

Surveillance of Heart Diseases and Stroke Using Centers for Medicare and Medicaid (CMS) Data: A Researcher's Perspective

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SCHOOL OF
MEDICINE

AHA Scientific Statement

Essential Features of a Surveillance System to Support the Prevention and Management of Heart Disease and Stroke

A Scientific Statement From the American Heart Association Councils on Epidemiology and Prevention, Stroke, and Cardiovascular Nursing and the Interdisciplinary Working Groups on Quality of Care and Outcomes Research and Atherosclerotic Peripheral Vascular Disease

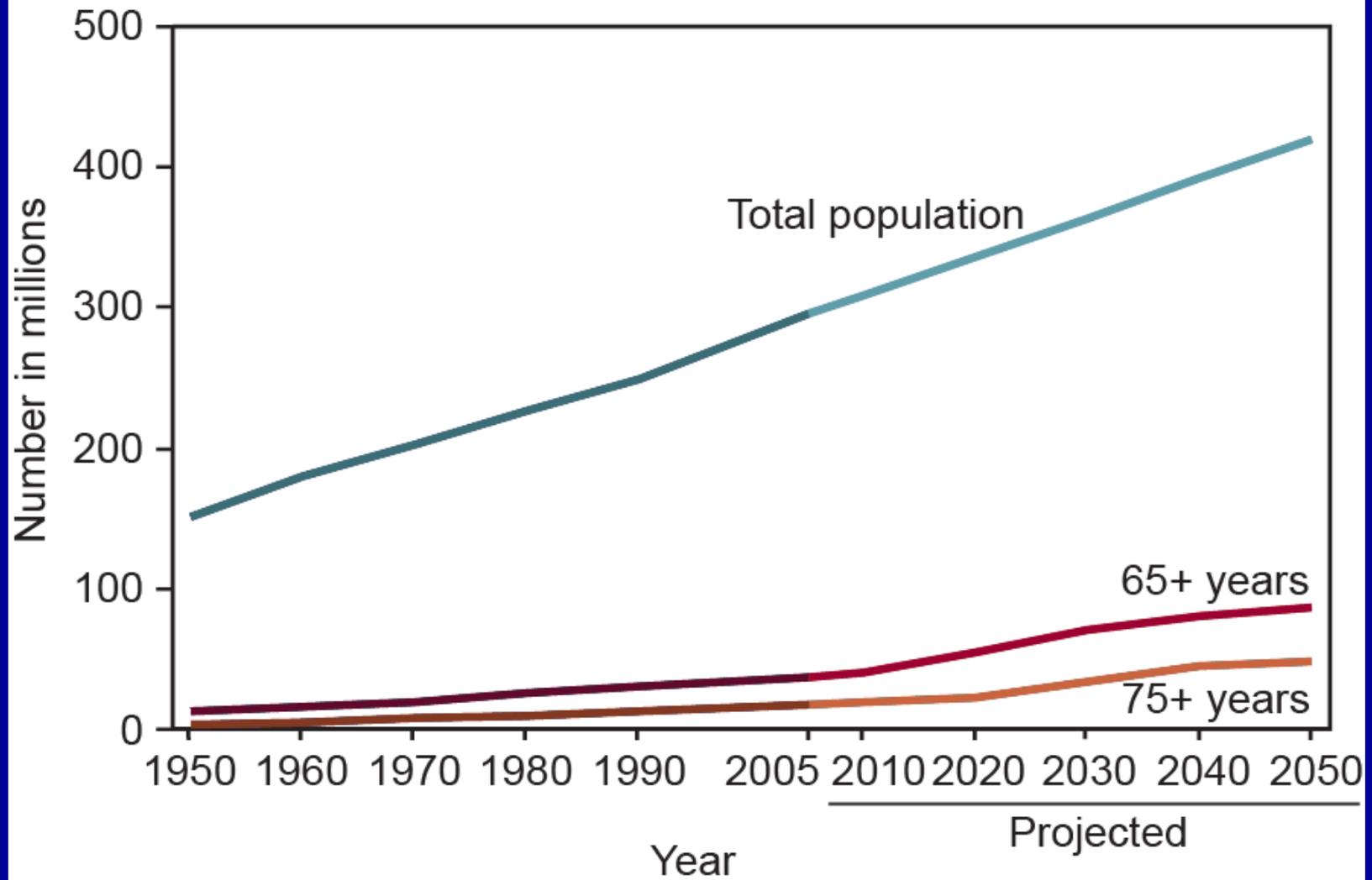
David C. Goff, Jr, MD, PhD; Lawrence Brass, MD†; Lynne T. Braun, PhD, RN, CNP; Janet B. Croft, PhD; Judd D. Flesch; Francis G.R. Fowkes, MD, PhD; Yuling Hong, MD, PhD; Virginia Howard, MSPH; Sara Huston, PhD; Stephen F. Jencks, MD, MPH; Russell Luepker, MD, MS; Teri Manolio, MD, PhD; Christopher O'Donnell, MD, MPH; Rose Marie Robertson, MD; Wayne Rosamond, PhD; John Rumsfeld, MD, PhD; Stephen Sidney, MD, MPH; Zhi Jie Zheng, MD, PhD

- Need for strong population-based data to achieve surveillance goals.

Current Gaps

- No comprehensive national surveillance system
 - Track patterns of disease, care, and outcomes over time
- Cohort Studies
 - Provide valuable information, but have limitations
- CVD and stroke have a large impact in the elderly population

Population growth



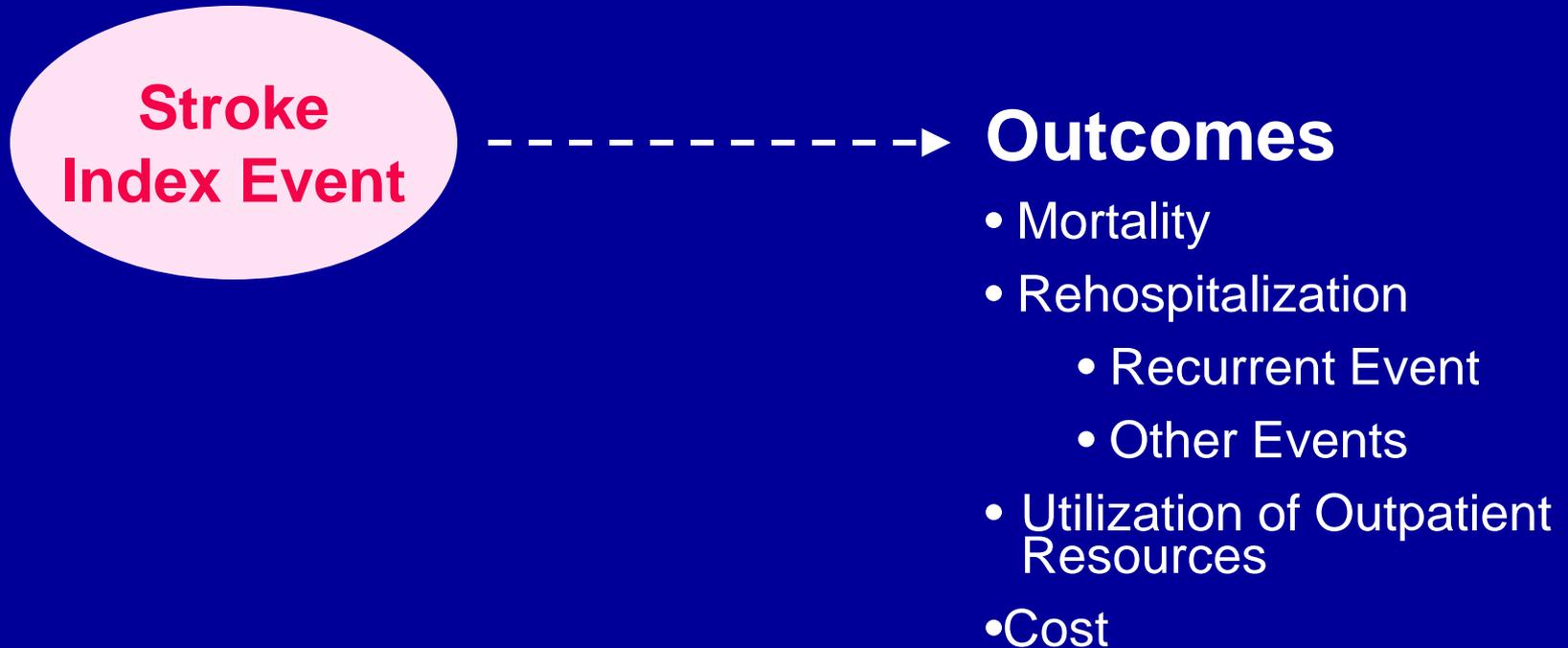
SOURCES: Centers for Disease Control and Prevention, National Center for Health Statistics, *Health, United States, 2006*, Figure 1. Data from the U.S. Census Bureau.

Previous Strategies Using CMS Data

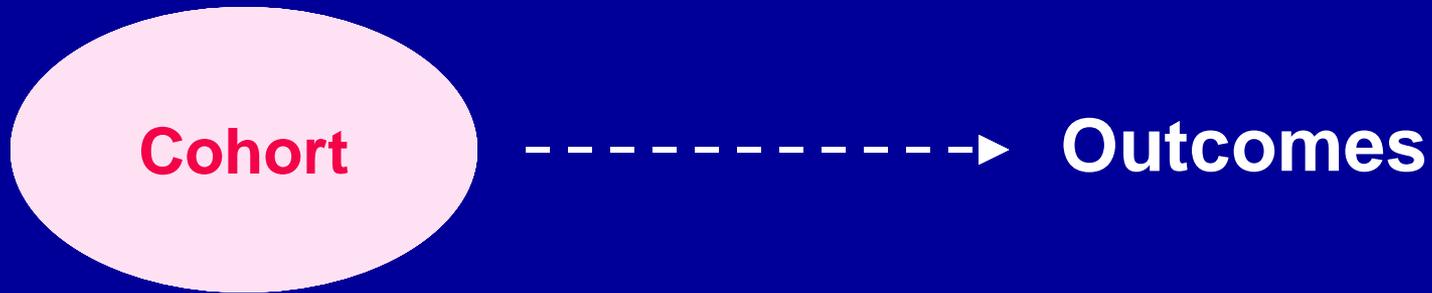
- Cross-sectional design
- Subset of national cohort
- Focus on short-term outcomes
- Limited patient-level information
- No individual follow-up over time



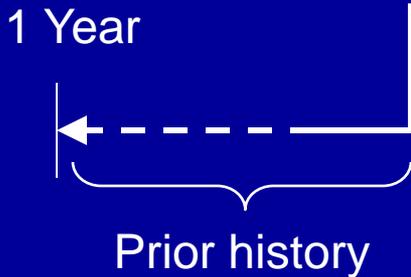
Prospective Surveillance



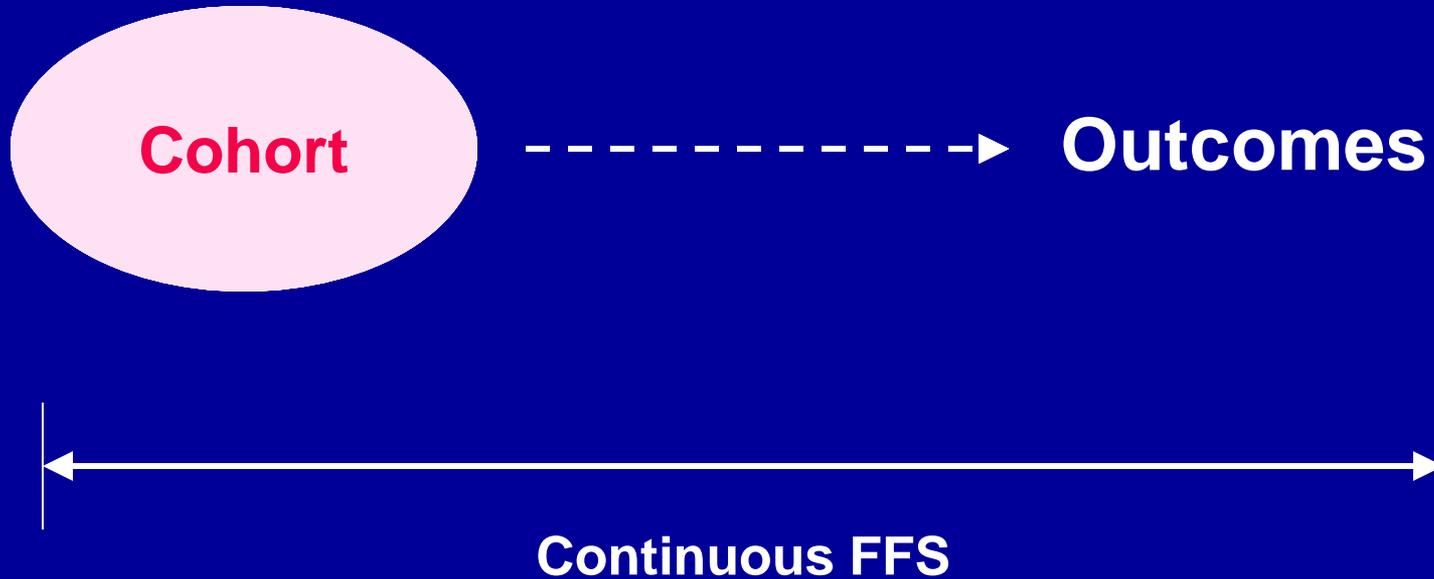
Risk-Adjustment



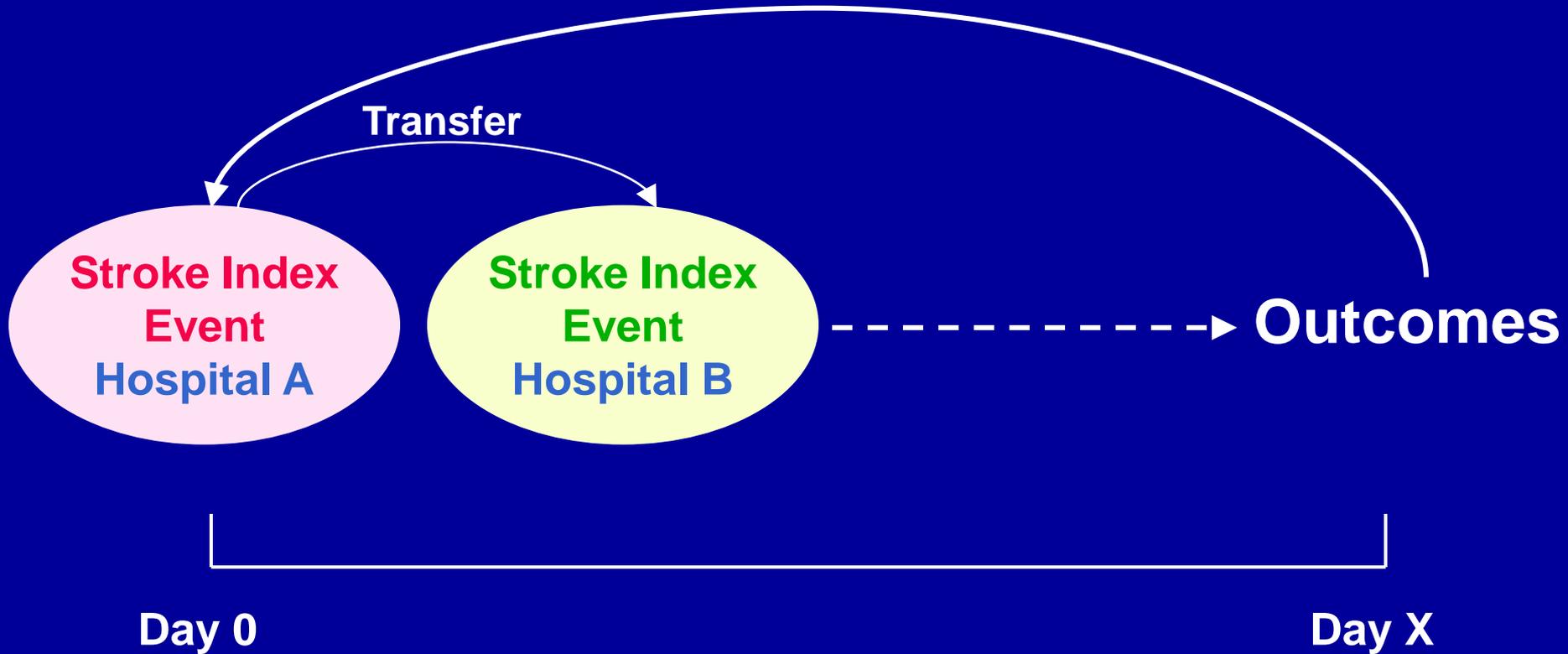
Index Event: Comorbid or Complication?



Track Cohort over Time



Linked Hospitalizations: “Episode of Care”



How to Access CMS Data: ResDAC



The image shows a screenshot of the ResDAC website. The header features the ResDAC logo and the text "Research Data Assistance Center". A navigation menu on the left includes links for Home, About Us, Available CMS Data, Data Documentation, Requesting CMS Data, Education, Technical Publications, Statistical Resources, and Organizations' Links. The "About Us" page is selected, displaying a description of the center and a list of links to various sections. A search bar and the ResDAC logo are visible at the bottom.

ResDAC Research Data Assistance Center

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- Staff
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- Location
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Available CMS Data ▶

Data Documentation ▶

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About Us

The Research Data Assistance Center (ResDAC) is a CMS contractor (Contract Number HHSM-500-2005-000271) that provides free assistance to academic, government and non-profit researchers interested in using Medicare and/or Medicaid data for their research. ResDAC is staffed by a consortium of epidemiologists, public health specialists, health services researchers, biostatisticians, and health informatics specialists from the [University of Minnesota](#).

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Last Modified November 24, 2008

www.resdac.umn.edu/

Search



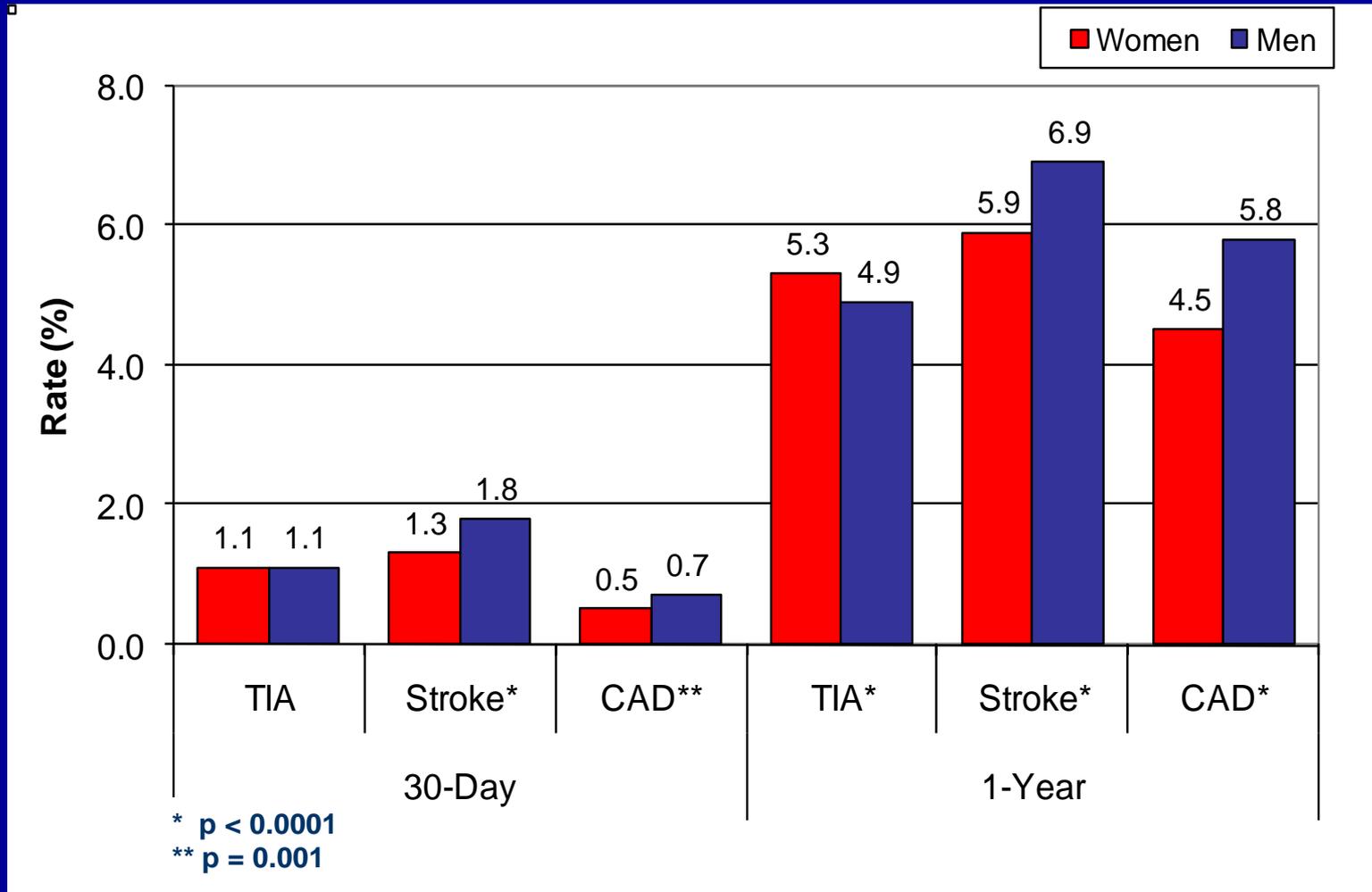
CMS Data:

Innovations have simplified the process

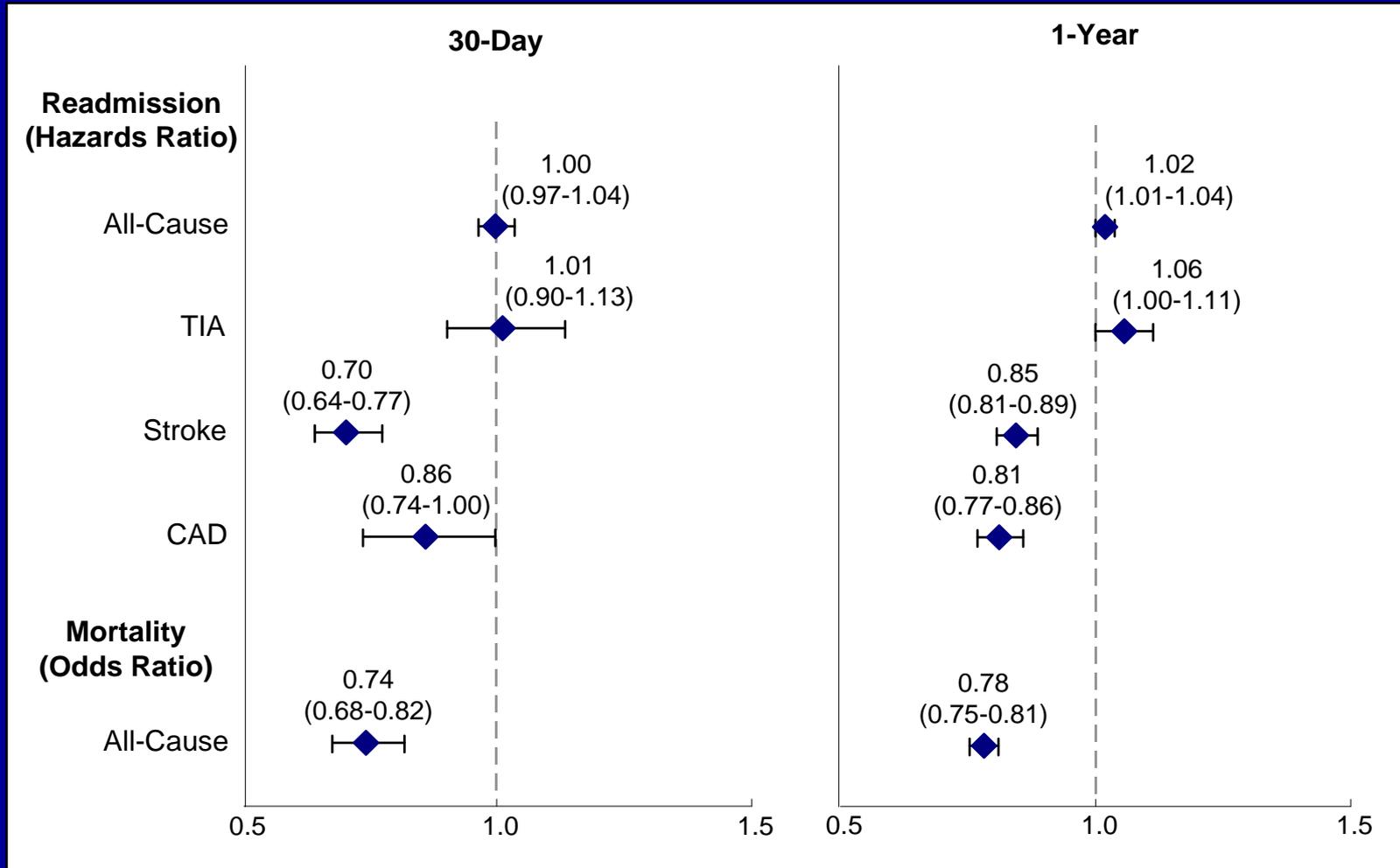


Readmission Rates by Sex

122,063 hospital discharges for TIA (ICD-9 435)

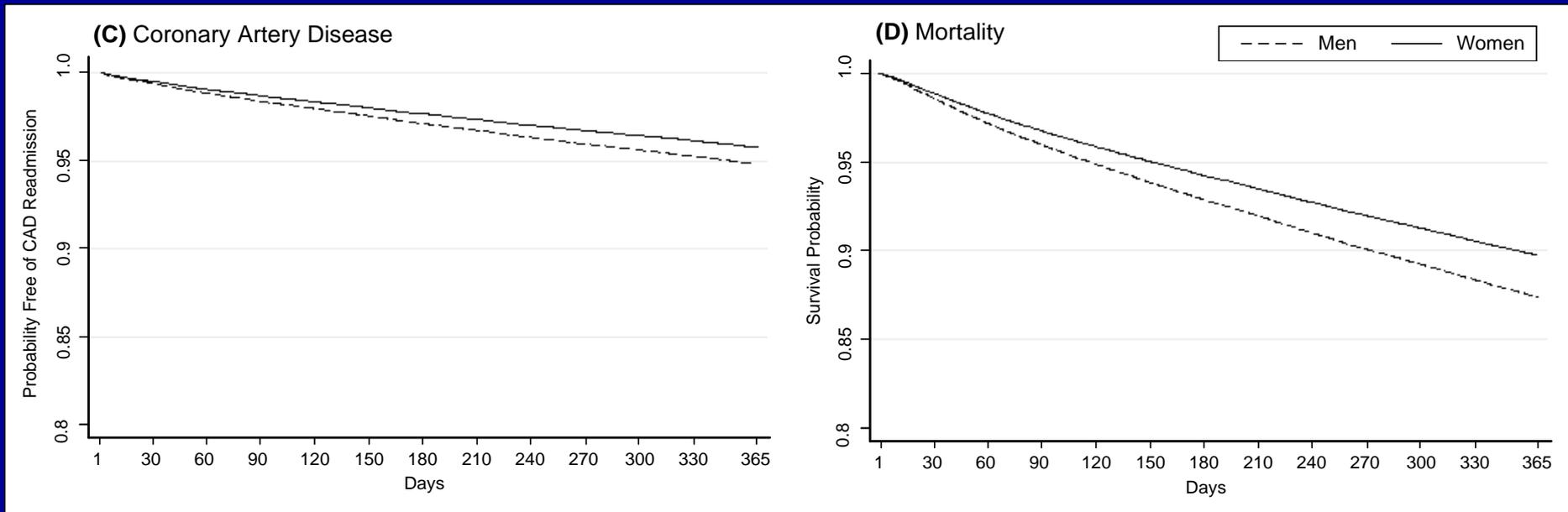


Risk-Adjusted Outcomes (Women / Men)



Analyses are risk-adjusted for age (continuous), race (white vs. other), admission source (ED, skilled nursing facility, vs. other), Deyo comorbidity score (≥ 3 vs. < 3), number of hospitalizations in prior year (≥ 2 vs. < 2), and medical history (yes vs. no; cancer, dementia, chronic obstructive pulmonary disease, ischemic stroke, diabetes, hypertension, acute myocardial infarction, congestive heart failure, and atrial fibrillation).
Stroke 2009;40:2116-2122

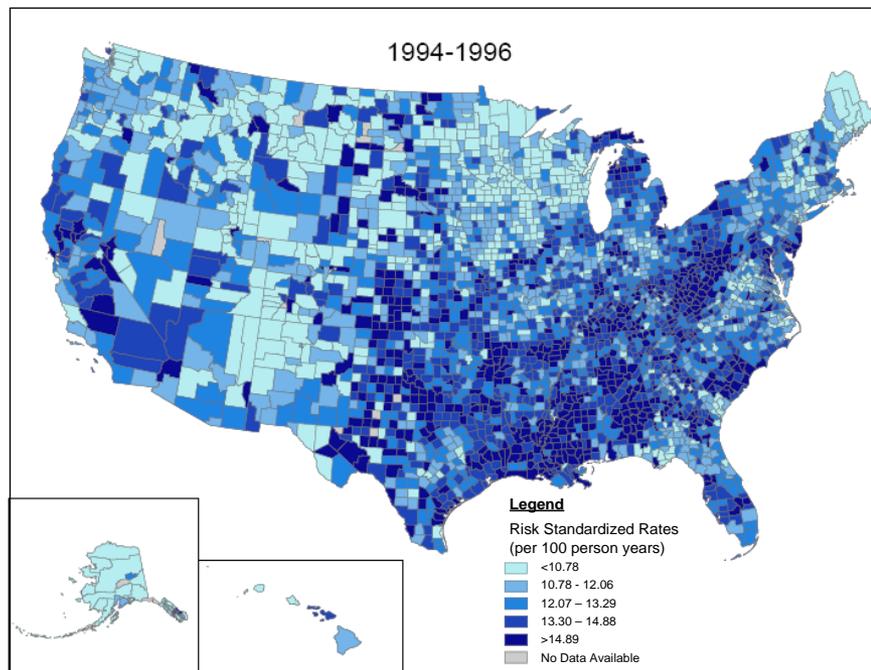
CAD and Mortality



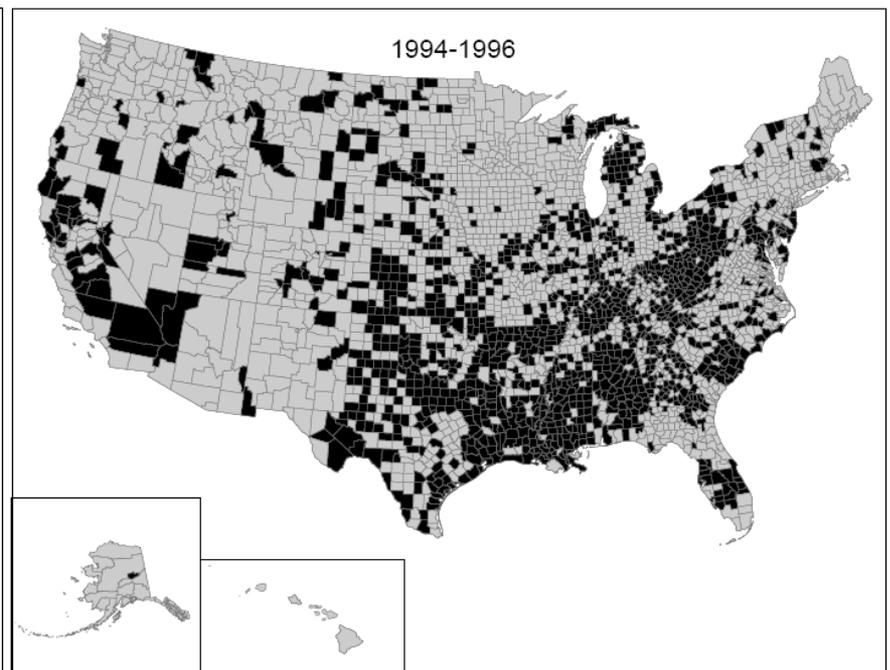
All analyses are adjusted for age (continuous), race (white vs. other), admission source (ED, skilled nursing facility, vs. other), Deyo comorbidity score (≥ 3 vs. < 3), number of hospitalizations in prior year (≥ 2 vs. < 2), and medical history (yes vs. no; cancer, dementia, chronic obstructive pulmonary disorder, ischemic stroke, diabetes, hypertension, acute myocardial infarction, congestive heart failure, and atrial fibrillation). $P < 0.01$

1-Year Recurrent Stroke Rates 1994-1996

A. Risk Standardized Recurrent Stroke Rates

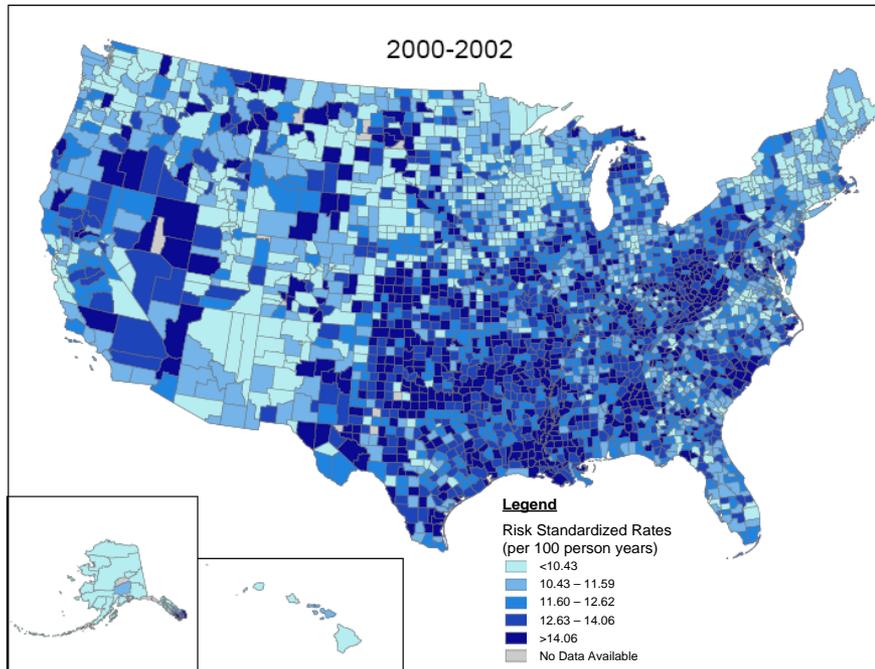


B. Counties with Standardized Rates Above the National Mean

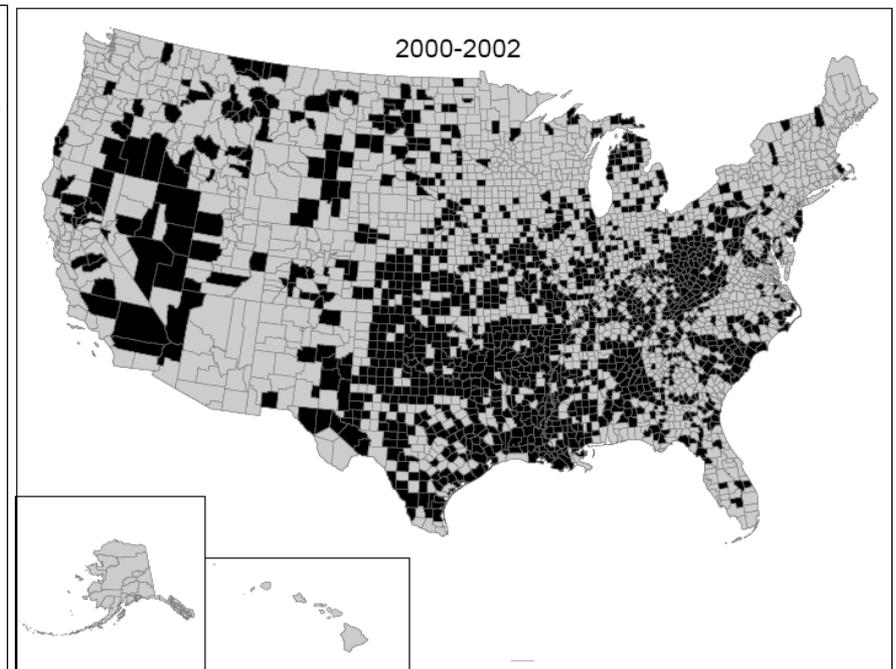


1-Year Recurrent Stroke Rates 2000-2002

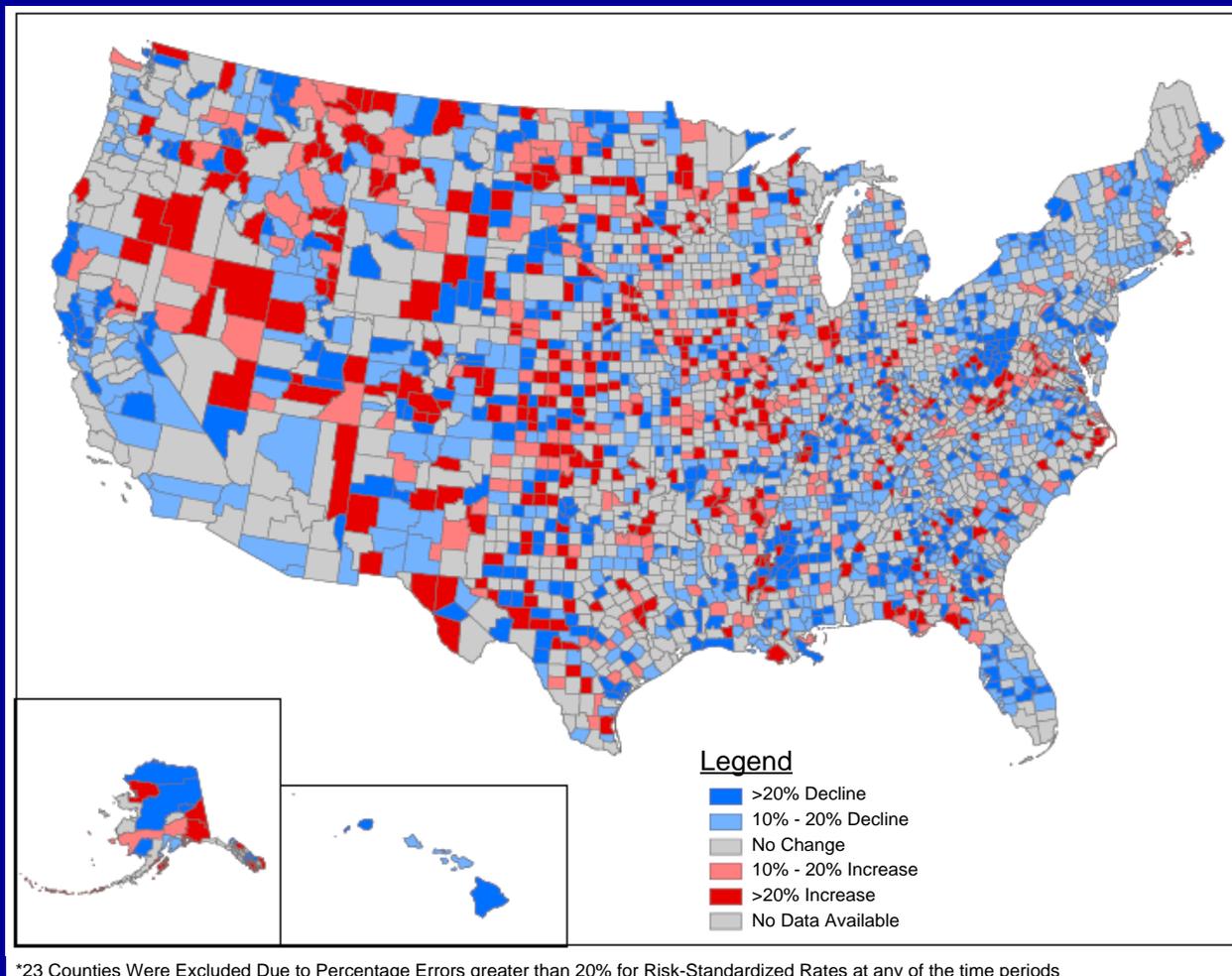
A. Risk Standardized Recurrent Stroke Rates



B. Counties with Standardized Rates Above the National Mean



Percentage Change in Risk Standardized 1-Year Recurrent Stroke Rates from 1994-1996 to 2000-2002



- Recurrent stroke hospitalization rates decreased by 5%
- Marked geographic variation

Health Services and Outcomes Research

An Administrative Claims Model Suitable for Profiling Hospital Performance Based on 30-Day Mortality Rates Among Patients With an Acute Myocardial Infarction

Harlan M. Krumholz, MD, SM; Yun Wang, PhD; Jennifer A. Mattera, MPH; Yongfei Wang, MS; Lein Fang Han, PhD; Melvin J. Ingber, PhD; Sheila Roman, MD, MPH; Sharon-Lise T. Normand, PhD

An Administrative Claims Measure Suitable for Profiling Hospital Performance on the Basis of 30-Day All-Cause Readmission Rates Among Patients With Heart Failure

Patricia S. Keenan, PhD, MHS; Sharon-Lise T. Normand, PhD; Zhenqiu Lin, PhD; Elizabeth E. Drye, MD, SM; Kanchana R. Bhat, MPH; Joseph S. Ross, MD, MHS; Jeremiah D. Schuur, MD, MHS; Brett D. Stauffer, MD; Susannah M. Bernheim, MD, MHS; Andrew J. Epstein, PhD, MPP; Yongfei Wang, MSc; Jeph Herrin, PhD; Jersey Chen, MD, MPH; Jessica J. Federer, MPH; Jennifer A. Mattera, MPH; Yun Wang, PhD; Harlan M. Krumholz, MD, SM

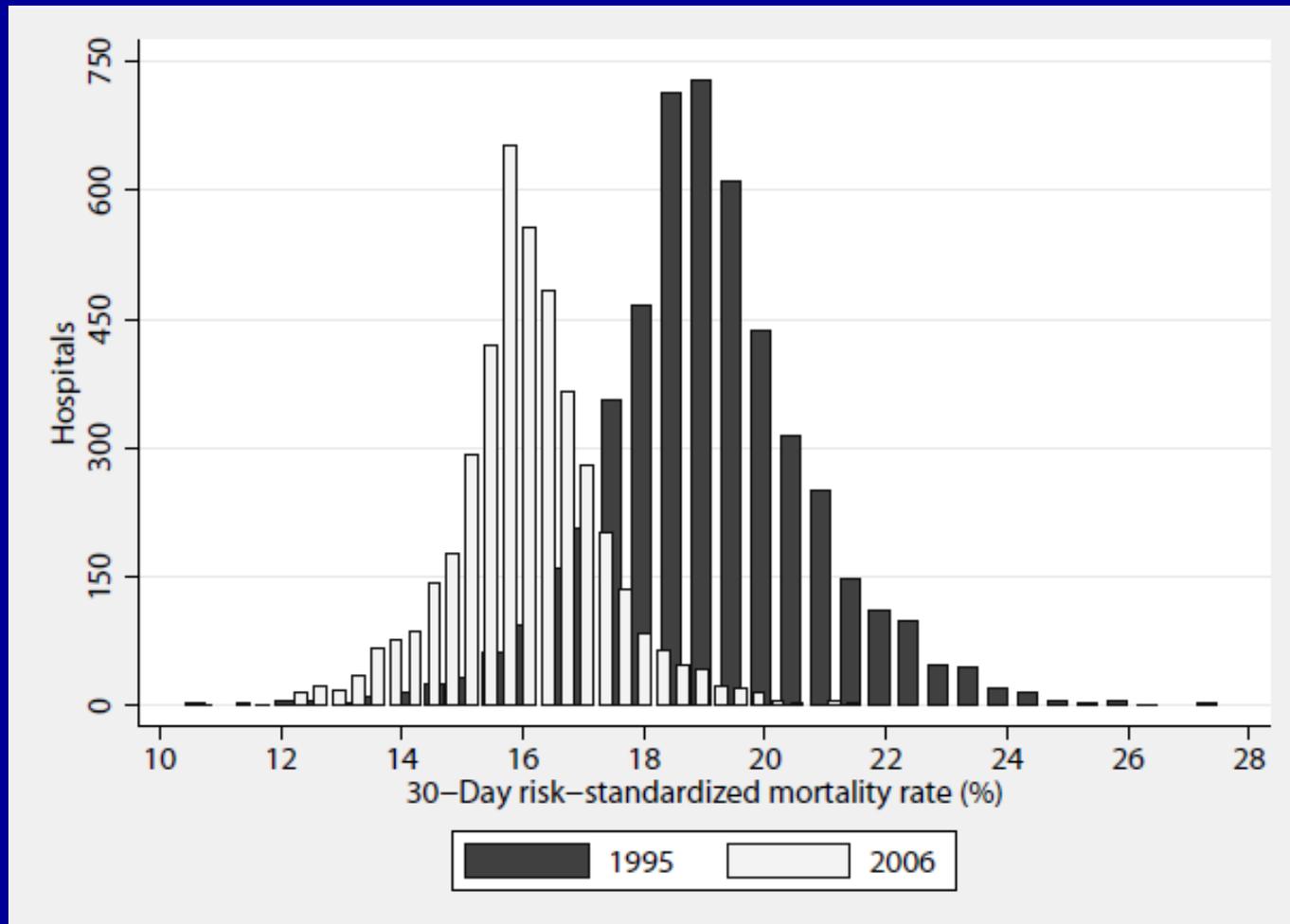
CLINICIAN UPDATE



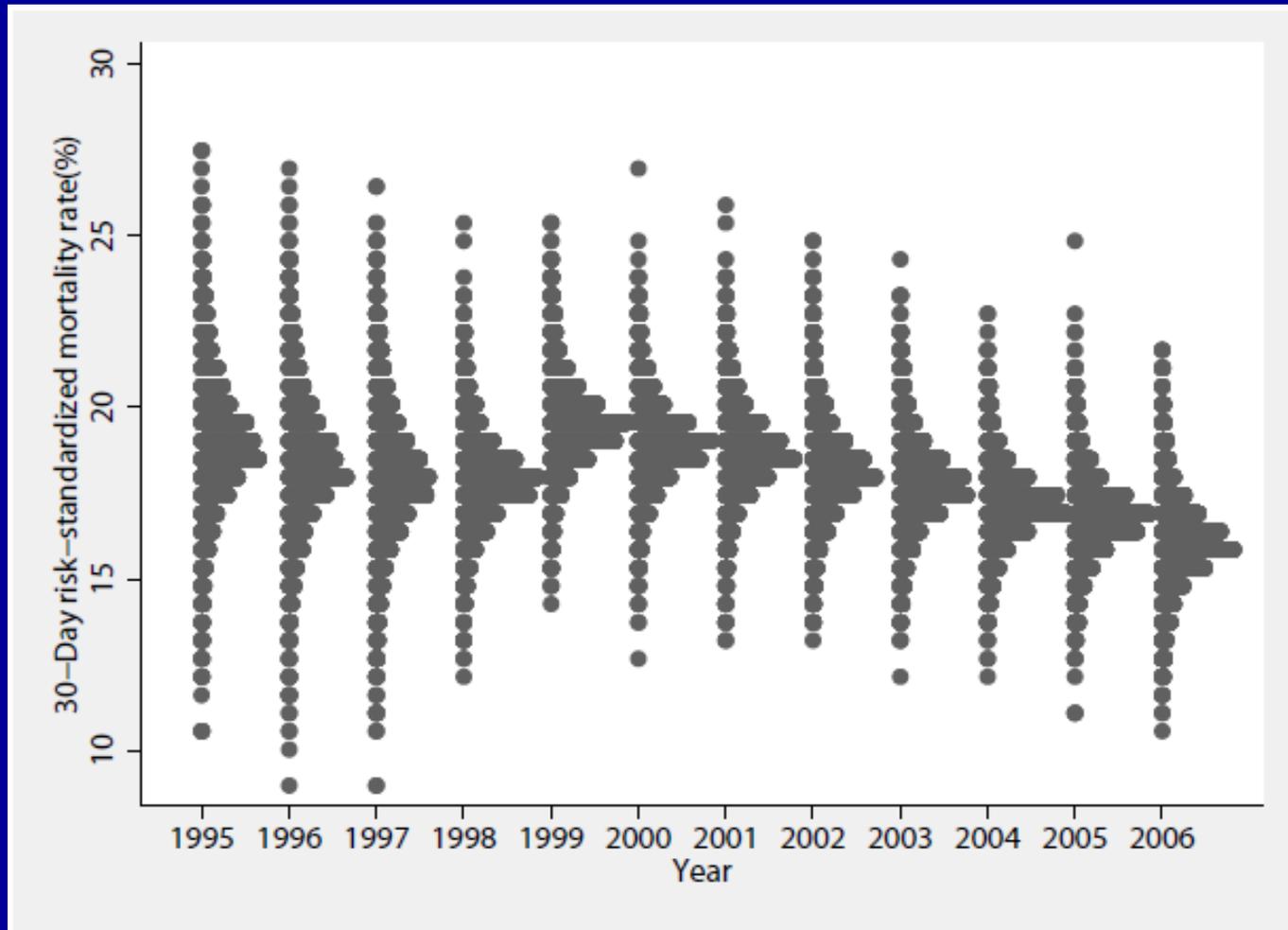
Public Reporting of 30-Day Mortality for Patients Hospitalized With Acute Myocardial Infarction and Heart Failure

Harlan M. Krumholz, MD, SM; Sharon-Lise T. Normand, PhD

Change in AMI All-Cause Risk-Standardized Mortality Rates (RSMR) From 1995 to 2006



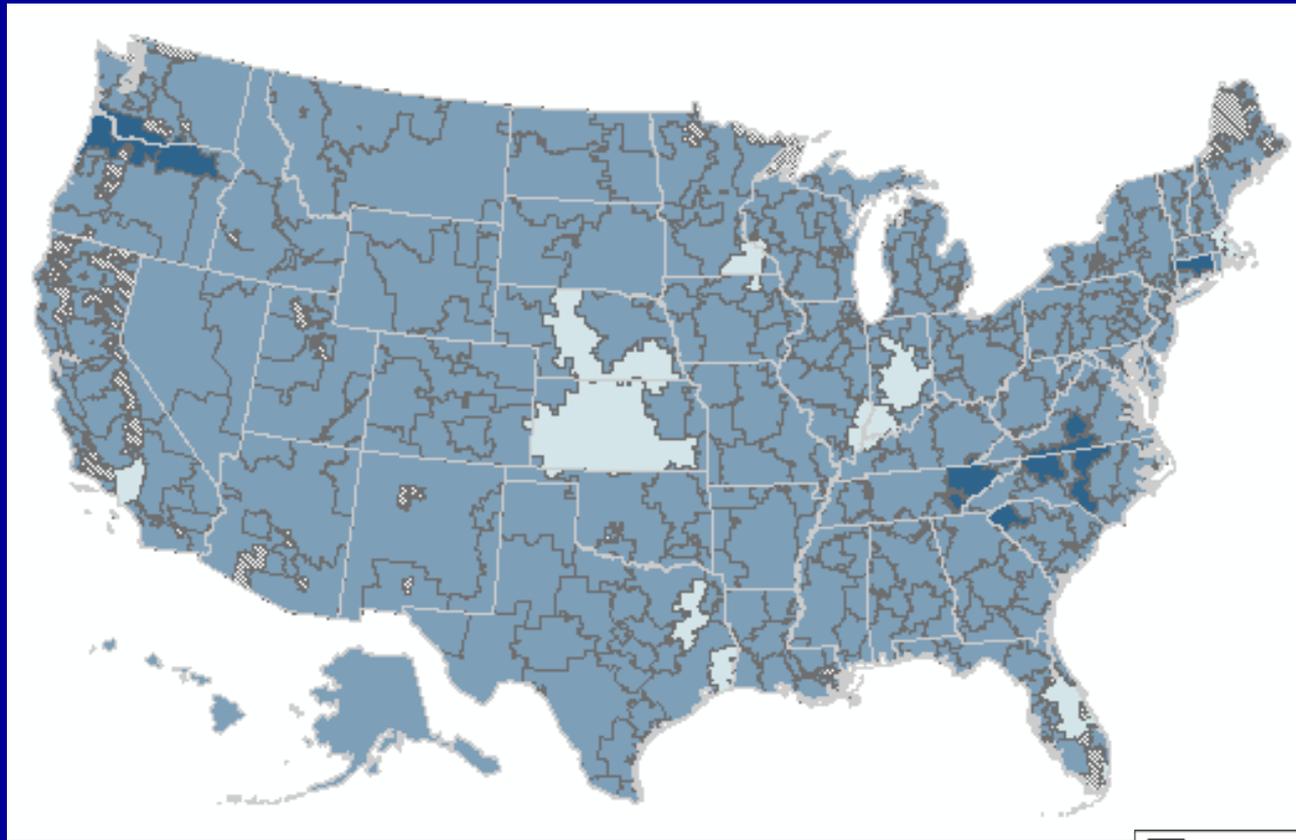
AMI All-Cause Risk-Standardized Mortality Rates (RSMR) From 1995 to 2006



30-Day Stroke Risk Standardized Mortality Rate by HRR

1999

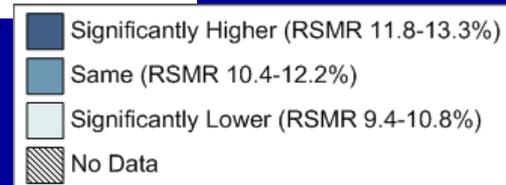
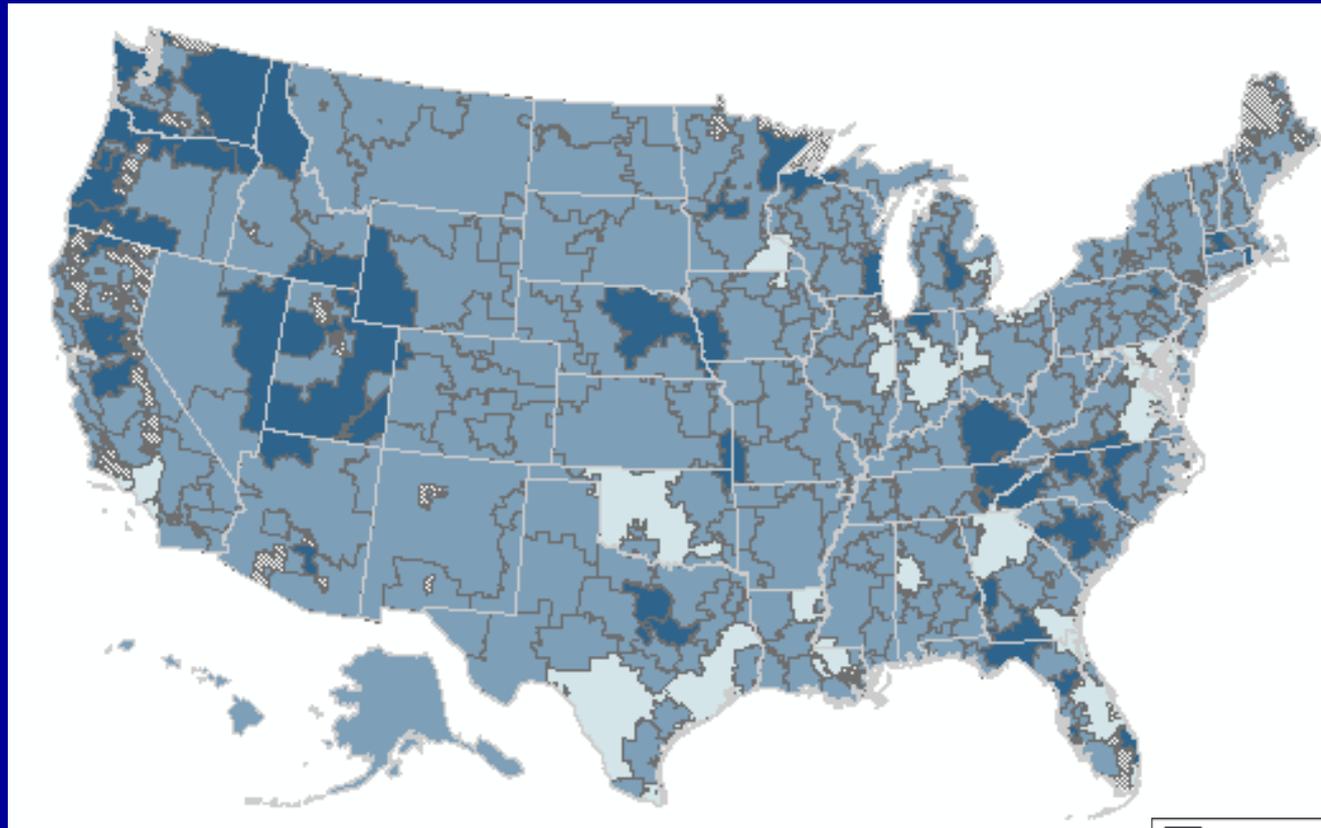
(National Average RSMR = 10.5 [SD 2.6] %)



30-Day Stroke Risk Standardized Mortality Rate by HRR

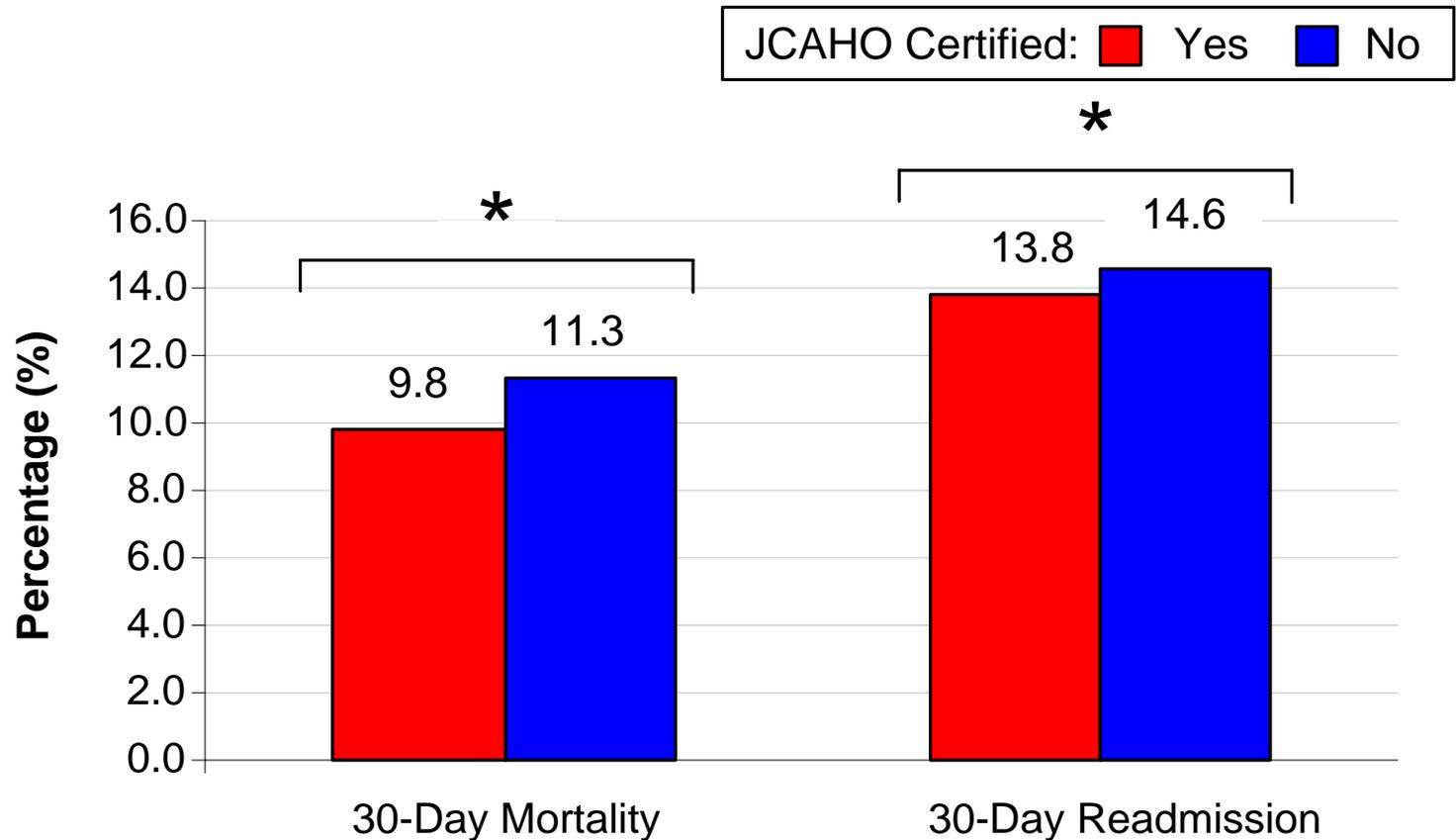
2005

(National Average RSMR = 11.2 [SD 1.7] %)



Organization of Stroke Care: Joint Commission Certified Primary Stroke Centers

Unadjusted Outcomes



*p < .0001

Risk Adjusted Outcomes For Patients Treated at JCAHO Certified Stroke Centers vs Non-Accredited Hospitals



Risk Adjusted Analyses: Stroke Outcomes

<u>Outcomes*</u>	<u>OR (95% CI)</u>
30-Day Mortality.....	0.94 (0.92-0.97)
30-Day Readmission.....	0.97 (0.95-0.99)

Referent Group=Non-JCAHO Certified Hospitals
 *Adjusted for age, gender, race, Deyo score 3+, 2+ hospitalizations in prior year, prior stroke, diabetes, history of AMI, cancer, heart failure, COPD, dementia, hypertension, CABG and PTCA

Advantages of Using CMS Data

- National perspective
 - Patient level and hospital level analyses
- “Aerial” view of disease in the elderly
 - Subgroups
 - Time trends
 - Utilization of resources
- Complements the perspective of cohort studies and registries

Limitations

- Accuracy of diagnostic codes
- Unmeasured factors in administrative data
 - Symptoms, test results, medical decisions
 - Disease severity
 - Medications
- Restriction to hospitalized events
 - Underestimate true burden in community
 - *but* .. reflects hospital resource utilization, can expand surveillance with outpatient files

Future.....

- Develop expertise in using administrative data for disease surveillance (seminars, workshops)
- Use additional CMS data files (Outpatient, SNF)
- Combine data resources
 - Social economic status
 - Behavioral / lifestyle factors
 - Access and availability of care
 - Medications
 - Cost data
 - Registries with additional clinical detail

Thank you