Data Innovations

Agency for Healthcare Research and Quality

Variability in Statin Use After Hospitalization for Cardiovascular Events or Procedures Among Commercially Insured Beneficiaries Ages 45-64

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Highlights

- For commercially insured beneficiaries ages 45-64, national rates of statin use after hospitalization were:
  - 46.6 percent for ischemic stroke (IS) or transient ischemic attack (TIA),
  - 54.8 percent for acute myocardial infarction (AMI), and
  - 53.8 percent for coronary artery bypass graft (CABG) or percutaneous coronary intervention (PCI).
- Among beneficiaries hospitalized for IS/TIA and CABG/PCI, overall use of statins was lower inside the "stroke belt" compared with outside the stroke belt (IS/TIA: 48.5% vs. 55.4%; CABG/PCI: 47.9% vs. 54.7%).
- Commercially insured beneficiaries in California and Louisiana generally had the highest and lowest rates of statin use, respectively, across the three cardiovascular groups estimated.

Introduction

Individuals who experienced recent cardiovascular events can benefit from the use of statins. Such events can include ischemic stroke (IS), "mini stroke" or transient ischemic attack (TIA), or acute myocardial infarction (AMI). In addition, statins can help people who underwent procedures to revascularize or reopen blockages in blood vessels, such as coronary artery bypass graft surgery (CABG) and percutaneous coronary intervention (PCI).

Statins or 3-hydroxy-3-methylglutaryl coenzyme A (HMG-CoA) reductase inhibitors are lipid-lowering agents that have been recommended in clinical guidelines for use in preventing recurrent ischemic and coronary events.[i] Use of statins are recommended regardless of cholesterol concentration unless statins cannot be tolerated by patients. Previous research indicates that statins are underused.[ii,iii]

The southeastern region of the United States has been referred to as the "stroke belt" due to the region's unusually high incidence of stroke and other cardiovascular-related mortality compared with the rest of the country.[iv,v]

This Data Innovations Statistical Brief presents data from AHRQ's Synthetic Healthcare Data for Research (SyH-DR) database. The brief focuses on regional and state variability in prescription statin use among commercially insured beneficiaries ages 45-64 hospitalized for cardiovascular events or procedures. We examined any outpatient statin prescription use during the first 3 months after the hospitalization for a cardiovascular event or procedure. All differences mentioned in the text are significant at the 0.05 level or better.

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Findings

Overall utilization rates

In 2016, about half of the commercially insured beneficiaries ages 45-64 who were hospitalized for IS/TIA (46.6%) or AMI (54.8%) or who underwent a CABG/PCI procedure (53.8%) used a statin within 3 months of discharge.

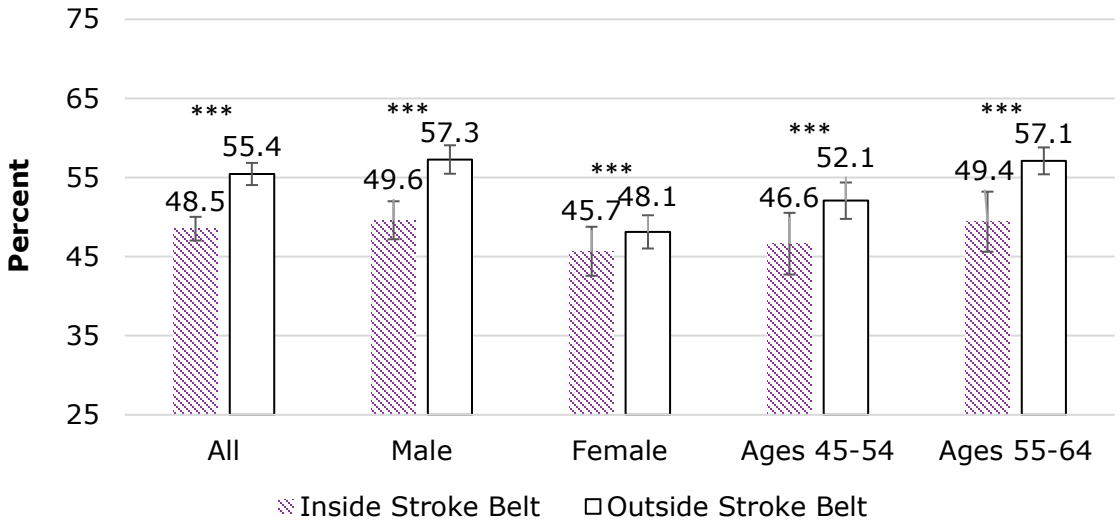
Utilization rates by region

Among those hospitalized for IS/TIA, the overall statin rate was lower inside (48.5%) than outside (55.4%) the stroke belt (Figure 1). Statin use was lower inside the stroke belt for both sex and age categories.

Among beneficiaries hospitalized for AMI, the statin use rate was lower inside than outside the stroke belt for females (46.1% vs. 52.8%) and those ages 45-54 (51.7% vs. 57.5%) (Figure 2.)

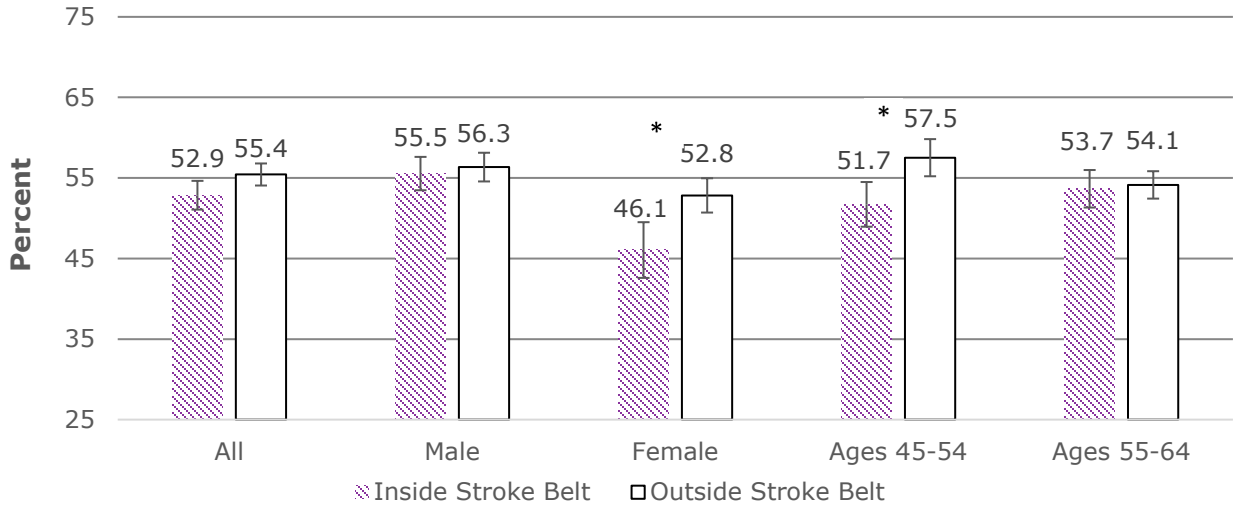
Among hospitalized beneficiaries who underwent a CABG/PCI procedure, statin use was also lower inside than outside the stroke belt (47.9% vs. 54.7%) (Figure 3). Statin use was lower inside than outside the stroke belt for males (49.6% vs. 56.6%) and the 55-64 age group (48.9% vs. 56.3%).

Figure 1. Percentage of commercially insured beneficiaries ages 45-64 who used a statin within 3 months of hospitalization for IS/TIA, by region



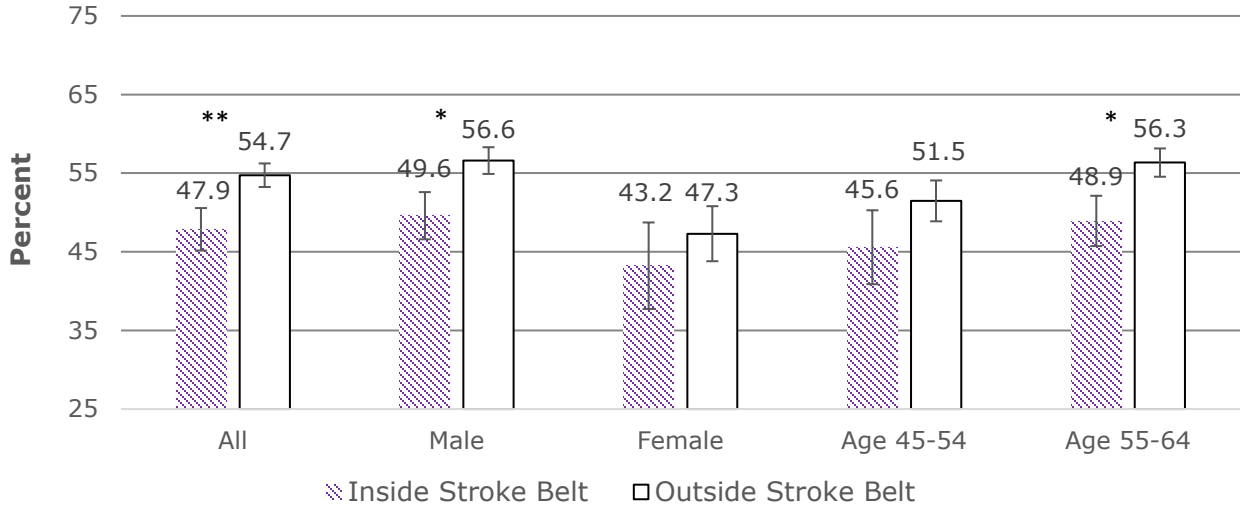
Key: IS-ischemic stroke; TIA–transient ischemic attack; inside stroke belt: Alabama, Arkansas, Georgia, Indiana, Kentucky, Louisiana, North Carolina, South Carolina, Tennessee, and Virginia; outside stroke belt: rest of states, including District of Columbia.
*p<0.05; **p<0.005; ***p<0.005.
Source: Agency for Healthcare Research and Quality, Synthetic Healthcare Database for Research (SyH-DR), 2016.

Figure 2. Percentage of commercially insured beneficiaries ages 45-64 who used a statin within 3 months of hospitalization for AMI, by region



AMI-acute myocardial infarction; inside stroke belt: Alabama, Arkansas, Georgia, Indiana, Kentucky, Louisiana, North Carolina, South Carolina, Tennessee, and Virginia; outside stroke belt: rest of states, including District of Columbia.
*p<0.05; **p<0.005; ***p<0.005.
Source: Agency for Healthcare Research and Quality, Synthetic Healthcare Database for Research (SyH-DR), 2016.

Figure 3. Percentage of commercially insured beneficiaries ages 45-64 who used a statin within 3 months of hospitalization for a CABG/PCI procedure, by region



Key: CABG-coronary artery bypass graft; PCI-percutaneous coronary intervention; inside stroke belt: Alabama, Arkansas, Georgia, Indiana, Kentucky, Louisiana, North Carolina, South Carolina, Tennessee, and Virginia; outside stroke belt: rest of states, including District of Columbia.
*p<0.05; **p<0.005; ***p<0.005.
Source: Agency for Healthcare Research and Quality, Synthetic Healthcare Database for Research (SyH-DR), 2016.

Utilization rates by state

Figures 4-6 display the overall U.S. and state-level rates of statin use within 3 months of hospitalization for IS/TIA, AMI, and CABG/PCI. Estimates for states with fewer than 30 discharges were suppressed. The figures are divided into three groups:

- State rate is significantly higher than overall U.S. rate.
- State rate is not different than overall U.S. rate.
- State rate is significantly lower than overall U.S. rate.

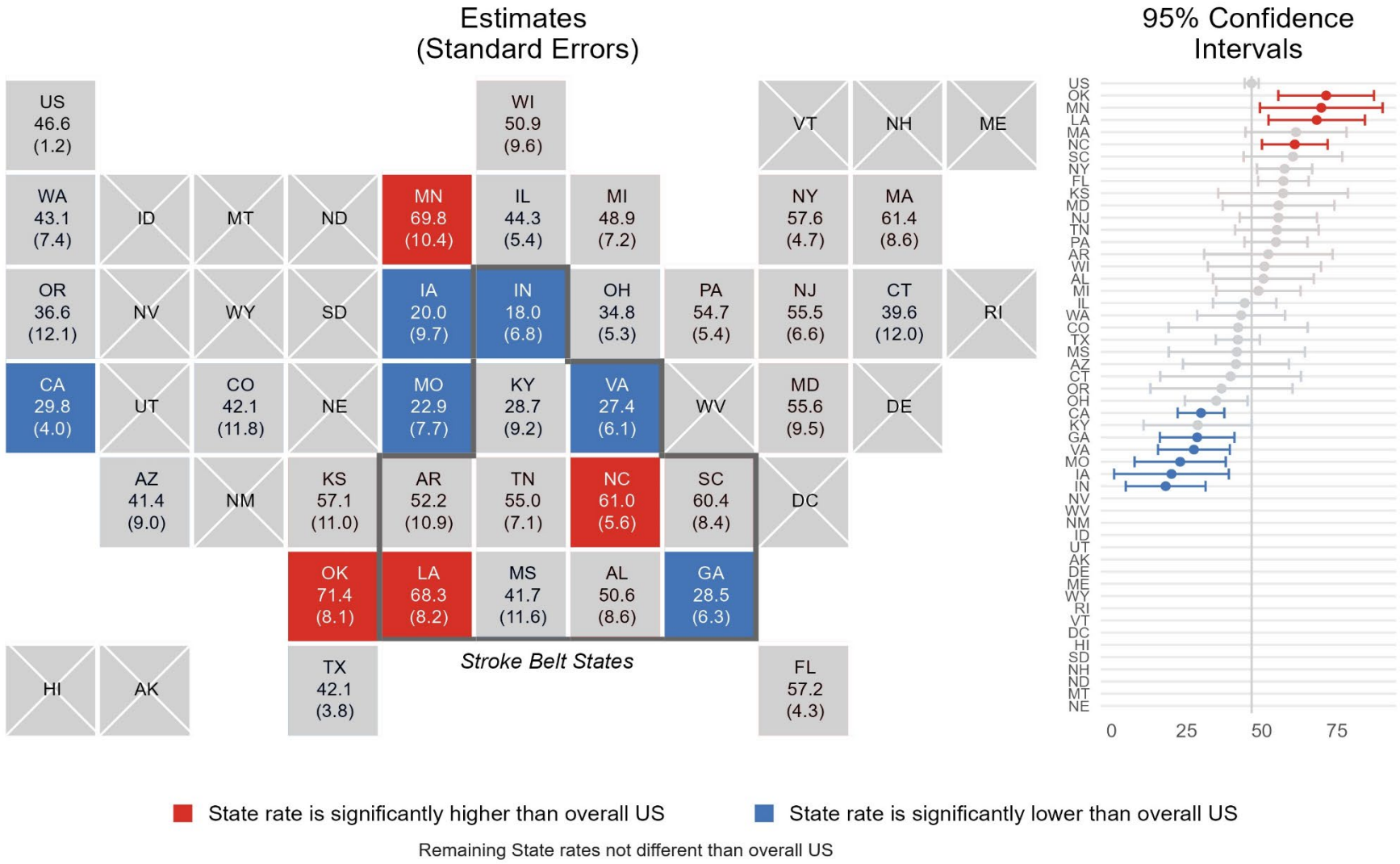
The standard errors and 95 percent confidence intervals (the upper and lower bounds of the estimate) are also presented to show estimate precision.

The overall U.S. rate of statin use after hospitalization for IS/TIA was 46.6% (Figure 4). The rates in Oklahoma (71.4%), Minnesota (69.8%), Louisiana (68.3%), and North Carolina (61.0%) were significantly higher than the overall U.S. rate. Rates in Indiana (18.0%), Iowa (20.0%), Missouri (22.9%), Virginia (27.4%), Georgia (28.5%), and California (29.8%) were significantly lower.

The overall U.S. rate of statin use after hospitalization for AMI was 54.8% (Figure 5). The rates in West Virginia (82.0%), Idaho (80.1%), Louisiana (74.0%), Florida (73.9%), Oklahoma (70.7%), and New York (69.3%) were significantly higher than the U.S. rate. The rates in Iowa (17.4%), Indiana (30.2%), California (33.8%), Kentucky (36.7%), and Ohio (44.2%) were significantly lower.

The overall U.S. rate of statin use after hospitalization for a CABG/PCI procedure was 53.8% (Figure 6). The rates in Louisiana (80.4%), Florida (78.5%), and Arizona (75.9%) were significantly higher than the U.S. rate. The rates in Kentucky (21.2%), Indiana (23.4%), Iowa (27.2%), Virginia (35.1%), and California (38.1%) were significantly lower.

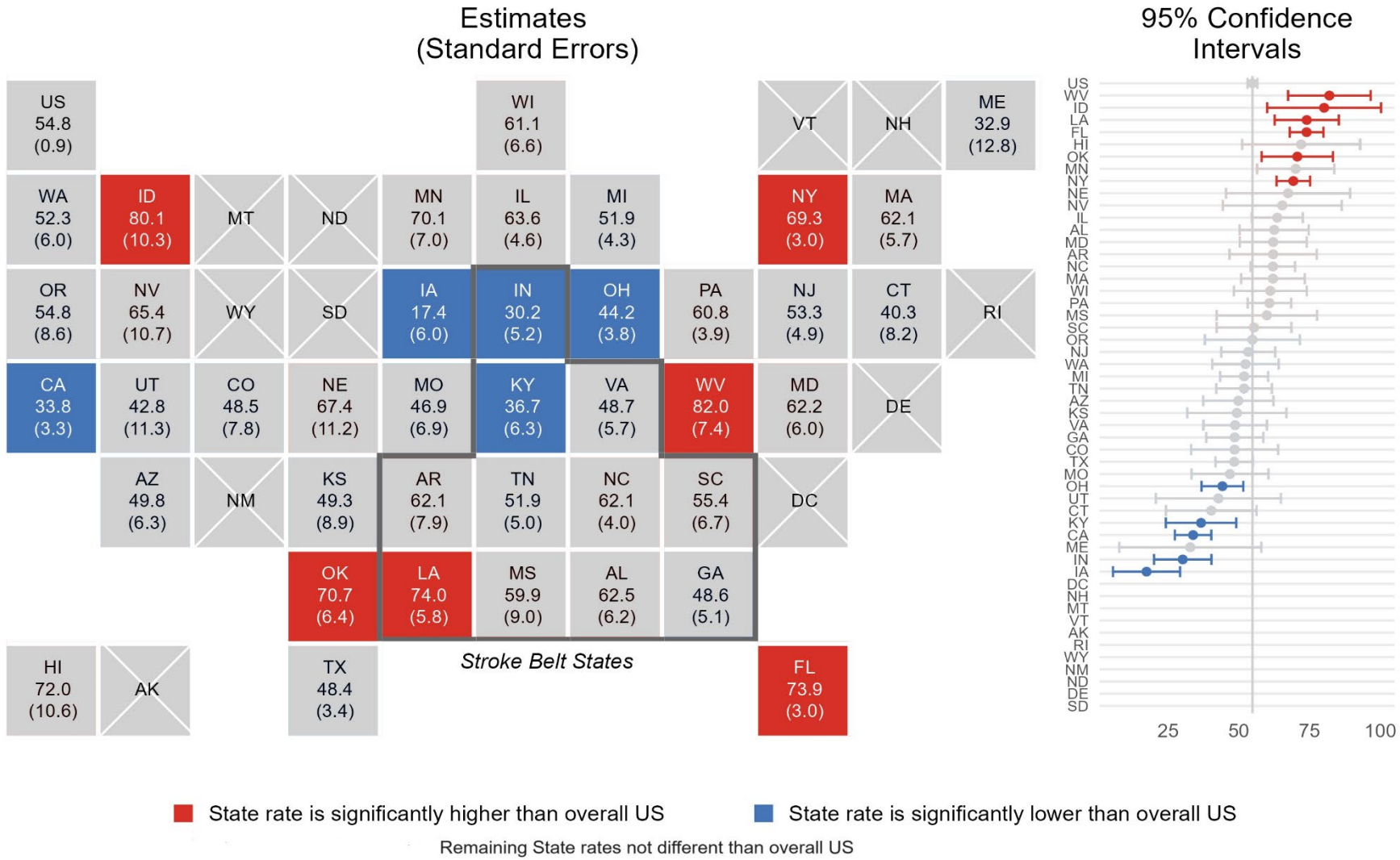
Figure 4. Percentage of commercially insured beneficiaries ages 45-64 who used a statin within 3 months of hospitalization for IS/TIA



IS-ischemic stroke; TIA–transient ischemic attack.

Source: Agency for Healthcare Research and Quality, Synthetic Healthcare Database for Research (SyH-DR), 2016.

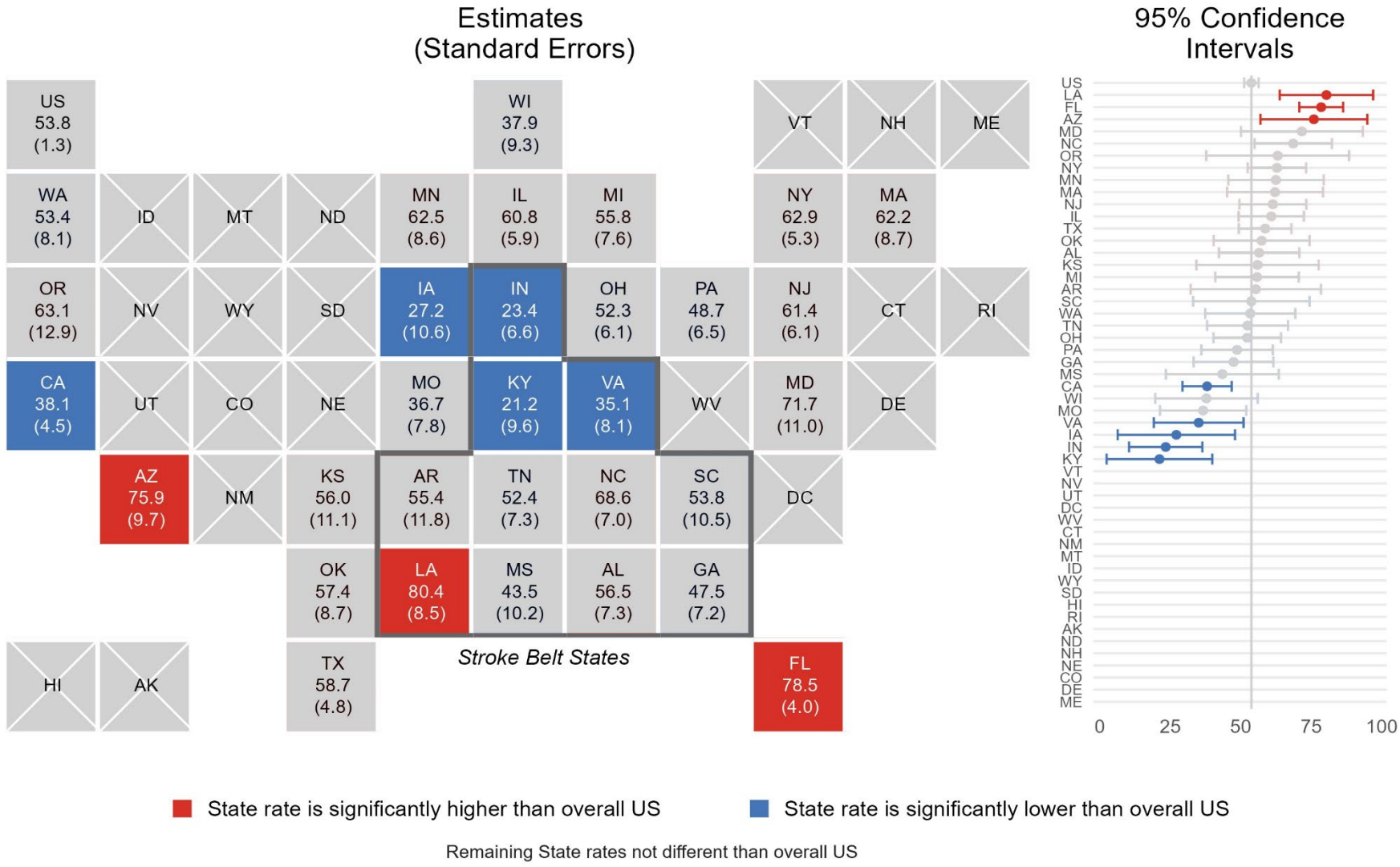
Figure5. Percentage of commercially insured beneficiaries ages 45-64 who used a statin within 3 months of hospitalization for AMI



AMI-acute myocardial infarction.

Source: Agency for Healthcare Research and Quality, Synthetic Healthcare Database for Research (SyH-DR), 2016.

Figure 6. Percentage of commercially insured beneficiaries ages 45-64 who used a statin within 3 months of hospitalization for CABG/PCI



CABG-coronary artery bypass graft; PCI-percutaneous coronary intervention.
Source: Agency for Healthcare Research and Quality, Synthetic Healthcare Database for Research (SyH-DR), 2016.

Data Source

The data in this statistical brief are derived from the SyH-DR 2016 public use files. These files include commercial enrollment and claims data. This analysis was limited to events that occurred in a hospital setting and outpatient prescription medication use.

Definitions

Use of Statins

In this statistical brief, we examined statin outpatient prescription fills. Statins are identified by generic drug names for statins in the Multum Lexicon database from Cerner Multum. Our analysis included the following types of single-formulation statin drugs: atorvastatin, fluvastatin, lovastatin, pitavastatin, pravastatin, rosuvastatin, and simvastatin. We included any single-dose formulation of statins.

Statin Prescription Fills

We examine the percentage of adults ages 45-64 with any outpatient statin prescription fills during the 3 months after hospitalization ("any statin use") from a cardiovascular event or procedure.

Case Definition

This study used the International Classification of Diseases, 10th Revision, Clinical Modification/Procedure Coding System (ICD-10 CM/PCS) codes to identify cardiovascular events. Table 1 lists diagnosis codes used to identify IS, TIA, and AMI. The primary listed diagnosis was used to identify cases.

The diagnosis codes in SyH-DR are partially synthesized, where the first three characters were retained from the original values. Similarly, procedure codes were partially synthesized with synthetic codes replacing those in the source files if they belonged to the same procedure category.

We identified coronary revascularization using procedure codes. We performed procedure categorization using the AHRQ Clinical Classification Software Refined (CCSR) for ICD-10-PCS. All revascularization procedures used in this study exactly match the codes included in the CABG and PCI CCSR categories: CAR003 – Coronary artery bypass grafts; CAR004 – Percutaneous coronary interventions.

We excluded patients with hospital stays greater than 30 days. We also excluded patients under age 45 and over age 64.

Table 1. Codes defining diagnosis

ICD-10-CM/PCS Code	Code Description
Acute Myocardial Infarction	
I21	Acute myocardial infarction
I22	Subsequent ST elevation (STEMI) and non-ST elevation (NSTEMI) myocardial infarction
I23	Certain current complications following ST elevation (STEMI) and non-ST elevation (NSTEMI) myocardial infarction (within the 28-day period)
Ischemic Stroke	
I63	Cerebral infarction
Transient Ischemic Attack	
G45	Transient cerebral ischemic attacks and related syndromes

Key: CM: Clinical Modification; PCS: Procedure Coding System.

Stroke Belt

- Alabama
- Arkansas
- Georgia
- Indiana
- Kentucky‘
- Louisiana
- North Carolina
- South Carolina
- Tennessee,
- Virginia

Insurance Coverage

To be included in the analysis, commercial insurance enrollees who met the case definition had to have insurance coverage from the time they were admitted to the hospital to 3 months after their hospital discharge.

About SyH-DR

SyH-DR is an all-payer, nationally representative claims database. The database consists of a sample of inpatient, outpatient, and prescription drug claims, including utilization, payment, and enrollment data, for people insured by Medicare, Medicaid, or commercial health insurance in 2016. AHRQ created SyH-DR, in part, as a resource to facilitate improvements to price and quality transparency in healthcare.

SyH-DR is a synthetic database that preserves the structure and statistical properties of the original claims data while protecting privacy and confidentiality of people and institutions. Synthetic data are created by statistically modeling or changing original data so that new values or data elements are generated while maintaining the original data's statistical properties. Additional steps, such as masking, are taken to reduce the risk of identifying people and institutions so that the data may be made publicly available to a broad community of researchers.

SyH-DR is a robust and nationally representative dataset that can be used to conduct research at various levels of granularity, including sex, age group, and insurance source at the national or state level. For more information about SyH-DR, visit the SyH-DR web page at https://www.ahrq.gov/data/innovations/syh-dr.html.

About AHRQ Data Innovations

AHRQ is engaged in several data development activities that have become known as "AHRQ Data Innovations." These activities include identifying data needs and data gaps. In addition, AHRQ is creating new research databases that complement existing databases to address emerging questions in U.S. healthcare delivery. These include the Physician and Physician Practice Research Database (3P-RD), Social Determinants of Health (SDOH) database, Synthetic Healthcare Data for Research (SyH-DR), and Hospital Financial Measures Database (HFMD).

Suggested Citation

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