Flex Monitoring Team
University of Minnesota
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MBQIP Quality Measures Annual Report

North Carolina - 2019

Key Findings

- **Patient Safety/Inpatient Measures:** The Patient Safety/Inpatient reporting rate of 90.0% for North Carolina in 2019 was lower than the national reporting rate of 95.3%. Compared with all CAHs nationally, CAHs in North Carolina scored significantly better on 0 measures, significantly worse on 1 measure, and did not have significantly different performance on the remaining 2 measures.
- **Outpatient Measures:** The Outpatient reporting rate of 90.0% for North Carolina in 2019 was higher than the national reporting rate of 86.8%. Compared with all CAHs nationally, CAHs in North Carolina scored significantly better on 0 measures, significantly worse on 2 measures, and did not have significantly different performance on the remaining 2 measures.
- **Patient Engagement Measures:** The HCAHPS reporting rate of 90.0% for North Carolina in 2019 was lower than the national reporting rate of 90.2%. Compared with all CAHs nationally, CAHs in North Carolina scored significantly better on 0 measures, significantly worse on 0 measures, and did not have significantly different performance on the remaining 10 measures.
- **Care Transitions Measures:** The EDTC reporting rate of 95.0% for North Carolina in 2019 was higher than the national reporting rate of 93.1%. Compared with all CAHs nationally, CAHs in North Carolina scored significantly better on 1 measure, significantly worse on 3 measures, and did not have significantly different performance on the remaining 4 measures.

Contents

Background

The Medicare Beneficiary Quality Improvement Program (MBQIP) focuses on quality improvement efforts in the 45 states that participate in the Medicare Rural Hospital Flexibility (Flex) Program. Through Flex, MBQIP supports more than 1,350 small hospitals certified as rural Critical Access Hospitals (CAHs) in voluntarily reporting quality measures that are aligned with those collected by the Centers for Medicare and Medicaid Services (CMS) and other Federal programs. The Flex Monitoring Team (FMT) has been producing state-level annual reports on quality measures for over a decade, and this and future annual reports from the FMT will focus specifically on MBQIP measures using data collected under the four MBQIP domains: Patient Safety/Inpatient, Outpatient, Patient Engagement, and Care Transitions.

Data and Approach

The data used for this report are reported to the CMS and extracted from QualityNet, or to the Centers for Disease Control and Prevention (CDC) National Healthcare Safety Network (NHSN) annual survey. Emergency Department Transfer Communication (EDTC) data used for this report are from the Federal Office of Rural Health Policy as reported by CAHs to State Flex Programs. The data values in this report only include CAHs with a signed MBQIP Memorandum of Understanding (MOU).

Quality measures included in this report are limited to MBQIP measures, including: nine Patient Safety/Inpatient measures (HCP/IMM-3; Antibiotic Stewardship; ED-2b; CLABSI; CAUTI; SSI:C; SSI:H; MRSA; CDIFF), four Outpatient measures (OP-2; OP-22; OP-3b; OP-18b), ten Patient Engagement measures (from the Hospital Consumer Assessment of Healthcare Providers and Systems, or HCAHPS survey), and the Care Transitions (EDTC) measure. The six Healthcare-Associated Infections (HAI) measures (CLABSI; CAUTI; SSI:C; SSI:H; MRSA; CDIFF) are part of the MBQIP program, but not in the "core" measure set, and instead are a part of the "additional" measures set which is not required.

For each of the four domains, there are two sections of analyses: reporting and performance. Data are aggregated to the state and national levels. In all domains, data are not displayed for measures where the aggregated state or national data include fewer than 25 patients/cases/surveys.

Reporting identifies the number of CAHs reporting in each domain, and CAHs were considered reporting for any domain if they reported data in any quarter for any one measure with a denominator of one or more for that domain (indicating they had at least one patient, case, or survey for the applicable measure). Due to a lack of population and sampling data, these analyses did not include CAHs that may have reported a zero, since there is no way to determine if the zero was due to non-reporting or to a lack of an applicable population for a given measure. One exception to this is for the HAI measures, where we *include* data reported for these 6 measures where CAHs indicated they had a 0 denominator (0 patients in 2019 that would fall under any of these HAI categories). The reporting denominator of all CAHs in the U.S. for 2019 is 1,351 CAHs (the total number of CAHs designated on December 31, 2019), and the reporting numerator includes all CAHs with a signed MBQIP MOU reporting for the specific domain or measure. Please see the Appendix for additional information about the calculation for performance score values and statistical testing in each domain.

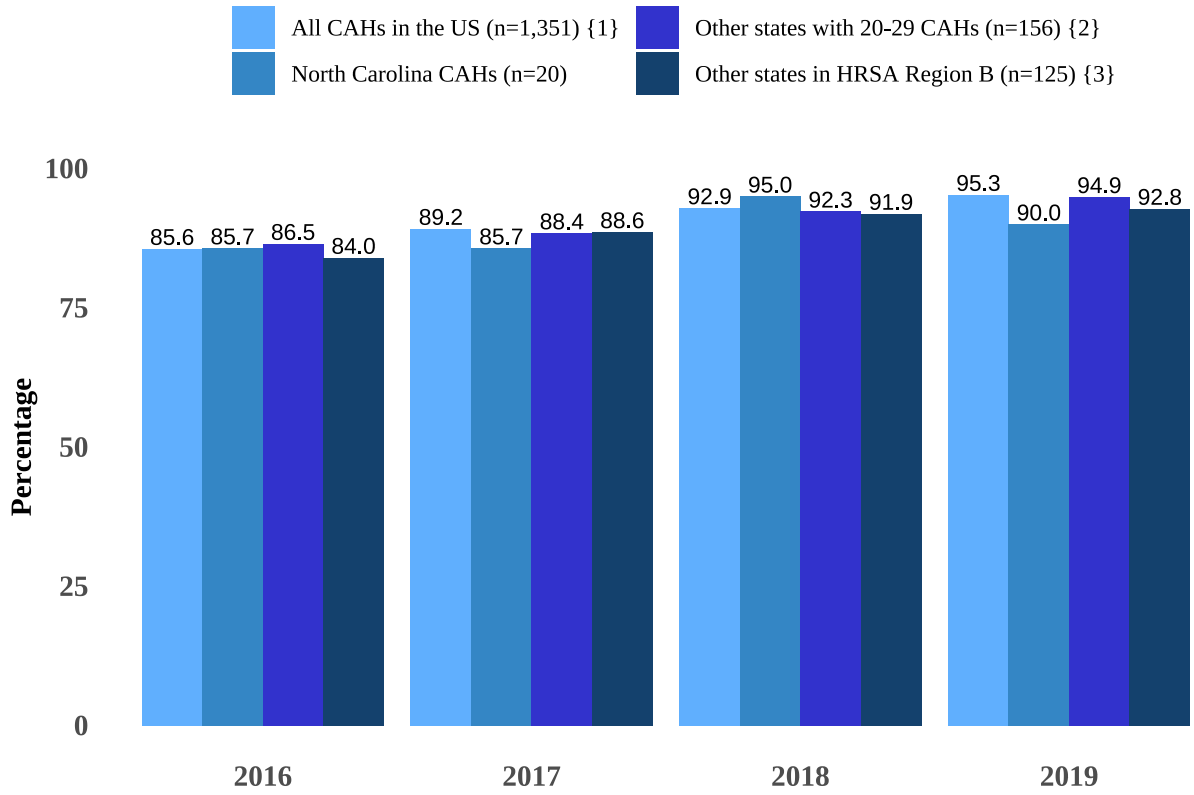
Patient Safety/Inpatient Domain

CAH Reporting

Results

The percent of CAHs reporting Patient Safety/Inpatient quality data varied considerably across states. In North Carolina, 90.0% of 20 CAHs reported data on at least one Patient Safety/Inpatient quality measure in 2019, and Figure 1 displays data for 2016-2019 among CAHs in four groups: those in North Carolina, all CAHs nationally, other states with a similar number of CAHs as North Carolina, and other states located in the same Health Resources and Services Administration (HRSA) geographic region as North Carolina. Table 1 compares the Patient Safety/Inpatient reporting rates of CAHs in North Carolina to those located in the other 44 states participating in the Flex Program as well as the rate for all CAHs nationally. The North Carolina CAH Patient Safety/Inpatient reporting rate of 90.0% ranks #37 nationally. The number of CAHs reporting individual quality measures may differ by measure for several reasons. Some measures only apply to a portion of patients; others exclude patients with contraindications, or only apply to conditions not treated or procedures not performed in some CAHs.

Figure 1: Percentage of CAHs Reporting at Least One Patient Safety/Inpatient Measure



Footnotes:

{1} Listed n values refer to most recent data (2019) only
{2} Group includes states with 20-29 CAHs: AR(28), ID(27), KY(28), LA(27), OR(25), WV(21)
{3} HRSA Region B includes: AL(5), FL(12), GA(30), KY(28), MS(31), SC(4), TN(15)

Table 1: State Ranking of CAH Reporting Rates for Patient Safety/Inpatient Quality Measures, 2019

Rank	State	CAHs reporting	% of CAHs	Rank	State	CAHs reporting	% of CAHs
1	Kansas	82	100.0	24	Ohio	32	97.0
1	Minnesota	78	100.0	25	Kentucky	27	96.4
1	Nebraska	64	100.0	26	Idaho	26	96.3
1	Wisconsin	58	100.0		National	1,287	95.3
1	Illinois	51	100.0	27	West Virginia	20	95.2
1	Washington	39	100.0	28	Oklahoma	37	94.9
1	South Dakota	38	100.0	29	Michigan	35	94.6
1	North Dakota	36	100.0	30	Missouri	33	94.3
1	Indiana	35	100.0	31	California	32	94.1
1	Colorado	32	100.0	32	Iowa	77	93.9
1	Georgia	30	100.0	32	Montana	46	93.9
1	Arkansas	28	100.0	34	Tennessee	14	93.3
1	Oregon	25	100.0	35	Utah	12	92.3
1	Maine	16	100.0	36	Florida	11	91.7
1	Wyoming	16	100.0	37	North Carolina	18	90.0
1	Pennsylvania	15	100.0	37	New Mexico	9	90.0
1	Alaska	13	100.0	39	Mississippi	26	83.9
1	New Hampshire	13	100.0	40	New York	15	83.3
1	Nevada	13	100.0	41	Louisiana	22	81.5
1	Vermont	8	100.0	42	Arizona	12	80.0
1	Virginia	7	100.0	42	Alabama	4	80.0
1	South Carolina	4	100.0	44	Texas	68	78.2
1	Massachusetts	3	100.0	45	Hawaii	7	77.8

CAH Performance

Results

Tables 2-4 display the results for performance of CAHs on Patient Safety/Inpatient measures for North Carolina and all CAHs nationally. Table 3 displays results for median time measures (lower scores, indicating shorter median times, are better). Table 4 displays HAI measures, including SIR performance results. Comparisons to other states are not provided for HAI measures because the majority of states did not meet the conditions for statistical comparisons. Compared with all CAHs nationally, CAHs in North Carolina scored significantly better on 0 measures, significantly worse on 1 measure, and did not have significantly different performance on the remaining 2 measures. The six HAI measures in this domain are not included in these totals since we are not able to perform statistical testing on HAI measures.

Table 2: Patient Safety/Inpatient Quality Measure Results in North Carolina and All CAHs Nationally, 2019

Significantly better than all CAHs nationally Significantly worse than all CAHs nationally

		NC CAHs (n=20)		All CAHs (n=1,351)	
Measure	**Description**	**CAHs reporting**	**Performance % {1}{2}**	**CAHs reporting**	**Performance % {2}**
HCP/IMM-3	Healthcare workers given influenza vaccination	12	91.4	719	91.5
Antibiotic Stewardship	Fulfill antibiotic stewardship core elements	10	100.0	1,077	79.9

Footnotes:

{1} Rates without highlights were not significantly different from comparable rates in all CAHs nationally.
{2} HCP/IMM-3 is expressed as the percentage of health care workers immunized, and Antibiotic Stewardship is the percentage of CAHs fulfilling all antibiotic stewardship core elements.
∗ Indicates insufficient data to calculate rate (<25 patients)

Table 3: Patient Safety/Inpatient Median Time Quality Measure Results in North Carolina and All CAHs Nationally, 2019

Significantly better than all CAHs nationally Significantly worse than all CAHs nationally

		NC CAHs (n=20)		All CAHs (n=1,351)	
Measure	**Description**	**CAHs reporting**	**Minutes {1}**	**CAHs reporting**	**Minutes**
ED-2b	Admit decision time to ED departure time for admitted patients	17	65.5	1,063	43.0

Footnotes:

{1} Median minutes to receiving care. Lower is better for all measures. Rates without highlights were not significantly different from comparable rates in all CAHs nationally.
∗ Indicates insufficient data to calculate rate (<25 patients)

Table 4: Healthcare-Associated Infection Measures Reported by CAHs in North Carolina and All CAHs Nationally, 2019

		NC CAHs (n=20)		All CAHs (n=1,351)	
Measure	**Description**	**CAHs reporting**	**SIR {1}**	**CAHs reporting**	**SIR**
HAI-1	Central-line-associated bloodstream infections (CLABSI)	15	*	1,028	0.5
HAI-2	Catheter-associated urinary tract infections (CAUTI)	15	0.2	1,106	0.6
HAI-3	Surgical site infections from colon surgery (SSI:C)	9	1.2	436	1.0
HAI-4	Surgical site infections from abdominal hysterectomy (SSI:H)	8	*	415	1.2
HAI-5	Methicillin-resistant Staphylococcus Aureus (MRSA) infections	11	1.0	693	0.5
HAI-6	Clostridium difficile (C.diff) intestinal infections	11	0.8	792	0.8

Footnotes:

{1} SIRs are a ratio of the total number of infections observed in 2019 divided by the predicted number of annual infections.
***** Indicates insufficient data to calculate SIR
- Indicates no data available for this measure

Note: Significance tests for HAI Measures are not included as statistical tests are not able to be performed on these data.

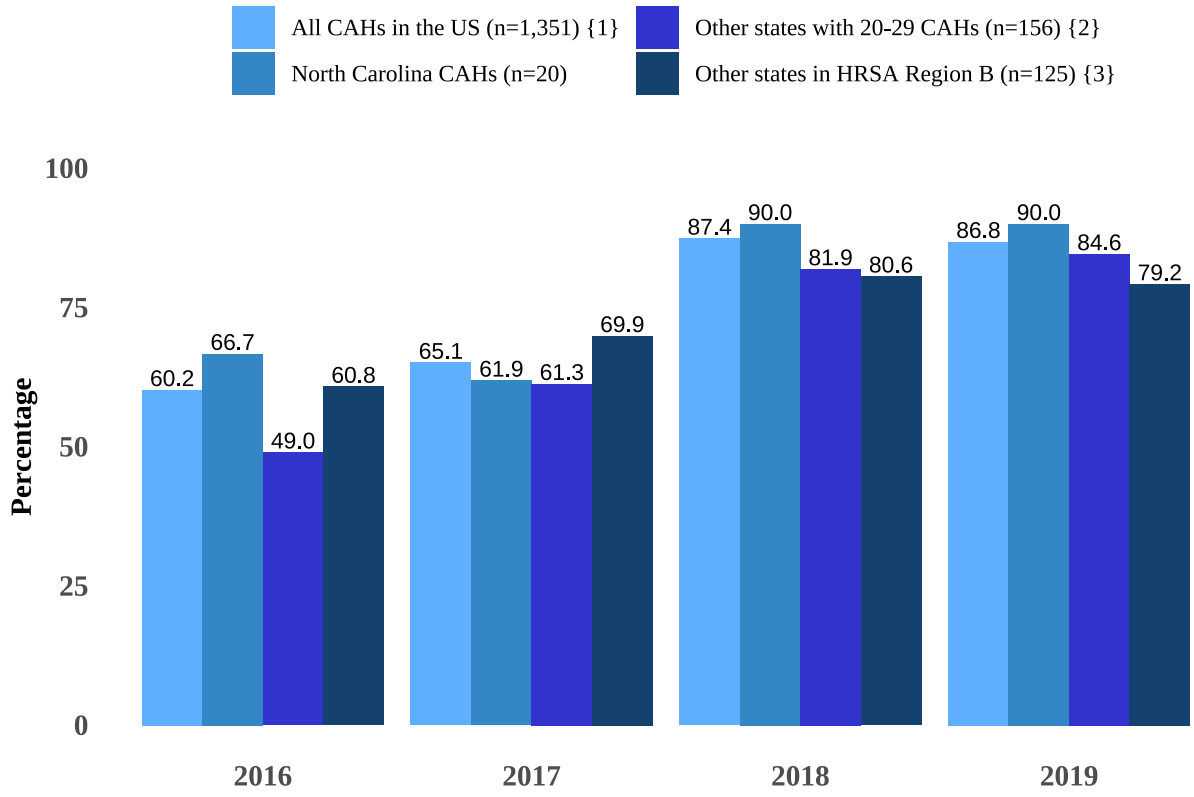
Outpatient Domain

CAH Reporting

Results

The percent of CAHs reporting Outpatient quality data varied considerably across states. In North Carolina, 90.0% of the 20 CAHs reported data on at least one Outpatient quality measure in 2019, and Figure 2 displays data for 2016-2019 among CAHs in four groups: those in North Carolina, all CAHs nationally, other states with a similar number of CAHs as North Carolina, and other states located in the same HRSA geographic region as North Carolina. Table 5 compares the Outpatient reporting rates of CAHs in North Carolina to those located in the other 44 states participating in the Flex Program as well as the rate for all CAHs nationally. The North Carolina CAH Outpatient reporting rate of 90.0% ranks #24 nationally. The number of CAHs reporting individual quality measures may differ by measure for several reasons, other than missing data. Some measures may only apply to a portion of patients; others exclude patients with contraindications, or only apply to conditions not treated or procedures not performed in some CAHs.

Figure 2: Percentage of CAHs Reporting at Least One Outpatient Measure



Footnotes:

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{3} HRSA Region B includes: AL(5), FL(12), GA(30), KY(28), MS(31), SC(4), TN(15)

Table 5: State Ranking of CAH Reporting Rates for Outpatient Quality Measures, 2019

Rank	State	CAHs reporting	% of CAHs	Rank	State	CAHs reporting	% of CAHs
1	Minnesota	78	100.0	24	North Carolina	18	90.0
1	Nebraska	64	100.0	24	New Mexico	9	90.0
1	Michigan	37	100.0	26	Washington	35	89.7
1	Georgia	30	100.0	27	Wyoming	14	87.5
1	Arkansas	28	100.0	28	Oklahoma	34	87.2
1	Idaho	27	100.0		National	1,173	86.8
1	New York	18	100.0	29	Montana	42	85.7
1	Pennsylvania	15	100.0	30	Colorado	27	84.4
1	New Hampshire	13	100.0	31	South Dakota	32	84.2
1	Hawaii	9	100.0	32	Oregon	20	80.0
1	Virginia	7	100.0	33	Iowa	64	78.0
1	South Carolina	4	100.0	34	Alaska	10	76.9
1	Massachusetts	3	100.0	35	Ohio	25	75.8
14	Wisconsin	57	98.3	36	Kentucky	21	75.0
15	Kansas	80	97.6	37	Arizona	11	73.3
16	West Virginia	20	95.2	38	California	24	70.6
17	North Dakota	34	94.4	39	Texas	60	69.0
18	Maine	15	93.8	40	Illinois	35	68.6
19	Tennessee	14	93.3	41	Florida	8	66.7
20	Nevada	12	92.3	42	Vermont	5	62.5
20	Utah	12	92.3	43	Mississippi	19	61.3
22	Indiana	32	91.4	44	Alabama	3	60.0
22	Missouri	32	91.4	45	Louisiana	16	59.3

CAH Performance

Results

Tables 6 and 7 display the results for performance of CAHs on Outpatient measures for North Carolina and all CAHs nationally. Table 7 displays results for median time measures (lower scores, indicating shorter median times, are better). Compared with all CAHs nationally, CAHs in North Carolina scored significantly better on 0 measures, significantly worse on 2 measures, and did not have significantly different performance on the remaining 2 measures.

Table 6: Outpatient Quality Measure Results in North Carolina and All CAHs Nationally, 2019

Significantly better than all CAHs nationally Significantly worse than all CAHs nationally

Measure	Description	NC CAHs (n=20)		All CAHs (n=1,351)	
		CAHs reporting {2}	% of patients {1}	CAHs reporting {2}	% of patients
OP-2	Fibrinolytic therapy received within 30 minutes	10	40.0	479	52.4
OP-22	Patients left without being seen (lower is better)	12	1.1	669	0.9

Footnotes:

{1} Rates without highlights were not significantly different from comparable rates in all CAHs nationally.
{2} CAHs reporting indicates CAHs that had a denominator of one or more.
∗ Indicates insufficient data to calculate rate (<25 patients)

Table 7: Outpatient Median Quality Measure Results in North Carolina and All CAHs Nationally, 2019

Significantly better than all CAHs nationally Significantly worse than all CAHs nationally

Measure	Description	NC CAHs (n=20)		All CAHs (n=1,351)	
		CAHs reporting {2}	Minutes {1}	CAHs reporting {2}	Minutes
OP-3b	Median time to transfer to another facility - acute coronary intervention	12	54.2	596	64.5
OP-18b	Median time from ED arrival to ED departure for discharged patients	17	117.0	1,117	107.0

Footnotes:

{1} Median minutes to receiving care. Lower is better for all measures. Rates without highlights were not significantly different from comparable rates in all CAHs nationally.
{2} CAHs reporting indicates CAHs that had a denominator of one or more.
∗ Indicates insufficient data to calculate rate (<25 patients)

Patient Engagement Domain

CAH Reporting

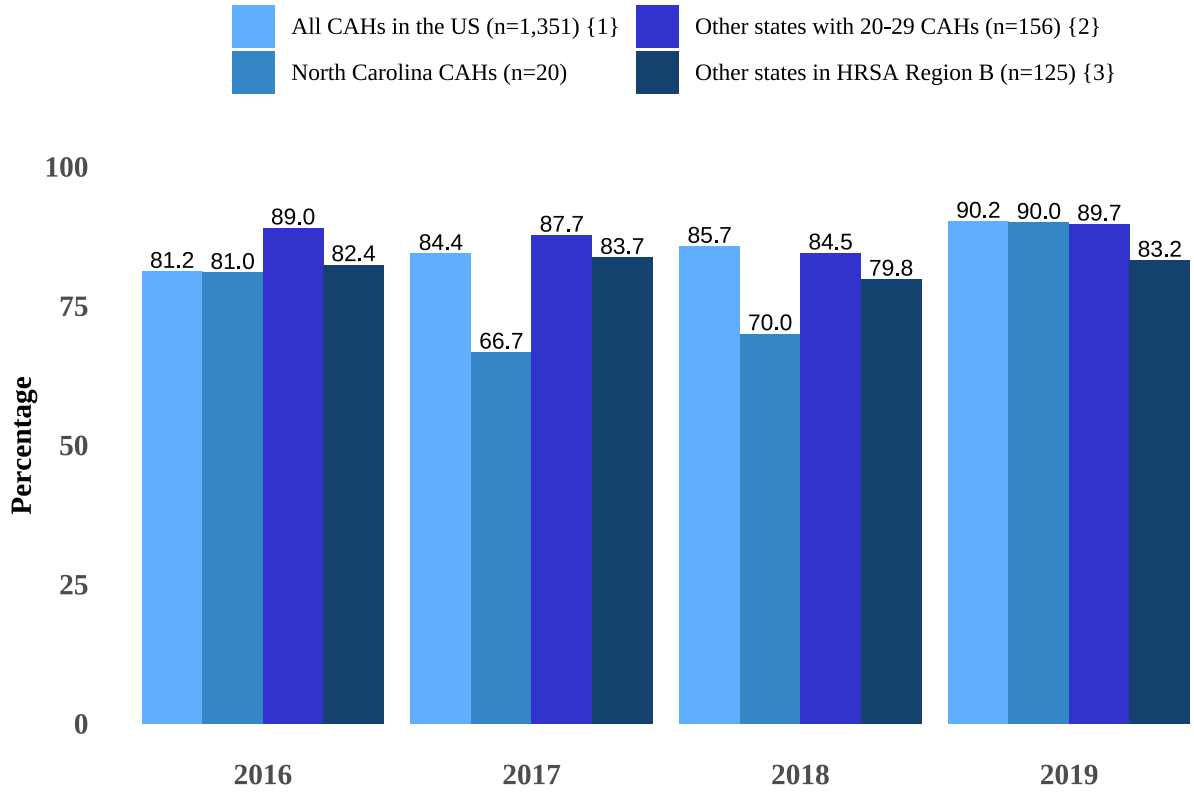
Results

Figure 3 compares reporting rates from 2016-2019 in the Patient Engagement domain (HCAHPS) over time among four groups of CAHs: those in North Carolina, all CAHs nationally, those located in other states with a similar number of CAHs, and those located in the same HRSA geographic region as North Carolina. The HCAHPS reporting rate of 90.0% for North Carolina CAHs was lower than the national reporting rate of 90.2%.

The number of completed HCAHPS surveys per CAH in North Carolina and nationally in the five survey completion and three survey response rate categories reported by CMS are shown in Table 8. Hospitals with 100 or more completed HCAHPS surveys over a four-quarter period receive HCAHPS Star Ratings from CMS. 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. 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 9 compares the HCAHPS reporting rates of CAHs in North Carolina to those located in the other 44 states participating in the Flex Program as well as the rate for all CAHs nationally. The North Carolina HCAHPS reporting rate of 90.0% ranks #28 nationally.

Figure 3: Percentage of CAHs Reporting at Least One Patient Engagement Measure (HCAHPS)



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{3} HRSA Region B includes: AL(5), FL(12), GA(30), KY(28), MS(31), SC(4), TN(15)

Table 8: Number of Completed HCAHPS Surveys and Response Rates in North Carolina and All CAHs Nationally, 2019

		Number of Completed HCAHPS Surveys					HCAHPS Survey Response Rates		
	Total CAHs reporting	<25	25-49	50-99	100-299	300+	<25%	25-50%	>50%
National	1,219	249	253	307	347	63	403	784	32
North Carolina	18	1	3	4	4	6	9	9	0

Table 9: State Ranking of CAH Reporting Rates for HCAHPS Quality Measures, 2019

Rank	State	CAHs reporting	% of CAHs	Rank	State	CAHs reporting	% of CAHs
1	Nebraska	64	100.0	24	Georgia	28	93.3
1	Wisconsin	58	100.0	25	South Dakota	35	92.1
1	Oregon	25	100.0	26	Michigan	34	91.9
1	New York	18	100.0	27	California	31	91.2
1	Maine	16	100.0		National	1,219	90.2
1	Wyoming	16	100.0	28	North Carolina	18	90.0
1	Pennsylvania	15	100.0	29	Montana	44	89.8
1	New Hampshire	13	100.0	30	Kansas	73	89.0
1	Nevada	13	100.0	31	Vermont	7	87.5
1	Utah	13	100.0	32	Washington	33	84.6
1	Virginia	7	100.0	33	Oklahoma	32	82.1
1	South Carolina	4	100.0	34	Missouri	28	80.0
1	Massachusetts	3	100.0	34	Tennessee	12	80.0
14	North Dakota	35	97.2	34	New Mexico	8	80.0
15	Ohio	32	97.0	34	Alabama	4	80.0
16	Colorado	31	96.9	38	Texas	69	79.3
17	Mississippi	30	96.8	39	Louisiana	21	77.8
18	Arkansas	27	96.4	40	Indiana	27	77.1
19	Idaho	26	96.3	41	Kentucky	21	75.0
20	Illinois	49	96.1	42	Arizona	11	73.3
21	West Virginia	20	95.2	43	Alaska	9	69.2
22	Iowa	78	95.1	44	Florida	5	41.7
23	Minnesota	73	93.6	45	Hawaii	3	33.3

CAH Performance

Results

Table 10 displays the results for performance on Patient Engagement (HCAHPS) measures for North Carolina and all CAHs nationally. Compared with all CAHs nationally, CAHs in North Carolina scored significantly better on 0 measures, significantly worse on 0 measures, and did not have significantly different performance on the remaining 10 measures.

Table 10: HCAHPS Results for CAHs in North Carolina and All CAHs Nationally, 2019

Significantly better than all CAHs nationally

Significantly worse than all CAHs nationally

	Average percentage of patients that gave the highest level of response (e.g., "always")	
HCAHPS Measure	**NC CAHs (n=20)**	**All CAHs (n=1,351)**
CAHs reporting	n=18	n=1,219
Nurses always communicated well	85.1	84.6
Doctors always communicated well	84.8	85.2
Patients always received help as soon as wanted	78.0	77.2
Staff always explained medications before giving them to patients	71.2	69.8
Staff always provided information about what to do during recovery at home	88.7	89.1
Patients strongly understood their care when they left the hospital	56.4	57.3
Patient's room and bathroom were always clean	80.8	81.7
Area around patient's room was always quiet at night	65.4	66.4
Patient gave a rating 9 or 10 [high] on a 1-10 scale	76.8	78.1
Patient would definitely recommend the hospital to friends and family	76.1	76.2

Footnote:

* Indicates insufficient data to calculate rate (<25 surveys)

Care Transitions Domain

CAH Reporting

Results

Figure 4 compares reporting in the Care Transitions domain (EDTC) for North Carolina and all CAHs nationally for 2019. 95.0% of North Carolina CAHs reported the EDTC measure. Only 2019 data are included in this report due to the lack of historical data on EDTC in previous FMT reports. In addition, collection and reporting procedures for the EDTC measure changed beginning in 2020. Future reports will include only data for the new measure. Table 11 compares the EDTC reporting rates of CAHs in North Carolina to those located in the other 44 states participating in the Flex Program as well as the rate for all CAHs nationally. The North Carolina EDTC reporting rate of 95.0% ranks #25 nationally.

Figure 4: Percentage of CAHs Reporting Care Transitions Measure (EDTC), 2019

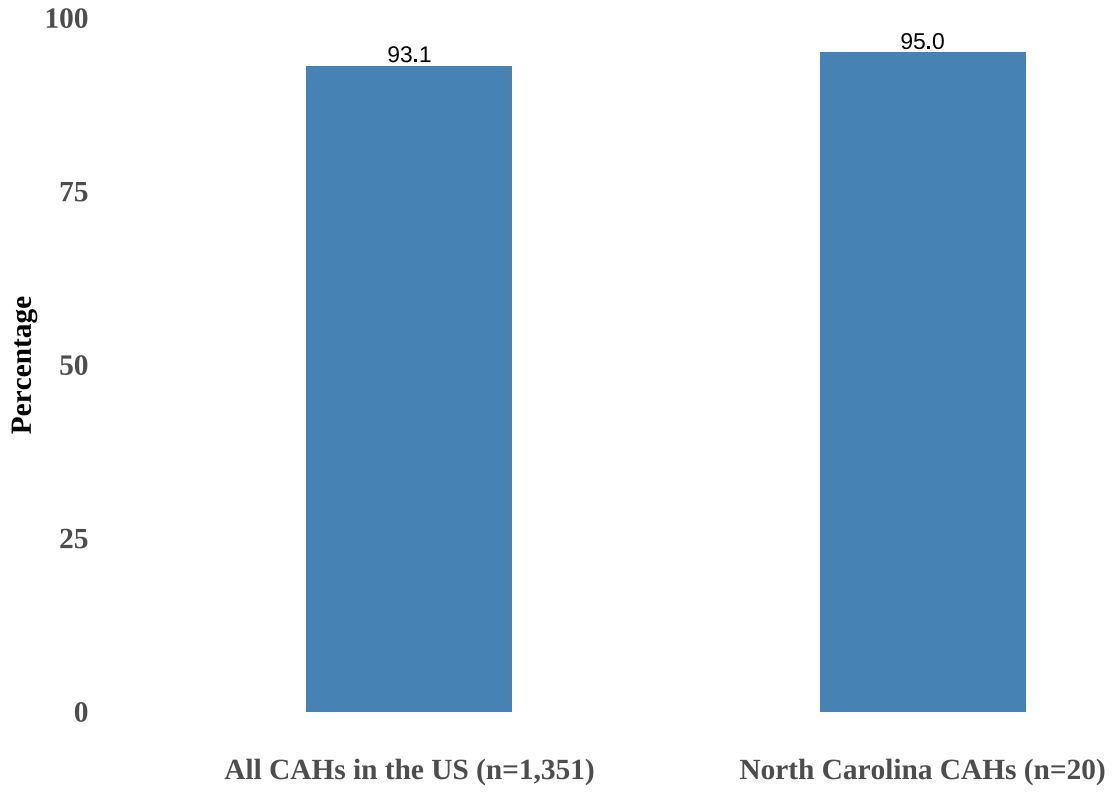

Table 11: State Ranking of CAH Reporting Rates for EDTC Quality Measure, 2019

Rank	State	CAHs reporting	% of CAHs	Rank	State	CAHs reporting	% of CAHs
1	Minnesota	78	100.0	24	Illinois	49	96.1
1	Wisconsin	58	100.0	25	North Carolina	19	95.0
1	Oklahoma	39	100.0	26	New York	17	94.4
1	South Dakota	38	100.0	27	Wyoming	15	93.8
1	North Dakota	36	100.0	28	Arizona	14	93.3
1	Georgia	30	100.0	28	Tennessee	14	93.3
1	Arkansas	28	100.0		National	1,258	93.1
1	Idaho	27	100.0	30	Kentucky	26	92.9
1	West Virginia	21	100.0	31	Louisiana	25	92.6
1	Pennsylvania	15	100.0	32	Washington	36	92.3
1	New Hampshire	13	100.0	32	Alaska	12	92.3
1	Nevada	13	100.0	34	Florida	11	91.7
1	Utah	13	100.0	35	Indiana	32	91.4
1	New Mexico	10	100.0	36	Iowa	74	90.2
1	Hawaii	9	100.0	37	Montana	44	89.8
1	Virginia	7	100.0	38	Missouri	31	88.6
1	South Carolina	4	100.0	39	Maine	14	87.5
1	Massachusetts	3	100.0	40	Oregon	21	84.0
19	Nebraska	63	98.4	41	Alabama	4	80.0
20	Kansas	80	97.6	42	Texas	66	75.9
21	Michigan	36	97.3	43	Ohio	24	72.7
22	California	33	97.1	44	Colorado	22	68.8
23	Mississippi	30	96.8	45	Vermont	4	50.0

CAH Performance

Results

Table 12 displays the results for performance on the Care Transitions (EDTC) measure for North Carolina and all CAHs nationally. Compared with all CAHs nationally, CAHs in North Carolina scored significantly better on 1 measure, significantly worse on 3 measures, and did not have significantly different performance on the remaining 4 measures.

Table 12: EDTC Results for CAHs in North Carolina and All CAHs Nationally, 2019

Significantly better than all CAHs nationally Significantly worse than all CAHs nationally

EDTC Measure	Average Percentage	
	NC CAHs (n=20)	**All CAHs (n=1,351)**
CAHs Reporting	n=19	n=1,258
EDTC-All: Composite	90.8	84.7
Administrative Communication	96.0	96.6
Patient Information	94.8	96.2
Vital Signs	95.9	95.9
Medication Information	95.0	94.9
Physician or Practitioner Generated Information	95.2	95.4
Nurse Generated Information	96.5	91.8
Procedures and Tests	94.9	97.0

Footnote:

* Indicates insufficient data to calculate rate (<25 patients)

Appendix

This appendix includes additional detailed information regarding the methods and data used in this report. Performance for each measure is shown in a variety of ways depending on the measure.

Percentages are calculated using the number of patients (or healthcare workers for the measure HCP/IMM-3) who meet the measure criteria, divided by the number of patients or workers in the measure population, which are specifically defined for each measure. For antibiotic stewardship measures, this report shows the percentage of CAHs in your state that met the seven elements individually, as well as the percentage that met all elements. Values are rounded to the nearest decimal place. State performance was compared to the performance for all CAHs nationally using Chi-square tests ($p < 0.05$). The results of the state performance comparisons were classified as: 1) insufficient data (less than 25 total patients); 2) not significantly different that all CAHs nationally; 3) significantly better than all CAHs nationally; or 4) significantly worse than all CAHs nationally.

Median time includes the median number of minutes until the specified event occurs among patients who meet certain criteria, which are specifically defined for each measure. For median time measures, lower scores, indicating shorter median times, are better. Wilcoxon-Mann-Whitney tests were used to compare the median times for CAHs in each state to all CAHs nationally.

Antibiotic stewardship performance was measured as the percentage of CAHs that fulfilled all seven core elements of an antibiotic stewardship program. The questions in the NHSN address different activities CAHs can participate in to fulfill the core elements. The state-level performance on antibiotic stewardship was compared to the performance of all other CAHs nationally using Fisher's exact test.

Performance for each HAI measure was calculated using Standardized Infection Ratios (SIRs). SIRs are a ratio of the total number of infections observed in 2018 divided by the predicted number of annual infections. Predicted number of infections data are calculated and made available by the CDC. SIRs can only be calculated when there are one or more predicted infections for the time period. A lower SIR indicates better performance. Significance tests comparing state HAI performance to the performance all CAHs nationally were not performed because the majority of states did not meet the conditions for statistical comparisons: at least one predicted infection and the state's predicted number of infections multiplied by the SIR of all other CAHs must be equal to or greater than one.

For each **HCAHPS measure**, the percentages of patients reporting the highest response (e.g., "always") on each measure were summed and averaged across all reporting CAHs within a state and all CAHs nationally. Two-sample t-tests were used to compare whether the mean scores on each measure are significantly different between CAHs in each state and all CAHs nationally.

Performance for the EDTC measure was calculated as the percentage of patients that met all of the seven data elements. State performance was compared to the performance for all CAHs nationally using Chi-square tests ($p < 0.05$). Changes to the EDTC measure in 2020 included adjustments to help streamline and modernize the measure, including a reduction in the total number of data elements from 27 to 8 and clarifications to specific definitions of individual data elements.

For more information on this study, please contact Megan Lahr at lahrx074@umn.edu.

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