes)	127	180.5	135
Onset to ED arrival time (minutes)			
0-60	42 (26.6)	72 (19.8)	104 (23.6)
61-120	15 (9.5)	41 (11.3)	58 (13.2)
121-180	8 (5.1)	17 (4.7)	37 (8.4)
181-270	5 (3.2)	18 (4.9)	18 (4.1)
>270	47 (29.7)	112 (30.8)	126 (28.6)
Unknown	41 (25.9)	104 (28.6)	98 (22.2)
EMS pre-notification, n (%)	61 (85.9)	127 (85.2)	130 (76.9)
IV tPA use among IS, n (%)	3 (6.8)	12 (11.1)	20 (14.6)
Not admitted, n (%)	64 (40.5)	153 (42.0)	205 (46.5)
Ischemic stroke	11 (25.0)	25 (23.1)	49 (49.0)
Intracerebral hemorrhage	13 (65.0)	17 (65.4)	26 (76.5)
Subarachnoid hemorrhage	3 (60.0)	9 (81.8)	3 (60.0)
Transient ischemic attack	20 (33.9)	63 (50.0)	68 (42.2)
Undetermined	17 (56.7)	39 (49.4)	59 (67.0)
Drip/ship tPA, n (%)	2 (67.7)	12 (100)	18 (90.0)

TPA within 4.5 hrs if arrived < 4.5 hrs



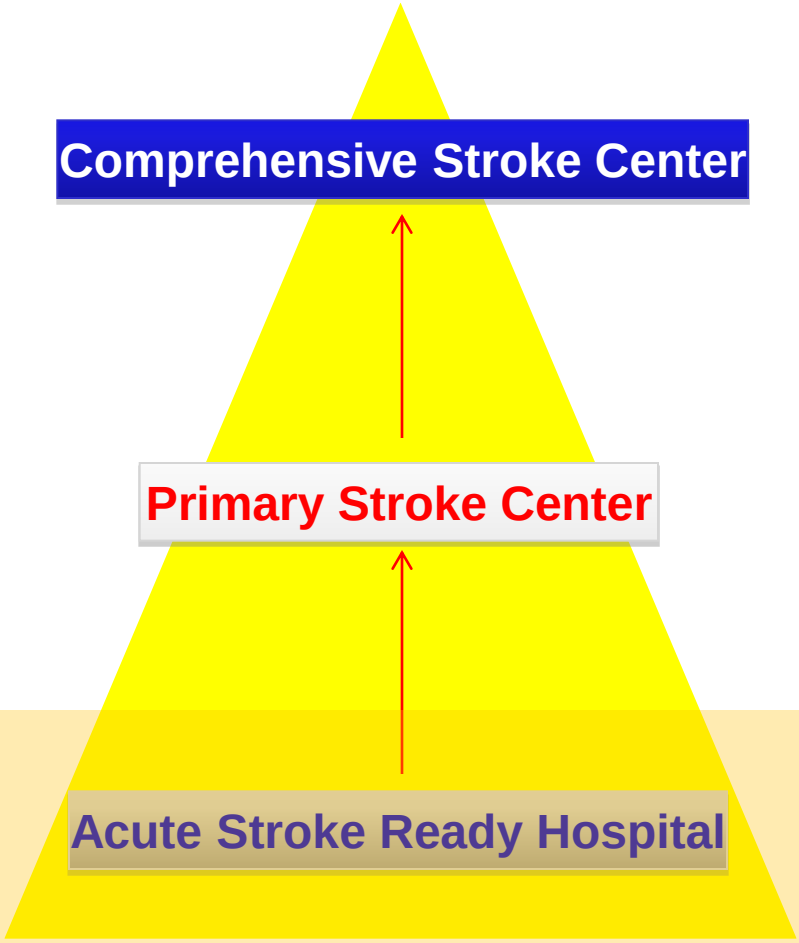
CT < 15 minutes if arrived < 4.5 hrs



Discussion

- Quality improvement at CAHs is feasible
  - Increases in tPA use noted
  - More rapid CT imaging
- Opportunities for improvement remain
- Potential solutions
  - Emergent (acute) stroke ready hospital designation
  - Drip/ship tPA protocols
  - Telemedicine
- Stroke systems should incorporate CAHs
  - Focus thus far has been on PSC (and CSCs)

Discussion



Academic Medical Center or Tertiary Care facility; neurosurgical and interventional services

Wide range of hospitals; standard stroke care; stroke unit; use TPA

Rural hospitals; basic care; drip and ship; use tele-technologies

Acknowledgements

- Funding: Telligen (QIO), Genentech, AHA Midwest Affiliate
- Peggy Jones: pjones@icahn.org
- ICAHN network hospitals

Thank you for your attention