Care Management for Medicaid-enrolled Children: Insights for Savings Optimization

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KEY POINTS FROM THIS BRIEF:

- Most children in the Medicaid program are at low risk of hospital admission and readmission, but CCNC's Impactability Scores™ effectively identify children most likely to benefit from multidisciplinary care management support.
    - Intelligent selection of patients for transitional care management increases near-term return-on-investment eight-fold.
    - CCNC's transitional care model reduces 30-day readmission rates from 35% to less than 15% among prioritized children.
    - Healthcare utilization patterns that reflect poor management of chronic conditions are better predictors of impactability than the presence of any given diagnosis, risk factor or event.
- Highly impactable children commonly face social challenges such as poor support systems, unmet nutritional needs, or unstable housing; circumstances which demand a community-based multidisciplinary care team approach to effectively leverage community-based resources.
- Since 2012, CCNC's strategies have helped to drive down statewide utilization rates for Medicaid-enrolled children: hospitalization rates by 33.1%, emergency department utilization by 11.7%, and readmission rates by 65.7%.

Background

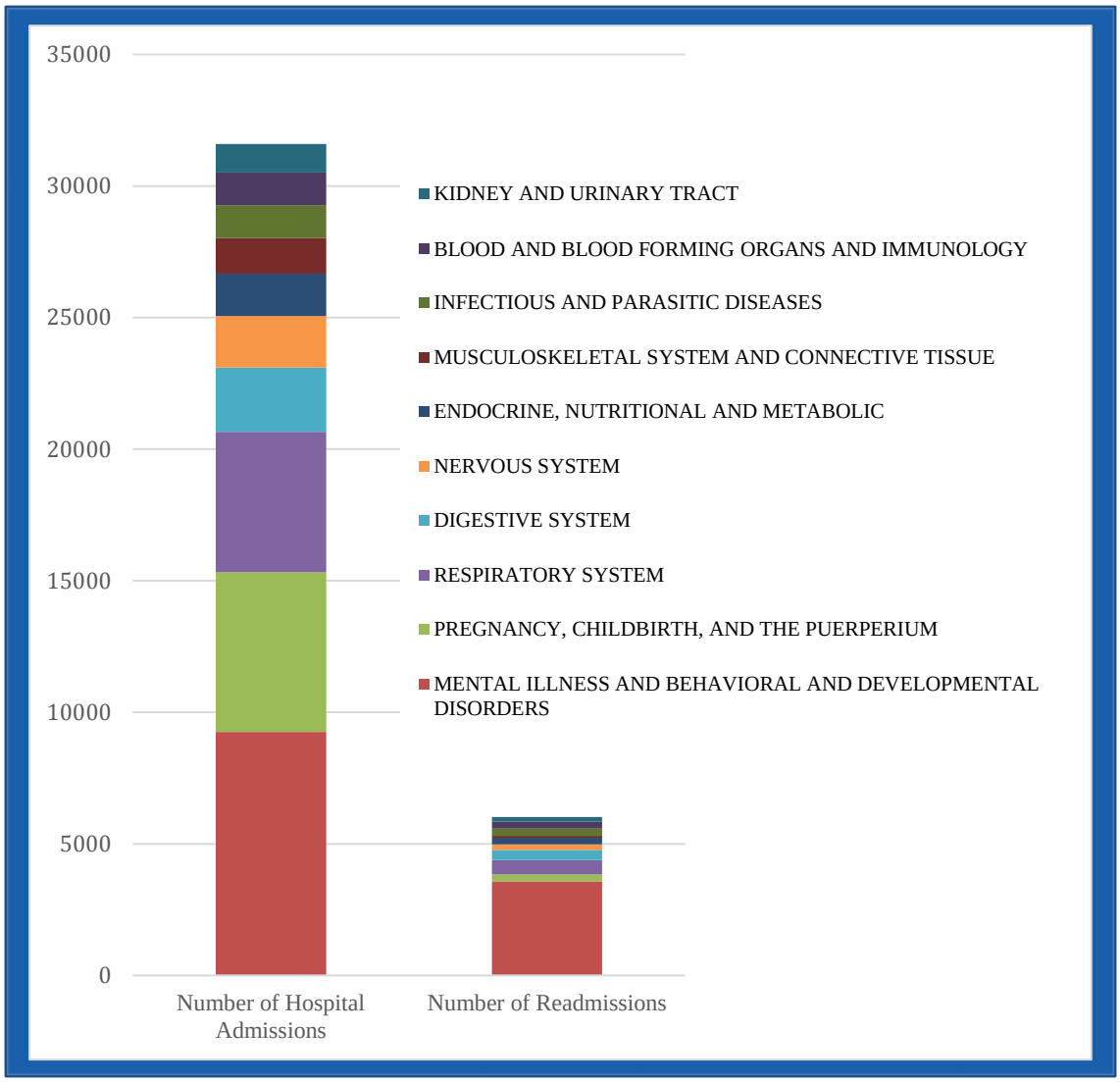
Care management of high cost/high risk patients is a common strategy for improving outcomes and containing costs in a managed population. Community Care of North Carolina has provided community-based, multidisciplinary care management support for NC Medicaid recipients since 2008, through an innovative statewide infrastructure supporting over 1800 participating primary care medical homes and all NC hospitals in coordinated patient- and family-centered care. With a member population of over 1.6 million individuals, including 1.1 million children under

the age of 21, and the resources to provide intensive care management support to fewer than one percent of members at any given time, it has been necessary for CCNC to judiciously allocate care management interventions within available budget. CCNC has actively evolved its care management targeting strategies to better identify patients most likely to benefit from this support, utilizing a statewide longitudinal data base of care management documentation and complete Medicaid claims, and the culture and discipline of continuous quality improvement. This data brief provides an overview of CCNC findings with regard to optimizing near-term cost savings through care management of the pediatric Medicaid population.

Pediatric Hospitalizations and Readmissions

While transitional care management has emerged as a common strategy for reducing hospital readmissions among older adults, particularly in response to Medicare financial incentives, less has been written about transitional care for children: is there a need, and will it lead to better outcomes and lower costs? In contrast to Medicare, where over 15% of hospital discharges lead to a readmission within 30 days, this overall readmission rate is approximately 8% among NC Medicaid-enrolled children. Figure 1 on the following page shows the distribution of admissions and readmissions by major diagnostic category. While the vast majority of Medicaid pediatric hospitalizations are for newborn care, newborn readmission is uncommon (2% 30-day readmission rate). Mental illness and behavioral and developmental disorders are the next most common reason for hospitalization, with readmission being much more frequent (39% 30-day readmission rate).

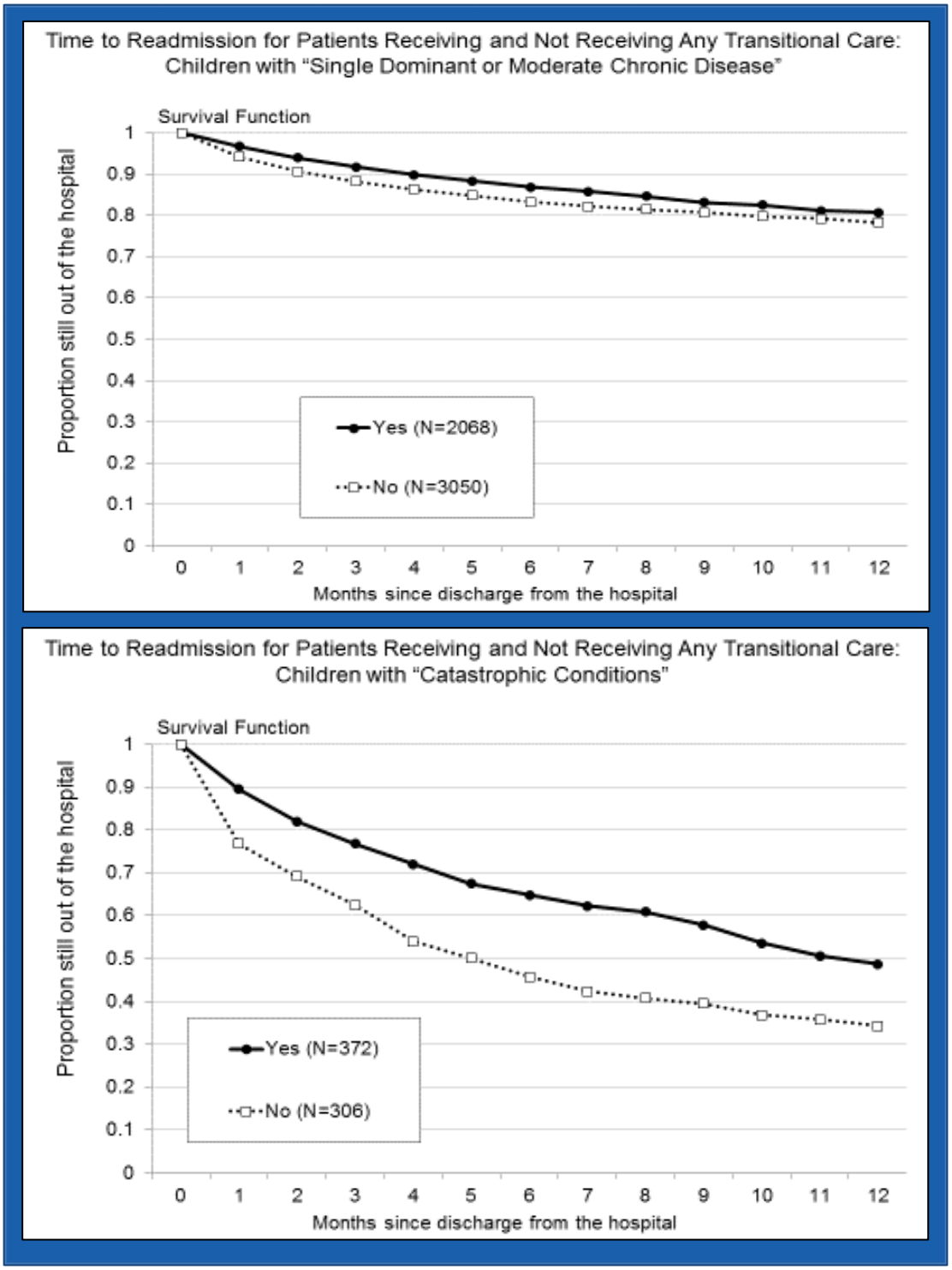
Figure 1: Hospital Admissions and Readmissions for Medicaid-enrolled Children Ages 0-20, SFY16, by Top 10 Major Diagnostic Categories*



Fine-tuning Transitional Care Strategy for Pediatric Populations

In examining the impact of transitional care support over time, CCNC has found that complexity and chronicity of a child's clinical conditions are strong indicators of likelihood of benefit from transitional care support. Figure 2 on the following page illustrates the rate at which children were readmitted to the hospital during the 12 months following an initial hospitalization; comparing those who received CCNC transitional care (solid line) to matched controls who did not (dotted line).

Figure 2: Eight-fold higher return on investment for transitional care, depending on patient selection (Illustration of low- vs. highly-impactable patient populations



*Includes non-dually enrolled Medicaid patients with an initial discharge in SFY 2011 (excluding obstetrics, newborns, malignancies, burns and traumas) who were CCNC-enrolled at time of discharge or month after. Significant group differences: Wilcoxon (Gehan) statistic = 12.68, p<.001

Among children with a single chronic disease without comorbidities (for example, asthma) in Figure 2, fewer than 10% were readmitted within one month and approximately 20% were readmitted within a year. Those who received transitional care were less likely to experience a readmission. In this group, one readmission was prevented for every 42 children who received transitional care support. Figure 3 shows the readmission pattern among more complex children with catastrophic conditions (for example, spina bifida, cystic fibrosis, late-stage kidney failure, dependence on a mechanical ventilator): in the absence of transitional care, 25% were readmitted within 30 days and 65% within a year.

Among those who received CCNC transitional care support, however, those rates were reduced to approximately 10% and 50% respectively. For these children, one readmission was prevented for every five children who received transitional care. The key insight here is that, while transitional care management may benefit anyone being discharged from the hospital, *the return on investment is profoundly greater when the intervention is targeted toward those patients who are most likely to benefit*.

CCNC's Pediatric Transitional Care Priority Population

CCNC is now able to assign a Transitional Care Impactability Score™ to every NC Medicaid recipient to predict the expected savings opportunity through transitional care in the event that the patient is hospitalized. These scores are largely driven by indicators of disease burden and complexity available through the patient's claims history, which are predictive of both readmission risk and the degree to which CCNC care team support has been shown to improve outcomes for similar patients in the past.

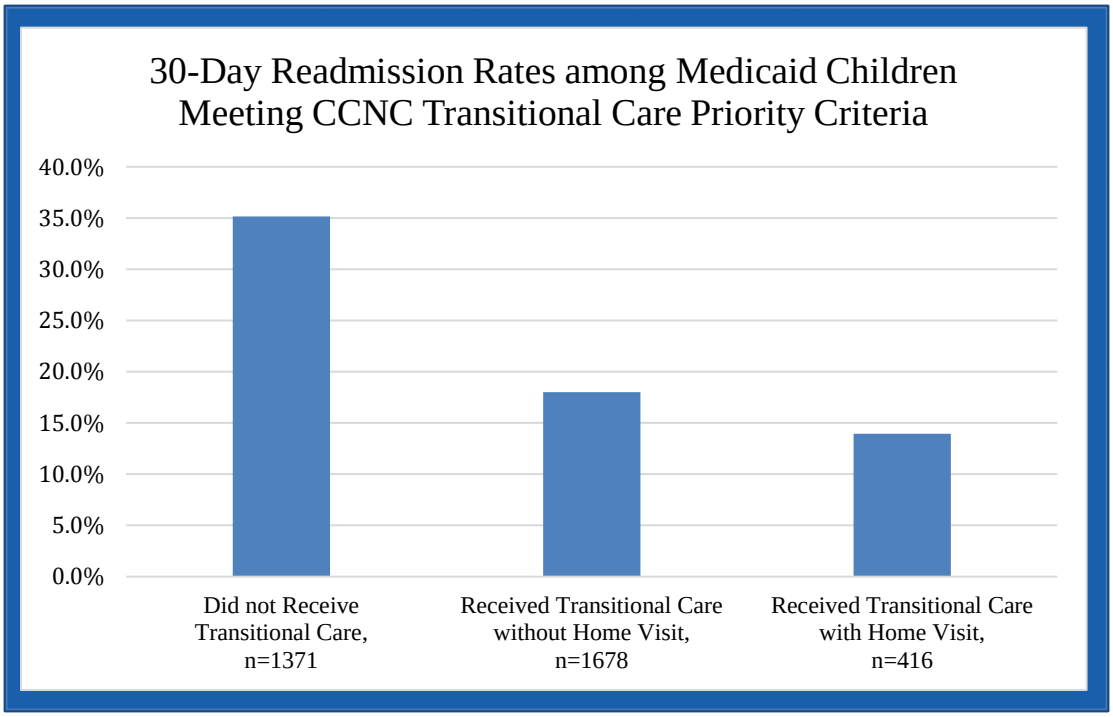
Children with scores over 200 are considered highest priority for transitional care, and represent fewer than 25% of Medicaid pediatric discharges. While these children may be hospitalized for a wide variety of reasons, intellectual or developmental disability and mental illness are common underlying conditions (Table 1 on following page). Chronic gastrointestinal disorders, neurological conditions, and asthma are the most prevalent medical diagnoses.

Table 1: Characteristics of Children Prioritized for Transitional Care Management, FY16 (N=2,276 children)

Intellectual Developmental Disability	46.7%
Mental Illness	37.6%
Chronic Gastrointestinal Disease	38.0%
Chronic Neurological Condition	37.8%
Asthma	31.0%
Hypertension	12.9%
Diabetes	7.6%
Cancer	7.4%
Sickle Cell Disease	6.9%
Chronic Kidney Disease	5.6%
Average Medicaid Cost During FY16	$71,497
Average Inpatient Visits During FY16	2.18
Average ED Visits During FY16	2.32

As shown in Figure 3 on the following page, the impact of providing transitional care support to these prioritized children is substantial. In the absence of such support, 35% will be readmitted within 30 days. Likelihood of readmission is cut in half for those receiving transitional care. For those whose transitional care support includes a home visit, readmission rates are reduced even further to less than 15%.

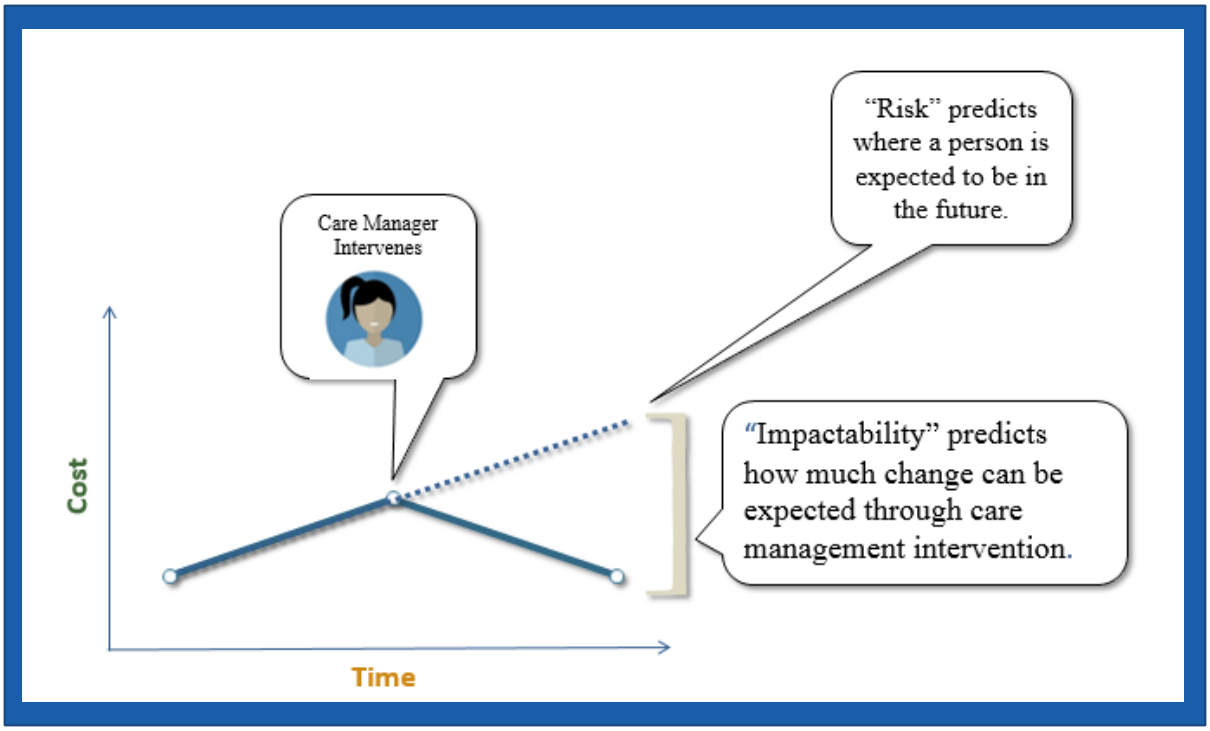
Figure 3: Readmission Rates in Pediatric Transitional Care Priority Population, with and without Care Management Support



Beyond Transitional Care: Savings Opportunities through Complex Care Management

Many children who receive intensive CCNC care management support are identified outside of the hospital setting, through provider referral or, more commonly, through continuous surveillance of available data and use of novel predictive modeling strategies that are designed to optimize the benefit of available care team resources. Using controlled evaluations over time, we have been able to quantify the savings attributable to care management interventions and discern characteristics of patients who may be high cost/high risk, but for whom care management had little or no impact on future outcomes. Conversely, we can identify lower cost and less clinically complex patients, who may not have qualified for care management under more traditional risk segmentation strategies, but who benefitted substantially from care management support. These insights led to a fundamental shift in our predictive modeling strategy away from predicting "risk," to predicting "impactability" (Figure 4 on following page), producing patient-specific estimates of expected savings through care management based on signals in available data known prior to intervention.

Figure 4: Optimizing Return on Investment Requires a Focus on Impactability, Rather than Risk



Characteristics of Children Highly Responsive to Care Management Outreach and Intervention

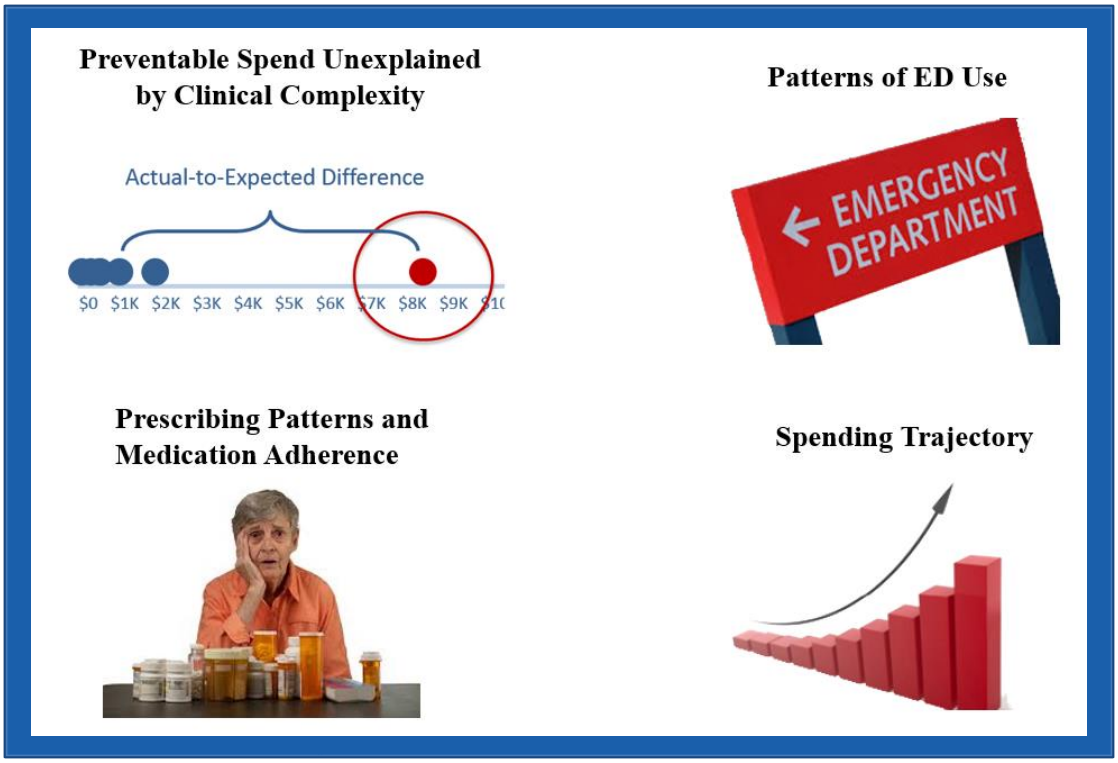
Approximately 4,300 out of 1.1 million CCNC Medicaid-enrolled children generate a CCNC Complex Care Management Impactability Score™ >200 each month, which indicates an expected near-term gross savings opportunity >$1,200 per child over six months through multidisciplinary, complex care management. Characteristics of this population are shown in detail in Table 2 on the following page.

Table 2. Characteristics of Children with Complex Care Management Impactability Score™ >200

Asthma	45%
Any Mental Illness	41%
ADHD	14%
Chronic Gastroenterological Disease	14%
Depression	13%
Developmental Disability	9%
Chronic Neurological Disease	9%
Bipolar Disorder	5%
Hypertension	5%
Diabetes	4%
Three or More Chronic Conditions	23%
Average ED Visits in Prior Year	3.4
Average Inpatient Admissions in Prior Year	0.5
Average Monthly Medicaid Costs	$1,100

We have found that utilization patterns related to adherence to chronic medications and emergency department use, and spending that is higher than expected after adjusting for clinical disease burden, are more important predictors of impactability than the presence of any specific disease or event. While asthma and mental illness are prevalent conditions among children who receive CCNC care management (each present in over 40% of prioritized children), those diagnoses do not predict impactability in and of themselves. In fact, less than 2% of all Medicaid-enrolled children with asthma or mental illness meet CCNC's threshold "Impactability Score" of 200 that triggers highest priority care management intervention. Children with sickle cell disease and diabetes are slightly more likely to meet this priority threshold (5.7% and 3.5%, respectively); but they will have a higher Impactability Scores™ than other children with the same diagnoses. This is due to historical patterns of service utilization, medication adherence, and comorbidities that have been shown to be stronger signals of responsiveness to care management intervention.

Figure 5: Predictors of Impactability in Administrative Data



Once the care management team engages with these patients and families, they commonly identify additional social and economic obstacles that have been contributing to the observed spending and utilization patterns, such as poor support systems, unmet nutritional needs, transportation barriers, and unstable housing. These factors can be effectively mitigated through patient and family education, self-management support, facilitated communication and care plan coordination between the primary care medical home and specialist providers, and linkage to available community resources.

Social risk factors for NC Medicaid children with high Impactability Scores™:

- **32% lack adequate support system**
- **19% have unmet nutritional needs**
- **18% lack adequate transportation**
- **11% have unstable housing**
- **7% have experienced trauma or abuse**

Savings Impact of Targeted Care Management

Table 3 conveys the importance of targeting care management interventions in order to maximize the return on investment. In this controlled evaluation, gross Medicaid savings attributable to care management for children with Impactability Scores<200 amounted to $65 per member per month (pmpm) over six months ($390 per patient).

For children with Impactability Scores >200, care management generated a savings of $537 pmpm, or *$3,222 per patient* during six months of follow up.

Table 3. Impactability Scores™ and relative return on investment

	N	PMPM (pre)	PMPM (post)	PMPM (diff)
LOW Impactable Patients (Score<200)				
CONTROL	7,571	$502	$497	-$4
INTERVENTION	9,879	$697	$628	-$69
Incremental Benefit of Complex Care Management				**-$65**
HIGH Impactable Patients (Score=200+)				
CONTROL	663	$2,546	$2,534	-$13
INTERVENTION	1,531	$2,598	$2,048	-$550
Incremental Benefit of Complex Care Management				**-$537**

Magnitude of Success: Hospital Utilization Trends for CCNC Medicaid-Enrolled Children

CCNC's success in lowering costs through reductions in hospital and ED use, has been well described in a number of external evaluations.[1-5] Figures 6-8 on the following pages provide evidence of continual improvement, with a focus on the pediatric population. Benchmarked against NC Medicaid-specific utilization rates during calendar years 2011 and 2012, with adjustments for variations in case mix over time, we are seeing hospitalization rates 33.1% below expected, emergency department utilization rates 11.7% below expected, and potentially preventable readmission rates 65.7% below expected through calendar year 2016.

Figure 6: Statewide Trend in Inpatient Admissions – CCNC Pediatric Medicaid Population, 2012-2016

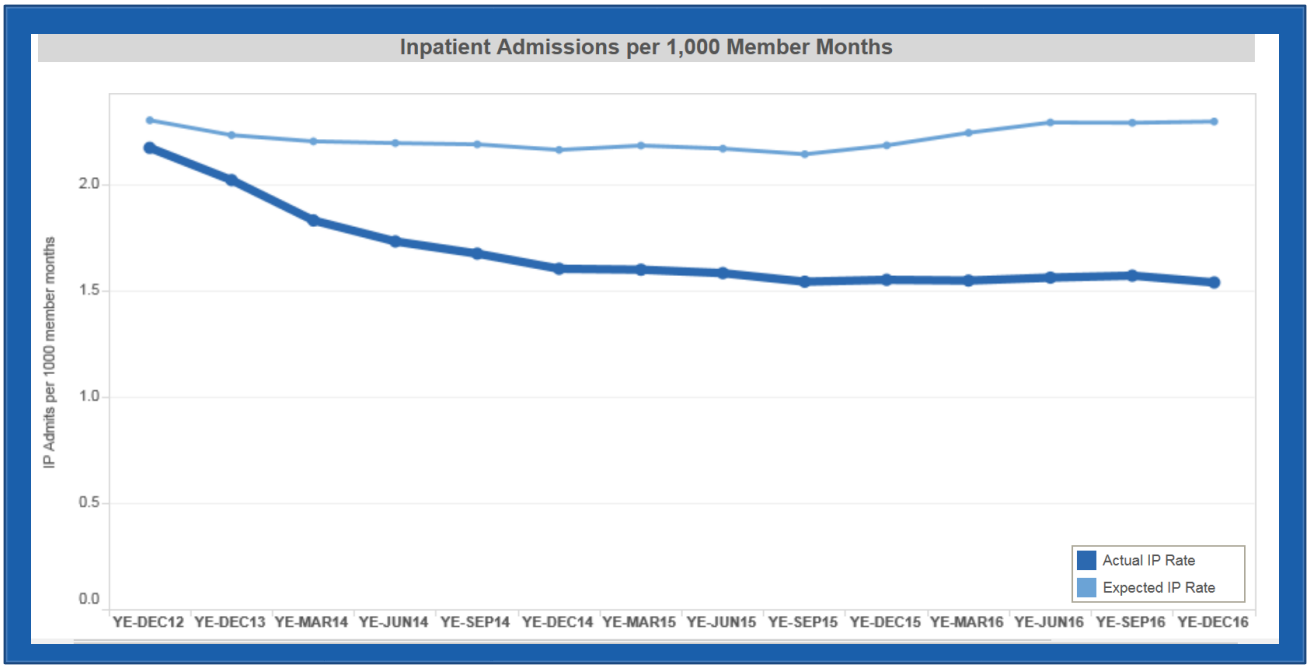


Figure 7: Statewide Trend in ED Use – CCNC Pediatric Medicaid Population, 2012-2016

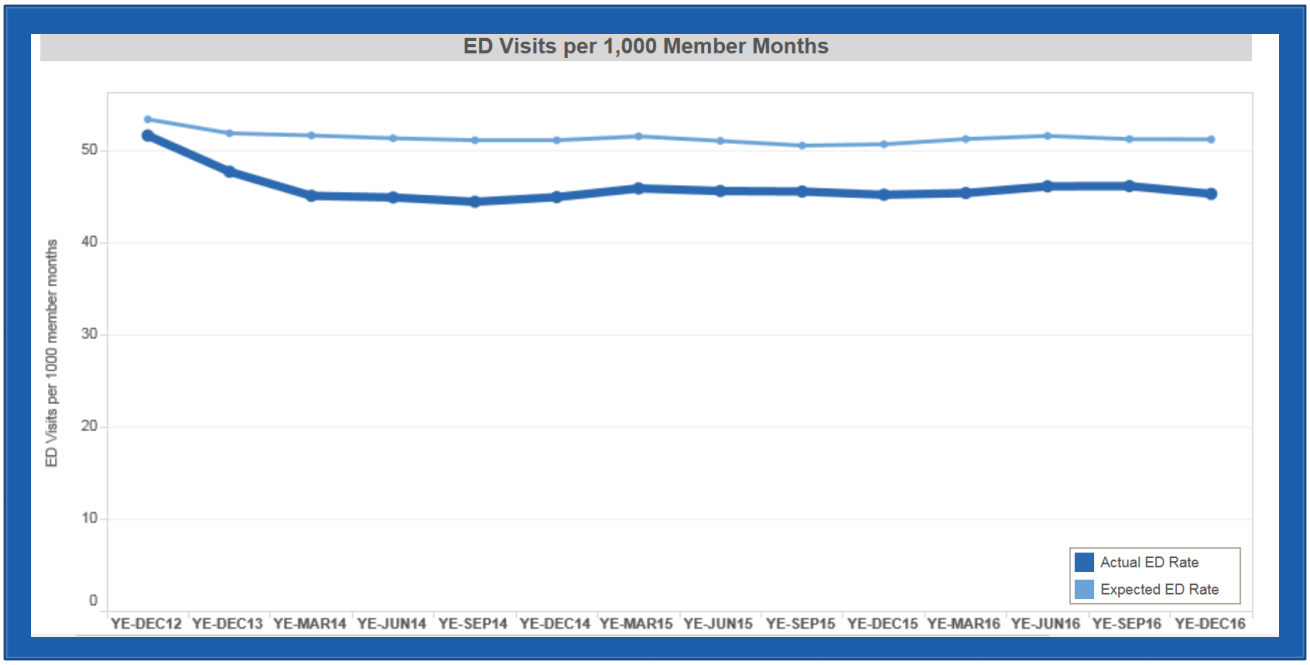
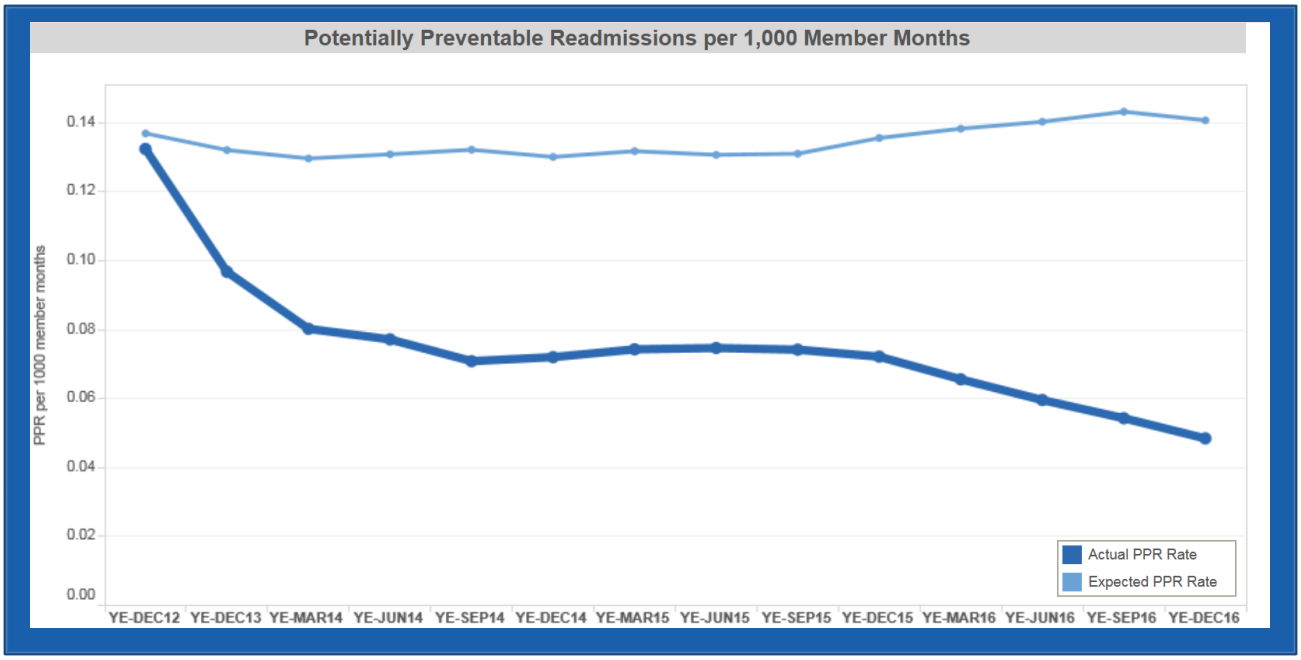


Figure 8: Statewide Trends in Readmissions - CCNC Pediatric Medicaid Population, 2012-2016



Conclusion

With over 15 years of experience providing care management services to Medicaid-enrolled children, CCNC has actively evolved its care management strategies through rigorous and iterative evaluation of what works. This data brief summarizes learnings most pertinent to the near-term goals of reducing avoidable hospital use and demonstrating cost reductions through careful allocation of care team resources. It is clear that "high-cost/high-risk" is not the same thing as "highly impactable." Predictive modeling strategies that focus on the former may struggle to prove return on investment. Less discriminant care management strategies, such as targeting all hospitalized children or all children with asthma, are also unlikely to yield measurable net savings in the near term. In the face of limited care team resources, finding that "sweet spot" of impactability is key to demonstrating value, and building capacity over time for reinvestment in longer term health outcomes for our children and our communities.

References:

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