Running the Numbers

A Periodic Feature to Inform North Carolina Health Care Professionals About Current Topics in Health Statistics

Key Performance Indicators of Cost and Utilization for Medicaid Recipients Enrolled in Community Care of North Carolina

Community Care of North Carolina (CCNC) may be best known for advancing quality of care for Medicaid recipients in North Carolina, but quality of care is only half of the value equation. This column examines trends and geographic variation in key performance indicators related to cost and utilization, and it discusses the use of data to gain insights that drive effective intervention strategies.

Key Performance Indicators: Cost and Utilization

The North Carolina Department of Health and Human Services' Division of Medical Assistance contracts with North Carolina Community Care Networks (more commonly known as CCNC) to operate a primary care, case management model, managed care program that currently serves 1.6 million North Carolinians with Medicaid or Health Choice coverage. For the non-dual Medicaid population enrolled in CCNC, 4 key performance indicators related to cost and utilization are reported quarterly, based on a rolling 12-month period: total Medicaid expenditure per member per month, emergency department visits per 1,000 member months, inpatient admissions per 1,000 member months, and potentially preventable readmissions per 1,000 member months. Actual rates are reported along with benchmark rates for what would be expected given the illness burden, or case mix, of the population CCNC is serving during each reporting period, compared to baseline Medicaid spending and utilization norms during calendar year 2012.

As shown in Figure 1, statewide performance on each of these key indicators is tracking well below expected rates. For the 12-month period ending December 2015, total costs were 5% below the benchmark; inpatient admissions were 26% below the benchmark; readmissions were 51% below the benchmark; and emergency department utilization was 7% below the benchmark. Actual spending per beneficiary declined substantially over the past year, despite an increase in clinical complexity among Medicaid beneficiaries enrolled in CCNC statewide.

Key performance indicators related to total spending and hospital utilization provide evidence of effective cost containment at the program level, but there are always localized opportunities for continual improvement. Performance variation can be readily examined through the use of "heat mapping," which assigns a color based on variance in observed versus expected rates. In Figure 2, the red shading indicates the degree to which cost or utilization is higher than what would be expected for enrollees in a geographical area, taking into account their illness burden, compared to 2012. The green shading indicates the degree to which cost or utilization performance is better than expected. In the majority of counties and ZIP codes across North Carolina, the costs of care for CCNC-enrolled Medicaid beneficiaries are lower than expected, and the rates of hospital admissions and readmissions are far lower than expected. Greater variation is observed in emergency department utilization, with a wide spectrum of performance above and below expected at the ZIP-code level.

Methodology for Benchmark Rates and Case Mix Adjustment

To calculate expected benchmarks, enrollees are assigned to clinical risk groups (CRGs) via 3M Health Information Systems' Clinical Risk Grouper. CRGs take all available claims data during a

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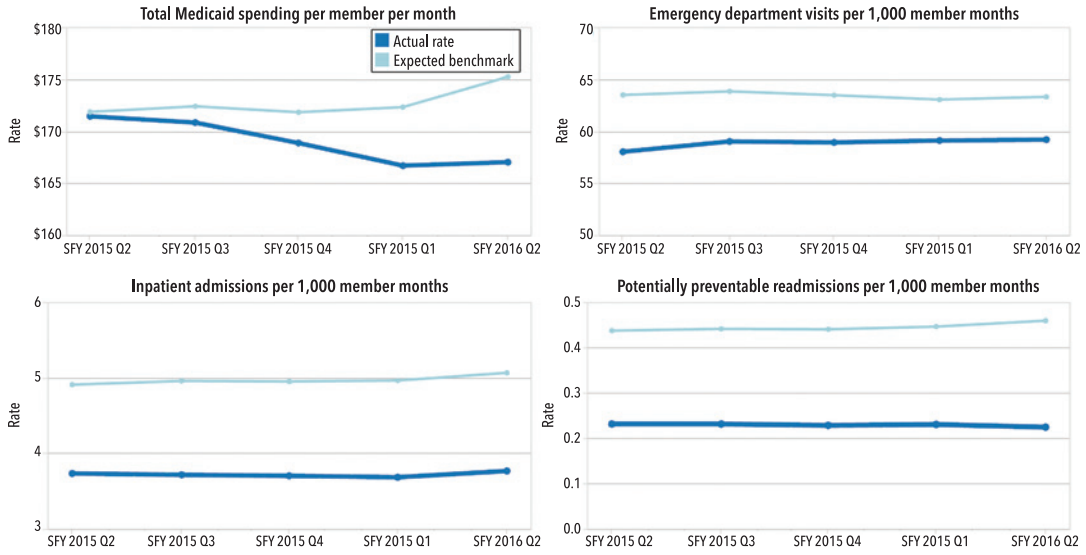
FIGURE 1.
Community Care of North Carolina Key Performance Indicators: Total Medicaid Spending, Emergency Department Visits, Inpatient Admissions, and Potentially Preventable Readmissions

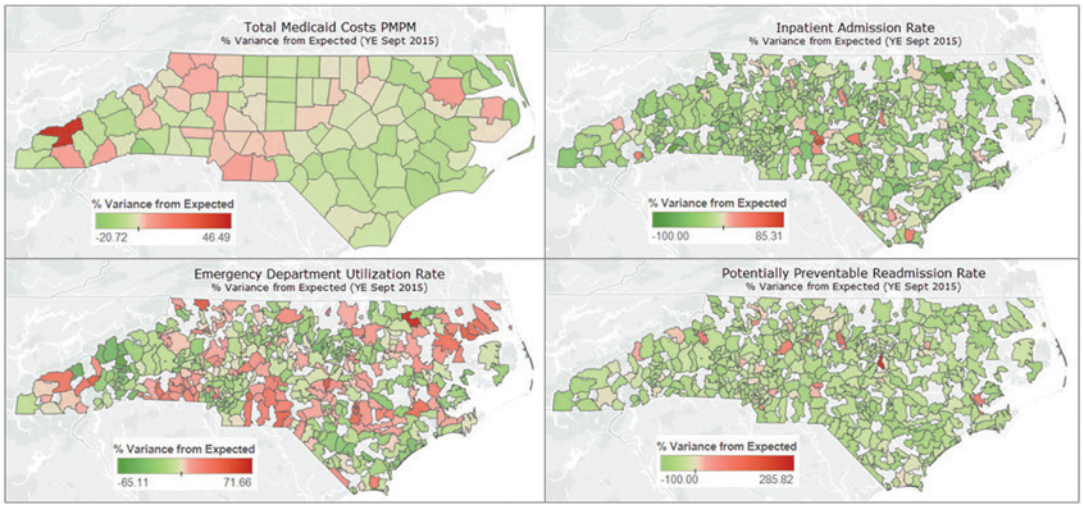


Note. SFY, state fiscal year.

12-month period and assign individuals to 1 of 1,075 mutually exclusive groups characterized by number and type of chronic conditions and associated severity. Resource intensity weights are generated at the CRG/age/sex level, resulting in more than 15,000 risk strata, based on the average spending among all non-dual Medicaid eligible individuals during calendar year 2012; beneficiaries who would not be eligible for CCNC enrollment, such as those living in skilled nursing facilities, are excluded from the benchmark calculation.

Once individual weights are calculated, we apply them to the enrollees within any given reporting period and aggregate up to the program level for an estimate of illness burden, where 1.0 is equivalent to the case mix for all non-dual Medicaid beneficiaries in calendar year 2012 (with higher numbers reflecting greater clinical complexity). To determine

FIGURE 2.
Geographic Variation in Key Performance Indicators by County and ZIP Codes



the expected value for a reporting period or for a smaller unit of analysis (such as county or practice), the case mix index is multiplied by the average Medicaid spending for all non-dual Medicaid beneficiaries enrolled in calendar year 2012.

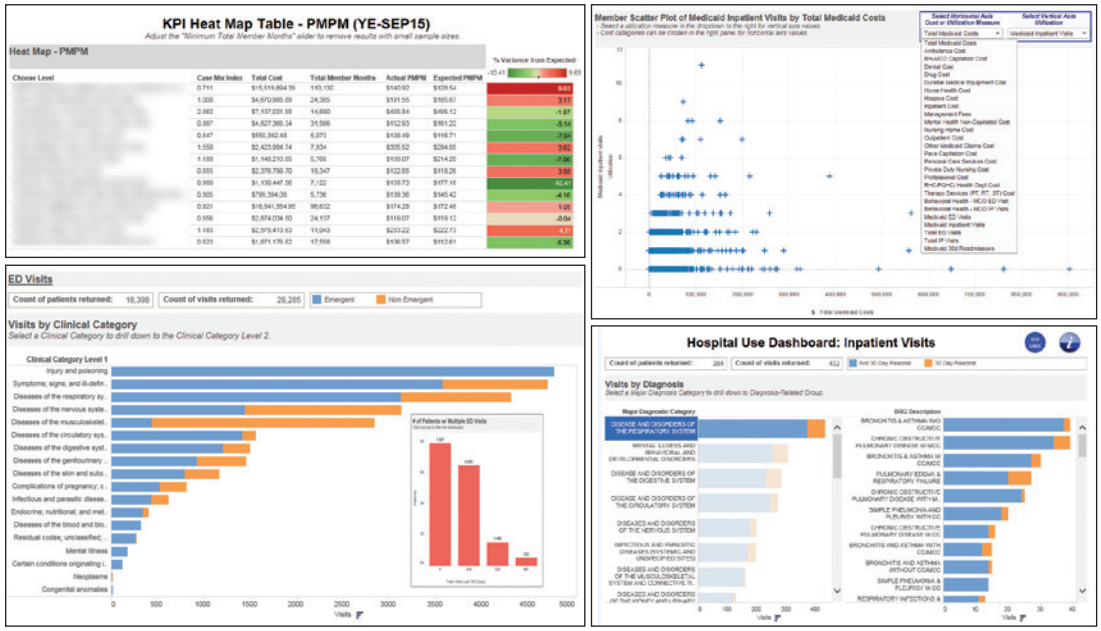
Determination of expected utilization rates is similar to the calculation of expected spending benchmarks, except that the baseline period for expected utilization rates includes both calendar year 2011 and calendar year 2012, to generate more reliable estimates by CRG for relatively rare events.

From Measuring Results to Getting Results!

CCNC's mission is to strengthen and support the health care delivery system by deploying a collaborative practice support model that engages providers and practices to assist them in achieving high-quality, cost-effective, patient-centered care. CCNC supports over 1,800 participating primary care practices across the state with tools, resources, coaching, and a collaborative learning environment in which practices can assess their performance and engage systematically in improvement activities using their own practice data and comparisons to others as benchmarks. Local CCNC networks employ a trained, multidisciplinary quality improvement practice support team that follows a systematic process for assessing quality, cost, and utilization performance; this team engages practices in improvement activities on a targeted basis.

The CCNC Informatics Center provides a robust data analysis platform to assist providers and network quality improvement experts in monitoring trends, examining underlying causes, and identifying opportunities for intervention or improvement. Figure 3 displays examples of the CCNC Care Impact business intelligence dashboards, which are updated weekly with Medicaid paid claims and daily with encounter data from 87 hospitals across the state. These dashboards enable users

FIGURE 3.
Examples of CCNC Analytic Tools for Investigating Cost and Utilization Patterns



Note. CCNC, Community Care of North Carolina.
Panel A (top left) is a display by practice of case mix index, total Medicaid costs, member months (number of Medicaid recipients enrolled with the practice as a primary care medical home times the number of months enrolled during the 12-month measurement period), actual costs per member per month, expected costs per member per month (based on 2012 statewide benchmark, adjusted to case mix), and percent variance from expected. Panel B (top right) is a scatterplot displaying member distribution against selected cost category and utilization parameters. Panel C (bottom right) is a display of inpatient visits by diagnostic category, with color shading indicating 30-day readmissions. Panel D (bottom left) is a display of emergency department visits by diagnostic category, with color shading indicating nonemergent visits. The histogram indicates count of patients with 1, 2–4, 5–9, or 10+ emergency department visits during the selected time frame. All dashboards allow filtering by population demographic or clinical characteristics, geomapping, and drill-through to additional member-level details.

to readily detect variations in cost and utilization rates by practice on a risk-adjusted basis, to examine hospital and emergency department utilization patterns, to investigate spending by service category and member characteristics, and to identify high-risk patients most likely to benefit from a care management intervention. Custom reports can be generated to identify patients who are appropriate for specialized interventions. Examples include transitional care, complex care management, and medication management, as well as focused initiatives related to chronic pain, opiate misuse, palliative care, foster care, sickle cell disease, hepatitis C virus infection, high-risk pregnancy, and behavioral health conditions with identified care gaps.

In population health management, the use of data analysis to inform intervention strategies is analogous to clinical decision making in direct patient care. Cost and utilization performance indicators may be best understood as symptoms or signs of underlying illness in the health care system—as opposed to outcomes in and of themselves. Wasteful spending and avoidable hospital utilization in a population are nonspecific symptoms, manifesting any number of potential underlying pathologies related to social determinants of health, access to care, misaligned financial incentives for ancillary service providers, or collective provider failure to communicate and coordinate care plans across settings of care, among other systemic issues. A signal of high emergency department use or a high readmission rate has a broad differential diagnosis, and effective treatment requires that a more precise diagnosis be made. Table 1 provides examples of key performance indicator signals, underlying drivers, and interventions appropriate to the diagnosis.

Conclusion

For the CCNC-enrolled North Carolina Medicaid population, key performance indicators related to hospital utilization and total cost of care are tracking well below expected rates relative to 2012, and per-member spending continues to decline. Observed geographic and practice-level variations signal opportunities for continual improvement. Sophisticated, provider-facing data analytic tools that can isolate underlying drivers of performance trends are essential to the design and execution of successful interventions to improve quality and efficiency in health care delivery. NCMJ

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TABLE 1.
Diagnosis and Treatment of Delivery System Disease: Example Drivers and Interventions Signaled by Analysis of Key Performance Indicators

Signal	Example driver	Example interventions
Emergency department visit rates higher than expected	Rise in emergency department visits in a rural 5-county region for nonspecific complaints of pain, by patients seeking opiate prescriptions	• Implement best-practice recommendations for chronic pain management in primary care practices and local emergency departments • Engage stakeholders in community-based coalition to address opiate misuse
Hospital admission rates higher than expected	High volume of asthma-related admissions from patients enrolled in a large safety-net practice	• Quality improvement initiative to implement planned visits for asthma patients, with patient and family education • Establish system for using prescription fill data to recognize overuse of rescue medications or nonadherence to controller medications, to trigger early intervention
Hospital readmission rates higher than expected	Low rates of outpatient follow-up after discharge among patients with complex care needs	• Reserve appointment slots for hospital follow-up and coordinate scheduling system between hospital and community clinic staff • Alert care manager when a high-risk patient is discharged from the hospital, to assure appointment is kept within recommended interval
Rise in total cost of care despite hospital utilization rates lower than expected	Escalation of spending for personal care services in a local area	• Review medical necessity of the frequency and scope of personal care services • Educate authorizing physicians