

National Study of Treatment and Addiction Recovery Residences Report VIRGINIA

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 216 recovery residences (2.55 houses per 100,000 population) in Virginia (see Table 1). Compared to other states (which include DC), Virginia ranked 28 in terms of recovery housing availability per capita. All residences in Virginia could be geocoded for these analyses. Winchester City, an urban county, had the most recovery residences per 100,000 population, and 102 counties had no identified recovery residences, representing a mix of rural-urban classifications; 121 had fewer than 5 recovery residences (see Figure 1).

We used geographic information systems to identify hot and cold spots in Virginia. 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 11.60 in Virginia for the years 2009-2019. Virginia ranked 50 on alcohol- and drug-involved mortality out of the 50 states and DC. Among the counties ranked, Dickenson County had the highest alcohol- and drug-involved mortality rate and Loudoun County had the lowest alcohol- and drug-involved mortality rate. Of the three counties that had the highest mortality rates in Virginia (i.e., Dickenson, Tazewell, and Martinsville City), two 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. Twenty-four counties were classified as having very high vulnerability, and 16 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).

216
RESIDENCES
TOTAL

28
NATIONAL
AVAILABILITY
RANKING

102
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
VIRGINIA	8,454,463		216	2.55	28	11.60	50	
Accomack	32,673	Adjacent rural	0	0.00	133	35.00	33	Very high vulnerability
Albemarle	107,405	Urban	0	0.00	133	14.30	120	Low
Alexandria City	157,613	Urban	2	1.27	27	15.80	117	Moderate
Alleghany	15,157	Adjacent rural	0	0.00	133	31.40	45	Moderate
Amelia	12,953	Urban	0	0.00	133	20.10	99	High
Amherst	31,775	Urban	0	0.00	133	18.90	108	Moderate
Appomattox	15,707	Urban	0	0.00	133	20.90	97	Low
Arlington	233,464	Urban	6	2.57	21	12.70	123	Low
Augusta	75,079	Urban	0	0.00	133	26.90	68	Low
Bath	4,307	Adjacent rural	0	0.00	133	Suppressed	-	Moderate
Bedford	78,376	Urban	0	0.00	133	24.90	76	Low
Bland	6,388	Adjacent rural	0	0.00	133	36.00	31	Low
Botetourt	33,343	Urban	0	0.00	133	21.30	91	Low
Bristol city	16,912	Urban	0	0.00	133	48.10	7	Very high vulnerability
Brunswick	16,520	Adjacent rural	0	0.00	133	21.70	90	Very high vulnerability
Buchanan	21,788	Non-adjacent rural	0	0.00	133	49.40	6	High
Buckingham	17,059	Urban	0	0.00	133	13.60	122	High
Buena Vista City	6,484	Adjacent rural	0	0.00	133	Suppressed	-	Moderate
Campbell	55,225	Urban	1	1.81	24	23.50	84	Moderate
Caroline	30,381	Urban	0	0.00	133	27.20	66	Moderate
Carroll	29,801	Non-adjacent rural	0	0.00	133	27.20	66	Moderate
Charles City	7,014	Urban	0	0.00	133	29.80	52	Moderate
Charlotte	12,040	Adjacent rural	0	0.00	133	25.30	74	High
Charlottesville city	47,096	Urban	6	12.74	3	26.10	70	Moderate
Chesapeake City	239,982	Urban	2	0.83	29	24.80	77	Moderate
Chesterfield	343,551	Urban	7	2.04	22	21.30	91	Low
Clarke	14,423	Urban	0	0.00	133	28.30	61	Moderate
Colonial Heights city	17,428	Urban	0	0.00	133	37.20	29	Very high vulnerability
Covington City	5,598	Adjacent rural	0	0.00	133	43.90	11	Moderate
Craig	5,110	Urban	0	0.00	133	Suppressed	-	Very low vulnerability
Culpeper	51,101	Urban	0	0.00	133	34.70	34	High
Cumberland	9,824	Adjacent rural	0	0.00	133	22.00	88	Moderate
Danville City	41,070	Adjacent rural	0	0.00	133	35.50	32	Very high vulnerability
Dickenson	14,756	Non-adjacent rural	0	0.00	133	59.30	1	Moderate
Dinwiddie	28,485	Urban	0	0.00	133	19.30	105	High

Essex	10,998	Adjacent rural	0	0.00	133	21.10	95	Moderate
Fairfax	1,145,862	Urban	39	3.40	16	12.30	124	Low
Fairfax City	23,531	Urban	3	12.75	2	25.00	75	Moderate
Falls Church City	14,128	Urban	1	7.08	9	17.90	111	Low
Fauquier	69,728	Urban	0	0.00	133	32.70	40	Low
Floyd	15,704	Urban	0	0.00	133	23.90	82	Very low vulnerability
Fluvanna	26,594	Urban	0	0.00	133	14.20	121	Low
Franklin	56,187	Urban	0	0.00	133	38.20	24	High
Franklin City	8,147	Adjacent rural	0	0.00	133	31.40	45	High
Frederick	86,415	Urban	0	0.00	133	31.30	47	Moderate
Fredericksburg City	28,622	Urban	1	3.49	15	31.20	49	High
Galax City	6,517	Non-adjacent rural	0	0.00	133	41.70	19	Very high vulnerability
Giles	16,772	Urban	0	0.00	133	42.80	15	Low
Gloucester	37,222	Urban	0	0.00	133	32.30	43	Low
Goochland	22,865	Urban	0	0.00	133	21.00	96	Low
Grayson	15,742	Non-adjacent rural	0	0.00	133	24.30	81	Moderate
Greene	19,519	Urban	0	0.00	133	17.70	112	Low
Greensville	11,525	Adjacent rural	0	0.00	133	16.40	115	High
Halifax	34,552	Adjacent rural	0	0.00	133	24.40	80	High
Hampton City	135,041	Urban	8	5.92	10	31.70	44	High
Hanover	105,537	Urban	0	0.00	133	20.80	98	Low
Harrisonburg City	53,273	Urban	1	1.88	23	25.70	73	Very high vulnerability
Henrico	327,535	Urban	33	10.08	6	21.20	93	Moderate
Henry	51,308	Adjacent rural	0	0.00	133	41.90	18	Very high vulnerability
Highland	2,204	Adjacent rural	0	0.00	133	Suppressed	-	Very low vulnerability
Hopewell City	22,456	Urban	0	0.00	133	45.10	8	Very high vulnerability
Isle of Wight	36,627	Urban	0	0.00	133	24.80	77	High
James City	74,916	Urban	4	5.34	12	19.60	103	Low
King George	26,229	Adjacent rural	0	0.00	133	29.40	54	Low
King William	16,688	Urban	0	0.00	133	29.30	55	Very low vulnerability
King and Queen	7,042	Adjacent rural	0	0.00	133	23.10	85	Moderate
Lancaster	10,724	Non-adjacent rural	0	0.00	133	26.00	72	Moderate
Lee	23,948	Adjacent rural	0	0.00	133	32.70	40	High
Lexington City	7,241	Adjacent rural	0	0.00	133	Suppressed	-	Low
Loudoun	395,134	Urban	5	1.27	28	12.30	124	Low
Louisa	36,040	Adjacent rural	0	0.00	133	27.80	63	Moderate
Lunenburg	12,282	Non-adjacent rural	0	0.00	133	15.60	119	High
Lynchburg City	80,569	Urban	7	8.69	7	28.60	58	High
Madison	13,170	Adjacent rural	0	0.00	133	29.30	55	Low
Manassas Park city	16,986	Urban	1	5.89	11	Suppressed	-	High
Manassas City	41,174	Urban	2	4.86	13	26.10	70	High
Martinsville City	12,852	Adjacent rural	1	7.78	8	58.40	3	Very high vulnerability

Mathews	8,788	Urban	0	0.00	133	39.10	22	Low
Mecklenburg	30,728	Non-adjacent rural	0	0.00	133	28.60	58	Very high vulnerability
Middlesex	10,675	Adjacent rural	0	0.00	133	33.40	37	Moderate
Montgomery	98,140	Urban	0	0.00	133	22.00	88	Low
Nelson	14,831	Urban	0	0.00	133	22.50	86	Low
New Kent	21,686	Urban	0	0.00	133	24.70	79	Very low vulnerability
Newport News City	179,673	Urban	0	0.00	133	32.90	39	Very high vulnerability
Norfolk City	244,601	Urban	4	1.64	25	38.20	24	Very high vulnerability
Northampton	11,885	Adjacent rural	0	0.00	133	30.50	50	High
Northumberland	12,190	Non-adjacent rural	0	0.00	133	32.70	40	Moderate
Norton City	3,970	Non-adjacent rural	0	0.00	133	Suppressed	-	High
Nottoway	15,433	Adjacent rural	0	0.00	133	19.90	100	Very high vulnerability
Orange	36,010	Adjacent rural	0	0.00	133	41.40	20	High
Page	23,788	Adjacent rural	0	0.00	133	33.80	35	Moderate
Patrick	17,748	Adjacent rural	0	0.00	133	43.70	13	High
Petersburg City	31,362	Urban	1	3.19	18	42.70	16	Very high vulnerability
Pittsylvania	61,256	Adjacent rural	0	0.00	133	26.60	69	High
Poquoson City	12,090	Urban	0	0.00	133	19.50	104	Very low vulnerability
Portsmouth City	95,097	Urban	3	3.15	19	42.70	16	Very high vulnerability
Powhatan	28,815	Urban	0	0.00	133	19.10	106	Very low vulnerability
Prince Edward	22,905	Adjacent rural	0	0.00	133	21.20	93	High
Prince George	38,114	Urban	0	0.00	133	15.80	117	Moderate
Prince William	461,423	Urban	3	0.65	31	16.30	116	Moderate
Pulaski	34,182	Urban	1	2.93	20	43.50	14	Low
Radford City	17,691	Urban	0	0.00	133	27.30	65	Low
Rappahannock	7,378	Urban	0	0.00	133	29.70	53	Low
Richmond	8,884	Non-adjacent rural	0	0.00	133	27.80	63	Very high vulnerability
Richmond City	226,622	Urban	27	11.91	5	37.30	28	Very high vulnerability
Roanoke	93,823	Urban	0	0.00	133	28.40	60	Moderate
Roanoke City	99,229	Urban	12	12.09	4	52.30	4	Very high vulnerability
Rockbridge	22,570	Adjacent rural	0	0.00	133	19.70	102	Low
Rockingham	80,284	Urban	0	0.00	133	16.80	114	High
Russell	27,141	Non-adjacent rural	0	0.00	133	37.20	29	Moderate
Salem City	25,317	Urban	1	3.95	14	44.40	9	Moderate
Scott	21,902	Urban	0	0.00	133	33.70	36	High
Shenandoah	43,224	Adjacent rural	0	0.00	133	29.20	57	High
Smyth	30,767	Non-adjacent rural	0	0.00	133	38.20	24	Very high vulnerability
Southampton	17,880	Adjacent rural	0	0.00	133	18.90	108	Moderate
Spotsylvania	132,833	Urban	1	0.75	30	22.40	87	Moderate
Stafford	146,773	Urban	0	0.00	133	17.20	113	Moderate

Staunton City	24,432	Urban	0	0.00	133	38.60	23	High
Suffolk City	90,093	Urban	0	0.00	133	19.10	106	High
Surry	6,523	Adjacent rural	0	0.00	133	30.30	51	Moderate
Sussex	11,377	Urban	0	0.00	133	19.90	100	Very high vulnerability
Tazewell	41,603	Non-adjacent rural	0	0.00	133	58.70	2	High
Virginia Beach City	450,201	Urban	15	3.33	17	23.80	83	Moderate
Warren	39,492	Urban	0	0.00	133	44.00	10	Moderate
Washington	54,071	Urban	0	0.00	133	28.10	62	Moderate
Waynesboro City	22,140	Urban	0	0.00	133	33.30	38	High
Westmoreland	17,751	Adjacent rural	0	0.00	133	40.40	21	High
Williamsburg City	14,927	Urban	0	0.00	133	31.30	47	Moderate
Winchester City	27,897	Urban	17	60.94	1	43.80	12	Very high vulnerability
Wise	38,486	Non-adjacent rural	0	0.00	133	51.40	5	Very high vulnerability
Wythe	28,844	Adjacent rural	0	0.00	133	37.90	27	Moderate

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.

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 133 (lowest number of residences per 100,000 population). Counties without recovery residences were all assigned a tied rank of 133.

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 124 (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

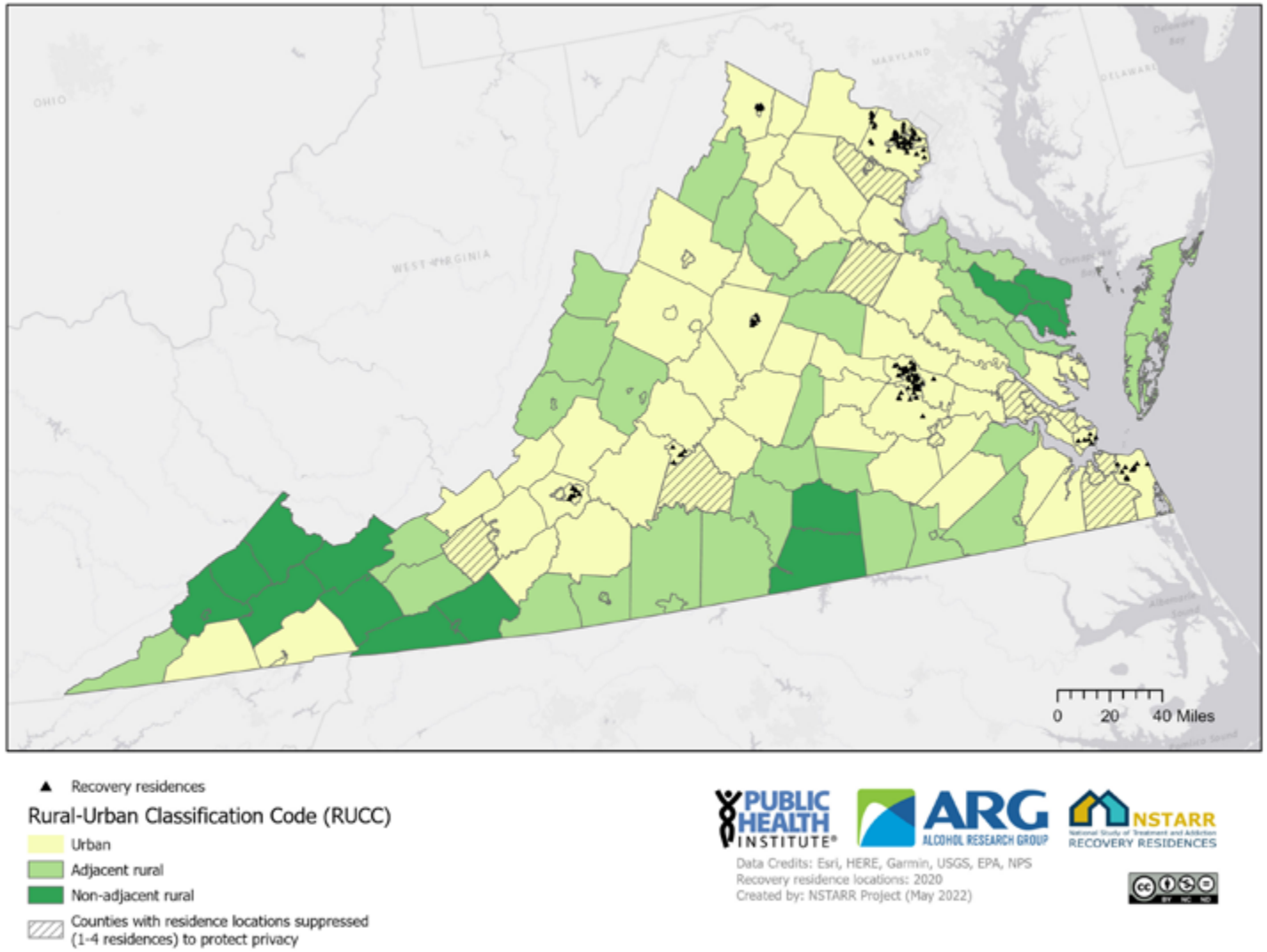
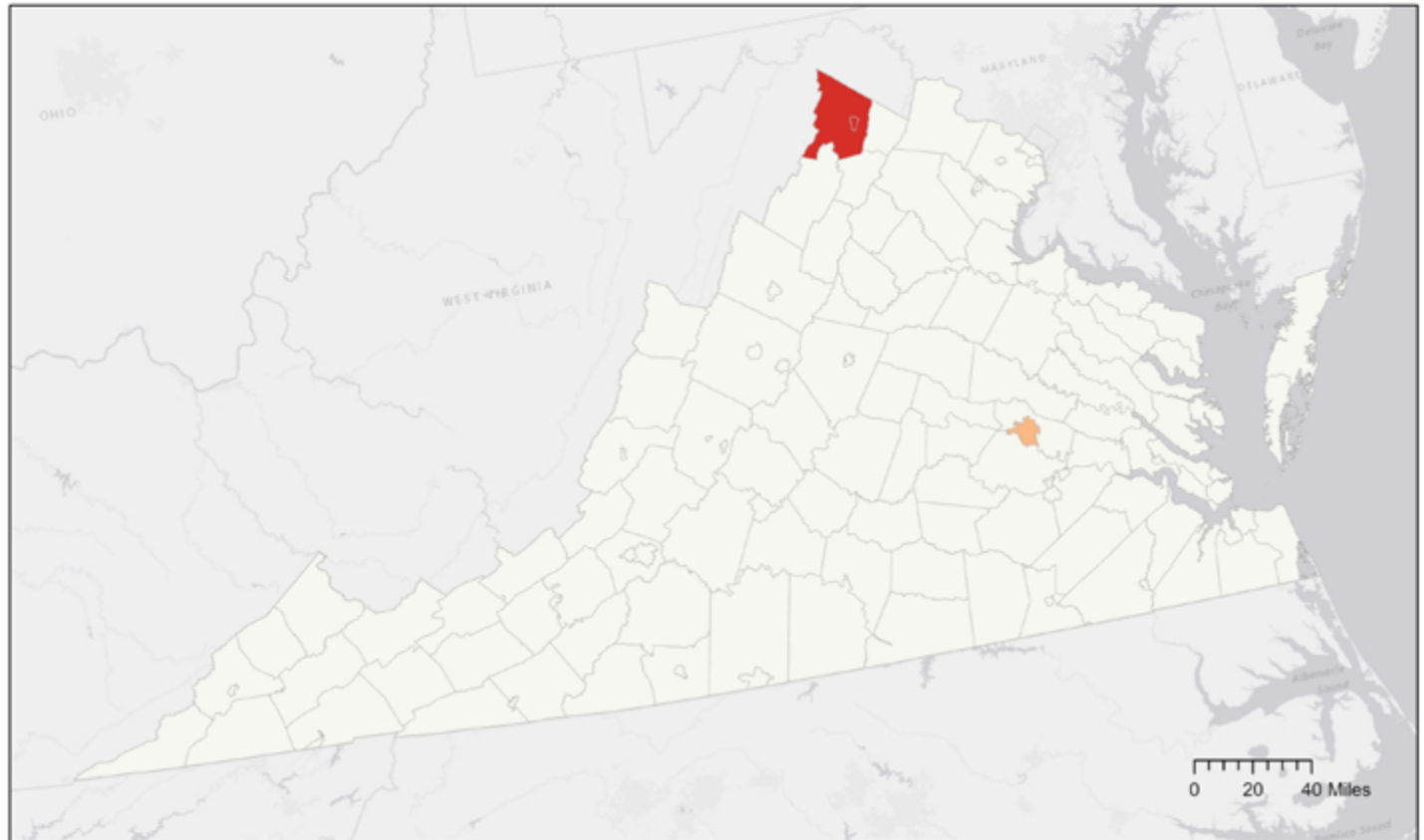


Figure 2. Hot/Cold Spot Analysis of Recovery Residence Locations



Hot Spot Analysis (Getis-Ord GI*)

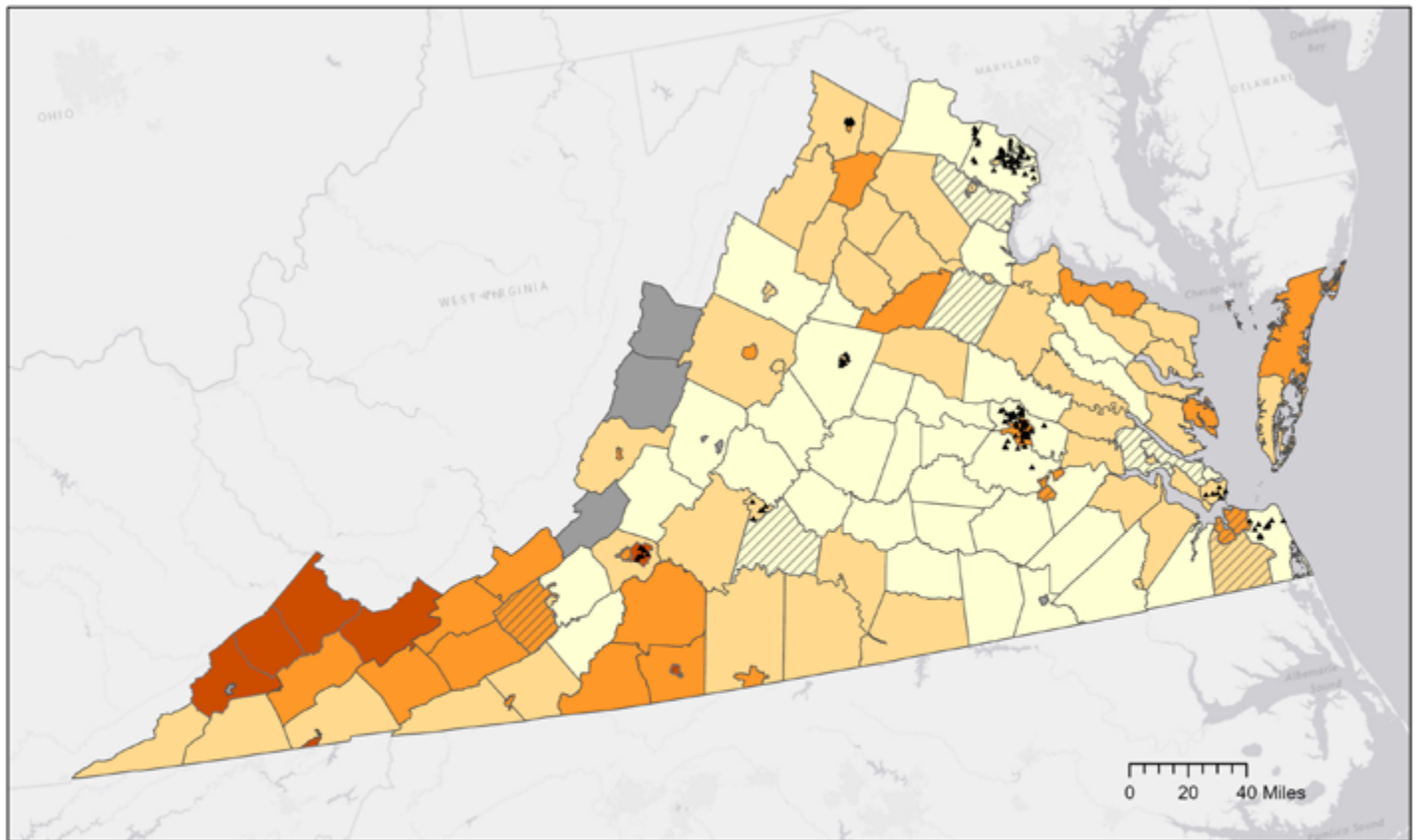
- Cold Spot with 99% Confidence
- Cold Spot with 95% Confidence
- Cold Spot with 90% Confidence
- Not Significant
- Hot Spot with 90% Confidence
- Hot Spot with 95% Confidence
- Hot Spot with 99% Confidence



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



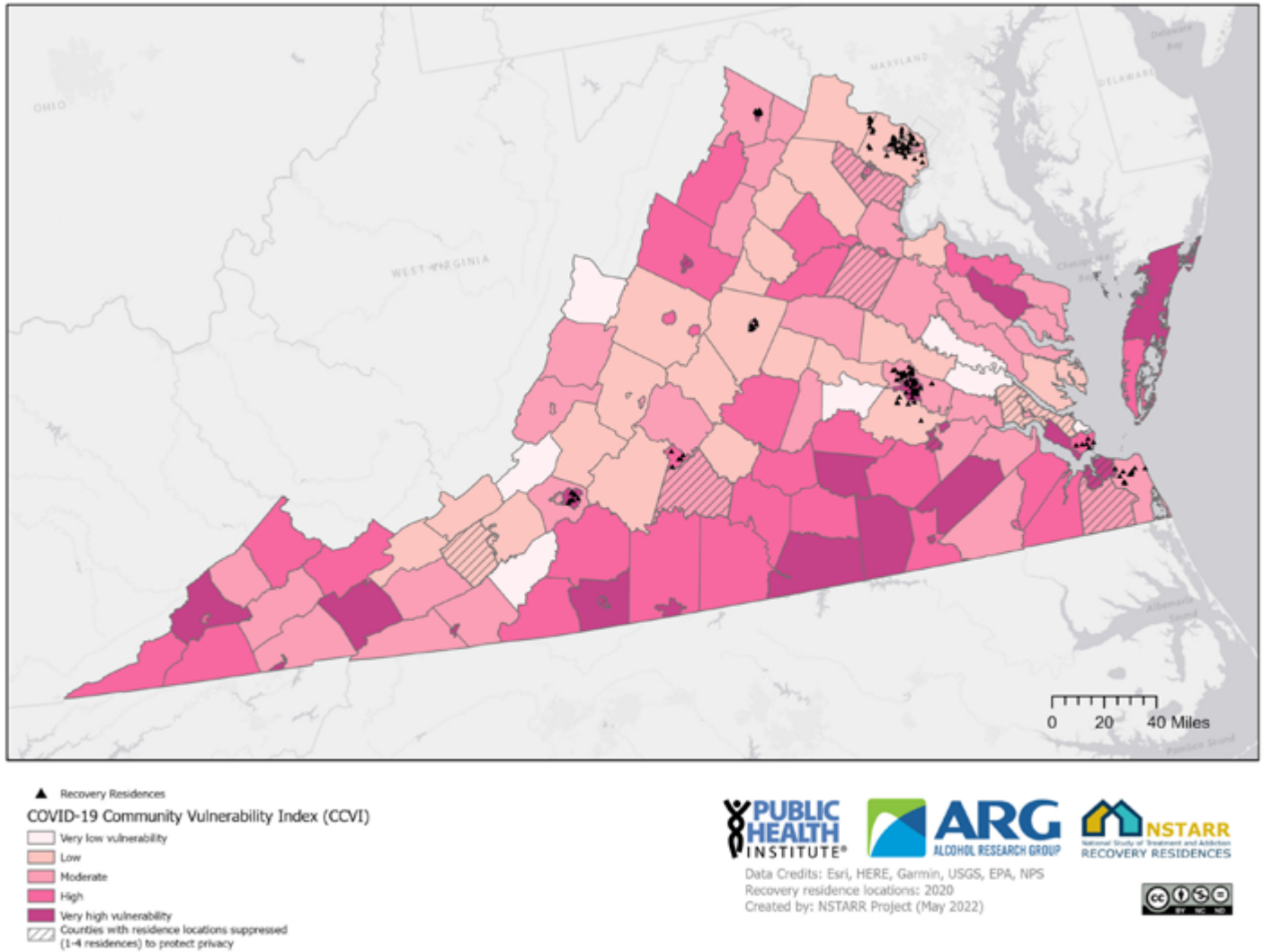
- ▲ Recovery residences
Age-adjusted alcohol and drug
mortality rate per 100,000 population
- 12 - 23
 - 24 - 34
 - 35 - 45
 - 46 - 59
 - Suppressed/Unreliable
 - Counties with residence locations suppressed
(1-4 residences) to protect privacy



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



Figure 4. Distribution of Residences by COVID-19 Community Vulnerability Index





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