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Critical Access Hospital Year 7 Hospital Compare Participation and Quality Measure

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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.

The core activity areas of the Flex Grant Program are: 1) support for quality improvement in CAHs; 2) support for financial and operational improvement in CAHs; 3) support health system development and community engagement, including the integration of EMS into local and regional systems of care; and 4) conversion of eligible rural hospitals into CAHs. States use Flex resources for performance management activities, training programs, needs assessments, and network building. The Flex Program has implemented a new special project, the Medicare Beneficiary Quality Improvement Project (MBQIP) focused on Medicare beneficiary health status improvement.

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

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EXECUTIVE SUMMARY

Introduction

This report examines 2010 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, and surgical care improvement; 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 2010 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 2010 American Hospital Association Annual Survey.

The 2010 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 2008, 2009 and 2010. 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, all rural PPS hospitals and all urban PPS hospitals 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, and 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 whose rates for each condition were not different than, better than or worse than the national rates, was determined by assessing whether the 95% confidence intervals for the CAH rate for that condition were above, below or included the national rate.

Results

For 2010 discharges, a total of 977 CAHs (73.6%) submitted data on at least one inpatient measure to Hospital Compare. The overall CAH participation rate of 74% on inpatient process measures for 2010 discharges compares to previous rates of 41% (2004); 53% (2005), 63% (2006), 69% (2007), 70% (2008), and 71% (2009). By state, the percent of participating CAHs ranged from 22% to 100%. Eight states had 100% of their CAHs participating. CAHs remain more likely to report data on pneumonia and heart failure measures than on AMI and surgical infection prevention measures.

A total of 282 CAHs (21.2%) submitted data to Hospital Compare on at least one outpatient process of

care measure. By state, the percent of CAHs reporting outpatient process of care measures ranged from 0% to 83.5%.

For 2010 discharges, CAHs did not perform as well as did rural and urban PPS hospitals on many of the inpatient and outpatient measures. Although the percent of CAH patients receiving recommended care increased from 2006-2010 for all inpatient measures, the percent of rural and urban PPS hospital patients receiving recommended care also increased at similar rates 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, 38% of CAHs publicly reported HCAHPS survey data to Hospital Compare in 2010. By state, the percent of CAHs publicly reporting HCAHPS data ranged from 0% to 100% of CAHs in 2010. On average, CAHs have significantly higher ratings on HCAHPS measures than all U.S. hospitals.

For AMI, few CAHs had sufficient data to calculate 30-day risk adjusted mortality (8%) or readmission (3%) rates and none had rates different than the U.S. averages. More CAHs had sufficient data to calculate mortality rates for heart failure (58%) and pneumonia (73%), and readmission rates for heart failure (61%) and pneumonia (74%), but few CAHs had rates that were significantly different than the U.S. rates for all hospitals.

Discussion and Conclusions

Overall, 15% of CAHs publicly reported inpatient, outpatient, and HCAHPS data; 23% of CAHs publicly reported inpatient and HCAHPS data; six percent of CAHs publicly reported inpatient and outpatient data; and less than one percent each publicly reported outpatient data only or HCAHPS data only. These results indicate that a subset of CAHs (45%) have expanded their public reporting efforts beyond inpatient measures to include additional types of quality measures.

At the same time, one fourth of CAHs (25%) are not publicly reporting quality data of any kind to Hospital Compare. It is somewhat surprising that more CAHs are not reporting outpatient and HCAHPS measures, given the relevance of these measures for small rural hospitals and the fact that CAHs overall perform better than other hospitals on HCAHPS. Given that the outpatient measures are still relatively new to Hospital Compare, it may just take more time for CAHs to become familiar with them.

Factors that are likely to affect CAH quality reporting in the future include: 1) CMS changes to the Hospital Compare quality measurement set; 2) implementation of the Medicare Beneficiary Quality Improvement Project (MBQIP) by the Office of Rural Health Policy and the Quality Improvement Organizations' (QIO) 10th Scope of Work, both of which will encourage and assist CAHs in quality reporting; and 3) continued interest in payment reform at the national level, including the establishment of Value Based Purchasing demonstrations involving CAHs and other low volume hospitals.

It will be important to monitor the impact of these factors on CAH quality reporting, including CAH participation in public reporting and quality performance. The CMS changes to Hospital Compare are reducing the number of quality measures for pneumonia and heart failure, which are the most common inpatient conditions in CAHs, while adding new inpatient and outpatient measures for other conditions that are relevant to CAHs. The impact of these changes will depend on the extent to which CAHs report data on existing and new measures. Both MBQIP and QIO efforts should increase the number of CAHs that are publicly reporting quality data, especially for outpatient and HCAHPS measures and improve CAH quality performance, since quality improvement activities are an integral part of these initiatives.

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 inpatient measure to Hospital Compare increased from 41% for 2004 discharges to 74% for 2010 discharges.[1-6]

The current Hospital Compare quality measures include inpatient process of care measures that reflect recommended treatments for acute myocardial infarction (AMI), heart failure, pneumonia, and surgical care improvement; 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.

This project is part of ongoing Flex Monitoring Team efforts to assess the impact of the Flex program on rural hospitals and communities, including improving access to quality health care services. Previous Flex Monitoring Team reports analyzed CAH participation and Hospital Compare inpatient quality measure results nationally for 2004-2010 and at the state level for 2006-2010.

PURPOSE OF THIS PROJECT

The purpose of this project is to:

- Determine the percent of CAHs participating in Hospital Compare for 2010 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 data on outpatient process of care measures;
- Determine the percent of CAHs reporting HCAHPS survey results and compare the results to those of PPS hospitals; and
- 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 2010 were downloaded from the CMS Hospital Compare website when they became available in October 2011. These data were linked with previously downloaded process of care data for 2005-2009; data on the four year (July 2006 to June 2010) 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 2010 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 Federal information processing standard (FIPs) county 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 U.S. 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. Two outpatient AMI/chest pain measures, time to patient transfer for specialized care and time to ECG, are reported by hospitals as the median number of minutes for eligible patients at that hospital (a lower number of minutes is better). For this report, an average (mean) score was calculated by summing the median times for all CAHs in the state, all CAHs nationally, and all U.S. hospitals, and dividing those times by the number of hospitals reporting.

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.[7]

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, sex, 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.[8]

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, was determined by assessing whether the confidence intervals for the CAH rate for that condition were above, below or included the national rate.

RESULTS

CAH Reporting to Hospital Compare

Table 1 shows the number and percent of CAHs that reported data to Hospital Compare for 2010 discharges. Of the 1,328 CAHs that were certified in 2010, 998 (75.1%) submitted data on at least one measure, including inpatient, outpatient and/or HCAHPS data. Just under one third of CAHs (30.3%) only submitted inpatient data. Slightly less than one fourth (22.9%) of CAHs submitted inpatient and HCAHPS data, while 5.9% submitted inpatient and outpatient data, and 14.5% of CAHs submitted all three types of data. (These totals do 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).

Table 1. CAHs reporting Hospital Compare Inpatient, Outpatient and HCAHPS data for 2010 (n = 1,328 CAHs)[1]

	Number (percent) of CAHs)
At least one Hospital Compare measure (Inpatient process measure, outpatient process measure and/or HCAHPS)	998 (75.1%)
Inpatient, outpatient and HCAHPS	192 (14.5%)
Inpatient and outpatient only	78 (5.9%)
Inpatient and HCAHPS only	304 (22.9%)
Outpatient and HCAHPS only	0 (0.0%)
Inpatient only	403 (30.3%)
Outpatient only	12 (0.9%)
HCAHPS only	9 (0.7%)
No Hospital Compare data (inpatient, outpatient or HCAHPS)	330 (24.9%)

[1]For inpatient and outpatient data, submitting data was defined as having at least one denominator greater than or equal to one for at least one measure.

Reporting on Inpatient Process of Care Measures

Table 2 shows the number of CAHs in each state as of December 2010 and the percent of CAHs that were participating in Hospital Compare by submitting data on inpatient measures for 2010 discharges. Overall, a total of 977 CAHs (73.6%) submitted data on at least one inpatient measure. This rate is slightly lower than the overall rate of 75.1% reporting for any Hospital Compare measure, since a small number of CAHs reported outpatient or HCAHPS data without reporting any inpatient data. Hereafter in this report, Hospital Compare participation rate refers to the 73.6% inpatient reporting rate, in order to be consistent with the definition used in previous reports.

By state, the percent of CAHs reporting inpatient process of care measures for 2010 ranged from 22% to 100%. Of the 45 states in the Flex Program, eight states had 100% of their CAHs publicly reporting in 2010, while five states had less than half of their CAHs reporting.

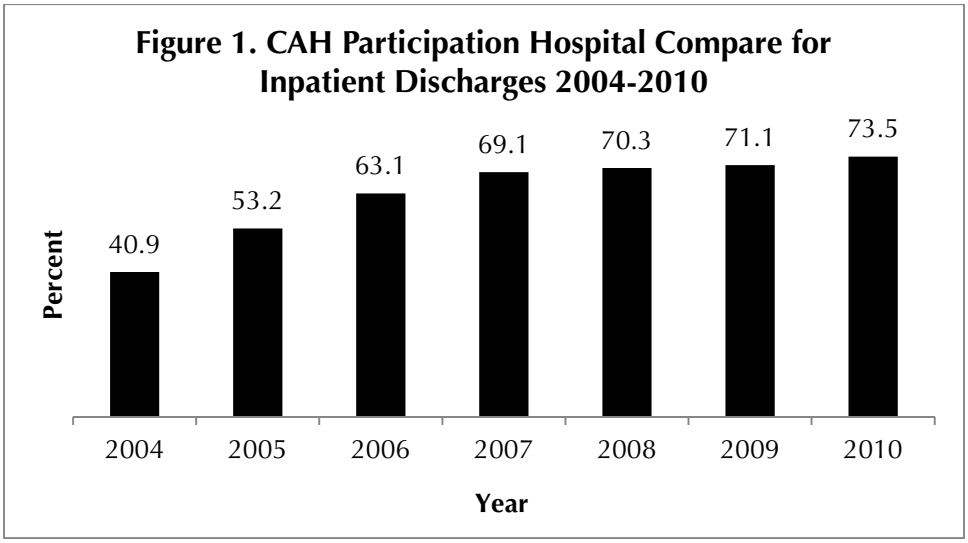
The overall CAH participation rate of 73.6% for 2010 inpatient discharges compares to previous rates of 41% (2004); 53% (2005); 63% (2006); 69% (2007); and 70% (2008); and 71% (2009) (Figure 1).

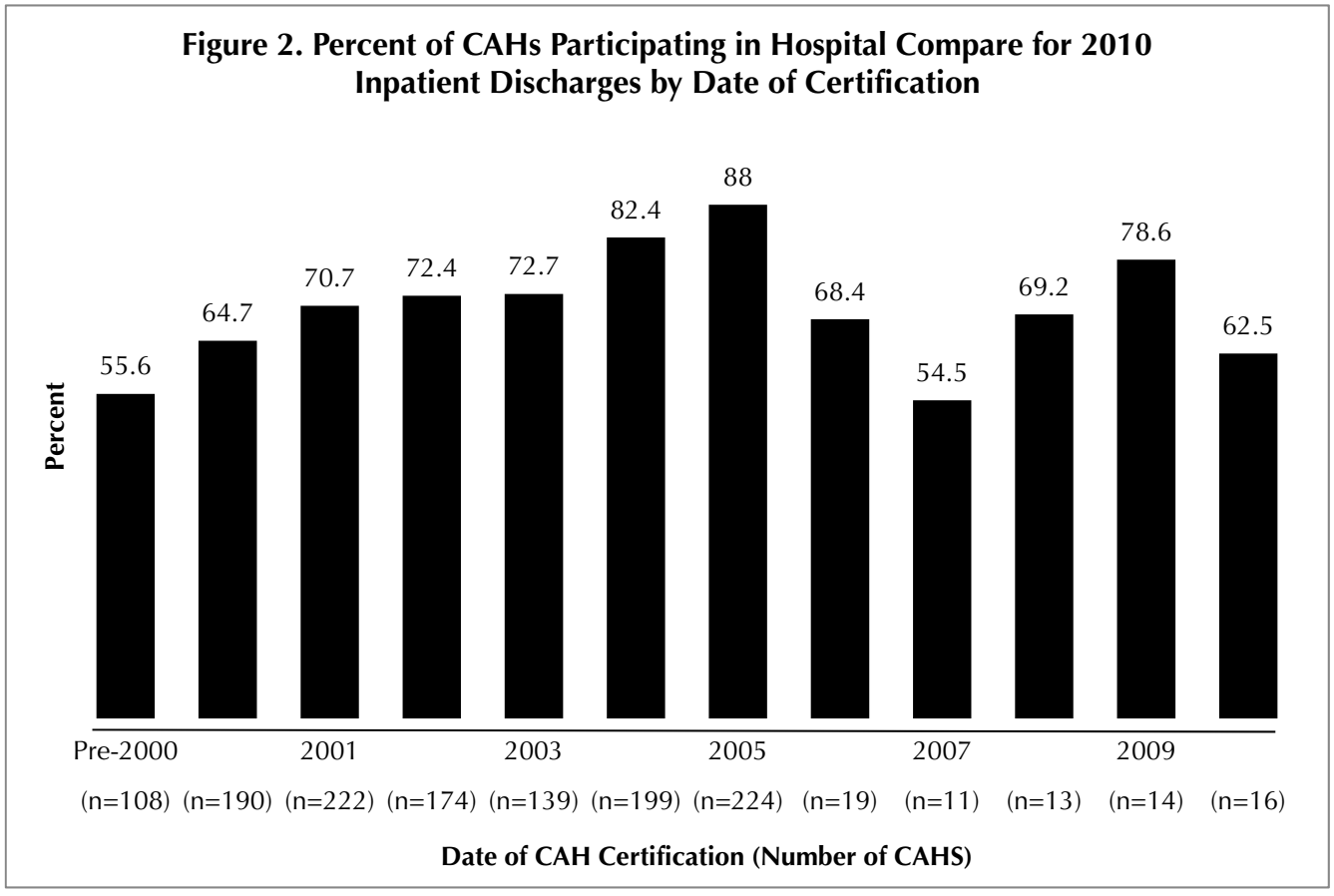
Table 2. Critical Access Hospital (CAH) Participation in Hospital Compare by State for 2010 Discharges (Inpatient Measures)

State[1]	Number of CAHs[2]	Percent of CAHs Participating in Hospital Compare[3]	State	Number of CAHs	Percent of CAHs Participating in Hospital Compare
Alabama	3	100.0%	Nebraska	65	95.4%
Alaska	13	53.8%	Nevada	11	27.3%
Arizona	14	57.1%	New Hampshire	13	100.0%
Arkansas	29	93.1%	New Mexico	7	100.0%
California	31	67.7%	New York	13	69.2%
Colorado	29	58.6%	North Carolina	23	82.6%
Florida	13	53.8%	North Dakota	36	58.3%
Georgia	34	64.7%	Ohio	34	88.2%
Hawaii	9	22.2%	Oklahoma	34	88.2%
Idaho	27	29.6%	Oregon	25	92.0%
Illinois	51	86.3%	Pennsylvania	13	69.2%
Indiana	35	82.9%	South Carolina	5	80.0%
Iowa	82	86.6%	South Dakota	38	57.9%
Kansas	83	62.7%	Tennessee	17	70.6%
Kentucky	29	100.0%	Texas	79	38.0%
Louisiana	27	37.0%	Utah	11	63.6%
Maine	16	100.0%	Vermont	8	100.0%
Massachusetts	3	100.0%	Virginia	7	85.7%
Michigan	36	77.8%	Washington	38	52.6%
Minnesota	79	98.7%	West Virginia	18	83.3%
Mississippi	31	51.6%	Wisconsin	59	93.2%
Missouri	36	72.2%	Wyoming	16	100.0%
Montana	48	66.7%	All States	1328	73.5%

[1]Five states (Connecticut, Delaware, Maryland, New Jersey and Rhode Island) do not have any CAHs.
[2]Number of CAHs certified as of December 2010.
[3]Participation was defined as providing data on at least one patient for one inpatient measure.
Data sources: Hospital Compare data for 2010 discharges downloaded from CMS website October 2011 and Flex Monitoring Team CAH database.

Figure 2 shows the percent of CAHs that participated in Hospital Compare for 2010 discharges by date of CAH certification. From 2000 through 2005, between 190 and 224 CAHs were certified each year. The number of CAHs certified annually decreased significantly in 2006-2010; the State-designated "necessary provider" provision ended in 2006. CAHs certified in 2004 and 2005 have the highest Hospital Compare participation rates. The lower participation rate among 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 (88%) than non-accredited CAHs (69%) to participate in Hospital Compare (Table 3). The higher rate of Hospital Compare participation among accredited CAHs, which has been a trend since 2004, is not surprising. The Joint Commission has required accredited hospitals to report performance measurement data since 2002 and initiated public reporting of core measure data in 2004 (although accredited CAHs have the option of sharing data with Joint Commission surveyors rather than publicly reporting it).

While accredited CAHs are more likely to participate in Hospital Compare, the large number of non-accredited CAHs means that 64% of the CAHs that participated in Hospital Compare were not accredited. Eighty-two percent of private non-profit CAHs participated in Hospital Compare, compared to 66% of those with government/public ownership and 64% of for-profit CAHs. On average, CAHs that participate in Hospital Compare have more beds (23.2 vs. 20.2) and a higher average daily census (21.4 vs. 17.5) than those that do not participate.

Table 3. CAH Hospital Compare Participation by Organizational Characteristics

	Total Number of CAHs	Percent that Participate in Hospital Compare
Accreditation		
Accredited	402	87.8
Not accredited	926	68.7
Ownership		
Government/public	548	65.7
Private non-profit	707	82.3
For profit	74	63.5
	CAHs that participate in Hospital Compare	**CAHs that do not participate in Hospital Compare**
Size		
Number of Beds (mean)	23.2	20.2
Average Daily Census (mean)	21.4	20.2

Reporting on Outpatient Process of Care Measures

A total of 282 CAHs (21.2%) publicly reported data on at least one outpatient process of care measure for 2010 discharges (Table 4). By state, the percent of CAHs reporting outpatient process of care measures ranged from 0% to 84%.

HCAHPS Reporting

Nationally, 38% of CAHs publicly reported HCAHPS survey data to Hospital Compare in 2010 (Table 5). By state, the percent of CAHs publicly reporting HCAHPS data ranged from 0% to 100% of CAHs. Two states had 100% of their CAHs reporting HCAHPS data while only one state had 0% reporting.

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 27% of reporting CAHs had 300 or more completed surveys (Table 6). The vast majority of reporting CAHs (86%) 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%.[8]

Table 4. Critical Access Hospital (CAH) Reporting of Outpatient Measures to Hospital Compare by State for 2010 Discharges

State[1]	Number of CAHs[2]	Percent of CAHs reporting outpatient measures[3]	State	Number of CAHs	Percent of CAHs reporting outpatient measures
Alabama	3	33.3%	Nebraska	65	9.2%
Alaska	13	7.7%	Nevada	11	18.2%
Arizona	14	7.1%	New Hampshire	13	46.2%
Arkansas	29	13.8%	New Mexico	7	0.0%
California	31	16.1%	New York	13	23.1%
Colorado	29	13.8%	North Carolina	23	21.7%
Florida	13	30.8%	North Dakota	36	5.6
Georgia	34	23.5%	Ohio	34	26.5%
Hawaii	9	0.0%	Oklahoma	34	5.9%
Idaho	27	7.4%	Oregon	25	20.0%
Illinois	51	23.5%	Pennsylvania	13	15.4%
Indiana	35	34.3%	South Carolina	5	20.0%
Iowa	82	17.1%	South Dakota	38	7.9%
Kansas	83	12.0%	Tennessee	17	47.1%
Kentucky	29	6.7%	Texas	79	7.6%
Louisiana	27	11.1%	Utah	11	54.5%
Maine	16	25.0%	Vermont	8	0.0%
Massachusetts	3	0.0%	Virginia	7	28.6%
Michigan	36	27.8%	Washington	38	18.4%
Minnesota	79	83.5%	West Virginia	18	16.7%
Mississippi	31	19.4%	Wisconsin	59	35.6%
Missouri	36	8.3%	Wyoming	16	31.3%
Montana	48	10.4%	All States	1328	21.2%

[1]Five states (Connecticut, Delaware, Maryland, New Jersey and Rhode Island) do not have any CAHs.
[2]Number of CAHs certified as of December 2010.
[3]Participation was defined as providing data on at least one patient for one inpatient measure.
Data sources: Hospital Compare data for 2010 discharges downloaded from CMS website October 2011 and Flex Monitoring Team CAH database.

Table 5. Critical Access Hospital (CAH) Reporting of HCAHPS Survey Results to Hospital Compare by State for 2010 Discharges

State[1]	Number of CAHs[2]	Percent of CAHs Reporting HCAHPS Results	State	Number of CAHs	Percent of CAHs Reporting HCAHPS Results
Alabama	3	66.7%	Nebraska	65	35.4%
Alaska	13	15.4%	Nevada	11	18.2%
Arizona	14	28.6%	New Hampshire	13	53.8%
Arkansas	29	13.8%	New Mexico	7	85.7%
California	31	38.7%	New York	13	38.5%
Colorado	29	37.9%	North Carolina	23	43.5%
Florida	13	30.8%	North Dakota	36	11.1%
Georgia	34	17.6%	Ohio	34	73.5%
Hawaii	9	0.0%	Oklahoma	34	26.5%
Idaho	27	18.5%	Oregon	25	44.0%
Illinois	51	41.2%	Pennsylvania	13	23.1%
Indiana	35	60.0%	South Carolina	5	20.0%
Iowa	82	45.1%	South Dakota	38	50.0%
Kansas	83	8.4%	Tennessee	17	29.4%
Kentucky	29	37.9%	Texas	79	16.7%
Louisiana	27	25.9%	Utah	11	45.5%
Maine	16	100.0%	Vermont	8	100.0%
Massachusetts	3	66.7%	Virginia	7	57.1%
Michigan	36	47.2%	Washington	38	31.6%
Minnesota	79	62.0%	West Virginia	18	66.7%
Mississippi	31	9.7%	Wisconsin	59	83.1%
Missouri	36	22.2%	Wyoming	16	62.5%
Montana	48	27.1%	All States	1328	38.0%

[1]Five states (Connecticut, Delaware, Maryland, New Jersey and Rhode Island) do not have any CAHs
[2]Number of CAHs certified as of December 2010.
Data sources: HCAHPS data for 2010 discharges downloaded from CMS Hospital Compare website October 2011 and Flex Monitoring Team CAH database.

Table 6. Completed HCAHPS Surveys and Response Rates for CAHs Nationally in 2009

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%
505	97	274	134	39	444	22

CAH Reporting by Condition and Measure

Process of Care Measures

Figure 3 describes the inpatient and outpatient process of care measures in Hospital Compare for 2010 discharges.

Figure 3. Hospital Compare Process of Care Measures for 2010 Discharges

Inpatient Heart Attack / Acute Myocardial Infarction (AMI) Measures
Aspirin at arrival – AMI patients without aspirin contraindications who received aspirin within 24 hours before or after hospital arrival. **Aspirin at discharge** – AMI patients without aspirin contraindications who were prescribed aspirin at hospital discharge. **ACE inhibitor or ARB for left ventricular systolic dysfunction (LVSD)** – 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. **Beta Blocker at discharge** – AMI patients without beta-blocker contraindications who were prescribed a beta-blocker at hospital discharge. **Fibrinolytic medication received within 30 minutes of hospital arrival** – AMI patients receiving fibrinolytic therapy during the hospital stay and having a time from hospital arrival to fibrinolysis of 30 minutes or less. **PCI received within 90 minutes of hospital arrival** – AMI patients receiving Percutaneous Coronary Intervention (PCI) during the hospital stay with a time from hospital arrival to PCI of 90 minutes or less. **Smoking cessation advice/counseling** – AMI patients with a history of smoking cigarettes, who are given smoking cessation advice or counseling during a hospital stay.
Inpatient Pneumonia Measures
Initial antibiotic timing – Pneumonia inpatients that receive initial antibiotics within 6 hours after arrival at the hospital. **Pneumococcal vaccination status** – Pneumonia inpatients age 65 and older who were screened for pneumococcal vaccine status and were administered the vaccine prior to discharge, if indicated. **Influenza vaccination status** – Pneumonia patients 50 years and older, hospitalized in October through February who were screened for influenza vaccine status and vaccinated prior to discharge, if indicated. **Smoking cessation advice/counseling** – Pneumonia patients with a history of smoking cigarettes, who are given smoking cessation advice or counseling during a hospital stay. **Appropriate initial antibiotic selection** – Immunocompetent patients with pneumonia who receive an initial antibiotic regimen that is consistent with current guidelines. **Blood Culture Prior to First Antibiotic** – Cultures performed in the emergency department prior to initial antibiotic received in hospital - Pneumonia patients whose initial emergency room blood culture specimen was collected prior to first hospital dose of antibiotics.

Figure 3. Hospital Compare Process of Care Measures for 2010 Discharges (Continued)

Inpatient Heart Failure Measures
Evaluation of left ventricular systolic (LVS) function – 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. **ACE inhibitor or ARB for left ventricular systolic dysfunction (LVSD)** – Heart failure patients with LVSD and without ACE inhibitor or ARB contraindications who are prescribed an ACE inhibitor or an ARB at hospital discharge. **Discharge instructions** – Heart failure patients discharged home with written instructions or educational material given to patient or caregiver at discharge or during hospital stay addressing activity level, diet, discharge medications, follow-up appointment, weight monitoring, and what to do if symptoms worsen. **Smoking cessation advice/counseling** – Heart failure patients with a history of smoking cigarettes, who are given smoking cessation advice or counseling during a hospital stay.
Inpatient Surgical Care Improvement Measures
Prophylactic antibiotic received within 1 hour prior to surgical incision – Surgical patients who received prophylactic antibiotics within 1 hour prior to surgical incision. **Prophylactic antibiotics discontinued within 24 hours after surgery end time** – Surgical patients whose prophylactic antibiotics were discontinued within 24 hours after surgery end time. Prophylactic antibiotic selection – Surgical patients who received the recommended antibiotics for their particular type of surgery. **Surgery patients with recommended Venous Thromboembolism (VTE) prophylaxis ordered** - Surgery patients with recommended VTE prophylaxis ordered anytime from hospital arrival to 48 hours after surgery end time. **Surgery patients who received appropriate VTE prophylaxis within 24 hours prior to surgery to 24 hours after surgery** - Surgery patients who received appropriate VTE prophylaxis within 24 hours prior to surgical incision time to 24 hours after surgery end time. **Cardiac surgery patients with controlled 6 A.M. postoperative blood glucose** – Cardiac surgery patients with controlled 6 A.M. blood glucose (< 200 mg/dL) on postoperative day one and postoperative day two with surgery end date being postoperative day zero. **Surgery patients with appropriate hair removal** – 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. **Surgery patients on a beta blocker prior to arrival who received a beta blocker during the perioperative period** – 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. **Urinary catheter removed 1st/2nd day after surgery** – Inpatients whose urinary catheters were removed within 2 days after surgery to reduce the risk of infections – Shows the percent of surgery patients whose urinary catheters were removed on the first or second day after surgery.

Figure 3. Hospital Compare Process of Care Measures for 2010 Discharges (Continued)

Outpatient Surgical Measures
Prophylactic Antibiotic Received Within 1 Hour Prior to Surgical Incision - Surgical outpatients who received prophylactic antibiotics within 1 hour prior to surgical incision. **Prophylactic Antibiotic Selection** - Surgical outpatients who received the recommended antibiotics for their particular type of surgery.
Outpatient AMI/Chest Pain Measures
Fibrinolytic Medication within 30 Minutes of Arrival – Outpatients with AMI receiving fibrinolytic therapy during the hospital stay and having a time from hospital arrival to fibrinolysis of 30 minutes or less. **Aspirin at Arrival** - Outpatients with chest pain or possible heart attack who got aspirin within 24 hours of arrival **Median Time to Transfer to Another Facility for Acute Coronary Intervention** - Median number of minutes before outpatients with heart attack who needed specialized care were transferred to another hospital. **Median Time to ECG** – Median number of minutes before outpatients with heart attack had an ECG.

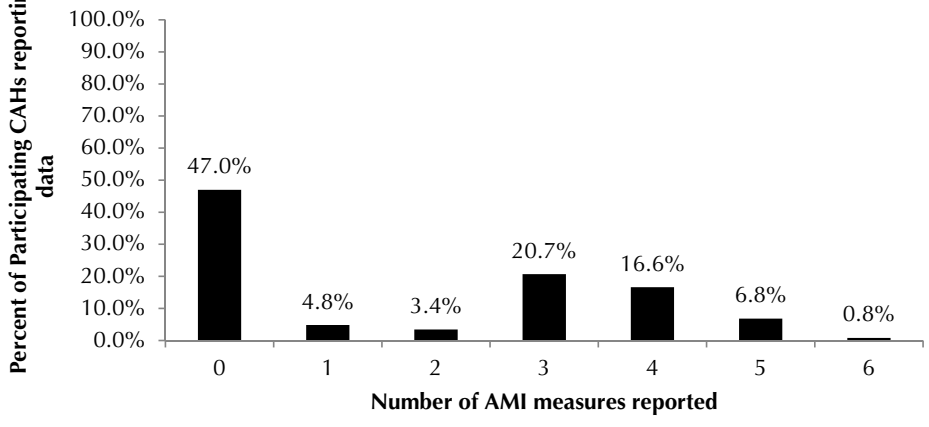
Source: CMS, http://www.hospitalcompare.hhs.gov/, 2010.

Reporting by Condition

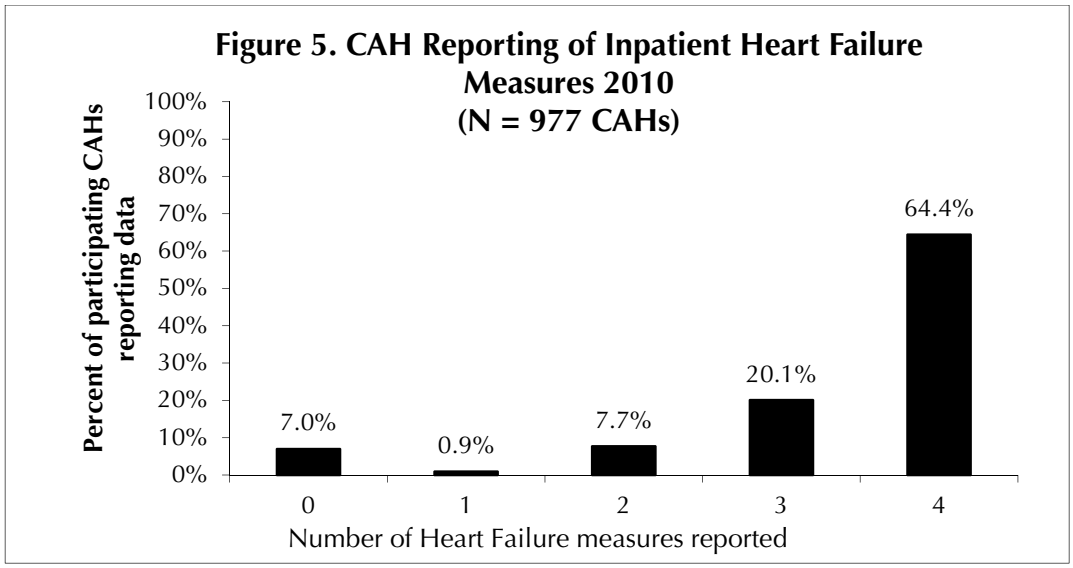
Data for the AMI percutaneous coronary intervention (PCI) were not included in the report because the total number of CAH patients nationally was less than 25. PCI procedures require specialized equipment and cardiology expertise not usually present in CAHs.

CAHs were more likely to report data on the inpatient 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.) Forty-seven percent of the 977 CAHs that participated in Hospital Compare for 2010 discharges did not report data on any AMI measures, while 45% reported data on three or more measures (Figure 4).

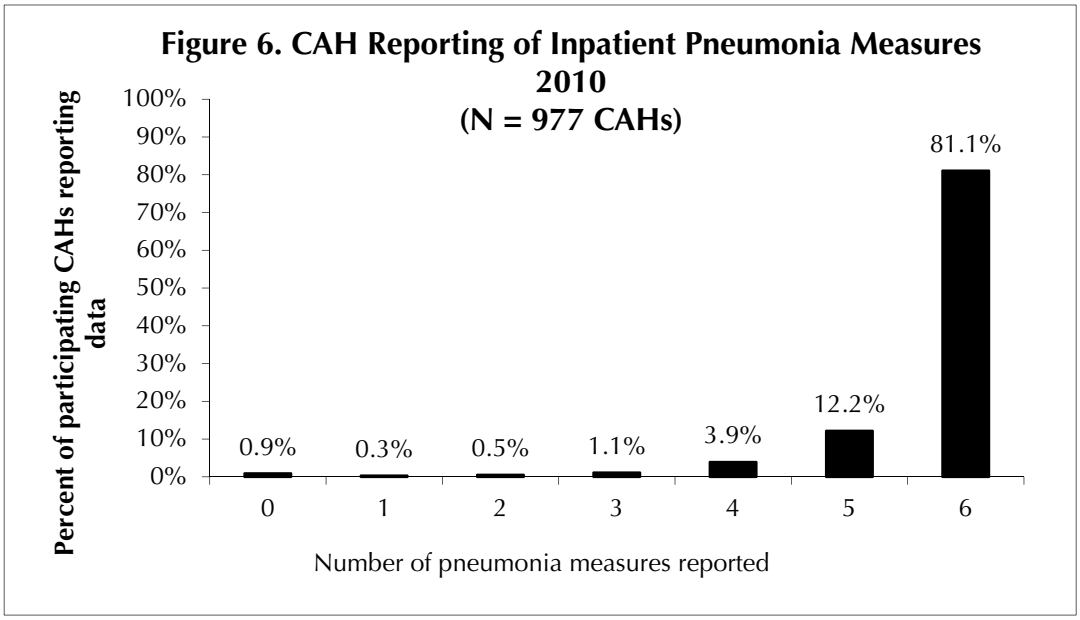
Figure 4. CAH Reporting of Inpatient AMI Measures 2010 (N=977 CAHs)



Sixty-four percent of the 977 participating CAHs reported data on all four heart failure measures, while only 7% did not report data on any heart failure measures (Figure 5).

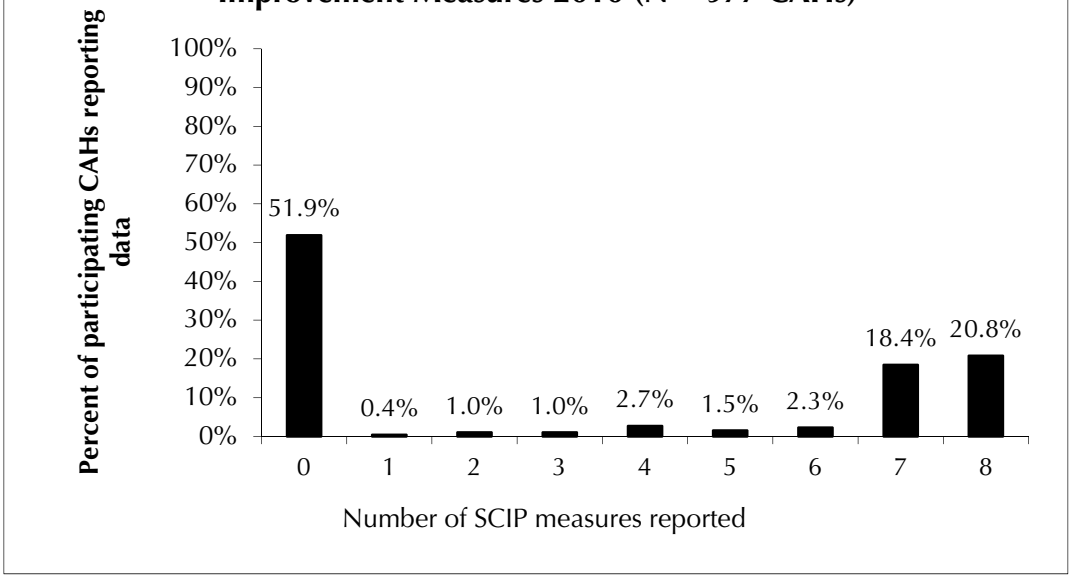


The majority of participating CAHs (81%) reported data on all six pneumonia measures and an additional 12% reported data on five measures; less than one percent did not report data on any pneumonia measures (Figure 6).



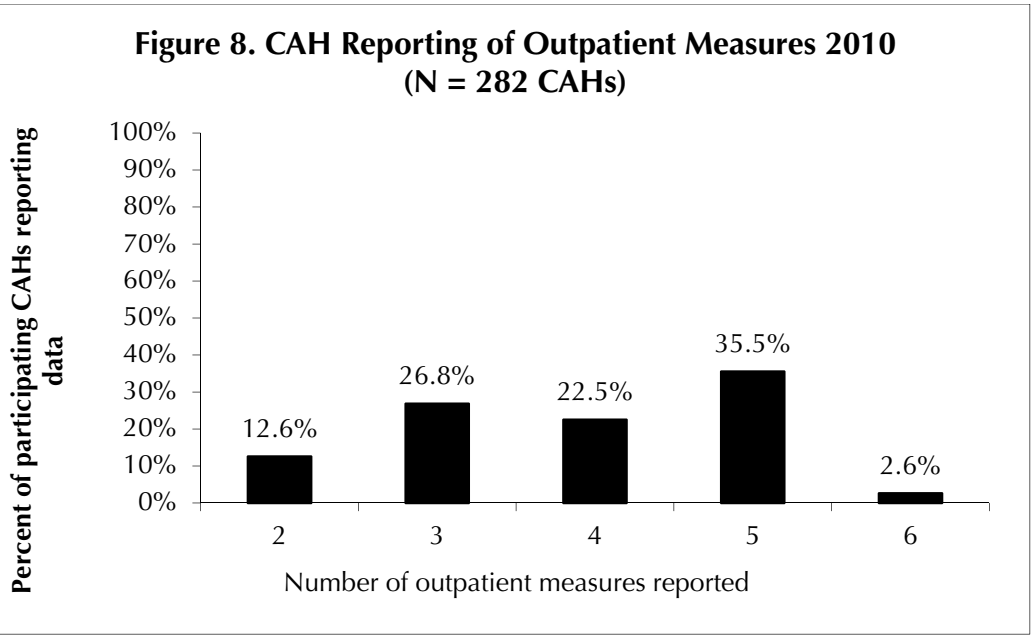
For the surgical care improvement measures, 52% of CAHs that participate in Hospital Compare did not report data on any measures, while 42% reported data on at least six measures (Figure 7). Approximately 20% of all CAHs do not provide inpatient surgery.

Figure 7. CAH Reporting of Inpatient Surgical Care Improvement Measures 2010 (N = 977 CAHs)



A total of 282 CAHs reported data on one or more outpatient measures (Figure 8). The majority of these CAHs (61%) reported on four or more measures.

Figure 8. CAH Reporting of Outpatient Measures 2010 (N = 282 CAHs)



Reporting by Measure

The number of CAHs reporting data and the number of patients for whom data are submitted varies widely across measures. For each measure, Table 7 shows the number of CAHs that reported data for one or more patients and for 25 or more patients. (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.)

Fewer than 5 CAHs reported data for 25 or more patients on any of the AMI measures, two heart failure measures (discharge instructions, assessment of LVS), one inpatient surgical care improvement measure (controlled 6 am post-op blood glucose), and two outpatient measures (OP with CP/AMI received drugs for clots within 30 minutes, and median minutes before OP with CP/AMI transferred). Between 30 and 63 CAHs reported data for 25 or more patients for two pneumonia measures (smoking cessation advice and influenza vaccination), one inpatient surgical care improvement measure (beta blockers before/after surgery), and two outpatient measures (antibiotic within one hour before surgery and right kind of antibiotic.) The total number of CAH patients nationally per measure ranges from 33 for the AMI fibrinolytic measure to 29,508 for the pneumococcal vaccination measure.

Table 7. CAHs Reporting and Number of CAH Patients by Measure for 2010 Discharges

Condition	Measure	Number of CAHs reporting data for >1 patient	Number of CAHs reporting data for >25 patients	Total number of CAH patients with data
AMI	Aspirin at arrival	501	5	2,194
	Aspirin at discharge	452	3	1,569
	ACEI or ARB for LVSD	194	0	312
	Smoking cessation advice	111	0	168
	Beta blocker at discharge	460	2	1,602
	Fibrinolytic w/in 30 minutes of arrival	26	0	33
	PCI at arrival	*	*	*
Heart Failure	Discharge instructions	895	185	14,329
	Assessment of LVS	907	369	20,990
	ACE inhibitor or ARB for LVSD	780	5	4,854
	Smoking cessation advice	681	0	2,614
Pneumonia	Pneumococcal vaccination	966	515	29,508
	Blood culture prior to first antibiotic	888	356	22,220
	Smoking cessation advice	907	63	8,658
	Initial antibiotic(s) within 6 hours	940	485	29,217
	Most appropriate initial antibiotic(s)	951	374	22,299
	Influenza vaccination	893	51	9,601
Surgical Care Improvement	Preventative antibiotic(s) 1 hour before incision	444	222	19,044
	Received most appropriate preventative antibiotic(s)	440	222	19,113
	Preventative antibiotic(s) stopped within 24 hours after surgery	439	220	18,548
	Doctors ordered blood clot prevention treatments	422	146	8,990
	Received blood clot prevention treatments 24 hours pre/post-surgery	418	145	8,926
	Controlled 6 am post-op blood glucose	*	*	*
	Appropriate hair removal	458	262	25,081
	Beta blockers before/after surgery	219	53	3,635
	Urinary cast removed 1st/2nd day after surgery	408	143	10,758
Outpatient AMI/Chest Pain	OP with CP/AMI received drugs for clots within 30 minutes	149	0	481
	Median minutes before OP with CP/AMI transferred	181	2	844
	OP with CP/AMI received aspirin within 24 hours of arrival	281	172	12,853
	Median minutes to ECG for OP with CP/AMI	281	173	13,434
Outpatient surgery	Received antibiotic within 1 hour before surgery	158	30	2,423
	Received right kind of antibiotic	154	32	2,418

*The total number of CAH patients nationally with data on this measure was less than 25.
Data source: Hospital Compare data for Jan - Dec 2010, downloaded from CMS website October 2011

Comparison of 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 2006-2010 time period for each group of hospitals (Appendix B).

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 in quality measures 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 8 compares the quality measure results for accredited and non-accredited CAHs. Differences between the two groups were not statistically significant for seven measures (three inpatient and four outpatient measures). Eighteen inpatient measures were significantly higher for accredited CAHs and one inpatient measure was significantly higher for non-accredited CAHs.

Table 9 compares the quality measure results for CAHs by type of ownership. The number of participating for-profit CAHs is small. Consequently, for-profit CAHs had less than 25 patients for four AMI measures and one surgical care improvement measure. Public/government CAHs had less than 25 patients for two AMI measures and one surgical care improvement measure.

Table 8. Percent of Patients Receiving Recommended Care in Accredited and Non-Accredited CAHs in 2010

		Percent of Patients Receiving Recommended Care		Significance of differences between Accredited CAHs and Non-Accredited CAHs
Condition	**Measure**	**Accredited CAHs[1]**	**Non-Accredited CAHs[2]**	
AMI	Aspirin at arrival	94.9	91.3	<0.001
	Aspirin at discharge	93.1	88.4	0.001
	ACEI or ARB for LVSD	84.0	84.6	NS
	Smoking cessation advice	87.4	76.7	NS
	Beta blocker at discharge	93.2	87.8	<0.001
	Fibrinolytic within 30 minutes of arrival	*	*	*
	PCI at Arrival	*	*	*
Heart Failure	Discharge instructions	85.0	74.4	<0.001
	Assessment of LVS	89.7	79.2	<0.001
	ACE inhibitor or ARB for LVSD	87.9	83.5	<0.001
	Smoking cessation advice	91.6	81.3	<0.001
Pneumonia	Pneumococcal vaccination	89.5	84.4	<0.001
	Blood culture prior to first antibiotic	94.3	92.7	<0.001
	Smoking cessation advice	92.6	83.6	<0.001
	Initial antibiotic(s) within 6 hours	95.7	95.0	0.004
	Most appropriate initial antibiotic(s)	89.2	88.3	0.03
	Influenza vaccination	87.4	84.0	<0.001
Surgical Care Improvement	Preventative antibiotic(s) 1 hour before incision	93.6	92.1	<0.001
	Received appropriate preventative antibiotic(s)	97.0	96.4	0.04
	Preventative antibiotic(s) stopped within 24 hours after surgery	94.7	92.1	<0.001
	Doctors ordered blood clot prevention treatments	91.4	89.5	0.003
	Received blood clot prevention treatments 24 hours pre/post-surgery	90.5	88.6	0.004
	Controlled 6AM post-op glucose	*	*	*
	Appropriate Hair Removal	99.1	98.8	0.01
	Beta blockers before/after surgery	89.8	88.3	NS
	Urinary cath. removed 1st/2nd day after surgery	90.7	88.9	0.002
Outpatient AMI/Chest Pain	OP with CP/AMI aspirin within 24 hrs of arrival	95.4	95.8	NS
	OP with CP/AMI received drugs for clots within 30 minutes	47.6	47.1	NS
Outpatient Surgical Care	OP received antibiotic within 1 hour before surgery	84.1	84.9	NS
	OP having surgery received right kind of antibiotic	90.7	91.2	NS

1 For the inpatient measures, n = 348 accredited CAHs and n = 629 non-accredited CAHs.
2 For the outpatient measures, n = 131 accredited CAHs and n = 151 non-accredited CAHs
*The total number of CAH patients nationally with data on this measure was less than 25.
NS = not significant

Table 9. Percent of Patients Receiving Recommended Care in CAHs by Ownership Type in 2010

		Percent of Patients Receiving Recommended Care			Significance of differences between:		
Condition	**Measure**	**Public/ Gov't CAHs**	**Non-profit CAHs**	**For profit CAHs**	**Public/ Gov't and non-profit CAHs**	**Public/ Gov't and for profit CAHs**	**Non-profit and for profit CAHs**
AMI	Aspirin at arrival	91.3	94.2	86.0	0.02	NS	0.002
	Aspirin at discharge	87.0	92.9	80.3	<0.001	NS	<0.001
	ACEI or ARB for LVSD	75.7	87.1	83.3	0.02	*	*
	Smoking cessation advice	68.9	89.5	66.7	0.002	*	*
	Beta blocker at discharge	86.9	92.8	78.6	<0.001	NS	<0.001
	Fibrinolytic within 30 minutes of arrival	*	*	*	*	*	*
	PCI at Arrival	*	*	*	*	*	*
Heart Failure	Discharge instructions	74.4	82.9	70.2	<0.001	0.02	<0.001
	Assessment of LVS	78.3	87.7	77.7	<0.001	NS	<0.001
	ACE inhibitor or ARB for LVSD	84.0	86.7	87.7	0.01	NS	NS
	Smoking cessation advice	81.7	88.9	89.9	<0.001	0.02	NS
Pneumonia	Pneumococcal vaccination	82.9	89.0	83.4	<0.001	NS	<0.001
	Blood culture prior to first antibiotic	91.6	94.5	94.1	<0.001	0.007	NS
	Smoking cessation advice	85.5	89.7	88.7	<0.001	NS	NS
	Initial antibiotic(s) within 6 hours	94.5	95.8	94.9	<0.001	NS	NS
	Most appropriate initial antibiotic(s)	86.2	90.1	86.8	<0.001	NS	<0.001
	Influenza vaccination	82.7	87.1	85.0	<0.001	NS	NS
Surgical Care Improvement	Preventative antibiotic(s) 1 hour before incision	90.1	93.9	93.2	<0.001	0.006	NS
	Received appropriate preventative antibiotic(s)	96.2	97.1	94.4	0.002	0.02	<0.001
	Preventative antibiotic(s) stopped within 24 hours after surgery	92.0	94.1	94.3	<0.001	0.02	NS
	Doctors ordered blood clot prevention treatments	87.6	91.5	92.4	<0.001	0.006	NS
	Received blood clot prevention treatments 24 hours pre/post-surgery	87.3	90.6	89.2	<0.001	NS	NS
	Controlled 6AM post-op glucose	*	*	*	*	*	*
	Appropriate Hair Removal	97.9	99.4	99.0	<0.001	0.01	NS
	Beta blockers before/after surgery	87.1	89.6	92.1	NS	NS	NS
	Urinary cath. removed 1st/2nd day after surgery	89.4	89.9	94.3	NS	<0.001	<0.001
Outpatient AMI/Chest Pain	OP with CP/AMI aspirin within 24 hrs of arrival	94.4	95.9	96.1	<0.001	0.03	NS
	OP with CP/AMI received drugs for clots within 30 minutes	48.9	46.1	52.9	NS	NS	NS
Outpatient Surgical Care	OP received antibiotic within 1 hour before surgery	80.0	85.5	91.9	0.002	0.002	0.05
	OP having surgery received right kind of antibiotic	85.9	92.2	94.0	<0.001	0.02	NS

Note: For the inpatient measures, N = 354 public/government CAHs; N = 577 private non-profit CAHs; N = 46 for-profit CAHs. For the outpatient measures, N = 91 public/government CAHs; N = 174 private non-profit CAHs; N = 17 for-profit CAHs.
*The total number of CAH patients nationally with data on this measure was less than 25.
NS = not significant

For public and private non-profit CAHs, there were an insufficient number of cases to compare three measures; for for-profit CAHs, five measures had an insufficient number of cases for comparisons.

Differences in the quality measure results for private non-profit CAHs and public/government owned CAHs were not statistically significant for three measures. The results for 24 measures were significantly higher for private non-profit CAHs than for public/government owned CAHs.

Differences between private non-profit CAHs and for-profit CAHs were not statistically significant for 15 measures. Eight measures were significantly higher for private non-profit CAHs than for for-profit CAHs. Two measures were significantly higher for for-profit CAHs than for private non-profit CAHs.

Differences between public/government owned CAHs and for-profit CAHs were not statistically significant for 13 measures. The results were significantly higher for public/government owned CAHs for two measures and for for-profit CAHs for 10 measures.

CAHs and PPS Hospitals

Table 10 compares results for CAH patients with rural PPS patients nationally. The percent of CAH patients receiving recommended care in 2010 was significantly lower than the percent of rural PPS patients on 25 measures. For three measures, differences between CAH patients and rural PPS patients were not significantly different. There were not enough cases in CAHs nationally to analyze two measures.

Table 11 compares results for CAH patients with urban PPS patients nationally. Compared to urban PPS patients, the percent of CAH patients receiving recommended care in 2010 was significantly lower on 26 measures. For two measures, differences between CAH patients and urban PPS patients were not significantly different. Again, there were two measures where there were not enough cases in CAHs nationally to analyze.

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., some of the pneumonia and surgical care improvement measures). However, other differences are much larger.

Table 10. Percent of Patients Receiving Recommended Care in CAHs and Rural PPS Hospitals in 2010

		Percent of Patients Receiving Recommended Care		Significance of differences between CAHS and Rural PPS Hospitals
Condition	**Measure**	**CAHs**	**Rural PPS Hospitals**	
AMI	Aspirin at arrival	93.1	97.8	<0.001
	Aspirin at discharge	90.8	97.7	<0.001
	ACEI or ARB for LVSD	84.3	94.7	<0.001
	Smoking cessation advice	82.7	99.2	<0.001
	Beta blocker at discharge	90.6	97.0	<0.001
	Fibrinolytic within 30 minutes of arrival	48.5	55.4	NS
	PCI at Arrival	*	87.7	*
Heart Failure	Discharge instructions	79.8	87.1	<0.001
	Assessment of LVS	84.3	95.8	<0.001
	ACE inhibitor or ARB for LVSD	85.9	92.1	<0.001
	Smoking cessation advice	86.7	97.4	<0.001
Pneumonia	Pneumococcal vaccination	86.8	93.1	<0.001
	Blood culture prior to first antibiotic	93.6	95.9	<0.001
	Smoking cessation advice	88.3	96.6	<0.001
	Initial antibiotic(s) within 6 hours	95.4	96.1	<0.001
	Most appropriate initial antibiotic(s)	88.7	91.5	<0.001
	Influenza vaccination	85.6	90.7	<0.001
Surgical Care Improvement	Preventative antibiotic(s) 1 hour before incision	92.9	96.8	<0.001
	Received appropriate preventative antibiotic(s)	96.7	97.1	0.007
	Preventative antibiotic(s) stopped within 24 hours after surgery	93.6	94.9	<0.001
	Doctors ordered blood clot prevention treatments	90.6	93.1	<0.001
	Received blood clot prevention treatments 24 hours pre/post-surgery	89.7	91.5	<0.001
	Controlled 6AM post-op glucose	*	93.8	*
	Appropriate Hair Removal	99.0	99.7	<0.001
	Beta blockers before/after surgery	89.2	93.0	<0.001
	Urinary cath. removed 1st/2nd day after surgery	90.0	90.2	NS
Outpatient AMI/Chest Pain	OP with CP/AMI aspirin within 24 hrs of arrival	95.5	95.7	NS
	OP with CP/AMI received drugs for clots within 30 minutes	47.4	55.4	<0.001
Outpatient Surgical Care	OP received antibiotic within 1 hour before surgery	84.4	92.4	<0.001
	OP having surgery received right kind of antibiotic	90.9	93.8	<0.001

Note: For the inpatient measures, N = 977 CAHs and N = 941 rural PPS hospitals. or the outpatient measures, N = 282 CAHs and N = 900 rural PPS hospitals.
*The total number of CAH patients nationally with data on this measure was less than 25.
NS = not significant

Table 11. Percent of Patients Receiving Recommended Care in CAHs and Urban PPS Hospitals in 2010

		Percent of Patients Receiving Recommended Care		Significance of differences between CAHS and Urban PPS Hospitals
Condition	**Measure**	**CAHs**	**Urban PPS Hospitals**	
AMI	Aspirin at arrival	93.1	99.0	<0.001
	Aspirin at discharge	90.8	98.9	<0.001
	ACEI or ARB for LVSD	84.3	96.7	<0.001
	Smoking cessation advice	82.7	99.6	<0.001
	Beta blocker at discharge	90.6	98.7	<0.001
	Fibrinolytic within 30 minutes of arrival	48.5	64.4	NS
	PCI at Arrival	*	91.4	*
Heart Failure	Discharge instructions	79.8	90.6	<0.001
	Assessment of LVS	84.3	99.0	<0.001
	ACE inhibitor or ARB for LVSD	85.9	95.6	<0.001
	Smoking cessation advice	96.7	99.2	<0.001
Pneumonia	Pneumococcal vaccination	86.8	94.9	<0.001
	Blood culture prior to first antibiotic	93.6	96.4	<0.001
	Smoking cessation advice	88.3	98.5	<0.001
	Initial antibiotic(s) within 6 hours	95.4	95.8	0.002
	Most appropriate initial antibiotic(s)	88.7	93.6	<0.001
	Influenza vaccination	85.6	92.4	<0.001
Surgical Care Improvement	Preventative antibiotic(s) 1 hour before incision	92.9	97.5	<0.001
	Received appropriate preventative antibiotic(s)	96.7	97.9	<0.001
	Preventative antibiotic(s) stopped within 24 hours after surgery	93.6	95.8	<0.001
	Doctors ordered blood clot prevention treatments	90.6	95.4	<0.001
	Received blood clot prevention treatments 24 hours pre/post-surgery	89.7	93.7	<0.001
	Controlled 6AM post-op glucose	*	94.1	*
	Appropriate Hair Removal	99.0	99.7	<0.001
	Beta blockers before/after surgery	89.2	94.4	<0.001
	Urinary cath. removed 1st/2nd day after surgery	90.0	91.2	<0.001
Outpatient AMI/Chest Pain	OP with CP/AMI aspirin within 24 hrs of arrival	95.5	95.5	NS
	OP with CP/AMI received drugs for clots within 30 minutes	47.4	59.6	<0.001
Outpatient Surgical Care	OP received antibiotic within 1 hour before surgery	84.4	94.6	<0.001
	OP having surgery received right kind of antibiotic	90.9	94.6	<0.001

Note: For the inpatient measures, N = 977 CAHs and N = 2397 urban PPS hospitals. For the outpatient measures, N = 282 CAHs and N = 2289 urban PPS hospitals.
*The total number of CAH patients nationally with data on this measure was less than 25.
NS = not significant

Inpatient Measure Trends over Time for CAHs and PPS Hospitals

Figures 9-29 in Appendix B show the inpatient data trends for 2006-2010 for CAHs, rural PPS, and urban PPS hospitals. These data include all hospitals reporting in each category for each year. The numbers of hospitals are shown in Table 12.

Table 12. Number of Hospitals with Inpatient Process of Care Data by Hospital Type from 2006-2010

Hospital Type	2006	2007	2008	2009	2010
CAHs	812	892	914	933	977
Rural PPS	1,004	993	973	958	941
Urban PPS	2,431	2,441	2,414	2,388	2397

Figures 9-14 show the four year trends for the pneumonia measures. Performance has improved for all three groups of hospitals and is similar (< 3% difference) on two pneumonia measures related to receipt of antibiotics (Figures 10 and 11). CAH performance on the influenza and pneumococcal vaccination measures (Figures 9 and 13) improved, but performance by rural and urban PPS hospitals continues to outpace CAHs. CAH performance on the pneumonia smoking cessation measure has improved, but remains well below rural and urban PPS hospitals (Figure 12).

CAH performance improved for all heart failure measures (Figures 15-18). The gap in performance between CAH and PPS hospitals narrowed a little for two measures. However, CAHs continue to perform lower than PPS hospitals on all measures and the gap for one measure, percent of patients receiving ACE or ARB for LVSD, widened between 2009 and 2010.

CAH performance improved on three of five AMI measures (Figures 19-23); however, the percent of patients receiving both smoking cessation advice and ACEI or ARB for LVSD both decreased approximately seven percent. The performance by rural PPS and urban PPS hospitals was higher at the onset and continued to improve over the five-year time period. Consequently, a gap in performance remains between CAHs and PPS hospitals for all AMI measures. (Performance on the fibrinolytic measure (Figure 23) improved from 2009 to 2010 but continued to be lower than in 2006-2007; it should be noted that this measure is based on a very small number of CAH patients nationally.)

Performance by all groups of hospitals on the surgical care improvement measures has consistently been high (> 88%) and the difference in performance between CAH and PPS hospitals is relatively small (< 5%) (Figures 24-29).

Outpatient Measure Trends over Time for CAHs and PPS Hospitals

Figures 30-33 in Appendix B show the outpatient data trends for 2009-2010 for CAHs, rural PPS, and urban PPS hospitals. The data show small improvements in performance on the outpatient measures for all three groups of hospitals over the two years. However, caution should be used in interpreting these trends, since only two years of data were available, and a small number of CAHs reported outpatient data in each year.

HCAHPS Survey Results for CAHs

Table 13 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 2010: CAHs nationally and all non-CAHs. For all measures, CAH patients nationally had significantly higher average scores than patients in all non-CAHs ($p < .0001$). The better performance of CAHs has been the trend over the three years of HCAHPS tracking in these reports.

Table 13. HCAHPS Results for CAHs Nationally for 2010

Percent of patients who reported that:	Mean (average) for: CAHs Nationally (n=505)	Non-CAHs (n=3,321)
Nurses always communicated well	81%	76%
Doctors always communicated well	84%	80%
Patient always received help as soon as wanted	74%	63%
Pain was always well controlled	72%	69%
Staff always explained about medications before giving them to patient	66%	60%
Yes, staff gave patient information about what to do during recovery at home	84%	82%
Area around patient room was always quiet at night	63%	58%
Patient room and bathroom were always clean	80%	70%
They gave an overall hospital rating of 9 or 10 (high) on 1-10 scale	73%	67%
They would definitely recommend the hospital to friends and family	73%	69%

Note: Differences in mean scores between CAHs and non-CAHs are all significant at $p < .0001$.

Mortality and Readmission Rates for CAHs

Table 14 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 2006 to June 2010 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, 92% of CAHs either were missing AMI mortality data or had too few cases to reliably calculate a rate; the remaining 8% of CAHs did not have an AMI mortality rate that is different from the U.S. rate for all hospitals. More CAHs had the minimum number of patients to reliably calculate mortality rates for heart failure (58%) and pneumonia (73%). 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 14. Number (Percent) of CAHs Nationally in Risk-adjusted Mortality Rate Categories (2007-2010)

	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	1328	347 (26.1%)	873 (65.7%)	109 (8.2%)	0	0
Heart Failure	1328	286 (21.5%)	275 (20.7%)	760 (57.2%)	0	8 (0.6%)
Pneumonia	1328	280 (21.1%)	81 (6.1%)	928 (69.8%)	0	40 (3%)

Table 15 shows the 30 day risk-adjusted readmission rates for AMI, heart failure, and pneumonia for CAHs nationally. For AMI, 97% of CAHs either were missing AMI readmission data or had too few cases to reliably calculate a rate, and the remaining 3% of CAHs did not have a rate that is different from the U.S. rate for all hospitals. More CAHs had the minimum number of patients to reliably calculate readmission rates for heart failure (61%) and pneumonia (73%), but few CAHs had readmission rates that are either better than or worse than the US rates for all hospitals (0.3% of CAHs for heart failure and 0.2% of CAHs for pneumonia).

Table 15. Number (Percent) of CAHs Nationally in Risk-adjusted Readmission Rate Categories (2007-2010)

	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	1328	393 (29.6%)	899 (67.6%)	37 (2.8%)	0	0
Heart Failure	1328	286 (21.5%)	228 (17.2%)	811 (61%)	1 (0.1%)	3 (0.2%)
Pneumonia	1328	280 (21.1%)	71 (5.3%)	976 (73.4%)	0	2 (0.2%)

Mortality and readmission rates are frequently used as outcome measures for hospitals. However, these analyses indicate that small volume limits their usefulness as individual hospital measures for CAHs, even using three years of data.

DISCUSSION AND CONCLUSIONS

Three key issues are likely to affect CAH quality reporting in the future: 1) CMS changes to the Hospital Compare quality measure set; 2) implementation of the Medicare Beneficiary Quality Improvement Project (MBQIP) by the Office of Rural Health Policy and the Quality Improvement Organizations' (QIO) 10th Scope of Work, both of which will encourage and assist CAHs in quality reporting; and 3) continued interest in payment reform at the national level, including the establishment of Value Based Purchasing demonstrations involving CAHs and other low volume hospitals.

Changes to CMS Hospital Compare

In January 2012, CMS made several changes to the Hospital Compare inpatient quality measure set that will reduce the number of pneumonia, heart failure and AMI measures while adding new measures.[10]

These changes include:
- Retiring the pneumonia initial antibiotic timing measure due to concerns about potential incentives to overuse antibiotics.
- Retiring the pneumonia, heart failure and AMI smoking cessation advice measures and the pneumonia influenza and pneumococcal vaccination measures.
- Suspending data collection for three inpatient AMI measures (aspirin at arrival, ACEI/ARB for LVSD, and beta blocker at discharge) because performance is uniformly high nationwide (although CAH performance is not as high as other hospitals).
- Adding two new global influenza and pneumococcal vaccination measures.

The Medicare Beneficiary Quality Improvement Project

The Office of Rural Health Policy (ORHP) created the Medicare Beneficiary Quality Improvement Project (MBQIP) as a Flex Grant Program activity within the core area of quality improvement. The primary goal of this project is for CAHs to implement quality improvement initiatives to improve their patient care. CAHs that opt to participate in MBQIP were asked to sign a Memorandum of Understanding (MOU) allowing ORHP to access their quality measure data. As of June 2012, over 1000 of the 1328 CAHs had signed MOUs.

The MBQIP measures include the CMS inpatient pneumonia and heart failure measures (Phase 1, being implemented in 2011-2012); CMS outpatient AMI/chest pain, outpatient surgery, and HCAHPS measures (Phase 2, starting in 2012-2013); the outpatient Emergency Department Transfer Communication measures and Pharmacist CPOE/verification of medication orders within 24 hours (Phase 3, starting in 2013-2014).

Quality Reporting and Payment Reform

Beginning in FY 2013, the CMS Value-Based Purchasing (VBP) Program will provide Medicare incentive payments to acute care hospitals that are paid under the Prospective Payment System, based on how well the hospitals perform on certain quality measures or how much the hospitals' performance improves from their baseline performance. Although CAHs are currently excluded from the CMS VBP Program, the Patient Protection and Affordable Care Act of 2010 included provisions for CMS to establish VBP demonstrations for CAHs and other low volume hospitals excluded from the VBP Program.

Impact on CAH Quality Reporting and Performance

It will be important to monitor the impact of these factors on CAH quality reporting, including CAH participation in public reporting and quality performance. The CMS changes to Hospital Compare are reducing the number of quality measures for pneumonia and heart failure, which are the most

common inpatient conditions in CAHs, while adding new inpatient and outpatient measures for other conditions that are relevant to CAHs. The impact of these changes will depend on the extent to which CAHs report data on existing and new measures. Both MBQIP and QIO efforts should increase the number of CAHs that are publicly reporting quality data, especially for outpatient and HCAHPS measures and improve CAH quality performance, since quality improvement activities are an integral part of these initiatives.

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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 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.
- 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.

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.hrsa.gov/ruralhealth.

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 communitiesas well as activities in the following core areas: 1) support for quality improvement in CAHs, 2) support for financial and operation improvement in CAHs, and 3) health system development and community engagement. 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 9. Percent of Inpatient Pneumonia Patients Receiving Pneumoccocal Vaccination 2006-2010

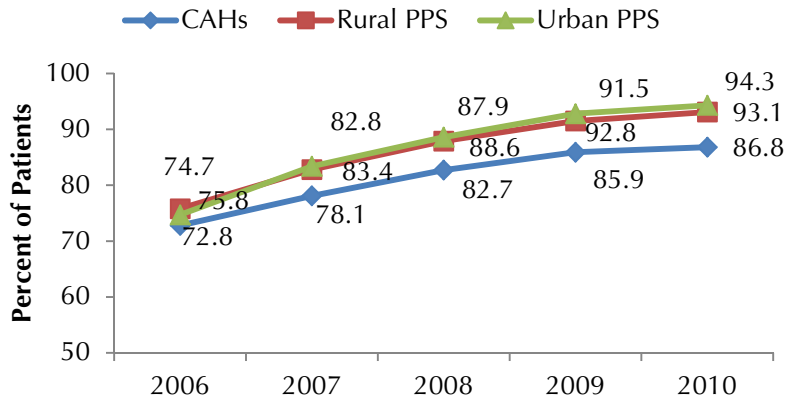


Figure 10. Percent of Inpatient Pneumonia Patients Receiving Blood Culture Prior to First Antibiotic 2006-2010

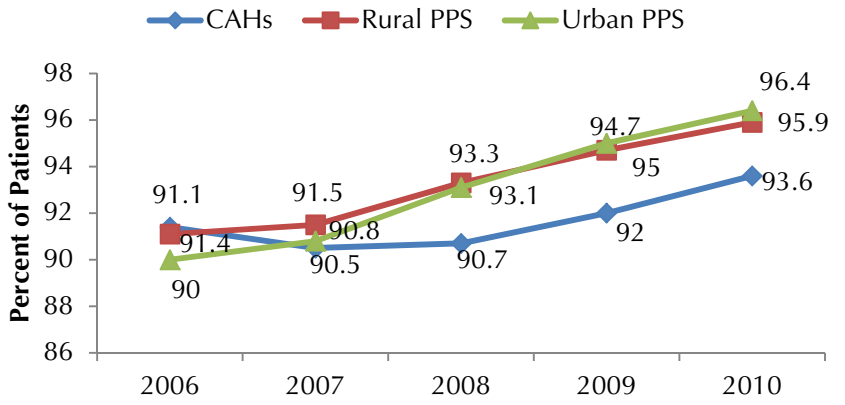


Figure 11. Percent of Inpatient Pneumonia Patients Receiving Timely Initial Antibiotic 2006-2010

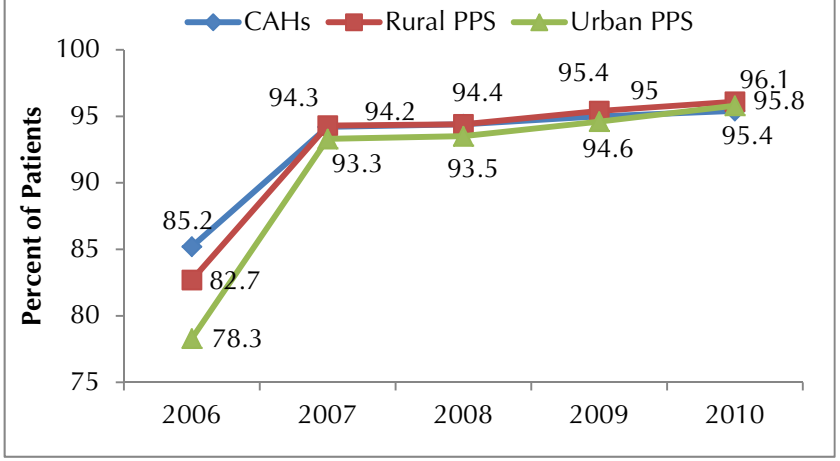
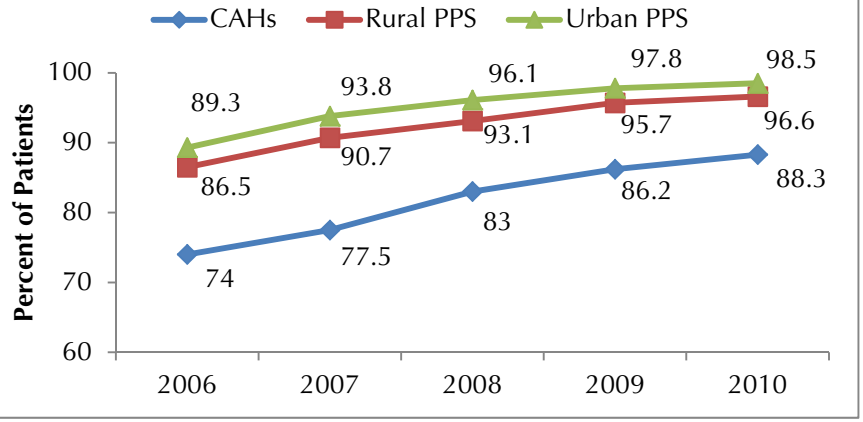


Figure 12. Percent of Inpatient Pneumonia Patients Receiving Smoking Cessation Advice 2006-2010



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

Figure 13. Percent of Inpatient Pneumonia Patients Receiving Influenza Vaccination 2006-2010

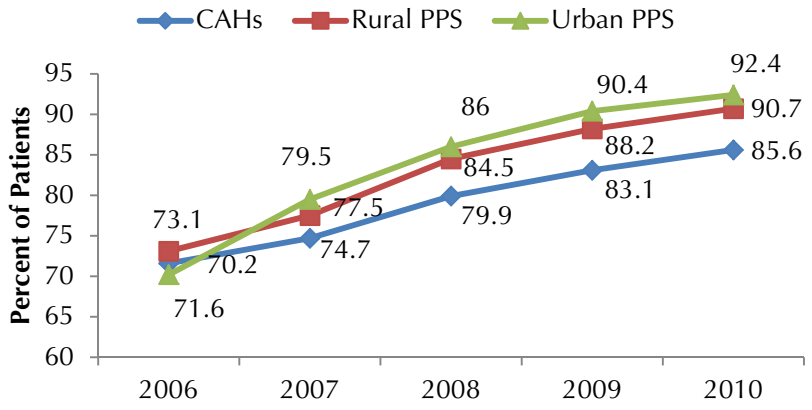


Figure 14. Percent of Inpatient Pneumonia Patients Receiving Appropriate Initial Antibiotic 2006-2010

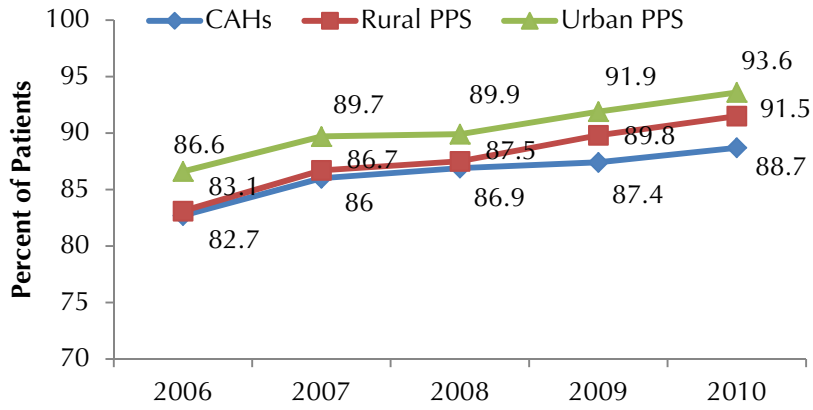


Figure 15. Percent of Inpatient Heart Failure Patients Receiving Discharge Instructions 2006-2010

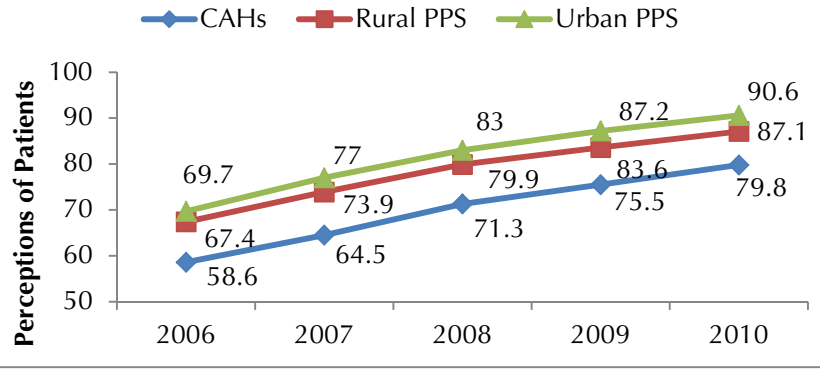
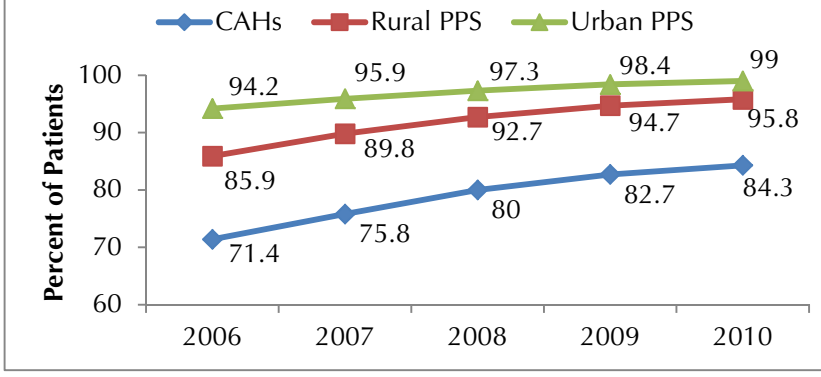


Figure 16. Percent of Inpatient Heart Failure Patients Receiving Assessment of LVS 2006-2010



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

Figure 17. Percent of Inpatient Heart Failure Patients Receiving ACEI or ARB for LVSD 2006-2010

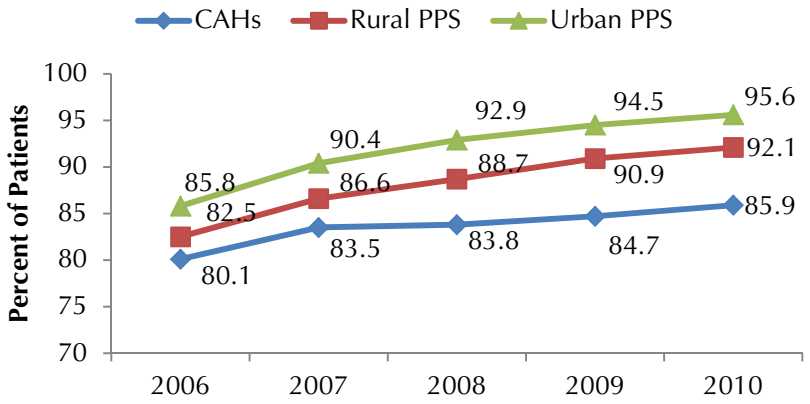


Figure 18. Percent of Inpatient Heart Failure Patients Receiving Smoking Cessation Advice 2006-2010

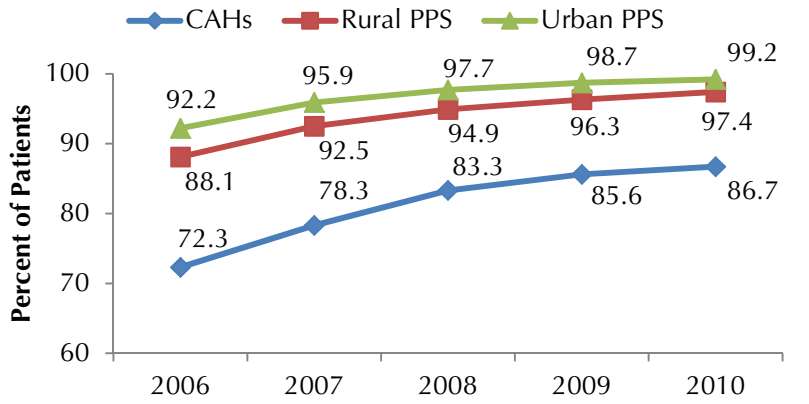


Figure 19. Percent of Inpatient AMI Patients Receiving Aspirin at Arrival 2006-2010

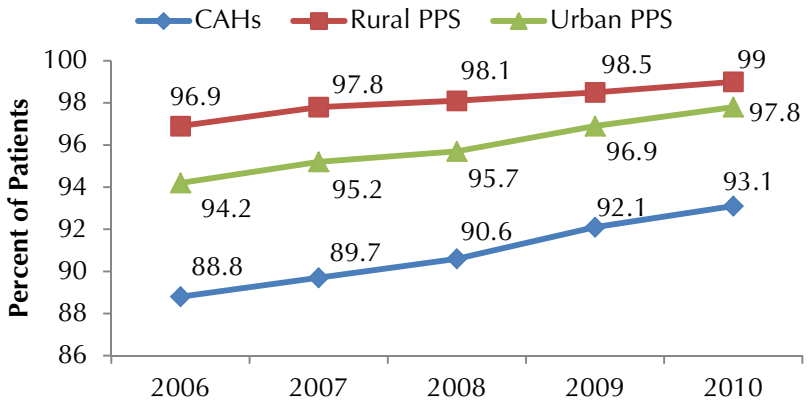
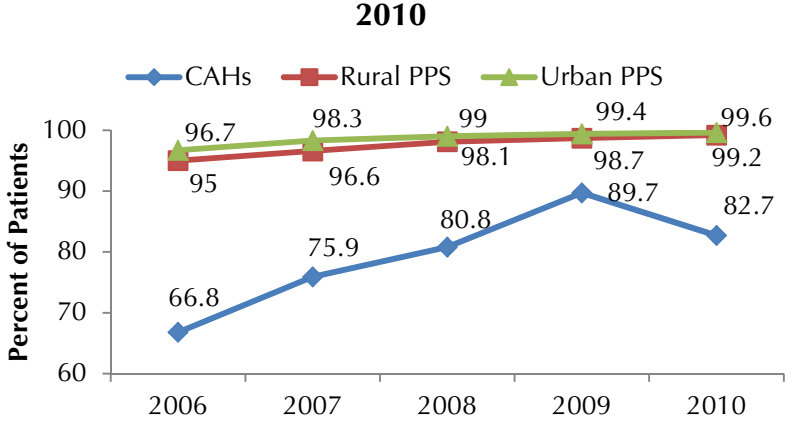


Figure 20. Percent of Inpatient AMI Patients Receiving Smoking Cessation Advice 2006-2010



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

Figure 21. Percent of Inpatient AMI Patients Receiving ACEI or ARB for LVSD 2006-2010

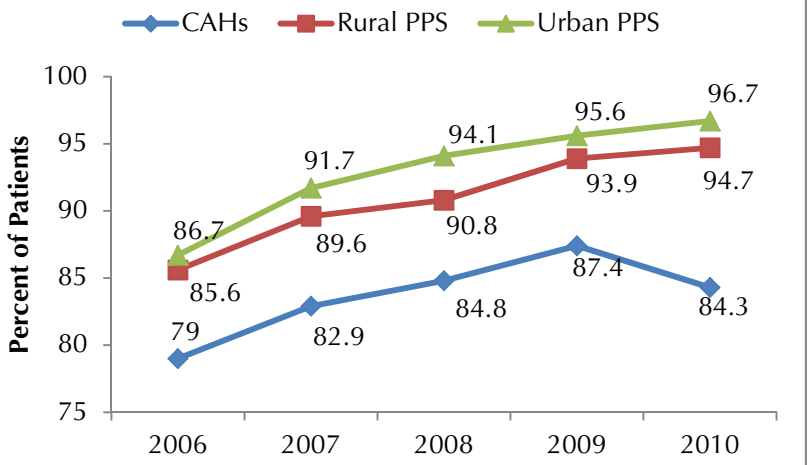


Figure 22. Percent of Inpatient AMI Patients Receiving Aspirin at Discharge 2006-2010

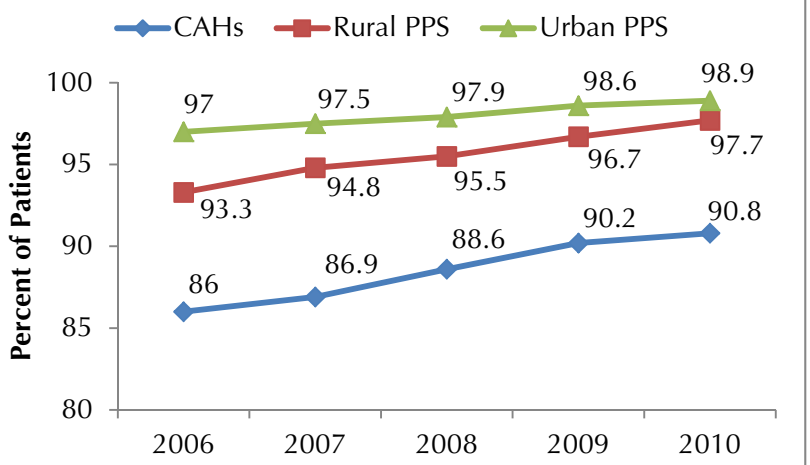


Figure 23. Percent of Inpatient AMI Patients Receiving Fibrinolytic in 30 Minutes 2006-2010

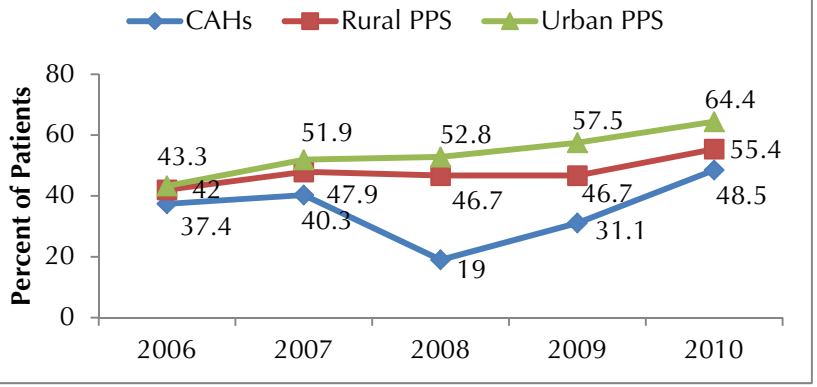
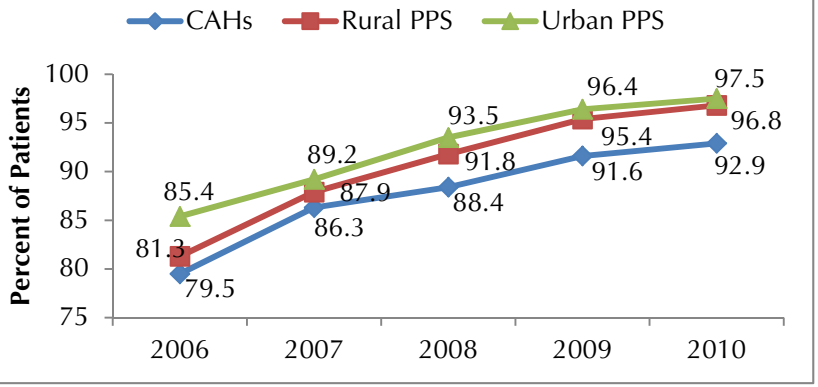


Figure 24. Percent of Inpatient Surgical Patients Receiving Antibiotic One Hour Before Incision 2006-2010



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

Figure 25. Percent of Inpatient Surgical Patients Receiving Most Appropriate Antibiotic 2006-2010

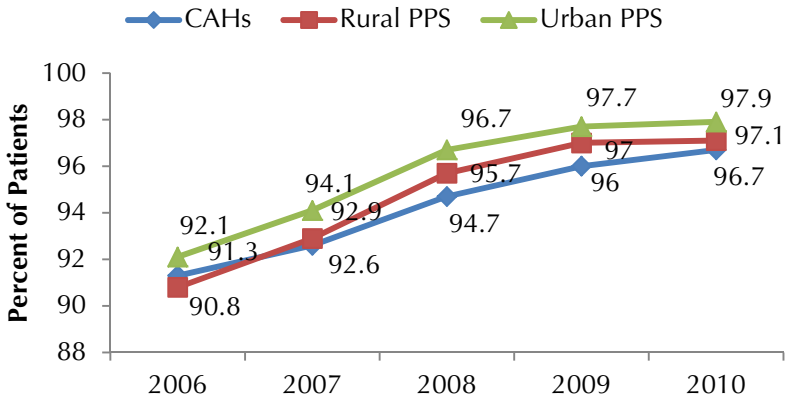


Figure 26. Percent of Inpatient Surgical Patients with Antibiotic Stopped in 24 Hours 2006-2010

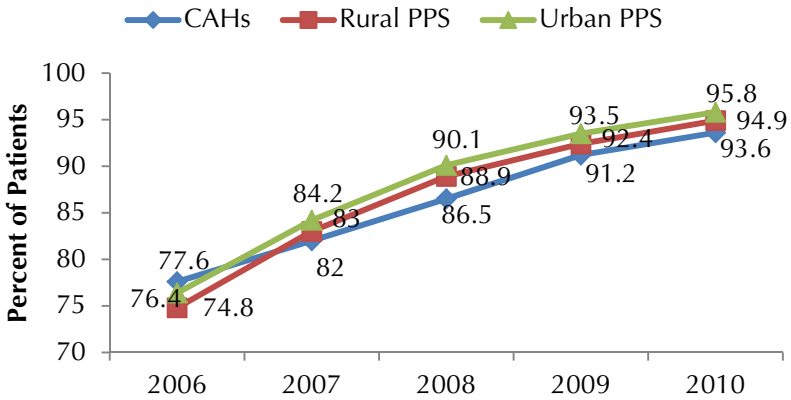


Figure 27. Inpatient Doctors Ordered Blood Clot Prevention Treatments 2007-2010

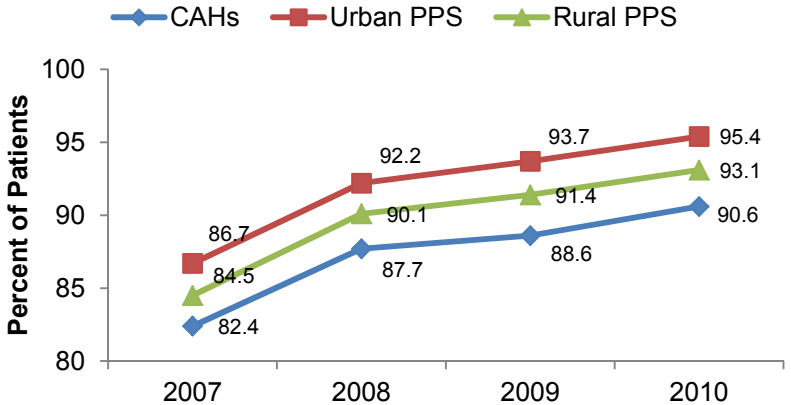
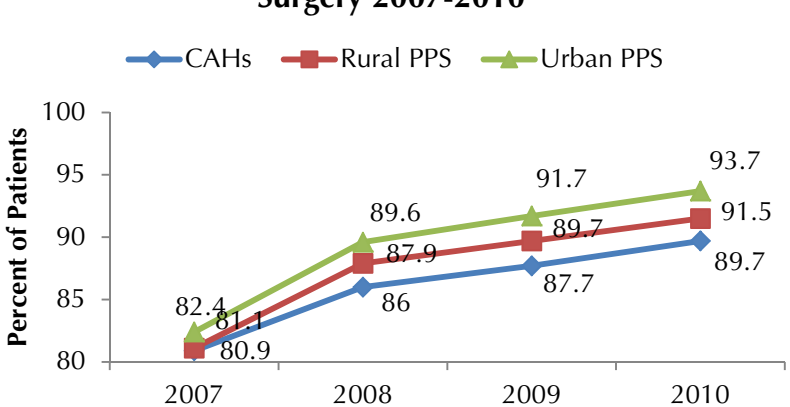


Figure 28. Inpatient Received Blood Clot Prevention Treatment 24 Hours Pre/Post Surgery 2007-2010



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

Figure 29. Inpatient Appropriate Hair Removal for Surgical Patients 2008-2010

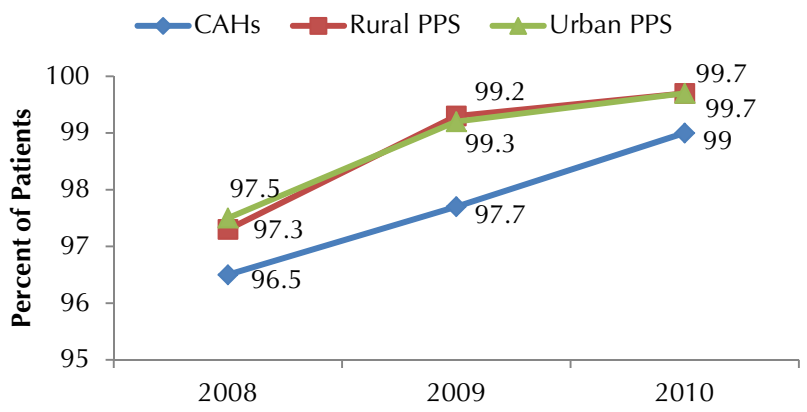


Figure 30. Outpatient AMI Aspirin Within 24 Hours of Arrival

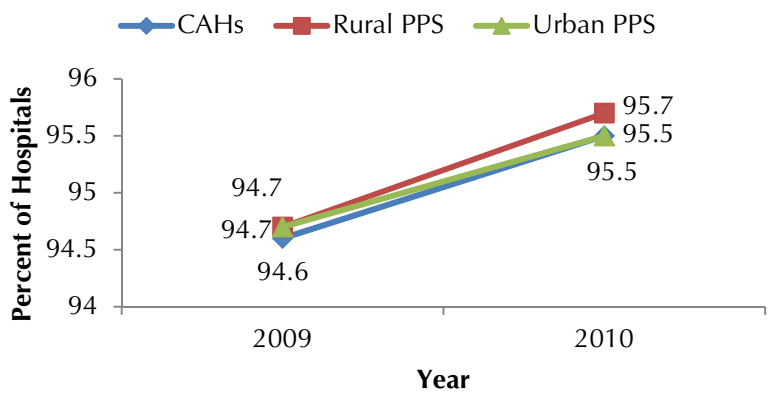


Figure 31. Outpatient AMI Fibrinolytic Within 30 Minutes

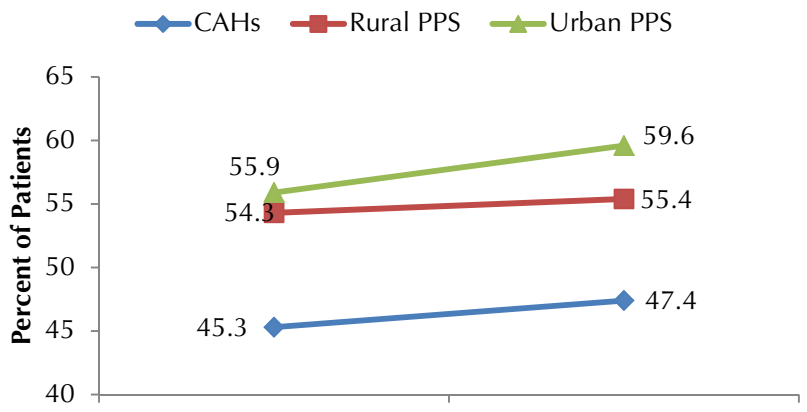
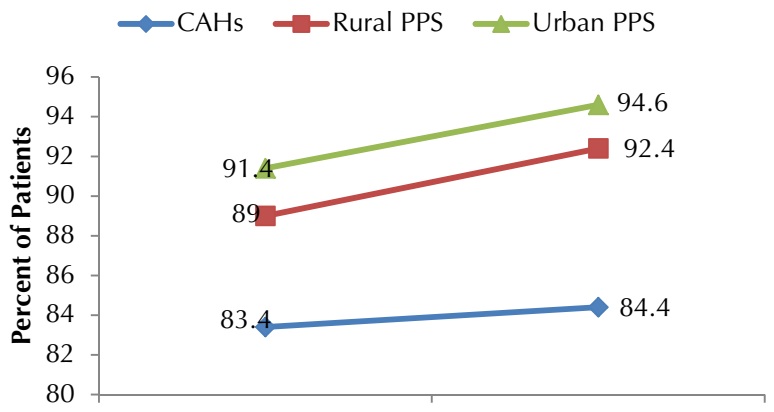
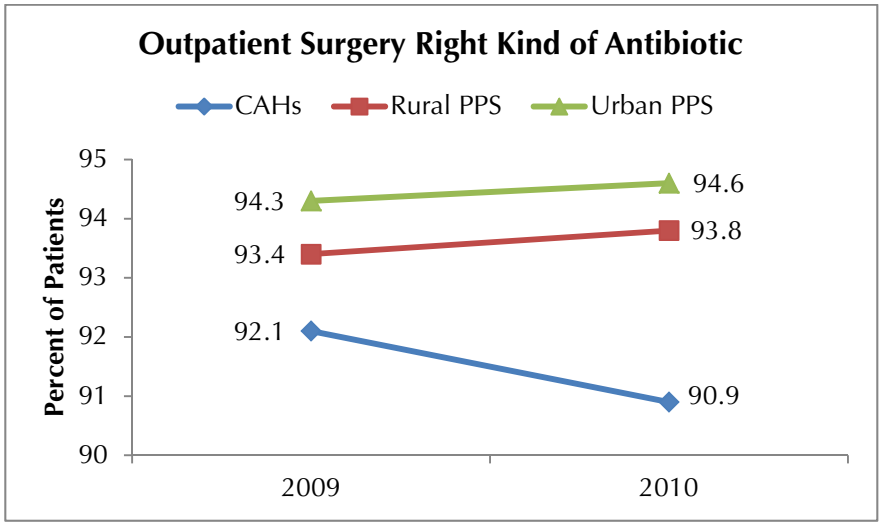


Figure 32. Outpatient Surgery Antibiotic 1 Hour Before Surgery



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