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Critical Access Hospital Year 8 Hospital Compare Participation and Quality Measure Results

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University of Minnesota
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University of Southern Maine

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.

This report was prepared by Michelle Casey M.S., Peiyin Hung M.S.P.H., and Ira Moscovice PhD at the University of Minnesota Rural Health Research Center.

Questions regarding the report should be addressed to:
Michelle Casey
(612) 623-8316
mcasey@umn.edu.

http://www.flexmonitoring.org

University of Minnesota
Division of Health Services Research & Policy
420 Delaware Street, SE, Mayo Mail Code 729
Minneapolis, MN 55455-0392
612.624.8618

University of North Carolina at Chapel Hill
Cecil B. Sheps Center for Health Services Research
725 Martin Luther King Jr. Boulevard, CB #7590
Chapel Hill, NC 27599-7590
919.966.5541

University of Southern Maine
Muskie School of Public Service
PO Box 9300
Portland, ME 04104-9300
207.780.4435

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 for 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. In the core area of quality improvement, the Medicare Beneficiary Quality Improvement Project (MBQIP) focuses 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

TABLE OF CONTENTS

Executive Summary v

Introduction 1

Purpose of the Project 1

Methods 1

Results 3

- CAH Reporting to Hospital Compare 3
- CAH Reporting by Condition and Measure 9
- Comparison of Process of Care Results 14
- Inpatient Measure Trends over Time for CAHs and PPS Hospitals 21
- Outpatient Measure Trends over Time for CAHs and PPS Hospitals 21
- HCAHPS Survey Results for CAHs 22
- Mortality and Readmission Rates for CAHs 22

Discussion and Conclusions 24

References 25

Appendix A. Hospital Compare Process of Care Measures for 2011 Discharges 26

Appendix B: Graphs of Trends in CAH and PPS Results 29

TABLES AND FIGURES

Table 1. CAHs reporting Hospital Compare Inpatient, Outpatient and HCAHPS data for 2011 3
Table 2. Critical Access Hospital (CAH) Participation in Hospital Compare by State for 2011 Discharges (Inpatient Measures) 4
Table 3. CAH Hospital Compare Participation by Organizational Characteristics 6
Table 4. Critical Access Hospital (CAH) Reporting of Outpatient Measures to Hospital Compare by State for 2011 Discharges 7
Table 5. Critical Access Hospital (CAH) Reporting of HCAHPS Survey Results to Hospital Compare by State for 2011 Discharges 8
Table 6. Completed HCAHPS Surveys and Response Rates for CAHs Nationally in 2011 9
Table 7. CAHs Reporting and Number of CAH Patients by Measure for 2011 Discharges 12
Table 8. Percent of Patients Receiving Recommended Care in Accredited and Non-Accredited CAHs in 2011 14
Table 9. Percent of Patients Receiving Recommended Care in CAHs by Ownership Type in 2011 16
Table 10. Percent of Patients Receiving Recommended Inpatient Care in CAHs and Rural PPS Hospitals in 2011 18
Table 11. Percent of Patients Receiving Recommended Outpatient Care in CAHs and Rural PPS Hospitals in 2011 19
Table 12. Percent of Patients Receiving Recommended Inpatient Care in CAHs and Urban PPS Hospitals in 2011 19
Table 13. Percent of Patients Receiving Recommended Outpatient Care in CAHs and Urban PPS Hospitals in 2011 20
Table 14. Number of Hospitals with Inpatient Process of Care Data by Hospital Type from 2006-2011 21
Table 15. HCAHPS Results for CAHs Nationally for 2011 22
Table 16. Number (Percent) of CAHs Nationally in Risk-adjusted Mortality Rate Categories 22
Table 17. Number (Percent) of CAHs Nationally in Risk-adjusted Readmission Rate Categories 23

Figure 1. CAH Participation Hospital Compare for Inpatient Discharges 2004-2011 5
Figure 2. Percent of CAHs Participating in Hospital Compare for 2011 Inpatient Discharges by Year of Certification 5
Figure 3. CAH Reporting of AMI Measures 2011 9
Figure 4. CAH Reporting of Heart Failure Measures 2011 10
Figure 5. CAH Reporting of Pneumonia Measures 2011 CAHs 10
Figure 6. CAH Reporting of Surgical Care Improvement Measures 2011 11
Figure 7. CAH Reporting of Outpatient Measures 2011 11

EXECUTIVE SUMMARY

Introduction

This report examines 2011 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 2011 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 2011 inpatient and outpatient process of care measure results for participating CAHs were compared 1) by accreditation status and ownership and 2) with those of rural and urban Prospective Payment System (PPS) hospitals. Results were also compared over time for 2005-2011. The percentages of patients that received recommended care for the inpatient and outpatient 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, and in CAHs grouped by accreditation status and ownership type.

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 other reporting hospitals in the U.S. The mean scores for each measure for CAHs and for all other hospitals were compared using t-tests.

CMS calculates hospital-level 30-day risk-standardized mortality and readmission rates for heart attack, heart failure, and pneumonia 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 better than, worse, than or not different 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 2011 discharges, a total of 1,059 CAHs (79.7%) submitted data on at least one inpatient measure to Hospital Compare. This total includes CAHs whose inpatient data were suppressed by CMS and reported as “too few cases” in Hospital Compare. Twelve states had 100% of their CAHs participating while three states had less than half of CAHs reporting. CAHs remain more likely to report data on pneumonia and heart failure measures than on AMI and surgical infection prevention measures.

A total of 362 CAHs (27.3%) submitted data to Hospital Compare on at least one outpatient process of

care measure. This total includes CAHs whose outpatient data were suppressed by CMS and reported as "too few cases" in Hospital Compare. Outpatient reporting ranges from 0% of CAHs in two states to 100% of CAHs in one state.

For 2011 discharges, CAHs did not perform as well as rural and urban PPS hospitals on many measures. Although the percent of CAH patients receiving recommended care increased from 2006-2011 for all measures with enough data to draw conclusions, the percent of rural and urban PPS hospital patients receiving recommended care also increased during this time period. Thus, while showing improvement, CAHs continued to have lower scores relative to rural and urban PPS hospitals on most measures.

In addition, 548 CAHs (41.3%) of CAHs publicly reported HCAHPS survey data to Hospital Compare in 2011. Three states have 100% of CAHs reporting HCAHPS data, and 27 states have less than half of CAHs reporting. On average, CAHs have higher ratings on HCAHPS measures than all US hospitals.

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

Discussion and Conclusions

The percent of CAHs reporting publicly on inpatient process of care measures increased from 73.5% in 2010 to 79.7% in 2011. Public reporting of outpatient process measures also increased from 21.2% of CAHs in 2010 to 27.3% in 2011. CAH reporting of HCAHPS measures increased from 38% in 2010 to 41.3% in 2011.

As with previous years, there was wide variation across the 45 Flex states in CAH reporting. For inpatient measures, 12 states had 100% of CAHs reporting while three states had less than half of CAHs reporting. Outpatient reporting ranged from 0% of CAHs in two states to 100% in one state, and HCAHPS reporting ranged from 0% in one state to 100% of CAHs in three states.

For 2011 discharges, CMS instituted a policy of suppressing Hospital Compare data for hospitals that reported data for ten or fewer patients on a measure. As a consequence, 151 CAHs had their data suppressed or missing for all inpatient measures and 105 CAHs had their data suppressed or missing for all outpatient measures; many additional CAHs had data suppressed on some measures. ORHP is working with CMS to obtain access to all data reported by CAHs to Hospital Compare, including the suppressed data, for ongoing monitoring of CAH quality performance at the hospital, state and national levels. We anticipate being able to include these data in future reports on CAH reporting and quality measure results.

Quality measurement is an important component of health care reform efforts. CAHs will need to report quality measures to show meaningful use of electronic health records (EHRs) and to participate in payment reform initiatives, such as Accountable Care Organizations. In states where CAH reporting is lower than the national average, additional state initiatives may be necessary to encourage reporting. Efforts to assist CAHs in quality reporting are underway as part of the Medicare Beneficiary Quality Improvement Project (MBQIP) and Quality Improvement Organizations' (QIO) 10th Scope of Work.

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 has increased from 40.9% for 2004 discharges to 79.7% for 2011 discharges.

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.

Previous Flex Monitoring Team reports analyzed CAH participation and Hospital Compare inpatient quality measure results nationally for 2004-2010[1-7] and at the state level for 2006-2011.[8]

PURPOSE OF THIS PROJECT

The purpose of this project is to:

- Determine the percent of CAHs that are participating in Hospital Compare for 2011 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 that are reporting data on outpatient process of care measures and compare the results to those of PPS hospitals;
- 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 and outpatient process of care measures and HCAHPS survey results for January through December 2011, and data on the 3 year (July 2008 to June 2011) mortality and readmission rates calculated by CMS, were downloaded from the CMS Hospital Compare website when they became available in October 2012. These data were linked with previously downloaded data for 2006-2010, data on all CAHs maintained by the Flex Monitoring Team, and American Hospital Association Annual Survey Data for 2010.

For 2011 discharges, CMS instituted a policy of suppressing Hospital Compare data for hospitals that reported data for ten or fewer patients on a measure. The suppressed data was not available for this report. CMS has agreed to provide the full reporting data to ORHP going forward in order to ensure continued access to all data reported by CAHs to Hospital Compare, including the suppressed data, for ongoing monitoring of CAH quality performance at the hospital, state and national levels. We anticipate being able to include these data in future reports on CAH reporting and quality measure results.

Inpatient and Outpatient Process Measures

For each inpatient and outpatient process measure, the percentages of patients that received recommended care were calculated by dividing the total number of patients who received the recommended care by the total number of eligible patients in each comparison group. The comparison groups were based on CAH organizational characteristics including accreditation status and ownership type, and hospital type (CAHs vs. rural PPS and urban PPS hospitals).

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 with data on a measure was less than 25.

Chi-square tests were used to calculate whether differences between groups were statistically significant. For each inpatient and outpatient measure, scores were classified as: 1) insufficient data (less than 25 patients total); 2) not significantly different; or 3) significantly different between two groups of hospitals.

Three outpatient AMI/chest pain measures, time to fibrinolysis, 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). No statistical comparisons were done on these measures due to insufficient data and concerns about outlier values.

HCAHPS

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.[9]

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 nationally, and for all other hospitals in the U.S. Results on each measure for all CAHs nationally were compared with all other hospitals (non-CAHs) using t-tests.

Mortality and Readmission Rates

CMS calculates hospital-level 30-day risk-standardized mortality and readmission rates for pneumonia, heart failure, and AMI using three years of 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.[10]

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 better than, worse than or not different 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.

MBQIP and Hospital Compare Data

The Medicare Beneficiary Quality Improvement Project (MBQIP) was created by the Federal Office of Rural Health Policy (ORHP) as a Flex Grant Program activity within the core area of quality improvement. The primary goal of MBQIP is for CAHs to implement quality improvement initiatives to improve their patient care. The MBQIP Phase 1 and Phase 2 quality measures are a subset of the Hospital Compare measures, and include inpatient pneumonia and heart failure, outpatient AMI/chest pain, outpatient surgery, and HCAHPS measures. The Phase 3 MBQIP measures are a set of Emergency Department Transfer Communication measures and a measure of Pharmacist CPOE/verification of medication orders within 24 hours, neither of which are Hospital Compare measures.

The data used in this report are from CAHs that allow their quality data to be publicly reported to Hospital Compare. Some CAHs submit data to their Quality Improvement Organization (QIO) or to MBQIP, but do not allow the data to be publicly reported on Hospital Compare; their data are *not* included in this report.

RESULTS

CAH Reporting to Hospital Compare

Table 1. CAHs reporting Hospital Compare Inpatient, Outpatient, and HCAHPS data for 2011

	Number (percent) of CAHs (n=1,328[1])
At least one Hospital Compare measure (HCAHPS, inpatient, and/or outpatient process measures)	1,080 (81.3%)
Inpatient, outpatient, and HCAHPS	226 (17.0%)
Inpatient and outpatient only	126 (9.5%)
Inpatient and HCAHPS only	311 (23.4%)
Outpatient and HCAHPS only	0 (0.0%)
Inpatient only	396 (29.8%)
Outpatient only	10 (0.8%)
HCAHPS only	11 (0.8%)
No Hospital Compare data (inpatient, outpatient, or HCAHPS)	248 (18.7%)

Table 1 shows the number and percent of CAHs that reported data to Hospital Compare for 2011 discharges. Of the 1,328 CAHs that were certified in 2011, 1,080 (81.3%) submitted data on at least one measure, including inpatient, outpatient and/or HCAHPS data. Just under one third of CAHs (29.8%) only submitted inpatient data. Slightly less than one fourth (23.4%) of CAHs submitted inpatient and HCAHPS data, while 9.5% submitted inpatient and outpatient data, and 17.0% of CAHs submitted all three types of data.

Table 2. Critical Access Hospital (CAH) participation in Hospital Compare by state for 2011 discharges (Inpatient Measures)

State[1]	Total Number of CAHs[2]	Percent of CAHs Participating in Hospital Compare[3]	State	Total Number of CAHs	Percent of CAHs Participating in Hospital Compare
Alabama	2	100.0%	Nebraska	65	100.0%
Alaska	13	69.2%	Nevada	11	36.4%
Arizona	14	71.4%	New Hampshire	13	100.0%
Arkansas	29	96.6%	New Mexico	8	100.0%
California	31	64.5%	New York	13	100.0%
Colorado	29	62.1%	North Carolina	23	82.6%
Florida	13	69.2%	North Dakota	36	83.3%
Georgia	34	76.5%	Ohio	34	85.3%
Hawaii	9	44.4%	Oklahoma	34	88.2%
Idaho	27	55.6%	Oregon	25	92.0%
Illinois	51	86.3%	Pennsylvania	13	100.0%
Indiana	35	94.3%	South Carolina	5	100.0%
Iowa	82	87.8%	South Dakota	38	55.3%
Kansas	83	69.9%	Tennessee	17	76.5%
Kentucky	29	100.0%	Texas	79	43.0%
Louisiana	27	51.9%	Utah	11	54.5%
Maine	16	100.0%	Vermont	8	100.0%
Massachusetts	3	100.0%	Virginia	7	85.7%
Michigan	36	83.3%	Washington	38	94.7%
Minnesota	79	98.7%	West Virginia	18	83.3%
Mississippi	32	53.1%	Wisconsin	58	91.4%
Missouri	36	77.8%	Wyoming	16	100.0%
Montana	48	75.0%	All States	1328	79.7%

1. Five states (Connecticut, Delaware, Maryland, New Jersey and Rhode Island) do not have any CAHs.
2. Number of CAHs certified as of December 2011.
3. Participation was defined as providing data on at least one patient for one inpatient measure.

Data sources: Hospital Compare data for 2011 discharges downloaded from CMS website October 2012 and Flex Monitoring Team CAH database.

Reporting on Inpatient Process of Care Measures

Table 2 shows the number of CAHs in each state as of December 2011 and the percent of CAHs that were participating in Hospital Compare by submitting data on inpatient measures for 2011 discharges. Overall, a total of 1,059 CAHs (79.7%) submitted data on at least one inpatient measure. This rate is slightly lower than the overall rate of 81.3%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 79.7% 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 2011 ranged from 36.4% to 100%. Of the 45 states in the Flex Program, 12 states had 100% of their CAHs publicly reporting in 2011, while three states had less than half of their CAHs reporting.

The overall CAH participation rate of 79.7% for 2011 inpatient discharges compares to previous rates of 41% (2004); 53% (2005); 63% (2006); 69% (2007); 70% (2008); 71% (2009); and 73.6% for 2010 (Figure 1).

Figure 2 shows the percent of CAHs that participated in Hospital Compare for 2011 inpatient discharges by date of CAH certification. From 2000 through 2005, between 138 and 223 CAHs were certified each year; the number of CAHs certified annually decreased significantly in 2006-2011. CAHs certified prior to 2000 and during 2006, 2007, 2010 and 2011 have the lowest Hospital Compare participation rates. The lower participation rate among more 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 (90.0%) than non-accredited CAHs (75.3%) 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, since the Joint Commission has required accredited hospitals to report performance measurement data since 2002, and it initiated public reporting of core measure data in 2004 (although accredited CAHs do have the option of sharing data with Joint Commission surveyors rather than publicly reporting it).

Although accredited CAHs are more likely to participate in Hospital Compare, many CAHs are

Figure 1. CAH participation in Hospital Compare for inpatient discharges 2004-2011

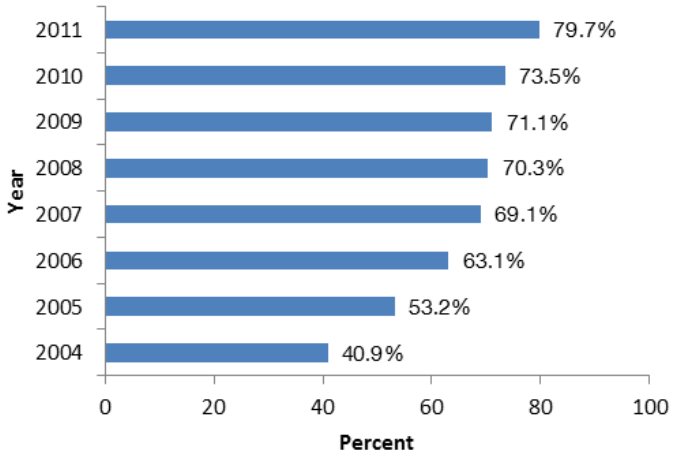
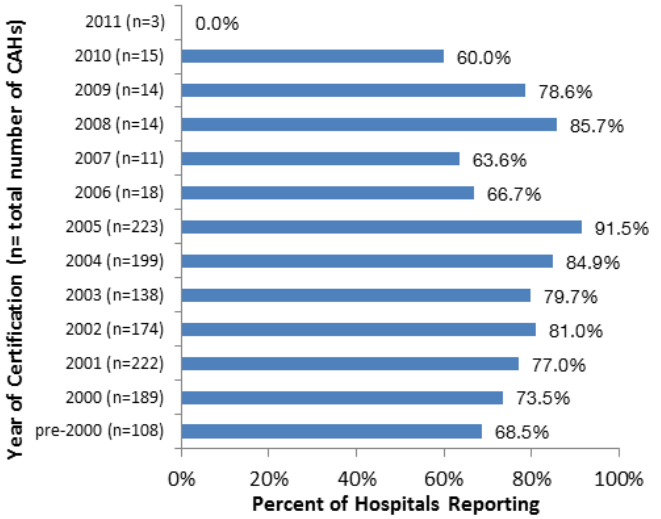


Figure 2. Percent of CAHs participating in Hospital Compare for 2011 inpatient discharges by year of CAH certification



not accredited; thus 66% of the CAHs that participated in Hospital Compare were not accredited. Eighty-seven percent of private non-profit CAHs participated in Hospital Compare, compared to 73% of those with government/public ownership and 69% of for-profit CAHs.

CAHs that participate in Hospital Compare have more beds on average (23.0 vs. 19.8) and a higher average daily census (21.5 vs. 17.1) 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	90.0%
Not accredited	926	75.3%
Ownership		
Government/public	547	72.8%
Private non-profit	708	86.3%
For profit	73	68.5%
	CAHs that participate in Hospital Compare	CAHs that do not participate in Hospital Compare
Size	Mean (Std. Dev.)	Mean (Std. Dev.)
Number of Beds	23.0 (4.2)	19.8 (7.2)
Average Daily Census	21.5 (26.5)	17.1 (18.9)

Data sources: Hospital Compare data for 2011 discharges, American Hospital Association Annual Survey data FY 2010, and Flex Monitoring Team CAH database.

Reporting on Outpatient Process of Care Measures

A total of 362 CAHs (27.3%) publicly reported data on at least one outpatient process of care measure for 2011 discharges (Table 4). By state, the percent of CAHs reporting outpatient process of care measures ranged from 0% to 100%.

Table 4. Critical Access Hospital (CAH) reporting of outpatient measures to Hospital Compare by state for 2011 discharges

State[1]	Total Number of CAHs[2]	Percent of CAHs reporting outpatient measures[3]	State	Total Number of CAHs	Percent of CAHs reporting outpatient measures
Alabama	2	100.0%	Nebraska	65	15.4%
Alaska	13	7.7%	Nevada	11	18.2%
Arizona	14	7.1%	New Hampshire	13	46.2%
Arkansas	29	13.8%	New Mexico	8	25.0%
California	31	19.4%	New York	13	84.6%
Colorado	29	17.2%	North Carolina	23	26.1%
Florida	13	30.8%	North Dakota	36	13.9%
Georgia	34	29.4%	Ohio	34	23.5%
Hawaii	9	11.1%	Oklahoma	34	70.6%
Idaho	27	14.8%	Oregon	25	20.0%
Illinois	51	25.5%	Pennsylvania	13	23.1%
Indiana	35	42.9%	South Carolina	5	20.0%
Iowa	82	24.4%	South Dakota	38	10.5%
Kansas	83	12.0%	Tennessee	17	47.1%
Kentucky	29	17.2%	Texas	79	10.1%
Louisiana	27	22.2%	Utah	11	45.5%
Maine	16	18.8%	Vermont	8	0.0%
Massachusetts	3	0.0%	Virginia	7	28.6%
Michigan	36	33.3%	Washington	38	34.2%
Minnesota	79	89.9%	West Virginia	18	16.7%
Mississippi	32	18.8%	Wisconsin	58	36.2%
Missouri	36	8.3%	Wyoming	16	43.8%
Montana	48	12.5%	All States	1328	27.3%

1. Five states (Connecticut, Delaware, Maryland, New Jersey and Rhode Island) do not have any CAHs.
2. Number of CAHs certified as of December 2011.
3. Participation was defined as providing data on at least one patient for one outpatient measure.

Data sources: Hospital Compare data for 2011 discharges downloaded from CMS website October 2012 and Flex Monitoring Team CAH database.

HCAHPS Reporting

Nationally, 41.3% of CAHs publicly reported HCAHPS survey data to Hospital Compare in 2011 (Table 5). By state, the percent of CAHs publicly reporting HCAHPS data ranged from 0% to 100% of CAHs. Three states had 100% of their CAHs reporting HCAHPS data.

Table 5. Critical Access Hospital (CAH) reporting of HCAHPS survey results to Hospital Compare by state for 2011 discharges

State[1]	Total Number of CAHs[2]	Percent of CAHs reporting HCAHPS Results
Alabama	2	50.0%
Alaska	13	15.4%
Arizona	14	28.6%
Arkansas	29	13.8%
California	31	38.7%
Colorado	29	37.9%
Florida	13	30.8%
Georgia	34	20.6%
Hawaii	9	0.0%
Idaho	27	25.9%
Illinois	51	43.1%
Indiana	35	65.7%
Iowa	82	46.3%
Kansas	83	13.3%
Kentucky	29	41.4%
Louisiana	27	29.6%
Maine	16	100.0%
Massachusetts	3	100.0%
Michigan	36	52.8%
Minnesota	79	65.8%
Mississippi	32	9.4%
Missouri	36	27.8%
Montana	48	27.1%
Nebraska	65	41.5%
Nevada	11	18.2%
New Hampshire	13	53.8%
New Mexico	8	62.5%
New York	13	61.5%
North Carolina	23	47.8%
North Dakota	36	13.9%
Ohio	34	85.3%
Oklahoma	34	23.5%
Oregon	25	60.0%
Pennsylvania	13	30.8%
South Carolina	5	20.0%
South Dakota	38	50.0%
Tennessee	17	41.2%
Texas	79	19.0%
Utah	11	45.5%
Vermont	8	100.0%
Virginia	7	57.1%
Washington	38	39.5%
West Virginia	18	66.7%
Wisconsin	58	84.5%
Wyoming	16	62.5%
All States	1328	41.3%

1. Five states (Connecticut, Delaware, Maryland, New Jersey and Rhode Island) do not have any CAHs.
2. Number of CAHs certified as of December 2011.

Data sources: HCAHPS data for 2011 discharges downloaded from CMS Hospital Compare website October 2012 and Flex Monitoring Team CAH database.

CMS recommends that each hospital obtains 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 20% of reporting CAHs had 300 or more completed surveys (Table 6). The vast majority of reporting CAHs (87%) had survey response rates of 25% to 50%. During this time period, the average survey response rate for all hospitals reporting HCAHPS data to Hospital Compare was 32%.[12]

Table 6. Completed HCAHPS surveys and response rates for Critical Access Hospitals (CAHs) nationally in 2011

Total CAHs reporting HCAHPS data	Total Number of CAHs[2] Percent of CAHs reporting HCAHPS Results			State Total Number of CAHs Percent of CAHs reporting HCAHPS Results		
	<100 surveys	100-299 surveys	≥300 surveys	< 25%	25-50%	> 50%
548	132 (24.1%)	309 (56.4%)	107 (19.5%	53 (9.7%	476 (86.7%)	19 (3.5%)

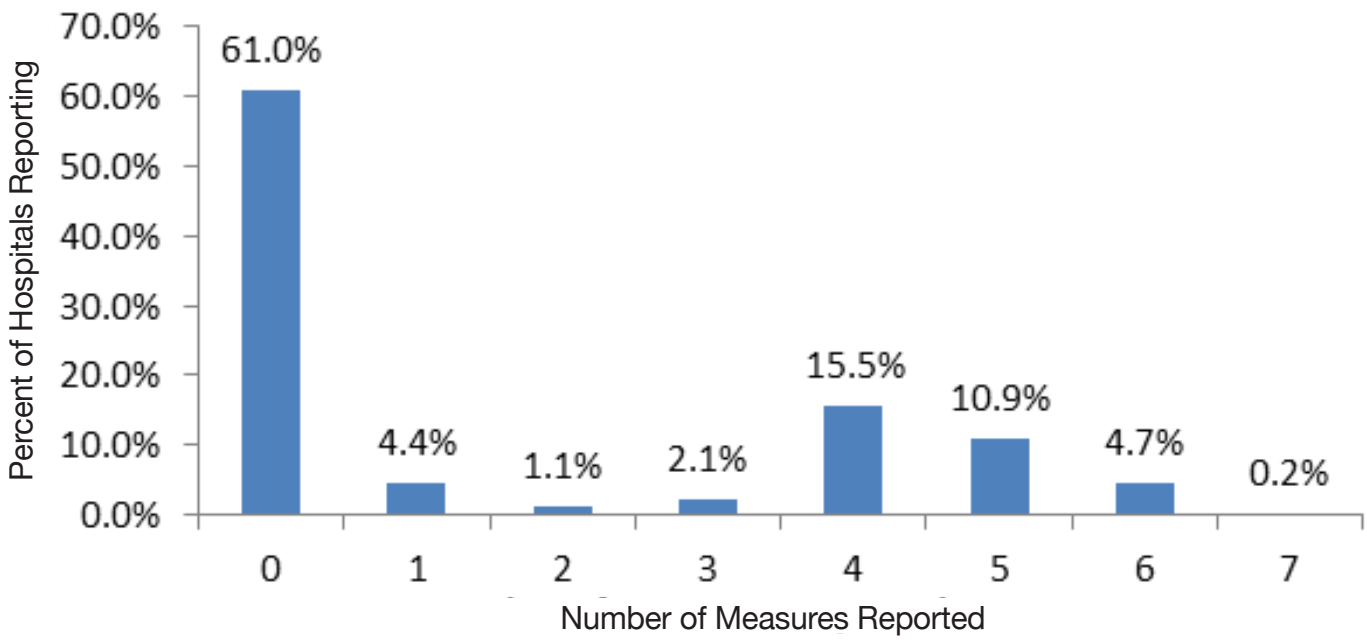
Data sources: HCAHPS data for 2011 discharges downloaded from CMS Hospital Compare website October 2012.

CAH Reporting by Condition

Data for three inpatient measures (AMI percutaneous coronary intervention (PCI), fibrinolytic w/in 30 minutes of arrival, and controlled 6AM post-op blood glucose for cardiac surgery patients) were not included in the report because the total number of CAH patients nationally was less than 25. CAHs do not usually provide cardiac surgery or procedures like PCI, which require specialized equipment and cardiology expertise not usually present in CAHs.

Overall, 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.) Among all 1328 CAHs, 61% did not report data on any inpatient AMI measures, while 33% reported data on three or more measures (Figure 3).

Figure 3. Critical Access Hospital (CAH) reporting of AMI measures, 2011 (n=1,328 CAHs)



Almost half (48%) of all CAHs reported data on all four heart failure measures, while 25% did not report data on any heart failure measures (Figure 4). Sixty-one percent of all CAHs reported data on all six pneumonia measures and an additional 11% reported data on five measures; 22% did not report data on any pneumonia measures (Figure 5).

Figure 4. CAH reporting of heart failure measures, 2011

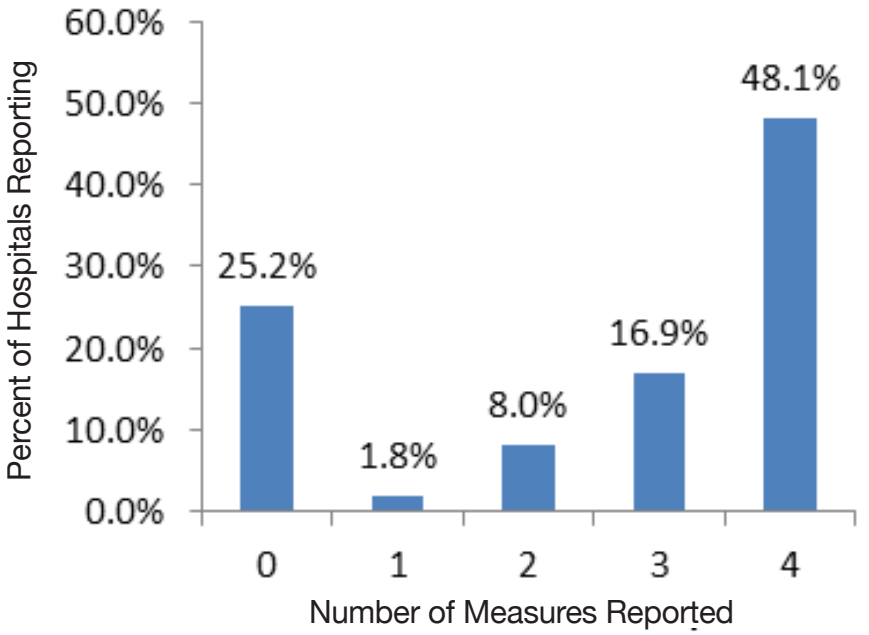
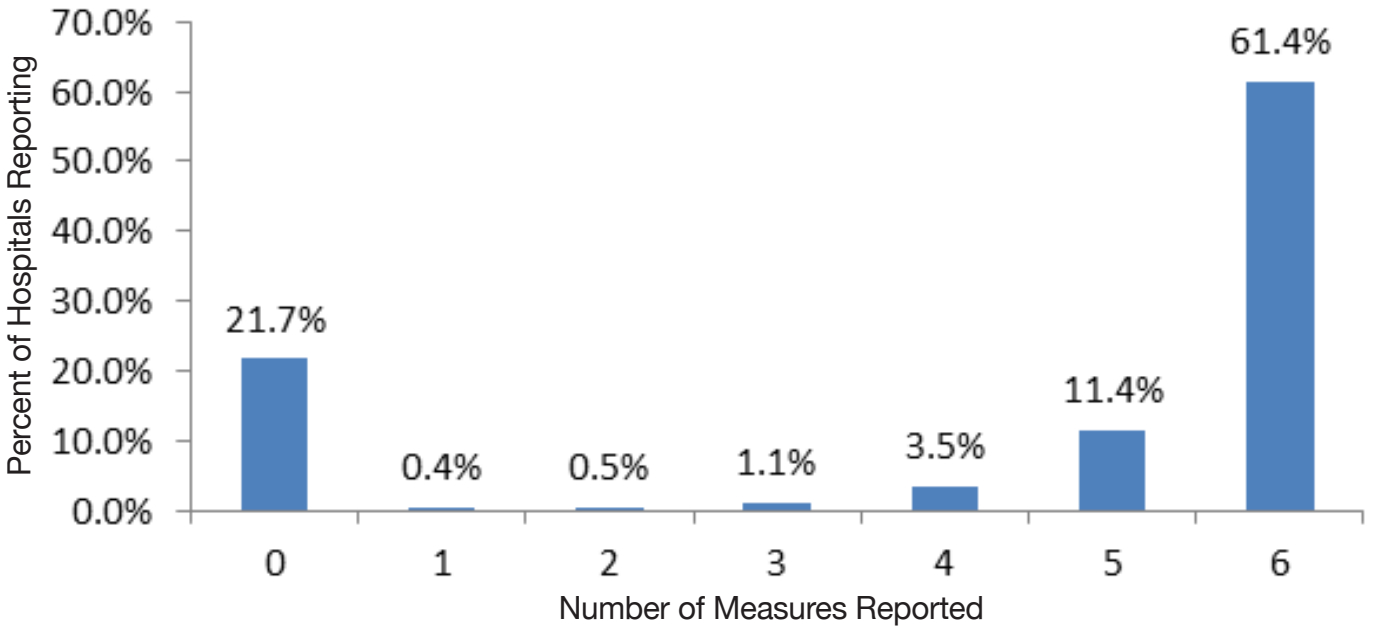


Figure 5. CAH reporting of pneumonia measures, 2011 (n=1,328 CAHs)



Approximately 20% of CAHs do not provide inpatient surgery. Among the 1,052 CAHs that provide inpatient surgery (based on AHA Annual Survey data), 53% did not report data on any surgical care improvement measures, while 42% reported data on at least six measures (Figure 6). Among all 1,328 CAHs, 27% reported data on one or more outpatient measures (Figure 7).

Figure 6. CAH reporting of surgical care improvement measures, 2011 (n=1,328 CAHs)

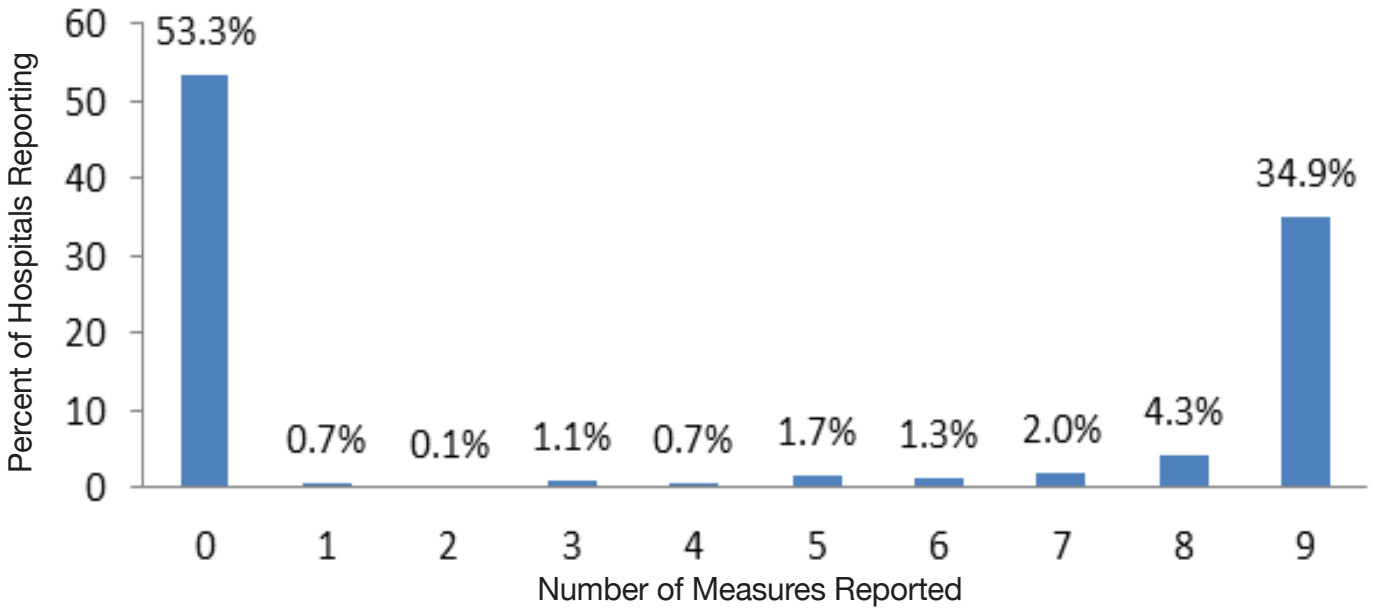
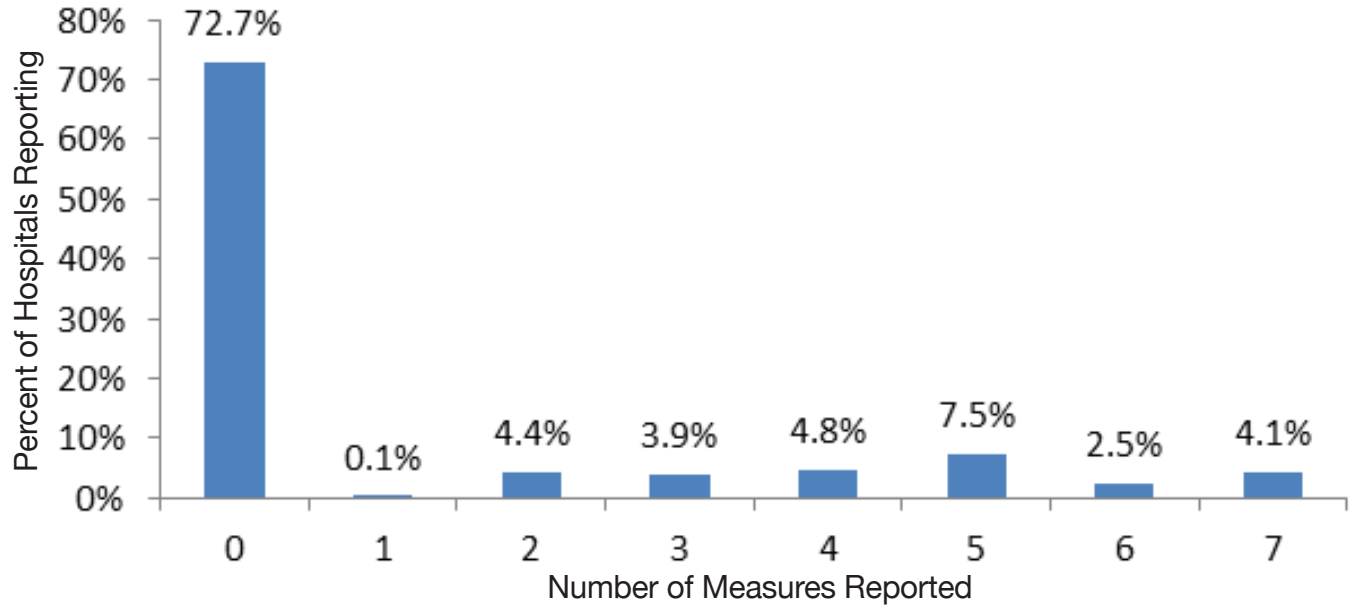


Figure 7. CAH reporting of outpatient measures, 2011 (n=1,328 CAHs)



CAH 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; this total includes CAHs with 1-10 patients whose data was suppressed by CMS. It also shows the number of CAHs with data 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.) Very few CAHs reported data for 25 or more patients on all of the inpatient AMI measures, two heart failure measures (ACE inhibitor, smoking cessation advice), and three outpatient measures (OP median time to fibrinolysis, OP fibrinolytic within 30 minutes of arrival and median minutes before OP with CP/AMI transferred.)

Table 7. CAHs reporting and number of CAH patients by measure for 2011 discharges

		# of CAHs reporting data for ≥1 patient[1]	#of CAHs reporting data for ≥25 patients	Total # of patients with data for analysis[2]
Inpatient AMI	Inpatient: Aspirin at arrival	502	2	735
	Aspirin at discharge	435	1	274
	ACEI or ARB for LVSD	167	0	3
	Smoking cessation advice	111	0	15
	Beta blocker at discharge	450	1	259
	Inpatient: fibrinolytic w/in 30 minutes of arrival	27	0	0
	PCI at arrival	1	0	0
	Statin at Discharge	422	1	262
Outpatient AMI/Chest Pain	OP Median Time to Fibrinolysis	157	0	41
	Outpatient: fibrinolytic w/in 30 minutes of arrival	157	0	41
	Median minutes before OP with CP/AMI transferred	207	2	289
	Outpatient: Aspirin at arrival	360	179	11,483
	Median minutes to ECG for OP with CP/AMI	361	188	12,011
Heart Failure	Discharge instructions	961	185	11,884
	Assessment of LVS	990	329	18,840
	ACE inhibitor or ARB for LVSD	804	3	2,197
	Smoking cessation advice	709	0	536
Pneumonia	Pneumococcal vaccination	1,035	513	29,971
	Blood culture prior to first antibiotic	964	395	23,529
	Smoking cessation advice	955	69	6,666
	Initial antibiotic(s) within 6 hours	963	471	28,044
	Most appropriate initial antibiotic(s)	1,018	407	22,387
	Influenza vaccination	965	48	6,694

Table 7. CAHs reporting and number of CAH patients by measure for 2011 discharges

		# of CAHs reporting data for ≥1 patient[1]	#of CAHs reporting data for ≥25 patients	Total # of patients with data for analysis[2]
Inpatient Surgical Care Improvement	Inpatient: Preventative antibiotic(s) 1 hour before incision	455	229	18,784
	Inpatient: Received appropriate preventative antibiotic(s)	453	230	18,815
	Preventative antibiotic(s) stopped within 24 hours after surgery	453	225	18,355
	Doctors ordered blood clot prevention treatments	456	238	18,553
	Received blood clot prevention treatments 24 hours pre/post surgery	453	236	18,431
	Controlled 6AM post-op blood glucose	0	0	0
	Appropriate hair removal	474	266	25,169
	Beta blockers before/after surgery	414	71	5,398
	Urinary Catheter removed 1st/2nd day after surgery	434	163	12,171
	Surgery Patients with Perioperative Temperature Management	479	270	25,981
Outpatient Surgical Care Improvement	Outpatient: Preventative antibiotic(s) 1 hour before incision	188	36	2,239
	Outpatient: Received appropriate preventative antibiotic(s)	177	37	2,345

[1]Includes CAHs with 1-10 patients whose data was suppressed by CMS.
[2]Does not include patients whose data was suppressed by CMS.
Data source: Hospital Compare data for Jan - Dec 2011, downloaded from CMS website October 2012

The last column in Table 7 shows the total number of CAH patients **with data for analysis**, i.e., numerators and denominators that could be used to calculate the percent of patients receiving recommended care. Because of the CMS data suppression policy, data from CAHs with 1-10 patients was not available for analysis.

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 2005-2011 time period for each group of hospitals.

As with our previous analyses of Hospital Compare data, several caveats are necessary in evaluating these results. Although the percent of CAHs participating in Hospital Compare has increased, participating and non-participating CAHs still differ significantly on several organizational characteristics (e.g., average number of beds, average daily census, accreditation status, type of ownership, and year of CAH certification). Thus, the quality measure results for CAHs that voluntarily participate in Hospital Compare may not be representative of all CAHs.

In comparing the results for CAHs with rural and urban PPS hospitals, it is important to recognize that hospital characteristics such as patient volume, the size and composition of medical and nursing staff, financial resources, and the availability of technology may influence the measurement of quality as well as the provision of care in the hospital environment.

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

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

CAHs by Accreditation Status and Ownership

Table 8 compares the quality measure results for accredited and non-accredited CAHs:

Table 8. Percent of patients receiving recommended care in accredited and non-accredited CAHs in 2011

	Measure	Percent of patients		Significance of differences
		Accredited (n=362)	Non-accredited (n=697)	
Inpatient AMI	Inpatient: Aspirin at arrival	96.6	95	NS
	Aspirin at discharge	94	91.5	NS
	ACEI or ARB for LVSD	100	100	*
	Smoking cessation advice	100	0	*
	Beta blocker at discharge	94.2	89.3	NS
	Inpatient: Fibrinolytic w/in 30 minutes of arrival	*	*	*
	PCI at arrival	*	*	*
	Statin at Discharge	77.7	74.6	NS

Note: NS - Not Significant; * - Insufficient data for significance tests

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	Measure	Percent of patients		Significance of differences
		Accredited (n=362)	Non-accredited (n=697)	
Heart Failure	Discharge instructions	87.8	79.9	<0.001
	Assessment of LVS	92.4	83.4	<0.001
	ACE inhibitor or ARB for LVSD	88.5	87	NS
	Smoking cessation advice	92.1	89.3	NS
Pneumonia	Pneumococcal vaccination	92.2	88	<0.001
	Blood culture prior to first antibiotic	94.8	93.9	0.004
	Smoking cessation advice	94.3	87.8	<0.001
	Initial antibiotic(s) within 6 hours	96.2	95.6	0.01
	Most appropriate initial antibiotic(s)	90.5	88.2	<0.001
	Influenza vaccination	90.8	87.1	<0.001
Inpatient Surgical Care	Preventative antibiotic(s) 1 hour before incision	95.6	94.5	<0.001
	Received appropriate preventative antibiotic(s)	97.6	97.6	NS
	Preventative antibiotic(s) stopped within 24 hours	95.1	93.4	<0.001
	Doctors ordered blood clot prevention treatments	95.8	95.3	NS
	Received blood clot prevention treatments within 24 hrs.	95.4	94.8	NS
	Controlled 6AM post-op blood glucose	*	*	*
	Appropriate Hair Removal	99.6	99.4	0.005
	Beta blockers before/after surgery	94	89.2	<0.001
	Patients with Perioperative Temperature Management	98.6	99.1	<0.001
	Urinary Catheter removed 1st/2nd day after surgery	94.2	93.5	NS
Outpatient	AMI/Chest Pain: Aspirin at arrival	96	96.3	NS
	AMI/Chest Pain: Fibrinolytic w/in 30 minutes of arrival	83.3	75.9	*
	Surgical Care: Preventative antibiotic(s) 1 hour before incision	90.7	85.8	<0.001
	Surgical Care: Received appropriate preventative antibiotic(s)	92.3	94.9	0.02

Note: NS - Not Significant; * - Insufficient data for significance tests

Differences between the two groups were not statistically significant for 10 inpatient measures and 1 outpatient measure. Thirteen inpatient measures and one outpatient measure were significantly higher for accredited CAHs and one inpatient and one outpatient measure were significantly higher for non-accredited CAHs. There was insufficient data to compare six measures.

Table 9 compares the quality measure results for CAHs by type of ownership:

Table 9. Percent of patients receiving recommended care in CAHs by ownership type in 2011

	Measure	Percent of patients			Significance of differences		
		Public/ Gov't CAHs *n= 398*	Non-profit CAHs *n= 611*	For profit CAHs *n= 50*	Public/ Gov't and non-profit CAHs	Public/ Gov't and for profit CAHs	Non-profit and for profit CAHs
Inpatient AMI	Aspirin at arrival	96.5	95.8	91.7	NS	*	*
	Aspirin at discharge	94.7	92.8	92.3	NS	*	*
	ACEI or ARB for LVSD	100	100	*	*	*	*
	Smoking cessation advice	0	100	*	*	*	*
	Beta blocker at discharge	88.9	92.9	84.6	NS	*	*
	Fibrinolytic w/in 30 minutes of arrival	*	*	*	*	*	*
	PCI at arrival	*	*	*	*	*	*
	Statin at Discharge	64.9	78.9	66.7	NS	*	*
Heart Failure	Discharge instructions	80.7	86.6	73.5	<0.001	<0.001	<0.001
	Assessment of LVS	84.5	90	81.5	<0.001	0.02	<0.001
	ACE inhibitor or ARB for LVSD	87	89.2	81.7	NS	NS	0.004
	Smoking cessation advice	92	92.1	81.7	NS	0.02	0.01
Pneumonia	Pneumococcal vaccination	86	92.1	88.3	<0.001	0.01	<0.001
	Blood culture prior to first antibiotic	93.2	94.9	95.3	<0.001	0.008	NS
	Smoking cessation advice	88.6	93.8	83.2	<0.001	0.004	<0.001
	Initial antibiotic(s) within 6 hours	95.4	96.4	94.2	<0.001	NS	<0.001
	Most appropriate initial antibiotic(s)	86.6	90.8	87.3	<0.001	NS	<0.001
	Influenza vaccination	86.1	91.1	83	<0.001	NS	<0.001
Inpatient Surgical Care	Preventative antibiotic(s) 1 hour before incision	94	95.6	92.9	<0.001	NS	<0.001
	Received appropriate preventative antibiotic(s)	97.1	97.9	95.7	<0.001	0.04	<0.001
	Preventative antibiotic(s) stopped within 24 hrs.	93.5	94.6	95.2	0.005	NS	NS
	Blood clot prevention treatments ordered	94.9	95.9	95.6	0.004	NS	NS
	Received blood clot prevention within 24 hrs.	94.6	95.4	94	0.02	NS	NS
	Controlled 6AM post-op blood glucose	*	*	*	*	*	*
	Appropriate Hair Removal	99.3	99.6	98.7	0.005	0.03	<0.001
	Beta blockers before/after surgery	89.6	93.4	81.4	<0.001	<0.001	<0.001
	Patients with Perioperative Temp. Management	97.5	99.2	98.6	<0.001	0.03	0.02
	Urinary Catheter removed 1st/2nd day after surgery	90.9	94.9	95.8	<0.001	<0.001	NS

Note: NS - Not Significant; * - Insufficient data for significance tests

(continued, next page)

	Measure	Percent of patients			Significance of differences		
		Public/ Gov't CAHs *n= 398*	Non-profit CAHs *n= 611*	For profit CAHs *n= 50*	Public/ Gov't and non-profit CAHs	Public/ Gov't and for profit CAHs	Non-profit and for profit CAHs
Outpatient	Preventative antibiotic(s) 1 hour before incision	83	89.8	98.5	<0.001	<0.001	0.001
	Aspirin at arrival	95.8	96.5	93.5	NS	0.007	<0.001
	Fibrinolytic w/in 30 minutes of arrival	73.3	80.8	*	*	*	*
	Received appropriate preventative antibiotic(s)	90.2	93.9	95.3	0.005	NS	NS

Note: NS - Not Significant; * - Insufficient data for significance tests

The number of participating for-profit CAHs is small. Consequently, this group of CAHs had a total of less than 25 patients for four AMI measures and one surgical care improvement; public/government CAHs also had less than 25 patients for two AMI measures, one surgical care improvement measure and two outpatient measures.

Differences in the quality measure results for private non-profit CAHs and public/ government owned CAHs showed a statistically significant greater percentage of patients received recommended care for 19 measures at private non-profit CAHs than at public/government CAHs. There were no significant findings in 7 other comparisons, and 9 measures did not have enough data.

Differences between public/government owned CAHs and for-profit CAHs showed significantly higher rates of recommended care for eight measures and significantly lower rates of recommended care for five measures in public/ government owned CAHs as compared to for-profit CAHs. There were no significant differences for eight other measures and not enough data to calculate for 14 other measures.

Compared to for-profit CAHs, private non-profit CAHs had significantly higher percentages of patients receiving recommended care for 15 measures and a significantly lower percentage for one measure. There were no significant differences for six measures and not enough data to calculate differences for 13 other measures.

CAHs and PPS Hospitals

Table 10 compares results for CAH patients with rural PPS patients nationally. Compared to rural PPS patients, the percent of CAH patients receiving recommended care in 2011 was significantly lower on 28 measures. For five measures, differences between CAH patients and rural PPS patients could not be calculated and for one measure the difference was not significant.

Table 10. Percent of Patients Receiving Recommended Inpatient Care in CAHs and Rural PPS Hospitals in 2011

	Measure	Percent of patients		Significance of differences
		CAHs (n=1,059)	Rural PPS Hospitals (n=927)	
Inpatient AMI	Inpatient: Aspirin at arrival	95.8	98.8	<0.001
	Aspirin at discharge	93.1	98.5	<0.001
	ACEI or ARB for LVSD	100.0	97.0	*
	Smoking cessation advice	93.3	99.7	*
	Beta blocker at discharge	91.9	98.4	<0.001
	Inpatient: Fibrinolytic w/in 30 minutes of arrival	*	73.9	*
	PCI at arrival	*	91.7	*
	Statin at Discharge	76.3	95.4	<0.001
Heart Failure	Discharge instructions	84.2	89.5	<0.001
	Assessment of LVS	87.9	97.1	<0.001
	ACE inhibitor or ARB for LVSD	88.0	93.9	<0.001
	Smoking cessation advice	90.9	98.7	<0.001
Pneumonia	Pneumococcal vaccination	90.0	95.1	<0.001
	Blood culture prior to first antibiotic	94.4	96.6	<0.001
	Smoking cessation advice	91.7	97.8	<0.001
	Initial antibiotic(s) within 6 hours	95.9	96.5	<0.001
	Most appropriate initial antibiotic(s)	89.4	93.6	<0.001
	Influenza vaccination	89.1	93.0	<0.001
Inpatient Surgical Care	Inpatient: Preventative antibiotic(s) 1 hour before incision	95.1	97.8	<0.001
	Inpatient: Received appropriate preventative antibiotic(s)	97.6	97.9	0.01
	Preventative antibiotic(s) stopped within 24 hrs	94.4	96.4	<0.001
	Doctors ordered blood clot prevention treatments	95.6	96.8	<0.001
	Received blood clot prevention treatments within 24 hrs	95.2	96.0	<0.001
	Controlled 6AM post-op blood glucose	*	95.5	*
	Appropriate Hair Removal	99.5	99.9	<0.001
	Beta blockers before/after surgery	92.1	95.2	<0.001
	Surgery Patients with Perioperative Temp. Management	98.8	99.5	<0.001
	Urinary Catheter removed 1st/2nd day after surgery	93.9	93.4	NS
Outpatient	Preventative antibiotic(s) 1 hour before incision	88.8	94.8	<0.001
	Aspirin at arrival	96.1	96.7	0.003
	Fibrinolytic w/in 30 minutes of arrival	78.0	67.4	NS
	Received appropriate preventative antibiotic(s)	93.2	95.9	<0.001

NS-Not Significant; *Insufficient data for significance tests; the total number of CAH patients nationally with data on this measure was less than 25.

Table 11. Percent of Patients Receiving Recommended Outpatient Care in CAHs and Rural PPS Hospitals in 2011

	Measure	Percent of patients		Significance of differences
		CAHs (n=362)	Rural PPS Hospitals (n=889)	
Outpatient	Preventative antibiotic(s) 1 hour before incision	88.8	94.8	<0.001
	Aspirin at arrival	96.1	96.7	0.003
	Fibrinolytic w/in 30 minutes of arrival	78.0	67.4	NS
	Received appropriate preventative antibiotic(s)	93.2	95.9	<0.001

NS-Not Significant

Tables 12 and 13 compare results for CAH patients with urban PPS patients nationally. Compared to urban PPS patients, the percent of CAH patients receiving recommended care in 2011 was significantly lower on 26 measures. For five measures, differences between CAH patients and urban PPS patients could not be calculated due to a lack of data and for one measure there was no significant difference.

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 12. Percent of Patients Receiving Recommended Inpatient Care in CAHs and Urban PPS Hospitals in 2011

	Measure	Percent of patients		Significance of differences
		CAHs (n=1,059)	Urban PPS Hospitals (n=2,390)	
Inpatient AMI	Inpatient: Aspirin at arrival	95.8	99.3	<0.001
	Aspirin at discharge	93.1	99.2	<0.001
	ACEI or ARB for LVSD	100	97.6	*
	Smoking cessation advice	93.3	99.8	*
	Beta blocker at discharge	91.9	99.1	<0.001
	Inpatient: Fibrinolytic w/in 30 minutes of arrival	*	70.2	*
	PCI at arrival	*	94.1	*
	Statin at Discharge	76.3	97.7	<0.001
Heart Failure	Discharge instructions	84.2	92.9	<0.001
	Assessment of LVS	87.9	99.4	<0.001
	ACE inhibitor or ARB for LVSD	88	96.7	<0.001
	Smoking cessation advice	90.9	99.5	<0.001

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	Measure	Percent of patients		Significance of differences
		CAHs (n=1,059)	Urban PPS Hospitals (n=2,390)	
Pneumonia	Pneumococcal vaccination	90	96.4	<0.001
	Blood culture prior to first antibiotic	94.4	97.2	<0.001
	Smoking cessation advice	91.7	99	<0.001
	Initial antibiotic(s) within 6 hours	95.9	96.2	0.01
	Most appropriate initial antibiotic(s)	89.4	95.8	<0.001
	Influenza vaccination	89.1	94.5	<0.001
Inpatient Surgical Care	Inpatient: Preventative antibiotic(s) 1 hour before incision	95.1	98.3	<0.001
	Inpatient: Received appropriate preventative antibiotic(s)	97.6	98.5	<0.001
	Preventative antibiotic(s) stopped within 24 hrs	94.4	97.2	<0.001
	Doctors ordered blood clot prevention treatments	95.6	98	<0.001
	Received blood clot prevention treatments within 24 hrs	95.2	97	<0.001
	Controlled 6AM post-op blood glucose	*	95.3	*
	Appropriate Hair Removal	99.5	99.9	<0.001
	Beta blockers before/after surgery	92.1	96.5	<0.001
	Surgery Patients with Perioperative Temp. Management	98.8	99.7	<0.001
	Urinary Catheter removed 1st/2nd day after surgery	93.9	94	NS
Outpatient	Preventative antibiotic(s) 1 hour before incision	88.8	94.8	<0.001
	Aspirin at arrival	96.1	96.7	0.003
	Fibrinolytic w/in 30 minutes of arrival	78.0	67.4	NS
	Received appropriate preventative antibiotic(s)	93.2	95.9	<0.001

NS-Not Significant; *Insufficient data for significance tests; the total number of CAH patients nationally with data on this measure was less than 25.

Table 13. Percent of Patients Receiving Recommended Outpatient Care in CAHs and Urban PPS Hospitals in 2011

	Measure	Percent of patients		Significance of differences
		CAHs (n=362)	Urban PPS Hospitals (n=2,289)	
Outpatient	Preventative antibiotic(s) 1 hour before incision	88.8	96.4	<0.001
	Aspirin at arrival	96.1	96.6	0.01
	Fibrinolytic w/in 30 minutes of arrival	78.0	65.6	NS
	Received appropriate preventative antibiotic(s)	93.2	96.4	<0.001

Inpatient Measure Trends over Time for CAHs and PPS Hospitals

Figures 8-28 in Appendix B show the data trends for 2006-2011 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 14.

Table 14. Number of Hospitals with Inpatient Process of Care Data by Hospital Type from 2006-2011

Hospital Type	2006	2007	2008	2009	2010	2011
CAHs	812	892	914	933	977	1,059
Rural PPS	1,004	993	973	958	941	927
Urban PPS	2,431	2,441	2,414	2,388	2,397	2,390

Figures 8-13 (Appendix B) show the six year trends for the pneumonia measures. Performance has improved for all three groups of hospitals and is similar (< 3% difference) on three pneumonia measures related to receipt of antibiotics and vaccination (Figures 8 - 10). 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 improved for all heart failure measures (Figures 14-17, appendix). The gap in performance between CAH and PPS hospitals narrowed for all four measures yet CAHs continue to have comparatively lower performance for all for measures. This difference is particularly striking for the Assessment of LVS measure (Figure 15) with over ten percentage points of difference between CAHs and urban PPS hospitals.

CAH performance improved throughout this time on most AMI measures (Figures 18-22). The performance by rural PPS and urban PPS hospitals was higher at the onset and continued to improve over the six-year time period, but due to more rapid improvement among CAHs, this gap has decreased. Furthermore, CAHs achieved higher performance than both other hospital groups in ACEI or ARB for LVSD (Figure 22).

Performance by all groups of hospitals on the inpatient surgical care improvement measures has consistently been high over the past three years (> 88%) and the difference in performance between CAH and PPS hospitals is relatively small (< 5%) (Figures 23-28).

Outpatient Measure Trends over Time for CAHs and PPS Hospitals

Figures 29-31 in Appendix B show the outpatient measure data trends 2009-2011 for CAHs, rural PPS, and urban PPS hospitals. Performance by all groups of hospitals on the outpatient AMI aspirin on arrival measure has been consistently high (Figure 29). On the outpatient surgery antibiotic timing measure (Figure 30), all groups have improved over time; the CAH rate remains a little lower than PPS hospitals. The CAH outpatient surgery appropriate antibiotic rate also remains a little lower (Figure 31.)

HCAHPS Survey Results for CAHs

Table 15 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 2011: CAHs nationally, and all other hospitals. For all HCAHPS measures, CAHs nationally had significantly higher mean scores than all other hospitals (p value < 0.0001).

Table 15. HCAHPS Results for CAHs Nationally for 2011

Percent of patients who reported that:	Mean (average) for:	
	CAHs Nationally (n=548)	All other hospitals (n=3,318)
Nurses always communicated well	81%*	77%
Doctors always communicated well	85%*	80%
Patient always received help as soon as wanted	74%*	64%
Pain was always well controlled	73%*	70%
Staff always explained about medications before giving them to patient	67%*	61%
Yes, staff gave patient information about what to do during recovery at home	85%*	83%
Area around patient room was always quiet at night	64%*	59%
Patient room and bathroom were always clean	80%*	71%
They gave an overall hospital rating of 9 or 10 (high) on 1-10 scale	73%*	68%
They would definitely recommend the hospital to friends and family	73%*	70%

*Results for CAHs are significantly higher than for all other hospitals; p value < 0.0001.

Mortality and Readmission Rates for CAHs

Table 16 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 2008 to June 2011 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.

Table 16. Number (Percent) of CAHs Nationally in Risk-adjusted Mortality Rate Categories

	Number of CAHs with:					
	Total	No rate data in Hospital Compare	Not enough cases to reliably calculate	Not different from U.S. rate for all hospitals	Better than U.S. rate for all hospitals	Worse than U.S. rate for all hospitals
AMI	1328	295 (22.1%)	944 (71.1%)	89 (6.7%)	0	0
Heart Failure	1328	204 (15.4%)	371 (27.9%)	741 (55.8%)	0	12 (0.9%)
Pneumonia	1328	198 (14.9%)	116 (8.7%)	970 (73.0%)	1 (0.1%)	43 (3.2%)

Nationally, 93% of CAHs either were missing AMI mortality data or had too few cases to reliably calculate a rate; the remaining 7% of CAHs did not have an AMI mortality 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 (57%) and pneumonia (76%). 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 4% of CAHs for pneumonia).

Table 17 shows the 30 day risk-adjusted readmission rates for AMI, heart failure, and pneumonia for CAHs nationally. For AMI, 98% of CAHs either were missing AMI readmission data or had too few cases to reliably calculate a rate, and the remaining 2% 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 (77%), but few CAHs had readmission rates that are either better than or worse than the US rates for all hospitals (0.1% of CAHs for heart failure and 0.2% of CAHs for pneumonia).

Table 17. Number (Percent) of CAHs Nationally in Risk-adjusted Readmission Rate Categories

	Number of CAHs with:					
	Total	**No rate data in Hospital Compare**	**Not enough cases to reliably calculate**	**Not different from U.S. rate for all hospitals**	**Better than U.S. rate for all hospitals**	**Worse than U.S. rate for all hospitals**
AMI	1328	340 (25.6%)	956 (72.0%)	32 (2.4%)	0	0
Heart Failure	1328	205 (15.4%)	309 (23.3%)	813 (61.2%)	0	1 (0.1%)
Pneumonia	1328	198 (14.9%)	105 (7.9%)	1,021 (76.9%)	0	3 (0.2%)

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

DISCUSSION AND CONCLUSIONS

The percent of CAHs reporting publicly on inpatient process of care measures increased from 73.5% for 2010 to 79.7% for 2011. Public reporting of outpatient process measures also increased from 21.2% of CAHs for 2010 to 27.3% for 2011. CAH reporting of HCAHPS measures increased from 38.0% in 2010 to 41.3% in 2011.

As with previous years, there was wide variation across the 45 Flex states in CAH reporting. For inpatient measures, twelve states had 100% of CAHs reporting while three states had less than half of CAHs reporting. Outpatient reporting ranged from 0% of CAHs in two states to 100% in one state, and HCAHPS reporting ranged from 0% in one state to 100% of CAHs in three states.

Quality measurement is an important component of health care reform efforts. CAHs will need to report quality measures to show meaningful use of electronic health records (EHRs) and to participate in payment reform initiatives, such as Accountable Care Organizations. In states where CAH reporting is lower than the national average, additional state initiatives may be necessary to encourage reporting. Efforts to assist CAHs in quality reporting and improvement in outcomes are underway as part of the MBQIP project and the Quality Improvement Organizations' (QIO) 10th Scope of Work.

For 2011 discharges, CMS instituted a policy of suppressing Hospital Compare data for hospitals that reported data for ten or fewer patients on a measure. CMS has agreed to provide the full reporting data to ORHP going forward in order to ensure continued access to all data reported by CAHs to Hospital Compare, including the suppressed data, for ongoing monitoring of CAH quality performance at the hospital, state and national levels. We anticipate being able to include these data in future reports on CAH reporting and quality measure results.

Hospital Compare and MBQIP have several pneumonia and heart failure measures in common. Hospital Compare also includes several additional quality measures that are relevant to CAHs. ORHP encourages CAHs to participate in both MBQIP and public reporting to Hospital Compare, and to report on all cases, regardless of low volume. MBQIP data reports include all cases that meet CMS inclusion criteria reported by CAHs, with no data suppression. As MBQIP continues to be implemented and more CAHs participate in MBQIP, CAH reporting to both MBQIP and Hospital Compare will continue to be analyzed.

ORHP encourages each State Flex program to continue working with the CAHs in their state to ensure that the CAHs are reporting their data. When MBQIP reports are received each quarter, this data should be used to engage CAHs in quality improvement activities that will lead to improvements in their quality measure outcomes.

CMS also made several changes to the Hospital Compare inpatient quality measure set that became effective starting with 2012 discharges.[11] These changes included:

- 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 was uniformly high nationwide (although CAH performance is not as high as other hospitals).
- Adding two new global influenza and pneumococcal vaccination measures.

The CMS changes to the Hospital Compare measure set are reducing the number of quality measures

for pneumonia and heart failure, which are the most common inpatient conditions in CAHs. They are also adding new inpatient and outpatient measures for other conditions, some of which are relevant to CAHs. Future reports will reflect these changes and monitor their impact on CAH participation in public reporting and quality performance.

REFERENCES

1. Casey, M. and Moscovice, I. CAH Participation in Hospital Compare and Initial Results. Flex Monitoring Team Briefing Paper No. 9, February 2006.
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.
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.
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. Casey, M., Burlew, M. and Moscovice, I. Critical Access Hospital Year 5 Hospital Compare Participation and Quality Measure Results. Flex Monitoring Team Briefing Paper No. 26, March 2010.
6. Casey, M., Burlew, M. and Moscovice, I. Critical Access Hospital Year 6 Hospital Compare Participation and Quality Measure Results. Flex Monitoring Team Briefing Paper No. 28, April 2011.
7. Casey, M., Barton, B., Hung, P. and Moscovice, I. Critical Access Hospital Year 7 Hospital Compare Participation and Quality Measure Results. Flex Monitoring Team Briefing Paper No. 30, April 2012.
8. State level reports are available on the Flex Monitoring Team website at http://www.flexmonitoring.org/indicators.shtml
9. Centers for Medicare and Medicaid Services (CMS). HCAHPS Fact Sheet. May 2012. Available at: http://www.hcahpsonline.org/files/ HCAHPS%20Fact%20Sheet%20May%202012.pdf
10. Measure Methodology Reports: Mortality Measures and Readmission Measures Overview. Available at: www.qualitynet.org.
11. Summary of HCAHPS Survey Results: October 2012 Public Report (January 2011 to December 2011 Discharges). Available at: www.hcahpsonline.org. Accessed June 21, 2013.
12. CMS. Specifications Manual for National Hospital Inpatient Quality Measures Discharges 01-01-12 (1Q121Q12) through 12-31-12 (4Q124Q12). Available at www.qualitynet.org.

HOSPITAL COMPARE PROCESS OF CARE MEASURES FOR 2011 DISCHARGES

Inpatient and Outpatient AMI and Chest Pain

Aspirin at arrival – Acute myocardial infarction (AMI) patients without aspirin contraindications who received aspirin within 24 hours before or after hospital arrival. (Is both an inpatient and outpatient measure.) (Measure suspended by CMS starting Q1 2012).

Aspirin at discharge – AMI patients without aspirin contraindications who were prescribed aspirin at hospital discharge.

ACEI or ARB for LVSD – (Angiotensin Converting Enzyme [ACE] Inhibitor or Angiotensin Receptor Blocker [ARB] for Left Ventricular Systolic Dysfunction) - AMI patients with left ventricular systolic dysfunction (LVSD) and without angiotensin converting enzyme inhibitor (ACE inhibitor) contraindications or angiotensin receptor blocker (ARB) contraindications who are prescribed an ACE inhibitor or an ARB at hospital discharge. (Measure suspended by CMS starting Q1 2012).

Beta blocker at discharge – AMI patients without beta-blocker contraindications who were prescribed a beta-blocker at hospital discharge. (Measure suspended by CMS starting Q1 2012).

Fibrinolytic medication within 30 minutes of arrival – AMI patients receiving fibrinolytic therapy during the hospital stay and having a time from hospital arrival to fibrinolysis of 30 minutes or less (this is both an inpatient and outpatient measure.)

PCI at arrival – Percutaneous Coronary Intervention (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 – AMI patients with a history of smoking cigarettes, who are given smoking cessation advice or counseling during a hospital stay. (Measure retired by CMS starting Q1 2012).

Time to Fibrinolysis - Median time from arrival to fibrinolysis for patients that received fibrinolysis.

Time to transfer for specialized care – median time to transfer to another facility for acute coronary intervention (this is only an outpatient measure.) Median number of minutes before outpatients with heart attack who needed specialized car were transferred to another hospital (a lower number of minutes is better)

Time to ECG – (This is only an outpatient measure.) Median number of minutes before outpatients with heart attack (or with chest pain that suggest a possible heart attack) got an ECG (a lower number of minutes is better)

Statin at discharge - AMI patients who are prescribed a statin at hospital discharge.

Heart Failure

Discharge instructions – Heart failure patients discharged home with written instructions or educational material given to patient or care giver at discharge or during the hospital stay addressing all of the following: activity level, diet, discharge medications, follow-up appointment, weight monitoring, and what to do if symptoms worsen.

Assessment of LVS – Evaluation of left ventricular systolic (LVS) function - Heart failure patients with documentation in the hospital record that an evaluation of the left ventricular systolic (LVS) function was performed before arrival, during hospitalization, or is planned for after discharge.

ACE inhibitor or ARB for LVSD – Heart failure patients with left ventricular systolic dysfunction (LVSD) and without angiotensin converting enzyme inhibitor (ACE inhibitor) contraindications or angiotensin receptor blocker (ARB) contraindications who are prescribed an ACE inhibitor or an ARB at hospital discharge.

Smoking cessation advice – Heart failure patients with a history of smoking cigarettes, who are given smoking cessation advice or counseling during a hospital stay. (Measure retired by CMS starting Q1 2012).

Pneumonia

Pneumococcal vaccination – Pneumonia inpatients age 65 and older who were screened for pneumococcal vaccine status and were administered the vaccine prior to discharge, if indicated. (Measure retired by CMS starting Q1 2012).

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.

Smoking cessation advice – Pneumonia patients with a history of smoking cigarettes, who are given smoking cessation advice or counseling during a hospital stay. (Measure retired by CMS starting Q1 2012).

Initial antibiotics within six hours – Pneumonia inpatients that receive within 6 hours after arrival at the hospital. Evidence shows better outcomes for administration times less than four hours. (Measure retired by CMS starting Q1 2012).

Most appropriate initial antibiotics – Immunocompetent patients with pneumonia who receive an initial antibiotic regimen that is consistent with current guidelines.

Influenza vaccination – Pneumonia patients age 50 years and older, hospitalized during October, November, December, January, or February who were screened for influenza vaccine status and were vaccinated prior to discharge, if indicated. (Measure retired by CMS starting Q1 2012).

Inpatient and Outpatient Surgical Care Improvement

Preventative antibiotics one hour before incision – Surgical patients who received prophylactic antibiotics within 1 hour prior to surgical incision. (This is both an inpatient and outpatient measure.)

Received appropriate preventative antibiotics – Prophylactic antibiotic selection – Surgical patients who received the recommended antibiotics for their particular type of surgery. (This is both an inpatient and outpatient measure.)

Preventative antibiotics stopped within 24 hours after surgery – Prophylactic antibiotics discontinued within 24 hours after surgery end time – Surgical patients whose prophylactic antibiotics were

discontinued within 24 hours after surgery end time.

Doctors ordered blood clot prevention treatments – Surgery patients with recommended venous thromboembolism prophylaxis ordered – Surgery patients with recommended venous thromboembolism (VTE) prophylaxis ordered anytime from hospital arrival to 48 hours after Surgery End Time. (Measure retired by CMS starting Q1 2013).

Received blood clot prevention treatments 24 hours pre/post-surgery – Surgery patients who received appropriate venous thromboembolism prophylaxis within 24 hours prior to surgery to 24 hours after surgery – Surgery patients who received appropriate venous thromboembolism (VTE) prophylaxis within 24 Hours prior to Surgical Incision Time to 24 Hours after Surgery End Time.

Controlled 6AM post-op blood glucose – 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 (POD 1) and postoperative day two (POD 2) with Surgery End Date being postoperative day zero (POD 0).

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. (Measure suspended by CMS starting Q1 2012).

Beta blockers before/after surgery – Surgery patients on a beta blocker prior to arrival who received a beta blocker during the perioperative period – Surgery patients who were taking heart drugs called 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.

Surgery Patients with Perioperative Temperature Management - Surgery patients for whom either active warming was used intraoperatively for the purpose of maintaining normothermia or who had at least one body temperature equal to or greater than 96.8° Fahrenheit/36° Celsius recorded within the 30 minutes immediately prior to or the 15 minutes immediately after Anesthesia End Time.

Source: Specifications Manual for National Hospital Quality Measures. Available at: http://www.qualitynet.org/dcs/ContentServer?c=Page&pagename=QnetPublic%2FPage%2FQnetTier4&cid=1228771525863. Accessed February 5, 2013.

Figure 8. Inpatient Pneumonia: Pneumococcal Vaccination

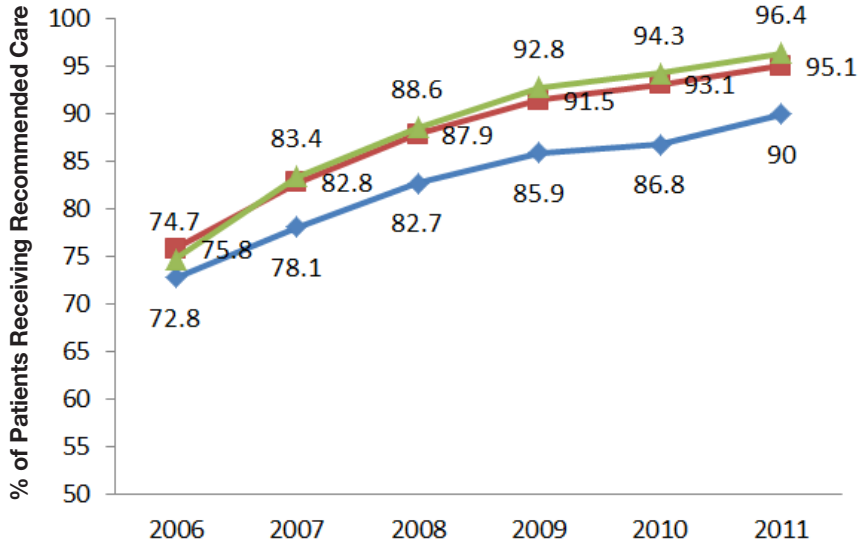


Figure 9. Inpatient Pneumonia: Blood Culture Prior to First Antibiotic

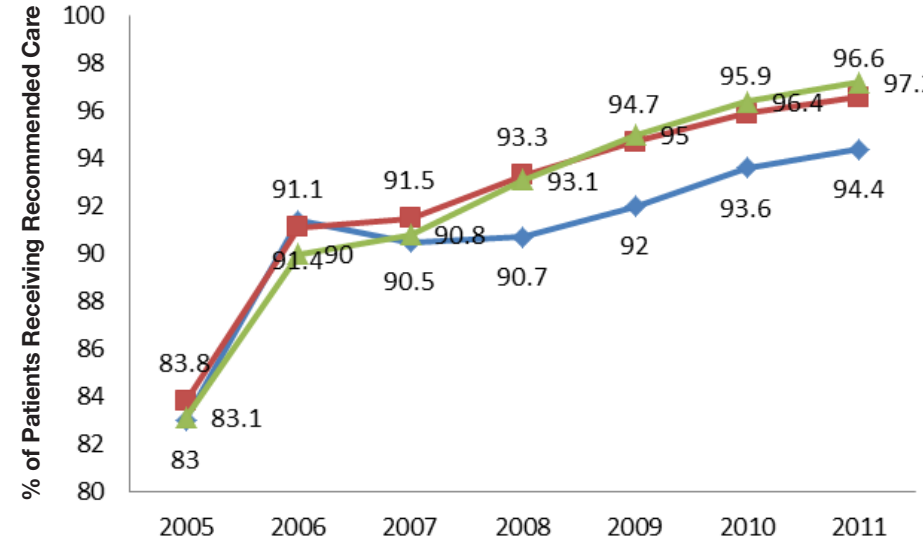


Figure 10. Inpatient Pneumonia: Initial Antibiotics within 6 Hours

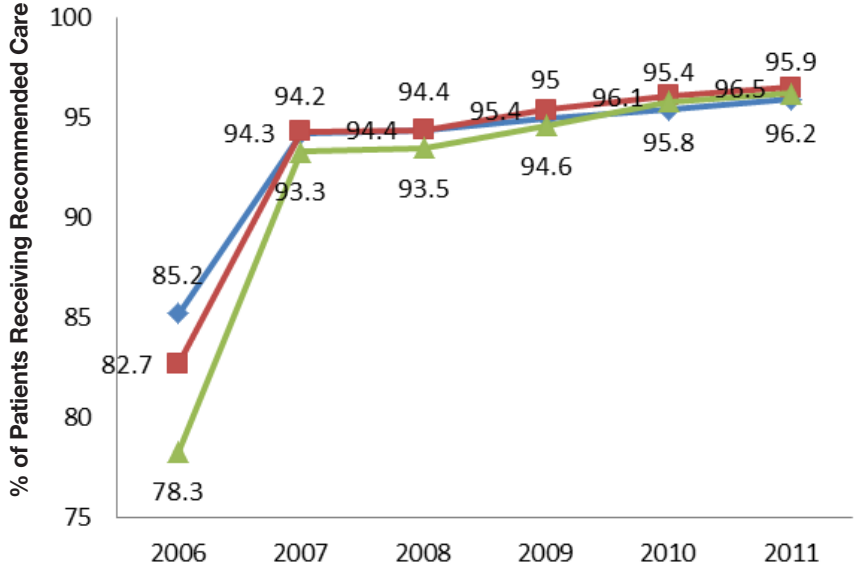


Figure 11. Inpatient Pneumonia: Smoking Cessation Advice

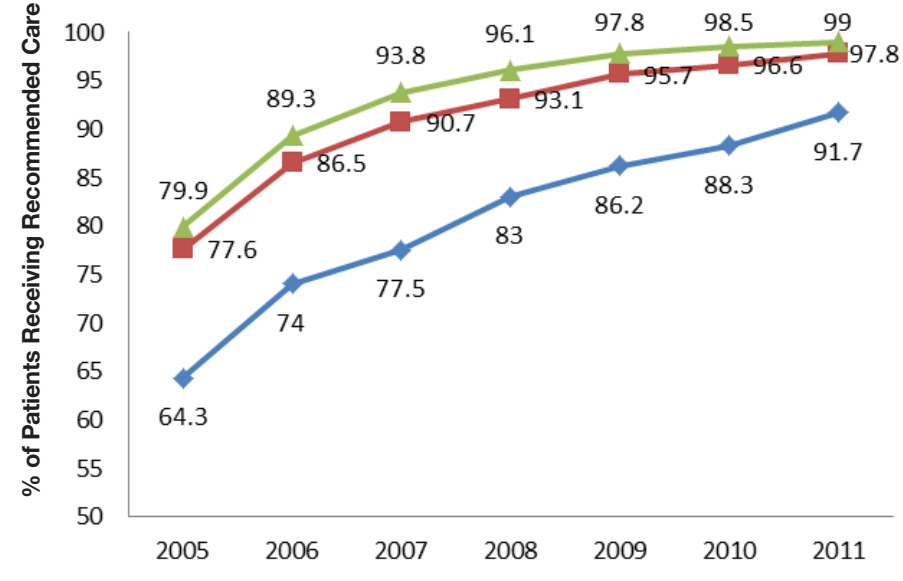


Figure 12. Inpatient Pneumonia: Influenza Vaccination

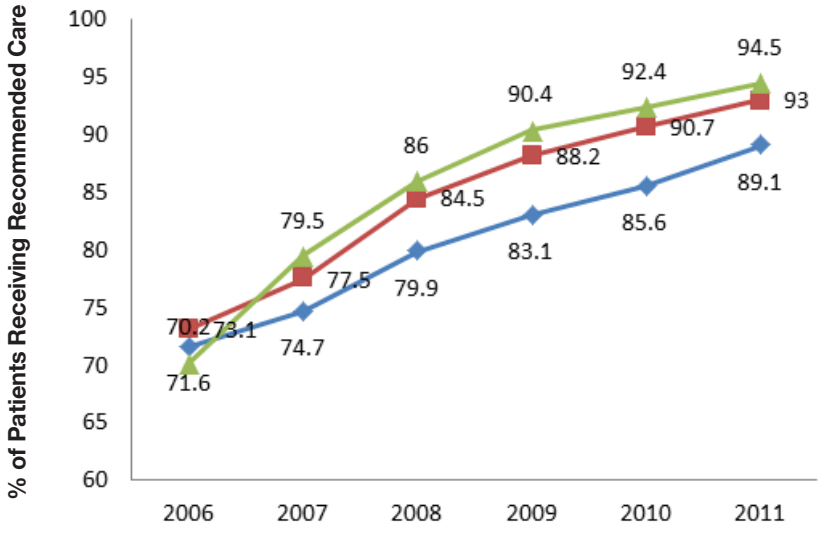


Figure 13. Inpatient Pneumonia: Most Appropriate Initial Antibiotic

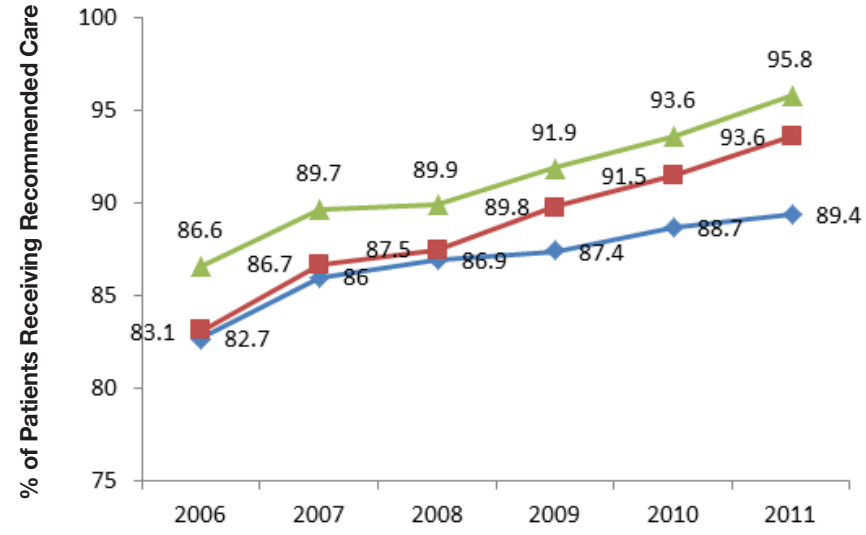


Figure 14. Inpatient Heart Failure: Discharge Instructions

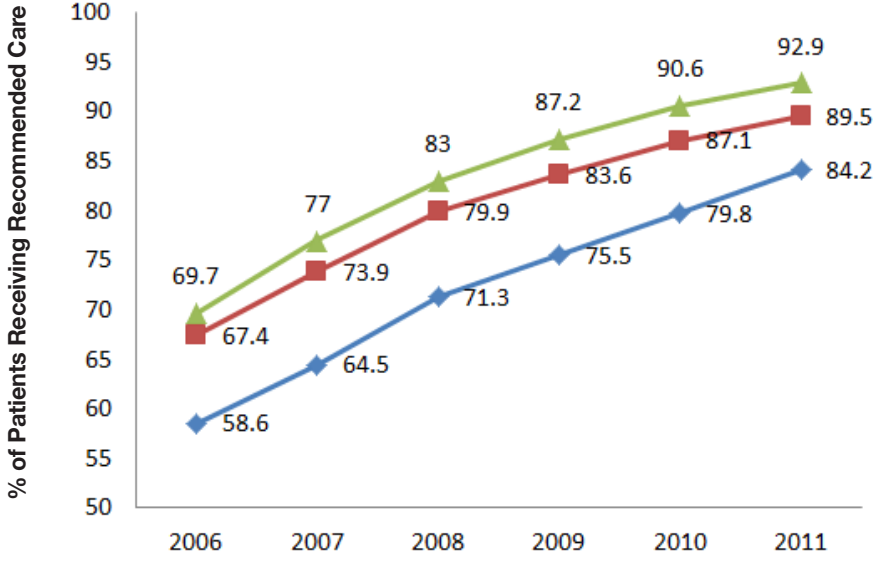


Figure 15. Inpatient Heart Failure: Assessment of LVS

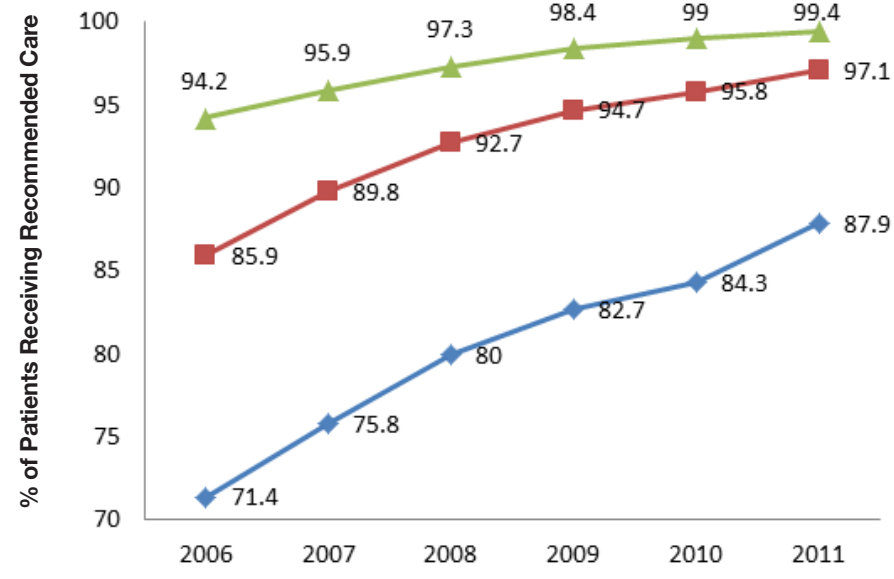


Figure 16. Inpatient Heart Failure: ACE Inhibitor or ARB for LVSD

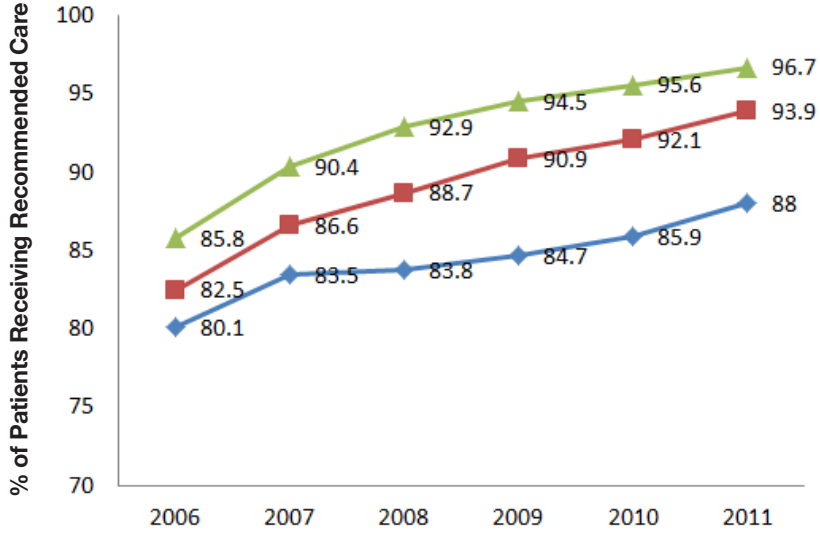


Figure 17. Inpatient Heart Failure: Smoking Cessation Advice

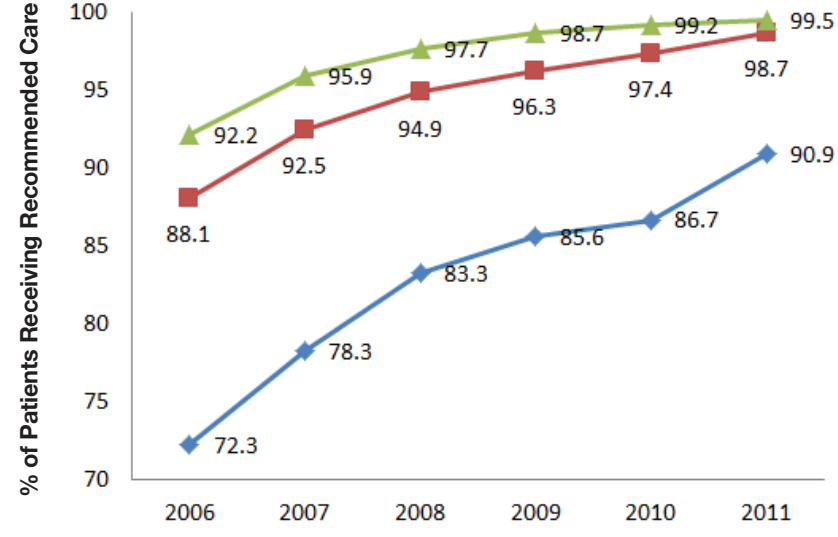


Figure 18. Inpatient AMI: Aspirin at Arrival

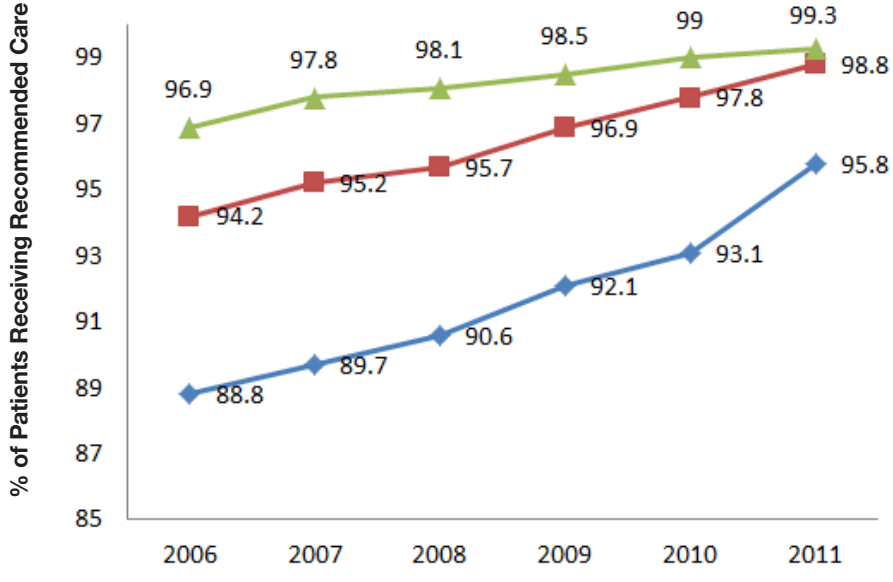


Figure 19. Inpatient AMI: Aspirin at Discharge

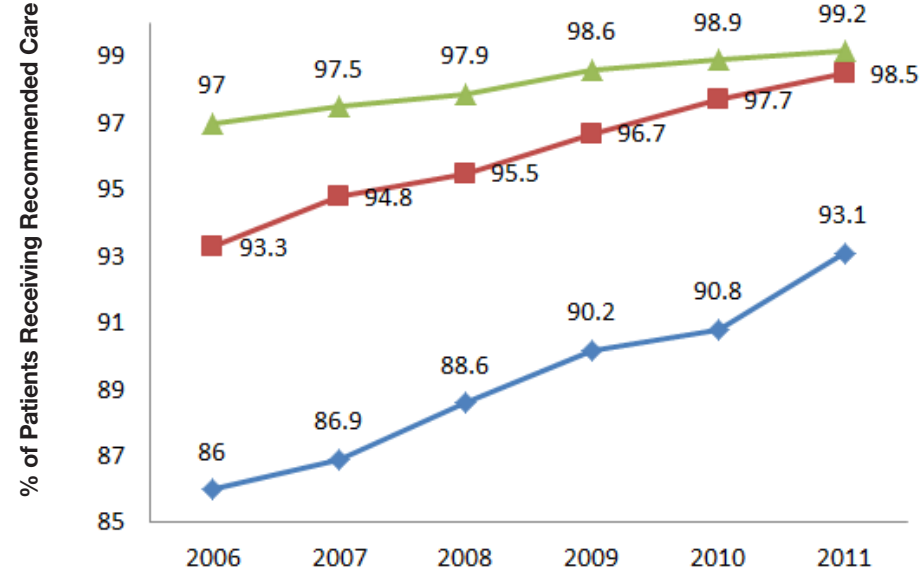


Figure 20. Inpatient AMI: Beta Blocker at Discharge

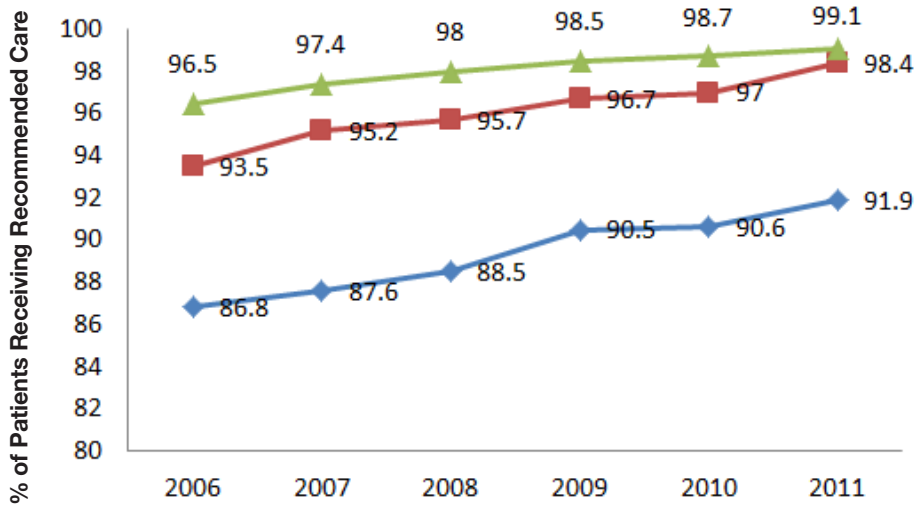


Figure 21. Inpatient AMI: Smoking Cessation Advice

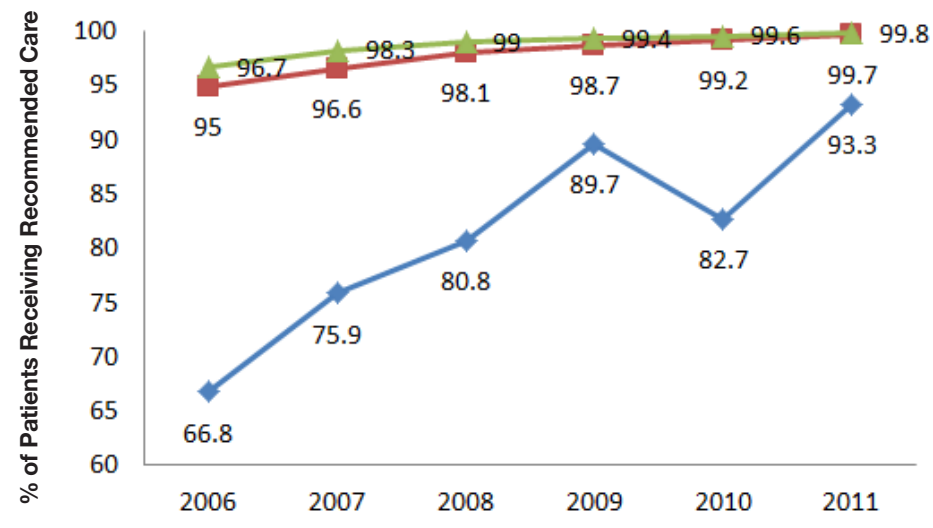


Figure 22. AMI Care: ACEI or ARB for LVSD

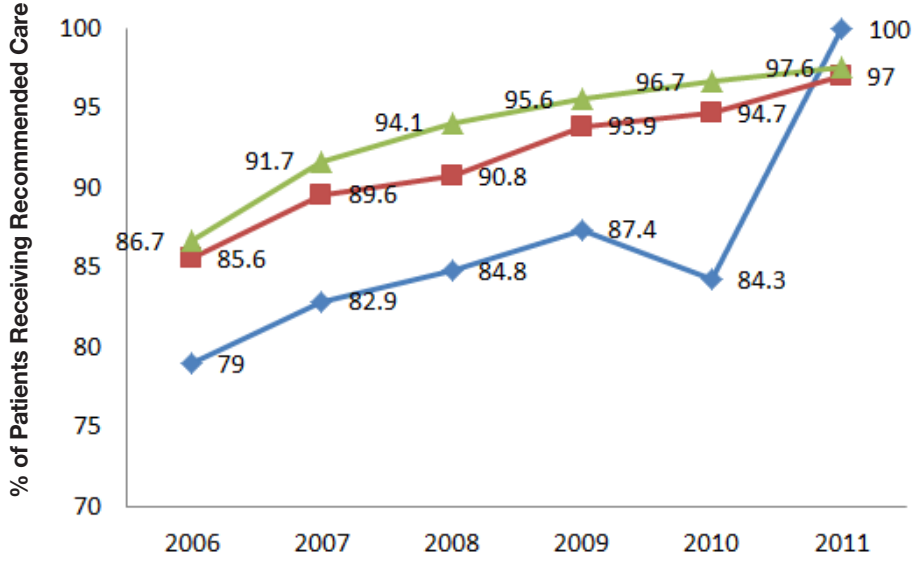


Figure 23. Inpatient Surgical Care: Antibiotic 1 Hour Before Incision

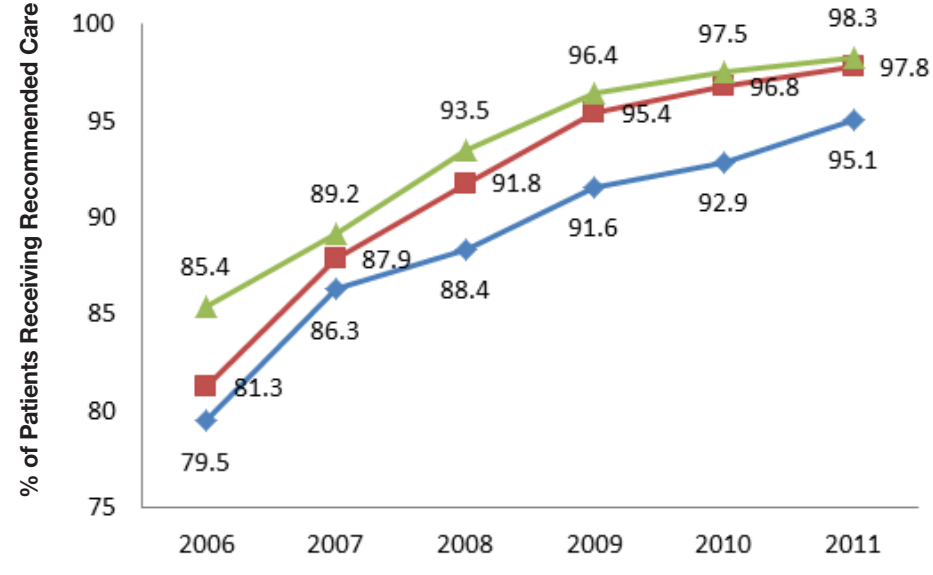


Figure 24. Inpatient Surgical Care: Appropriate Initial Antibiotic

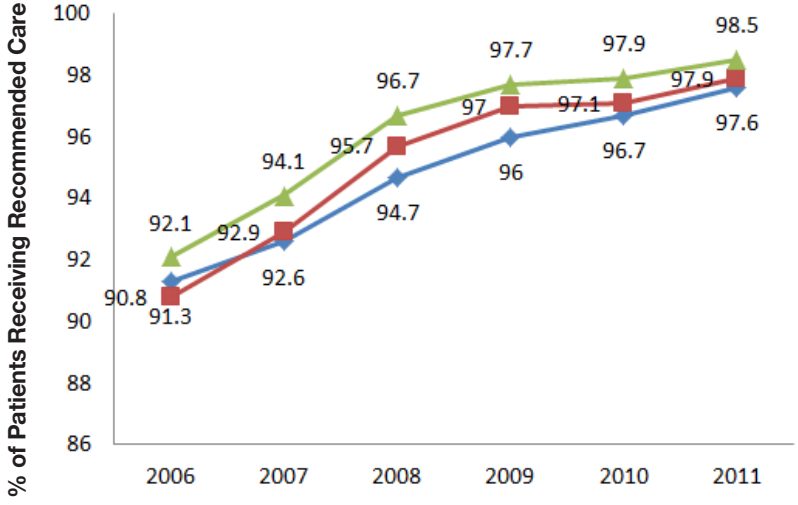


Figure 25. Inpatient Surgical Care: Preventative Antibiotics Stopped within 24 Hours after Surgery

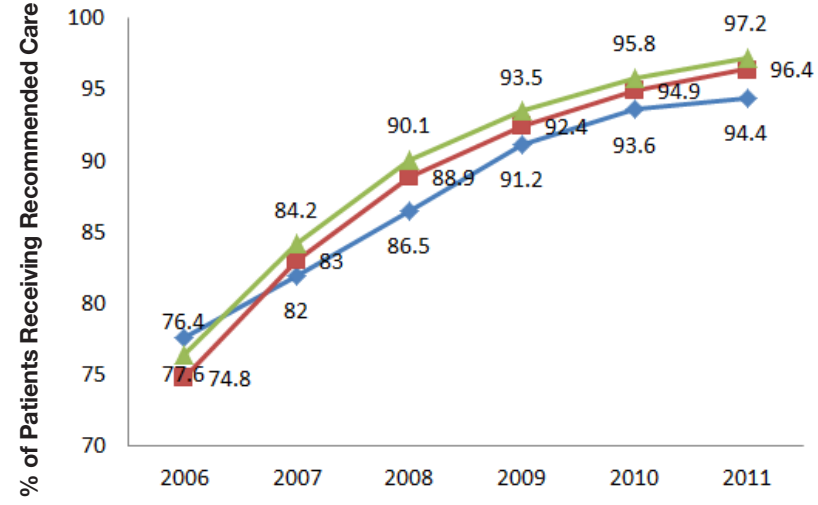


Figure 26. Inpatient Surgical Care: Doctors Ordered Blood Clot Prevention Treatments

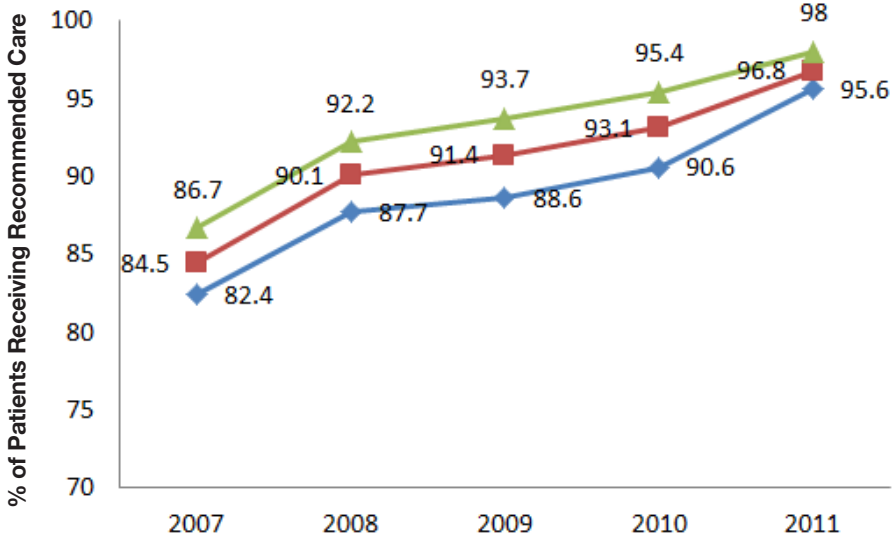


Figure 27. Inpatient Surgical Care: Received Blood Clot Prevention Treatment 24 Hours Pre/Post Surgery

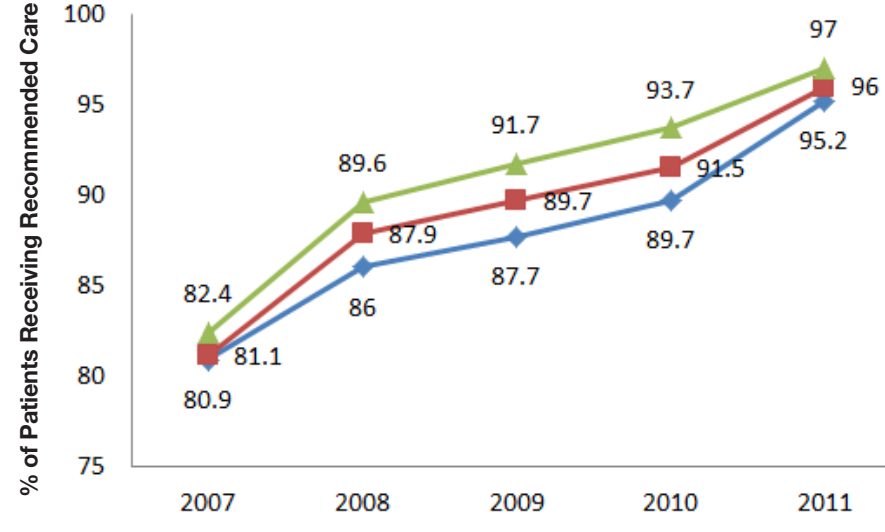


Figure 28. Inpatient Surgical Care: Appropriate Hair Removal

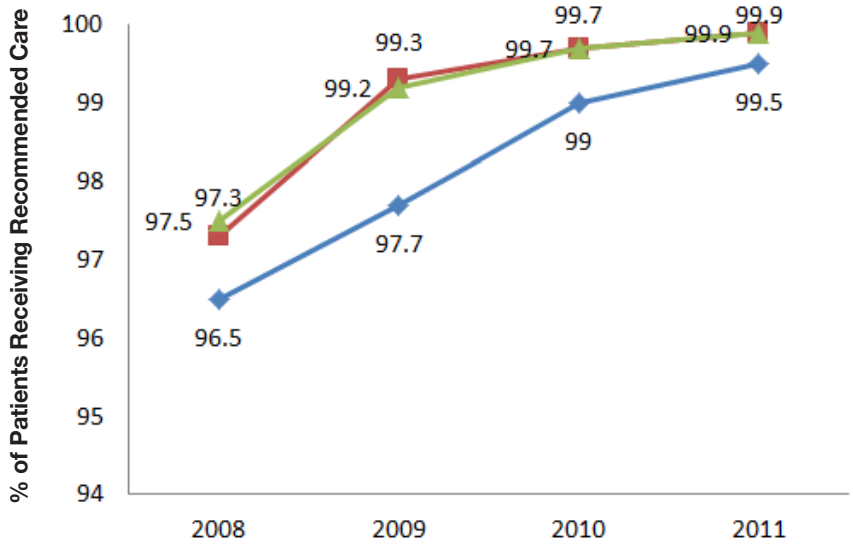


Figure 29. Outpatient Surgical Care: Appropriate Hair Removal

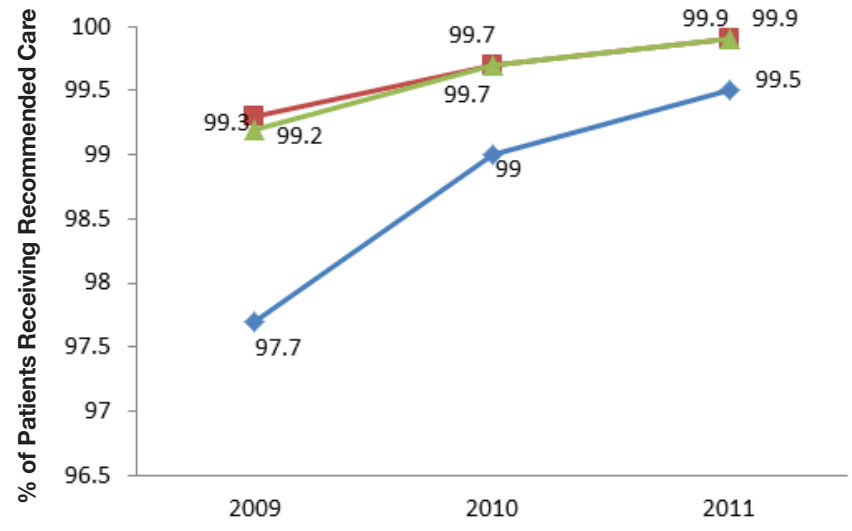


Figure 30. Outpatient AMI: Aspirin within 24 Hours of Arrival

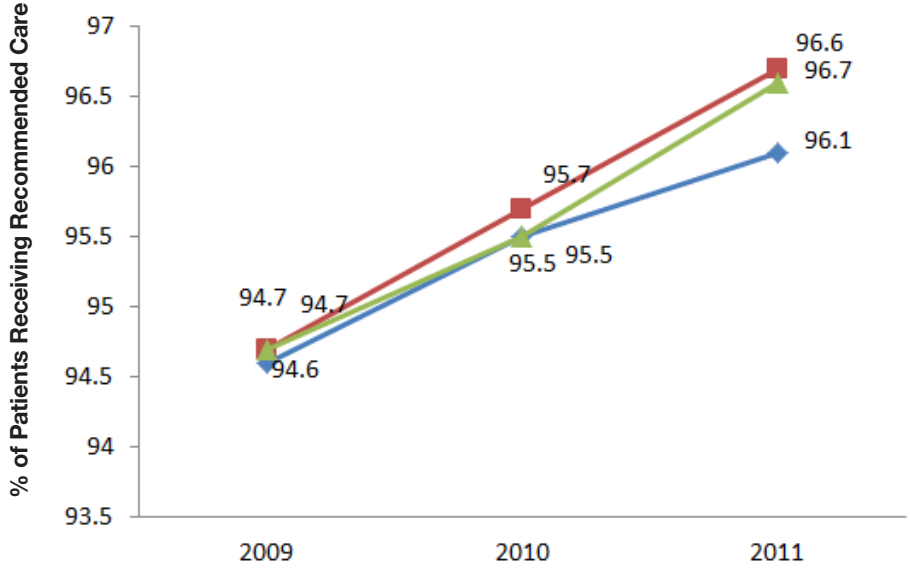
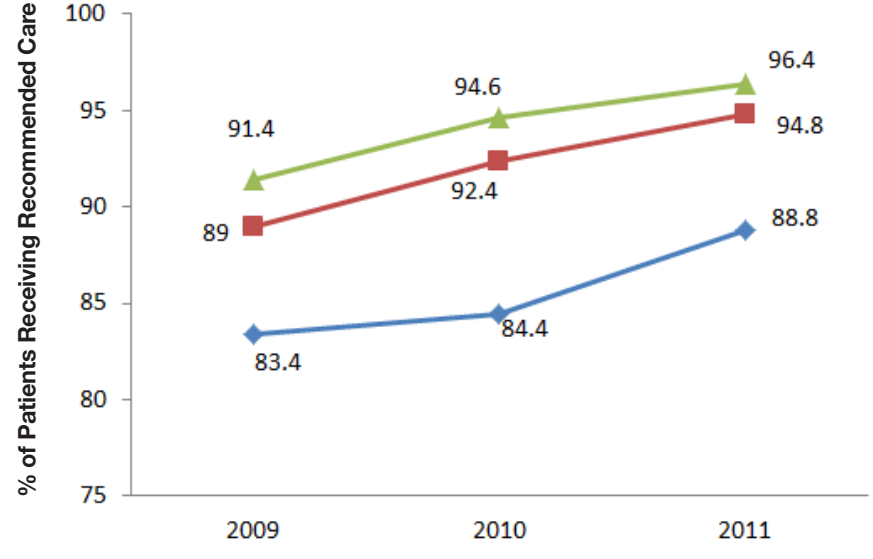


Figure 31. Outpatient Surgical Care: Antibiotic 1 Hour Before Surgery



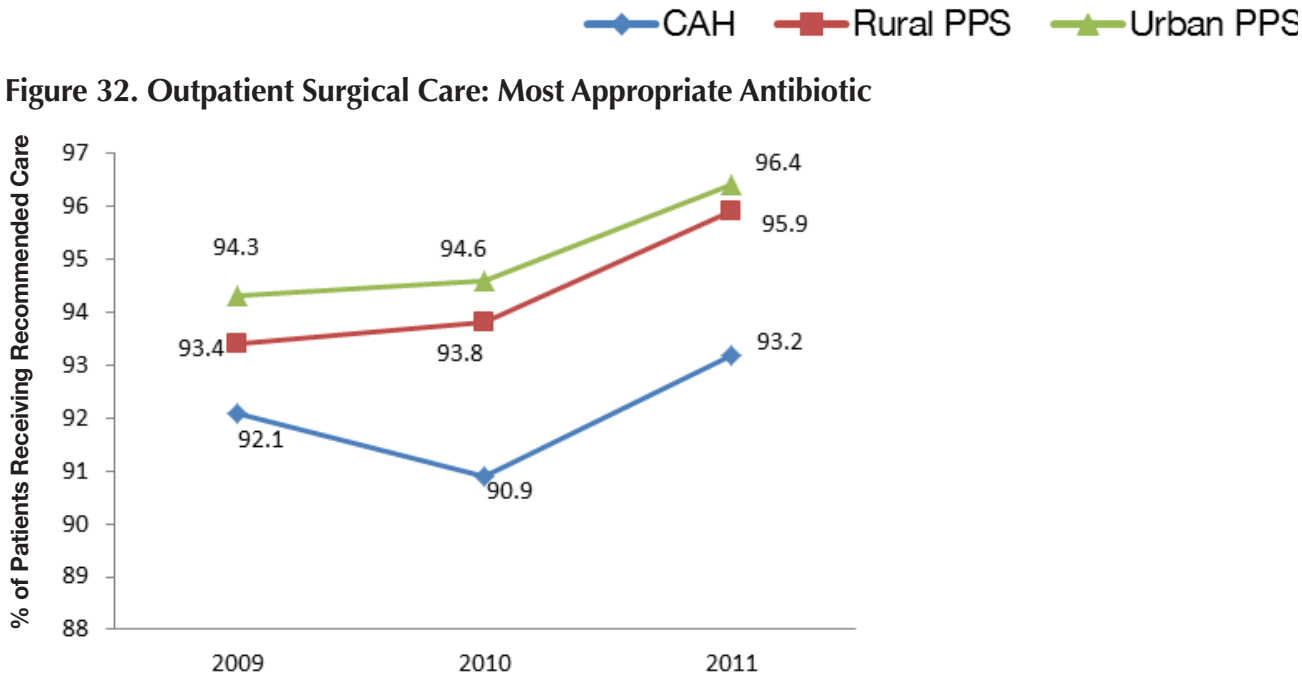


Figure 32. Outpatient Surgical Care: Most Appropriate Antibiotic