

National Study of Treatment and Addiction Recovery Residences Report North Carolina

The National Study of Treatment and Addiction Recovery Residences (NSTARR) constitutes the largest and most diverse study of recovery housing in the US to date. NSTARR compiled data from publicly available sources (e.g., Oxford House, National Alliance for Recovery Residences, and Substance Abuse and Mental Health Services Administration websites) and lists maintained by entities tracking recovery housing. Residences for which locating information was available were geocoded and linked with U.S. Census data on urbanicity, alcohol- and drug-involved mortality, and COVID vulnerability. Data collection began in January 2020 and is ongoing until June 2023. The NSTARR database currently contains information on 10,358 residences operated by 3,628 providers in all 50 states. For a detailed description of methods and national findings, please see Mericle et al., 2022.

KEY FINDINGS

The NSTARR team identified 345 recovery residences (3.36 houses per 100,000 population) in North Carolina (see Table 1). Compared to other states (which include DC), North Carolina ranked 22 in terms of recovery housing availability per capita. Ninety-three percent of residences in North Carolina could be geocoded for these analyses. Orange County, an urban county, had the most recovery residences per 100,000 population, and 65 counties had no identified recovery residences, representing a mix of rural-urban classifications; 87 had fewer than 5 recovery residences (see Figure 1).

We used geographic information systems to identify hot and cold spots in North Carolina. A hot spot is a cluster of high values (county with a high number of residences surrounded by other counties with high numbers of residences) and a cold spot is a cluster of low values (county with low counts surrounded by counties also with low counts). Our analyses found hot spots but no cold spots within the state (see Figure 2).

The age-adjusted alcohol- and drug-involved mortality rate (per 100,000 population) was 17.40 in North Carolina for the years 2009-2019. North Carolina ranked 29 on alcohol- and drug-involved mortality out of the 50 states and DC. Swain County had the highest alcohol- and drug-involved mortality rate and Wake County had the lowest alcohol- and drug-involved mortality rate. Of the three counties that had the highest mortality rates in North Carolina (i.e., Swain, Wilkes, and Pamlico), all three of them also ranked in the bottom half recovery housing availability per capita, suggesting more recovery resources may be needed (see Table 1 and Figure 3).

COVID vulnerability was summarized using the county-level data from the Centers for Disease Control and Prevention's COVID Vulnerability Index (CCVI). The CCVI is a composite measure of seven social determinants of health, encompassing modified themes from the Centers for Disease Control and Prevention's Social Vulnerability Index in combination with COVID risk factors to identify communities in need of additional support during the COVID pandemic. Sixty-three counties were classified as having very high vulnerability, and 39 of these counties were located in areas ranked in the bottom half of recovery housing availability per capita, again suggesting that more recovery resources may be needed (see Table 1 and Figure 4).

345
RESIDENCES
TOTAL

22
NATIONAL
AVAILABILITY
RANKING

65
COUNTIES
WITHOUT
RESIDENCES

Table 1. County-level Descriptive Statistics on Recovery Residences

County Name	Population ¹	RUCC Classification ²	Number of Recovery Residences ³	Recovery Residences Per 100,000 Population	Recovery Residences Availability per Capita (Rank) ⁴	Age-Adjusted Alcohol/Drug Mortality ⁵ Rate per 100,000 Population	Mortality Rate (Rank) ⁶	CCVI Quintile ⁷
NORTH CAROLINA	10,264,876		345	3.36	22	17.40	29	
Alamance	163,324	Urban	2	1.22	30	33.30	74	Very high vulnerability
Alexander	37,213	Urban	0	0.00	100	38.70	55	Very high vulnerability
Alleghany	11,008	Non-adjacent rural	0	0.00	100	48.10	22	High
Anson	24,902	Adjacent rural	0	0.00	100	36.60	59	Very high vulnerability
Ashe	26,863	Non-adjacent rural	0	0.00	100	41.90	42	High
Avery	17,506	Adjacent rural	0	0.00	100	31.30	84	High
Beaufort	47,168	Adjacent rural	0	0.00	100	57.60	4	Very high vulnerability
Bertie	19,380	Non-adjacent rural	0	0.00	100	25.90	91	Very high vulnerability
Bladen	33,407	Adjacent rural	0	0.00	100	40.80	47	Very high vulnerability
Brunswick	131,815	Urban	1	0.76	33	52.80	12	Moderate
Buncombe	256,886	Urban	26	10.12	3	46.50	26	High
Burke	89,968	Urban	2	2.22	23	54.20	9	Very high vulnerability
Cabarrus	206,615	Urban	0	0.00	100	31.50	82	High
Caldwell	81,884	Urban	1	1.22	31	50.00	18	Very high vulnerability
Camden	10,551	Adjacent rural	0	0.00	100	23.50	98	Moderate
Carteret	69,070	Adjacent rural	2	2.90	18	56.10	7	High
Caswell	22,684	Adjacent rural	0	0.00	100	31.40	83	Very high vulnerability
Catawba	157,613	Urban	8	5.08	11	41.50	43	Very high vulnerability
Chatham	71,338	Urban	0	0.00	100	23.90	95	Very high vulnerability
Cherokee	27,969	Non-adjacent rural	0	0.00	100	56.00	8	High
Chowan	14,097	Adjacent rural	0	0.00	100	47.60	23	Very high vulnerability
Clay	10,946	Non-adjacent rural	0	0.00	100	50.90	14	Moderate
Cleveland	97,282	Adjacent rural	0	0.00	100	37.00	58	Very high vulnerability
Columbus	56,068	Adjacent rural	0	0.00	100	44.90	32	Very high vulnerability
Craven	102,491	Urban	3	2.93	17	48.50	21	Very high vulnerability
Cumberland	332,861	Urban	10	3.00	14	38.70	55	Very high vulnerability
Currituck	26,363	Urban	0	0.00	100	36.50	60	Low
Dare	36,222	Adjacent rural	5	13.80	2	56.20	6	Moderate
Davidson	165,381	Urban	1	0.60	34	39.50	51	Very high vulnerability
Davie	42,257	Urban	0	0.00	100	33.00	75	Very high vulnerability
Duplin	58,967	Adjacent rural	0	0.00	100	27.10	90	Very high vulnerability

Durham	311,848	Urban	19	6.09	8	24.90	93	Very high vulnerability
Edgecombe	52,648	Urban	0	0.00	100	52.10	13	Very high vulnerability
Forsyth	375,195	Urban	11	2.93	16	34.00	71	Very high vulnerability
Franklin	66,362	Urban	0	0.00	100	34.10	69	Very high vulnerability
Gaston	219,271	Urban	4	1.82	26	41.50	43	Very high vulnerability
Gates	11,548	Urban	0	0.00	100	32.50	77	Moderate
Graham	8,509	Non-adjacent rural	0	0.00	100	57.30	5	High
Granville	59,328	Adjacent rural	0	0.00	100	34.60	68	Very high vulnerability
Greene	21,033	Adjacent rural	0	0.00	100	28.10	89	Very high vulnerability
Guilford	527,868	Urban	44	8.34	4	32.20	80	Very high vulnerability
Halifax	51,190	Adjacent rural	0	0.00	100	45.10	30	Very high vulnerability
Harnett	132,283	Adjacent rural	2	1.51	28	32.10	81	Very high vulnerability
Haywood	61,053	Urban	0	0.00	100	50.80	15	High
Henderson	114,913	Urban	0	0.00	100	39.90	49	High
Hertford	24,012	Adjacent rural	0	0.00	100	32.30	79	Very high vulnerability
Hoke	53,957	Urban	0	0.00	100	28.20	88	Very high vulnerability
Hyde	5,213	Non-adjacent rural	0	0.00	100	39.70	50	High
Iredell	175,538	Urban	4	2.28	22	33.70	72	Very high vulnerability
Jackson	42,938	Adjacent rural	0	0.00	100	53.70	10	High
Johnston	196,870	Urban	1	0.51	35	25.70	92	High
Jones	9,594	Urban	0	0.00	100	45.50	29	Very high vulnerability
Lee	60,481	Adjacent rural	0	0.00	100	41.10	45	Very high vulnerability
Lenoir	56,756	Adjacent rural	0	0.00	100	39.30	54	Very high vulnerability
Lincoln	82,919	Urban	0	0.00	100	34.10	69	Very high vulnerability
Macon	34,813	Non-adjacent rural	0	0.00	100	53.70	10	High
Madison	21,499	Urban	0	0.00	100	34.70	67	High
Martin	22,849	Adjacent rural	0	0.00	100	50.40	16	Very high vulnerability
McDowell	45,227	Adjacent rural	0	0.00	100	39.40	52	Very high vulnerability
Mecklenburg	1,074,475	Urban	40	3.72	13	24.70	94	High
Mitchell	15,004	Non-adjacent rural	0	0.00	100	43.60	36	High
Montgomery	27,252	Adjacent rural	0	0.00	100	32.40	78	Very high vulnerability
Moore	97,294	Adjacent rural	0	0.00	100	30.90	86	High
Nash	94,030	Urban	2	2.13	24	39.40	52	Very high vulnerability
New Hanover	227,938	Urban	15	6.58	7	43.80	34	High
Northampton	19,946	Non-adjacent rural	0	0.00	100	32.60	76	Very high vulnerability

Onslow	195,069	Urban	3	1.54	27	34.90	65	High
Orange	144,836	Urban	23	15.88	1	23.90	95	Moderate
Pamlico	12,701	Urban	0	0.00	100	58.60	3	Very high vulnerability
Pasquotank	39,514	Adjacent rural	1	2.53	21	35.90	62	Very high vulnerability
Pender	60,399	Urban	0	0.00	100	34.80	66	High
Perquimans	13,430	Adjacent rural	0	0.00	100	31.30	84	High
Person	39,345	Urban	1	2.54	20	38.70	55	Very high vulnerability
Pitt	178,433	Urban	12	6.73	6	41.00	46	Very high vulnerability
Polk	20,557	Adjacent rural	0	0.00	100	43.30	37	High
Randolph	143,118	Urban	3	2.10	25	42.10	40	Very high vulnerability
Richmond	44,997	Non-adjacent rural	0	0.00	100	45.60	28	Very high vulnerability
Robeson	132,596	Adjacent rural	2	1.51	29	43.70	35	Very high vulnerability
Rockingham	91,077	Urban	0	0.00	100	40.40	48	Very high vulnerability
Rowan	140,296	Urban	8	5.70	9	48.90	20	Very high vulnerability
Rutherford	66,599	Adjacent rural	0	0.00	100	46.70	25	Very high vulnerability
Sampson	63,385	Adjacent rural	0	0.00	100	42.30	38	Very high vulnerability
Scotland	35,076	Adjacent rural	0	0.00	100	35.00	64	Very high vulnerability
Stanly	61,588	Adjacent rural	0	0.00	100	42.00	41	High
Stokes	45,781	Urban	0	0.00	100	45.90	27	High
Surry	71,971	Adjacent rural	2	2.78	19	42.30	38	Very high vulnerability
Swain	14,260	Adjacent rural	0	0.00	100	76.10	1	Very high vulnerability
Transylvania	33,775	Adjacent rural	1	2.96	15	49.80	19	High
Tyrrell	4,095	Non-adjacent rural	0	0.00	100	50.40	16	Very high vulnerability
Union	231,053	Urban	0	0.00	100	22.90	99	Moderate
Vance	44,479	Adjacent rural	3	6.74	5	45.10	30	Very high vulnerability
Wake	1,069,079	Urban	56	5.24	10	18.80	100	Moderate
Warren	19,898	Adjacent rural	1	5.03	12	23.70	97	Very high vulnerability
Washington	11,922	Non-adjacent rural	0	0.00	100	30.70	87	Very high vulnerability
Watauga	54,925	Non-adjacent rural	0	0.00	100	33.60	73	Moderate
Wayne	123,603	Urban	1	0.81	32	35.70	63	Very high vulnerability
Wilkes	68,469	Adjacent rural	0	0.00	100	60.00	2	Very high vulnerability
Wilson	81,435	Adjacent rural	0	0.00	100	36.50	60	Very high vulnerability
Yadkin	37,602	Urban	0	0.00	100	44.00	33	Very high vulnerability
Yancey	17,760	Adjacent rural	0	0.00	100	47.60	23	High

¹Population data were downloaded from tables in Social Explorer's ACS five-year estimate (2015-2019). American Community Survey 5-year Estimates, 2015-2019. Social Explorer tables, ACS 2015-2019. Social Explorer.

²The Rural-Urban Continuum Code (RUCC) was used to classify each county as urban, adjacent rural, or non-adjacent rural. Urban counties are counties with codes 1 (Counties in metro areas of 1 million population or more), 2 (Counties in metro areas of 250,000 to 1 million population), and 3 (Counties in metro areas of fewer than 250,000 population). Adjacent rural counties are counties with codes 4 (Urban population of 20,000 or more, adjacent to a metro area), 6 (Urban population of 2,500 to 19,999, adjacent to a metro area), and 8 (Completely rural or less than 2,500 urban population, adjacent to a metro area). Non-adjacent rural counties are the remaining three codes - 5 (Urban population of 20,000 or more, not adjacent to a metro area), 7 (Urban population of 2,500 to 19,999, not adjacent to a metro area), and 9 (Completely rural or less than 2,500 urban population, not adjacent to a metro area). Rural-Urban Continuum Code (RUCC). <https://www.ers.usda.gov/data-products/rural-urban-continuum-codes.aspx>

³Recovery residences are from the NSTARR project and are current as of 2020. Twenty-five (25) recovery residences in the state were not successfully geocoded due to lack of adequate address information, and thus were not assigned to a county.

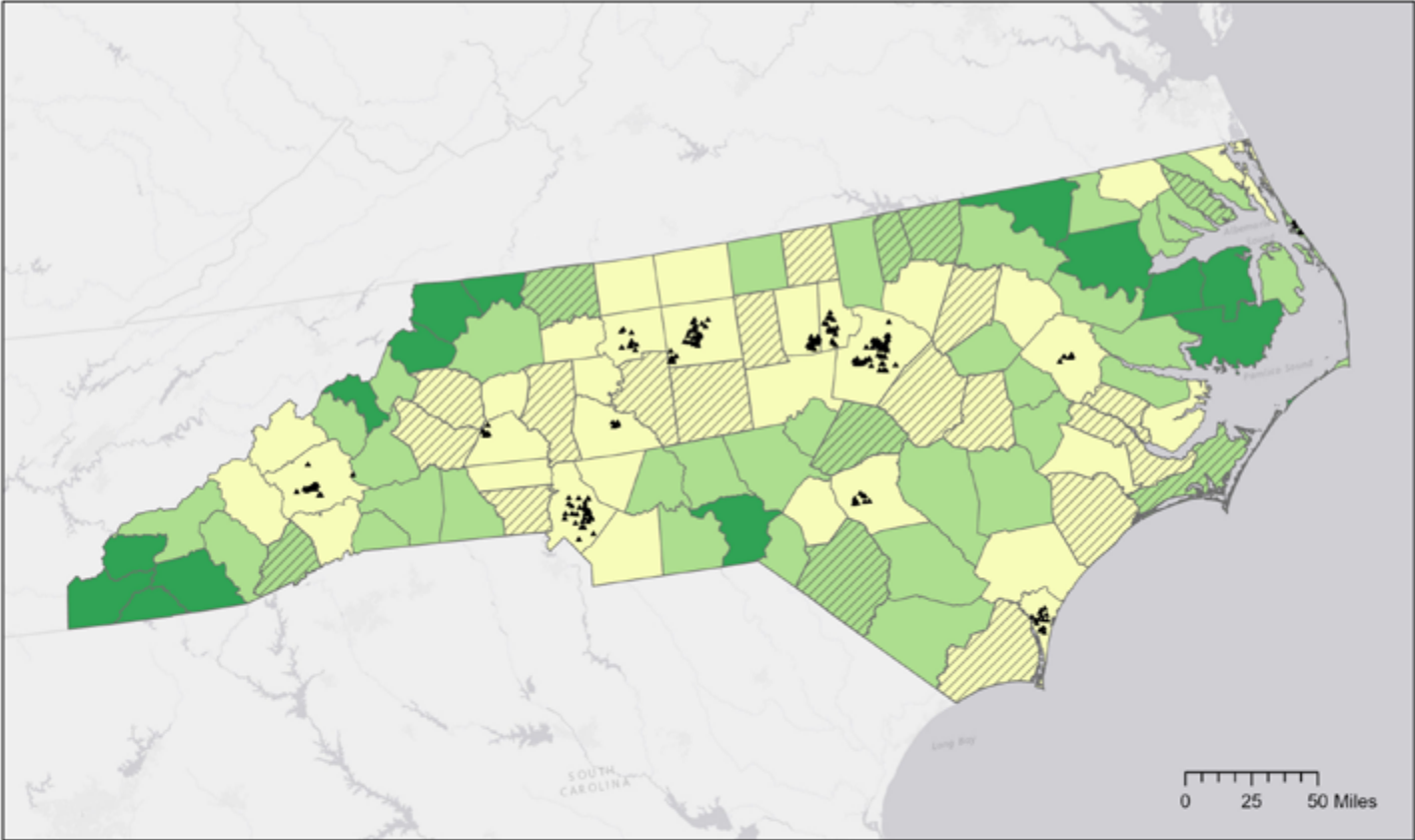
⁴Recovery residences availability per capita is ranked in order of decreasing recovery residence density per 100,000 population per county, with 1 (highest number of residences per 100,000) to 100 (lowest number of residences per 100,000 population). Counties without recovery residences were all assigned a tied rank of 100.

⁵Alcohol- and drug-involved mortality included all deaths as underlying causes of death and selected ICD-10 codes mentioning or attributed to alcohol or drugs as contributing cause of death. Data from the Centers for Disease Control and Prevention, 2020. CDC Wonder (Wide-ranging Online Data for Epidemiologic Research). U.S. Department of Health and Human Services, Atlanta, GA. Available at: <https://wonder.cdc.gov/>. For more information on coding multiple causes of death, see: Centers for Disease Control and Prevention, About Multiple Cause of Death, 1999-2019. <https://wonder.cdc.gov/mcd-icd10.html> accessed on August 9 2021.

⁶Mortality rate is ranked in order of decreasing alcohol- and drug-involved mortality from 1 (highest mortality per 100,000 population) to 100 (lowest mortality per 100,000 population).

⁷COVID-19 Community Vulnerability Index (CCVI) scores range in value from 0 – 1, with 0 being least vulnerable and 1 being the most vulnerable. Each county is ranked relative to all counties across the country, based on seven themes/domains. Each county was grouped into quintiles: very high (score of 0.8-1), high (0.6-0.8), moderate (0.4-0.6), low (0.2-0.4), and very low (0-0.2). For more information on how the CCVI is calculated, see: COVID-19 Community Vulnerability Index (CCVI) methodology. Retrieved from [https://covid-static-assets.s3.amazonaws.com/US-CCVI/COVID-19+Community+Vulnerability+Index+\(CCVI\)+Methodology.pdf](https://covid-static-assets.s3.amazonaws.com/US-CCVI/COVID-19+Community+Vulnerability+Index+(CCVI)+Methodology.pdf)

Figure 1. Distribution of Residences by Rural-Urban Classification



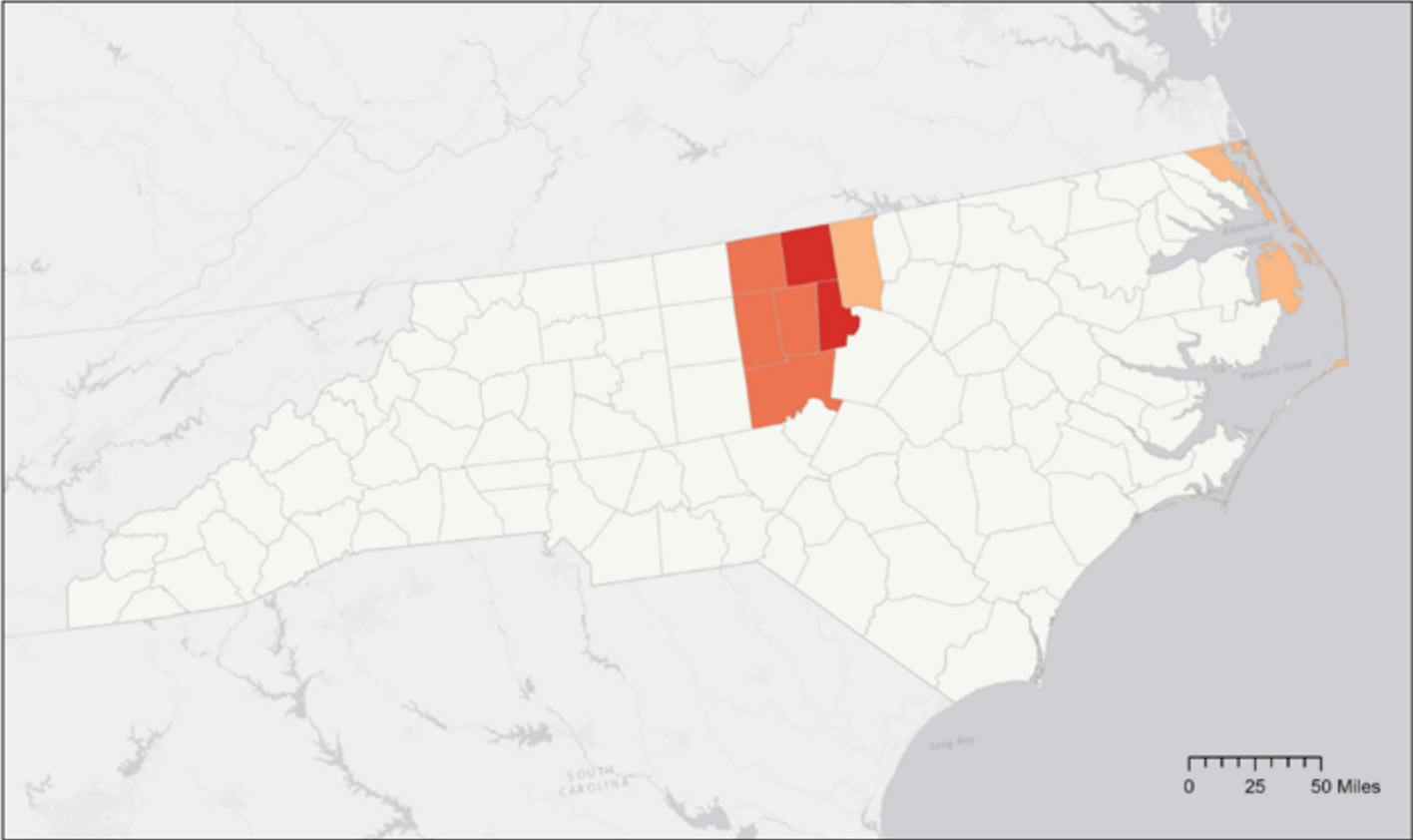
- ▲ Recovery residences
- Rural-Urban Classification Code (RUCC)
 - Urban
 - Adjacent rural
 - Non-adjacent rural
 - Counties with residence locations suppressed (1-4 residences) to protect privacy



Data Credits: Esri, HERE, Garmin, USGS, EPA, NPS
 Recovery residence locations: 2020
 Created by: NSTARR Project (May 2022)



Figure 2. Hot/Cold Spot Analysis of Recovery Residence Locations



Hot Spot Analysis (Getis-Ord GI*)

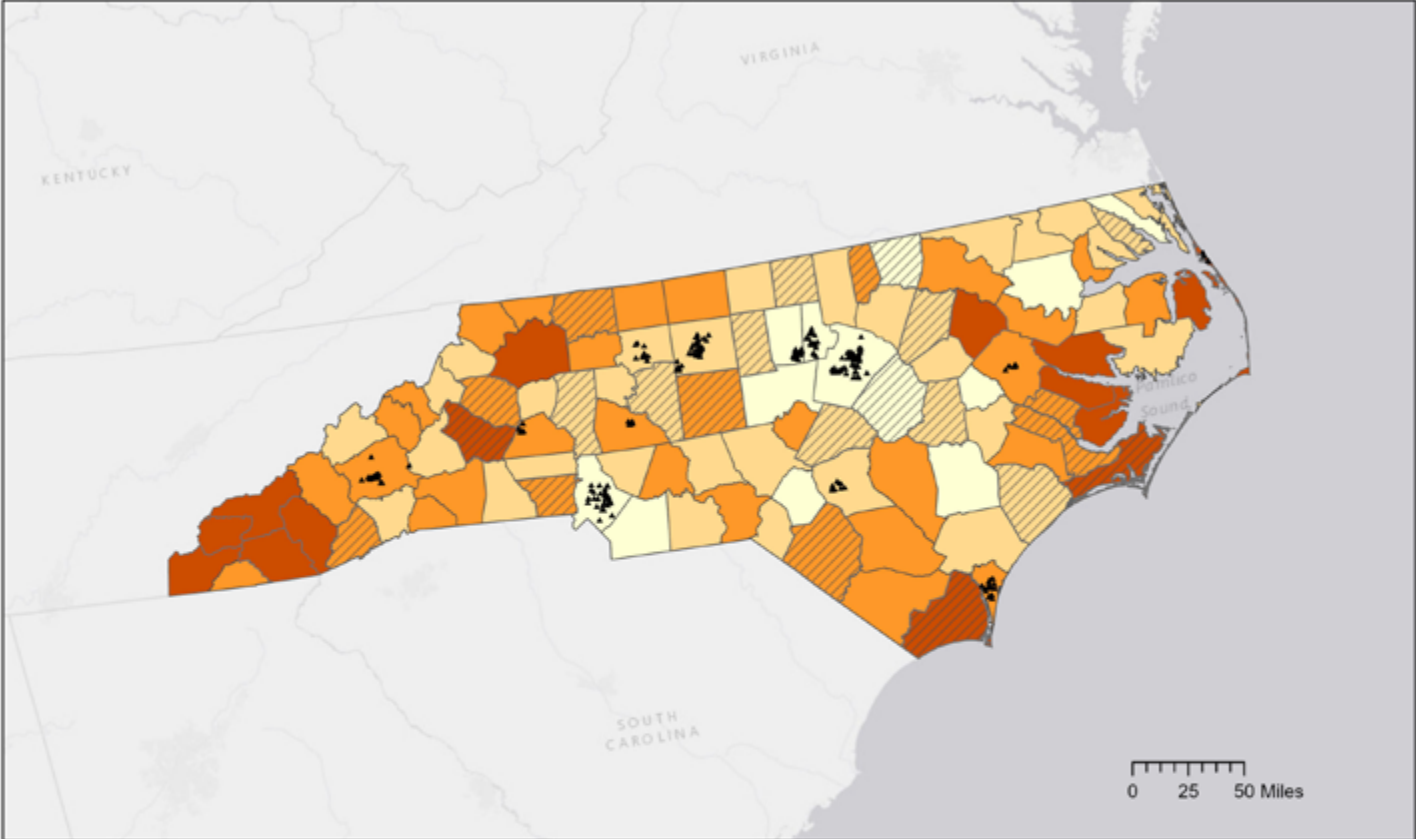
- Cold Spot with 99% Confidence
- Cold Spot with 95% Confidence
- Cold Spot with 90% Confidence
- Not Significant
- Hot Spot with 90% Confidence
- Hot Spot with 95% Confidence
- Hot Spot with 99% Confidence



Data Credits: Esri, HERE, Garmin, USGS, EPA, NPS
Recovery residence locations: 2020
Created by: NSTARR Project (May 2022)



Figure 3. Distribution of Residences by Age-adjusted Alcohol- and/or Drug-involved Mortality



▲ Recovery residences
 Age-adjusted alcohol and drug mortality rate per 100,000 population

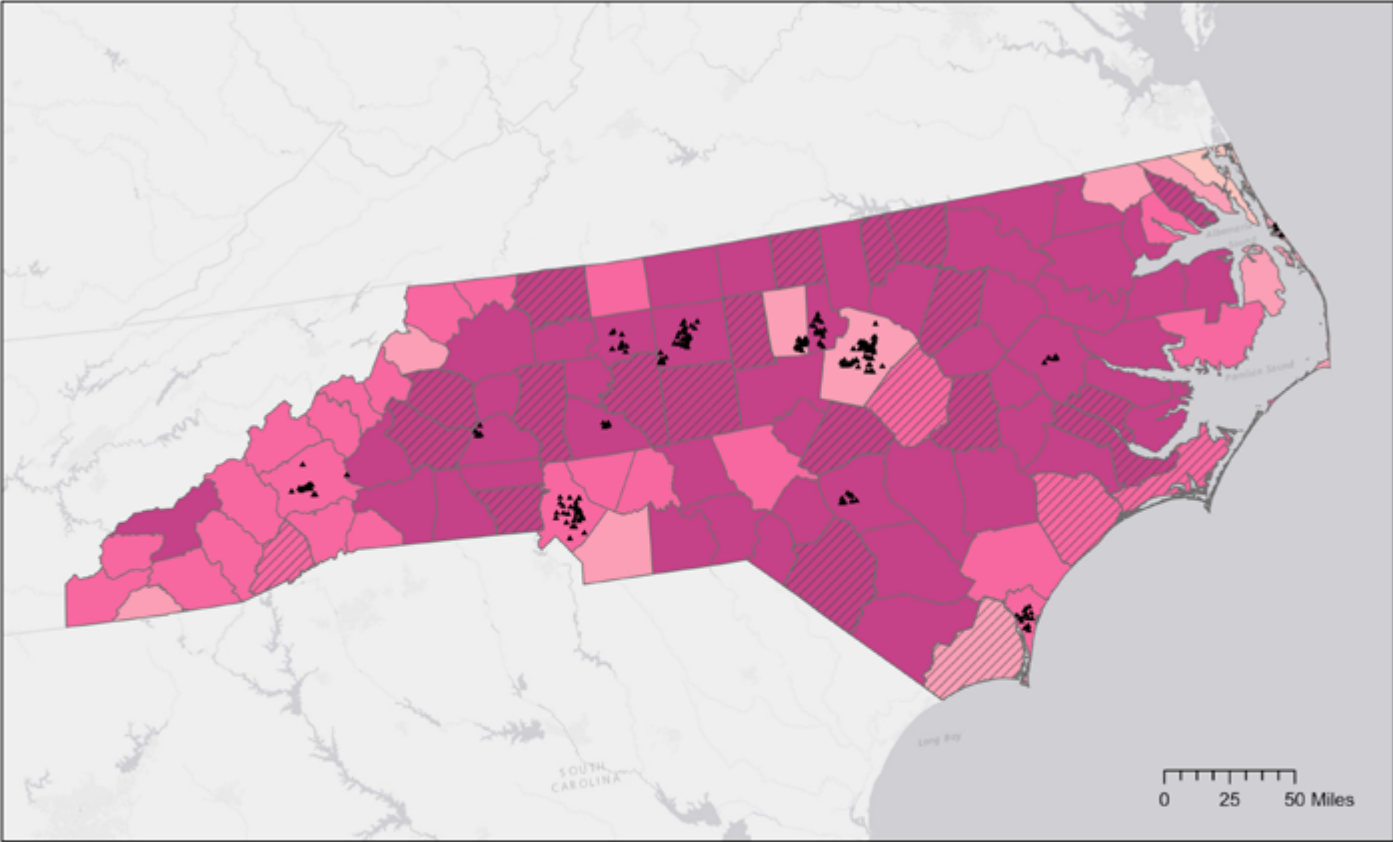
- 18 - 28
- 29 - 39
- 40 - 50
- 51 - 76
- Suppressed/Unreliable
- Counties with residence locations suppressed (1-4 residences) to protect privacy

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 Recovery residence locations: 2020
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Figure 4. Distribution of Residences by COVID-19 Community Vulnerability Index



- ▲ Recovery Residences
- COVID-19 Community Vulnerability Index (CCVI)
- Very low vulnerability
- Low
- Moderate
- High
- Very high vulnerability
- Counties with residence locations suppressed (1-4 residences) to protect privacy



Data Credits: Esri, HERE, Garmin, USGS, EPA, NPS
 Recovery residence locations: 2020
 Created by: NSTARR Project (May 2022)





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