

## Hospital Compare Quality Measures: 2008 National and Mississippi Results for Critical Access Hospitals

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### 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.

At the end of 2008, 1,300 CAHs were located in 45 states. These reports examine state-level CAH participation in Hospital Compare and quality measure results for 2008 as well as trends from 2005-2008 for each state with CAHs. 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.

### Data and Approach

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; and data on all CAHs maintained by the Flex Monitoring Team. Data were not yet available on the outpatient process of care measures.

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This study was conducted by the Flex Monitoring Team with funding from the Federal Office of Rural Health Policy (PHS Grant No. U27RH01080)

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, we calculated the number and percent of CAHs, by state and nationally, that: 1) did not have mortality rate and readmission rate data in Hospital Compare; 2) did not have the minimum 25 cases to report reliable mortality and readmission rates; and 3) had rates that were not different than, better than or worse than the national rates (as determined by CMS).

### Reporting of Data to Hospital Compare

As in previous years, the percent of CAHs reporting data to Hospital Compare varied considerably across states. In Mississippi, 14 of the 27 CAHs in 2008 reported data to Hospital Compare on at least one inpatient process of care measure for 2008 discharges (Table 1). The Mississippi participation rate of 51.9% was lower than the national rate of 70%. The 2008 rate was greater than the rate in 2007. (These numbers do not include CAHs that submit quality measure data to their Quality Improvement Organization (QIO) only, and do not allow it to be publicly reported to Hospital Compare).

**Table 1. CAHs Reporting Inpatient Quality Measure Data and HCAHPS Data in Hospital Compare in Mississippi and Nationally 2005-2008**

	Mississippi			National		
	Number of CAHs	CAHs reporting inpatient process of care data	CAHs reporting HCAHPS survey data	Number of CAHs	CAHs reporting inpatient process of care data	CAHs reporting HCAHPS survey data
<b>2005</b>	23	7 (30.4%)	N/A	1270	678 (53.4%)	N/A
<b>2006</b>	27	10 (37.0%)	N/A	1286	812 (63.1%)	N/A
<b>2007</b>	27	13 (48.1%)	N/A	1291	892 (69.1%)	N/A
<b>2008</b>	27	14 (51.9%)	2 (7.4%)	1300	914 (70.3%)	442 (34.0%)

Table 1 also shows that the number of CAHs in Mississippi that reported HCAHPS data was two, for an HCAHPS reporting rate of 7.4%. This rate was lower than the national HCAHPS reporting rate of 34% for CAHs.

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.

Table 2 shows the number of completed HCAHPS surveys per CAH in Mississippi and nationally, in the three categories reported by CMS: “less than 100 surveys”, “100 to 299 surveys”, and “300 or more surveys.” It also shows the survey response rates for the CAHs in Mississippi and nationally.

**Table 2. Number of Completed HCAHPS Surveys and Response Rates for CAHs in Mississippi and Nationally 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%
<b>Mississippi</b>	2	1	1	0	1	1	0
<b>National</b>	442	61	249	132	36	385	21

### **Inpatient Process of Care Results for CAHs in Mississippi and Nationally**

Table 3 displays the Hospital Compare inpatient quality measure results for 2008 discharges for CAHs in Mississippi, CAHs nationally and all US hospitals. Data are not reported for a measure where the total number of CAH patients in the state with data on the measure was less than 25.

Among CAHs nationally that reported data on the inpatient process of care measures, the majority reported data on the pneumonia and heart failure measures. Over half of the CAHs reported data on three AMI measures: aspirin at arrival, aspirin at discharge, and beta blocker at discharge. Between 42% and 45% of the CAHs reported data on the surgical care improvement measures.

For the process of care measures, the number of CAHs reporting and the number of patients for whom data are available may differ by measure for several reasons. Hospitals have had a longer time to become familiar with and report on the older measures. Some measures only apply to a portion of patients (e.g., the smoking cessation advice measures only apply to smokers), and several measures exclude patients with contraindications for receiving that type of medication. Small rural hospitals transfer many AMI patients seen in their emergency departments to larger hospitals, rather than admitting them as inpatients. Consequently, CAHs may have few eligible patients for the AMI measures. About two-thirds of CAHs provide inpatient surgery. The

surgical care improvement measures apply to selected surgeries; some (e.g., hysterectomies) are more commonly provided in CAHs than others (e.g., cardiac procedures).

Compared to all US hospitals, patients in CAHs are less likely to receive recommended care on the AMI and heart failure measures. For most of the pneumonia and surgical care improvement measures, the percentages of patients in CAHs and all US hospitals receiving recommended care are similar.

The figures that follow Table 3 compare the Mississippi and national data trends for CAHs for 2006, 2007 and 2008. The percentages for each year are based on all CAH patients for whom data were reported that year. Again, data are not shown for measures with fewer than 25 patients per year.

Over this time period, the percentage of CAH patients nationally that received recommended care increased for almost all inpatient process of care measures. Some states may have greater year-to-year fluctuation in results due to small sample sizes for some measures.

**Table 3. Inpatient Process of Care Results for 2008 Discharges for CAHs in Mississippi and Nationally and for All US Hospitals**

		Mississippi (n=14)			CAHs Nationally (n=914)			All US Hospitals (n=4,301)		
		Hospitals reporting data for =>1 patient	Total number of patients with data	Percent of patients receiving recommended care	Hospitals reporting data for =>1 patient	Total number of patients with data	Percent of patients receiving recommended care	Hospitals reporting data for =>1 patient	Total number of patients with data	Percent of patients receiving recommended care
<b>AMI</b>	<b>Aspirin at arrival</b>	*	*	*	550	2,448	90.6%	3,686	320,532	97.8%
	<b>Aspirin at discharge</b>	*	*	*	495	1,809	88.6%	3,606	385,792	97.6%
	<b>ACEI or ARB for LVSD</b>	*	*	*	208	382	84.8%	2,989	76,672	93.8%
	<b>Smoking cessation advice</b>	*	*	*	147	234	80.8%	2,853	137,509	98.9%
	<b>Beta blocker at discharge</b>	*	*	*	495	1,872	88.5%	3,611	383,882	97.8%
	<b>Fibrinolytic w/in 30 minutes of arrival</b>	*	*	*	56	84	19.0%	729	2,479	50.3%
	<b>PCI at arrival</b>	*	*	*	*	*	*	1,482	54,333	81.3%
<b>Heart Failure</b>	<b>Discharge instructions</b>	14	273	48.4%	833	15,204	71.3%	4,071	632,280	82.3%
	<b>Assessment of LVS</b>	14	446	66.4%	844	21,975	80.0%	4,095	782,802	96.2%
	<b>ACE inhibitor or ARB for LVSD</b>	14	118	74.6%	733	4,959	83.8%	3,930	254,392	92.2%
	<b>Smoking cessation advice</b>	13	88	89.8%	651	2,835	83.3%	3,838	133,185	97.0%
<b>Pneumonia</b>	<b>Oxygenation assessment</b>	13	542	96.3%	905	40,568	99.1%	4,165	702,873	99.7%
	<b>Pneumococcal vaccination</b>	13	402	72.4%	904	31,267	82.7%	4,163	533,603	88.2%
	<b>Blood culture prior to first antibiotic</b>	13	202	90.6%	832	21,562	90.7%	4,035	505,387	93.1%
	<b>Smoking cessation advice</b>	13	128	73.4%	856	9,113	83.0%	4,091	206,542	95.0%
	<b>Initial antibiotic(s) within 6 hours</b>	13	394	91.9%	890	31,776	94.4%	4,049	551,548	93.7%
	<b>Most appropriate initial antibiotic(s)</b>	13	300	85.3%	887	22,788	86.9%	4,125	369,698	89.2%
	<b>Influenza vaccination</b>	12	127	74.8%	827	8,921	79.9%	4,053	168,830	85.4%

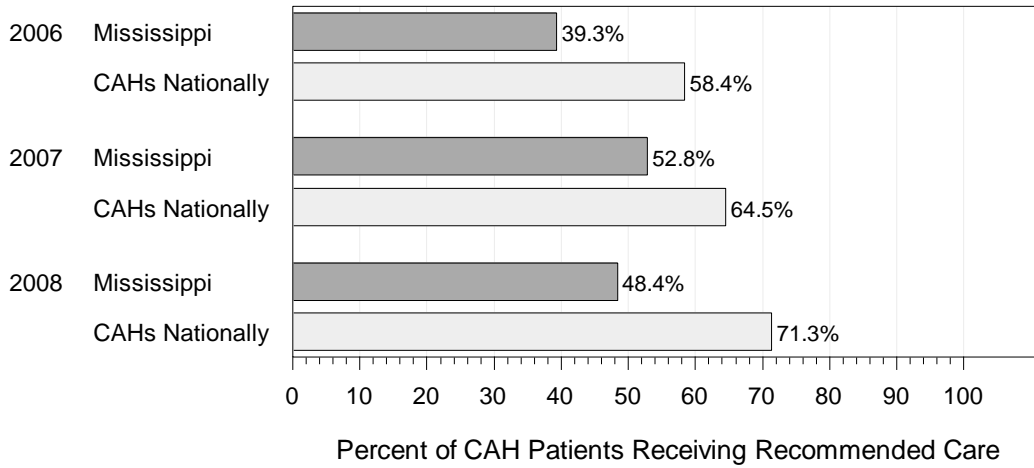
\*The Total number of patients in the state or nationally with data on this measure was less than 25.

**Table 3. Inpatient Process of Care Results for 2008 Discharges for CAHs in Mississippi and Nationally and for All US Hospitals**

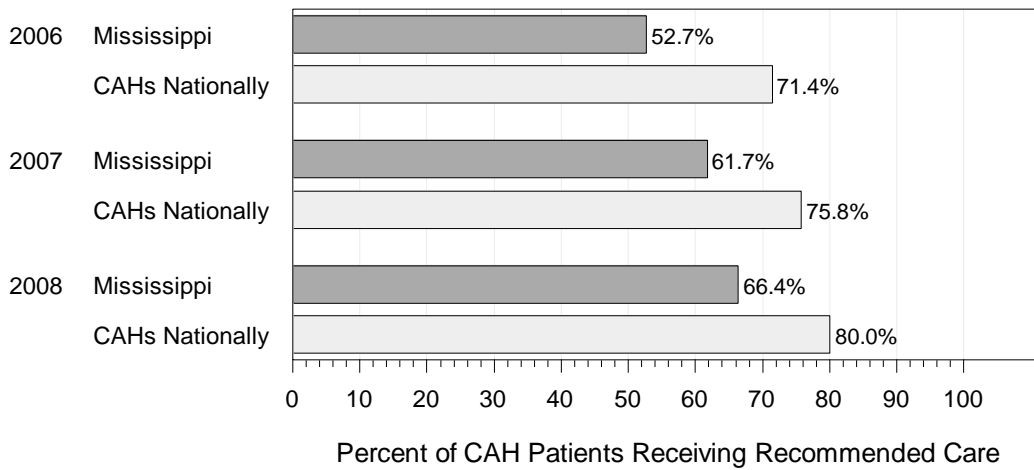
		Mississippi (n=14)			CAHs Nationally (n=914)			All US Hospitals (n=4,301)		
		Hospitals reporting data for =>1 patient	Total number of patients with data	Percent of patients receiving recommended care	Hospitals reporting data for =>1 patient	Total number of patients with data	Percent of patients receiving recommended care	Hospitals reporting data for =>1 patient	Total number of patients with data	Percent of patients receiving recommended care
<b>Surgical Care Improvement</b>	<b>Preventative antibiotic(s) 1 hour before incision</b>	*	*	*	410	16,259	88.4%	3,634	1,062,058	93.2%
	<b>Received appropriate preventative antibiotic(s)</b>	*	*	*	410	16,237	94.7%	3,633	1,069,968	96.6%
	<b>Preventative antibiotic(s) stopped within 24 hours after surgery</b>	*	*	*	407	15,742	86.5%	3,629	1,008,097	89.9%
	<b>Doctors ordered blood clot prevention treatments</b>	*	*	*	388	15,597	87.7%	3,636	966,698	91.8%
	<b>Received blood clot prevention treatments 24 hours pre/post surgery</b>	*	*	*	387	15,576	86.0%	3,634	965,822	89.3%
	<b>Controlled 6AM post-op blood glucose</b>	*	*	*	*	*	*	1,454	175,207	89.9%
	<b>Appropriate Hair Removal</b>	*	*	*	415	22,631	96.5%	3,689	1,612,221	97.4%

\*The Total number of patients in the state or nationally with data on this measure was less than 25.

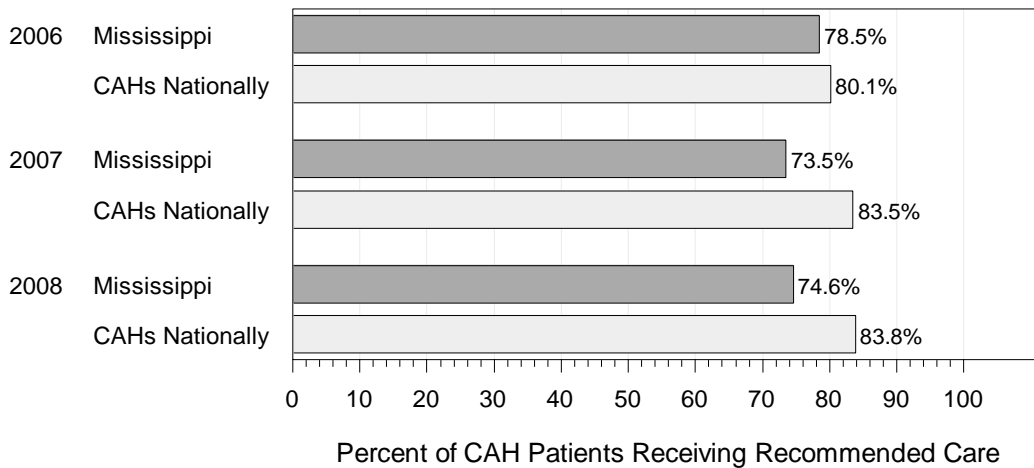
**Figure 1. Heart Failure: Discharge Instructions**



**Figure 2. Heart Failure: Assessment of LVS**

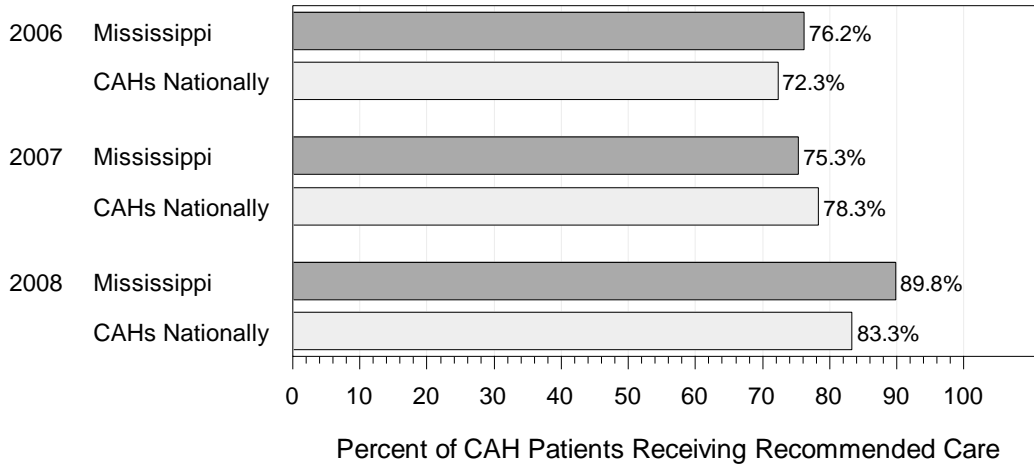


**Figure 3. Heart Failure: ACE Inhibitor or ARB for LVSD**

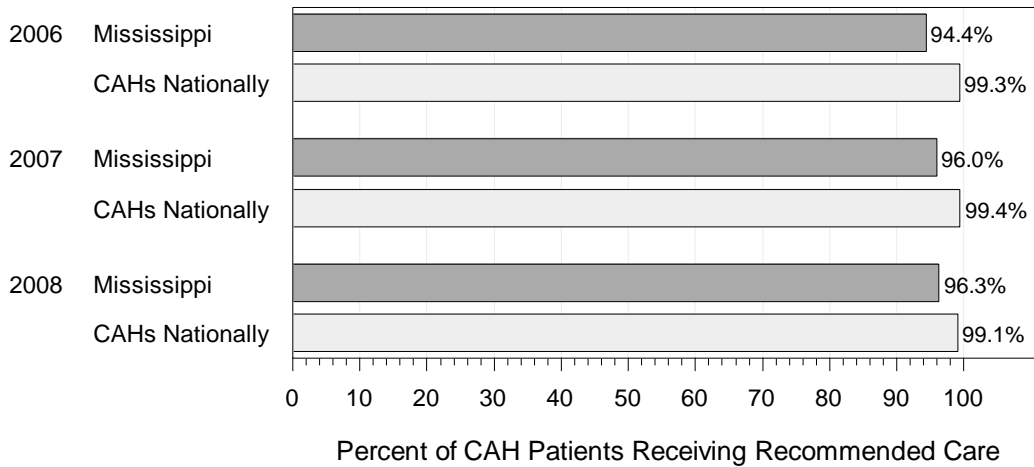




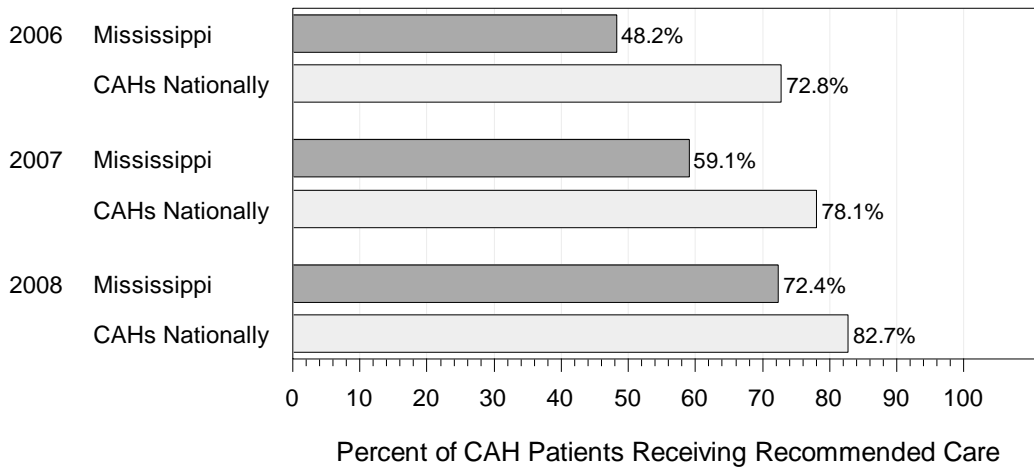
**Figure 4. Heart Failure: Smoking Cessation Advice**



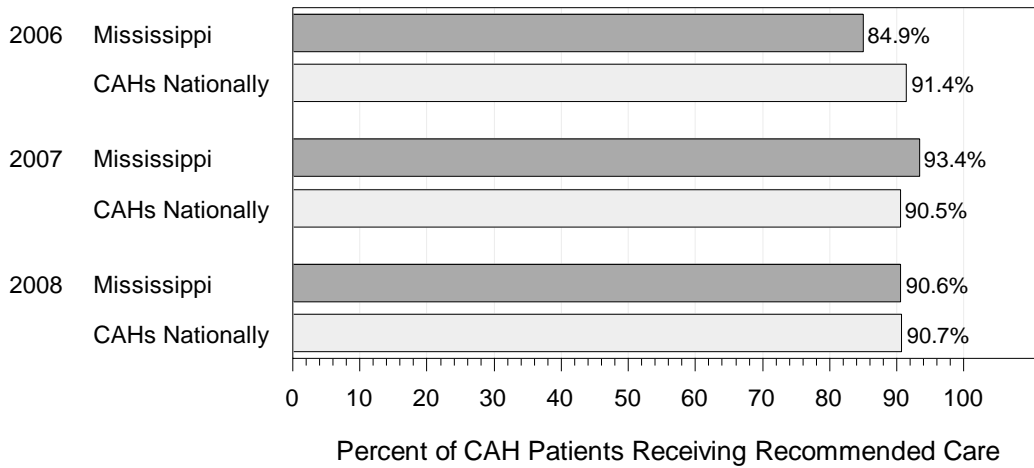
**Figure 5. Pneumonia: Oxygenation Assessment**



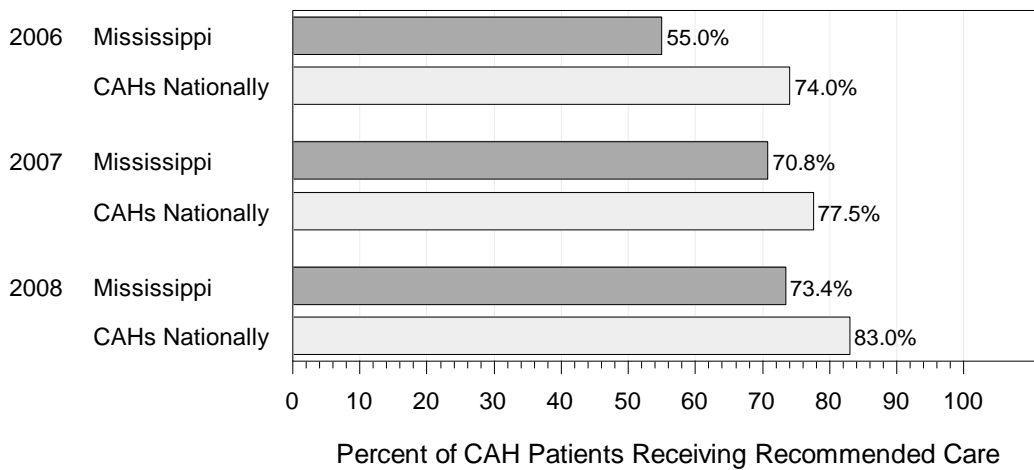
**Figure 6. Pneumonia: Pneumoccal Vaccination**



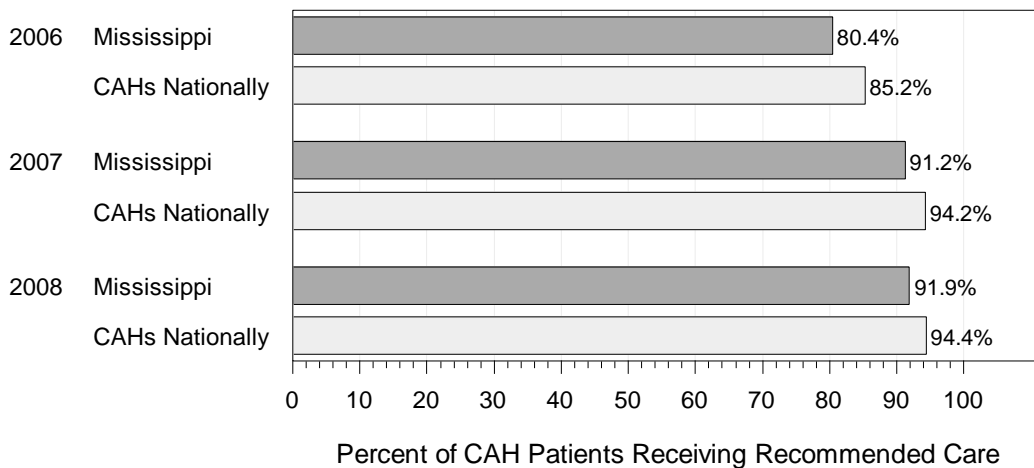
**Figure 7. Pneumonia: Blood Culture Prior to First Antibiotic**



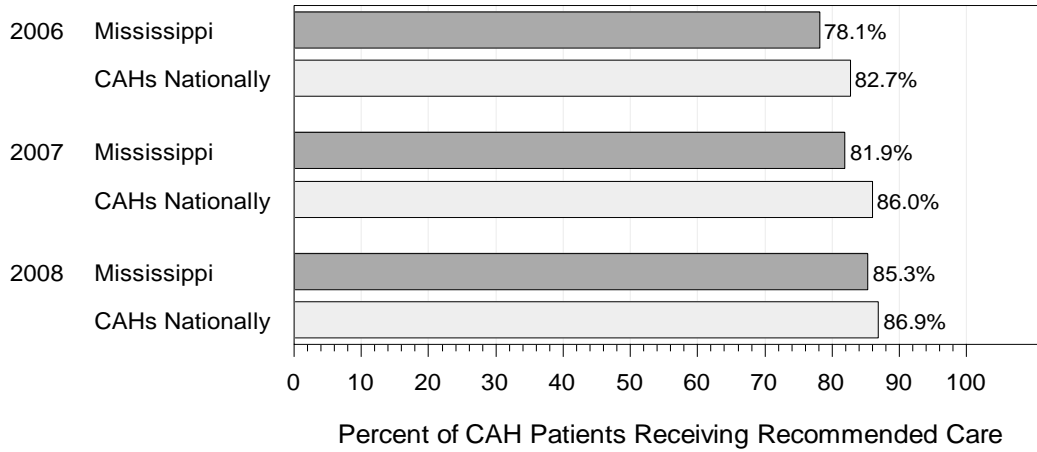
**Figure 8. Pneumonia: Smoking Cessation Advice**



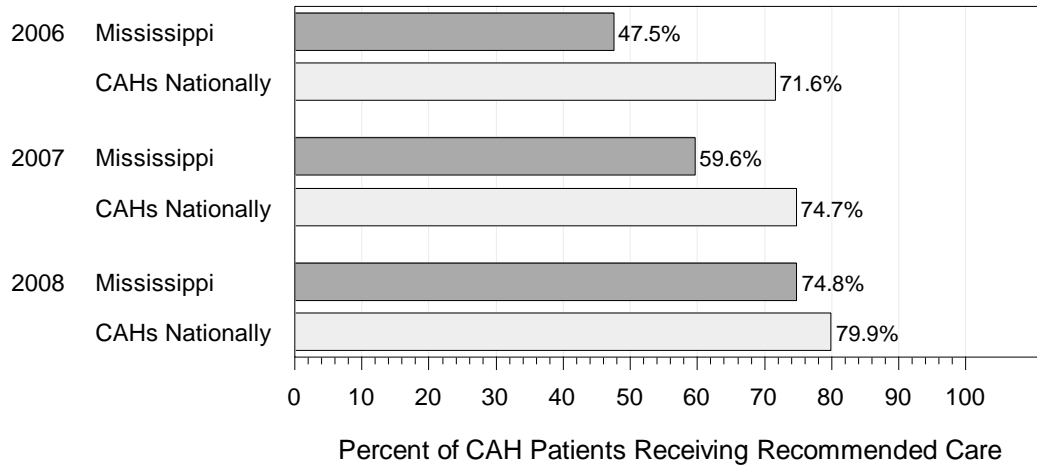
**Figure 9. Pneumonia: Timely Administration of Initial Antibiotic**



**Figure 10. Pneumonia: Most Appropriate Initial Antibiotic(s)**



**Figure 11. Pneumonia: Influenza Vaccination**



**HCAHPS Survey Results for CAHs in Mississippi and Nationally**

Table 4 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 three groups of hospitals that publicly reported HCAHPS data for 2008: CAHs in Mississippi, CAHs nationally, and all US hospitals.

Compared to all US hospitals, CAHs nationally had greater percentages of patients that assessed their experiences receiving care positively, i.e. gave the highest level of response for each of the HCAHPS survey measures.

Caution should be exercised in comparing HCAHPS results for states that have few CAHs reporting results and/or CAHs whose results are based on fewer than 100 completed surveys.

**Table 4. HCAHPS Results for 2008 for CAHs in Mississippi and Nationally and all US Hospitals**

Percent of patients who reported that:	Mean (average) for:		
	Mississippi CAHs (n =2)	CAHs Nationally (n = 442)	All US hospitals (n = 3,765)
Nurses always communicated well	86%	79%	74%
Doctors always communicated well	84%	83%	80%
Patient always received help as soon as wanted	65%	71%	62%
Pain was always well controlled	73%	71%	68%
Staff always explained about medications before giving them to patient	56%	63%	59%
Yes, staff gave patient information about what to do during recovery at home	86%	82%	80%
Area around patient room was always quiet at night	81%	61%	56%
Patient room and bathroom were always clean	83%	78%	69%
They gave an overall hospital rating of 9 or 10 (high) on 1-10 scale	85%	70%	64%
They would definitely recommend the hospital to friends and family	82%	71%	68%

### **Mortality and Readmission Rate Categories for CAHs in Mississippi and Nationally**

Table 5 displays the number of CAHs in Mississippi and 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 5. Number (Percent) of CAHs in Mississippi and 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	Mississippi CAHs	27	14 (51.9%)	13 (48.1%)	0	0	0
	CAHs Nationally	1300	390 (30.0%)	739 (56.8%)	171 (13.2%)	0	0
Heart Failure	Mississippi CAHs	27	12 (44.4%)	1 (3.7%)	14 (51.9%)	0	0
	CAHs Nationally	1300	352 (27.1%)	195 (15.0%)	742 (57.1%)	0	11 (0.8%)
Pneumonia	Mississippi CAHs	27	12 (44.4%)	0	15 (55.6%)	0	0
	CAHs Nationally	1300	349 (26.8%)	47 (3.6%)	865 (66.5%)	3 (0.2%)	36 (2.8%)

Table 6 shows the 30 day risk-adjusted readmission rates for AMI, heart failure, and pneumonia for CAHs in Mississippi and 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 (70%), 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 6. Number (Percent) of CAHs in Mississippi and 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	Mississippi CAHs	27	16 (59.3%)	11 (40.7%)	0	0	0
	CAHs Nationally	1300	428 (32.9%)	810 (62.3%)	62 (4.8%)	0	0
Heart Failure	Mississippi CAHs	27	12 (44.4%)	0	15 (55.6%)	0	0
	CAHs Nationally	1300	352 (27.1%)	158 (12.2%)	788 (60.6%)	1 (0.1%)	1 (0.1%)
Pneumonia	Mississippi CAHs	27	12 (44.4%)	0	15 (55.6%)	0	0
	CAHs Nationally	1300	349 (26.8%)	46 (3.5%)	896 (68.9%)	3(0.2%)	6 (0.5%)

## Discussion and Conclusions

Nationally, participation in Hospital Compare (defined as publicly reporting data on at least one inpatient process of care measure) increased from 41% of CAHs in 2004 to 70% of CAHs in 2008. By state, the percent of CAHs reporting inpatient process of care measures for 2008 ranged from 11% to 100%. Of the 45 states in the Flex Program, eight states had 100% of their CAHs publicly reporting in 2008, while seven states had less than half of their CAHs reporting.

In addition, 34% of CAHs publicly reported HCAHPS survey data to Hospital Compare in 2008. (Nearly all of the CAHs that reported HCAHPS survey data also reported data on inpatient process of care measures.) By state, the percent of CAHs publicly reporting HCAHPS data ranged from 0% to 100% of CAHs in 2008. Three states had 100% of their CAHs reporting HCAHPS data.

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.

## References

1. Casey, M. and Moscovice, I. *CAH Participation in Hospital Compare and Initial Results*. Flex Monitoring Team Briefing Paper No. 9, February 2006. [http://www.flexmonitoring.org/documents/BriefingPaper9\\_HospitalCompare.pdf](http://www.flexmonitoring.org/documents/BriefingPaper9_HospitalCompare.pdf)
2. Casey, M., Burlew, M. and Moscovice, I. *Critical Access Hospital Year 2 Hospital Compare Participation and Quality Measure Results*. Flex Monitoring Team Briefing Paper No. 16, April 2007. [http://www.flexmonitoring.org/documents/BriefingPaper16\\_HospitalCompare.pdf](http://www.flexmonitoring.org/documents/BriefingPaper16_HospitalCompare.pdf)
3. Casey, M., Burlew, M. and Moscovice, I. *Critical Access Hospital Year 3 Hospital Compare Participation and Quality Measure Results*. Flex Monitoring Team Briefing Paper No. 20, August 2008. [http://www.flexmonitoring.org/documents/BriefingPaper20\\_HospitalCompare3.pdf](http://www.flexmonitoring.org/documents/BriefingPaper20_HospitalCompare3.pdf)
4. Casey, M., Burlew, M. and Moscovice, I. *Critical Access Hospital Year 4 Hospital Compare Participation and Quality Measure Results*. Flex Monitoring Team Briefing Paper No. 22, October 2009.
5. Centers for Medicare and Medicaid Services (CMS). HCAHPS Fact Sheet. March 2009. Available at: <http://www.hcahpsonline.org/files/HCAHPS%20Fact%20Sheet,%20revised1,%203-31-09.pdf>
6. CMS. Hospital Outcome of Care Measures: Calculation of 30-Day Risk-Standardized Mortality Rates and Rates of Readmission. [http://www.hospitalcompare.hhs.gov/Hospital/Static/InformationForProfessionals\\_tabset.asp?activeTab=2&language=English&version=default](http://www.hospitalcompare.hhs.gov/Hospital/Static/InformationForProfessionals_tabset.asp?activeTab=2&language=English&version=default)

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