

*Flex Monitoring Team Briefing Paper No. 26*

# **Critical Access Hospital Year 5 Hospital Compare Participation and Quality Measure Results**

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A Performance Monitoring Resource for  
Critical Access Hospitals, States, and Communities

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Monitoring  
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With funding from the federal Office of Rural Health Policy (PHS Grant No. U27RH01080), the Rural Health Research Centers at the Universities of Minnesota, North Carolina, and Southern Maine are cooperatively conducting a performance monitoring project for the Medicare Rural Hospital Flexibility Program (Flex Program).

The monitoring project is assessing the impact of the Flex Program on rural hospitals and communities and the role of states in achieving overall program objectives, including improving access to and the quality of health care services; improving the financial performance of CAHs; and engaging rural communities in health care system development.

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## **The Medicare Rural Hospital Flexibility Program**

The Medicare Rural Hospital Flexibility Program (Flex Program), created by Congress in 1997, allows small hospitals to be licensed as Critical Access Hospitals (CAHs) and offers grants to States to help implement initiatives to strengthen the rural health care infrastructure. To participate in the Flex Grant Program, States are required to develop a rural health care plan that provides for the creation of one or more rural health networks; promotes regionalization of rural health services in the State; and improves the quality of and access to hospital and other health services for rural residents of the State. Consistent with their rural health care plans, states may designate eligible rural hospitals as CAHs.

CAHs must be located in a rural area (or an area treated as rural); be more than 35 miles (or 15 miles in areas with mountainous terrain or only secondary roads available) from another hospital or be certified before January 1, 2006 by the State as being a necessary provider of health care services. CAHs are required to make available 24-hour emergency care services that a State determines are necessary. CAHs may have a maximum of 25 acute care and swing beds, and must maintain an annual average length of stay of 96 hours or less for their acute care patients. CAHs are reimbursed by Medicare on a cost basis (i.e., for the reasonable costs of providing inpatient, outpatient and swing bed services).

The legislative authority for the Flex Program and cost-based reimbursement for CAHs are described in the Social Security Act, Title XVIII, Sections 1814 and 1820, available at [http://www.ssa.gov/OP\\_Home/ssact/title18/1800.htm](http://www.ssa.gov/OP_Home/ssact/title18/1800.htm)

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## **EXECUTIVE SUMMARY**

### **Introduction**

This report examines 2008 participation and quality measure results for Critical Access Hospitals (CAHs) in the Centers for Medicare and Medicaid Services (CMS) Hospital Compare public reporting database for hospital quality measures.

The current Hospital Compare quality measures include inpatient process of care measures that reflect recommended treatments for acute myocardial infarction (AMI), heart failure, pneumonia, surgical care improvement, and children's asthma care; outpatient AMI/chest pain and surgical process of care measures; Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) survey results; and hospital 30 day risk-adjusted mortality and readmission rates for AMI, heart failure, and pneumonia calculated by CMS using Medicare claims data.

### **Methods**

This study used data on hospital participation and quality measure results for January to December 2008 from the Hospital Compare website, linked with data on all CAHs maintained by the Flex Monitoring Team, and with data on hospital characteristics from the Fiscal Year 2008 American Hospital Association Annual Survey.

The 2008 inpatient process of care measure results for participating CAHs were compared by 1) accreditation status and ownership and 2) with those of rural and urban Prospective Payment System (PPS) hospitals. Results were also compared over time for 2005, 2006, 2007 and 2008. The percentages of patients that received recommended care for the inpatient process of care quality measures were calculated by dividing the total number of patients who received the recommended care by the total number of eligible patients in all CAHs nationally.

The percentages of patients reporting the highest response (e.g., always) on each HCAHPS measure were summed and averaged across all reporting CAHs nationally and for all reporting hospitals in the U.S.

CMS calculates hospital-level 30-day risk-standardized mortality and readmission rates for pneumonia, heart failure, heart attack using Medicare fee-for-service claims and enrollment data and statistical modeling techniques. Rates are not calculated for hospitals that are not in the Hospital Compare database or for hospitals with less than 25 qualifying cases over the three-year period. For this report, the number and percent of CAHs for which CMS did not calculate risk-adjusted mortality rates and readmission rates were determined. The number and percent of CAHs whose rates for each condition were not different than, better than or worse than the national rates, as determined by CMS, were then summed nationally.

### **Results**

For 2008 discharges, 70% of CAHs participated in Hospital Compare by submitting data for at least one patient on one inpatient process of care measure. By state, the percent of participating CAHs ranged from 11% to 100%. Eight states had 100% of their CAHs participating. CAHs

were more likely to report data on pneumonia and heart failure measures than on AMI and surgical infection prevention measures. The overall CAH participation rate of 70% for 2008 discharges compares to previous rates of 41% (2004); 53% (2005), 63% (2006) and 69% (2007).

For 2008 discharges, CAHs did not perform as well as did rural and urban PPS hospitals on many inpatient process of care measures. Although the percent of CAH patients receiving recommended care increased from 2005-2008 for nearly all measures, the percent of rural and urban PPS hospital patients receiving recommended care also increased during this time period. Thus, while showing improvement, CAHs continued to have lower scores relative to rural and urban PPS hospitals on most measures.

In addition, 34% of CAHs publicly reported HCAHPS survey data to Hospital Compare in 2008. By state, the percent of CAHs publicly reporting HCAHPS data ranged from 0% to 100% of CAHs in 2008. On average, CAHs have significantly higher ratings on HCAHPS measures than all US hospitals.

The vast majority of CAHs did not have enough cases for CMS to reliably calculate 30-day risk adjusted mortality and readmission rates for pneumonia, heart failure and AMI, or did not have rates that were significantly different than the US rates for all hospitals.

## **Conclusions**

Over the past five years, CAHs have improved their performance on nearly all Hospital Compare inpatient process of care measures. During this time, however, rural PPS and urban PPS hospitals also improved their performance. Thus, CAHs continue to have lower scores relative to rural and urban PPS hospitals on several measures, especially measures related to AMI and heart failure. The persistence over time of significant differences between CAHs and PPS hospitals, as well as within the group of CAHs, presents an ongoing quality improvement challenge for CAHs.

While many CAHs are participating in Hospital Compare and/or in state or regional quality reporting and benchmarking initiatives, others are not. To date, public reporting of quality measures has been voluntary for CAHs, in part due to concerns about the rural relevance of quality measures and the difficulty of reliably measuring quality for low volume providers. Although some quality measures are not relevant for CAHs because they involve procedures that are rarely performed in small rural hospitals (e.g., PCI), many of the current Hospital Compare measures, including the inpatient pneumonia and heart failure measures, the AMI/chest pain outpatient measures, and the HCAHPS survey measures, are relevant for CAHs. While small volume remains a challenge, several options exist for improving the reliability and usefulness of quality measures for low volume providers (e.g., calculating composite measures; aggregating data across groups of similar hospitals; using longer time periods to calculate measures; using statistical methods such as Bayesian models; and reporting confidence intervals for measures).

The health reform proposals being considered by Congress call for changes that would move the US toward a health care system that rewards the provision of high-quality care. Health care providers will increasingly be required to demonstrate the quality of the care they are providing to qualify for reimbursement incentives and avoid penalties for poor care. In this environment, CAHs that are unwilling to participate in quality reporting and benchmarking activities will be at a disadvantage.

## **INTRODUCTION**

Since 2004, acute care hospitals paid under the Medicare Prospective Payment System (PPS) have had a financial incentive to publicly report quality measure data on the Centers for Medicare and Medicaid Services' (CMS) Hospital Compare website. Although Critical Access Hospitals (CAHs) do not face the same financial incentives as PPS hospitals to participate, the Hospital Compare initiative provides an important opportunity for CAHs to assess and improve their performance on national standards of care. The percentage of CAHs voluntarily reporting data on at least one measure to Hospital Compare increased from 41% for 2004 discharges to 69% for 2007 discharges.<sup>1-4</sup>

The current Hospital Compare quality measures include inpatient process of care measures that reflect recommended treatments for acute myocardial infarction (AMI), heart failure, pneumonia, surgical care improvement, and children's asthma care; outpatient AMI/chest pain and surgical process of care measures; Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) survey results; and hospital 30 day risk-adjusted mortality and readmission rates for AMI, heart failure, and pneumonia calculated by CMS using Medicare claims data.

Previous Flex Monitoring Team reports analyzed CAH participation and Hospital Compare inpatient quality measure results nationally for 2004-2007 and at the state level for 2006 and 2007.

## **PURPOSE OF THIS PROJECT**

The purpose of this project is to:

- Determine the percent of CAHs that are participating in Hospital Compare for 2008 discharges by reporting data on inpatient process of care measures, identify key characteristics related to CAH participation, examine reporting by condition, and compare the results for CAHs with rural and urban PPS hospitals
- Determine the percent of CAHs reporting HCAHPS survey results and compare the results to those of PPS hospitals
- Analyze the risk-adjusted 30-day mortality and readmission rates for CAHs calculated by CMS

## **METHODS**

Data on the inpatient process of care measures and HCAHPS survey results for January through December 2008 were downloaded from the CMS Hospital Compare website when they became available in September 2009. These data were linked with previously downloaded process of care data for 2005, 2006, and 2007; data on the 3 year (July 2005 to June 2008) mortality and readmission rates calculated by CMS; data on all CAHs maintained by the Flex Monitoring Team; and data on hospital characteristics from the Fiscal Year 2008 American Hospital Association (AHA) Annual Survey. The Hospital Compare data were linked to these data sources using Medicare provider numbers, AHA identification numbers, hospital names and addresses, and county FIPs codes. PPS hospitals were classified as rural or urban based on their location in an Office of Management and Budget designated non-metropolitan (rural) or

metropolitan (urban) county. Participation rates for CAHs were calculated by accreditation status, size, date of CAH conversion and ownership type.

For this report, the percentages of patients that received recommended care for the inpatient process of care quality measures were calculated by dividing the total number of patients in all CAHs in the state, all CAHs nationally, and all US hospitals who received the recommended care by the total number of eligible patients in all CAHs in the state, all CAHs nationally, and all US hospitals for each measure. (The results for all US hospitals differ slightly from those calculated by CMS. CMS calculates mean scores for each hospital individually, and then calculates an average for the group of hospitals. This “average of averages” method can give a less accurate picture of the performance of a group of hospitals when a large number of the facilities have very small numbers of patients for the measures, as is currently the case with CAHs.)

CMS considers 25 patients to be the minimum number of patients for reliably calculating the process of care measures. Therefore, the percent of CAH patients receiving recommended care was not calculated when the total number of CAH patients in a state, or nationally, with data on a measure was less than 25.

HCAHPS is a national, standardized survey of patients’ perspectives of hospital care. It was developed by the Agency for Healthcare Research and Quality and CMS to complement other hospital tools designed to support quality improvement. The survey is administered to a random sample of adult patients following discharge from the hospital for inpatient medical, surgical, or maternity care.

Ten HCAHPS measures are publicly reported on the Hospital Compare website. Six composite measures address how well doctors and nurses communicate with patients, the responsiveness of hospital staff, pain management, and communication about medicines. These measures and two individual measures addressing the cleanliness and quietness of the hospital environment are reported in response categories of always, usually, and sometimes/never. Additional measures address the provision of discharge information (reported as yes/no), an overall rating of the hospital on a 1-10 scale (reported as high (9 or 10), medium (7 or 8), or low (6 or below), and a rating of the patient’s willingness to recommend the hospital (reported as definitely would recommend, probably would recommend, and probably/definitely would not recommend.) CMS adjusts the publicly reported HCAHPS results for patient-mix, mode of data collection and non-response bias.<sup>5</sup>

For this report, the percentages of patients reporting the highest response (e.g., always) on each HCAHPS measure were summed and averaged across all reporting CAHs within a state and nationally, and for all reporting hospitals in the U.S.

CMS calculates hospital-level 30-day risk-standardized mortality and readmission rates for pneumonia, heart failure, heart attack using Medicare fee-for-service claims and enrollment data and statistical modeling techniques. Rates are not calculated for hospitals that are not in the Hospital Compare database or for hospitals with less than 25 qualifying cases over the three-year period.



Both the mortality and the readmission rates are “all-cause” rates (e.g., the mortality rates include deaths from any cause within 30 days and the readmission rates include patients who are readmitted for any cause to a hospital within 30 days after being discharged alive to a non-acute care setting). The CMS statistical models adjust for patient-level risk factors that affect the likelihood of dying or readmission, such as age, gender, past medical history, and having other diseases or conditions. For small hospitals, the models also rely on pooled data from all hospitals treated for the condition, which moves their estimated rates toward the overall U.S. rates for all hospitals. This reduces the chance that small hospitals will be wrongly classified as worse or better performers, but also makes it less likely that they will fall into either the “better than the national rate” or “worse than the national rate” categories.<sup>6</sup>

For this report, the number and percent of CAHs for which CMS did not calculate risk-adjusted mortality rates and readmission rates were determined. The number and percent of CAHs whose rates for each condition were not different than, better than or worse than the national rates, as determined by CMS, were then summed by state and nationally.

## **RESULTS**

### **CAH Participation in Hospital Compare**

#### *Inpatient Process of Care Measures*

Table 1 shows the number of CAHs in each state as of December 2008 and the percent of CAHs that were participating in Hospital Compare for 2008 discharges. Overall, a total of 914 CAHs (70%) were participating in Hospital Compare, defined as submitting data for at least one patient for one measure. (This total of 914 does not include CAHs that submitted quality measure data to their Quality Improvement Organization and did not allow the data to be publicly reported to Hospital Compare).

By state, the percent of CAHs participating in Hospital Compare varies considerably, ranging from 11% to 100%. Of the 45 states with CAHs, three states had less than 25% participation; four states had between 25 and 50% participation; 14 states had between 51 and 75% participation; and 24 states had over 75% participation, including eight states that had 100% of their CAHs participating.

The overall CAH participation rate of 70% for 2008 discharges compares to previous rates of 41% (2004); 53% (2005); 63% (2006); and 69% (2007) (Figure 1).

**Table 1. Critical Access Hospital (CAH) Participation in Hospital Compare by State for 2008 Discharges**

State <sup>1</sup>	Number of CAHs <sup>2</sup>	Percent of CAHs Participating in Hospital Compare <sup>3</sup>	State	Number of CAHs	Percent of CAHs Participating in Hospital Compare
Alabama	3	100.0	Nebraska	65	93.8
Alaska	13	23.1	Nevada	11	36.4
Arizona	14	85.7	New Hampshire	13	100.0
Arkansas	29	75.9	New Mexico	6	100.0
California	28	89.3	New York	13	61.5
Colorado	29	55.2	North Carolina	21	90.5
Florida	11	54.5	North Dakota	35	42.9
Georgia	34	61.8	Ohio	34	85.3
Hawaii	9	11.1	Oklahoma	33	87.9
Idaho	26	11.5	Oregon	25	88.0
Illinois	51	84.3	Pennsylvania	13	69.2
Indiana	35	82.9	South Carolina	5	80.0
Iowa	82	84.1	South Dakota	37	59.5
Kansas	83	57.8	Tennessee	16	68.8
Kentucky	30	93.3	Texas	76	38.2
Louisiana	27	33.3	Utah	9	66.7
Maine	15	100.0	Vermont	8	100.0
Massachusetts	3	100.0	Virginia	7	100.0
Michigan	34	61.8	Washington	38	52.6
Minnesota	79	79.7	West Virginia	17	88.2
Mississippi	27	51.9	Wisconsin	59	91.5
Missouri	36	75.0	Wyoming	14	100.0
Montana	47	59.6	All States	1300	70.3

<sup>1</sup>Five states (Connecticut, Delaware, Maryland, New Jersey and Rhode Island) do not have any CAHs.

<sup>2</sup>Number of CAHs certified as of December 2008.

<sup>3</sup>Participation was defined as providing data on at least one patient for one measure.

Data sources: Hospital Compare data for 2008 discharges downloaded from CMS website September 2009 and Flex Monitoring Team CAH database.

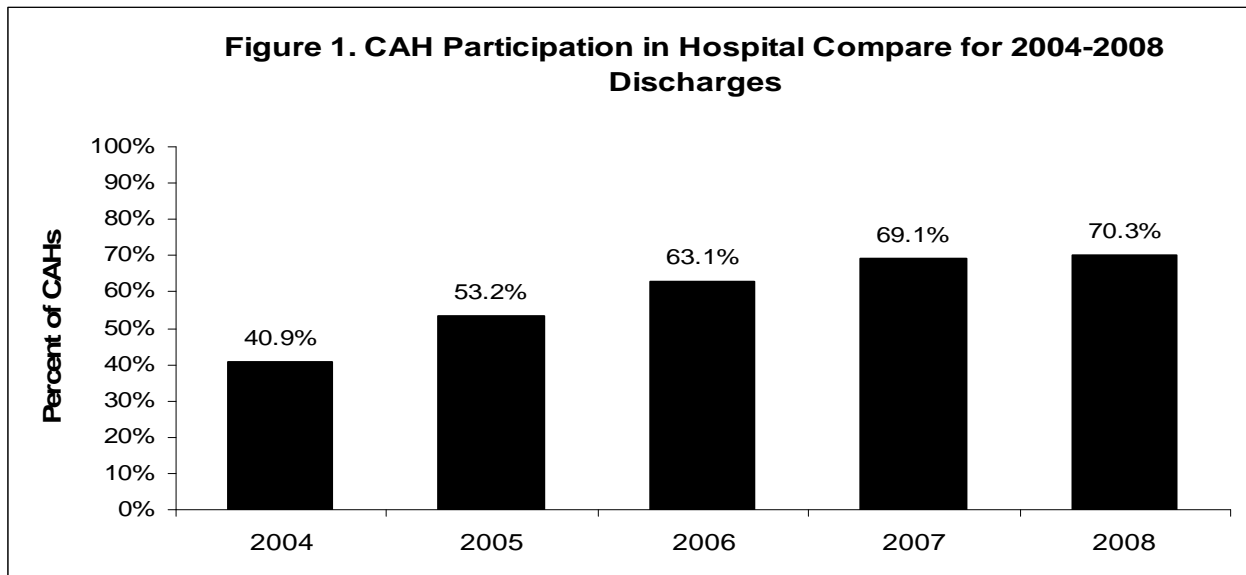
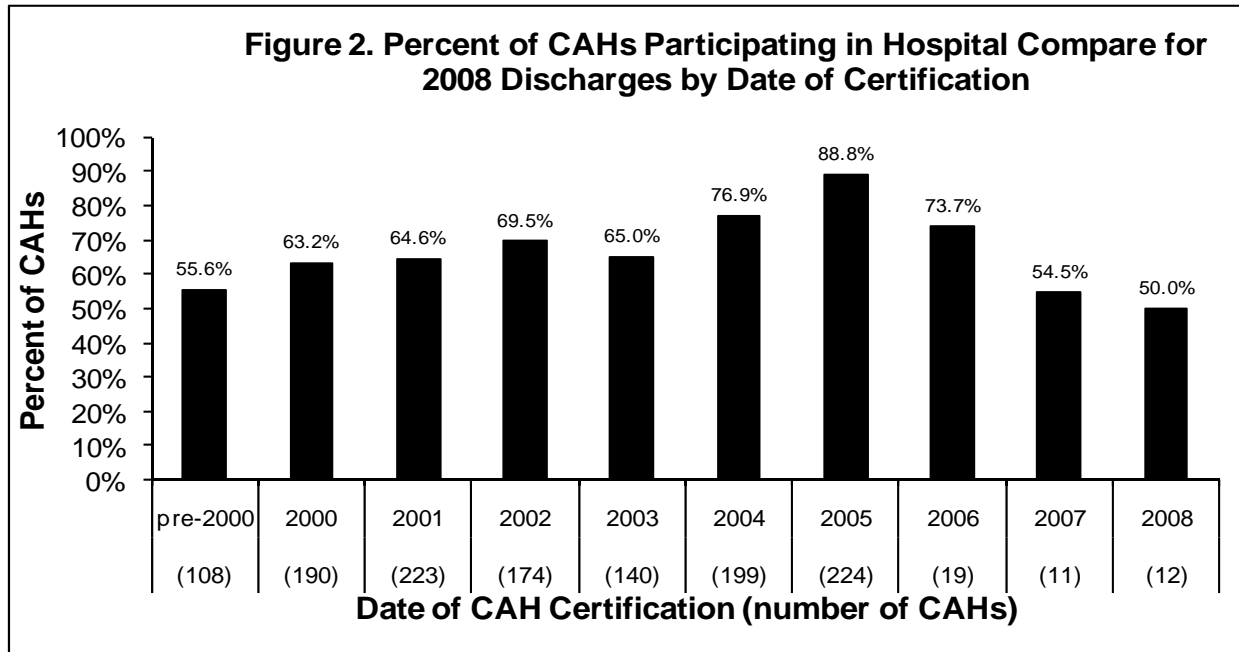


Figure 2 shows the percent of CAHs that participated in Hospital Compare for 2008 discharges by date of CAH certification. From 2000 through 2005, between 140 and 225 CAHs were certified each year; only 19 CAHs were certified in 2006, 11 in 2007, and 12 in 2008. CAHs certified in 2007 and 2008 had the lowest Hospital Compare participation rates, while those certified in 2005 had the highest rate. The lower participation rate among the most recently certified hospitals is somewhat surprising, given that nearly all converted from PPS hospitals and presumably have the capacity to report.

CAHs that were accredited by the Joint Commission or the American Osteopathic Association were more likely (92%) than non-accredited CAHs (62%) to participate in Hospital Compare (Table 2). The higher rate of Hospital Compare participation among accredited CAHs, which has been a trend since 2004, is not surprising, since the Joint Commission has required accredited hospitals to report performance measurement data since 2002, and it initiated public reporting of core measure data in 2004.

While accredited CAHs are more likely to participate in Hospital Compare, the large number of non-accredited CAHs means that almost two-thirds of the CAHs that participated in Hospital Compare were not accredited. Seventy-eight percent of private non-profit CAHs participated in Hospital Compare, compared to 63% of those with government/public ownership and 62% of for-profit CAHs.



**Table 2. CAH Hospital Compare Participation by Accreditation and Type of Ownership (N=1,300)**

	Total number of CAHs	Percent of CAHs that participate in Hospital Compare
<b>Accreditation</b>		
Accredited	343	92.4
Not accredited	957	62.4
<b>Ownership</b>		
Government/public	561	62.7
Private non-profit	670	77.5
For profit	69	62.3

*HCAHPS Reporting*

Nationally, 34% of CAHs reported HCAHPS data to Hospital Compare (Table 3). By state, the percent of CAHs reporting HCAHPS data ranged from 0 to 100%. Three states had 100% of their CAHs reporting HCAHPS data.

**Table 3. Critical Access Hospital (CAH) Reporting of HCAHPS Survey Results to Hospital Compare by State for 2008 Discharges**

State <sup>1</sup>	Number of CAHs <sup>2</sup>	Percent of CAHs Reporting HCAHPS Results	State	Number of CAHs	Percent of CAHs Reporting HCAHPS Results
Alabama	3	100.0	Nebraska	65	23.1
Alaska	13	7.7	Nevada	11	9.1
Arizona	14	28.6	New Hampshire	13	61.5
Arkansas	29	13.8	New Mexico	6	66.7
California	28	35.7	New York	13	46.2
Colorado	29	27.6	North Carolina	21	42.9
Florida	11	18.2	North Dakota	35	8.6
Georgia	34	20.6	Ohio	34	64.7
Hawaii	9	0.0	Oklahoma	33	30.3
Idaho	26	11.5	Oregon	25	44.0
Illinois	51	37.3	Pennsylvania	13	23.1
Indiana	35	62.9	South Carolina	5	0.0
Iowa	82	37.8	South Dakota	37	35.1
Kansas	83	9.6	Tennessee	16	25.0
Kentucky	30	36.7	Texas	76	13.2
Louisiana	27	18.5	Utah	9	55.6
Maine	15	93.3	Vermont	8	100.0
Massachusetts	3	100.0	Virginia	7	57.1
Michigan	34	44.1	Washington	38	26.3
Minnesota	79	48.1	West Virginia	17	64.7
Mississippi	27	7.4	Wisconsin	59	76.3
Missouri	36	27.8	Wyoming	14	57.1
Montana	47	27.7	All States	1300	34.1

<sup>1</sup>Five states (Connecticut, Delaware, Maryland, New Jersey and Rhode Island) do not have any CAHs

<sup>2</sup>Number of CAHs certified as of December 2008.

Data sources: HCAHPS data for 2008 discharges downloaded from CMS Hospital Compare website September 2009 and Flex Monitoring Team CAH database.

CMS recommends that each hospital obtain 300 completed HCAHPS surveys annually, in order to be more confident that the survey results are reliable for assessing the hospital's performance. However, some smaller hospitals may sample all of their HCAHPS-eligible discharges and still have fewer than 300 completed surveys. About 30% of reporting CAHs had 300 or more completed surveys (Table 4). The vast majority of reporting CAHs (87%) had survey response rates of 25% to 50%. During this time period, the average survey response rate for all hospitals reporting HCAHPS data to Hospital Compare was 33%.<sup>7</sup>

**Table 4. Completed HCAHPS Surveys and Response Rates for CAHs Nationally in 2008**

Total CAHs reporting HCAHPS data	Number of completed HCAHPS surveys			HCAHPS survey response rates		
	< 100 surveys	100-299 surveys	≥300 surveys	< 25%	25 – 50%	>50%
442 (34%)	61	249	132	36	385	21

### CAH Reporting of Measures by Condition

Figure 3 describes the inpatient process of care measures in Hospital Compare for 2008 discharges. Since last year's report, CMS dropped one AMI measure (beta-blocker at arrival) and added three new surgical care improvement measures (cardiac surgery patients with a controlled 6 AM postoperative blood glucose, surgery patients on a beta blocker prior to surgery who received a beta blocker during the perioperative period, and surgery patients with appropriate hair removal).

**Figure 3. Hospital Compare Measures for 2008 Discharges**

<b><i>Heart Attack / Acute Myocardial Infarction (AMI) Measures</i></b>
<b>Aspirin at arrival</b> – AMI patients without aspirin contraindications who received aspirin within 24 hours before or after hospital arrival.
<b>Aspirin at discharge</b> – AMI patients without aspirin contraindications who were prescribed aspirin at hospital discharge.
<b>ACE inhibitor or ARB for left ventricular systolic dysfunction (LVSD)</b> – AMI patients with LVSD and without angiotensin converting enzyme inhibitor (ACE inhibitor) or angiotensin receptor blocker (ARB) contraindications who are prescribed an ACE inhibitor or an ARB at hospital discharge.
<b>Beta Blocker at discharge</b> – AMI patients without beta-blocker contraindications who were prescribed a beta-blocker at hospital discharge.
<b>Fibrinolytic medication received within 30 minutes of hospital arrival</b> – AMI patients receiving fibrinolytic therapy during the hospital stay and having a time from hospital arrival to fibrinolysis of 30 minutes or less.
<b>PCI received within 90 minutes of hospital arrival</b> – AMI patients receiving Percutaneous Coronary Intervention (PCI) during the hospital stay with a time from hospital arrival to PCI of 90 minutes or less.
<b>Smoking cessation advice/counseling</b> – AMI patients with a history of smoking cigarettes, who are given smoking cessation advice or counseling during a hospital stay.

**Figure 3 continued**

<b>Heart Failure Measures</b>
<b>Evaluation of left ventricular systolic (LVS) function</b> – Heart failure patients with documentation in the hospital record that an evaluation of the LVS function was performed before arrival, during hospitalization, or is planned for after discharge.
<b>ACE inhibitor or ARB for left ventricular systolic dysfunction (LVSD)</b> – Heart failure patients with LVSD and without ACE inhibitor or ARB contraindications who are prescribed an ACE inhibitor or an ARB at hospital discharge.
<b>Discharge instructions</b> – Heart failure patients discharged home with written instructions or educational material given to patient or care giver at discharge or during the hospital stay addressing activity level, diet, discharge medications, follow-up appointment, weight monitoring, and what to do if symptoms worsen.
<b>Smoking cessation advice/counseling</b> – Heart failure patients with a history of smoking cigarettes, who are given smoking cessation advice or counseling during a hospital stay.
<b>Pneumonia Measures</b>
<b>Initial antibiotic timing</b> – Pneumonia inpatients that receive initial antibiotics within 6 hours after arrival at the hospital.
<b>Pneumococcal vaccination status</b> – Pneumonia inpatients age 65 and older who were screened for pneumococcal vaccine status and were administered the vaccine prior to discharge, if indicated.
<b>Influenza vaccination status</b> – Pneumonia patients age 50 years and older, hospitalized in October through February who were screened for influenza vaccine status and vaccinated prior to discharge, if indicated.
<b>Blood cultures performed in the Emergency Department prior to initial antibiotic received in hospital</b> – Pneumonia patients whose initial Emergency Department blood culture specimen was collected prior to first hospital dose of antibiotics.
<b>Appropriate initial antibiotic selection</b> – Immunocompetent patients with pneumonia who receive an initial antibiotic regimen that is consistent with current guidelines.
<b>Smoking cessation advice/counseling</b> – Pneumonia patients with a history of smoking cigarettes, who are given smoking cessation advice or counseling during a hospital stay.
<b>Surgical Care Improvement Measures</b>
<b>Prophylactic antibiotic received within 1 hour prior to surgical incision</b> – Surgical patients who received prophylactic antibiotics within 1 hour prior to surgical incision.
<b>Prophylactic antibiotics discontinued within 24 hours after surgery end time</b> – Surgical patients whose prophylactic antibiotics were discontinued within 24 hours after surgery end time.
<b>Prophylactic antibiotic selection</b> – Surgical patients who received the recommended antibiotics for their particular type of surgery.
<b>Surgery patients with recommended Venous Thromboembolism (VTE) prophylaxis ordered</b> - Surgery patients with recommended VTE prophylaxis ordered anytime from hospital arrival to 48 hours after surgery end time.
<b>Surgery patients who received appropriate Venous Thromboembolism (VTE) prophylaxis within 24 hours prior to surgery to 24 hours after surgery</b> - Surgery patients who received appropriate VTE prophylaxis within 24 hours prior to surgical incision time to 24 hours after surgery end time.
<b>Cardiac surgery patients with controlled 6 A.M. postoperative blood glucose</b> – Cardiac surgery patients with controlled 6 A.M. blood glucose ( $\leq 200$ mg/dL) on postoperative day one and postoperative day two with surgery end date being postoperative day zero.
<b>Surgery patients with appropriate hair removal</b> – Surgery patients with appropriate surgical site hair removal. No hair removal, or hair removal with clippers or depilatory is considered appropriate. Shaving is considered inappropriate.
<b>Surgery patients on a beta blocker prior to arrival who received a beta blocker during the perioperative period</b> – Surgery patients who were taking beta blockers before coming to the hospital, who were kept on the beta blockers during the period just before and after their surgery.

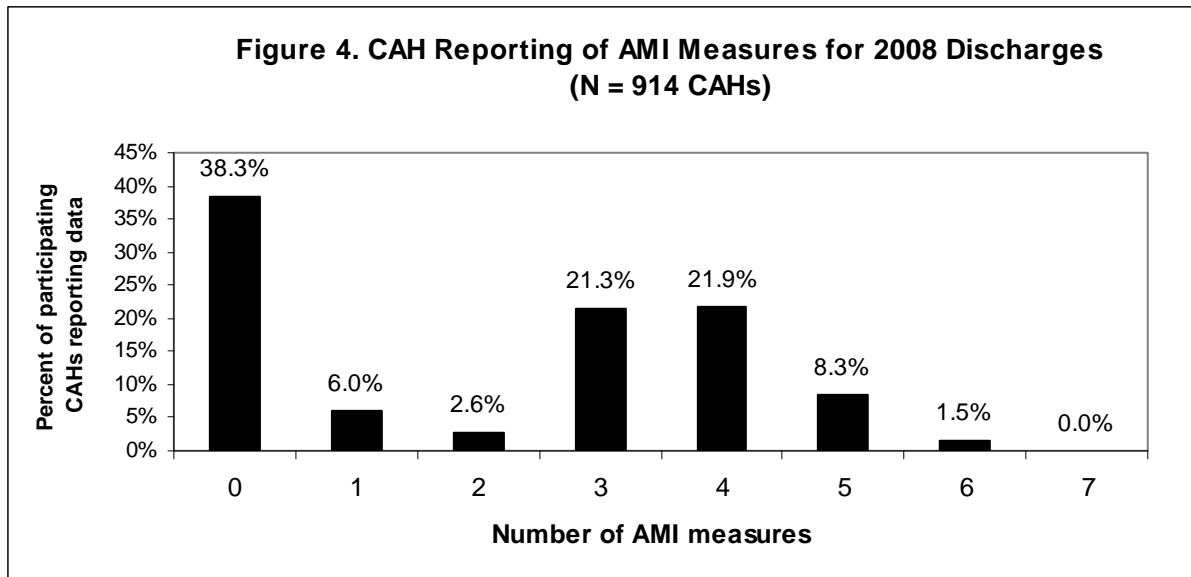
**Figure 3 continued**

<b>Children's Asthma Care</b>
<b>Use of reliever medication for inpatient asthma</b> - Use of relievers in pediatric patients admitted for inpatient treatment of asthma.
<b>Use of systemic Corticosteroid Medication for inpatient asthma</b> - Use of systemic Corticosteroid Medication in pediatric patients admitted for inpatient treatment of asthma.
<b>Home Management Plan of Care document given to patient/caregiver</b> – An assessment that there is documentation in the medical record that a Home Management Plan of Care (HMPC) document was given to the pediatric asthma patient/caregiver.

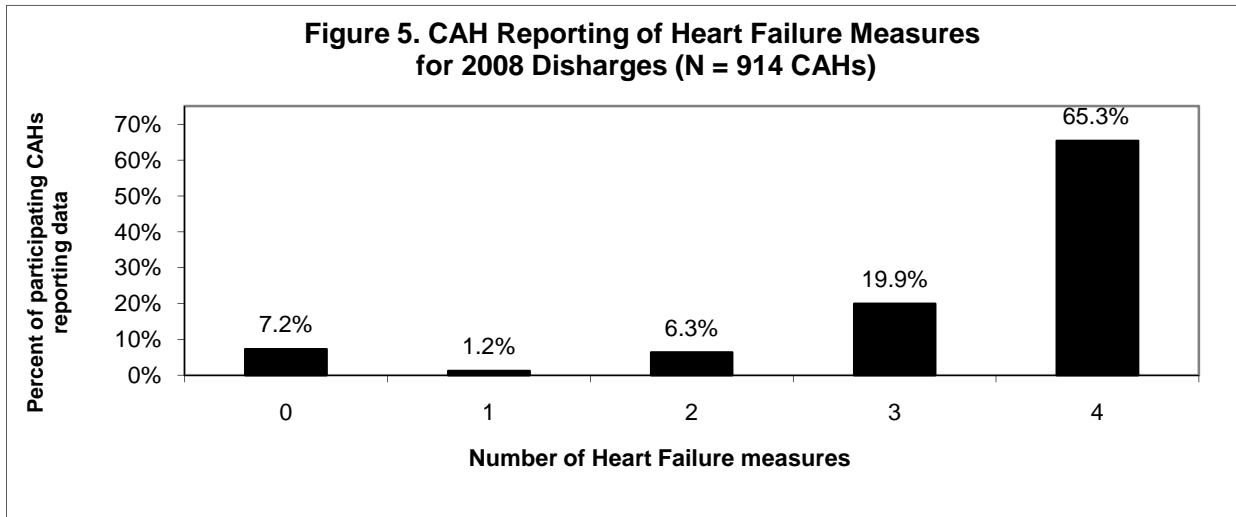
Source: CMS, <http://www.hospitalcompare.hhs.gov/>, 2009.

No CAHs reported data on the first two new surgical care measures or on the children’s asthma measures. Data for the AMI percutaneous coronary intervention (PCI) were not included in the report because the total number of CAH patients nationally was less than 25. PCI procedures require specialized equipment and cardiology expertise not usually present in CAHs.

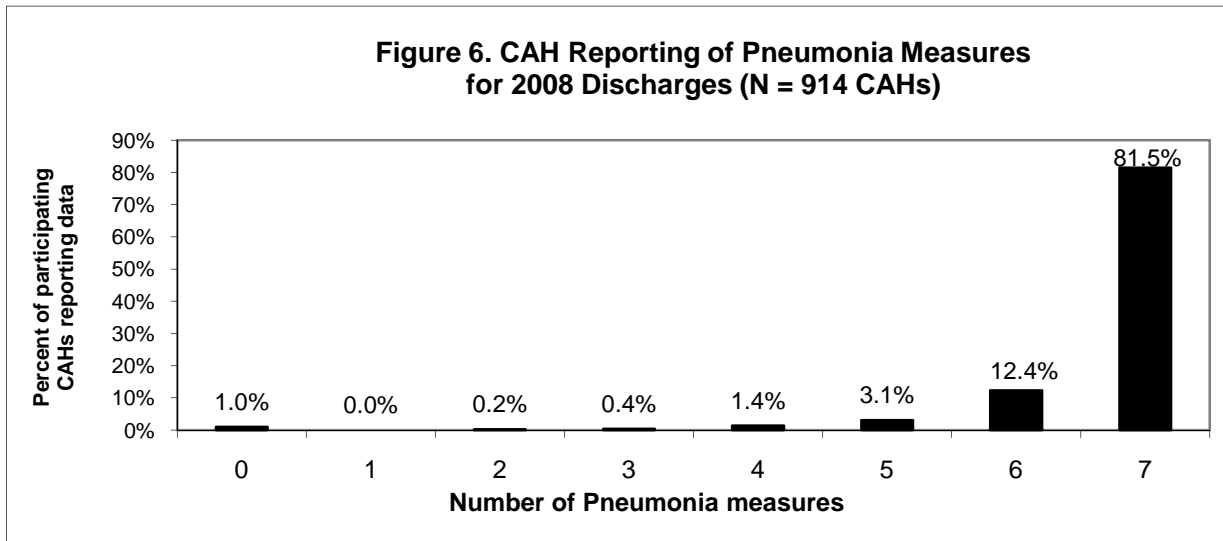
CAHs were more likely to report data on the pneumonia and heart failure measures than on the AMI and surgical improvement measures. (Reporting data was defined as having a denominator of one or more patients.) Over one-third (38%) of the 914 CAHs that participated in Hospital Compare for 2008 discharges did not report data on any of the AMI measures, while 53% reported data on three or more measures (Figure 4).



In contrast, 65% of the 914 participating CAHs reported data on all four heart failure measures, while only 7% did not report data on any heart failure measures (Figure 5).

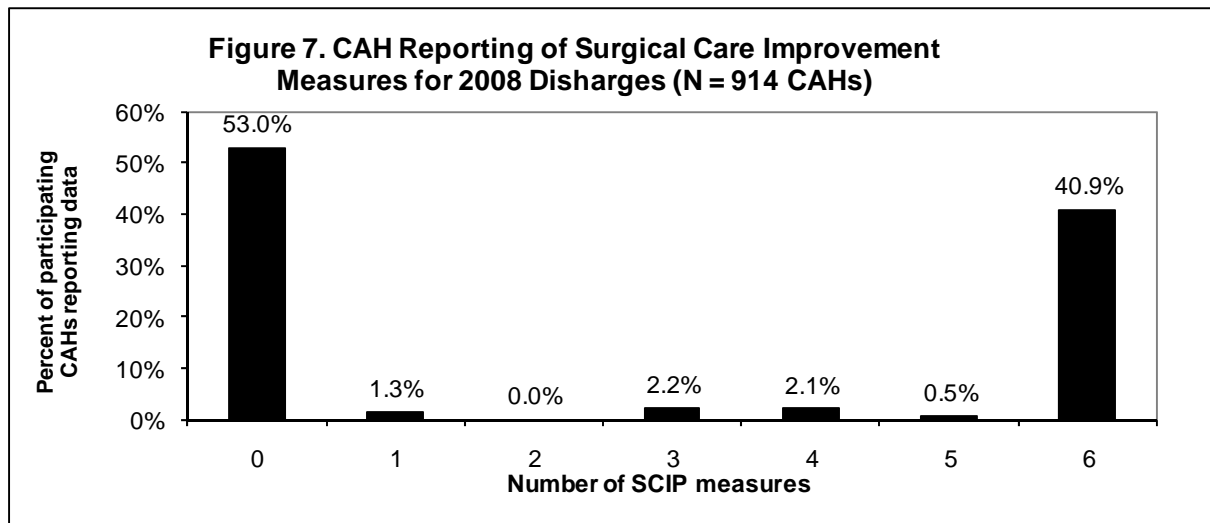


Similarly, 82% of participating CAHs reported data on all seven pneumonia measures and an additional 12% reported data on six measures; only 1% did not report data on any pneumonia measures (Figure 6).





For the surgical care improvement measures, 53% of participating CAHs did not report data on any measures, while 41% reported data on six measures (Figure 7).



Note: Approximately 1/3 of all CAHs do not provide inpatient surgery services; thus, these measures would not apply to those CAHs.

The number of CAHs reporting data and the number of patients for whom data are submitted varies widely across measures. For each measure, Table 5 shows the number of CAHs that reported data for one or more patients and for 25 or more patients.<sup>1</sup> Very few CAHs reported data for 25 or more patients on any of the AMI measures, two heart failure measures (ACE inhibitor/ARB for LVSD, smoking cessation advice), and two pneumonia measures (smoking cessation advice, influenza vaccination). The total number of CAH patients nationally per measure ranges from 84 for the AMI fibrinolytic measure to 40,568 for the pneumonia oxygenation assessment measure.

<sup>1</sup> When a hospital has less than 25 patients for a measure, the number of cases is considered by CMS to be too small to reliably predict performance at the hospital level. As the number of cases used to determine hospitals' rates increases, the reliability and stability of the rates increase.

**Table 5. CAHs Reporting and Number of CAH Patients by Measure for 2008 Discharges  
(N =914 CAHs)**

Condition	Measure	Number of CAHs reporting data for $\geq 1$ patient	Number of CAHs reporting data for $\geq 25$ patients	Total number of CAH patients with data
AMI	Aspirin at arrival	550	3	2,448
	Aspirin at discharge	495	1	1,809
	ACEI or ARB for LVSD	208	0	382
	Smoking cessation advice	147	1	234
	Beta blocker at discharge	495	1	1,872
	Fibrinolytic w/in 30 minutes of arrival	56	0	84
Heart Failure	Discharge instructions	833	223	15,204
	Assessment of LVS	844	385	21,975
	ACE inhibitor or ARB for LVSD	733	9	4,959
	Smoking cessation advice	651	2	2,835
Pneumonia	Oxygenation assessment	905	629	40,568
	Pneumococcal vaccination	904	530	31,267
	Blood culture prior to first antibiotic	832	349	21,562
	Smoking cessation advice	856	64	9,113
	Initial antibiotic(s) within 6 hours	890	521	31,776
	Most appropriate initial antibiotic(s)	887	400	22,788
	Influenza vaccination	827	39	8,921
Surgical Care Improvement	Preventative antibiotic(s) 1 hour before incision	410	209	16,259
	Received most appropriate preventative antibiotic(s)	410	211	16,237
	Preventative antibiotic(s) stopped within 24 hours after surgery	407	203	15,742
	Doctors ordered blood clot prevention treatments	388	197	15,597
	Received blood clot prevention treatments 24 hours pre/post surgery	387	196	15,576
	Appropriate Hair Removal	415	249	22,631

## **Comparison of Inpatient Process of Care Results**

The next section of the report compares the quality measure results for CAHs 1) by accreditation status and type of ownership and 2) with rural and urban PPS hospitals. Then, results are compared over the 2005-2008 time period for each group of hospitals.

As with our previous analyses of Hospital Compare data, several caveats are necessary in evaluating these results. Although the percent of CAHs participating in Hospital Compare has increased, participating and non-participating CAHs still differ significantly on several organizational characteristics (e.g., average number of beds, average daily census, accreditation status, type of ownership, and year of CAH certification). Thus, the quality measure results for CAHs that voluntarily participate in Hospital Compare may not be representative of all CAHs. In comparing the results for CAHs with rural and urban PPS hospitals, it is important to recognize that hospital characteristics such as patient volume, the size and composition of medical and nursing staff, financial resources, and the availability of technology may influence the measurement of quality as well as the provision of care in the hospital environment.

Many of the differences between CAHs and rural and urban PPS hospitals are statistically significant. Some of these differences are fairly large; other differences are significant because of the large sample sizes involved, but are only a few percentage points. The latter differences may not be of practical significance, especially if the percentages are high for all groups.

Finally, it is also very important to remember that the aggregate scores for groups of CAHs, and PPS rural and urban hospitals include a wide range of scores for individual hospitals. Some individual hospitals in each group are performing much better than the average, and others are performing worse.

### **CAHs by Accreditation Status and Ownership**

Table 6 compares the quality measure results for accredited and non-accredited CAHs. Differences between the two groups were not statistically significant for 10 measures. Two AMI, four heart failure, and four pneumonia measures were significantly higher for accredited CAHs while the three surgical improvement measures were significantly higher for non-accredited CAHs.

Table 7 compares the quality measure results for CAHs by type of ownership. The number of participating for-profit CAHs is small. Consequently, this group of CAHs had a total of less than 25 patients for three AMI measures and these data are not reported.

Differences in the quality measure results for private non-profit CAHs and public/government owned CAHs were not statistically significant for 10 measures. The results for the remaining 13 measures were significantly higher for private non-profit CAHs. Differences between private non-profit CAHs and for-profit CAHs were not statistically significant for 11 measures. Of the remaining nine measures, seven measures were significantly higher for private non-profit CAHs; two measures were significantly higher for for-profit CAHs. Differences between public/government owned CAHs and for-profit CAHs were not statistically significant for 12 measures. The results for three measures were significantly higher for public/government owned CAHs and for five measures for for-profit CAHs.

**Table 6. Percent of Patients Receiving Recommended Care in Accredited and Non-Accredited CAHs in 2008**

Condition	Measure	Percent of Patients Receiving Recommended Care		Significance of differences between accredited and non-accredited CAHs
		Accredited CAHs (n=317)	Non-Accredited CAHs (n=597)	
AMI	Aspirin at arrival	91.4	90.0	NS
	Aspirin at discharge	90.7	86.4	<.05
	ACEI or ARB for LVSD	86.8	82.4	NS
	Smoking cessation advice	85.1	75.0	NS
	Beta blocker at discharge	90.4	86.6	<.05
	Fibrinolytic w/in 30 minutes of arrival	18.2	19.6	NS
Heart Failure	Discharge instructions	76.8	65.9	<.001
	Assessment of LVS	84.4	76.0	<.001
	ACE inhibitor or ARB for LVSD	84.9	82.7	<.05
	Smoking cessation advice	87.2	79.1	<.001
Pneumonia	Oxygenation assessment	99.0	99.1	NS
	Pneumococcal vaccination	85.7	80.2	<.001
	Blood culture prior to first antibiotic	90.9	90.4	NS
	Smoking cessation advice	88.5	77.4	<.001
	Initial antibiotic(s) within 6 hours	94.5	94.3	NS
	Most appropriate initial antibiotic(s)	87.4	86.4	<0.05
	Influenza vaccination	82.3	77.7	<.001
Surgical Care Improvement	Preventative antibiotic(s) 1 hour before incision	88.6	88.1	NS
	Received appropriate preventative antibiotic(s)	94.4	95.2	<.05
	Preventative antibiotic(s) stopped within 24 hours after surgery	86.3	86.8	NS
	Doctors ordered blood clot prevention treatments	86.8	88.6	<.001
	Received blood clot prevention treatments 24 hours pre/post surgery	84.8	87.4	<.001
	Appropriate hair removal	96.4	96.7	NS

NS = not significant

**Table 7. Percent of Patients Receiving Recommended Care in CAHs by Ownership Type in 2008**

		Percent of Patients Receiving Recommended Care			Significance of differences between:		
Condition	Measure	Public/ Gov't CAHs (n=352)	Non- Profit CAHs (n=519)	For- Profit CAHs (n=43)	Public/ Gov't and Non- profit CAHs	Non- Profit and For- Profit CAHs	Public/ Gov't and For- Profit CAHs
AMI	Aspirin at arrival	86.9	92.7	92.6	<.001	NS	NS
	Aspirin at discharge	86.3	90.0	88.2	<0.05	NS	NS
	ACEI or ARB for LVSD	88.2	82.5	*	NS	N/A	N/A
	Smoking cessation advice	83.2	78.9	*	NS	N/A	N/A
	Beta blocker at discharge	87.9	88.7	90.1	NS	NS	NS
	Fibrinolytic w/in 30 minutes of arrival	22.2	18.5	*	NS	N/A	N/A
Heart Failure	Discharge instructions	66.0	74.5	67.7	<.001	<.001	NS
	Assessment of LVS	76.0	82.5	77.5	<.001	<.001	NS
	ACE inhibitor or ARB for LVSD	83.0	84.1	86.1	NS	NS	NS
	Smoking cessation advice	79.2	85.7	84.4	<.001	NS	NS
Pneumonia	Oxygenation assessment	98.9	99.1	99.6	<.05	<.05	<.01
	Pneumococcal vaccination	79.0	85.0	81.1	<.001	<.001	NS
	Blood culture prior to first antibiotic	89.5	91.2	92.2	<.001	NS	<.01
	Smoking cessation advice	78.8	84.9	89.4	<.001	<.01	<.001
	Initial antibiotic(s) within 6 hours	93.6	94.7	95.2	<.001	NS	<.05
	Most appropriate initial antibiotic(s)	84.9	88.0	87.7	<.001	NS	<.05
	Influenza vaccination	75.5	82.2	79.6	<.001	NS	NS
Surgical Care Improvement	Preventative antibiotic(s) 1 hour before incision	88.0	88.7	86.2	NS	NS	NS
	Received appropriate preventative antibiotic(s)	94.6	95.4	85.2	NS	<.001	<.001
	Preventative antibiotic(s) stopped within 24 hours after surgery	86.1	87.1	79.7	NS	<.001	<.001
	Doctors ordered blood clot prevention treatments	86.8	88.2	85.3	<.05	<.05	NS
	Received blood clot prevention treatments 24 hours pre/post surgery	86.0	86.2	83.8	NS	NS	NS
	Appropriate hair removal	96.4	96.7	94.4	NS	<.001	<.01

\*The total number of CAH patients nationally with data on this measure was less than 25.

NS = not significant

## CAHs and PPS Hospitals

Table 8 compares results for CAH patients with rural PPS patients nationally. Compared to rural PPS patients, the percent of CAH patients receiving recommended care in 2007 was significantly lower than the percent of rural PPS patients on all measures except one (the pneumonia initial antibiotic(s) within 6 hours measure).

**Table 8. Percent of Patients Receiving Recommended Care in CAHs and Rural PPS Hospitals in 2008**

Condition	Measure	Percent of Patients Receiving Recommended Care		Significance of differences between CAHs and Rural PPS Hospitals
		CAHs (n=914)	Rural PPS Hospitals (n=973)	
AMI	Aspirin at arrival	90.6	95.7	<.001
	Aspirin at discharge	88.6	95.5	<.001
	ACEI or ARB for LVSD	84.8	90.8	<.001
	Smoking cessation advice	80.8	98.1	<.001
	Beta blocker at discharge	88.5	95.7	<.001
	Fibrinolytic w/in 30 minutes of arrival	19.0	46.7	<.001
Heart Failure	Discharge instructions	71.3	79.9	<.001
	Assessment of LVS	80.0	92.7	<.001
	ACE inhibitor or ARB for LVSD	83.8	88.7	<.001
	Smoking cessation advice	83.3	94.9	<.001
Pneumonia	Oxygenation assessment	99.1	99.5	<.001
	Pneumococcal vaccination	82.7	87.9	<.001
	Blood culture prior to first antibiotic	90.7	93.3	<.001
	Smoking cessation advice	83.0	93.1	<.001
	Initial antibiotic(s) within 6 hours	94.4	94.4	NS
	Most appropriate initial antibiotic(s)	86.9	87.5	<.05
	Influenza vaccination	79.9	84.5	<.001
Surgical Care Improvement	Preventative antibiotic(s) 1 hour before incision	88.4	91.8	<.001
	Received appropriate preventative antibiotic(s)	94.7	95.7	<.001
	Preventative antibiotic(s) stopped within 24 hours after surgery	86.5	88.9	<.001
	Doctors ordered blood clot prevention treatments	87.7	90.1	<.001
	Received blood clot prevention treatments 24 hours pre/post surgery	86.0	87.9	<.001
	Appropriate hair removal	96.5	97.3	<.001

Compared to urban PPS patients nationally, the percent of CAH patients receiving recommended care in 2008 was significantly lower on all measures except the pneumonia initial antibiotic timing measure (Table 9).

Some of the differences between CAHs and rural PPS hospitals, and between CAHs and urban PPS hospitals were statistically significant because of the large sample sizes involved, but the differences are not large enough to be of practical significance (e.g., several pneumonia and surgical care improvement measures). The largest differences in percentages were on the smoking cessation advice measures.

**Table 9. Percent of Patients Receiving Recommended Care in CAHs and Urban PPS Hospitals in 2008**

		Percent of Patients Receiving Recommended Care		Significance of Differences between CAHs and Urban PPS Hospitals
Condition	Measure	CAHs (n=914)	Urban PPS Hospitals (n=2,414)	
AMI	Aspirin at arrival	90.6	98.1	<.001
	Aspirin at discharge	88.6	97.9	<.001
	ACEI or ARB for LVSD	84.8	94.1	<.001
	Smoking cessation advice	80.8	99.0	<.001
	Beta blocker at discharge	88.5	98.0	<.001
	Fibrinolytic w/in 30 minutes of arrival	19.0	52.8	<.001
Heart Failure	Discharge instructions	71.3	83.0	<.001
	Assessment of LVS	80.0	97.3	<.001
	ACE inhibitor or ARB for LVSD	83.8	92.9	<.001
	Smoking cessation advice	83.3	97.7	<.001
Pneumonia	Oxygenation assessment	99.1	99.8	<.001
	Pneumococcal vaccination	82.7	88.6	<.001
	Blood culture prior to first antibiotic	90.7	93.1	<.001
	Smoking cessation advice	83.0	96.1	<.001
	Initial antibiotic(s) within 6 hours	94.4	93.5	<.001
	Most appropriate initial antibiotic(s)	86.9	89.9	<.001
	Influenza vaccination	79.9	86.0	<.001
Surgical Care Improvement	Preventative antibiotic(s) 1 hour before incision	88.4	93.5	<.001
	Received appropriate preventative antibiotic(s)	94.7	96.7	<.001
	Preventative antibiotic(s) stopped within 24 hours after surgery	86.5	90.1	<.001
	Doctors ordered blood clot prevention treatments	87.7	92.2	<.001
	Received blood clot prevention treatments 24 hours pre/post surgery	86.0	89.6	<.001
	Appropriate hair removal	96.5	97.5	<.001

## Trends over Time for CAHs and PPS Hospitals

Figures 8-28 in Appendix B show the data trends for 2005, 2006, 2007 and 2008 for CAHs, rural PPS, and urban PPS hospitals. These data include all hospitals reporting in each category each year. The numbers of hospitals are shown in Table 10.

**Table 10. Number of Hospitals with Data by Hospital Type from 2006-2008**

<b>Hospital Type</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>
CAHs	683	812	892	914
Rural PPS	1,003	1,004	993	973
Urban PPS	2,370	2,431	2,441	2,414

During the 2005-2008 time period CAH performance improved on almost all AMI measures (Figures 8-14). (Performance on the fibrinolytic measure declined significantly between 2007 and 2008 (Figure 14); it should be noted that this measure is based on a very small number of CAH patients nationally.) However, the performance by rural PPS and urban PPS hospitals was higher at the onset and improved over the four-year time period. Consequently, a gap in performance remains between CAHs and PPS hospitals for the AMI measures.

CAH performance improved for all heart failure measures (Figures 15-18). As a result, the gap in performance between CAH and PPS hospitals narrowed for two measures. However, CAHs continue to perform lower than PPS hospitals on all measures and the gap for two measures, percent of patients receiving ACE or ARB for LVSD and percent of patients receiving discharge instructions, widened between 2007 and 2008.

Figures 19-25 show the four year trends for the pneumonia measures. For all three groups of hospitals, performance on the oxygenation measure has consistently been very high ( $\geq 99\%$  receiving recommended care). (CMS retired this measure, along with the heart failure beta-blocker on arrival measure, effective the second quarter of 2009.) Performance has improved for all three groups of hospitals and is similar ( $\leq 3\%$  difference) on three pneumonia measures related to receipt of antibiotics (Figures 21, 23 and 24). Although CAH performance on the influenza and pneumococcal vaccination measures (Figures 20 and 25) improved, so too did the performance by rural and urban PPS hospitals. CAH performance on the pneumonia smoking cessation measure has improved, but remains well below rural and urban PPS hospitals (Figure 22).

Performance by all groups of hospitals on the surgical care improvement measures has consistently been high ( $\geq 88\%$ ) and the difference in performance between CAH and PPS hospitals is relatively small ( $\leq 5\%$ ) (Figures 26-28).



## HCAHPS Survey Results for CAHs Nationally

Table 11 displays the mean (average) percentages of patients that gave the highest level of response (e.g., “always”) for each of the HCAHPS survey measures in two groups of hospitals that publicly reported HCAHPS data for 2008: CAHs nationally, and all US hospitals. For all measures, CAH patients nationally had higher average scores than patients in all US hospitals.

**Table 11. HCAHPS Results for CAHs Nationally for 2008**

Percent of patients who reported that:	Mean (average) for:	
	CAHs Nationally (n = 442)	All US hospitals (n = 3,765)
Nurses always communicated well	79%	74%
Doctors always communicated well	83%	80%
Patient always received help as soon as wanted	71%	62%
Pain was always well controlled	71%	68%
Staff always explained about medications before giving them to patient	63%	59%
Yes, staff gave patient information about what to do during recovery at home	82%	80%
Area around patient room was always quiet at night	61%	56%
Patient room and bathroom were always clean	78%	69%
They gave an overall hospital rating of 9 or 10 (high) on 1-10 scale	70%	64%
They would definitely recommend the hospital to friends and family	71%	68%

## Mortality and Readmission Rates for CAHs

Table 12 displays the number of CAHs nationally: 1) for which CMS did not calculate 30 day risk-adjusted mortality rates for AMI, heart failure, and pneumonia because they were not in the Hospital Compare database; 2) those that did not have the minimum 25 eligible cases per condition over the 3 year period from July 2005 to June 2008 to reliably calculate a rate; and 3) those that had rates that were not different from, better than or worse than the US rates for all hospitals.

Nationally, 87% of CAHs did not have an AMI mortality rate calculated, and the remaining 13% of CAHs did not have a rate that is different from the US rate for all hospitals. More CAHs had the minimum number of patients to reliably calculate mortality rates for heart failure (58%) and pneumonia (70%). However, few CAHs had mortality rates that are either better than or worse than the US rates for all hospitals (less than 1% of CAHs for heart failure and 3% of CAHs for pneumonia).

**Table 12. Number (Percent) of CAHs Nationally in Risk-adjusted Mortality Rate Categories**

	Number of CAHs with:					
	Total	No rate data in Hospital Compare	Not enough cases to reliably calculate	Not different from U.S. rate for all hospitals	Better than U.S. rate for all hospitals	Worse than U.S. rate for all hospitals
AMI	1300	390 (30.0%)	739 (56.8%)	171 (13.2%)	0	0
Heart Failure	1300	352 (27.1%)	195 (15.0%)	742 (57.1%)	0	11(0.8%)
Pneumonia	1300	349 (26.8%)	47 (3.6%)	865 (66.5%)	3 (0.2%)	36 (2.8%)

Table 13 shows the 30 day risk-adjusted readmission rates for AMI, heart failure, and pneumonia for CAHs nationally. For AMI, 95% of CAHs did not have a readmission rate calculated, and the remaining 5% of CAHs did not have a rate that is different from the US rate for all hospitals. More CAHs had the minimum number of patients to reliably calculate readmission rates for heart failure (61%) and pneumonia (69%), but few CAHs had readmission rates that are either better than or worse than the US rates for all hospitals (0.2% of CAHs for heart failure and 0.7% of CAHs for pneumonia).

**Table 13. Number (Percent) of CAHs Nationally in Risk-adjusted Readmission Rate Categories**

		Number of CAHs with:					
		Total	No rate data in Hospital Compare	Not enough cases to reliably calculate	Not different from U.S. rate for all hospitals	Better than U.S. rate for all hospitals	Worse than U.S. rate for all hospitals
AMI	CAHs Nationally	1300	428 (32.9%)	810 (62.3%)	62 (4.8%)	0	0
Heart Failure	CAHs Nationally	1300	352 (27.1%)	158 (12.2%)	788 (60.6%)	1 (0.1%)	1 (0.1%)
Pneumonia	CAHs Nationally	1300	349 (26.8%)	46 (3.5%)	896 (68.9%)	3(0.2%)	6 (0.5%)

Clearly, mortality and readmission rates are important outcome measures for all hospitals. However, these analyses indicate that small volume limits their usefulness as individual hospital measures for CAHs, even using three years of data. Future research needs to address alternative ways of calculating outcome measures at the individual hospital level for CAHs.

## DISCUSSION AND CONCLUSIONS

Over the past five years, CAHs have improved their performance on nearly all Hospital Compare inpatient process of care measures. During this time, however, rural PPS and urban PPS hospitals also improved their performance. Thus, CAHs continue to have lower scores relative to rural and urban PPS hospitals on several measures, especially measures related to AMI and heart failure. The persistence over time of significant differences between CAHs and PPS hospitals, as well as within the group of CAHs, presents an ongoing quality improvement challenge for CAHs.

On average, CAHs have significantly higher ratings on HCAHPS measures than all US hospitals. However, only one-third of CAHs are reporting HCAHPS results to Hospital Compare. The vast majority of CAHs did not have enough cases for CMS to reliably calculate 30-day risk adjusted mortality and readmission rates for pneumonia, heart failure and AMI, or did not have rates that were significantly different than the US rates for all hospitals.

While many CAHs are participating in Hospital Compare and/or in state or regional quality reporting and benchmarking initiatives, others are not. To date, public reporting of quality measures has been voluntary for CAHs, in part due to concerns about the rural relevance of quality measures and the difficulty of reliably measuring quality for low volume providers. Although some quality measures are not relevant for CAHs because they involve procedures that are rarely performed in small rural hospitals (e.g., PCI), many of the current Hospital Compare measures, including the inpatient pneumonia and heart failure measures, the AMI/chest pain outpatient measures, and the HCAHPS survey measures, are relevant for CAHs. While small volume remains a challenge, several options exist for improving the reliability and usefulness of quality measures for low volume providers (e.g., calculating composite measures; aggregating data across groups of similar hospitals; using longer time periods to calculate measures; using statistical methods such as Bayesian models; and reporting confidence intervals for measures).

The health reform legislation passed by Congress will move the US toward a health care system that rewards the provision of high-quality care. Health care providers will increasingly be required to demonstrate the quality of the care they are providing to qualify for reimbursement incentives and avoid penalties for poor care. In this environment, CAHs that are unwilling to participate in quality reporting and benchmarking activities will be at a disadvantage.

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## **APPENDIX A: ACRONYMS USED IN THIS REPORT**

**Critical Access Hospital (CAH)** A CAH is a facility that is designated as a CAH by the State in which it is located and meets the following criteria:

- Is a rural public, non-profit or for-profit hospital; or is a hospital that was closed within the previous ten years; or is a rural health clinic that was downsized from a hospital;
- Is located in a State that has established a State plan with CMS for the Medicare Rural Hospital Flexibility Program;
- Is located more than a 35-mile drive from any other hospital or CAH (in mountainous terrain or in areas with only secondary roads available, the mileage criterion is 15 miles) or be certified before January 1, 2006 by the State as being a necessary provider of health care services;
- Makes available 24-hour emergency care services 7 days per week;
- Provides not more than 25 beds for acute inpatient or swing bed care; and
- Provides an annual average length of stay of less than 96 hours per patient for acute care patients.

### **Federal Office of Rural Health Policy (ORHP)**

The Office of Rural Health Policy (ORHP) promotes better health care service in rural America. Established in August 1987 by the Administration, the Office was subsequently authorized by Congress in December 1987 and located in the Health Resources and Services Administration. Congress charged the Office with informing and advising the Department of Health and Human Services on matters affecting rural hospitals, and health care, co-coordinating activities within the department that relate to rural health care, and maintaining a national information clearinghouse. Additional information is available at <http://www.ruralhealth.hrsa.gov/>

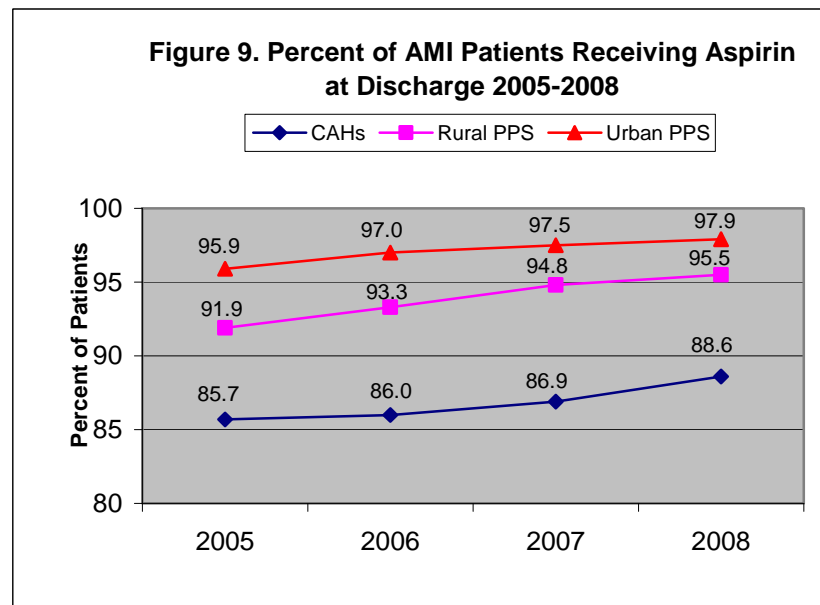
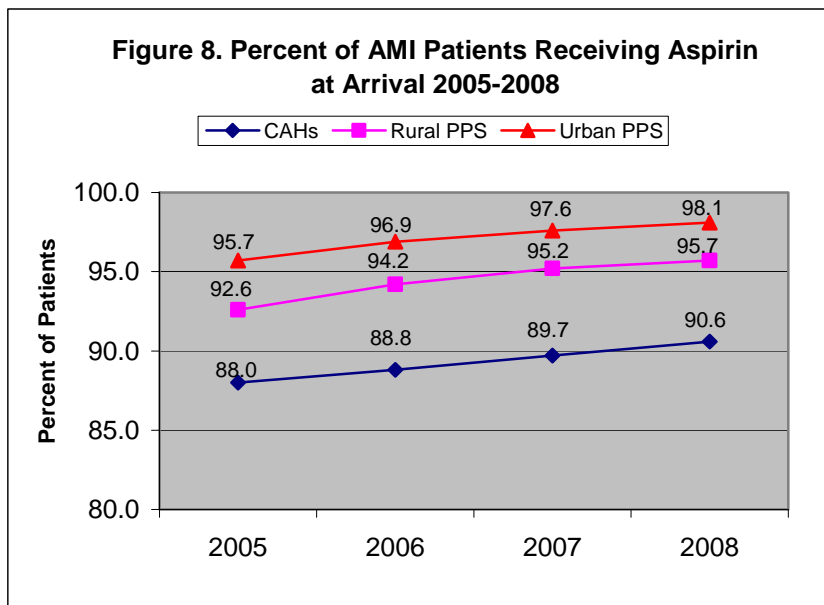
### **Medicare Rural Hospital Flexibility Program (Flex Program)**

The Medicare Rural Hospital Flexibility Program (Flex Program) was authorized by section 4201 of the Balanced Budget Act of 1997 (BBA), Public Law 105-33. The Flex Program provides funding to States for the designation of critical access hospitals (CAHs) in rural communities and the development of networks to improve access to care in these communities. Under the program, hospitals certified as CAHs can receive cost-based reimbursement from Medicare.

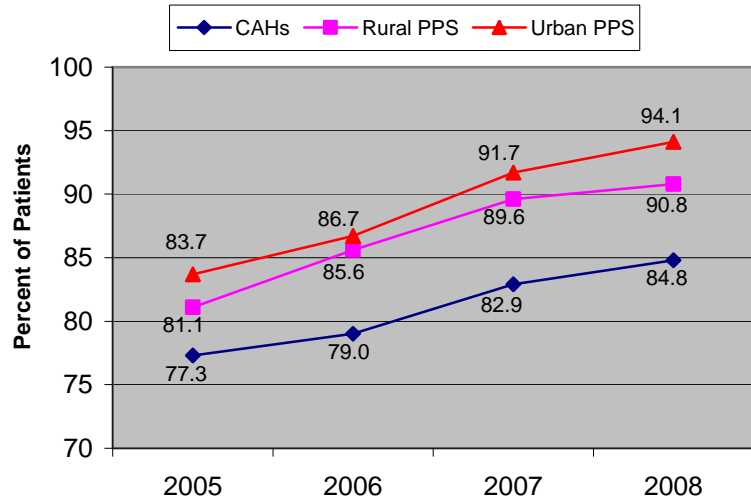
### **Prospective Payment System (PPS)**

Section 1886(d) of the Social Security Act sets forth a system of payment for the operating costs of acute care hospital inpatient stays under Medicare Part A based on prospectively set rates. Under the inpatient prospective payment system (PPS), each case is categorized into a diagnosis-related group (DRG). Each DRG has a payment weight assigned to it, based on the average resources used to treat Medicare patients in that DRG. The base payment rate is divided into a labor-related and non-labor share. The labor-related share is adjusted by the wage index applicable to the area where the hospital is located. This base payment rate is multiplied by the DRG relative weight. Hospitals that treat a high-percentage of low-income patients receive a percentage add-on payment, the disproportionate share hospital (DSH) adjustment. Approved teaching hospitals receive a percentage add-on payment for each case paid through IPPS. Finally, for outlier cases that are unusually costly, the PPS payment is increased.

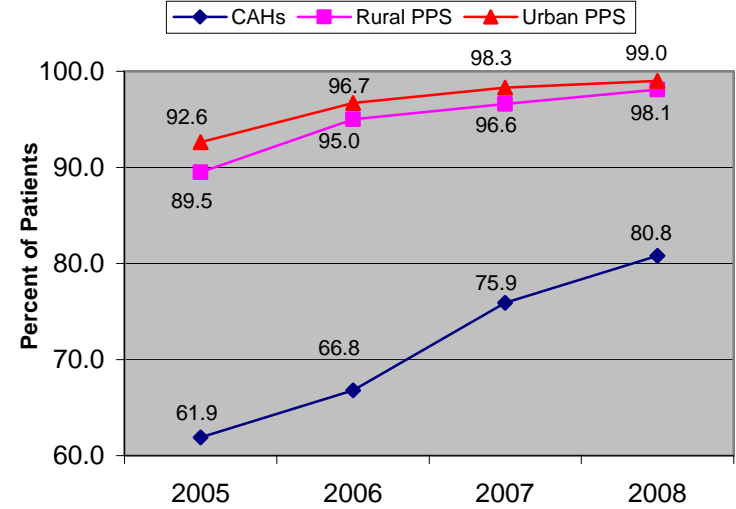
**APPENDIX B:  
GRAPHS OF TRENDS OVER TIME FOR CAHS AND PPS HOSPITALS**



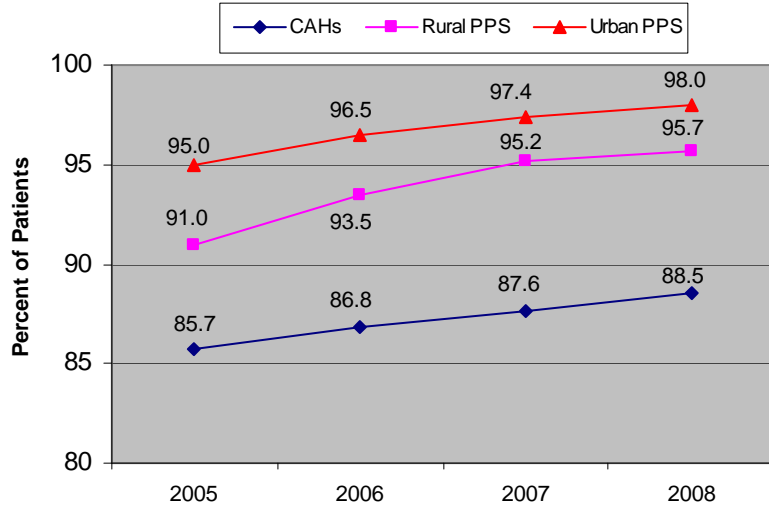
**Figure 10. Percent of AMI Patients Receiving ACE or ARB for LVSD 2005-2008**



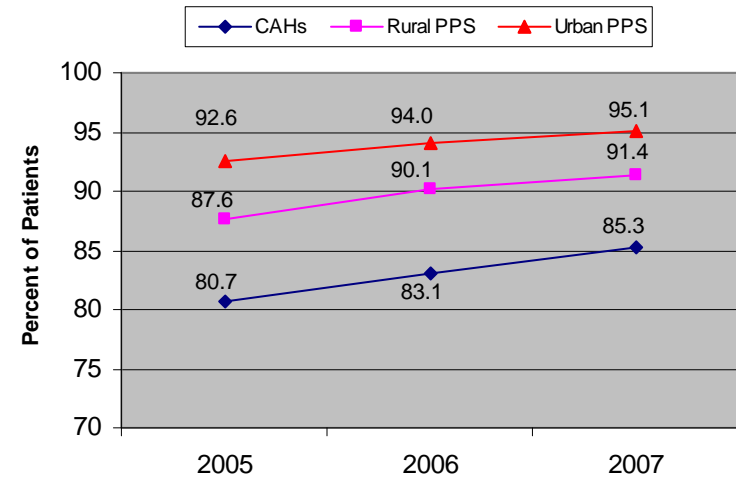
**Figure 11. Percent of AMI Patients Receiving Smoking Cessation Advice 2005-2008**



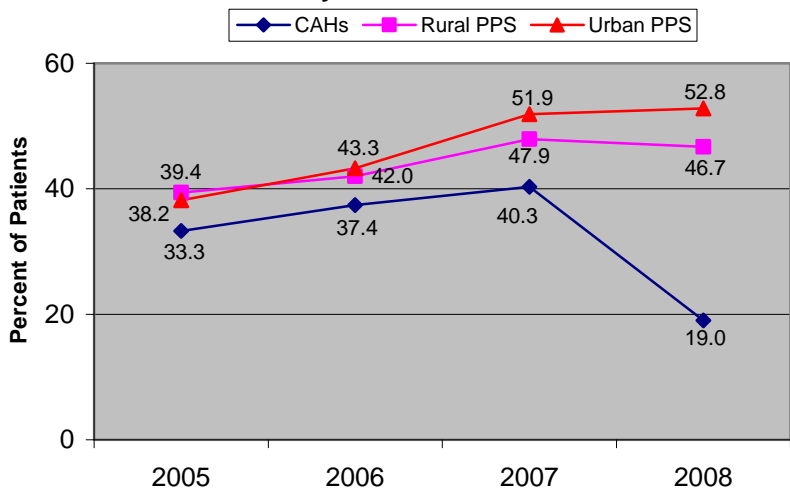
**Figure 12. Percent of AMI Patients Receiving Beta Blockers at Discharge 2005-2008**



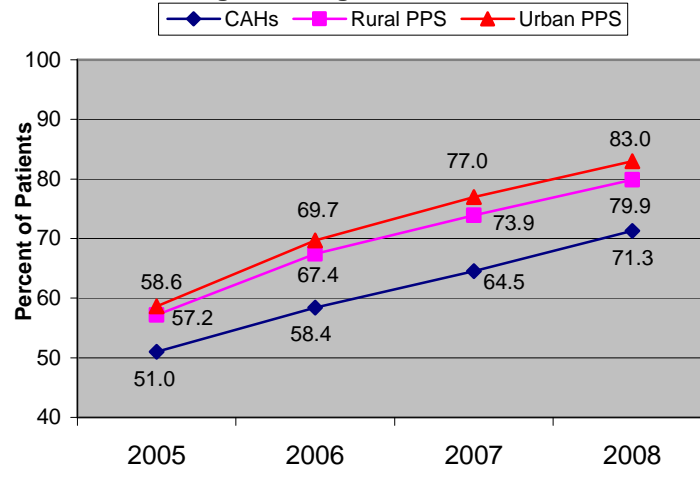
**Figure 13. Percent of AMI Patients Receiving Beta Blockers at Arrival 2005-2007; measure dropped 2008**



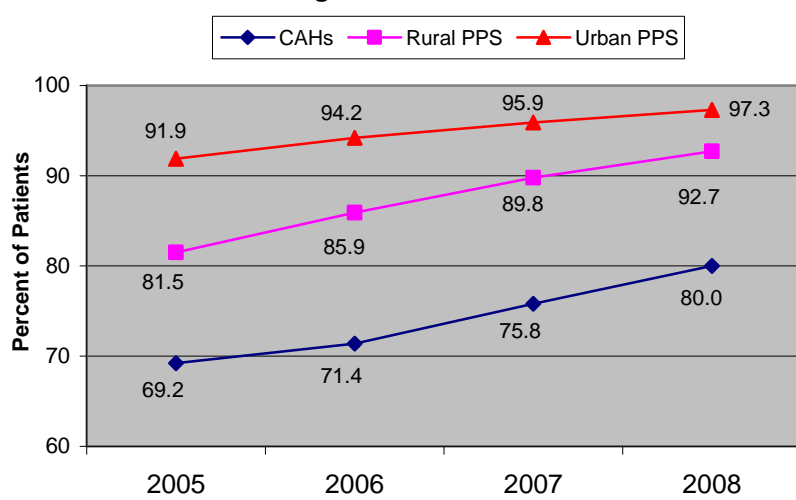
**Figure 14. Percent of AMI Patients Receiving Fibrinolytic in 30 Minutes 2005-2008**



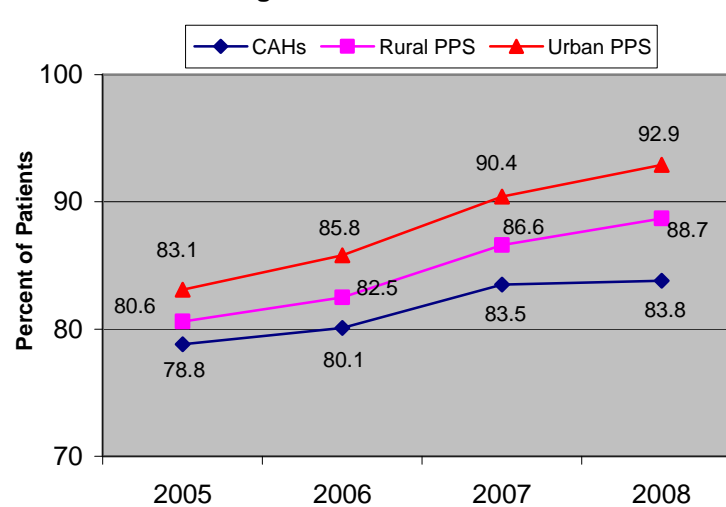
**Figure 15. Percent of Heart Failure Patients Receiving Discharge Instructions 2005-2008**



**Figure 16. Percent of Heart Failure Patients Receiving Assessment of LVS 2005-2008**

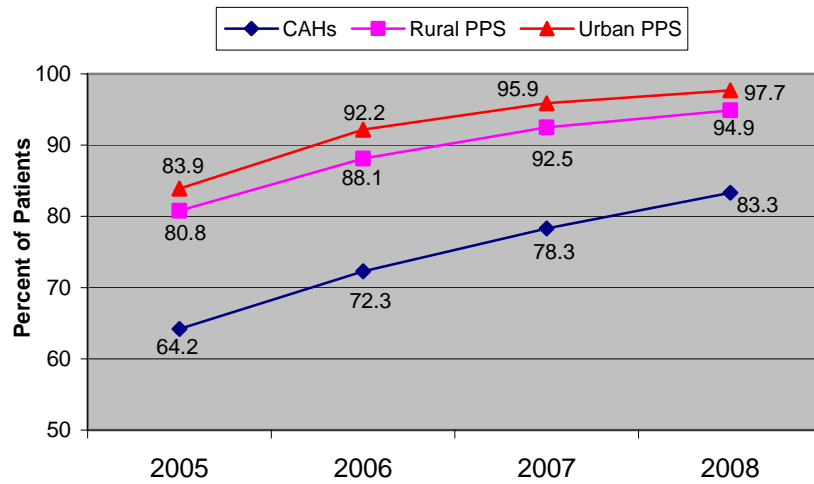


**Figure 17. Percent of Heart Failure Patients Receiving ACE or ARB for LVSD 2005-2008**

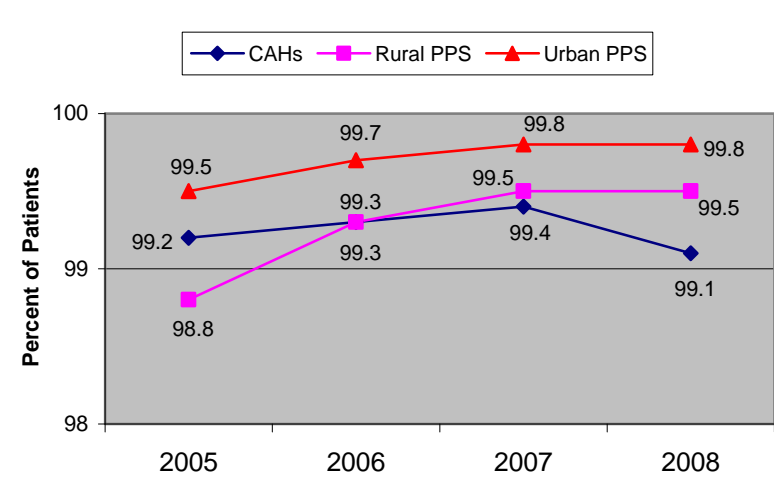




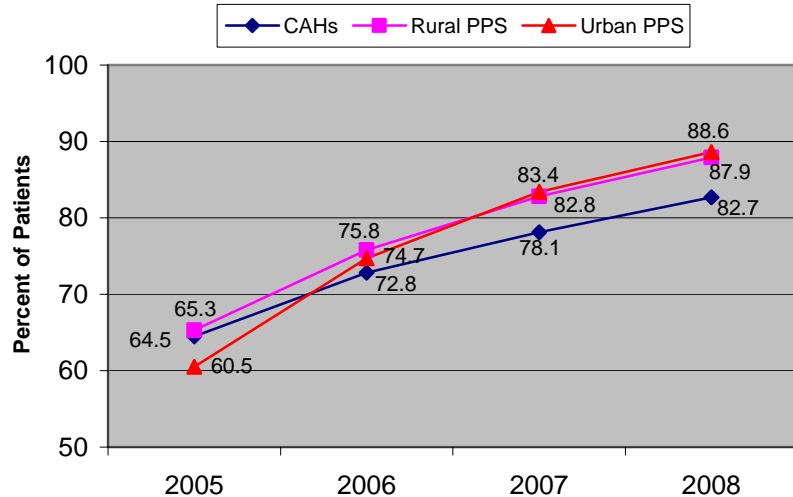
**Figure 18. Percent of Heart Failure Patients Receiving Smoking Cessation Advice 2005-2008**



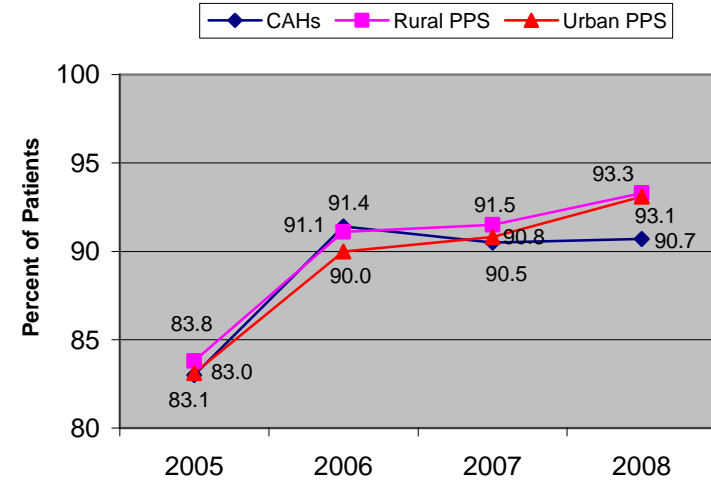
**Figure 19. Percent of Pneumonia Patients Receiving Oxygenation Assessment 2005-2008**



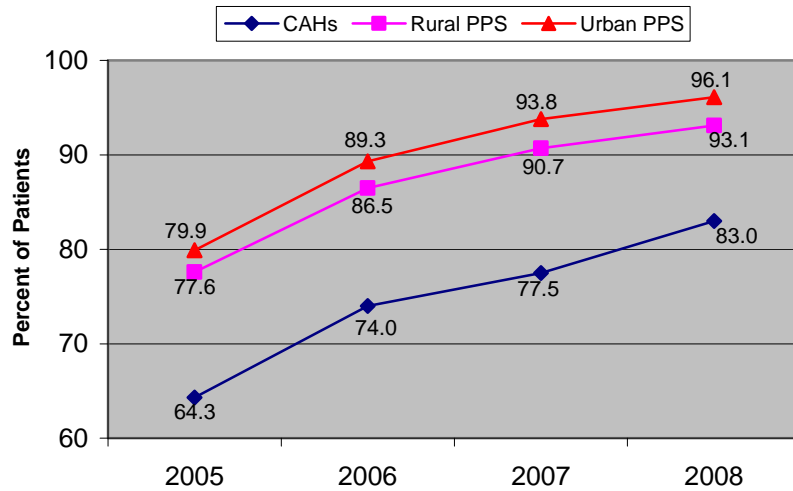
**Figure 20. Percent of Pneumonia Patients Receiving Pneumococcal Vaccination 2005-2008**



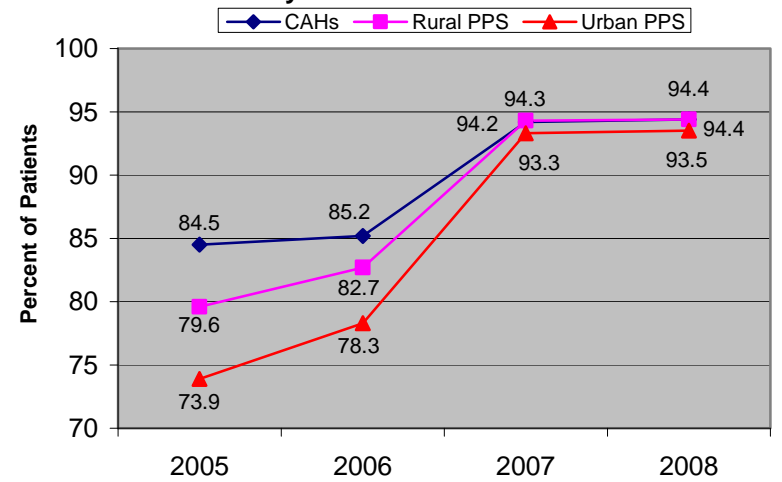
**Figure 21. Percent of Pneumonia Patients Receiving Blood Culture Prior to First Antibiotic**



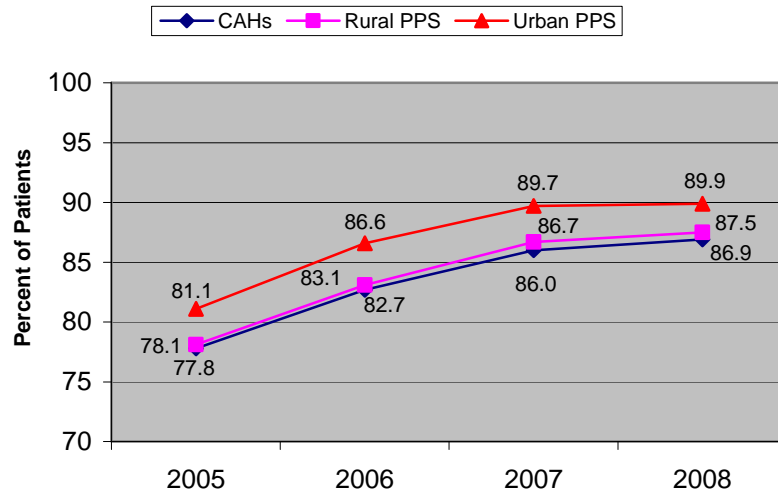
**Figure 22. Percent of Pneumonia Patients Receiving Smoking Cessation Advice 2005-2008**



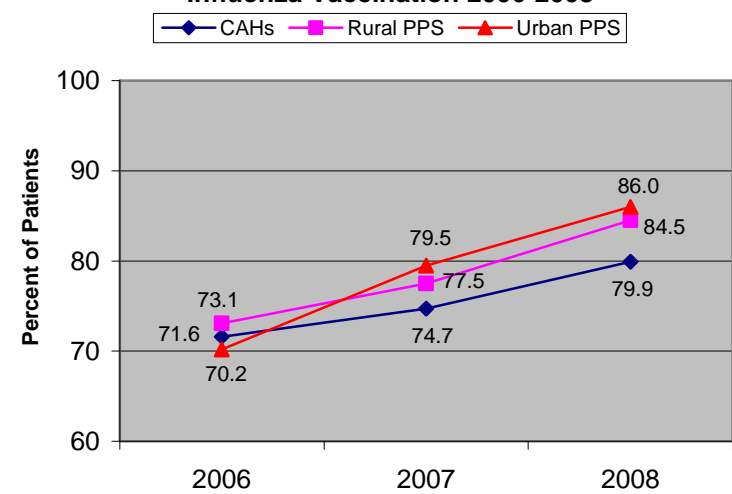
**Figure 23. Percent of Pneumonia Patients Receiving Timely Initial Antibiotic 2005-2008**



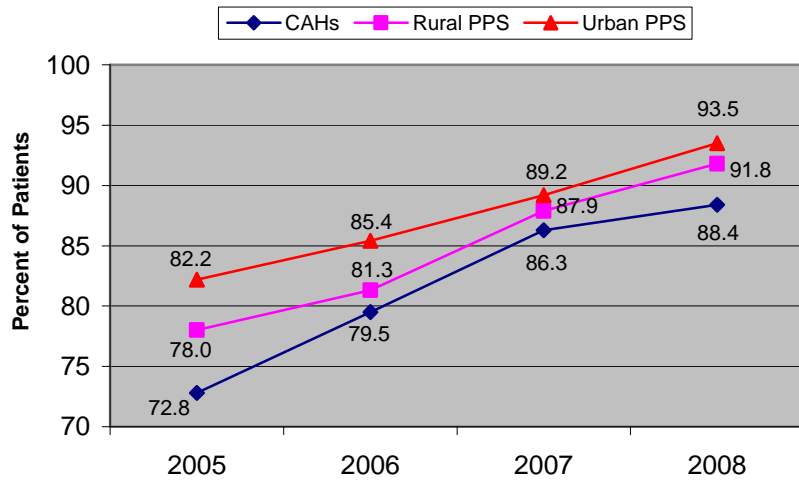
**Figure 24. Percent of Pneumonia Patients Receiving Appropriate Initial Antibiotic 2005-2008**



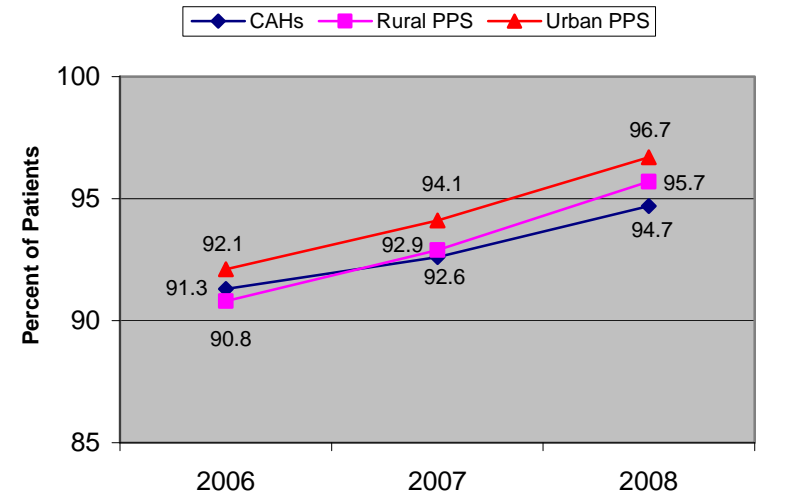
**Figure 25. Percent of Pneumonia Patients Receiving Influenza Vaccination 2006-2008**



**Figure 26. Percent of Surgical Patients Receiving Preventative Initial Antibiotic 1 Hour Before Incision 2005-2008**



**Figure 27. Percent of Surgical Patients Receiving Most Appropriate Antibiotic 2006-2008**



**Figure 28. Percent of Surgical Patients with Preventative Antibiotic Stopped within 24 Hours 2005-2008**

