



Title: NCDHHS ORH COVID-19 CHW Program NCCARE360 Referral and Social Support Programming Data Analysis (September 2021 – March 2022)

Outcomes: Outcomes include a) regional, vendor, and category distribution of social support referrals b) provision of social supports by CHW vendors (i.e., resolved referrals), and c) identification of gaps in care resource coordination

Data Source: NCCARE360 dataset from September 2021-March 2022 with 6 vendors: Kepro, One to One with Youth, Vidant Health, Mount Calvary Center for Leadership Development, Catawba County DPH, Southeastern Healthcare NC (note: two vendors, El Centro Hispano and Unete, are missing from this dataset and accordingly this data analysis).

Appendix includes findings from September 2020-June 2021 with 7 Vendors: Kepro, One to One with Youth, Vidant Health, Mount Calvary Center for Leadership Development, Catawba County DPH, Southeastern Healthcare NC, Curamericas Global.

Methods: We computed referrals and outcomes for each region, county, and vendor with descriptive statistics using data from September 2021-March 2022 from UniteUs dashboard. We excluded a county for referrals if: (a) that county was outside of the state; or (b) that county was not part of the vendor-specified coverage area. Missing values for counties were imputed using k-nearest neighbors (K-NN) algorithm. Summary tables were generated with frequency values, mean, median, and per capita rates of referrals and outcomes across Medicaid regions. The percentage of total was also calculated by category of social service. Heat maps were generated to depict variation and magnitude of referrals and case rates for social support categories and outcomes (closed, open, unresolved) by region and by CHW vendor. Stacked bar charts were generated to visualize the percentage of outcomes (resolved, unresolved, open) disaggregated by service type. All analyses and visualizations were done in R v4.1.1.

Key Definitions:

Referrals are requested social support services from clients to CHW vendors.

Cases are either accepted referrals submitted by CHWs to vendors OR one initiated by vendors while serving a client to address unmet needs. It is possible for a referral to not become a case based on determination by the CHW/vendor. Data around these decisions are not available via this analysis.

Resolved Cases are closed looped referrals in which the client's needs **are** met.

Unresolved Cases are closed looped referrals in which the client's needs are **not** met.

Open Cases are **not** closed looped referrals in which the client's needs are **still** being addressed.

Performance targets: $\geq 75\%$ for resolved cases (original program KPI target), $\leq 25\%$ for unresolved and open cases for social supports for the COVID-19 CHW program.

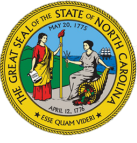
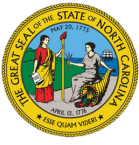


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I. Summary Statistics

Summary statistics: Between September 1, 2021 and March 24, 2022, 12,161 total NCCARE360 referrals were submitted to CHW vendors across six regions with 78 counties (fig. 1a). 82% were accepted referrals (cases) and 92% of cases were closed (78% were resolved and 14% were not resolved). 8% of cases remained open (Table 1a). Region three (3) had the highest total number of referrals, while region six (6) had the highest referral rates per population. Except for region two (2), regions with lower referral rates had higher percentage of resolved cases (Table 1b).¹ 58% of served counties had a percentage of resolved cases greater than 75% (fig. 1a), 19% had a percentage of unresolved cases greater than 25% (fig. 1b), and 21% had a percentage of open cases greater than 25% (fig. 1c).

Summary of Community Health Workers (CHWs) referral across regions						
Uses data from the COVID-19 CHW Program from September 2021 to March 2022						
Regions	Referrals(n)	Cases(n)	Resolved(n)	Unresolved(n)	Open(n)	Pop(n)
Region 3	6,596 ¹	5,968	4,747	980	241	2,609,006
Region 6	3,176	2,056	1,316	289	451	1,140,128
Region 4	1,717	1,553	1,350	122	81	2,431,177
Region 5	413	246	193	21	32	834,770
Region 1	175	128	112	15	1	740,217 ²
Region 2	84	64	45	10	9	1,562,212
TOTAL	12,161	10,015	7,763	1,437	815	9,317,510

¹ Region 3 has the largest referrals.

² Region 1 has the lowest population.

Source: Dataset is from NCCARE360.

Source: **6 vendors** including Kepro, One to One with Youth, Vidant Health, Mount Calvary Center for Leadership Development, Catawba County DPH, & Southeastern Healthcare NC.

a.

Summary of referral, cases, and outcome rates by regions						
Uses data from the COVID-19 CHW Program September 2021 to March 2022. rate is calculated for example as number of referrals per 100,000 people						
Requested Social Support	Served CHW Counties	Referral_Rate	Case_Rate	Resolved(%)	Unresolved(%)	Open(%)
Region 6	23	279 ¹	180	64	14	22
Region 3	12	253	229	80	16	4
Region 4	12	71	64	87	8	5
Region 5	9	49	29	78	9	13
Region 1	13	24	17	88 ²	12	1
Region 2	9	5	4 ³	70	16	14
min	—	5.0	4.0	64.0	8.0	1.0
max	—	279.0	229.0	88.0	16.0	22.0
avg	—	113.5	87.2	77.8	12.5	9.8
median	—	60.0	46.5	79.0	13.0	9.0

¹ Region 6 has the largest Referral Rate .

² Regions 1 has the highest resolution rates of cases

³ Region 2 has lowest Case Rate.

Source: Dataset is from NCCARE360.

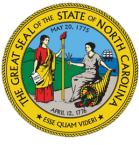
b.

Source: **6 vendors** Kepro, One to One with Youth, Vidant Health, Mount Calvary Center for Leadership Development, Catawba County DPH, & Southeastern Healthcare NC.

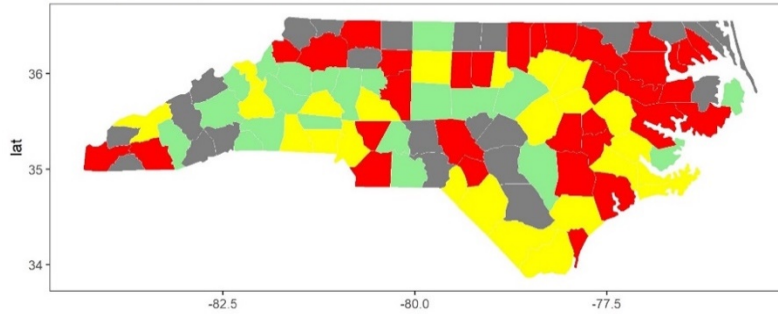
Table 1a. **Summary of referrals (n) and outcomes (cases, resolved, unresolved, open) by regions.** Conditional formatting for Referrals (n): red (<=1000), orange (>1000 & <=5000), and green (>5000); Pop(n): red (<=1M), orange (>1M & <=2M), green (>2M).

Table 1b. **Summary of referral and cases per capita and outcomes by regions.** The referral or case rates were calculated as the number of referrals received or accepted by the total population from served counties per 100k population. Conditional formatting for Resolved (%): red (<75%), orange (75-90%), and green (>90%); Unresolved and Open percentages: green (>10%), orange (10-25%), red (>25%).

¹ Data from two CHW vendors, El Centro Hispano (Regions 4/5) and Unete (Region 1), were not available for this analysis. Accordingly, the true number of referrals in those regions may be underestimated.



Resolution of referral cases across CHW served counties

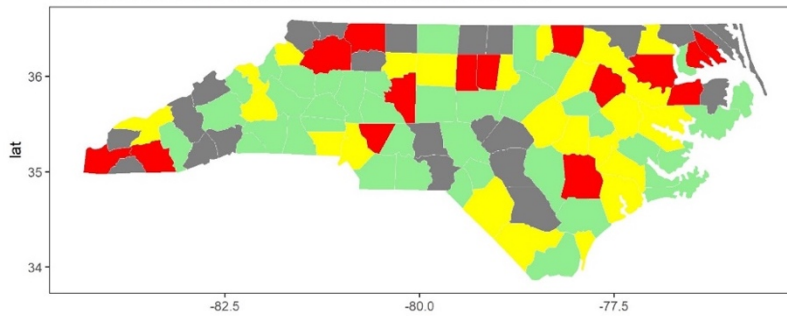


a.

Resolved_Rate ■ <75 ■ 75-90 ■ >90 ■ NA

Source: NCCARE360.

Unresolved referral cases across CHW served counties

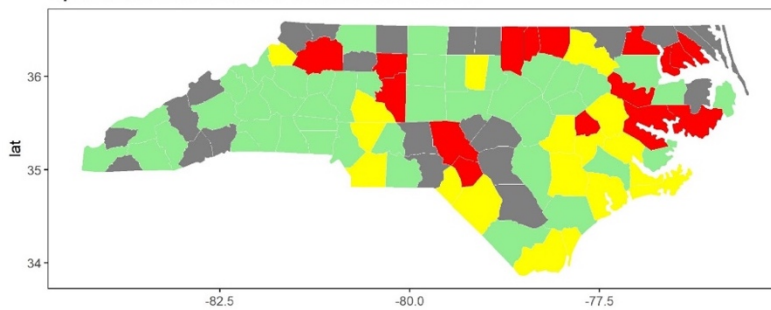


b.

Unresolved_Rate ■ <10 ■ 10-25 ■ >25 ■ NA

Source: NCCARE360.

Open referral cases across CHW served counties



c.

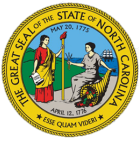
Open_Rate ■ <10 ■ 10-25 ■ >25 ■ NA

Source: NCCARE360.

Fig. 1a. **Percentage of resolved referral cases across all served counties.** Red (<75%), orange (75-90%), and green (>90%); Unresolved and Open percentages: green (>10%), orange (10-25%), red (>25%). (Note: NA indicates no referral was received from county).

Fig. 1b. **Percentage of unresolved referral cases across all served counties.** Green (<10%), orange (10-25%), and red (>25%); (Note: NA indicates no referral was received from county).

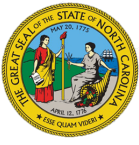
Fig. 1c. **The percentage of open referral cases across all served counties.** Green (<10%), orange (10-25%), and red (>25%); (Note: NA indicates no referral was received from county).



Requested Social Services from clients		
Uses data from the COVID-19 CHW Program from September 2021 to March 2022		
Services	Referrals	Percent
Individual & Family Support	4,393	36.12
Food Assistance	3,753	30.86
Housing & Shelter	1,937	15.93
Utilities	1,405	11.55
Income Support	205	1.69
Clothing & Household Goods	158	1.30
Employment	110	0.90
Physical Health	98	0.81
Benefits Navigation	48	0.39
Transportation	43	0.35
Education	4	0.03
Wellness	4	0.03
Social Enrichment	2	0.02
Sports & Recreation	1	0.01
TOTAL	12,161	100

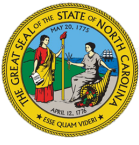
Source: Dataset is from NCCARE360.
Source: **6 vendors** Kepro, One to One with Youth, Vidant Health, Mount Calvary Center for Leadership Development, Catawba County DPH, & Southeastern Healthcare NC.

Table 2. Percent of social supports requested by clients, by type and (n). Sub-service types of each service provided include by not limited to: Individual & Family Support (e.g., case management, childcare, caregiving services, etc.); Food Assistance (e.g., Emergency Food, Food Pantry, SNAP/FNS, WIC/Other nutrition benefits, etc.); Housing & Shelter (e.g., Assisted Living, Rent/Mortgage Payment Assistance, Emergency Housing, etc.); Utilities (e.g., Bill Payment Assistance, Home Energy/Utilities Benefits, etc.); Income Support (e.g., Emergency/One-time Financial Assistance, TANF/Cash Assistance Programs, SSI/SSD & Disability Benefits, etc.); Clothing & Housing Goods (e.g. clothing & household goods, etc.), Employment (e.g., Job Search/Placement, Job Training, Career Skills Development, etc.); Physical Health (e.g. Medical Expense Assistance, Primary Care, Chronic Disease Prevention & Management, etc.); Benefits Navigation (e.g. Health Insurance/Benefits, Benefits Eligibility Screening, ID/Documentation Assistance, etc.), Transportation (e.g. Ride Coordination, Transportation Expense Assistance, Transportation Passes/Vouchers, etc.); Education(e.g. Degrees/Certifications, Language Classes, Computer/Technology Classes, etc.), Wellness(e.g. Nutrition Education, Mindfulness & Meditation, Health Literacy Classes, etc.), Social Enrichment (e.g. Youth Development, Arts & Crafts Classes, etc.), Sports & Recreation (e.g. Exercise Classes/Groups, etc.).



During the first 10 months of the COVID-19 CHW Program (September 2020-June 2021), food assistance, income, individual and family support, housing and shelter and utilities, in that order, were the top five (5) requested services (see appendix). However, during this evaluation period (September 2021-March 2022), individual & family support, food assistance, housing and shelter, utilities and income support were the top five requested by clients (Table 2).

Interpretation: The evolution of the COVID-19 CHW Program, with a primary focus on vaccination coupled with the end of Support Services 1.0 and other time-limited pandemic relief, saw the number of social support referrals decline after the first 10 months of the program (131,893 referrals between September 2020 and June 2021, Appendix table 4a). Despite the decline of state funded social supports (SSP, housing assistance, etc.), referral resolution percentage remained above the programmatic threshold of 75% (though decreased from 87% during the first 10 months of the program, Appendix table 4b). While the presence of direct social support programs likely increased demand during the first 10 months of the program, the top 5 requested service categories did not change significantly over this evaluation period from September 2021 through March 2022.

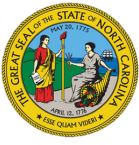


II. Social Support Referrals, Cases, and Outcomes by Region

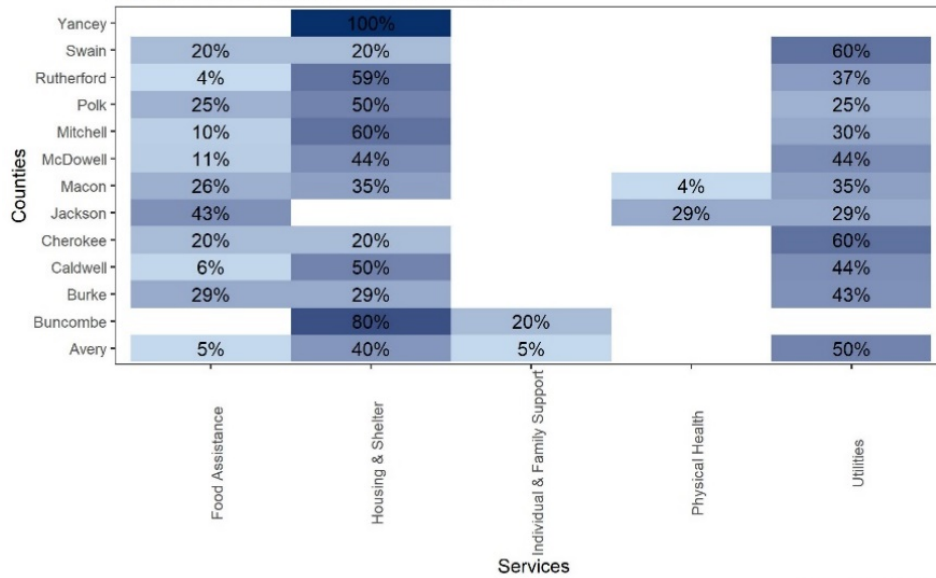
A. Region One²: Social Support Referrals, Cases, and Outcomes

Housing & Shelter (45%), Utilities (39%) and Food Assistance (14%) had the highest percentage of referrals and cases in most counties. All counties except Yancey, which had 100% of its referrals in housing and shelter, had changes in percentage of referrals and cases by service type (fig. 2a, fig. 2b). Referrals from Polk County varied; 50% were housing and shelter, 25% for food assistance and 25% for utilities. However, 100% of accepted referrals from this county was for housing and shelter. Referrals from Polk County for utilities and food assistance were not accepted. Interestingly, most counties had few or no referrals for individual and family support and physical health. Physical health was 2% of referrals; all referrals were accepted; however, 33% were unresolved cases (fig. 1a). Overall, housing and shelter and utilities had the highest percent of accepted and resolved cases (fig. 2c). On average, region one had higher than target ($\geq 75\%$) percentage of resolved cases (Table 1b). Unresolved and open cases were also lower than target ($\leq 25\%$). Noticeably, both referral and case rates were lower than other regions except region two (table 1b).

² Data from Unete were not available for this analysis. Accordingly, outcomes analysis for Jackson, Haywood, Transylvania, Buncombe, and Henderson Counties is incomplete. Data reflected Region One this reflects Kepro activities alone.



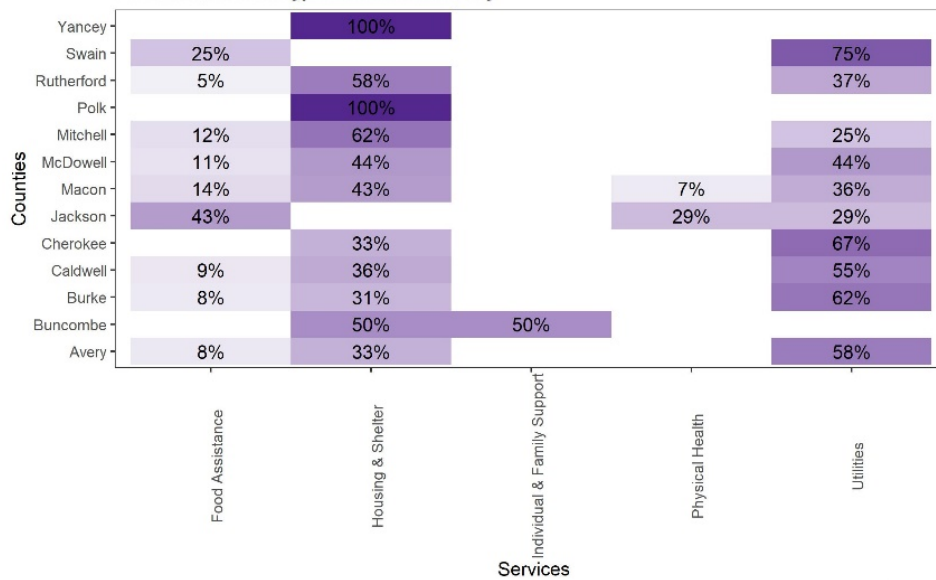
Heatmap of social services referral in region 1
Evaluation of referral types from each county



a.

Source: NCCARE360.

Heatmap of social service cases in region 1
Evaluation of case types from each county



b.

Source: NCCARE360.

Fig. 2a. **Percentage of total referrals(n) by county and service type in region one.** White rectangles signify no referrals from a county were made for a service type, the percentage represents the proportion of each service type of the total number of referrals received from each county. The darker the rectangle, the closer the value is to 100%.

Fig. 2b. **Percentage of total cases(n) by county and service type in region one.** White rectangles signify no referrals from a county were made for a service type, the percentage represents the proportion of each service type of the total number of referrals received from each county. The darker the rectangle, the closer the value is to 100%.

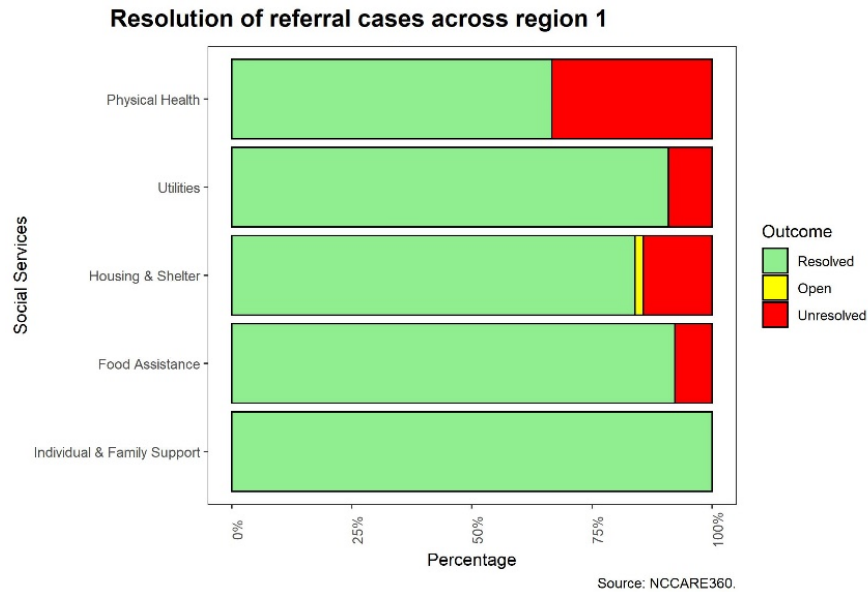
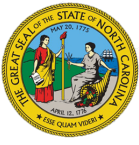


Fig. 2c. Cascade of social supports referral type and county and outcomes by percentage in region one. Green: % resolved; Yellow: % open; Red: % unresolved.

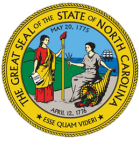
Interpretation: Housing & shelter and Utility referrals predominated in Region 1, and both were resolved at reasonably high rates (fig. 2c).

When a referral does not become a case, as reflected in different percentages between the referral and case figures for each service category, this could indicate a lack of referral options within NCCARE360 or CHW-determined client ineligibility for services. Investigation of those underlying reasons will be key to strengthening the program, especially if the answer is predominantly a lack of available social support resources within the county.

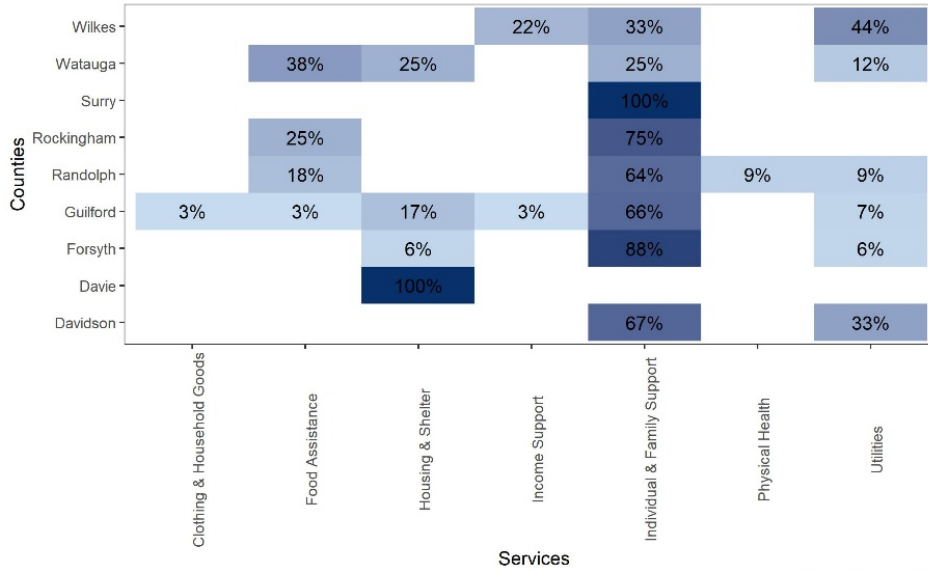
B. Region Two³: Social Support Referrals, Cases, and Outcomes

Referrals varied by county and service. Individual & family support (61%), housing & shelter (13%) and utilities (12%) had higher percentages for referrals and cases. All counties except Davie had referrals and cases for individual and family support (fig. 3a). Referrals from Wilkes (22%) and Guilford (3%) for income support were not accepted, likely indicating a need/demand without services to refer clients to. All individual and family support referrals were accepted as cases (fig. 3b). However, a lower percentage than target (>=75%) were resolved. A third of referrals for housing and shelter were accepted (again, indicating either low rates of resource availability or low rates of eligibility) and all were resolved (fig. 3c). 8% of referrals were for food assistance; however, 30% were accepted and 100% of cases remain open (fig. 3c). The average percentage of resolved cases was lower than target. Region two had the lowest referral and case rates (Table 1b).

³ Region Two is served by Southeastern Healthcare alone



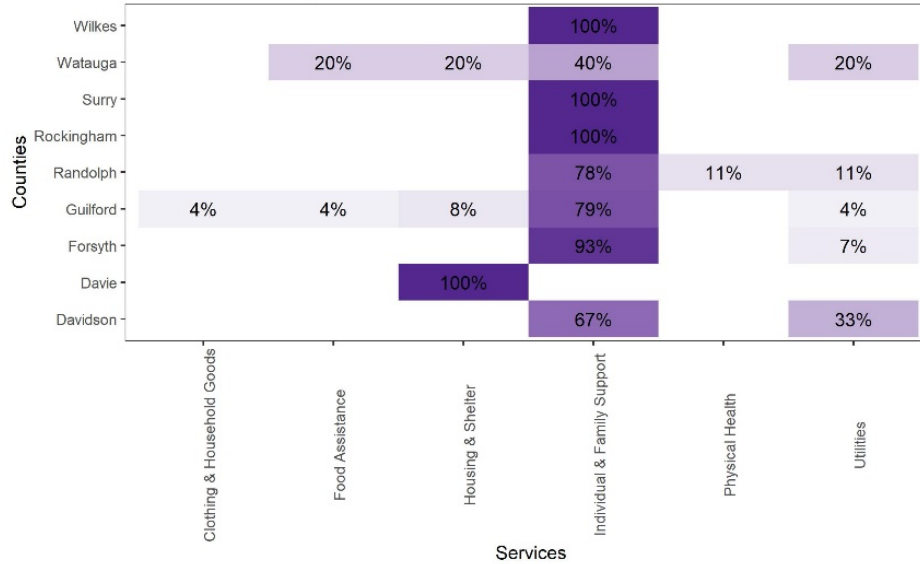
Heatmap of social services referral in region 2
Evaluation of referral types from each county



a.

Source: NCCARE360

Heatmap of social service cases in region 2
Evaluation of case types from each county

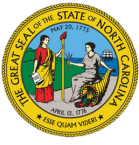


b.

Source: NCCARE360.

Fig. 3a. **The percentage of total referrals(n) by county and service type in region two.** White rectangles signify no referrals from a county were made for a service type, the percentage represents the proportion of each service type of the total number of referrals received from each county. The darker the rectangle, the closer the value is to 100%.

Fig. 3b. **The percentage of cases(n) by county and service type in region two.** White rectangles signify no referrals from a county were made for a service type, the percentage represents the proportion of each service type of the total number of referrals received from each county. The darker the rectangle, the closer the value is to 100%.



Resolution of referral cases across region 2

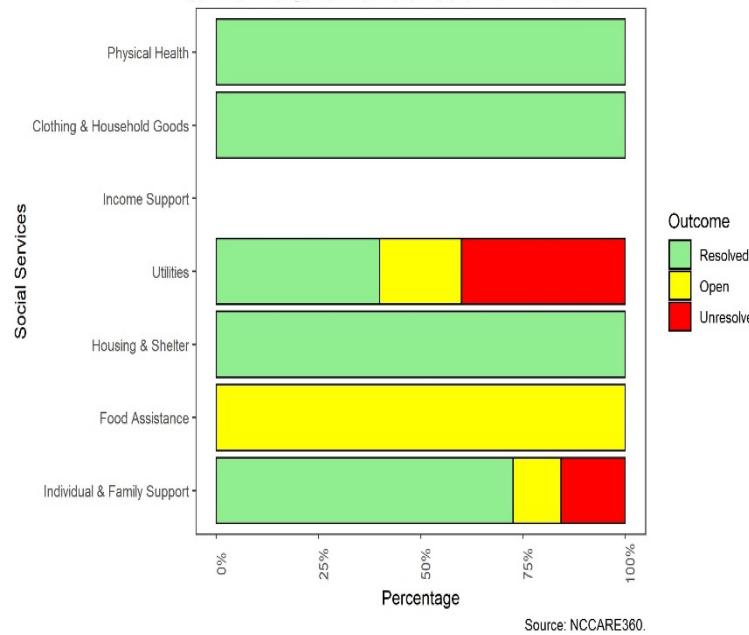


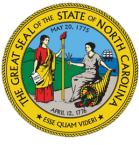
Fig. 3c. Cascade of social supports referral type, county, and outcomes by percentage in region two. Green: % resolved; Yellow: % open; Red: % unresolved.

Interpretation: As with Region 1, understanding the reasons why referrals do not become cases will be essential to strengthening the program. For example, if income support referrals were not accepted as cases by vendors in Wilkes and Guilford because of a lack of available resources, the recommendation would be to explore and strengthen referral options for this support type. However, if CHWs are screening individuals for eligibility for income support and find that they are ineligible, no further action is needed. Similar assessment would be useful for housing & shelter support in Watauga, Guilford, and Forsyth as well as food assistance in Rockingham and Randolph.

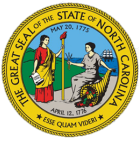
C. Region Three⁴: Social Support Referrals, Cases, and Outcomes

Individual & family support (45%), food assistance (23%), housing and shelter (18%) and utilities (11%) had higher percentage of referrals and cases for social supports. All counties had referrals for food assistance and utilities (fig.4a). Except for Alexander, there were referrals for housing and shelter in all counties (fig. 4a). Food assistance and utilities had greater percentages of resolved cases than target (>=75%). However, the percentages of resolved cases for individual and family support and housing & shelter were at target (fig. 4c). Of the referrals for income support, 63% were accepted and the percentage of resolved cases was less than target (fig. 4c). Less than 0.1% of accepted referrals were for Benefit navigation and employment (fig. 3b); yet

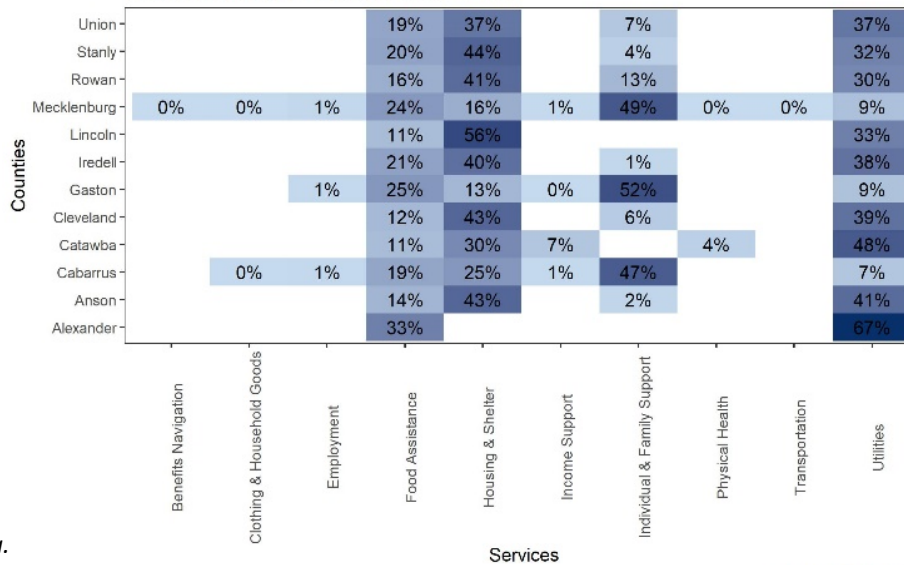
⁴ Region 3 is covered by Kepro (11 counties) and Catawba County Public Health Department (1 county)



their percentages of unresolved cases were higher than target (fig. 4c). Individual and family support also had a higher percentage of unresolved cases (fig 4c). Overall, region three had some of the highest referral and case rates, though also had a higher percentage of resolved cases than other regions (Table 1b). 79% of referrals submitted to CHW vendors in this region were from Mecklenburg County. Individual & family support (49%), food assistance (24%) and housing & shelter (16%) were frequently requested by clients (fig. 4a). Though, 91% of referrals were accepted, only 79% of these cases were resolved (fig. 4c).



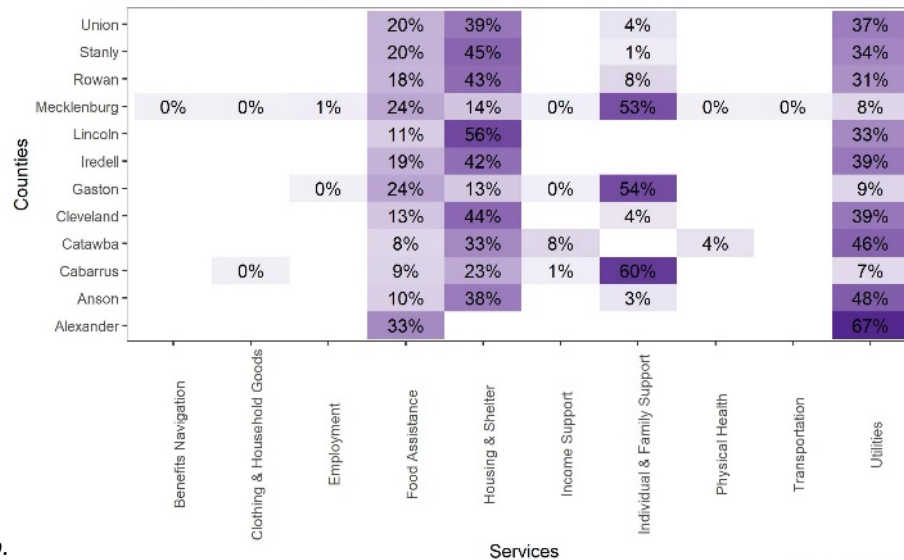
Heatmap of social services referral in region 3
Evaluation of referral types from each county



a.

Source: NCCARE360.

Heatmap of social service cases in region 3
Evaluation of case types from each county



b.

Source: NCCARE360.

Fig. 4a. **The percentage of total referrals(n) by county and service type in region three.** White rectangles signify no referrals from a county were made for a service type, the percentage represents the proportion of each service type of the total number of referrals received from each county. The darker the rectangle, the closer the value is to 100%.

Fig. 4b. **The percentage of total cases(n) by county and service type in region three.** White rectangles signify no referrals from a county were made for a service type, the percentage represents the proportion of each service type of the total number of referrals received from each county. The darker the rectangle, the closer the value is to 100%.

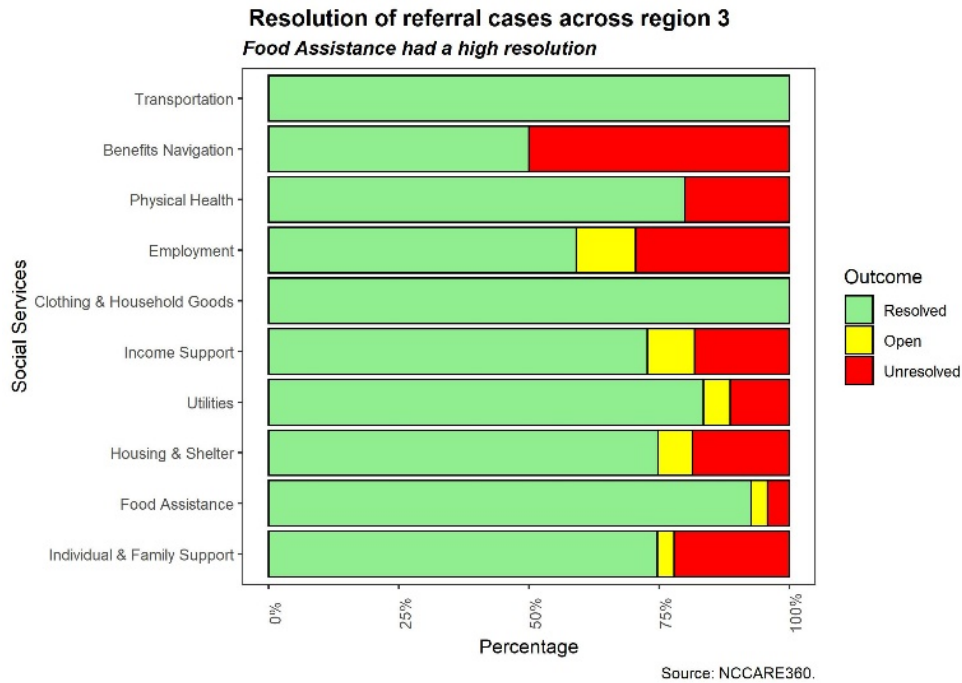
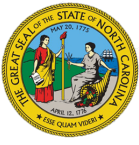
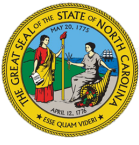


Fig. 4c. Cascade of social supports referral type, county, and outcomes by percentage in region three. Green: % resolved; Yellow: % open; Red: % unresolved.

Interpretation: Region 3 had some of the highest referral rates and the highest case rates of any region. This represents higher identified demand in the region (which may not be the same as actual demand, since referrals depend on the ability of CHWs to connect with vulnerable individuals) as well as higher rates of referral acceptance by the CHW vendor. The higher rates of vendors accepting a referral as a case may either represent a greater availability of social support resource organizations in NCCARE360 in the region (more likely) or more limited eligibility assessment by CHWs there (less likely).

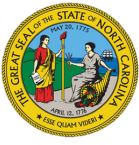
The higher unresolved and open rates than many other counties should be expected given the significantly higher case rates. Still, understanding the underlying reasons for unresolved cases across support types will be necessary to strengthening social support referral networks in the region.



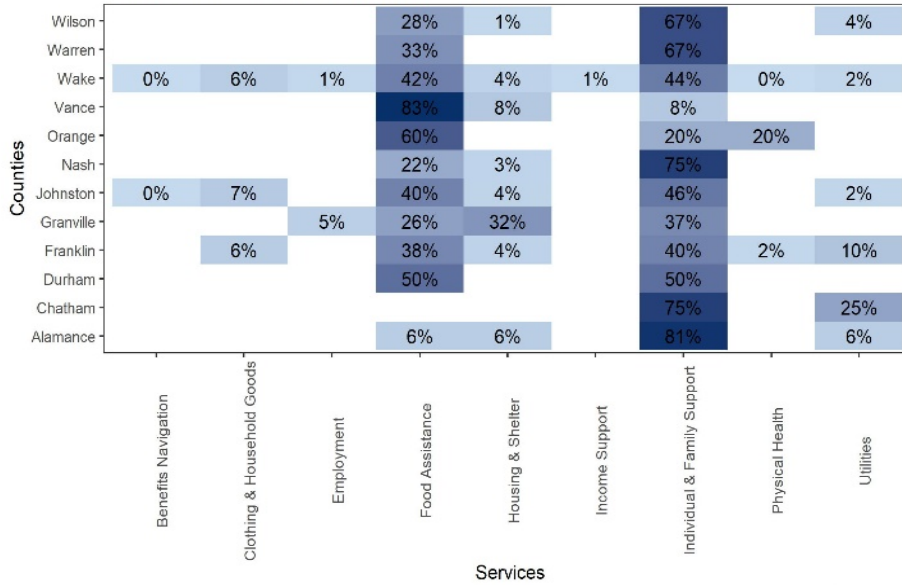
D. Region Four⁵: Social Support Referrals, Cases, and Outcomes

Individual and family support (48%) and food assistance (39%) were the most frequently requested social supports (fig. 4a). All referrals for individual and family support were accepted as compared to 86% for food assistance (fig. 4b). The percentages of resolved cases for both were higher than target ($\geq 75\%$) (fig. 4c). Utilities and housing and shelter had lower number of referrals; yet 72% and 60% were accepted for social supports. The percentage of resolved cases (38%) for Utilities was lower than target (fig. 4c). Similarly, housing and shelter had lower than target percentage of resolved cases (44%, fig. 4c). Overall, the percentage of resolved cases was higher than target; though, the region had lower referral and case rates than the top regions (Table 1b).

⁵ Data from El Centro Hispano were not available for this analysis. Accordingly, outcomes analysis for Orange, Durham, Person, and Vance Counties is incomplete. Data reflected Region Four reflect Southeastern Healthcare activities alone.



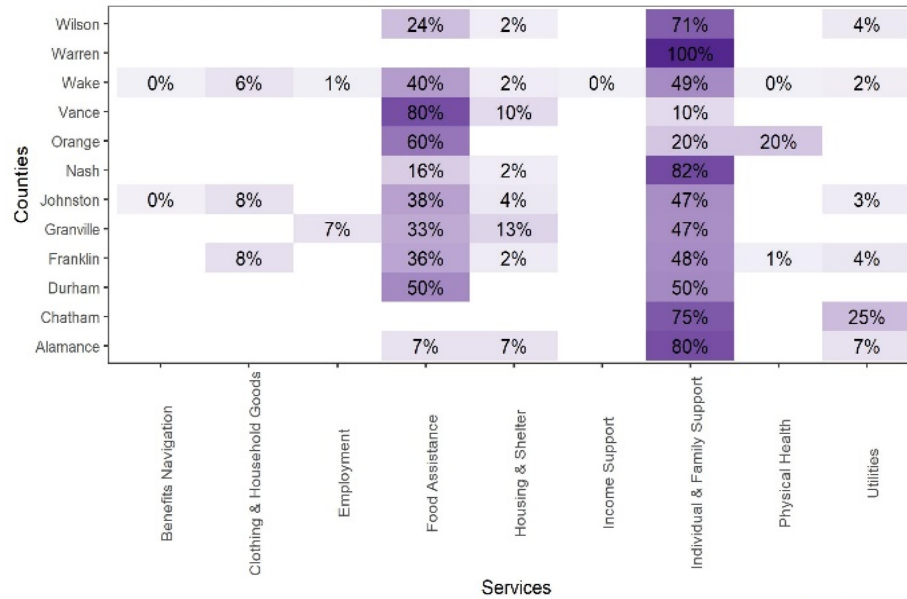
Heatmap of social services referral in region 4
Evaluation of referral types from each county



a.

Source: NCCARE360.

Heatmap of social service cases in region 4
Evaluation of case types from each county

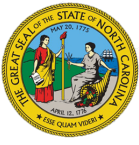


b.

Source: NCCARE360.

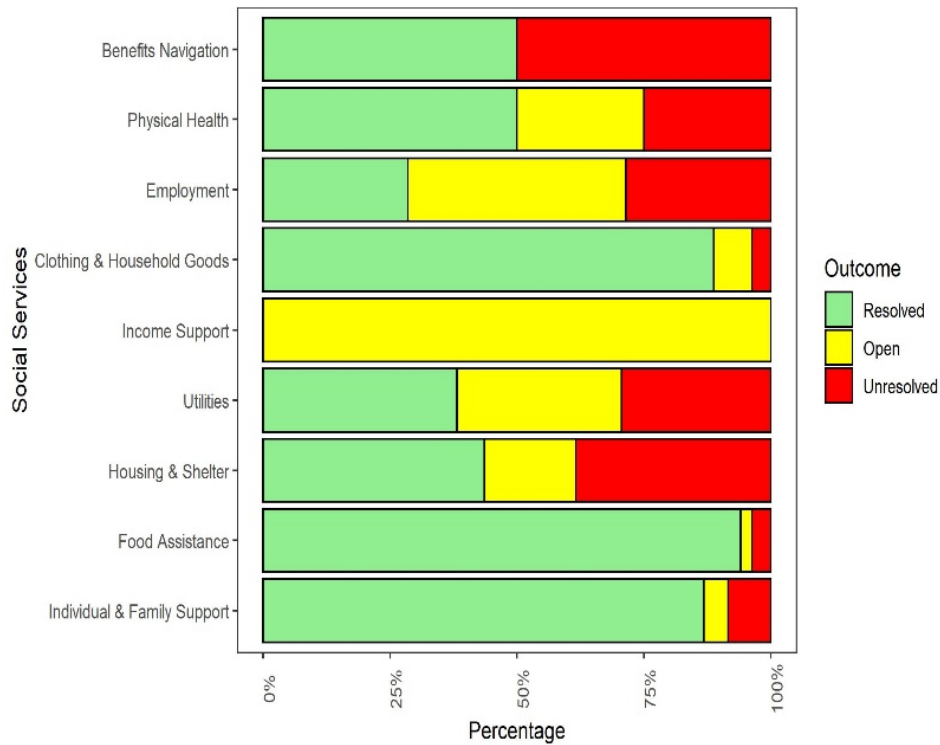
Fig. 5a. **The percentage of total referrals(n) by county and service type in region four.** White rectangles signify no referrals from a county were made for a service type, the percentage represents the proportion of each service type for the total number of referrals received from each county. The darker the rectangle, the closer the value is to 100%.

Fig. 5b. **The percentage of total cases(n) by county and service type in region four.** White rectangles signify no referrals from a county were made for a service type, the percentage represents the proportion of each service type of the total number of referrals received from each county. The darker the rectangle, the closer the value is to 100%.



Resolution of referral cases across region 4

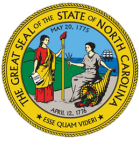
Food Assistance had a high resolution



Source: NCCARE360.

Fig. 5c. Cascade of social supports referral type, county, and outcomes by percentage in region four. Green: % resolved; Yellow: % open; Red: % unresolved.

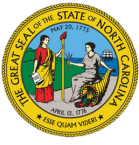
Interpretation: The bulk of referrals and cases in Region 4 comprised Individual and Family Support and Food Assistance. The resolution rates for these social support types were also high, suggesting that social support delivery organizations were able to meet the demand for the resources. All counties in this region were covered by the Central and Eastern Food Bank of North Carolina within the Support Services Program 2.0. This likely supported some of the success in driving referrals and cases as well as high resolution rates. Lower referral rates were made for other support types with variable success in connecting individuals with needed resources.



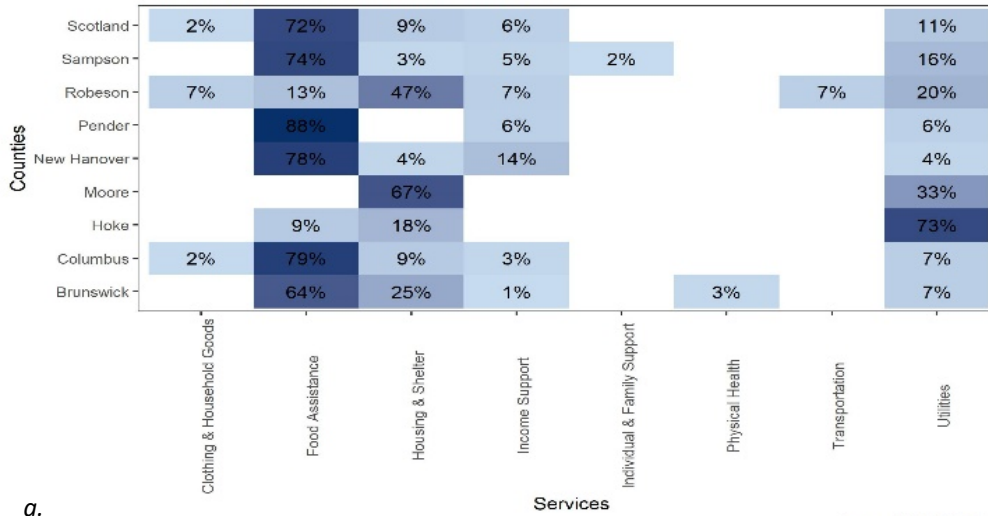
E. Region Five⁶: Social Support Referrals, Cases, and Outcomes

Food assistance (68%) and housing and shelter (13%) had the highest percentage of referrals (fig. 6a). 66% of referrals for food assistance and 53% of housing and shelter were accepted (fig. 6b). The percentage of resolved cases was higher than target ($\geq 75\%$) for food assistance (88%) (fig. 6a). However, it was much lower than target for housing & shelter (57%). Other social supports (i.e., utilities, income) had small number of referrals, lower percentage of accepted cases with percentage of resolved cases lower than target (fig. 6c). Brunswick had few referrals for physical health, but none was accepted (fig. 6a, fig. 6b). Clothing and housing goods had few referrals, and all cases were unresolved. Individual and family support had few referrals and all cases remained open (fig. 6c). The average percentage of resolved cases was higher than target (Table 1b).

⁶ Data from El Centro Hispano were not available for this analysis. Accordingly, outcomes analysis for Montgomery, Richmond, Moore, Lee, Harnett, and Cumberland Counties is incomplete. Data reflected Region Four reflect Mount Calvary activities alone.



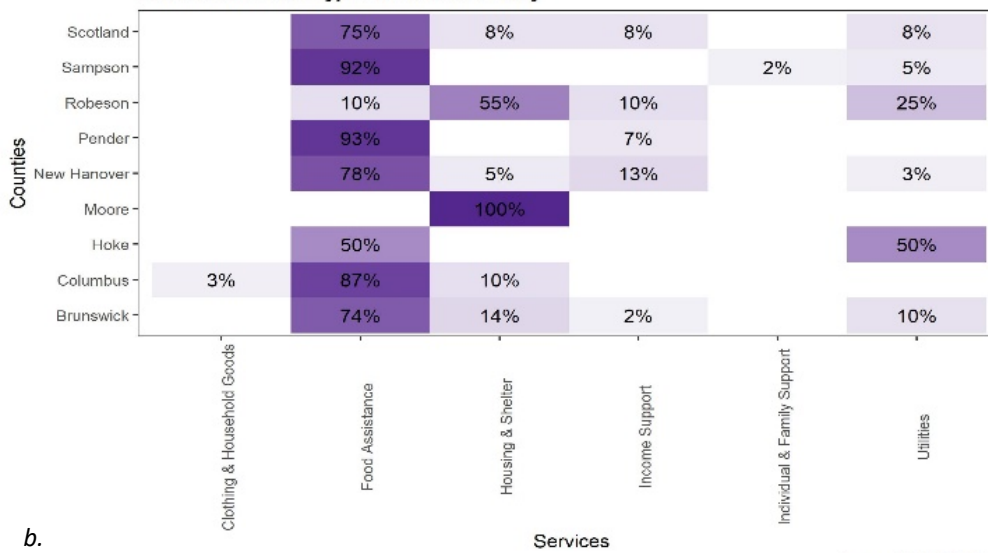
Heatmap of social services referral in region 5
Evaluation of referral types from each county



a.

Source: NCCARE360.

Heatmap of social service cases in region 5
Evaluation of case types from each county



b.

Source: NCCARE360.

Fig. 6a. **The percentage of total referrals(n) by county and service type in region five.** White rectangles signify no referrals from a county were made for a service type, the percentage represents the proportion of each service type of the total number of referrals received from each county. The darker the rectangle, the closer the value is to 100%.

Fig. 6b. **The percentage of total cases(n) by county and service type in region five.** White rectangles signify no referrals from a county were made for a service type, the percentage represents the proportion of each service type of the total number of referrals received from each county. The darker the rectangle, the closer the value is to 100%.

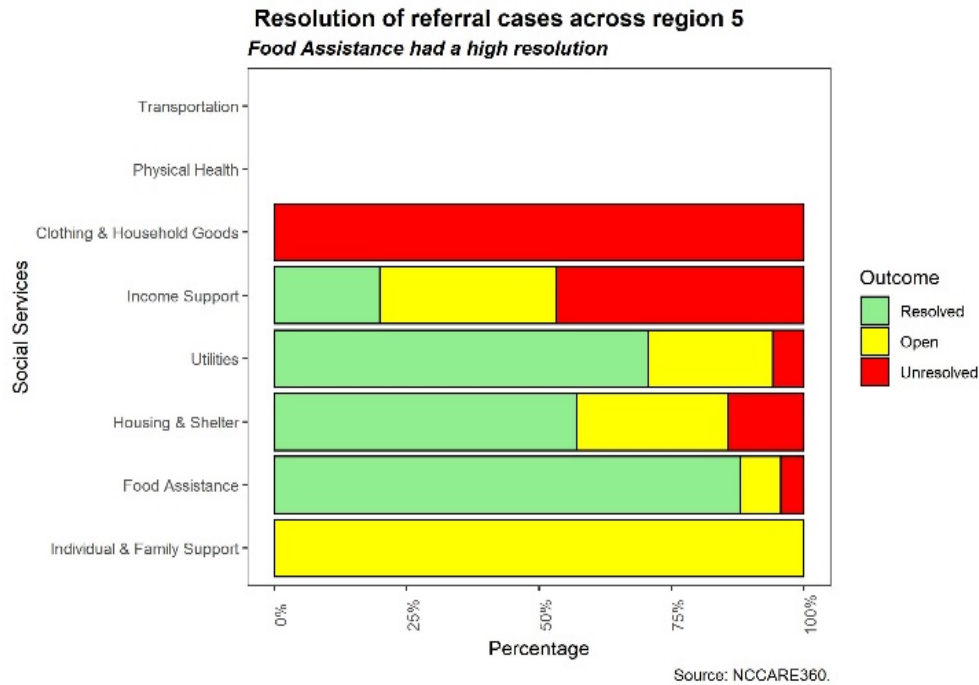
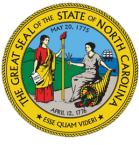


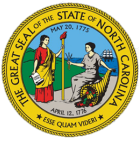
Fig. 6c. Cascade of social supports referral type, county, and outcomes by percentage in region five. Green: % resolved; Yellow: % open; Red: % unresolved.

Interpretation: Requests for food assistance in Region 5 predominated. Many counties in this region were covered by the Central and Eastern Food Bank of North Carolina within the Support Services Program 2.0. This likely supported some of the success in driving referrals and cases as well as high resolution rates. It isn't immediately clear why, although Individual and Family Support referrals were much higher across other regions, they were minimal in Region 5. While in other regions we observed a drop between referrals and cases for lower frequency social support types including for Housing & Shelter, Utilities, and Income assistance, they were more likely to become cases in Region 5, but with variable, limited success in resolving those referrals. Focus on building referral networks for these social support types in this region could be useful to strengthen the ability of the program to meet identified needs.

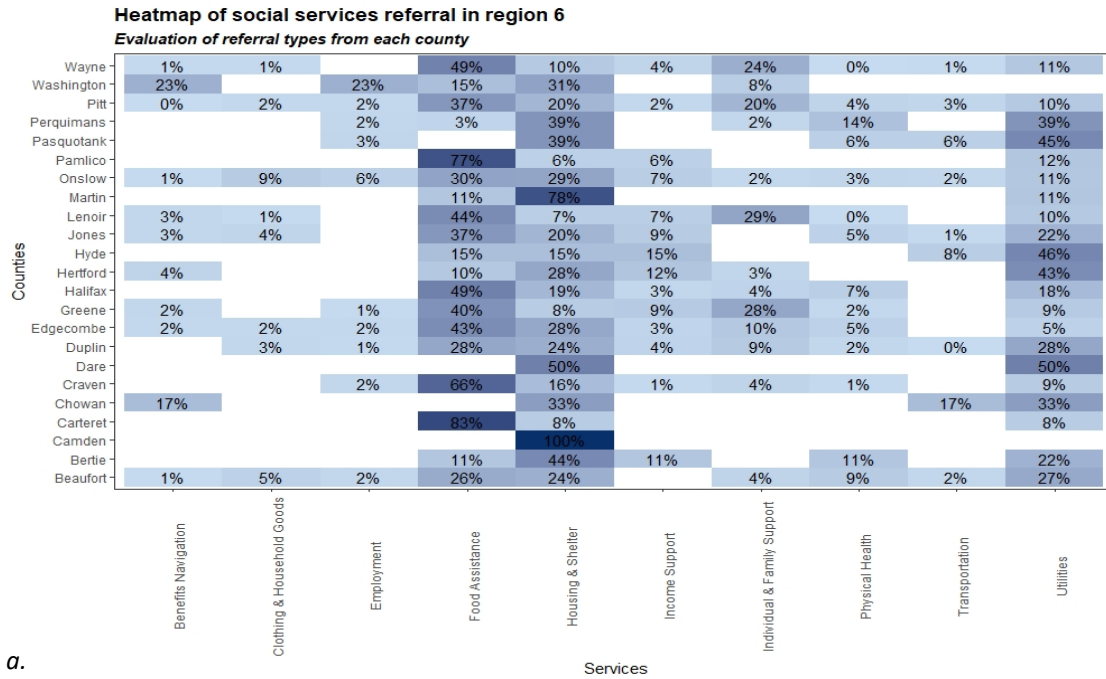
F. Region Six⁷: Social Support Referrals, Cases, and Outcomes

Food assistance (40%), individual and family support (17%), housing and shelter (17%) and utilities (15%) had higher percentage of referrals for social supports (fig. 7a). Individual and family support had 95% of referrals accepted; yet the percentage of resolved cases (46%) was lower than target (>=75%). Conversely, the percentage of accepted referrals for food assistance was 76% and 87% of cases were resolved. Housing and shelter and utilities had lower percentage of accepted referrals and resolved cases were also lower than target (fig.7b, fig. 7c).

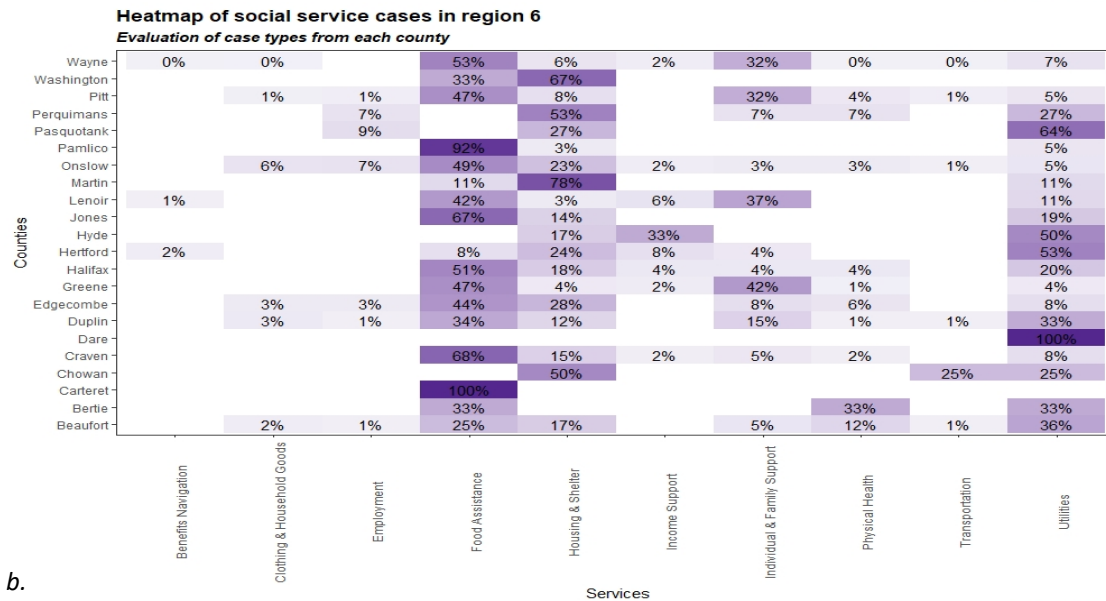
⁷ Region Six is served by One to One with Youth (3 counties) and Vidant Health (24 counties).



Overall, Region 6 had the highest referral and case rates (Table 1b), though the percentage of resolved cases was lower than target.



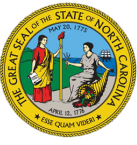
Source: NCCARE360.



Source: NCCARE360.

Fig. 7a. The percentage of total referrals(n) by county and service type in region six. White rectangles signify no referrals from a county were made for a service type, the percentage represents the proportion of each service type of the total number of referrals received from each county. The darker the rectangle, the closer the value is to 100%.

Fig. 7b. The percentage of total cases (n) by county and service type in region six. White rectangles signify no referrals from a county were made for a service type, the percentage represents the proportion of each service



type of the total number of referrals received from each county. The darker the rectangle, the closer the value is to 100%.

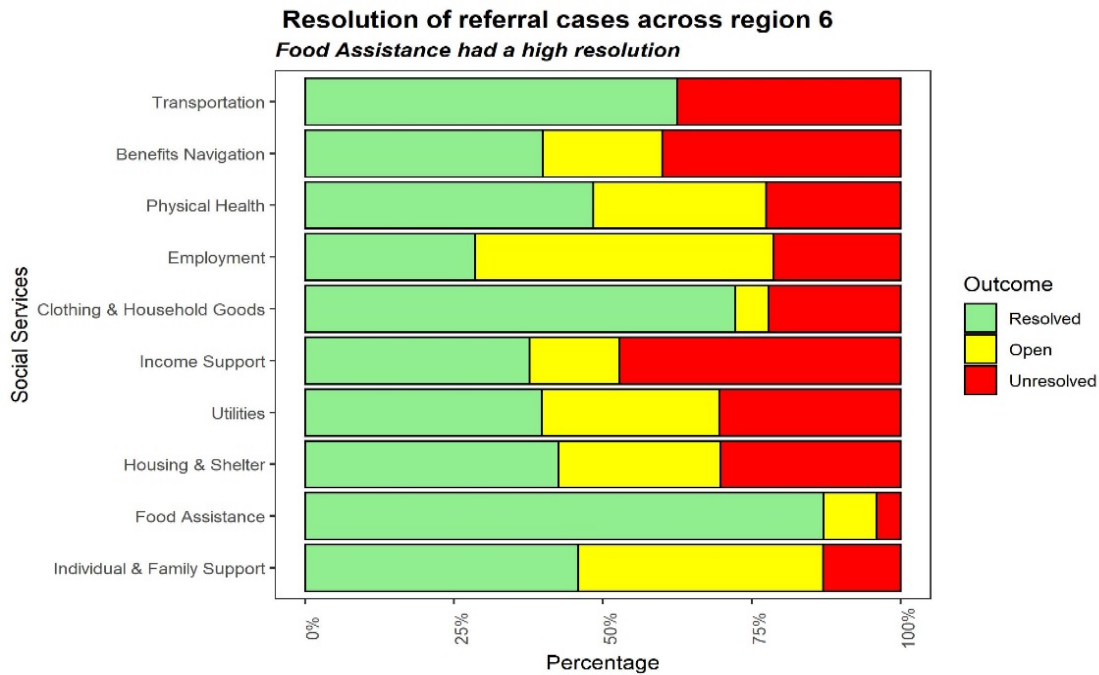
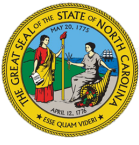


Fig. 7c. Cascade of social supports referral type, county, and outcomes by percentage in region six. Green: % resolved; Yellow: % open; Red: % unresolved.

Interpretation: Region 6 had the highest referral rates and one of the highest case rates of any region. This represents higher identified demand in the region (which may not be the same as actual demand, since referrals depend on the ability of CHWs to connect with vulnerable individuals) as well as higher rates of referral acceptance by the CHW vendor. The higher rates of vendors accepting a referral as a case may either represent a greater availability of social support resource organizations in NCCARE360 in the region (more likely) or more limited eligibility assessment by CHWs there (less likely).

Many counties in this region were covered by the Central and Eastern Food Bank of North Carolina within the Support Services Program 2.0. This likely supported some of the success in driving referrals and cases as well as high resolution rates. Unlike food assistance, individual and family supports referral networks are likely not as strong in the region. Focus on building referral networks for these social support types in this region could be useful to strengthen the ability of the program to meet identified needs.

The higher unresolved and open rates than many other counties should be expected given the significantly higher case rates. Still, understanding the underlying reasons for unresolved cases across support types will be necessary to strengthening social support referral networks in the region.



III. Vendors, Social Support Referrals, Cases, and Outcomes

Summary statistics: 12,109 referrals were submitted to CHW vendors from 72 counties (out of 75 served counties) between September 2021 and March 2022. 82% were accepted referrals (cases) and 92% of cases were closed (78% were resolved and 15% were not resolved). 7% of cases remained open (Table 3a). Kepro had the highest total number of referrals and One to One with Youth had the highest referral and case rates of six vendors⁸. Except for One to One with Youth and Vidant Health, all vendors had higher than target percentage of resolved cases (Table 3b).

Summary of Community Health Workers (CHWs) referral across vendors						
Uses data from the COVID-19 CHW Program from September 2021 to March 2022						
CHW Vendors	Served Counties	Referrals(n)	Cases(n)	Resolved(n)	Unresolved(n)	Open(n)
Kepro	22	6,732 ¹	6,063	4,830	993	240
Southeastern Healthcare	18	1,764	1,582	1,375	125	82
One to One	3	1,664	1,247	801	151	295
Vidant Health	20	1,512	809	515	138	156
Mt. Calvary	8	410	244	192	21	31
Catawba PH	1	27	24	20	2	2
TOTAL	—	12,109	9,969	7,733	1,430	806

¹ Kepro received the largest referrals.
² Catawba PH served the lowest population.
Source: Dataset is from NCCARE360.

Source: **6 vendors** including Kepro, One to One with Youth, Vidant Health, Mount Calvary Center for Leadership Development, Catawba County DPH, & Southeastern Healthcare NC.

Summary of referral, cases, and outcome rates by vendors						
Uses data from the COVID-19 CHW Program September 2021 to March 2022, rate is calculated for example as number of referrals per 100,000 people						
CHW Vendors	Served regions	Referral_Rate	Case_Rate	Resolved(%)	Unresolved(%)	Open(%)
One to One	1	863 ¹	646	64	12	24
Kepro	2	234	211	80	16	4
Vidant Health	1	160	85	64	17	19
Mt. Calvary	1	56	33	79	9	13
Southeastern Healthcare	2	51	45	87 ²	8	5
Catawba PH	1	17	15 ³	83	8	8
min	—	17.0	15.0	64.0	8.0	4.0
max	—	863.0	646.0	87.0	17.0	24.0
avg	—	230.2	172.5	76.2	11.7	12.2
median	—	108.0	65.0	79.5	10.5	10.5

¹ One to One has the largest Referral Rate
² Southeastern Healthcare has the highest percentage of Resolved Cases
³ Catawba has the lowest Case Rate.

Source: Dataset is from NCCARE360.

Source: **7 vendors** including Curamericas, Kepro, One to One with Youth, Vidant Health, Mount Calvary Center for Leadership Development, Catawba County DPH, & Southeastern Healthcare NC.

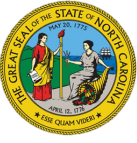
a.

b.

Table 3a. Summary of referrals (n) and outcomes (cases, resolved, unresolved, open) by vendors. For referrals (n): red (<=1000), orange (>1000 & <=5000), and green (>5000); Pop(n): red(<=500k), orange (>500k & <=2M), green (>2M).

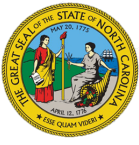
Table 3b. Summary of referral and cases per capita and outcomes by vendor. The referral or case rates were calculated as the number of referrals received or accepted by the total population from served counties per 100k population. Resolved (%): red (<75%), orange (75-90%), and green (>90%); Unresolved and Open percentages: green (>10%), orange (10-25%), red (>25%).

⁸ 8 total vendors are contracted across 100 counties in the state. At the time of this evaluation, data for Unete and El Centro Hispano were not available for analysis. Since this section focuses on individual vendors, the results are not affected.

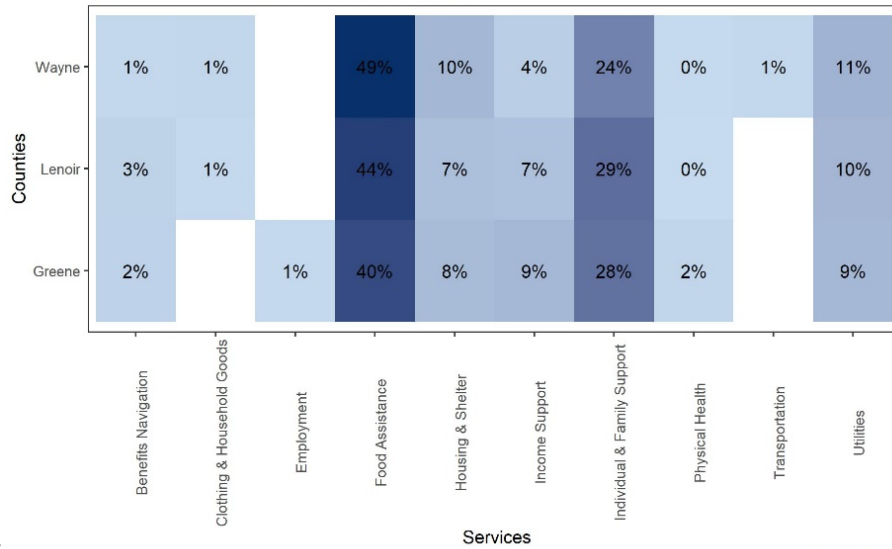


A. One to One with Youth

One to One with Youth had the highest referral and case rates across all vendors (Table 3b) across the 3 counties served. All served counties had higher percentage of referrals and cases for food assistance and individual & family and support services (fig. 8a, fig. 8b). The percentages of resolved cases for food assistance, income support, and individual and family support were higher than target ($\geq 75\%$). However, all counties had lower percentages of resolved cases for utilities and housing & shelter than target. The percentages of unresolved cases for utilities were also high across all counties (fig. 8f). In Greene County, 50% of accepted referrals for housing and shelter remained open (fig. 8h., appendix). Overall, all counties had percentages of resolved cases less than 75% (fig. 8C). Except Greene, all counties had the percentage of unresolved cases ranging from 10-25% (fig. 8d). However, Greene had greater than 25% of cases remaining open (fig. 8e).



Heatmap of social services referral by One to One
Evaluation of referral types from each county



a.

Source: NCCARE360.

Heatmap of social service cases by One to One
Evaluation of case types from each county

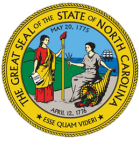


b.

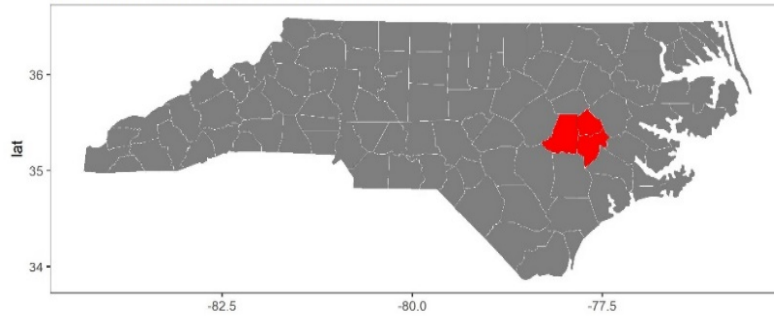
Source: NCCARE360.

Fig. 8a. **The percentage of total referrals(n) by county, service type, and vendor (One to One with Youth).** White boxes represent counties with no referrals for a service type, the percentage represents the proportion of each service type of the total number of referrals received from each county. The darker the rectangle, the closer the value is to 100%.

Fig. 8b. **The percentage of total cases(n) by county, service type, and vendor (One to One with Youth).** White boxes represent counties with no referrals for a service type, the percentage represents the proportion of each service type of the total number of referrals received from each county. The darker the rectangle, the closer the value is to 100%.



Resolution of referral cases by One to One

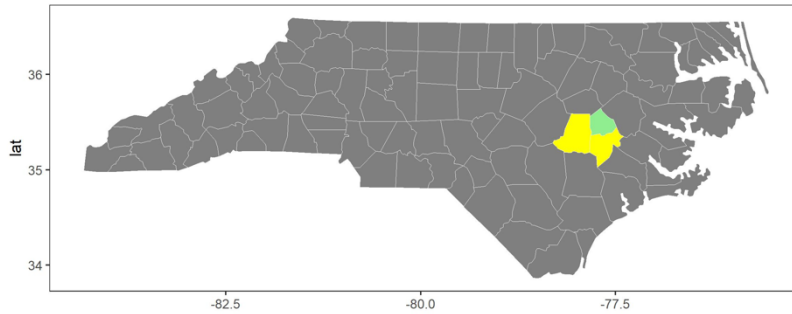


c.

Resolved_Rate ■ <75 ■ 75-90 ■ >90 ■ NA

Source: NCCARE360.

Unresolved referral cases by One to One

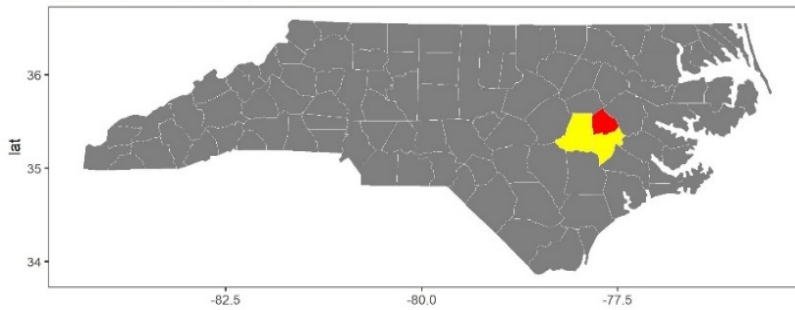


d.

Unresolved_Rate ■ <10 ■ 10-25 ■ >25 ■ NA

Source: NCCARE360.

Open referral cases by One to One



e.

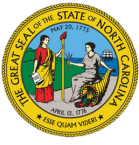
Open_Rate ■ 10-25 ■ >25 ■ NA

Source: NCCARE360.

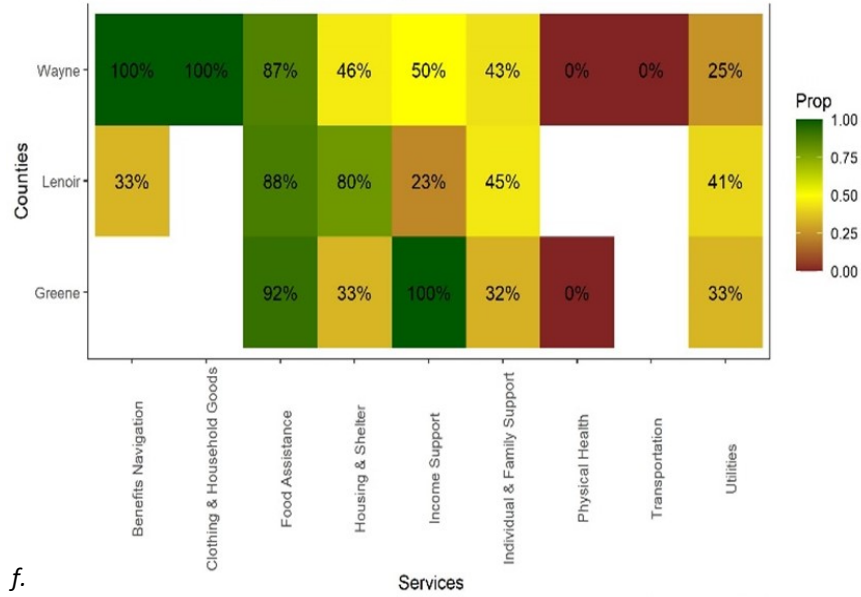
Fig. 8c. Percentage of resolved cases across served counties by vendor (One to One with Youth). Resolved (%): red (<75%), yellow (75-90%), and green (>90%). (Note: NA indicates no referral was received from county).

Fig. 8d. Percentage of unresolved cases across served counties by vendor (One to One with Youth). Unresolved percentages: green (<10%), orange (10-25%), red (>25%). (Note: NA indicates no referral was received from county).

Fig. 8e. Percentage of open cases across served counties by vendor (One to One with Youth). Open percentages: green (<10%), orange (10-25%), red (>25%).



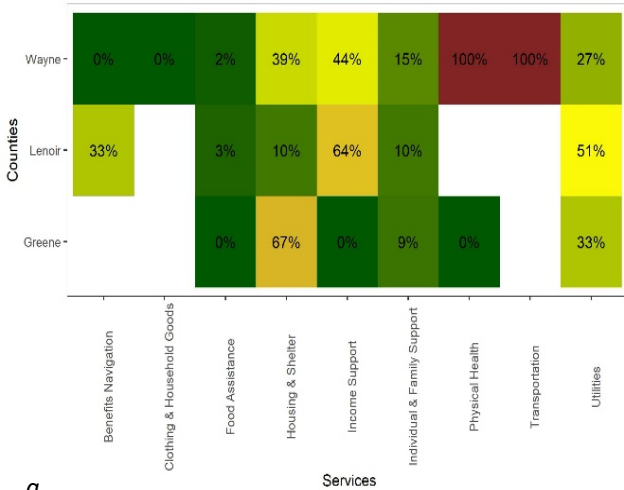
Heatmap of resolved cases by One to One
Evaluation of percentage of closed loop referrals



Source: NCCARE360.

f.

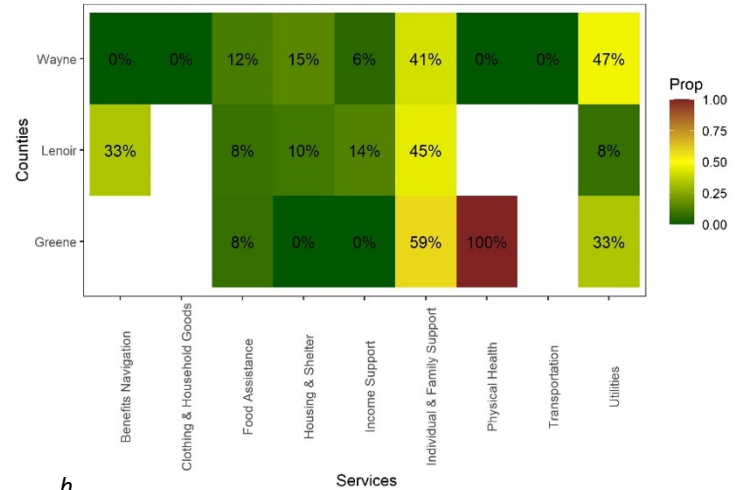
Heatmap of unresolved cases by One to One
Evaluation of percentage of closed loop referrals



Source: NCCARE360.

g.

Heatmap of open cases by One to One
Evaluation of percentage of open loop referrals



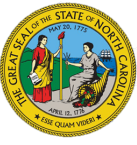
Source: NCCARE360.

h.

Fig. 8f. Percentage of resolved cases by served counties, services, and vendor (One to One with Youth). Red (<25%), yellow (>25 & <75%), green (>75%).

Fig. 8g. Percentage of unresolved cases by served counties, services, and vendor (One to One with Youth). Green (<25%), yellow (>25 & <75%), red (>75%).

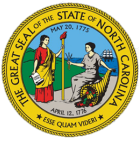
Fig. 8h. Percentage of open cases by served counties, services, and vendor (One to One with Youth). Green (<25%), yellow (>25 & <75%), red (>75%).



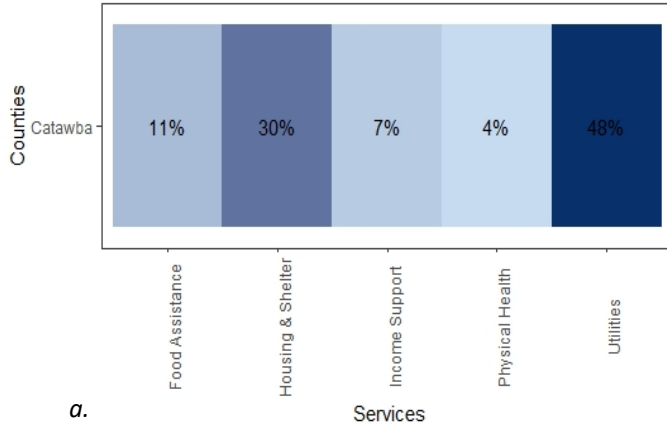
Interpretation: Counties served by One to One with Youth saw the highest demand (referrals) for food assistance and individual & family support, with referrals converted into cases, suggesting presence of social support delivery organizations in NCARE360 and CHW-determined eligibility for services. The above-target resolution rates for these services support this theory. All counties served by One to One with Youth were covered by the Central and Eastern Food Bank of North Carolina within the Support Services Program 2.0. This likely supported some of the success in driving referrals and cases as well as high resolution rates. Overall, One to One with Youth was able to resolve referrals at rates lower than target across all served counties. Potential resource gaps in these counties include utilities and housing & shelter. Lower referral rates for transportation or benefits navigation, among others, may not reflect low needs, but could instead represent low observed demand due to resource gaps. Focus on building referral networks for these social support types in this region could be useful to strengthen the ability of the program to uncover and meet identified needs.

B. Catawba County Public Health

Catawba County Public Health had a low overall number of referrals (27) as well as referral and case rates (Table 3a, 3b) across the single county served by the vendor. Utilities (50%), housing and shelter (29%) and food assistance (11%) had the higher percentages of referrals and cases (fig. 9a, fig. 9b). All services had higher than target ($\geq 75\%$) percentages of resolved cases except for physical health (fig. 9f). Referrals and cases for physical health had a lower percentage than other social supports (fig. 9f). 9% of accepted referrals for utilities were unresolved and 12% of housing and shelter remained open. Overall, 84% of accepted referrals were resolved, 8% were unresolved and 8% remained open cases (fig. 9c, fig. 9d, fig. 9e).



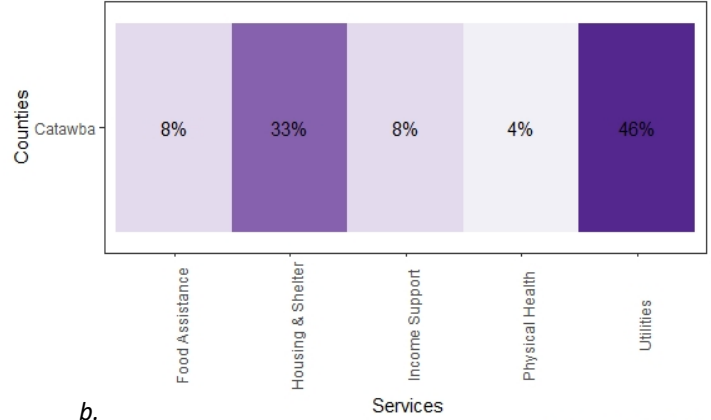
Heatmap of social services referral by Catawba PH Evaluation of referral types from each county



a.

Source: NCCARE360.

Heatmap of social service cases by Catawba PH Evaluation of case types from each county

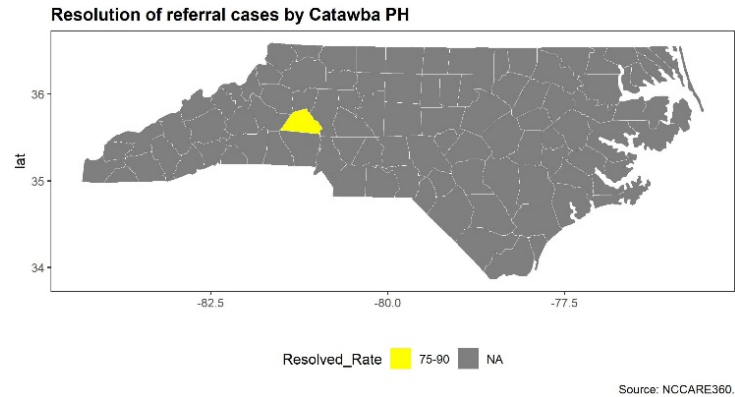
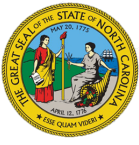


b.

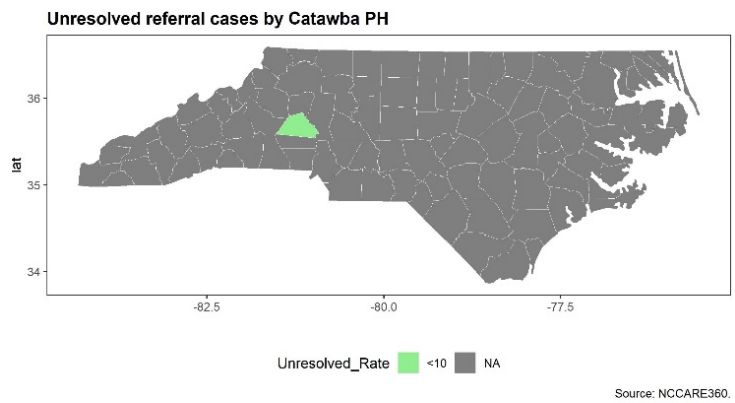
Source: NCCARE360.

Fig. 9a. The percentage of total referrals(n) by county, service type, and vendor (Catawba PH). White boxes represent counties with no referrals for a service type, the percentage represents the proportion of each service type of the total number of referrals received from each county. The darker the rectangle, the closer the value is to 100%.

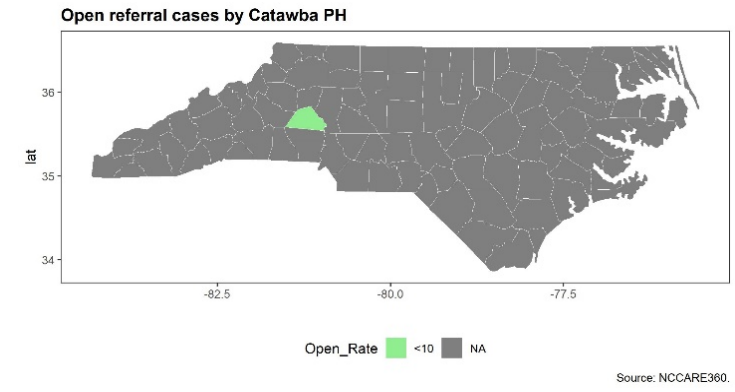
Fig. 9b. The percentage of total cases (n) by county, service type, and vendor (Catawba PH). White boxes represent counties with no referrals for a service type, the percentage represents the proportion of each service type of the total number of referrals received from each county. The darker the rectangle, the closer the value is to 100%.



c.



d.

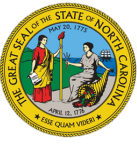


e.

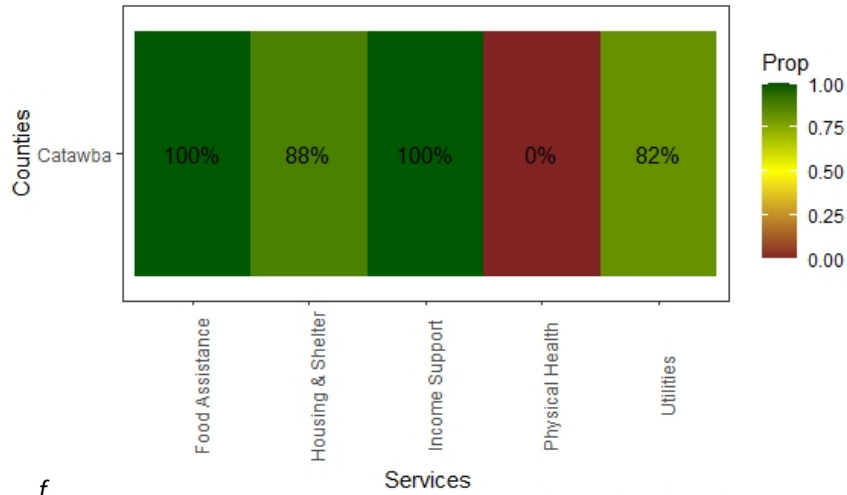
Fig. 9c. The overall percentage of resolved cases across served counties by vendor (Catawba PH). Resolved (%): red (<75%), yellow (75-90%), and green (>90%). (Note: NA indicates no referral was received from county)

Fig. 9d. The overall percentage of unresolved cases across served counties by vendor (Catawba PH). Unresolved percentages: green (<10%), orange (10-25%), red (>25%). (Note: NA indicates no referral was received from county).

Fig. 9e. The overall percentage of open cases across served counties by vendor (Catawba PH). Open percentages: green (<10%), orange (10-25%), red (>25%).



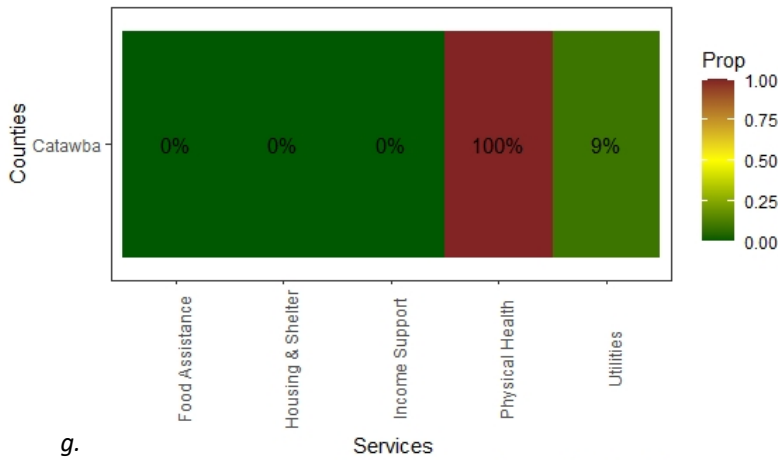
Heatmap of resolved cases by Catawba PH Evaluation of percentage of closed loop referrals



f.

Source: NCCARE360.

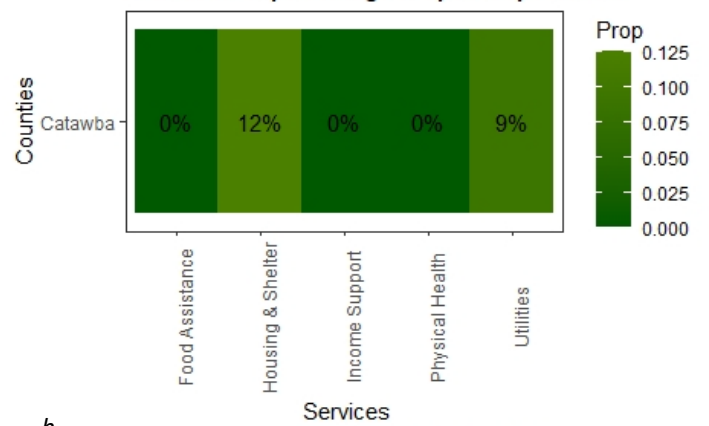
Heatmap of unresolved cases by Catawba PH Evaluation of percentage of closed loop referrals



g.

Source: NCCARE360.

Heatmap of open cases by Catawba PH Evaluation of percentage of open loop referrals



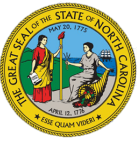
h.

Source: NCCARE360.

Fig. 9f. Percentage of resolved cases across served counties by vendor (Catawba PH). Red (<25%), yellow (>25 & <75%), green (>75%).

Fig. 9g. Percentage of unresolved cases across served counties by vendor (Catawba PH). Green (<25%), yellow (>25 & <75%), red (>75%).

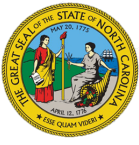
Fig. 9h. Percentage of open cases across served counties by vendor (Catawba PH). Green (<25%), yellow (>25 & <75%), red (>75%).



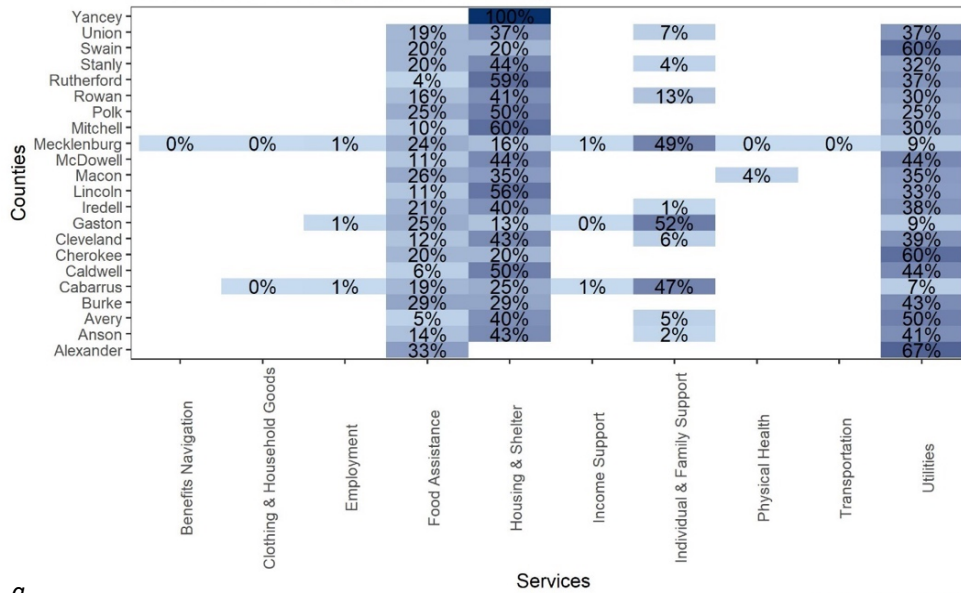
Interpretation: During this evaluation period (September 2021 – March 2022), Catawba County Public Health had a low total number of referrals in NCCARE360. Of note, it is possible that social support resource coordination screening and referrals happened external to NCCARE360, this underestimating the total impact of the work in the county. Still, more referrals became cases and cases were resolved across most service types at rates higher than target. Follow up to understand alternative referral pathways and potential mechanisms to increase screening and referral will be helpful to strengthen the social support resource coordination in Catawba County.

C. Kepro

Kepro had the highest total (6,732) and second highest per capita referral and case rates among vendors (Table 3a, 3b) across the 25 counties served (the largest county footprint by a single vendor). Individual and family support (44%), food assistance (28%), housing & shelter (19%) and utilities (12%) were frequently requested social supports (fig.10). Except Macon, all counties had higher than target percentages of resolved cases for food assistance. Mitchell, Mecklenburg, McDowell, Macon, and Cabarrus counties had lower than target percentage of resolved cases for housing and shelter. Anson, Cabarrus, Cleveland, and Rowan had lower percentages of resolved cases for individual and family support, with Gaston also having a higher percentage of unresolved cases than target. Except for Cabarrus, all counties had lower than target percentage of open cases for housing and shelter (fig. 10h,). Overall, all counties had a greater percentage of resolved cases except for Cherokee, Macon, Union, and Cabarrus counties (fig. 10c). Cherokee, Macon, and Cabarrus had higher percentages of unresolved cases (fig. 10d). All counties had lower percentage of open cases than target (fig. 10e). No referrals were made in Graham, Clay, or Madison County.



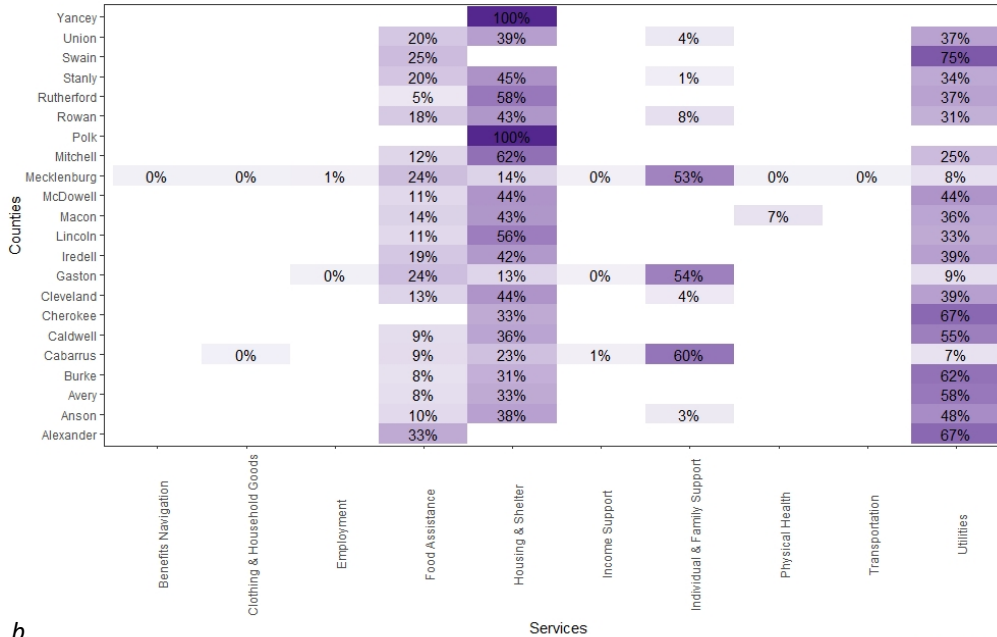
Heatmap of social services referral by Kepro
Evaluation of referral types from each county



a.

Source: NCCARE360.

Heatmap of social service cases by Kepro
Evaluation of case types from each county

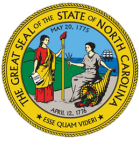


b.

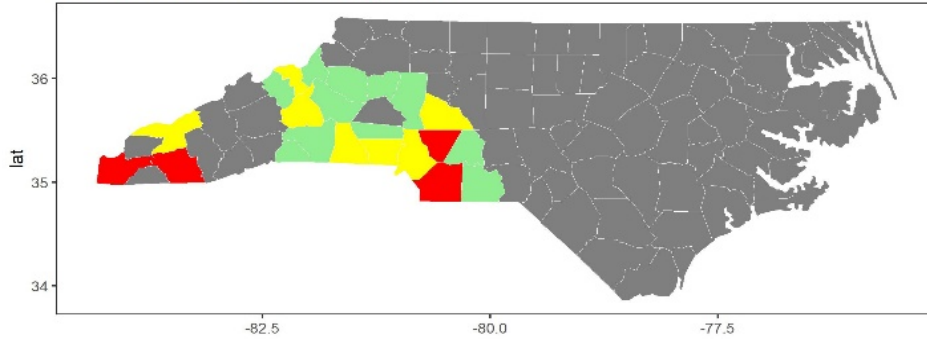
Source: NCCARE360.

Fig. 10a. **The percentage of total referrals (n) by county, service type, and vendor (Kepro).** White boxes represent counties with no referrals for a service type, the percentage represents the proportion of each service type of the total number of referrals received from each county. The darker the rectangle, the closer the value is to 100%.

Fig. 10b. **The percentage of total cases (n) by county, service type, and vendor (Kepro).** White boxes represent counties with no referrals for a service type, the percentage represents the proportion of each service type of the total number of referrals received from each county. The darker the rectangle, the closer the value is to 100%.



Resolution of referral cases by Kepro

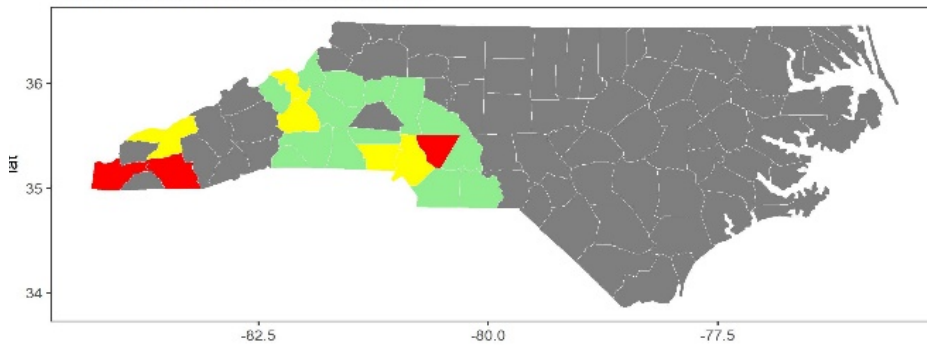


c.

Resolved_Rate <75% 75-90% >90% NA

Source: NCCARE360.

Unresolved referral cases by Kepro

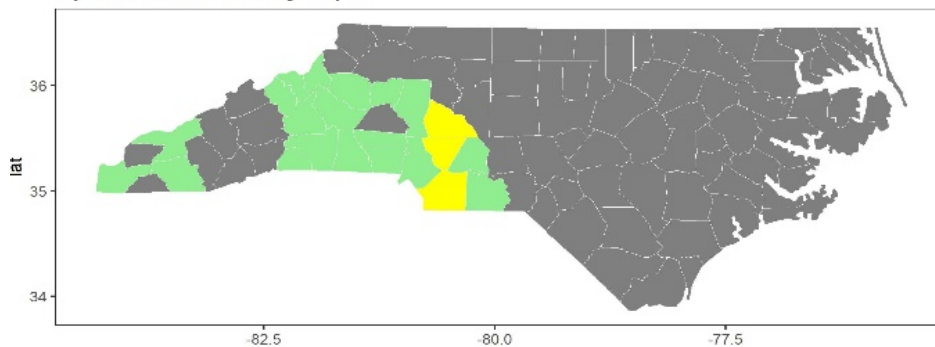


d.

Unresolved_Rate <10% 10-25% >25% NA

Source: NCCARE360.

Open referral cases by Kepro



e.

Open_Rate <10% 10-25% NA

Source: NCCARE360.

Fig. 10c. The overall percentage of resolved cases across served counties by vendor (Kepro). Red (<75%), yellow (75-90%), and green (>90%). (Note: NA indicates no referral was received from county).

Fig. 10d. The overall percentage of unresolved cases across served counties by vendor (Kepro). Green (<10%), orange (10-25%), red (>25%). (Note: NA indicates no referral was received from county).

Fig. 10e. The overall percentage of open cases across served counties by vendor (Kepro). Green (<10%), orange (10-25%), red (>25%). (Note: NA indicates no referral was received from county).

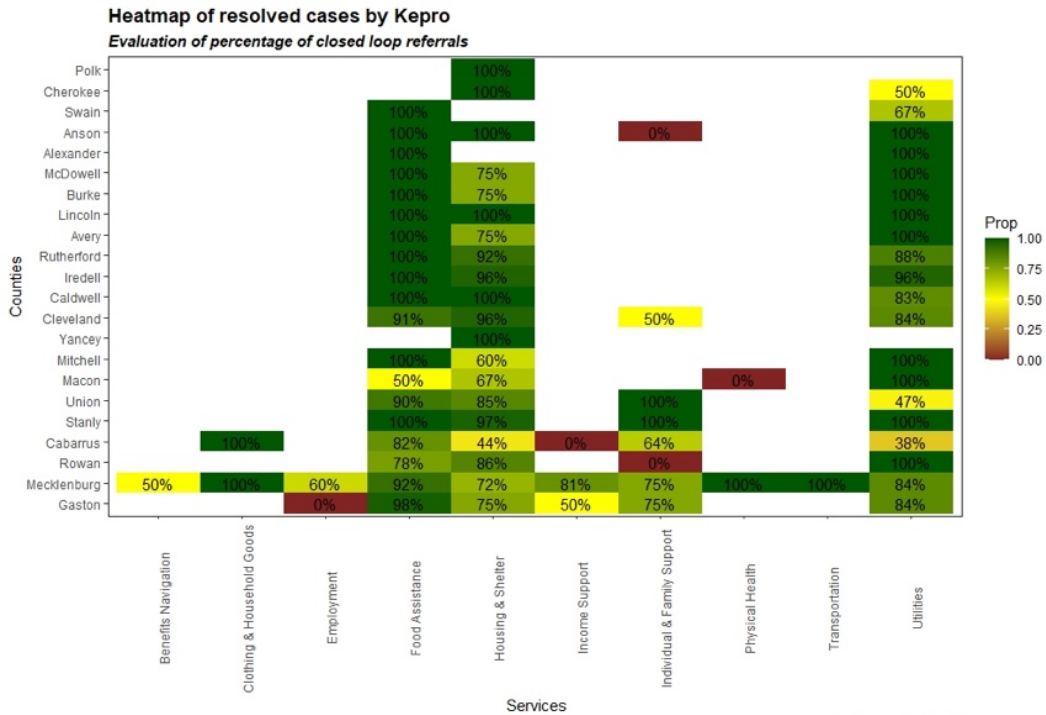
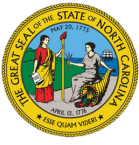


Fig. 10f. Percentage of resolved cases across served counties by vendor (Kepro). Red (<25%), yellow (>25 & <75%), green (>75%).

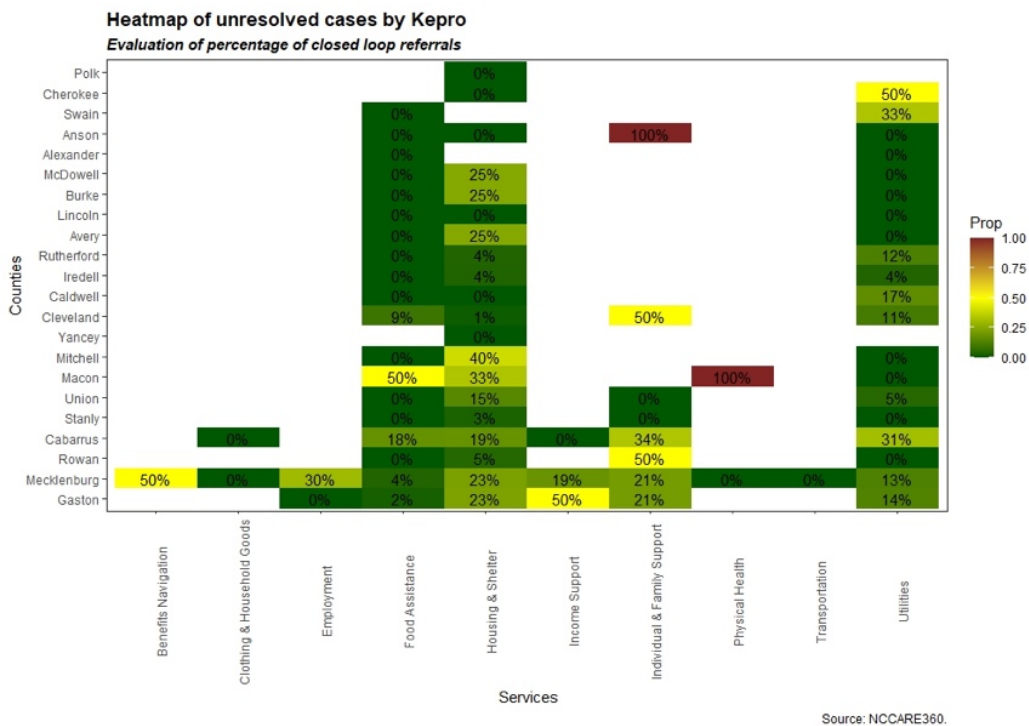


Fig. 10g. Percentage of unresolved cases across served counties by vendor (Kepro). Green (<25%), yellow (>25 & <75%), red (>75%).

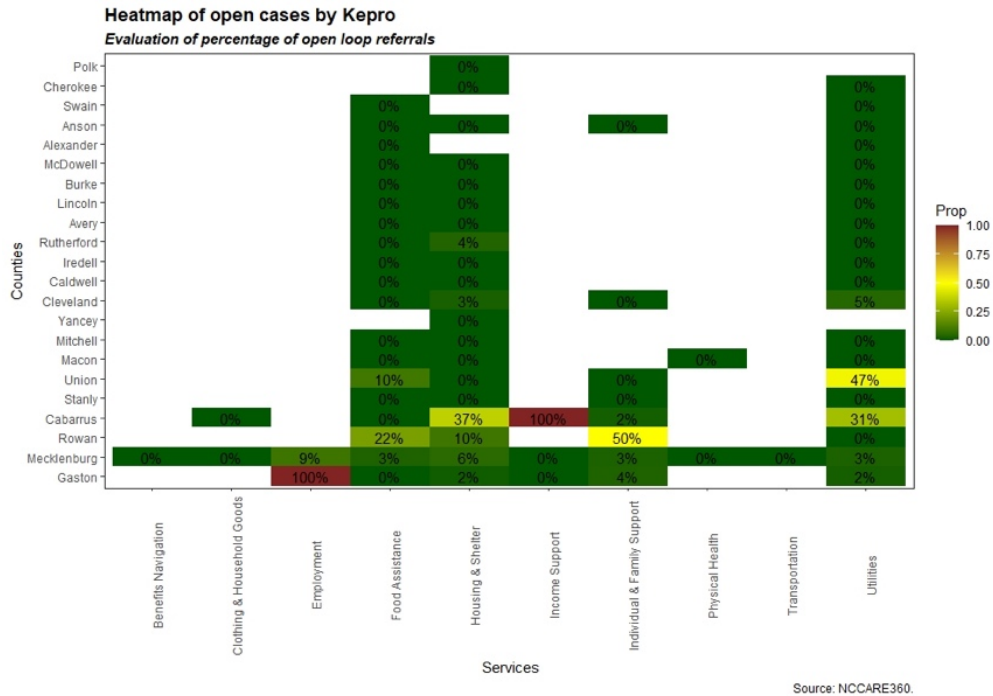
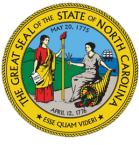
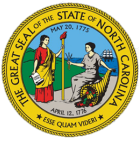


Fig. 10h. **Percentage of open cases across served counties by vendor (Kepro).** Green (<25%), yellow (>25 & <75%), red (>75%).

Interpretation: From September 2021 through March 2022 Kepro had the highest total referrals, with the largest percentage coming from Mecklenburg County. Across counties served by Kepro, the highest demand (referrals) for individual & family support, food assistance, housing & shelter, and utilities with referrals converted into cases, suggesting presence of social support delivery organizations in NCARE360 and CHW-determined eligibility for services. It would be helpful to understand why the proportion of individual & family support referrals was higher in Mecklenburg, Gaston, and Cabarrus than in other counties.

Potential gaps identified include zero referrals across three counties within the Kepro footprint: Graham, Clay, and Madison. Understanding reasons for low referral numbers across these counties will aid the program in strengthening connections to vulnerable communities to facilitate referrals and delivery of social supports. Additionally, several counties had lower than target resolution rates (Cherokee, Macon, Cabarrus, Union). The drivers of these rates vary by county, with Cherokee having both low rates of referrals as well as low resolution rates of utilities support; Macon having intermediate success with food assistance and housing & shelter; Cabarrus having low resolution rates of utilities and food assistance and intermediate resolution of individual & family support; Union having a low resolution rate for utilities. Targeted support to bolster referral networks for these social support service types can strengthen program response.



D. Vidant Health

Vidant Health had 1,512 NCCARE360 social support referrals and the third highest per capita referral and case rates between September 2021 and March 2022 (Table 3a, 3b). Food assistance (32%), housing and shelter (26%), and utilities (20%) had higher number of referrals and cases across counties (fig. 11a, fig. 11b). Except for Duplin, all counties had percentages of resolved cases higher than target for food assistance. The percentages of resolved cases for housing and shelter were lower than target across all counties (fig. 11f). Except for Onslow and Dare, all counties had lower than target resolved rates for utilities. Washington (50%), Pitt (58%), Perquimans (50%), and Edgecombe (60%) had the highest percentages of unresolved cases for housing and shelter. Bertie (100%), Duplin (52%), Edgecombe (33%), Halifax (40%), Jones (50%), and Pasquotank (43%) had the highest percentages of unresolved cases for utilities (fig. 11g). A large percentage of the accepted referrals for housing and shelter remained open. All accepted referrals for utilities remained open in Chowan and Martin counties (fig. 11h). Most counties had lower rates of resolved cases than target (fig. 11c). Overall, the percentage of resolved cases across coverage counties was lower than target for Vidant Health (Table 3b). No referrals were made from Northampton, Gates, Camden, Currituck, or Tyrrell County.

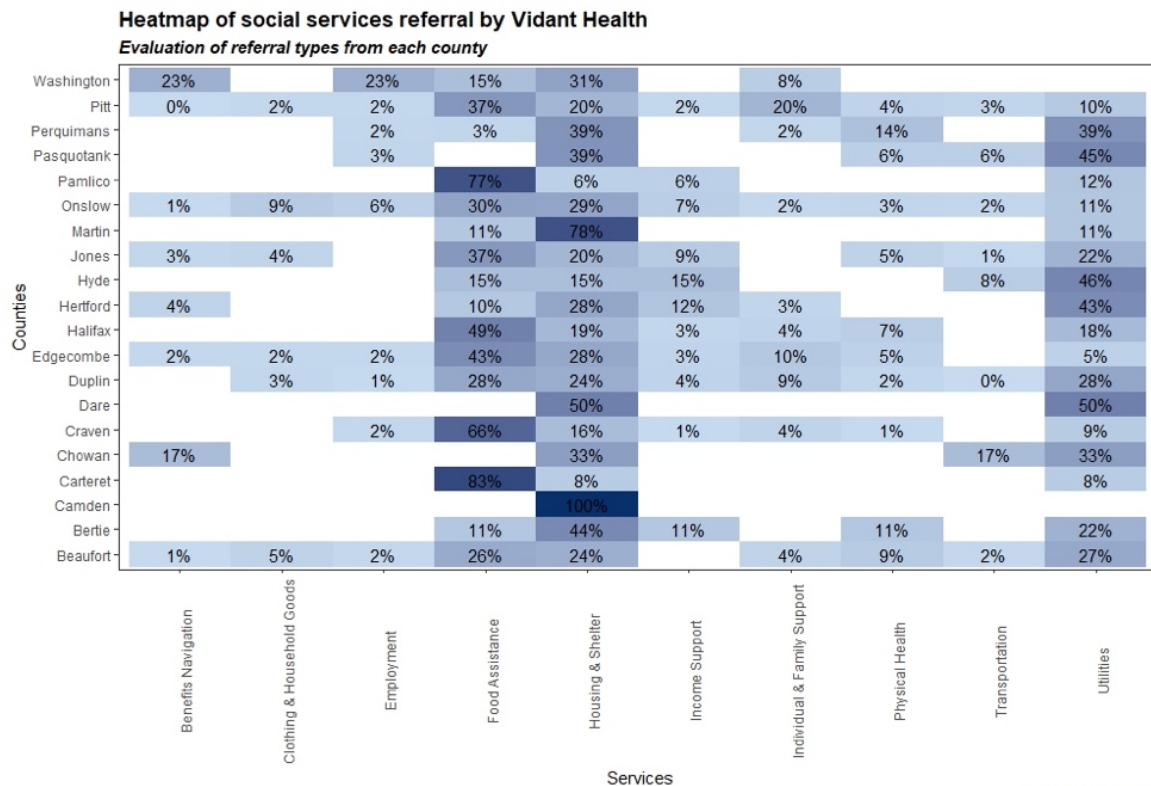
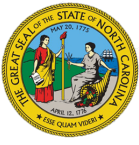
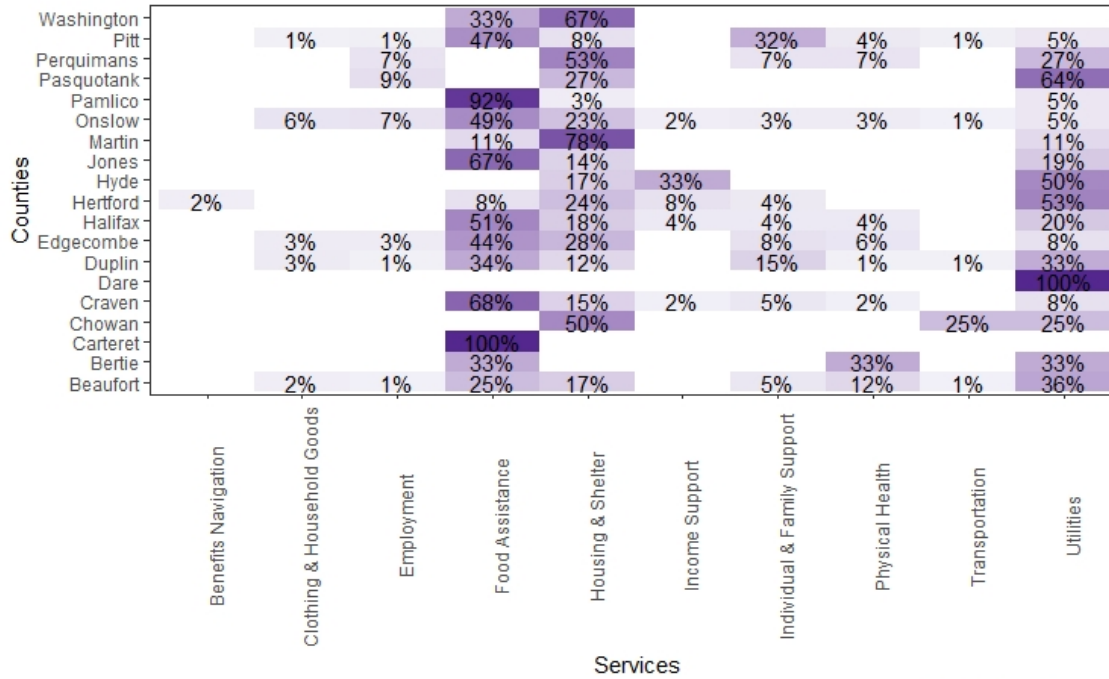


Fig. 11a. **The percentage of total referrals (n) by county, service type, and vendor (Vidant Health).** White boxes represent counties with no referrals for a service type, the percentage represents the proportion of each service type of the total number of referrals received from each county. The darker the rectangle, the closer the value is to 100%.



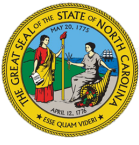
Heatmap of social service cases by Vidant Health

Evaluation of case types from each county

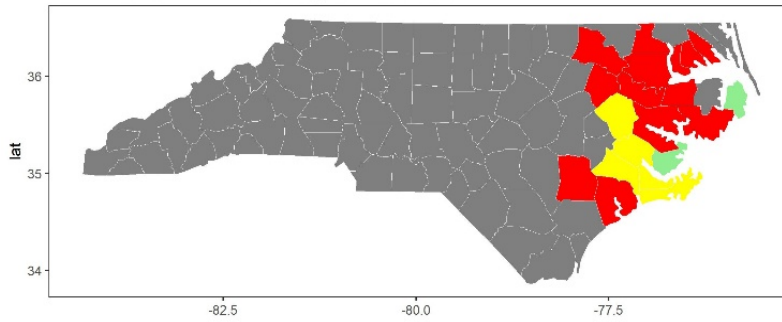


Source: NCCARE360.

Fig. 11b. **The percentage of total cases (n) by county, service type, and vendor (Vidant Health).** White boxes represent counties with no referrals for a service type, the percentage represents the proportion of each service type of the total number of referrals received from each county. The darker the rectangle, the closer the value is to 100%.



Resolution of referral cases by Vidant Health

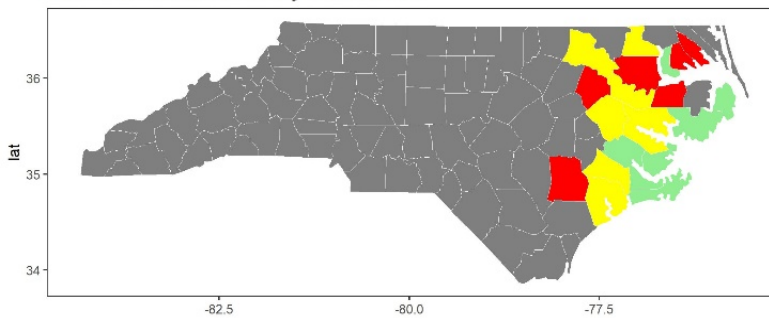


c.

Resolved_Rate ■ <75 ■ 75-90 ■ >90 ■ NA

Source: NCCARE360.

Unresolved referral cases by Vidant Health

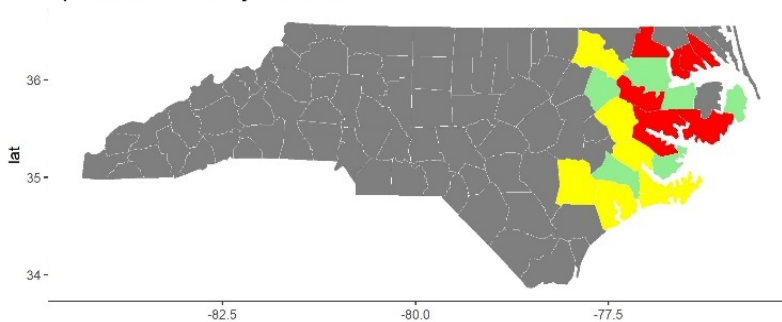


d.

Unresolved_Rate ■ <10 ■ 10-25 ■ >25 ■ NA

Source: NCCARE360.

Open referral cases by Vidant Health



e.

Open_Rate ■ <10 ■ 10-25 ■ >25 ■ NA

Source: NCCARE360.

Fig. 11c. The overall percentage of resolved cases across served counties by vendor (Vidant Health). Red (<75%), yellow (75-90%), and green (>90%). (Note: NA indicates no referral was received from county).

Fig. 11d. The overall percentage of unresolved cases across served counties by vendor (Vidant Health). Green (<10%), orange (10-25%), red (>25%). (Note: NA indicates no referral was received from county).

Fig. 11e. The overall percentage of open cases across served counties by vendor (Vidant Health). Green (<10%), orange (10-25%), red (>25%). (Note: NA indicates no referral was received from county).

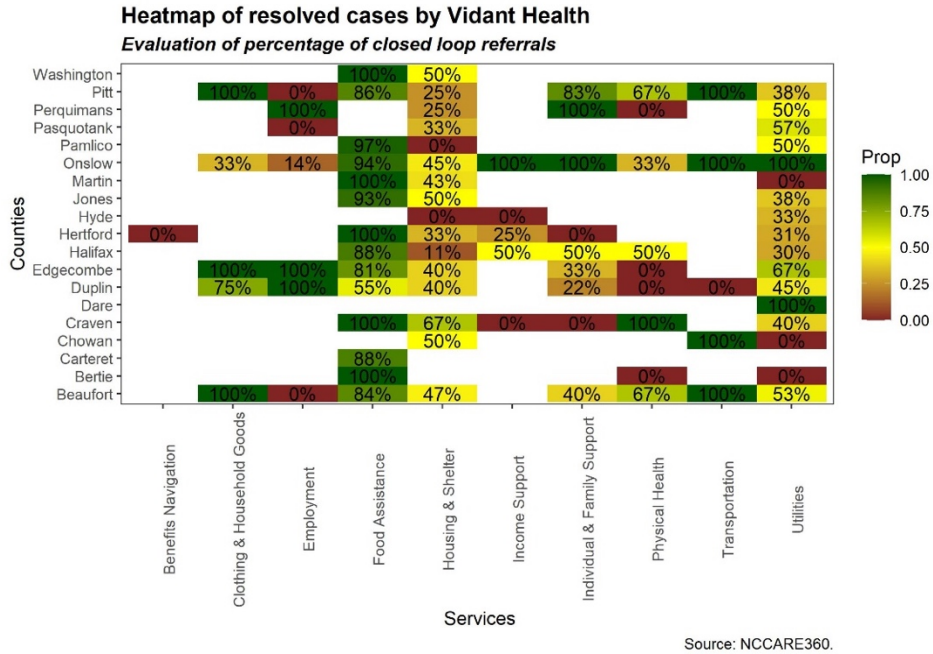
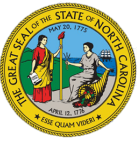


Fig. 11f. Percentage of resolved cases across served counties by vendor (Vidant Health). Red (<25%), yellow (>25 & <75%), green (>75%).

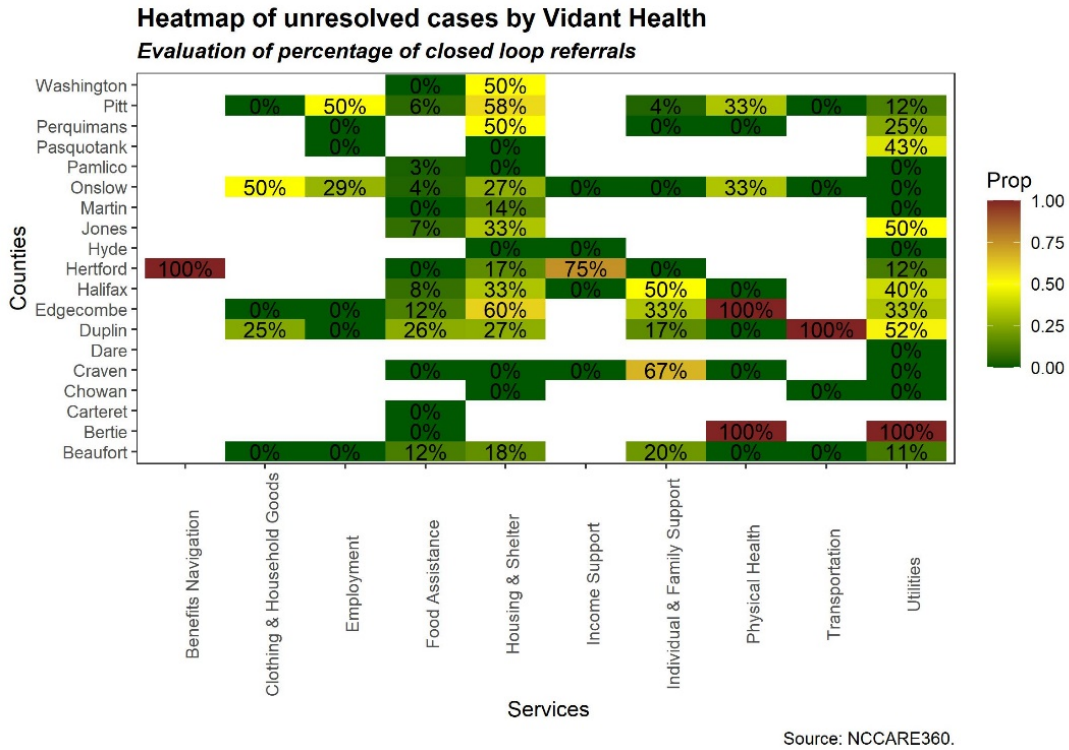


Fig. 11g. Percentage of unresolved cases across served counties by vendor (Vidant Health). Green (<25%), yellow (>25 & <75%), red (>75%).

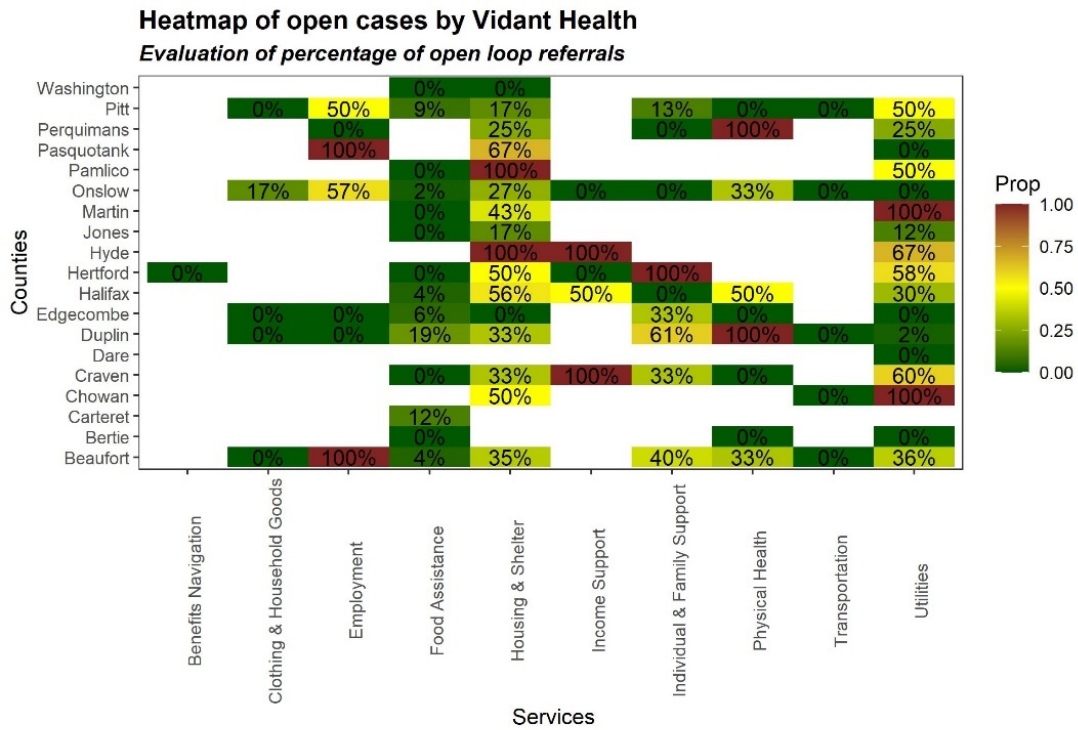
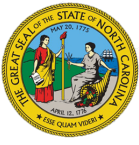
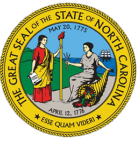


Fig. 11h. **Percentage of open cases across served counties by vendor (Vidant Health).** Green (<25%), yellow (>25 & <75%), red (>75%).

Interpretation: From September 2021 through March 2022, Vidant Health had the third highest per capita referrals and cases among vendors, with the most requested social support types of food assistance, housing & shelter. The majority of referrals were converted into cases, suggesting presence of social support delivery organizations in NCARE360 and CHW-determined eligibility for services. A consistent success in referrals was food assistance. This may have been supported by the coverage of 9 Vidant Health counties by the Central and Eastern Food Bank of North Carolina within the Support Services Program 2.0. Vidant Health’s multi-tiered food security network also including food banks and a medical food pantry also likely supported high rates of referral resolution for food assistance.

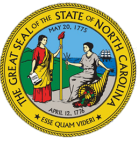
Potential gaps identified include zero referrals across five counties within the Vidant Health footprint: Northampton, Gates, Camden, Currituck, and Tyrrell. Understanding reasons for low referral numbers across these counties will aid the program in strengthening connections to vulnerable communities to facilitate referrals and delivery of social supports. Additionally, many counties had lower than target resolution rates (Duplin, Onslow, Beaufort, Hyde, Washington, Martin, Edgecombe, Halifax, Bertie, Hertford, Chowan, Perquimans, Pasquotank). The drivers of these rates were social support types outside of food assistance, notably housing & shelter, utilities, and individual & family support. Regional and county-level support to bolster referral networks for these social support service types will be essential to strengthening program



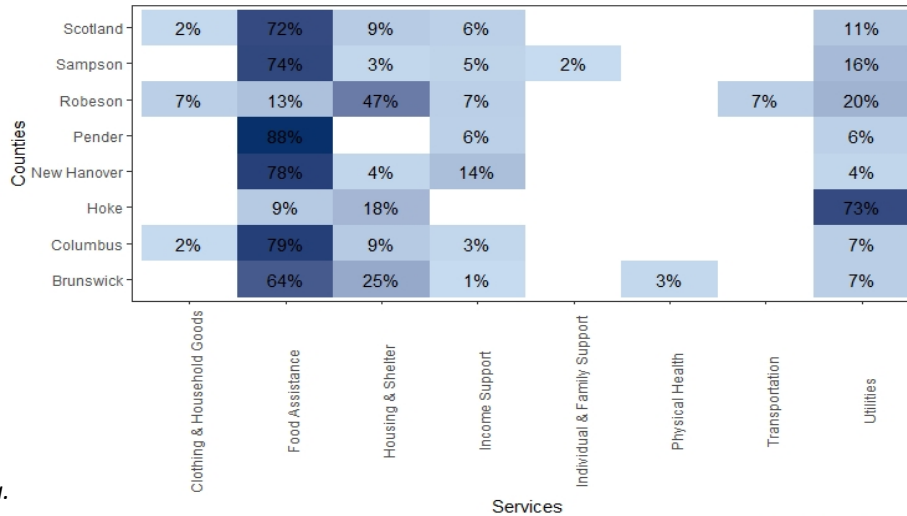
response. Finally, Vidant Health noted that transportation support remains a major challenge across counties, especially rural ones. This is evidenced in the analysis via low referral (perceived lack of resource) and low case rates (actual lack of resource). Efforts to strengthen transportation social support networks, especially in rural areas, will be key to meeting the needs of vulnerable communities.

E. Mt. Calvary Center for Leadership Development

Mt. Calvary had 410 NCCARE360 social support between September 2021 and March 2022 (Table 3a, 3b). Food assistance (68%), housing & shelter (12%), and utilities (11%) had high percentages of referrals and cases (fig. 12a, fig.12b). Except for Robeson and Hoke, all counties had a high percentage of resolved cases for food assistance. Conversely, 100% of accepted referrals for food assistance remained open in these two counties. Columbus (100%) and Robeson (82%) had higher percentage of resolved cases for housing & shelter. 33% of housing and shelter cases were unresolved in New Hanover. Except for Brunswick (75%) and Robeson (100%), all counties had lower percentages of resolved cases for utilities. Sampson had 50% of accepted referrals for utilities unresolved (fig. 12g). Except for Hoke and New Hanover, all counties had higher percentages of resolved cases and lower percentages of unresolved cases. Hoke had the higher percentage of open cases (fig. 12h). Overall, the percentage of resolved cases was higher than target across covered counties (fig. 12c). No referrals were received in Bladen County.



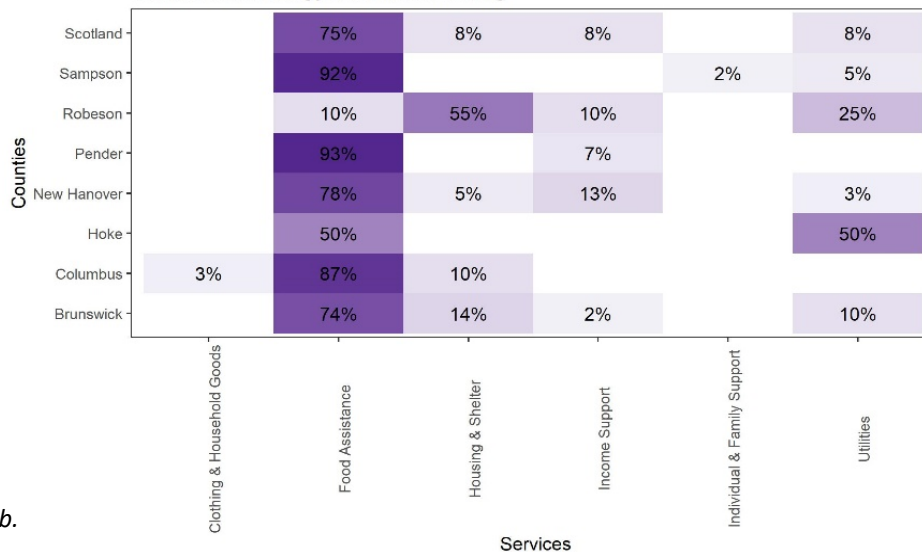
Heatmap of social services referral by Mt. Calvary
Evaluation of referral types from each county



a.

Source: NCCARE360.

Heatmap of social service cases by Mt. Calvary
Evaluation of case types from each county

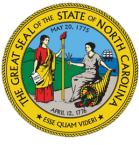


b.

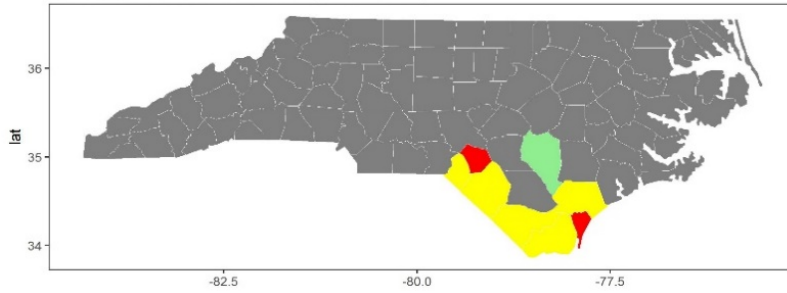
Source: NCCARE360.

Fig. 12a. **The percentage of total referrals (n) by county, service type, and vendor (Mt. Calvary).** White boxes represent counties with no referrals for a service type, the percentage represents the proportion of each service type of the total number of referrals received from each county. The darker the rectangle, the closer the value is to 100%.

Fig. 12b. **The percentage of total cases (n) by county, service type, and vendor (Mt. Calvary).** White boxes represent counties with no referrals for a service type, the percentage represents the proportion of each service type of the total number of referrals received from each county. The darker the rectangle, the closer the value is to 100%.



Resolution of referral cases by Mt. Calvary

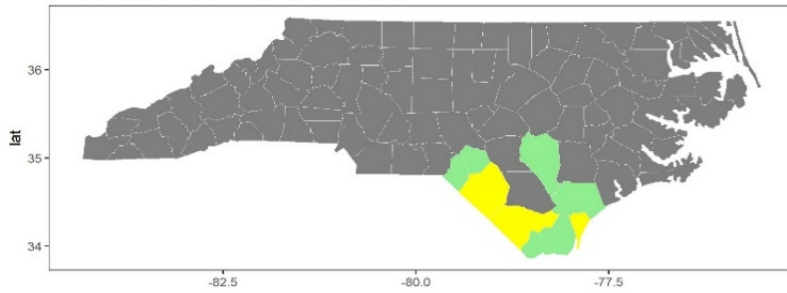


c.

Resolved_Rate ■ <75 ■ 75-90 ■ >90 ■ NA

Source: NCCARE360.

Unresolved referral cases by Mt. Calvary

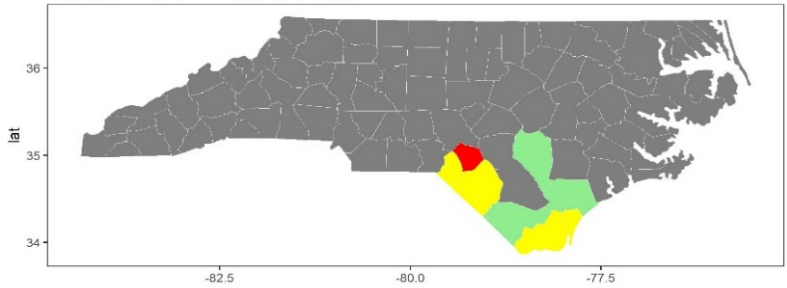


d.

Unresolved_Rate ■ <10 ■ 10-25 ■ NA

Source: NCCARE360.

Open referral cases by Mt. Calvary



e.

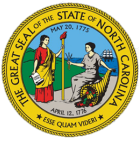
Open_Rate ■ <10 ■ 10-25 ■ >25 ■ NA

Source: NCCARE360.

Fig. 12c. **The overall percentage of resolved cases across served counties by vendor (Mt. Calvary).** Red (<75%), yellow (75-90%), and green (>90%). (Note: NA indicates no referral was received from county).

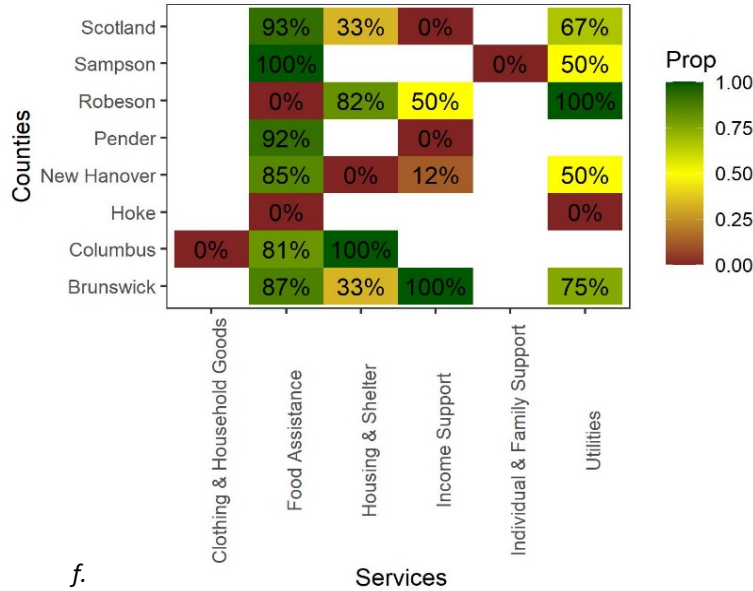
Fig. 12d. **The overall percentage of unresolved cases across served counties by vendor (Mt. Calvary).** Green (<10%), orange (10-25%), red (>25%). (Note: NA indicates no referral was received from county).

Fig. 12e. **The overall percentage of open cases across served counties by vendor (Mt. Calvary).** Green (<10%), orange (10-25%), red (>25%). (Note: NA indicates no referral was received from county)



Heatmap of resolved cases by Mt. Calvary

Evaluation of percentage of closed loop referrals

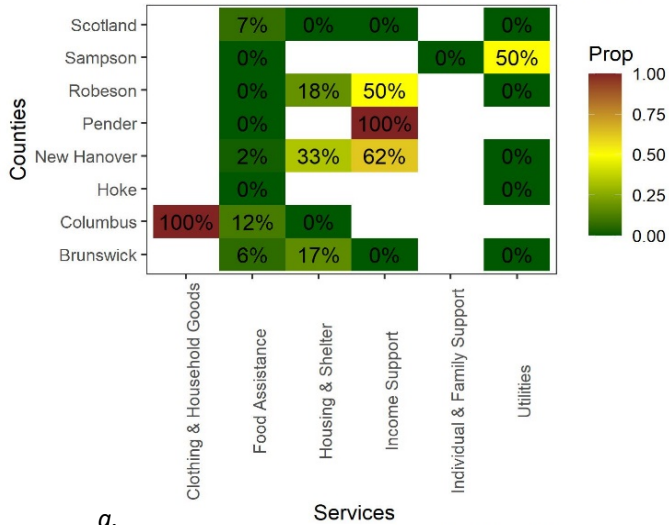


f.

Source: NCCARE360.

Heatmap of unresolved cases by Mt. Calvary

Evaluation of percentage of closed loop referrals

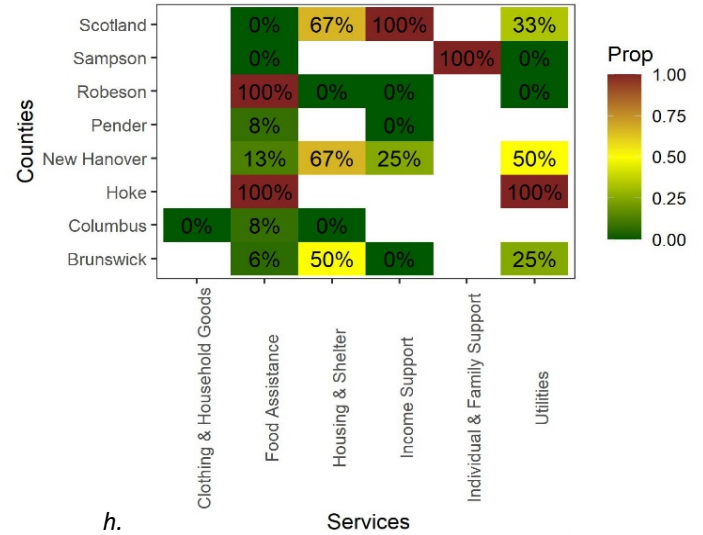


g.

Source: NCCARE360.

Heatmap of open cases by Mt. Calvary

Evaluation of percentage of open loop referrals



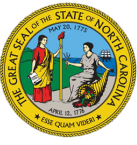
h.

Source: NCCARE360.

Fig. 12f. Percentage of resolved cases across served counties by vendor (Mt. Calvary). Red (<25%), yellow (>25 & <75%), green (>75%).

Fig. 12g. Percentage of unresolved cases across served counties by vendor (Mt. Calvary). Green (<25%), yellow (>25 & <75%), red (>75%).

Fig. 12h. Percentage of open cases across served counties by vendor (Mt. Calvary). Green (<25%), yellow (>25 & <75%), red (>75%).

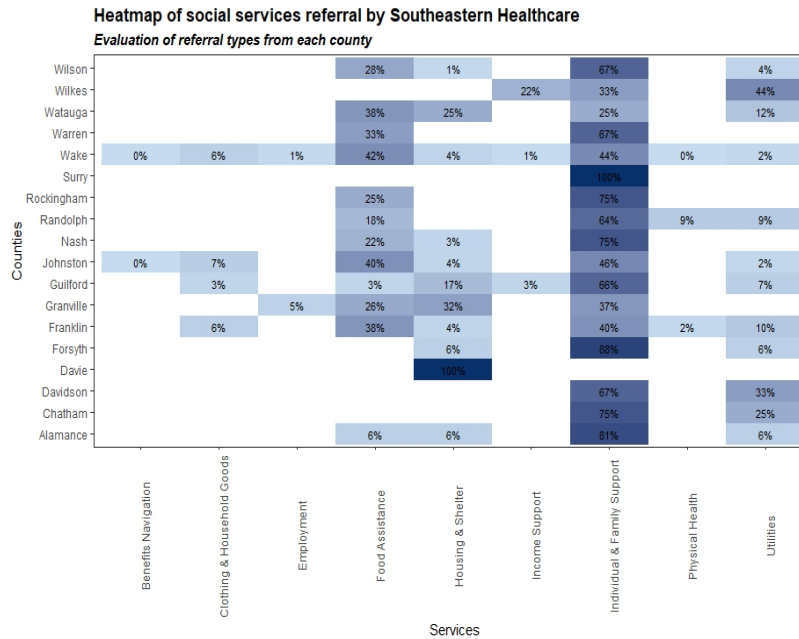
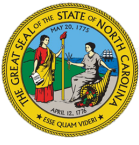


Interpretation: From September 2021 through March 2022, Mt. Calvary had the fifth highest total of referrals among vendors, with food assistance predominating referral requests along with housing & shelter and utilities. Five of the eight counties served by Mt. Calvary were covered by the Central and Eastern Food Bank of North Carolina within the Support Services Program 2.0. This likely supported some of the success in driving referrals and cases as well as high resolution rates. Lower rates of referral resolution for food assistance in Robeson and Hoke (as well as no referrals in Bladen), where SSP 2.0 did not operate, support this claim.

Potential gaps identified include zero referrals in Bladen County. Understanding reasons for low referral numbers in Bladen County will aid the program in strengthening connections to vulnerable communities to facilitate referrals and delivery of social supports. Counties served variably had gaps in utilities and housing & shelter. Targeted support to bolster referral networks for these social support service types will be essential to strengthening program response.

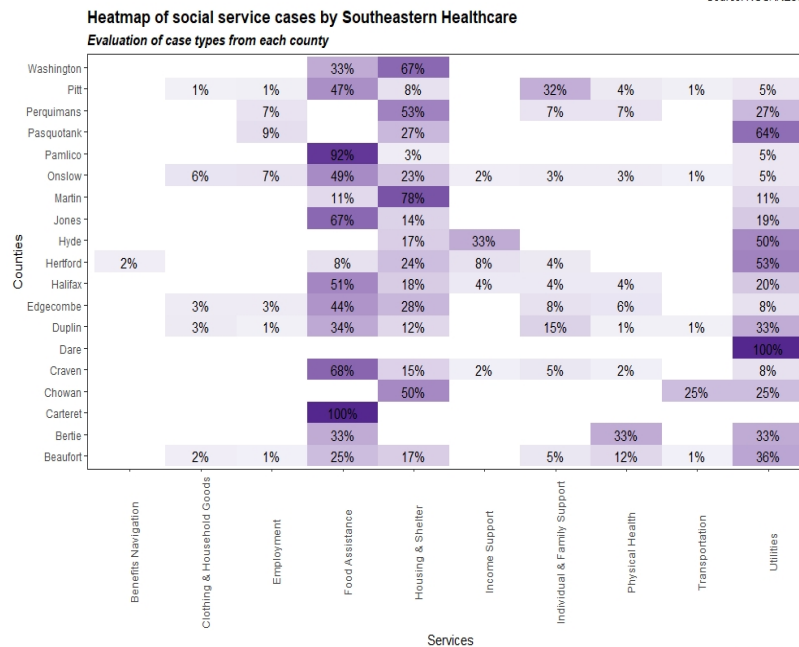
F. Southeastern Healthcare

Southeastern Healthcare had the second highest (1,764) total number but second lowest per capita referral and case rates of NCCARE360 social support between September 2021 and March 2022 (Table 3a, 3b). Individual and family support (50%) and food assistance (37%) had the highest percentages of referrals and cases (fig. 13a, fig. 13b). Food assistance resolution rates were variable across counties, with several having high resolution rates (Wilson, Wake, Nash, Johnston, Franklin), others with low resolution (Alamance, Granville, Guilford, Watauga), and others with no referrals (Wilkes, Warren, Surry, Rockingham, Randolph, Forsyth, Davie, Davidson, Chatham). Davidson, Forsyth, and Wilkes counties had percentages of resolved cases less than target for individual and family support with Surry and Warren having no resolved cases in this area (fig. 13c). Except for Davidson (50%), Surry (100%), and Warren (50%), all counties had a lower percentage of unresolved cases for individual and family support. Granville (60%), Guilford (100%), and Watauga (100%) had higher rates of open cases for food assistance. Similarly, Warren (50%) and Wilkes (33%) had higher percentage of open cases for individual and family support (fig. 13h). No referrals were made in Ashe, Alleghany, Yadkin, Stokes, and Caswell Counties. Half of the served counties had lower than target rates of resolved cases (fig. 13c) and higher percentages of open cases (fig. 13h). However, the overall percentage of resolved cases was higher than target across covered counties (Table 3b).



a.

Source: NCCARE360.

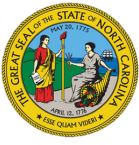


b.

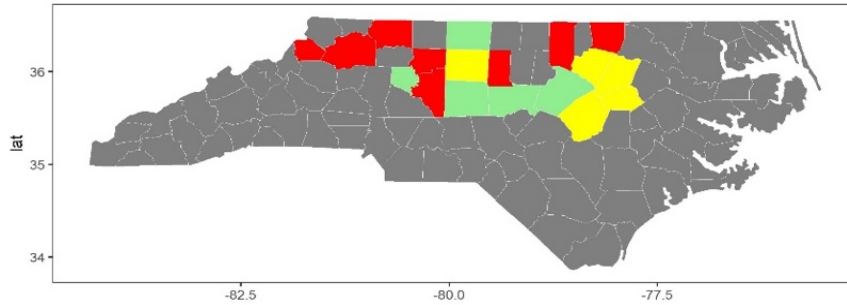
Source: NCCARE360.

Fig. 13a. **The percentage of total referrals (n) by county, service type, and vendor (Southeastern Healthcare).** White boxes represent counties with no referrals for a service type, the percentage represents the proportion of each service type of the total number of referrals received from each county. The darker the rectangle, the closer the value is to 100%.

Fig. 13b. **The percentage of total cases (n) by county, service type, and vendor (Southeastern Healthcare).** White boxes represent counties with no referrals for a service type, the percentage represents the proportion of each service type of the total number of referrals received from each county. The darker the rectangle, the closer the value is to 100%.



Resolution of referral cases by Southeastern Healthcare

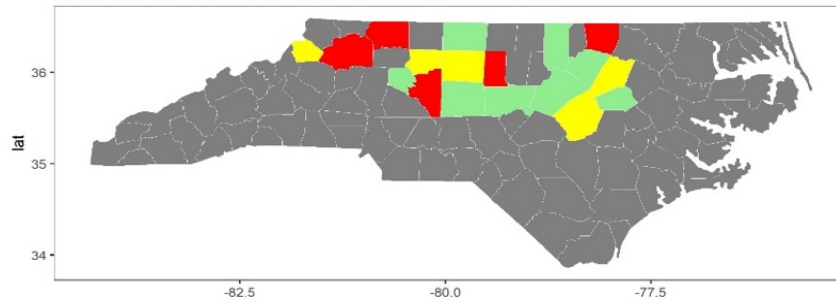


c.

Resolved_Rate <75 75-90 >90 NA

Source: NCCARE360.

Unresolved referral cases by Southeastern Healthcare

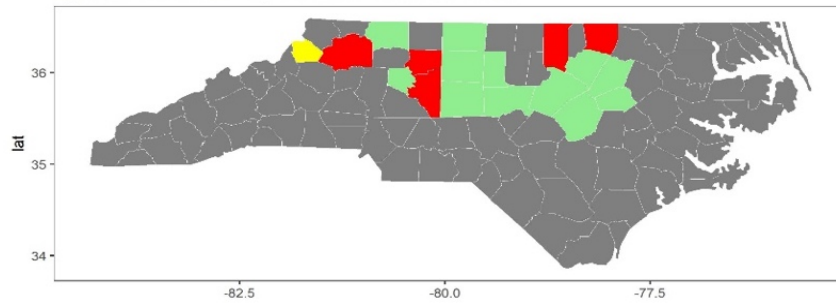


d.

Unresolved_Rate <10 10-25 >25 NA

Source: NCCARE360.

Open referral cases by Southeastern Healthcare



e.

Open_Rate <10 10-25 >25 NA

Source: NCCARE360.

Fig. 13c. The overall percentage of resolved cases across served counties by vendor (Southeastern Healthcare). Red (<75%), yellow (75-90%), and green (>90%). (Note: NA indicates no referral was received from county).

Fig. 13d. The overall percentage of unresolved cases across served counties by vendor (Southeastern Healthcare). Green (<10%), orange (10-25%), red (>25%). (Note: NA indicates no referral was received from county).

Fig. 13e. The overall percentage of open cases across served counties by vendor (Southeastern Healthcare). Green (<10%), orange (10-25%), red (>25%). (Note: NA indicates no referral was received from county).

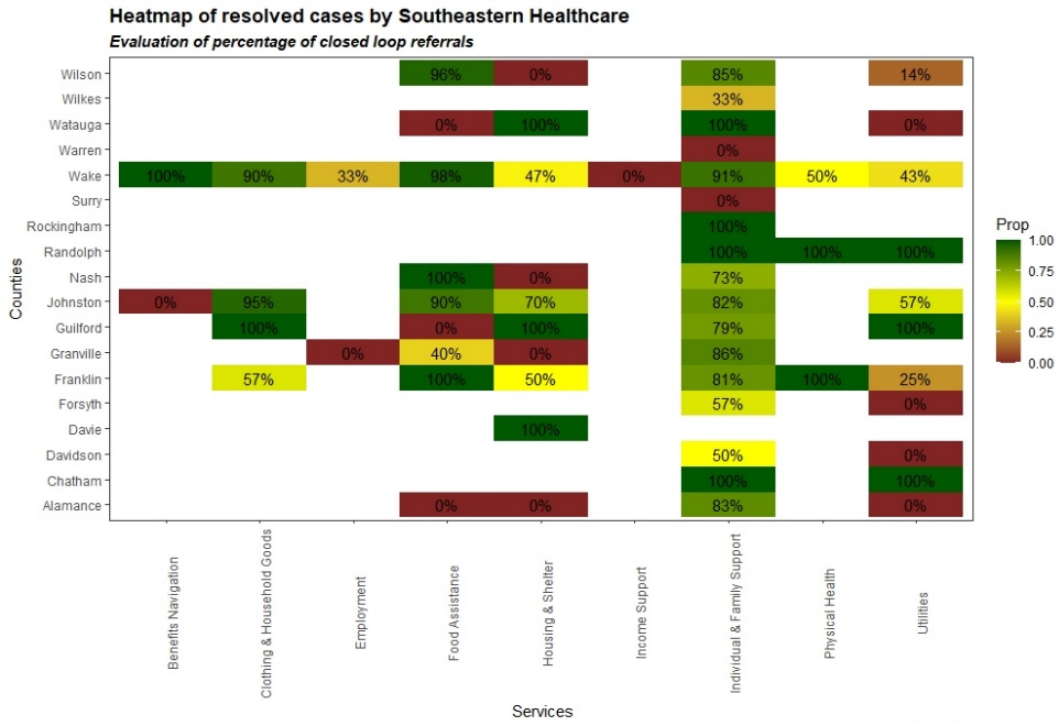
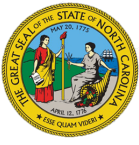


Fig. 13f. Percentage of resolved cases across served counties by vendor (Southeastern Healthcare). Red (<25%), yellow (>25 & <75%), green (>75%).

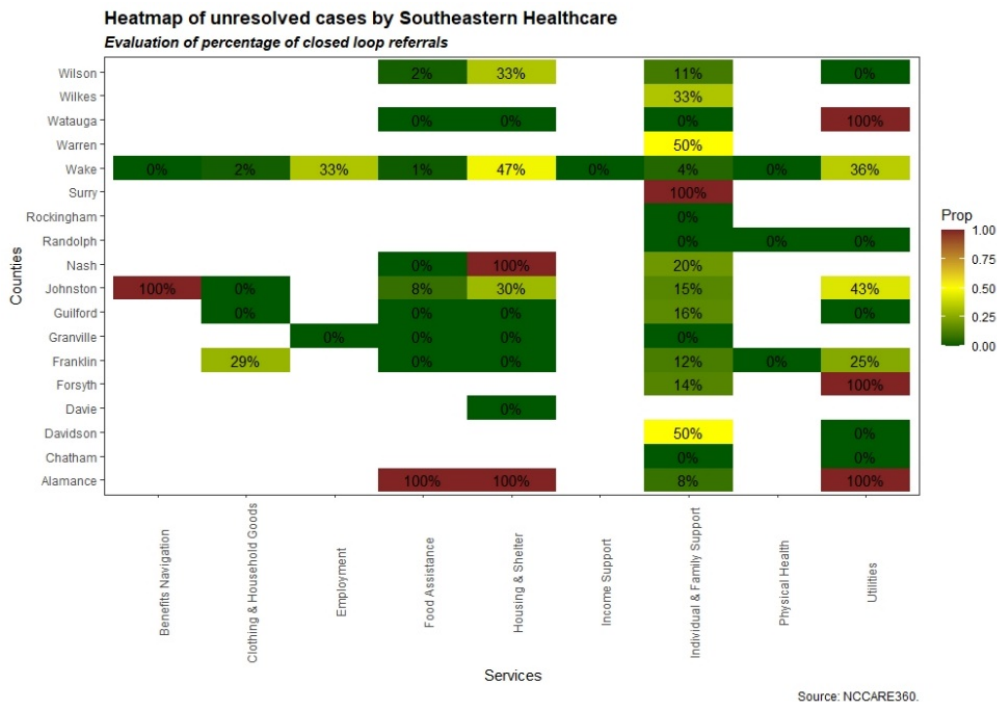


Fig. 13g. Percentage of unresolved cases across served counties by vendor (Southeastern Healthcare). Green (<25%), yellow (>25 & <75%), red (>75%).

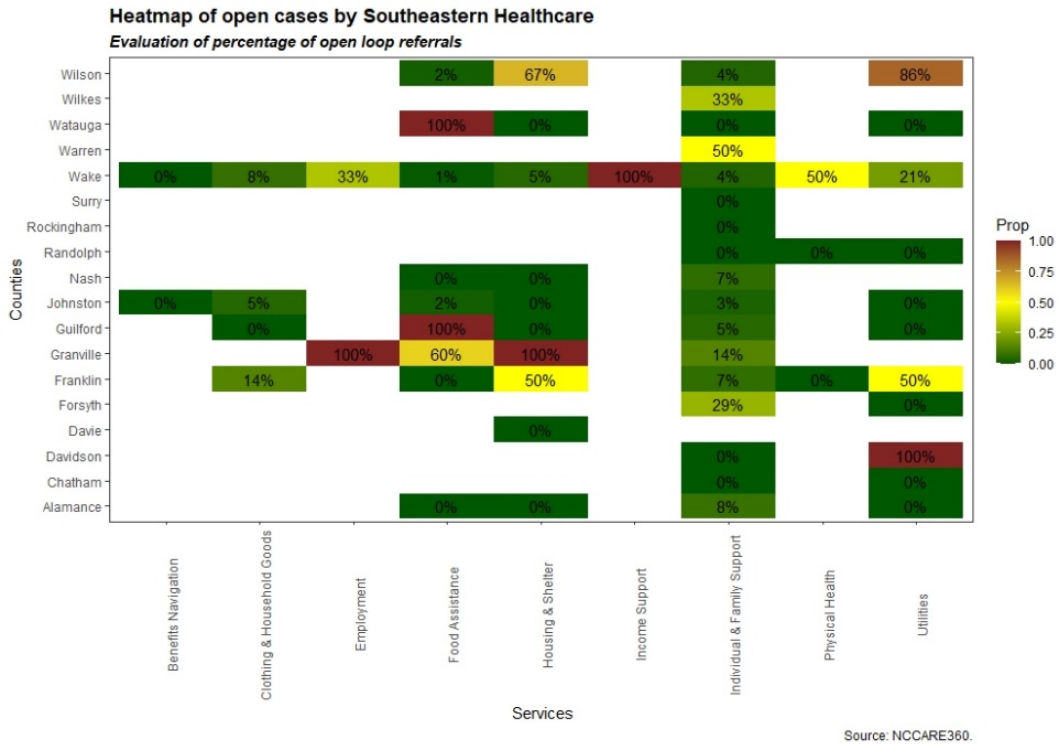
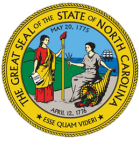
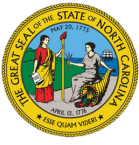


Fig. 13h. **Percentage of open cases across served counties by vendor (Southeastern Healthcare).** Green (<25%), yellow (>25 & <75%), red (>75%).

Interpretation: While Southeastern Healthcare had the second highest total number of referrals from September 2021 through March 2022, its 23-county footprint resulted in lower overall per capita referral and case rates. Across counties served by Southeastern Healthcare, individual & family support and food assistance were the most common referrals, though with variable referral, case, and resolution rates from county to county. County-to-county variability in these areas is an excellent demonstration of identified demand (counties with referrals) as well as unidentified demand (counties with no referrals at all where there is limited reason to believe that demand or vulnerability would be different), since referrals depend on the ability of CHWs to connect with vulnerable individuals as well as higher rates of referral acceptance by the CHW vendor. County-level variability in referrals being accepted as cases may either represent a greater availability of social support resource organizations in NCCARE360 in the region (more likely) or more limited eligibility assessment by CHWs there (less likely).

Eight of the 23 counties served by Southeastern were covered by the Central and Eastern Food Bank of North Carolina within the Support Services Program 2.0. This likely supported some of the success in driving referrals and cases as well as high resolution rates. Counties without SSP 2.0 coverage, however, fared worse with food assistance referrals with either no referrals (14 total counties: 9 counties with referrals for other social supports or low referral rates and 5 without any referrals) or low resolution rates (5 counties). These findings provide support for



the effectiveness of state-funded food assistance programs in generating demand and resolving referrals, while also highlighting the need for expanded food insecurity resource networks across counties and regions.

Additional gaps identified include zero referrals across five counties within the Southeastern Healthcare footprint: Ashe, Alleghany, Yadkin, Stokes, and Caswell. Understanding reasons for low referral numbers across these counties will aid the program in strengthening connections to vulnerable communities to facilitate referrals and delivery of social supports. Additionally, many counties had lower than target resolution rates (Watauga, Wilkes, Surry, Forsyth, Davidson, Alamance, Granville, Warren). The drivers of these rates were variable by social support type across counties including individual & family support (Wilkes, Forsyth, Davidson), housing & shelter (limited across most), and utilities (limited across most). Targeted county-level support as well as regional coordination to bolster referral networks for these social support service types will be essential to strengthening program response.

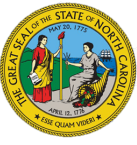
IV. Conclusions

Through analysis of NCCARE360 social support referral data across 6 COVID-19 CHW vendors between September 2021 and March 2022, we identified that individual & family support, food assistance, housing and shelter, utilities and income support were the top five social support referral types. These areas of identified need were similar from the prior period of analysis from September 2020 through June 2021.

The percentages of referrals, cases, and outcomes varied by counties, regions, and CHW vendors. County-to-county variability in resolution rates of cases was observed, with many achieving rates above target ($\geq 75\%$) but with others falling below, both within and across vendors and regions. No association was observed with the number of referrals and/or cases and the percentage of resolved cases. Key themes and questions emerged from this variability, both for high referral resolution rates that represent successes as well as low resolution rates that identify potential gaps.

Though variable across counties, resources were more often available for food assistance. While some vendors have more robust food support networks driving high referral resolution rates (e.g., Vidant Health), others benefitted from the presence of SSP 2.0 across 34 counties, likely driving high resolution rates there. Conversely, even for a single vendor, counties without SSP 2.0 experienced lower referral resolution rates suggesting that strengthened food assistance networks within counties and across regions could both increase demand as well as successfully addressing identified needs.

The count and rates of referrals within a county is used here as an indicator for social support needs/demand, but in fact represents *identified demand* rather than *total demand*, since referrals depend on the ability of CHWs to connect with vulnerable individuals) as well as higher



rates of referral acceptance by the CHW vendor. While [tools exist](#) to estimate and map the total demand across the state, a mechanism for ensuring that CHW referrals reflect those needs can be ensured by embedding CHWs as closely within all vulnerable communities as possible. Rates of vendors accepting a referral as a case may either represent availability of social support resource organizations in NCCARE360 in a county or region (more likely) or more limited eligibility assessment by CHWs there (less likely). Further inquiry will clarify reasons for referrals becoming or not becoming cases, allowing for programmatic planning to support identified gaps.

Clear gaps were identified for which further discussions, analysis, and planning should inform a strengthened program response and increase equity. Counties with no referrals during this evaluation period represent immediate areas for outreach to understand the underlying reasons, which more likely represent limited CHW connections and engagement within the county rather than a true reflection of zero demand. Additionally, counties and regions with lower than target overall or resource-specific referral resolution rates are another area for discussion and assessment to understand gaps and plan to reinforce social support resource networks. Part of this analysis should seek to understand the factors driving county-to-county variability for a vendor, region, or resource.

Next Steps

As next steps in understanding and responding to the identified programmatic gaps, we will explore the issues identified in “Conclusions” above. There areas include examining reasons for counties with zero referrals to understand challenges faced by CHWs in reaching the full vulnerable served population and bolster connections of CHWs within those counties; understanding factors that might influence the acceptance of referrals by CHW vendors; exploring reasons behind county overall and resource-specific gaps in social support resources. Programmatic action and collaboration across other stakeholders will be necessary to fully understand the challenges, plan for response, and to implement that plan to increase program effectiveness and equity. Finally, efforts should be made to onboard and capture referrals and outcomes data for the two vendors not included in this analysis to provide a more complete picture of the CHW Program as well as explore for similar patterns and insights.



V. Appendix – Evaluation Period September 2020 – June 2021 (first 10 months of the COVID-19 CHW Program)

Summary of Community Health Workers (CHWs) referrals across regions						
Uses data from the COVID-19 CHW Program from September 2020 to June 2021						
Regions	Referrals(n)	Cases(n)	Resolved(n)	Unresolved(n)	Open(n)	Pop(n)
Region 4	49,601 ¹	22,731	20,479	1,395	857	2,431,177
Region 3	45,363	34,355	28,315	5,714	326	2,177,485
Region 6	22,319	17,328	15,026	1,843	459	966,914
Region 5	12,601	11,007	10,627	291	89	624,858
Region 2	1,938	614	428	132	54	1,417,030
Region 1	71	36	20	14	2	385,733 ²
TOTAL	131,893	86,071	74,895	9,389	1,787	8,003,197

¹ Region 4 has the largest referrals.
² Region 1 has the lowest population.
Source: Dataset is from NCCARE360.

Source: **7 vendors** including Curamericas, Kepro, One to One with Youth, Vidant Health, Mount Calvary Center for Leadership Development, Catawba County DPH, & Southeastern Healthcare NC.

a.

Summary of referral, cases, and outcome rates by regions						
Uses data from the COVID-19 CHW Program September 2020 to June 2021, rate is calculated for example as number of referrals per 100,000 people						
Requested Social Support	Served CHW Counties	Referral_Rate	Case_Rate	Resolved(%)	Unresolved(%)	Open(%)
Region 6	15	2,308 ¹	1,792	87	11	3
Region 3	7	2,083	1,578	82	17	1
Region 4	12	2,040	935	90	6	4
Region 5	10	2,017	1,762	97 ²	3	1
Region 2	7	137	43	70	21	9
Region 1	2	18	9 ³	56	39	6
min	—	18.0	9.0	56.0	3.0	1.0
max	—	2,308.0	1,792.0	97.0	39.0	9.0
avg	—	1,433.8	1,019.8	80.3	16.2	4.0
median	—	2,028.5	1,256.5	84.5	14.0	3.5

¹ Region 6 has the largest referrals.
² Region 5 has the highest resolution rates of cases
³ Region 1 has lowest Case Rate.
Source: Dataset is from NCCARE360.

Source: **7 vendors** including Curamericas, Kepro, One to One with Youth, Vidant Health, Mount Calvary Center for Leadership Development, Catawba County DPH, & Southeastern Healthcare NC.

b.

Table 4a. **Summary of referrals (n) and outcomes (cases, resolved, unresolved, open) by region (September 2020-June 2021).** Conditional formatting for Referrals (n): red (<=5000), orange (>5000 & <=25000), and green (>25000); Pop(n): red(<=5000k), orange (>5000k & <=2M), green (>2M). Conditional formatting for Resolved (%): red (<75%), orange (75-90%), and green (>90%); Unresolved and Open percentages: green (>10%), orange (10-25%), red (>25%).

Table 4b. **Summary of referral and cases per capita and outcomes by region (September 2020-June 2021).**



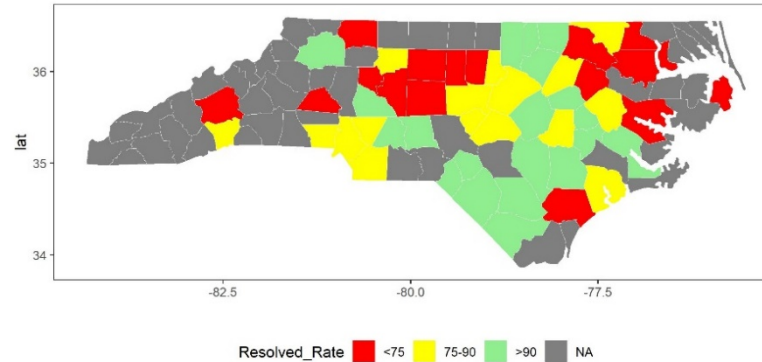
Requested Social Services from clients		
Uses data from the COVID-19 CHW Program from September 2020 to June 2021		
Services	Referrals	Percent
Food Assistance	43,023	32.62
Income Support	30,892	23.42
Individual & Family Support	20,200	15.32
Housing & Shelter	15,296	11.60
Utilities	10,815	8.20
Clothing & Household Goods	4,961	3.76
Employment	3,300	2.50
Physical Health	1,434	1.09
Transportation	1,169	0.89
Benefits Navigation	426	0.32
Education	260	0.20
Spiritual Enrichment	50	0.04
Entrepreneurship	21	0.02
Money Management	19	0.01
Wellness	17	0.01
Social Enrichment	7	0.01
Sports & Recreation	3	0.00
TOTAL : —	131,893	100

Source: Dataset is from NCCARE360.
Source: **7 vendors** including Curamericas, Kepro, One to One with Youth, Vidant Health, Mount Calvary Center for Leadership Development, Catawba County DPH, & Southeastern Healthcare NC.

Table 5. Percent of social supports requested by clients, by type and (n) (September 2020-June 2021). Sub-service types of each service provided include by not limited to: Individual & Family Support (e.g., case management, childcare, caregiving services, etc.); Food Assistance (e.g., Emergency Food, Food Pantry, SNAP/FNS, WIC/Other nutrition benefits, etc.); Housing & Shelter (e.g., Assisted Living, Rent/Mortgage Payment Assistance, Emergency Housing, etc.); Utilities (e.g., Bill Payment Assistance, Home Energy/Utilities Benefits, etc.); Income Support (e.g., Emergency/One-time Financial Assistance, TANF/Cash Assistance Programs, SSI/SSD & Disability Benefits, etc.); Clothing & Housing Goods (e.g. clothing & household goods, etc.), Employment (e.g., Job Search/Placement, Job Training, Career Skills Development, etc.); Physical Health (e.g. Medical Expense Assistance, Primary Care, Chronic Disease Prevention & Management, etc.); Benefits Navigation (e.g. Health Insurance/Benefits, Benefits Eligibility Screening, ID/Documentation Assistance, etc.), Transportation (e.g. Ride Coordination, Transportation Expense Assistance, Transportation Passes/Vouchers, etc.); Education(e.g. Degrees/Certifications, Language Classes, Computer/Technology Classes, etc.), Wellness(e.g. Nutrition Education, Mindfulness & Meditation, Health Literacy Classes, etc.), Social Enrichment (e.g. Youth Development, Arts & Crafts Classes, etc.), Sports & Recreation (e.g. Exercise Classes/Groups, etc.).

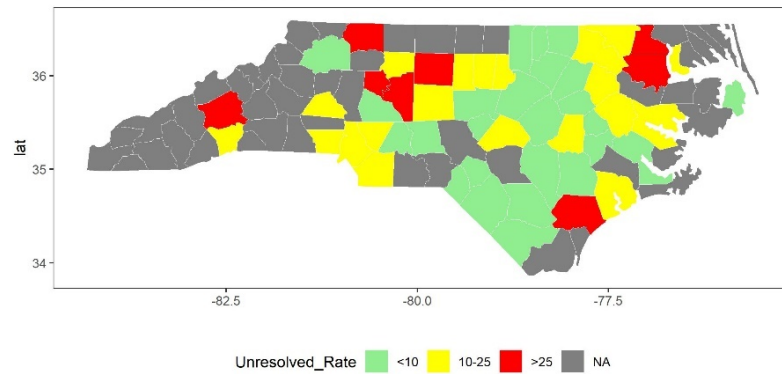


Resolution of referral cases across CHW served counties



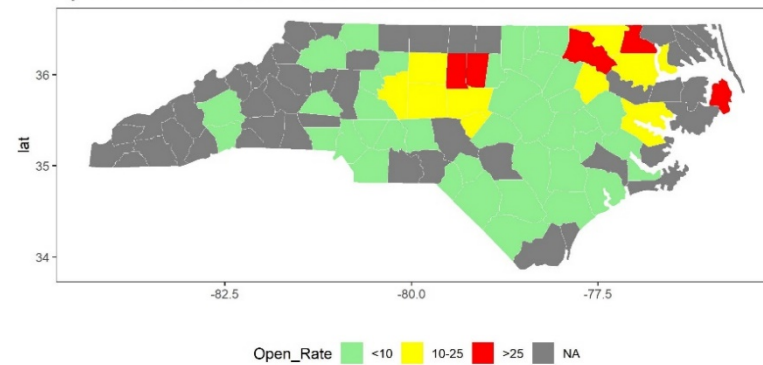
Source: NCCARE360.

Unresolved referral cases across CHW served counties



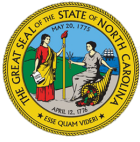
Source: NCCARE360.

Open referral cases across CHW served counties



Source: NCCARE360.

Fig. 14. Referral outcomes by across served counties (September 2020-June 2021). Resolved (%): red (<75%), yellow (75-90%), and green (>90%); Unresolved (%) & Open (%): green (<10%), orange (10-25%), red (>25%). (Note: NA indicates no referral was received from county).



Summary of referral, cases, and outcome rates by vendors

Uses data from the COVID-19 CHW Program **September 2020 to June 2021**, rate is calculated for example as **number of referrals per 100,000 people**

Requested Social Support	Served regions	Referral_Rate	Case_Rate	Resolved(%)	Unresolved(%)	Open(%)
One to One	2	7,518 ¹	6,709	95	5	0
Mt. Calvary	1	2,934	2,611	97 ²	2	1
Kepro	2	1,859	1,400	82	17	1
Southeastern Healthcare	4	1,815	1,237	86	12	2
Curamericas	5	1,111	437	88	7	5
Vidant Health	2	1,039	443	69	13	18
Catawba PH	1	247	136 ³	67	24	8
min	—	247.0	136.0	67.0	2.0	0.0
max	—	7,518.0	6,709.0	97.0	24.0	18.0
avg	—	2,360.4	1,853.3	83.4	11.4	5.0
median	—	1,815.0	1,237.0	86.0	12.0	2.0

¹ One to One has the largest Referral Rate

² Mt. Calvary has the highest percentage of Resolved Cases

³ Catawba has the lowest Case Rate.

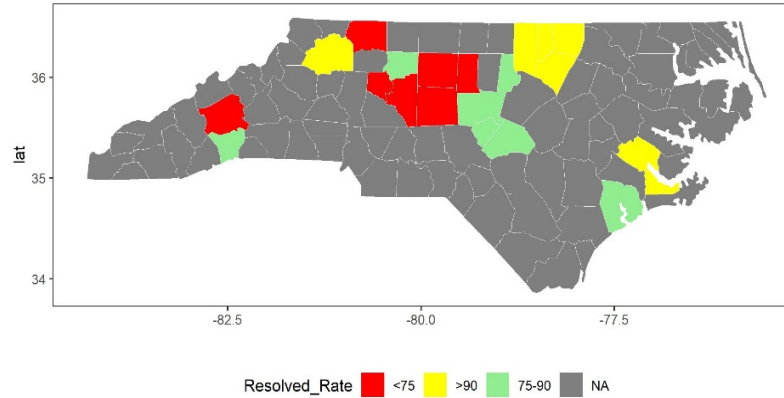
Source: Dataset is from NCCARE360.

Source: **7 vendors** including Curamericas, Kepro, One to One with Youth, Vidant Health, Mount Calvary Center for Leadership Development, Catawba County DPH, & Southeastern Healthcare NC.

Table 6. **Summary of referral and cases per capita and outcomes by vendor (September 2020-June 2021)**. Conditional formatting for Resolved (%): red (<75%), orange (75-90%), and green (>90%); Unresolved and Open percentages: green (>10%), orange (10-25%), red (>25%).

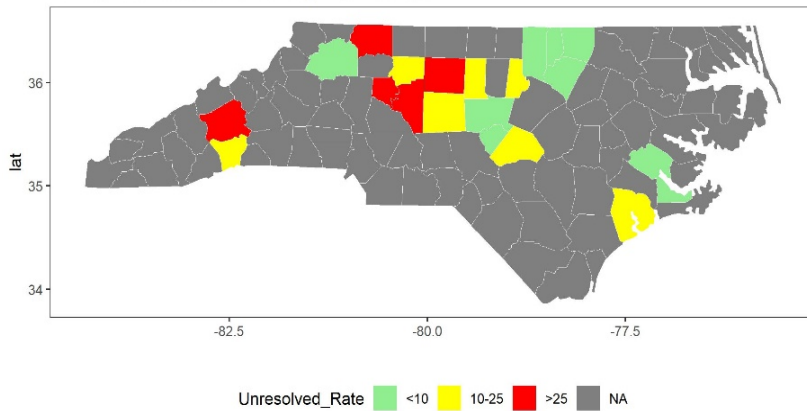


Resolution of referral cases by Curamericas



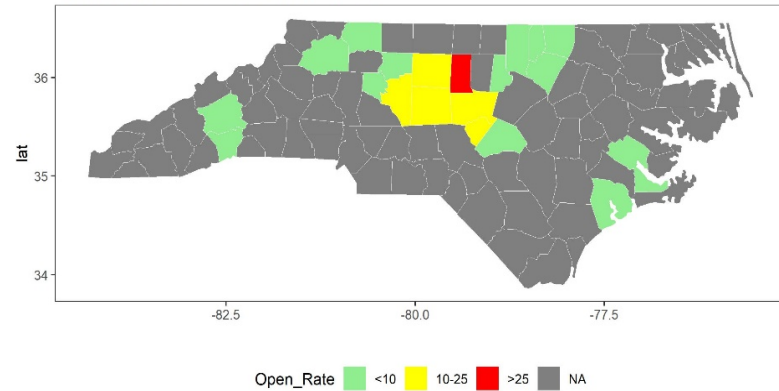
Source: NCCARE360.

Unresolved referral cases by Curamericas



Source: NCCARE360.

Open referral cases by Curamericas

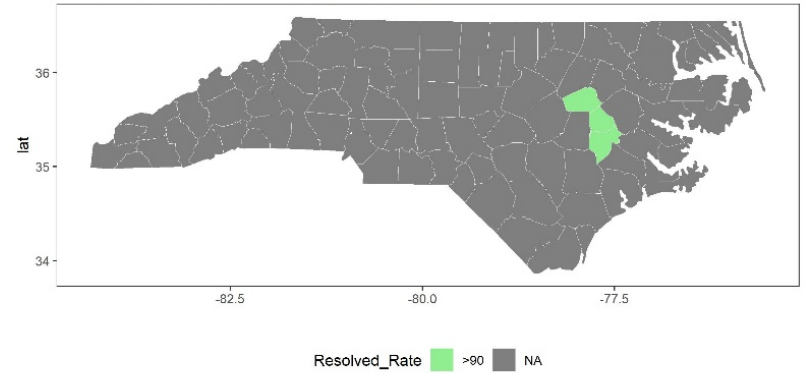


Source: NCCARE360.

Fig. 15. Referral outcomes across covered counties by Curamericas (September 2020-June 2021). Resolved (%): red (<75%), yellow (75-90%), and green(>90%); Unresolved (%) & Open (%): green (<10%), orange (10-25%), red (>25%). (Note: NA indicates no referral was received from county).

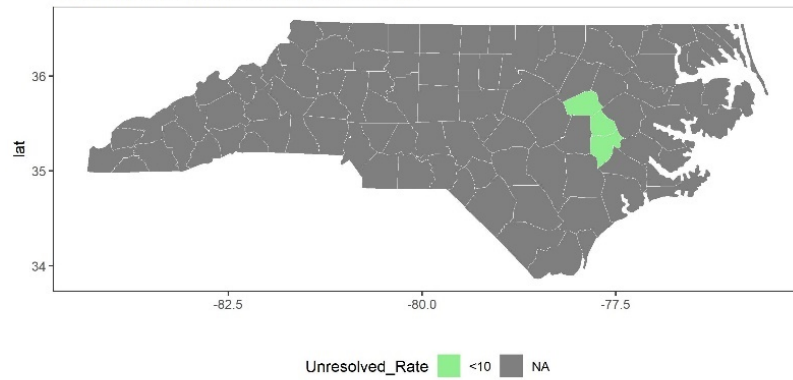


Resolution of referral cases by One to One



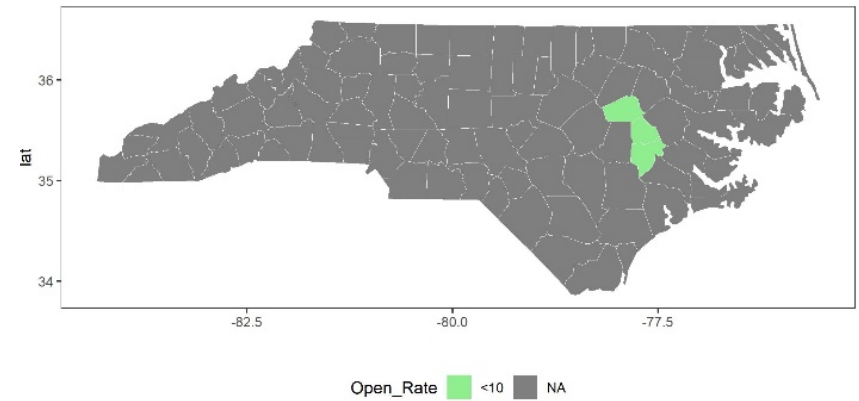
Source: NCCARE360.

Unresolved referral cases by One to One



Source: NCCARE360.

Open referral cases by One to One

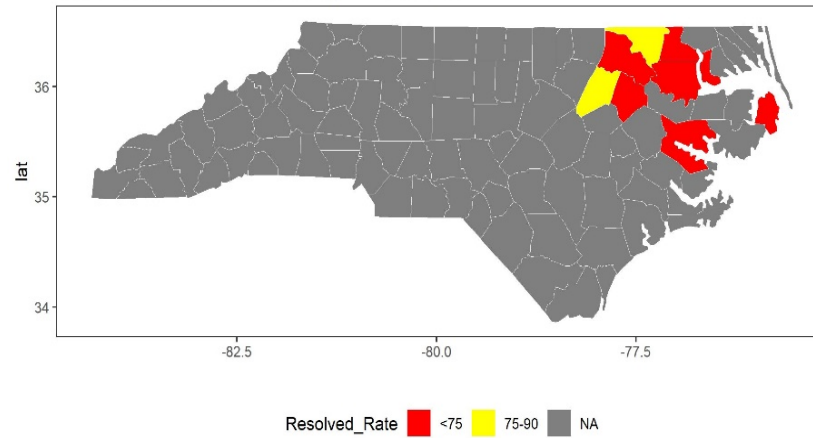


Source: NCCARE360.

Fig. 16. Referral outcomes across covered counties by One to One (September 2020-June 2021). Resolved (%): red (<75%), yellow (75-90%), and green (>90%); Unresolved (%) & Open (%): green (<10%), orange (10-25%), red (>25%). (Note: NA indicates no referral was received from county).

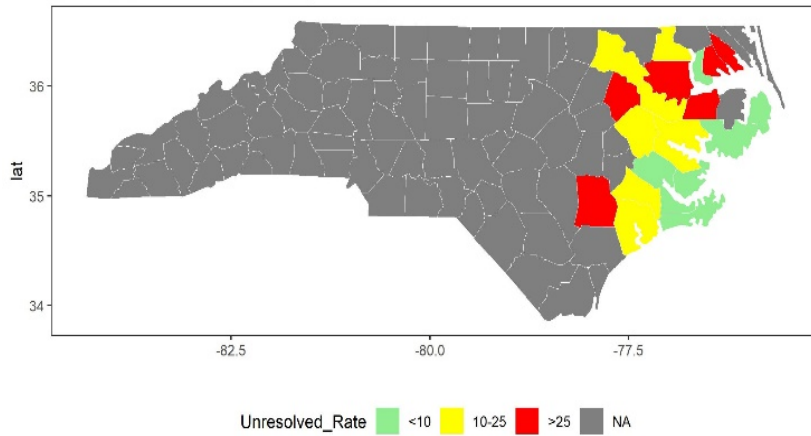


Resolution of referral cases by Vidant Health



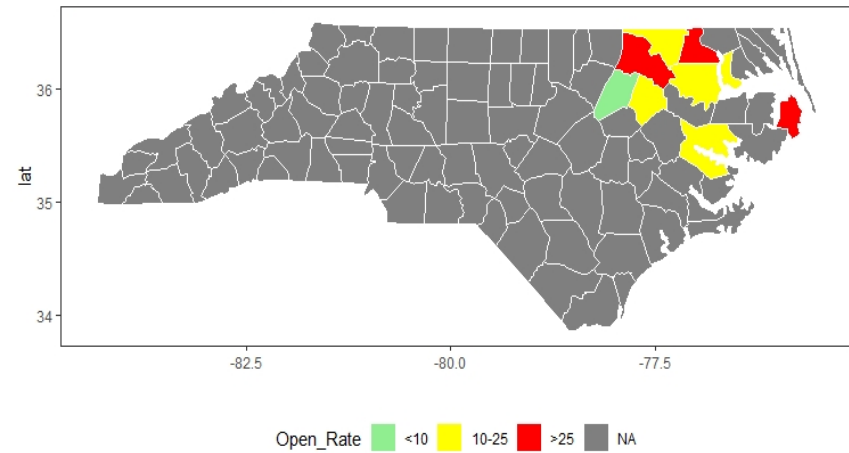
Source: NCCARE360.

Unresolved referral cases by Vidant Health



Source: NCCARE360.

Open referral cases by Vidant Health

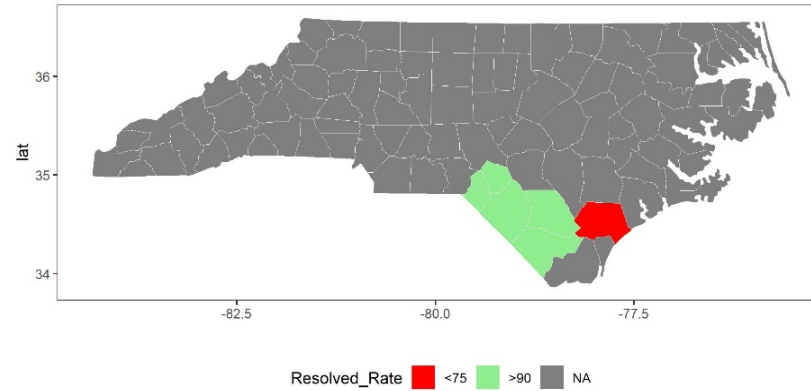


Source: NCCARE360.

Fig. 17. Referral outcomes across covered counties by Vidant (September 2020-June 2021). Resolved (%): red (<75%), yellow (75-90%), and green (>90%); Unresolved (%) & Open (%): green (<10%), orange (10-25%), red (>25%). (Note: NA indicates no referral was received from county).

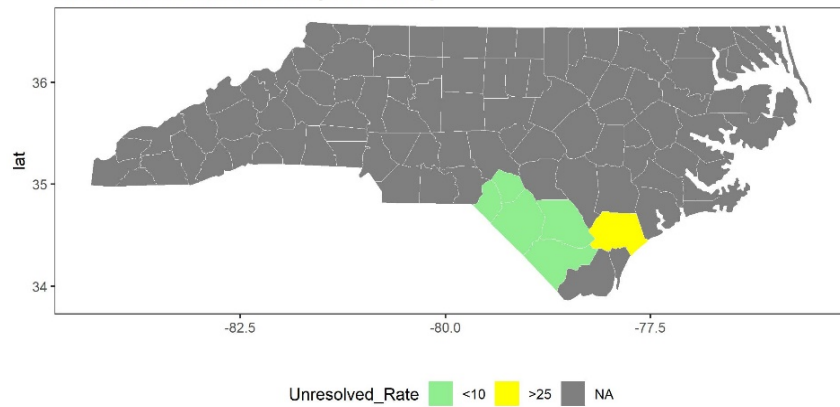


Resolution of referral cases by Mt. Calvary



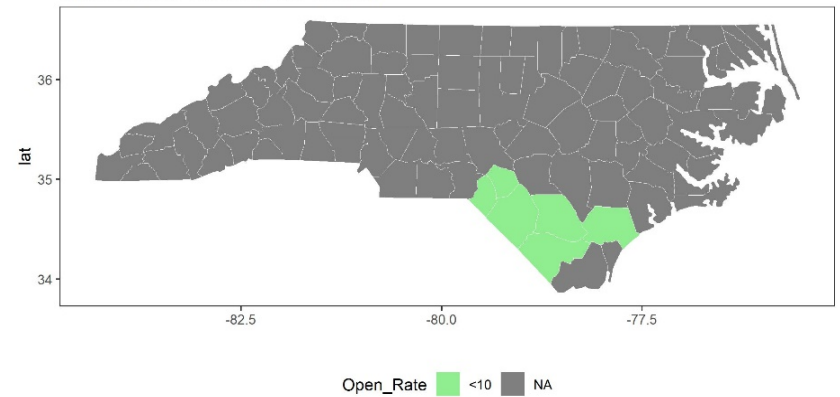
Source: NCCARE360.

Unresolved referral cases by Mt. Calvary



Source: NCCARE360.

Open referral cases by Mt. Calvary

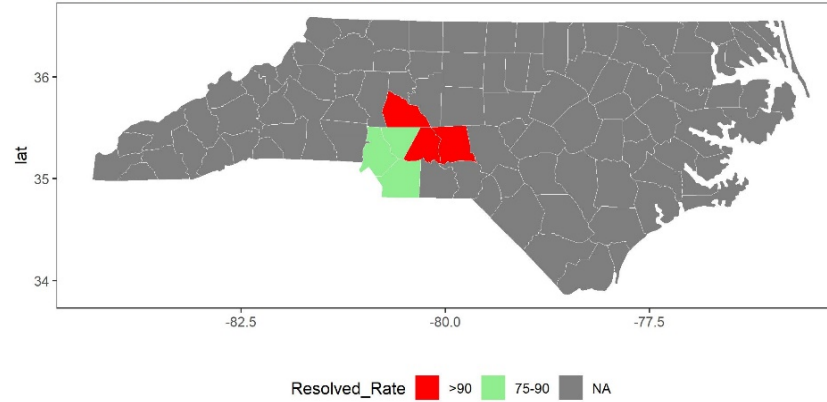


Source: NCCARE360.

Fig. 18. Referral outcomes across covered counties by Mt. Calvary (September 2020-June 2021). Resolved (%): red (<75%), yellow (75-90%), and green (>90%); Unresolved (%) & Open (%): green (<10%), orange (10-25%), red (>25%). (Note: NA indicates no referral was received from county).

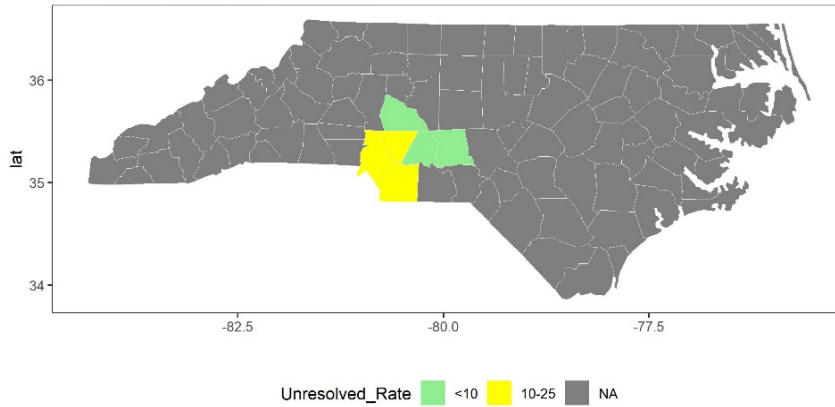


Resolution of referral cases by Kepro



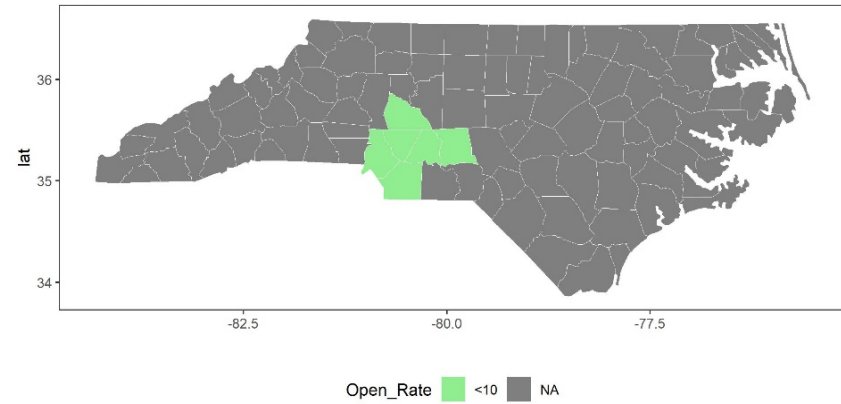
Source: NCCARE360.

Unresolved referral cases by Kepro



Source: NCCARE360.

Open referral cases by Kepro

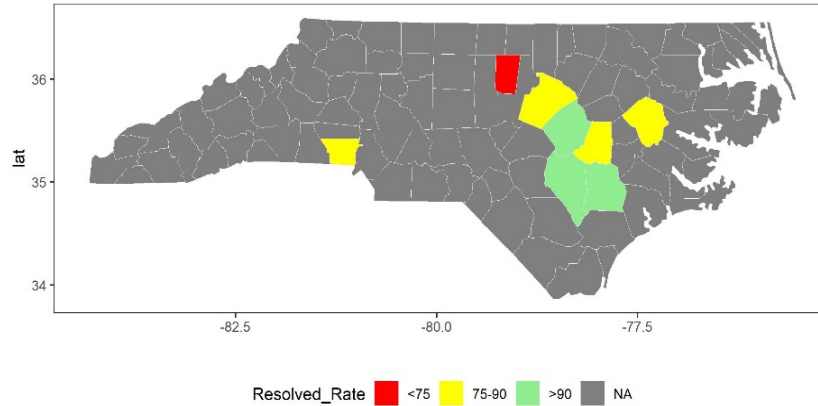


Source: NCCARE360.

Fig. 19. Referral outcomes across covered counties by Kepro (September 2020-June 2021). Resolved (%): red (<75%), yellow (75-90%), and green (>90%); Unresolved (%) & Open (%): green (<10%), orange (10-25%), red (>25%). (Note: NA indicates no referral was received from county).

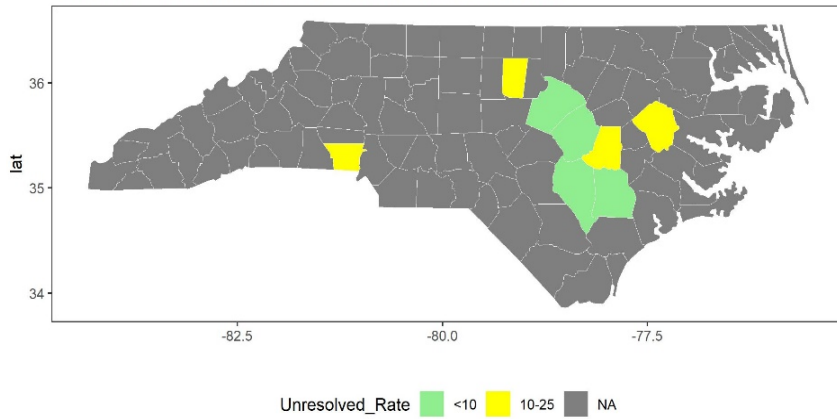


Resolution of referral cases by Southeastern Healthcare



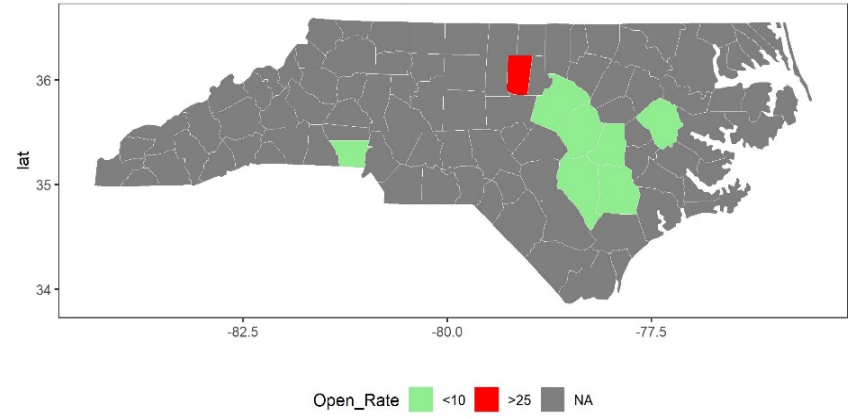
Source: NCCARE360.

Unresolved referral cases by Southeastern Healthcare



Source: NCCARE360.

Open referral cases by Southeastern Healthcare

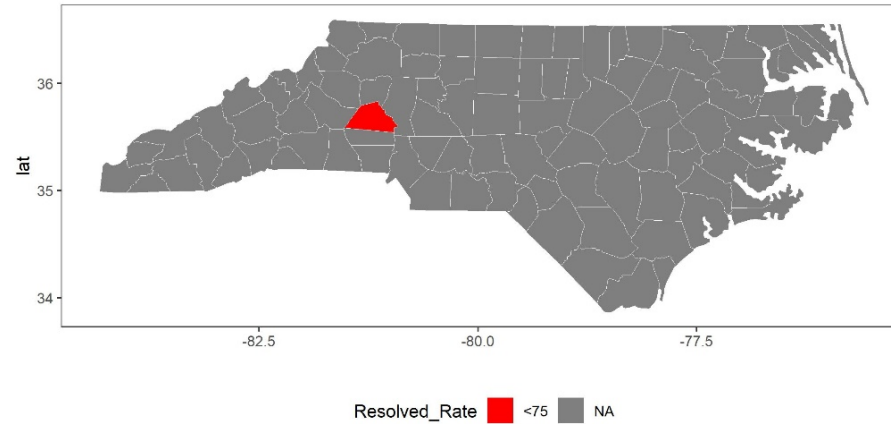


Source: NCCARE360.

Fig. 20. Referral outcomes across covered counties by Southeastern Healthcare (September 2020-June 2021). Resolved (%): red (<75%), yellow (75-90%), and green (>90%); Unresolved (%) & Open (%): green (<10%), orange (10-25%), red (>25%). (Note: NA indicates no referral was received from county).

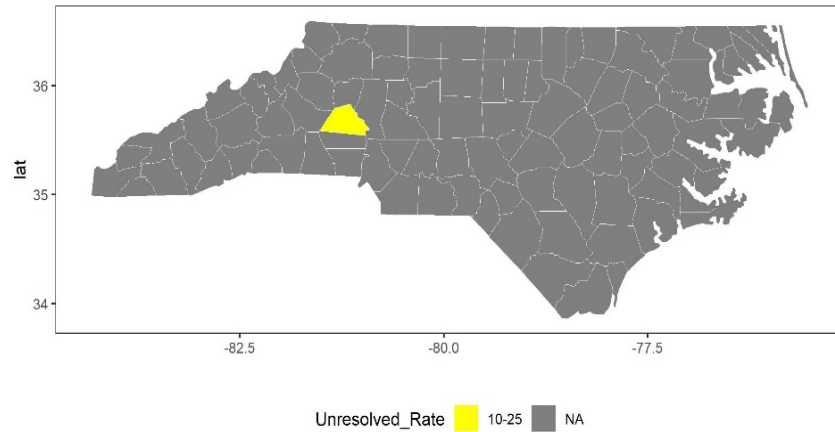


Resolution of referral cases by Catawba PH



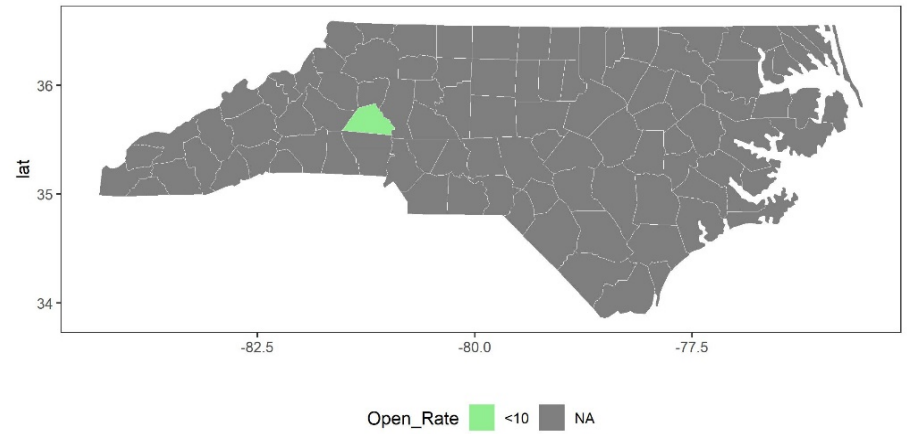
Source: NCCARE360.

Unresolved referral cases by Catawba PH



Source: NCCARE360.

Open referral cases by Catawba PH



Source: NCCARE360.

Fig. 21. Referral outcomes by across covered counties by Catawba PH (September 2020-June 2021). Resolved (%): red (<75%), yellow (75-90%), and green (>90%); Unresolved (%) & Open (%): green (<10%), orange (10-25%), red (>25%). (Note: NA indicates no referral was received from county).