HEALTH DISPARITIES AT CCPN:

Childhood Vaccine Completion Rates and Adult Chronic Diseases

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KEY POINTS FROM THIS BRIEF:

- Consistent with national data, health disparities are apparent among patients who receive care in CCPN practices, suggesting the need for innovative and organizational approaches to achieve health equity
- Racial disparities in child vaccinations exist in nearly every region in North Carolina, with Black and Native American children of CCPN practices most affected
- Diseases such as diabetes, hypertension, kidney disease, and heart failure are significantly higher among Black, Hispanic, and Native American adults of CCPN practices
- CCNC plans to address health disparities through an innovative, multilevel, and multidisciplinary approach, with a focus on addressing overarching issues that perpetuate disparities, as well as targeted interventions to address newly discovered disparities in childhood vaccination rates and adult chronic diseases

Background

Health care systems across our nation have increasingly invested in methods to address health disparities, however, many disparities continue to exist, with some worsening despite these efforts. Achieving health equity, the equal opportunity for all individuals to reach their best achievable health outcomes, will require a multilevel approach to address the many complex factors that contribute to inequities. Health Equity and Access is one of the core values of Community Care of North Carolina (CCNC) and serves as the foundation for all related organizational interventions explored thus far (Table 1). Through a combination of consultation, literature search, and organizational self-assessment, CCNC identified two topics of focus (one child health measure and one adult health measure) to explore for potential organizational interventions, and that historically and nationally present with disparities: childhood vaccine completion rates and chronic disease development in adults.

Vaccines are one of the best tools for prevention that we can provide for young children, whose immature immune systems often leave them susceptible to potentially fatal communicable diseases. From 2017-2018, data from the National Immunization Surveys showed that despite the majority of children completing series for all the recommended vaccines by 24 months of age, White children were more likely to complete vaccination series for most

of the recommended vaccinations within the first 24 months of life compared to other racial groups, particularly Black and Hispanic children.[1] Though reasons for this difference is likely multifactorial, evidence has shown that Black and Indigenous families receive poorer quality of communication leading to less shared decision making and there is overall decreased vaccine confidence in Black, Indigenous, and People of Color (BIPOC) communities.[2] Racial disparities also exist within adult health outcomes. An estimated 60% of all adults in the U.S. have at least one chronic disease and 40% have two or more,[3] and among this group, racial disparities have been well documented. For example, research has shown that the incidence of type 2 diabetes for Non-Hispanic Blacks, Hispanics, and American Indians and Alaskan Natives have been consistently higher than those who identify as Asian and White.[4,5] Recent literature has also questioned if current management guidelines are potentially inequitable and contribute to disparities. Evidence shows that lifestyle modification may be an inadequate treatment option for non-White populations who are still at significantly higher risk of chronic disease multimorbidity despite being at healthy weights, creating a proposal for these populations to be screened earlier than currently recommended for the general adult population.[6]

Using existing databases at CCNC, we aimed to analyze childhood immunization completions rates by race and ethnicity and region across CCPN (Community Care Physician Network) practices and examine prevalence of adult chronic diseases by race and ethnicity.

Table 1: Past and Current CCNC Organizational Interventions to Address Disparities

Intervention	Description
Organization Self-Assessment	▪ An external auditor assessed integrity of CCNC's diversity, equity, access, and inclusion (DEA&I), including evaluation of operations (policies, procedures, organizational structure, etc.), internal and external communications, employees' experiences, and member/provider experiences and outcomes.
Established DEA&I Advisory Committee	▪ Established to develop and implement the organization's strategic plan and to advance the organization's mission and commitment to DEA&I. ▪ Four key areas of focus: Operational Effectives (HR policies, Finance, leadership), Communications (internal & external), Employee Experience, and Beneficiary (Patient/Partner) Outcomes.
Enhanced Data Availability	▪ Enhanced care management performance and member engagement dashboards to include race and ethnicity data. ▪ Expanded data focusing on the social determinants of health (SDOH). Data elements, such as Social Vulnerability Index (SVI), integrated into models to display the geographical needs in the specific areas. ▪ Collaboration with Cape Fear Collective (CFC), which incorporates data science and analytics of community needs and resources. ▪ CCPN medical practice locations and specialties, CCNC staffing availability, and SVI were integrated into a single dashboard with the new CFC data elements, displaying medical access and community needs.

Enhanced Workforce Training	▪ Tiered approach based on the employees' roles and responsibilities.
	▪ Training for all workforce members: DEA&I training, which reviews topics like unconscious bias, health disparities, and ethnic and racial differences.
	▪ Training for clinical operations or staff who engage with the members/patients and providers: Cultural sensitivity, motivational interviewing, and trauma-informed care.
	▪ Training for Community Health Workers (CHWs): Partnership between CCNC and NC AHEC's Project ECHO to leverage educational material specific to CHWs and collaborative work with medical practices and Community Based Organizations (CBOs).
	  ▪ Strategies for engagement with community leaders and members
	  ▪ Self-care/awareness
	  ▪ Field safety
	  ▪ Health behaviors and change

Methods

Data to calculate childhood vaccine completion rates were obtained from claims, enrollment, and the North Carolina Immunization Registry (NCIR) for Medicaid-eligible kids assigned to CCPN practices. The Healthcare Effectiveness Data and Information Set (HEDIS) includes a childhood immunization measure, Combo 10, which is used by many healthcare systems to track how many children receive the recommended vaccinations in the first 24 months of life.[7] Included in the Combo 10 measure are the following vaccines: 4 doses of DTaP, 4 doses PCV, 3 doses of IPV, 3 doses Hepatitis B, 3 doses of Hib, 2 or 3 doses of Rotavirus vaccine, 2 doses of seasonal influenza vaccine, 1 dose of Hepatitis A, 1 dose of MMR, and 1 dose of VZV.

The sample population includes all children that were eligible for the Childhood Immunizations (Combo 10) measure in calendar year 2022 (CY22), meaning that all children in the sample population turned 2 years old in 2022 (born between 1/1/20 – 12/31/20). All children, who completed all doses included in the Combo 10 measurement before turning two years old, were used to determine percentages for completion of the Combo 10 measurement. This report reflects the percentage of children who are in the measure for CY22 and who have completed each of the 10 series. Percentages of Combo10 completion, overall and by region, were calculated. Disparity ratios were calculated by taking the completion rate for each individual subgroup and dividing it by the completion rate for the White referent group. Numbers larger than 1.0 reflect higher rates, and numbers below 1.0 reflect lower rates, relative to the referent group.

For adult chronic diseases, we analyzed paid claims data during the 12-month period from 5/1/22-4/30/23 and pulled diagnoses for identifying the presence of chronic conditions. The presence of any ICD-10 codes that correspond to diabetes, hypertension, chronic kidney disease, congestive heart failure and chronic obstructive pulmonary disease (COPD) were used to tag individual members as having one of those respective chronic diseases. We focused on these sets of conditions because they are preventable and managed within the primary care setting. Members were included in the analyses if they were at least 21 years of age, Medicaid eligible, and enrolled in a CCPN advanced medical home for all 12 months of the evaluation period. Race, ethnicity and age were pulled from the beneficiary files

received from the respective payers. Race and ethnicity were combined into a single variable with all Hispanic individuals combined into one group (regardless of race), and so all racial categories are assumed to be non-Hispanic. For this analysis, we had data for Black, White, and Native American races and Hispanic ethnicity. All other categories were combined into the Other subgroup. We applied the direct method of age-adjustment by calculating the age-specific rates of disease within each race subgroup and then rolling them up according to a standard age distribution (55% ages 21-40, 25% ages 41-60, and 20% ages 61 and older). Relative risk was calculated similar to the disparity ratios above in that the rates associated with a specific subgroup were divided by the rates associated with the White referent group.

Results

With the exception of Region 1, Black children had the lowest percentage of Combo10 measurement completion compared to children of any other group in all CCPN regions (Table 2). Native American children had a lower percentage of Combo10 measurement completion in Regions 2, 4, 5, and 6 compared to all other groups except Black children. In Regions 1 and 3, Native American children were observed to have higher Combo10 completion compared to White children at 33.3% vs. 27.7% and 50.0% vs. 30.5% respectively. In Region 1, White children were observed to have the lowest completion at 27.7%. The overall Combo10 completion reflected trends observed in most individual regions, with Black children having the lowest completion (21.9%), followed by Native American children (25.0%).

With White children as the referent group, disparity ratios were observed in every region except Region 1 (Table 3). The largest disparity ratio was observed in Region 4 between Native American and White children at 0.44, meaning Native American children were 56% less likely to be fully immunized. This region also was observed to have one of the largest disparity ratios for Black children at 0.61. The largest disparity for Black children was observed in Region 3, with a ratio of 0.6, meaning Black children were 40% less likely to be fully immunized.

Table 2: Combo10 Rates by Race, Ethnicity, and Region (CY22)

Region	Asian	Black	Hispanic	Native American	White	Unreported /Other	Overall
Region 1	39.5%	31.1%	44.5%	33.3%	27.7%	23.1%	30.7%
Region 2	41.3%	21.7%	36.0%	25.0%	31.7%	25.0%	29.2%
Region 3	45.9%	18.2%	41.0%	50.0%	30.5%	29.5%	29.5%
Region 4	49.6%	22.9%	44.7%	16.7%	37.5%	35.4%	33.9%
Region 5	41.8%	21.1%	43.3%	24.8%	34.8%	31.3%	29.7%
Region 6	55.4%	24.2%	48.1%	28.6%	38.6%	40.0%	34.0%
Overall	45.9%	21.9%	43.4%	25.0%	34.0%	31.3%	31.3%

Table 3: Combo10 Disparity Ratios by Race, Ethnicity, and Region (CY22)

Region	Asian	Black	Hispanic	Native American	White*	Unreported /Other	Overall
Region 1	1.43	1.12	1.61	1.20	0.00	0.83	1.11
Region 2	1.30	0.68	1.14	0.79	0.00	0.79	0.92
Region 3	1.50	0.60	1.34	1.64	0.00	0.96	0.96
Region 4	1.32	0.61	1.19	0.44	0.00	0.94	0.90
Region 5	1.20	0.61	1.25	0.71	0.00	0.90	0.85
Region 6	1.43	0.63	1.25	0.74	0.00	1.03	0.88
Overall	1.35	0.64	1.27	0.74	0.00	0.92	0.92

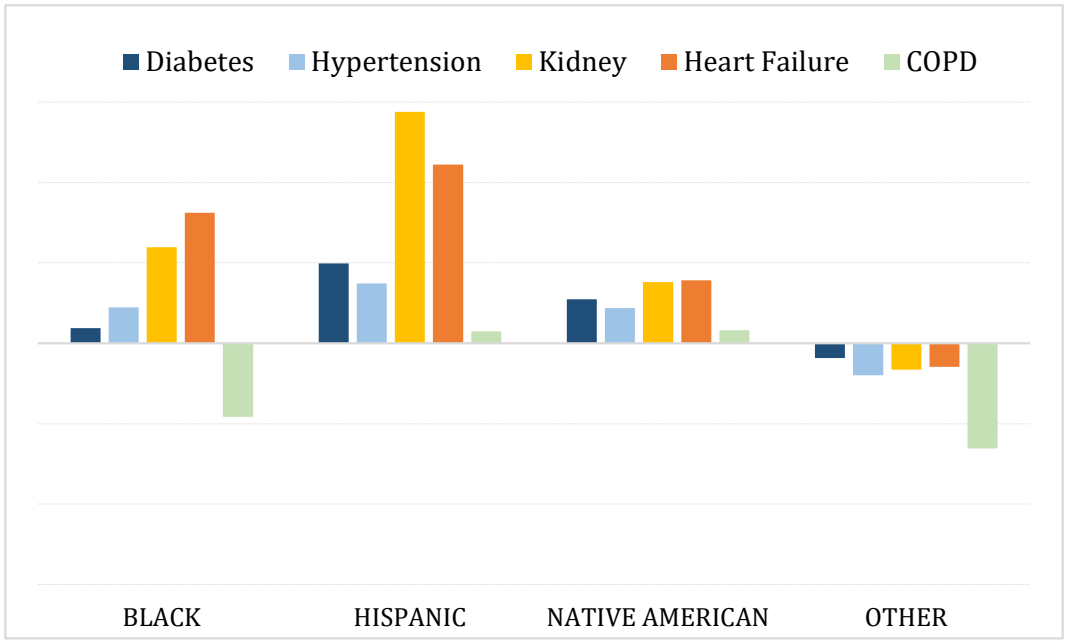
*Referent group

In our analysis of the current prevalence of chronic diseases among adult beneficiaries in our network, we found that Black, Hispanic and Native American beneficiaries were significantly more likely to have diabetes, hypertension, kidney disease and heart failure compared to their age-adjusted White counterparts. Table 4 reports the age-adjusted rates for each subgroup. Figure 1 illustrates the relative risk of each disease using the White subgroup as the referent group; a number higher than 1.0 means that subgroup is more likely to have that disease. For example, Hispanic adults are more than twice as likely to have kidney disease and congestive heart failure compared to White adults. Across all the conditions reported below, Black, Hispanic, and Native American beneficiaries were 11%, 35% and 22% more likely to have any one of those conditions compared to their age-adjusted White counterparts. Notably, COPD was the only condition where White beneficiaries were either more likely or similarly likely to have the disease.

Table 4: Age-Adjusted Prevalence of Adult Chronic Diseases by Race/Ethnicity, 2023

Race/ Ethnicity	Diabetes	Hypertension	Chronic Kidney Disease	Congestive Heart Failure	COPD
Black	13.5%	29.9%	3.2%	2.0%	4.6%
Hispanic	18.5%	33.6%	4.9%	2.3%	9.2%
Native American	15.8%	29.8%	2.8%	1.5%	9.3%
Other	11.2%	19.6%	1.7%	0.9%	3.0%
White	12.4%	24.5%	2.0%	1.1%	8.6%

Figure 1: Age-Adjusted Relative Risk of Chronic Diseases Compared to White Beneficiaries, 2023

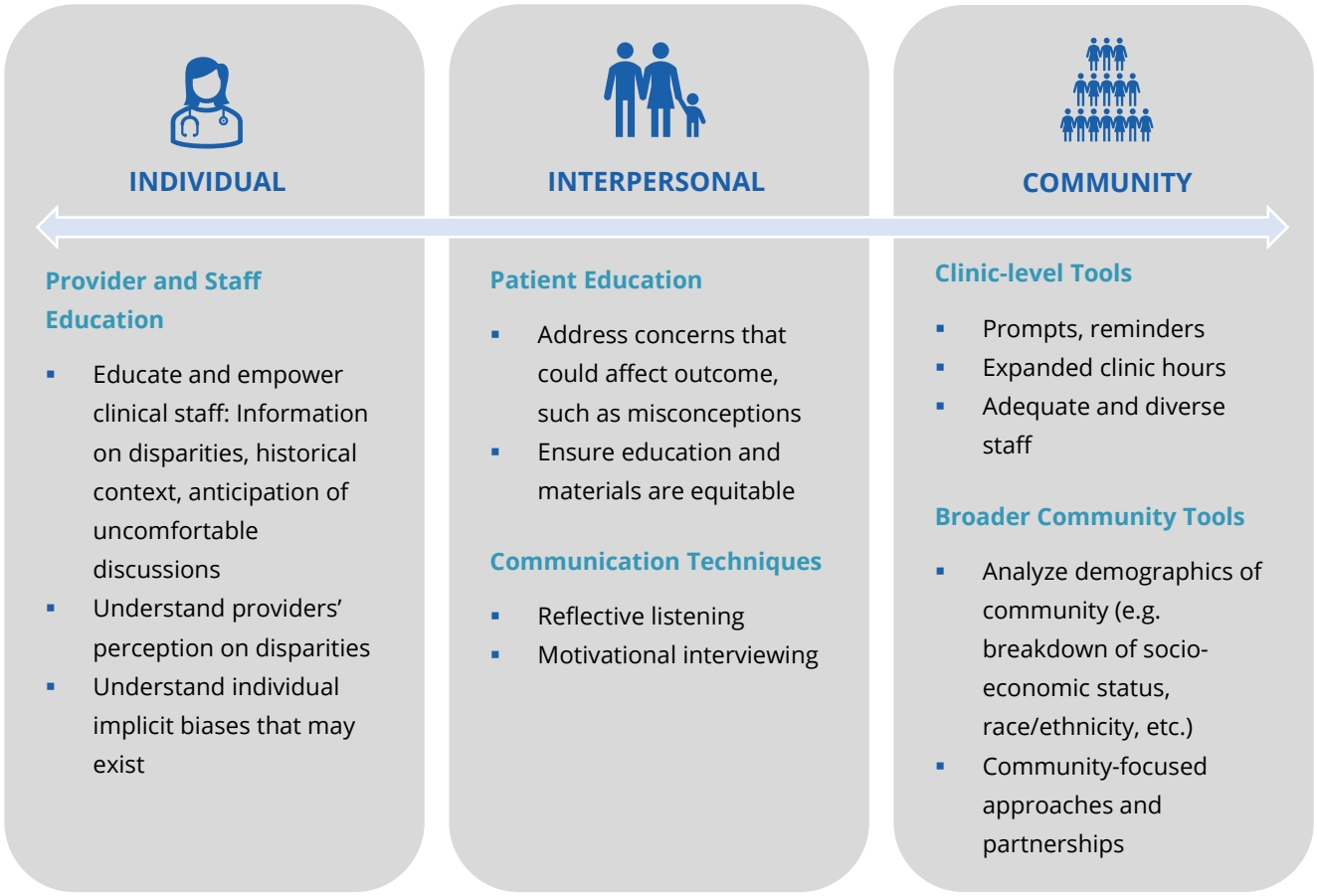


Discussion

Among CCPN's patient populations, racial disparities in the receipt of necessary child vaccinations exist in nearly every region and Black and Native American children are the most affected. Additionally, the prevalence of preventable chronic diseases, including diabetes, hypertension, kidney disease and heart failure is significantly higher among Black, Hispanic, and Native American adults within CCPN's patient population compared to its White beneficiaries. Although these findings likely mirror what is observed nationally, it's imperative that medical home providers of CCPN practices act to identify and minimize such disparities.

Community-based strategies that include community input are integral for improved compliance with healthcare provider recommendations, including important measures such as vaccine uptake.[8] Additionally, multicomponent strategies that include activities targeted at various levels are more likely to produce more favorable outcomes and improve all levels of prevention – primary, secondary, and tertiary.[9] A multilevel framework may be a useful tool for developing effective strategies at the level of the practice or community and can assist in tailoring interventions for the community in which these activities will be implemented (Figure 2). In this framework, there are three important levels: individual, interpersonal, and community.

Figure 2: Multilevel Quality Improvement Framework for Clinic-level Interventions to Address Health Disparities



At the individual level, clinics should plan for strategies to understand and improve underlying issues that can ultimately affect health outcomes, such as healthcare provider's and staff's individual beliefs, comfortability with having difficult and challenging conversations with patients and families, and existing individual biases that may subconsciously contribute to disparities. At the interpersonal level, clinics should plan strategies that improve communication and relationships between patients, such as developing educational materials appropriate for all patients served within the clinic and practicing techniques that promote trust and communication with patients and families. Lastly, at the community level, clinics should focus on both system changes within the clinic, such as developing systems to promote favorable health outcomes, as well as establish relationships with the community to build trust between community members and the systems in place that serve community members.

Communities, even if seemingly similar from an outside perspective, can vary greatly and have many diverse characteristics that are highly valuable amongst its members, such as cultural and religious values. Therefore, it is important that healthcare systems and their employees understand these values prior to implementation of new activities. It should be noted that positive changes to health policy is also an important, and often highly effective, level where change can lead to reduction of health disparities. However, interventions at this level would require a

broader interdisciplinary and organized approach that is often out of the scope for which most smaller clinics can achieve independently, and therefore, is excluded from this model that focuses on practice- and community-based strategies.

Future Directions

CCNC's Health Equity Council plans to use this multilevel framework and supporting evidence to implement two organizational quality improvement projects aimed at reducing discovered disparities in childhood vaccinations and chronic diseases.

Combo 10 Disparities

Through our statewide operations team, we plan to develop a systematic population health approach that involves enhanced outreach to patients and families, including education about available medical services, wellness, preventive care, and immunization health. Team members delivering these communications will continue to receive training to understand and address health disparities and all materials and communications will be reviewed to optimize inclusivity and equity. Additionally, we will develop a strategic approach for our influenza vaccine campaigns in Fall 2023 and subsequent seasons, including organizing vaccine clinics in areas with high flu and/or Combo 10 vaccination disparities to allow for extended patient education outside of the traditional medical setting and improve access to care.

Chronic Diseases Disparities

For the second improvement project, CCNC plans to expand our innovative Health Equity Outreach Program that includes collaborations between select CCPN practices within the communities of pilot regions (regions 3 and 5), CHWs, and members of the community. Through this multipronged approach, we will increase our CHW staff in these targeted regions, ensuring that CHWs are from the communities they will serve and are linguistically and culturally trained as appropriate for their respective communities. CHWs will help identify members in the community who have not had a visit with their primary care provider in 2 or more years and are potentially at higher risk for chronic disease development, and therefore, would likely benefit from early intervention and management. Additionally, this practice-driven approach focuses on developing equity-optimized practices. To achieve this, providers of participating practices will receive: 1) health equity coaching, including assistance with practice health equity assessments using a gap analysis[10] and provider training on topics such as cultural competence, biases, and microaggressions; 2) a health equity toolkit, which will be used as a resource for supplemental health equity education and will include tools to guide practice-level improvement projects; and 3) a health equity report card, which will highlight any existing disparities among their own patient populations.

Through use of our multilevel quality improvement framework, we hope to establish a system that encourages quality improvement teams, in collaboration with organizational leadership, to use an interdisciplinary approach for addressing issues that contribute to disparities, and involve multiple stakeholders as mentioned. Our vision is that, as an organization, we can use our enhanced data systems for ongoing assessment of health disparity gap closure and to

inform our pilot interventions, with hopes of developing a model for scalability across the state, and a long-term goal of meaningful health disparity reductions for our CCPN patient populations.

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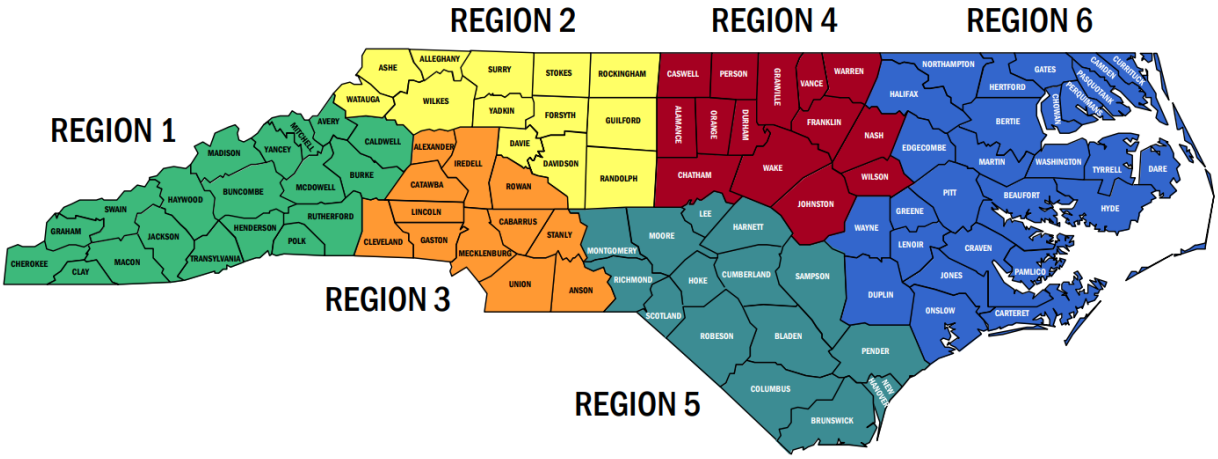
Appendices

Appendix A: North Carolina Medicaid Managed Care Regions



NC Medicaid Managed Care Regions - NC DHHS 2019[11]