

# North Carolina at a Demographic Crossroad: Loss of Lives and the Impact

**James H. Johnson, Jr.**

**Allan M. Parnell**

**Jeanne Milliken Bonds**

Kenan-Flagler Business School  
University of North Carolina at Chapel Hill



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# North Carolina at a Demographic Crossroad: Loss of Lives and the Impact

## **Absract**

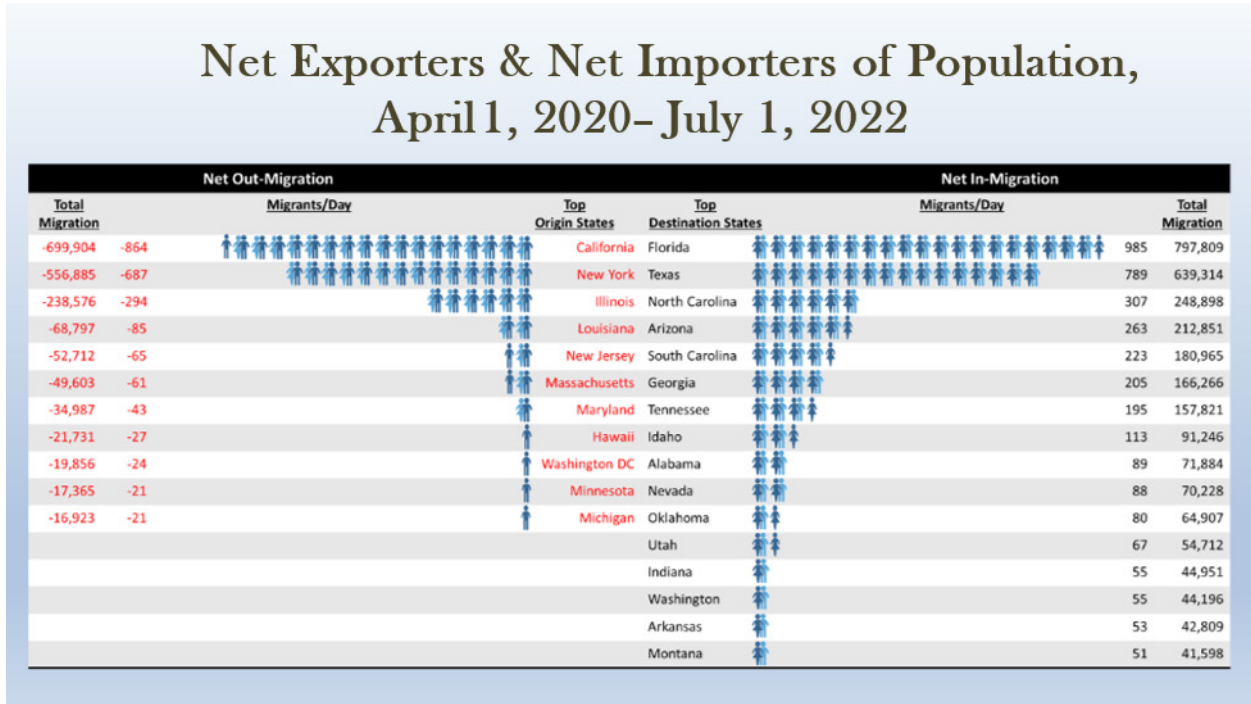
North Carolina's phenomenal migration-driven population growth masks a troubling trend: high rates of death and dying prematurely which, left unchecked, can potentially derail the state's economic growth and prosperity in the years ahead. On average, 246 North Carolinians died each day during the 2010s, increasing to 317 daily between April 1, 2020 and July 1, 2022. COVID-19 and the substance abuse crisis have played a major role in premature deaths of prime working age citizens of the state. Both people-based and place-based strategies and interventions are urgently needed to address the state's death crisis.

## **Critical Background & Context**

North Carolina is one of the nation's most attractive migration destinations (Johnson, Bonds, & Parnell, 2021a; Johnson, Parnell, and Bonds, 2024). As a result of a near decade-long average of 150 newcomers daily, the state's population increased more rapidly (9.5%) between 2010 and 2020 than the nation's population (7.4%). And since 2020, North Carolina has replaced Arizona as the nation's third most popular migration destination after Florida and Texas.

During a 27-month period encompassing the COVID-19 pandemic-induced shutdown of the nation's economy (April 1, 2020 - July 1, 2022), North Carolina received on average 307 transplants each day, according to Census Bureau population estimates and components of change statistics. New York, New Jersey, and Massachusetts in the Northeast; Ohio, Michigan, and Illinois in the Midwest; and California in the West were major contributors of those moving to North Carolina (Johnson, Parnell, & Bonds, 2024; also see, Figure 1).

Figure 1



Source: <https://www.census.gov/data/tables/time-series/demo/popest/2020s-state-total.html>.

Continuing the prior decade trend, North Carolina’s population growth far outpaced the nation’s (0.5%) and the South’s (1.9%) population growth between April 2020 and July 2022 (Table 1). With net absolute growth of nearly 260,000, this migration-driven growth (96% or 248,898) profoundly reshaped both the geographic distribution and composition of the state’s population.

Table 1: Absolute and Percent Population Change, U.S., Regions, & North Carolina, April 1, 2020-July 1, 2022

Area	Total Population July, 2020	Absolute Population Change, April 1, 2020-July 1, 2022	Percent Population Change, April 1, 2020-July 1, 2022
<b>United States</b>	333,287,557	1,838,037	0.5
<b>Northeast</b>	57,040,406	-567,750	-1.0
<b>Midwest</b>	68,787,595	-197,942	-0.3
<b>South</b>	128,716,192	2,449,930	1.9
<b>West</b>	78,743,364	154,799	0.2
<b>North Carolina</b>	10,689,973	259,559	2.5

Source: <https://www.census.gov/data/tables/time-series/demo/popest/2020s-state-total.html>.

## Moving from Concentrated to Dispersed Growth

Between 2010 and 2020, North Carolina’s migration induced population growth was highly concentrated (Figure 2A). Two counties—Wake and Mecklenburg—captured roughly half of net growth. Cumulatively, ninety-five percent of the growth was concentrated in 15 counties—mainly centers of government, commerce, and research and development along the I-40/I-85 corridor and amenity rich communities on the coast, in the mountains, and within commuting distance of the major centers of higher education, health care, and innovation (Johnson, Bonds, & Parnell, 2022). In contrast to the fifteen rapidly growing counties, the remaining eighty-five, mostly rural counties experienced slow growth, no growth, or population decline in the last decade.

Figure 2 - A

### NC County Growth Poles, April 1, 2020 – July 1, 2022

County		Percent of Net Growth: 259,559	
Wake	45,628	Mecklenburg	29,866
Johnston	18,787	Brunswick	16,837
Union	10,370	Cabarrus	9,990
New Hanover	9,216	Iredell	9,198
Durham	7,831	Forsyth	6,573
Lincoln	6,279	Gaston	6,273
Franklin	5,961	Moore	5,806
Pender	5,529	Harnett	5,278
Alamance	4,924	Gulford	4,792
Buncombe	4,134	Davidson	3,653
Chatham	3,594	Pitt	3,301
Currituck	2,912	Catawba	2,853
Rowan	2,767	Onslow	2,713
Lee	2,195	Cumberland	1,971
Randolph	1,892	Henderson	1,827
Hoke	1,706	Stanly	1,647
Davie	1,375	Cleveland	1,149
Macon	1,049	Dare	1,046
Watauga	1,012		

Figure 2 - B

## NC County Growth Poles, April 1, 2020 – July 1, 2022

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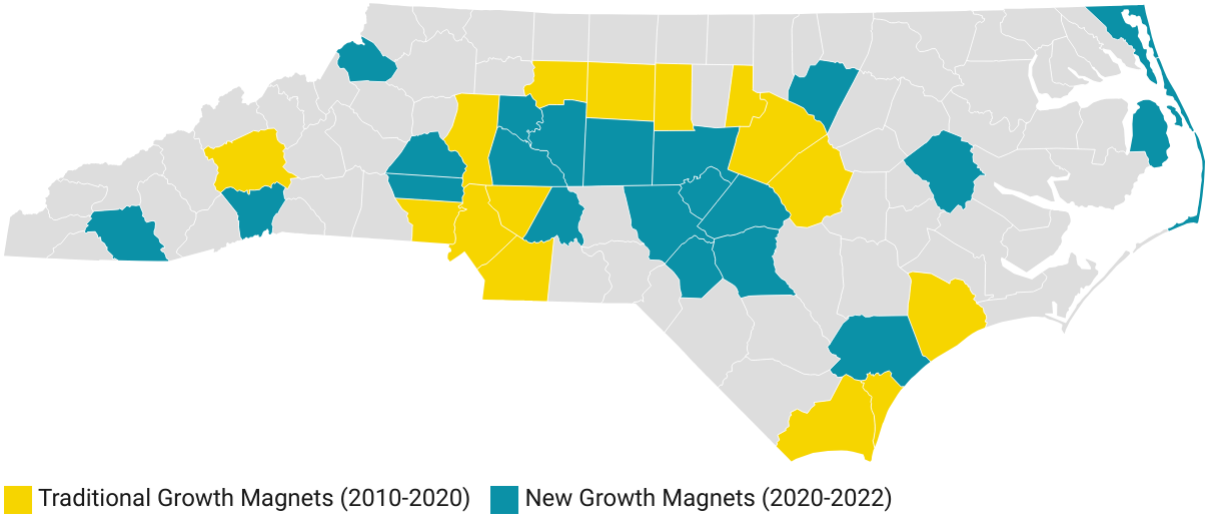
Source: <https://www.census.gov/data/datasets/time-series/demo/popest/2020s-counties-total.html>.

With the massive influx of COVID-19 pandemic refugees between April 2020 and July 2022 (Johnson, 2021a,b), most of the state’s recent net population growth (96%) has been dispersed across a broader set of 37 North Carolina counties (Figure 2B). As newcomers drove up both demand and the cost of housing in the 15 traditional growth markets, growth spilled over the boundaries of these counties into 22 mostly adjacent and nearby counties where residential developers aggressively built new housing and communities to accommodate demand (Figure 3).<sup>1</sup> We should note that, in these newly emergent population growth magnet

counties, which had experienced slow growth, no growth, or population decline prior to the pandemic, demand was driven not only by transplants moving to the state, but also existing North Carolina residents who were priced out housing markets in the state’s 15 traditional growth centers.<sup>2</sup>

1 The exceptions, as Figure 3 shows, include Pitt, Currituck and Dare counties in the east and Watauga and Macon counties in the west.  
 2 The population boom’s attendant accelerated housing costs forced some long-term residents of these rapidly growing counties into structured homelessness, that is, into either living with relatives and friends on a temporary basis as “couch surfers” or independently in weekly hotel rentals (Wilson, 2020). It forced other long-term residents, including some police officers, fire personnel, EMS workers, public school teachers, and other civil servants, to seek alternative housing in communities far away from their jobs and longstanding institutional ties and social networks in these rapidly growing counties (Campbell, 2021; Henkel, 2021; Flannery, 2022; Moore, 2022; Muraca, 2021; Noguera, 2022; Johnson, Bonds, and Parnell, 2021b; also see ATTOM Staff, 2022; Baker, 2022; Southern Economic Advancement Project, 2022). For adults with caregiving responsibilities (children, older adults, or both), the residential dislocations have been particularly stressful, resulting in some instances in job loss or economic dislocation—especially among those forced into one-way daily commutes of ninety minutes or longer—the so-called “super commuter” (Stacker, 2021; also see Berr, 2018; Henderson, 2017; Perry, 2022; Wheatley, 2021).

Figure 3: North Carolina’s Traditional & New Growth Magnets



### Browning and Greying

Between April 2020 and July 2022, the race and ethnic as well as age composition of North Carolina’s population changed dramatically (Table 2). Collectively, people of color—Asians, Blacks, Hispanics, Mixed-Race, Native Americans, and Pacific Islanders—accounted for nearly three-quarters the state’s growth (70%). Hispanics drove absolute growth (81,488) while Asians (9.9%) and people self-identifying as mixed-race (9.1%) experienced the most rapid rates of growth—far exceeding the state’s overall rate of growth (2.5%) during this period. Increasing by only 2 percent (77,000), non-Hispanic whites accounted for less than one-third of the state’s absolute growth (259,000) between April 2020 and July 2022, extending a trend defined elsewhere as the “browning” of the state’s population (Johnson, Farrell, & Guinn, 1997; Johnson and Parnell, 2019).

Table 2: North Carolina Population Change by Race/Ethnicity, April 1, 2020-July 1, 2022

Race/Ethnicity	Total July 1, 2022 Population	Absolute Change April 1, 2020-July 1, 2022	Percent Change April 1, 2020-July 1, 2022
<b>Total</b>	10,698,973	259,559	2.5
<b>Non-Hispanic</b>	9,576,964	178,071	1.9
<b>White</b>	6,584,019	77,196	1.2
<b>Black</b>	2,267,145	45,214	2.0
<b>AI/AN</b>	111,183	2,286	2.1
<b>Asian</b>	370,540	33,298	9.9
<b>NH/PI</b>	7,607	398	5.5
<b>2 or more races</b>	236,740	19,679	9.1
<b>Hispanic</b>	1,122,009	81,488	7.8

Source: <https://www.census.gov/data/tables/time-series/demo/popest/2020s-counties-detail.html>

Simultaneous with becoming more racially and ethnically diverse, North Carolina’s population also was aging—a trend popularly characterized as the “greying” of the state (Johnson and Parnell, 2019; Johnson, Parnell & Bonds, 2024). Increasing by 7.2 percent, seniors aged 65 and older were the state’s most rapidly growing population between April 2020 and July 2022 (Table 3). Both the 18-64 and under age 18 populations increased at much slower rate—by 1.9 percent and 0.5 percent, respectively—and notably slower than the state’s overall rate of growth (2.5%). Part of a national trend, this shift in the state’s age structure reflects the combined effects of the progressive aging of the state’s baby boomer cohort (those born between 1946 and 1964), extended longevity among older adults, and the influx of aging and elderly newcomers—many whom are retirees (Johnson, 2016; Johnson, Parnell, & Lian, 2018). Premature deaths among North Carolina’s prime working age population, as we discuss below, is also contributing to the greying of the state’s population (Office of the Chief Medical Examiner, 2022).

Table 3: North Carolina Population Change by Age, April 1, 2020 – July 1, 2022

Age	2022 Population	Absolute Population Change, 2020-2022	Percent Population Change, 2020-2022
<b>&lt;18</b>	2,294,879	12,301	0.5
<b>18-64</b>	6,542,215	121,510	1.9
<b>65+</b>	1,861,879	125,748	7.2

Source: <https://www.census.gov/data/tables/time-series/demo/popest/2020s-counties-detail.html>



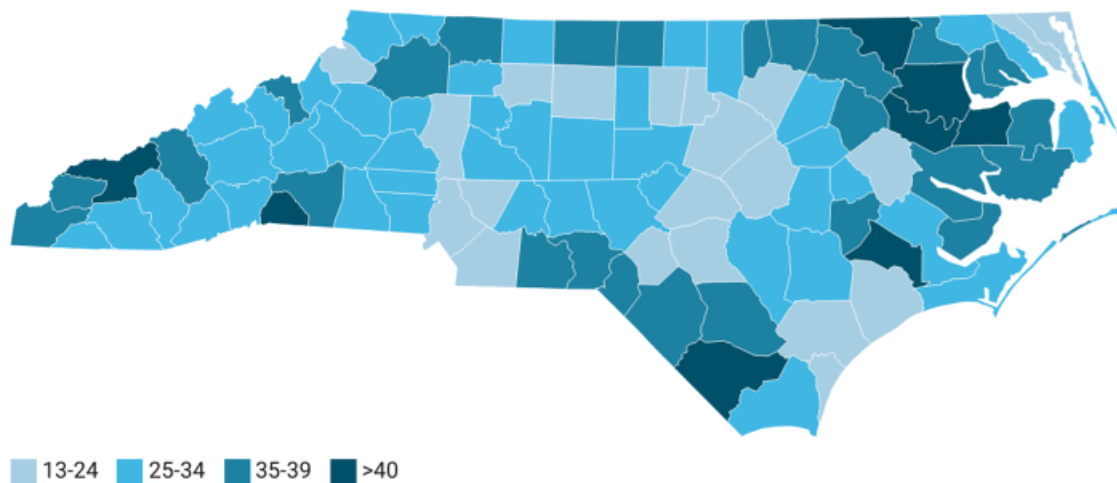
## A Cause for Concern

The influx of a more diverse set of newcomers, as we have shown elsewhere (Johnson, Bonds, & Parnell, 2022; Johnson, 2021b), has stimulated economic growth in the state, triggering residential, commercial, and industrial development as well as boosting consumer spending and tax revenues. Further, the state’s migration-induced demographic and economic dividends have further enhanced North Carolina’s image and reputation as an ideal place to live, work, play, and do business for prospective domestic and international migrants as well as corporate leaders (CNBC, 2022).

However, this pattern of phenomenal growth masks a troubling trend: high rates of death and dying prematurely, which, left unchecked, can potentially derail the state’s economic growth and prosperity in the years ahead.<sup>3</sup> Reflecting all causes of death, 24 North Carolinians died for every 1,000 residents of the state during the 27 months covered in the Census Bureau’s latest population estimates. However, looking across the state’s 100 counties (Figure 4), death rates ranged from a low of 13/1000 population in some counties to a high of more than 40/1000 population in other counties between April 2020 and July 2022.

Figure 4

### North Carolina Death Rates by County, April 1, 2020 – July 1, 2022



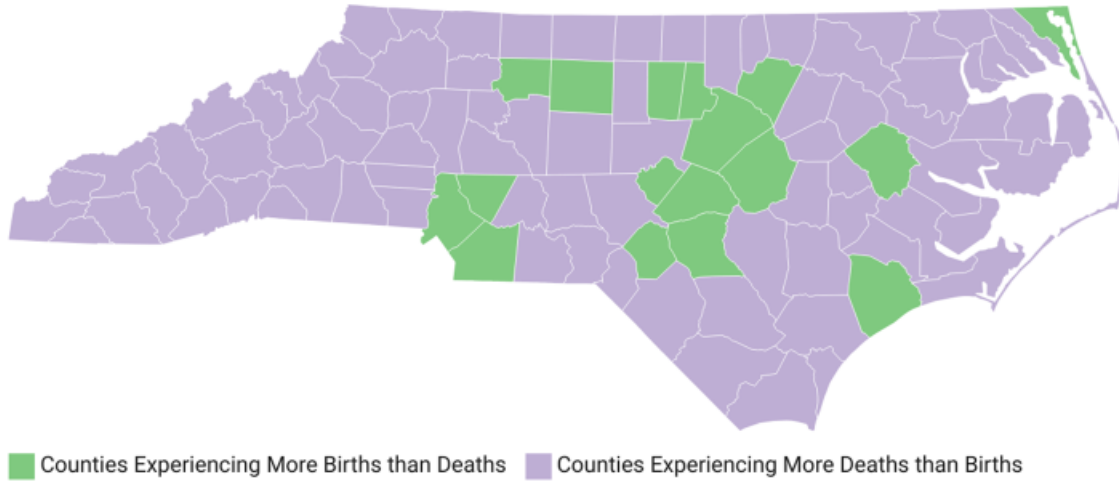
Source: <https://www.census.gov/data/tables/time-series/demo/popest/2020s-counties-total.html>

Normal population aging partially explains the revealed patterns of deaths within the state. However, declining fertility is another factor (Tavernise, 2021; Kekkatos, 2019; Kwon, 2020; Stone, 2018). The total fertility rate has been below the replacement level—2.1 children per woman of childbearing age—in the U.S. since 2008 and in North Carolina since 2015 (Tavernise, et al, 2021; NCSCHS, n.d.). Owing to the combined effects of below replacement level fertility and an older population in rural areas, deaths exceeded births in 87 of North Carolina’s 100 counties between April 2020 and July 2022. Only 17 counties registered more births than deaths during this 27-month period (Figure 5).

<sup>3</sup> As a recent article in *The Economist* (2023) demonstrates, premature deaths are a national problem, and it is much worse in the U.S. than in other rich countries

Figure 5

## North Carolina Natural Population Change by County, April 1, 2020 – July 1, 2022



Source: <https://www.census.gov/data/tables/time-series/demo/popest/2020s-counties-total.html>

Unfortunately, normal population aging and declining fertility are only part of the issue. The COVID-19 pandemic, which reportedly caused further declines in fertility (Tavernise, 2021; Rogers, 2021; Kearney & Levine, 2021a,b),<sup>4</sup> and a substance abuse crisis also have strongly influenced the patterns of death and dying in North Carolina (Case & Deaton, 2020; Karma, 2020; Sabo & Johnson, 2022; NCDHHS, 2022; Johnson, Bonds, & Parnell, 2021b; Healy, 2019; Gold, 2020).

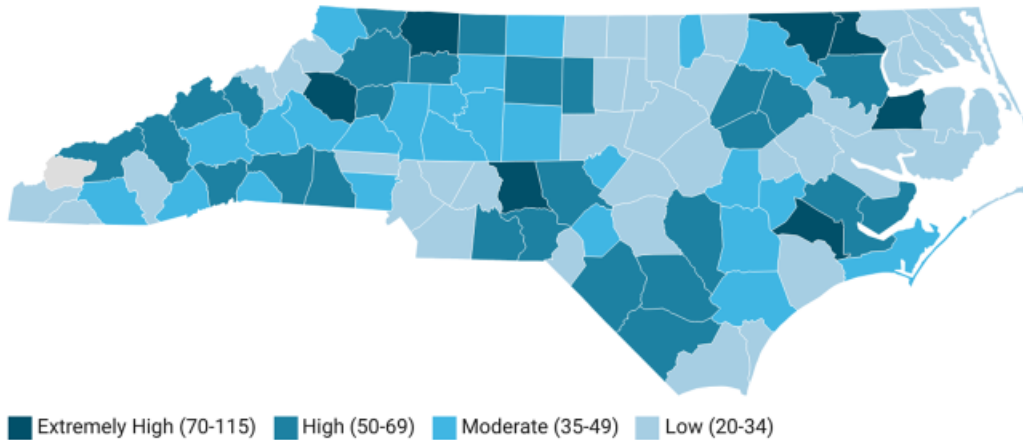
In the last year alone, which was the tail end of the pandemic, there were 36 COVID-19 deaths per 100,000 population in the state. But, because of differential rates of exposure to the deadly coronavirus and vaccination hesitancy rates (Johnson, Bonds, & Parnell, 2021c), the incidence of COVID-19 deaths varied markedly across the state, ranging from 20-34 deaths per 100,000 population in thirty-eight counties to an unimaginable 75-115 deaths

per 100,000 population in seven of the state’s counties. In between these extremes, COVID-19 death rates were moderate (35-49) to high (50-69) in the remaining fifty-five counties (Figure 6).

4 One study (Bailey, Currie, & Schwandt, 2022) confirms a slight baby bump among highly-educated white women who were mostly in their late thirties having their first child during the COVID-19 pandemic. However, these births were offset by significant declines in fertility among immigrant women and women of color (also see Livingston, 2015).

Figure 6

## North Carolina COVID-19 Death Rates by County, 2022 (NC=36 deaths/100,000 population)



\*Graham County had 0 COVID-19 deaths in 2022.

Source: <https://covid19.ncdhhs.gov/dashboard/cases-and-deaths>.

COVID-19 has taken the lives of 29,059 North Carolinians. Nearly a quarter (24% or 7,154) of these COVID casualties were working age individuals (18-64). Another age group that research shows are still actively engaged in the labor market (Leonesio, et al, 2012; Simons, 2020)—the so-called young old (aged 65-74)—also constituted nearly a quarter (23.6% or 6,855) of COVID-19 deaths. These two groups combined made up roughly half of all COVID deaths—a tragic loss of human capital sorely needed to propel the state’s economy and sustain social safety net systems (Table 4).

Table 4: Total COVID-19 Deaths\*

Age Group	Number of Deaths	Percent of Total Deaths	Cumulative Percent of Deaths
<18	33	0.1	0.1
18-24	64	0.2	0.3
25-49	1,715	5.9	6.2
50-64	5,375	18.5	24.7
65-74	6,855	23.6	48.3
75+	15,016	51.7	100.0

\*April 14, 2020 through April 22, 2023

Source: <https://covid19.ncdhhs.gov/dashboard/cases-and-deaths#COVID-19CasesandDeaths-7876>.

Making matters worse, the COVID-19 lockdown forced people struggling with drug addiction into isolation and constrained their access to in-person drug counseling and treatment (Jamison, 2021; Bernstein & Achenbach, 2021), which exacerbated the state’s drug overdose crisis (NCDHHS, 2022). North Carolina overdose deaths increased by 60 percent between 2019 (2,352 deaths) and 2021 (3,759 deaths). In addition, there was a 29 percent increase (3,596 cases) in overdose-related visits to hospital emergency departments between 2019 (12,115 cases) and 2021 (15,724 cases). Notably, the increase in overdose deaths would have been even greater were it not for a 40 percent increase in Naloxone reversals between 2019 (2,960) and 2021 (4,154)—restoring victims normal breathing by blocking the effects of opioids.

In 2022 there were 3,761 drug overdose deaths in North Carolina, two more than in 2021 (3,759) and 1,409 more than in 2019 (2,352). For all North Carolinians, the overdose death rate was 35.9/100,000 population in 2022. However, among the state’s various race/ethnic groups, Native Americans had by far the highest drug overdose death rate (83.6) followed by whites (36.1) and Blacks (26.7). Hispanics (10.7) and Asians (4.6) had the lowest drug overdose deaths rates in 2022. In absolute numbers, Whites accounted for the largest share of the overdose deaths (2,424) -- 64% of the total (3,761)— followed by Blacks (627), Hispanics (113), Native Americans (104), and Asians (17) (Table 5).

**Table 5: North Carolina Drug Overdose Death Rates by Race/Ethnicity, 2022**

Race/Ethnic Group	Number of Deaths	Deaths/100,000 Population e
<b>All Races</b>	3,761	35.9
<b>White</b>	2,424	36.1
<b>Black</b>	627	26.7
<b>Hispanic</b>	113	10.7
<b>Native American</b>	104	83.6
<b>Asian</b>	17	4.6

Source: <https://www.ncdhhs.gov/opioid-and-substance-use-action-plan-data-dashboard>

Between 2000 and 2020, according to the North Carolina Department of Health and Human Services (NCDHHS, 2022), “28,000 North Carolinians lost their lives to drug overdoses.” Our research shows there were 1,718 overdose deaths, roughly five per day, in North Carolina in 2018 (Johnson, 2021b).

Paralleling national trends, Office of the Chief Medical Examiner (2022) data confirm that overdose deaths in North Carolina have been concentrated disproportionately among males. In 2020, for example, males accounted for 2,360 of the 3,454 total casualties recorded (68 percent). Moreover, the male drug overdose death rate (45.8/100,000 population) was more than double the female drug overdose death rate (20/100,000 population). And among males, 88 percent of drug overdose deaths were concentrated among the prime working age demographic (25-64). Death rates were especially high among males aged 25-34 (95/100,000),

35-44 (98/100,000), and 45-54 (70/100,000). Notably, among males, close to ten percent of drug overdose deaths were concentrated among those aged 15-24—a key demographic that will have to propel the state’s economy forward in the years ahead (Table 6). Research presented elsewhere confirms that white males with less than a college education make up a disproportionate share of these drug overdose deaths (Case and Deaton, 2020).

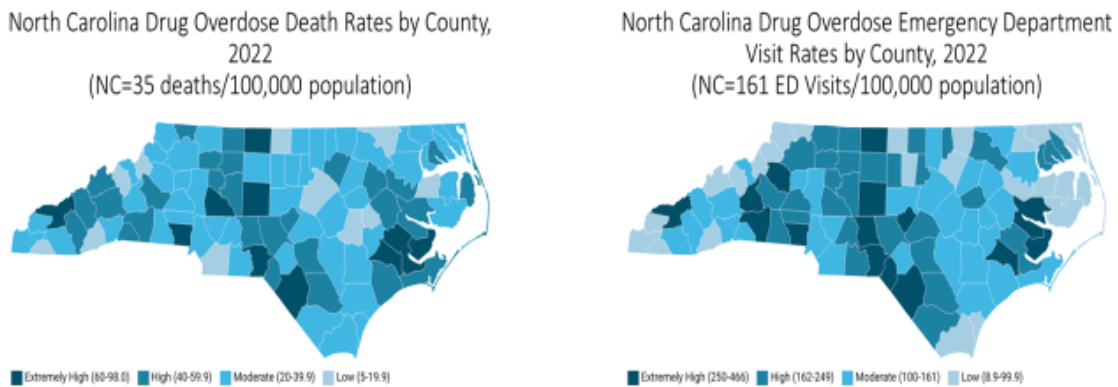
Table 6: Total and Male Drug Overdose Deaths by Age, 2020

Age	Total Deaths	Total Male Deaths	Percent Male Deaths	Male DeathRate
All Ages	3,454	2,360	68	45.8
0-4	5	3	60	1.0
5-14	3	1	33	0.2
15-24	300	202	67	28.1
25-34	941	683	73	95.3
35-44	914	628	69	98.0
45-54	710	464	65	70.3
55-64	460	304	66	46.6
65+	121	76	63	9.6

Source: Office of the Chief Medical Examiner (2022).

Reflecting what might be characterized as manifestations of a “geography of despair,” there were isolated pockets and high concentrations of not only overdose deaths, but also overdose hospital emergency department visits throughout the state in 2022. It is worth noting that, correspondingly, the incidence of these drug overdose deaths and hospital emergency department visits oftentimes was high in the same counties adversely affected by COVID-19 deaths (Figures 6 and 7).

Figure 7



Source: <https://www.ncdhhs.gov/opioid-and-substance-use-action-plan-data-dashboard>

Against the backdrop of these deaths of despair, concrete steps are urgently needed to nurture, support, and protect North Carolina’s human capital base, including both homegrown and imported talent, which unquestionably is the state’s most valuable resource (Office of State Budget and Management 2023; Brown, 2023). Further unraveling the complexity of how the state is changing demographically, we believe, is critically important for strategy development to address the problem.

## Unpacking Demographic Complexity

To specifically “see” where the problem lies within the state at a more granular level and to provide context for strategy development, we build upon and expand our prior research by applying the Balance of Population Change equation to the Census Bureau’s North Carolina county level population change estimates and components of change statistics for the 27 months between April 1, 2020-July 1, 2022 (see Johnson, Parnell, & Bonds, 2024).

Descriptively, the equation stipulates that for any geographic area over a specified timeframe:

$$\textit{Population Change} = \textit{In-Flows} \textit{ minus } \textit{Out-Flows}$$

*where*

$$\textit{In-flows} = [\textit{Births} + \textit{In-Migration}]$$

*and*

$$\textit{Out-Flows} = [\textit{Deaths} + \textit{Out-Migration}]$$

Using this equation, we classified the demographic experiences of North Carolina’s 100 counties into a six-fold typology based on the dynamic interactions among these measures of natural population change (births and deaths) and net migration (in- and out-migration). The typology along with definitions of each of the six types of demographic experiences appear in Table 6 and the corresponding demographic data for North Carolina counties appear in Table 7. Suffice it to state here that

three of the entries reflect sources of population growth experiences—balanced growth, natural growth, and migration magnet--and the other three reflect sources of population decline experiences—biologically declining, emptying out, and dying.

Table 6: Typology of Demographic Experiences

Demographic Experience	Drivers
<b>Balanced Growth</b>	Births exceed deaths and in-migration exceeds out-migration.
<b>Natural Growth</b>	Out-migration exceeds in-migration but /this population loss is offset by an excess of births over deaths.
<b>Migration Magnet</b>	Deaths exceed births but population loss is averted because in-migration exceeds out-migration
<b>Dying</b>	Deaths exceed births and out-migration exceeds in-migration, resulting in population loss.
<b>Biologically Declining</b>	In-migration exceeds out-migration but this net migration is not substantial enough to offset an excess of deaths over births. Q
<b>Emptying Out</b>	Births exceed deaths but out-migration exceeds in-migration, resulting in net population loss.

Source: authors.

Table 7: North Carolina County Level Demographic Drivers of Change

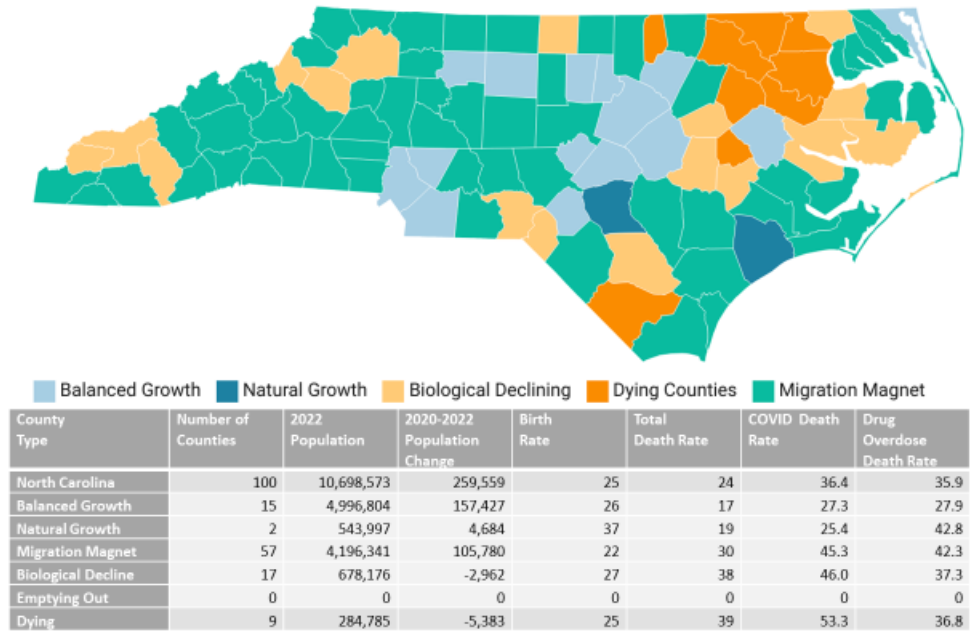
County Type	Number of Counties	2022 Population	2020-2022 Population Change	Natural Population Change	Net Migration
<b>North Carolina</b>	100	10,698,573	259,559	10,940	248,898
<b>Balanced Growth</b>	15	4,996,804	157,427	41,926	129,568
<b>Natural Growth</b>	2	543,997	4,684	9,700	-5,167
<b>Migration Magnet</b>	57	4,196,341	105,780	-30,327	136,007
<b>Biological Decline</b>	17	678,176	-2,962	-6,411	4,278
<b>Emptying Out</b>	0	0	0	0	0
<b>Dying</b>	9	284,785	-5,383	-3,849	-1,529

Source: <https://www.census.gov/data/tables/time-series/demo/popest/2020s-counties-total.html>.

Figure 8 shows the demographic experiences of North Carolina counties according to the balance of population change typology. Total, COVID-19, and drug overdose death rates as well as birth rates across the county-level demographic experiences typology appear in the table below the map.

Figure 8

North Carolina Demographic Change Typology Counties, April 1, 2020 – July 1, 2022



Source: <https://www.census.gov/data/tables/time-series/demo/popest/2020s-counties-total.html>. Total deaths/1000 population. COVID-19 and Drug Overdose deaths/100,000 population.

North Carolina counties fall into five of the six categories in the typology: balanced growth, natural growth, migration magnet, biological decline, and dying. No county was “emptying out” between April 2020 and July 2022.

Fifteen counties experienced balanced growth, that is, both net migration (129,568) and more births than deaths (natural population increase of 41,925) were sources of growth (157,427). These fifteen counties are the state’s major growth poles, hubs of creativity, innovation, and entertainment which accounted for 61 percent of net growth between 2020 and 2022 and 46 percent of the state’s total population in July 2022. Total, COVID-19, and drug overdose death rates were well below the statewide averages in these 15 counties in 2022.

Two counties—Onslow and Cumberland--experienced natural population growth between 2020 and 2022. In these two counties excess births over deaths (9,700) offset net out-migration (-5,167), resulting in modest growth (4,684). These are both military communities, so this specific demographic pattern is not surprising, especially given the high concentration of young military families, which largely accounts for the well-above average birth rate (37/1000 versus 25/1000 statewide), and high rates of military personnel deployments. What is particularly noteworthy, however, is the exceptionally high drug overdose death rate in these two communities (42.8 vs 35.6 statewide). Research confirms that “U.S. military veterans have been heavily impacted by the opioid overdose crisis” (Bennett, et al., 2022).



Over half of North Carolina counties were migration magnets—major beneficiaries of the state’s post 2020 pandemic induced population boom (136,007), which offset the longstanding trend of net-outmigration from most of these counties (-30,427) and contributed to significant net population growth (105,780). However, deaths rates remained stubbornly high in these counties, especially deaths caused by COVID (45.3) and drug overdoses (42.3), despite capturing 41 percent of the state’s total net growth (259,559) between 2020 and 2022.

Seventeen counties experienced biological decline between 2020 and 2022. Modest net in-migration (4,278) from the pandemic boom was offset by natural population loss, that is, an excess of deaths over births (-6,411), resulting in overall population loss (-2,962). Reflecting aging populations, total (38) and COVID (46) death rates were significantly higher than the respective statewide death rates on these indicators (24 and 36, respectively). Notably, drug overdose death rates in these seventeen counties (37.3) were slightly above the statewide death rate (35.9), but significantly lower than the death rate in natural growth (42.8) and migration magnet (42.3) counties with younger populations.

Nine counties did not benefit in any way from the pandemic population boom. According to our demographic change typology, these counties were literally dying between 2020 and 2022. That is, they experienced population loss due to both net outmigration—more people leaving than entering (-1,529) and natural change—more deaths than births (-3,849). COVID-19, as the table shows in Figure 8 shows, exacted a particularly heavy toll in these counties (53 deaths/100,000).

## Concluding Thoughts and Recommendations

Mortality is central to understanding the aging process, and North Carolina is an aging state. But the dynamics of death in the state extend beyond normal aging and are rooted in, among other causes, the COVID pandemic and the drug overdose crisis which is leading to the premature loss of far too many lives. During the 2010s, an average of 246 North Carolinians died each day. That average number increased to 317 per day between April 1, 2020 and July 1, 2022.

The demographic impact of this natural population loss is obscured by the state’s migration-driven absolute population change. However, a cursory look at North Carolina’s aggregate population growth trend over the past three decades highlights the magnitude of the problem and foreshadows a potential worsening of the current worker shortage in the years ahead—if the current death spiral is not properly addressed.

North Carolina’s net absolute population growth in the 2010s (903,000) paled by a substantial margin the absolute growth the state experienced in the 1990s (1.49 million) and the 2000s (1.42 million). Compared to the previous two decades, North Carolina grew by 500,000 fewer people between 2010 and 2020. In relative terms, after growing by 21.4 percent in the 1990s and 18.5 percent in the 2000s, the state experienced a 9.5 percent rate of growth in the 2010s (Johnson, Bonds, & Parnell, 2021a; Johnson, Parnell, and Bonds, 2024).

This slowing growth trend in North Carolina is rooted in a set of disruptive demographic shifts nationally, including slowing total and foreign-born population growth, declining fertility, and white population decline<sup>5</sup>—forces that are and will continue to profoundly reshape both the size and composition of population of the U.S. and North Carolina well into the future (Haroun & Hoff, 2021; Bahrapour, et al, 2021; Tavernise & Gebeloff, 2021; Johnson, Parnell, & Bonds, 2024). Due to declining fertility nationally and within the state, for example, we are on the cusp of a major enrollment cliff in both K-12 and higher education (Drozowski, 2023), which holds enormous implications for the pipeline of talent required to maintain a viable economy, not to mention the threats to education institutions in particular as hubs of innovation.

Against the backdrop of these national demographic trends, North Carolina leaders must leverage the lessons learned from the COVID crisis to develop sound policies, practices, and procedures to minimize population exposure risks and mitigate loss of life in future public health crises, including adverse weather events caused by climate change. In addition, in this research, we have identified both groups of North Carolina citizens and places within the state that not only are highly vulnerable to future public health and climate risks but also the vagaries of the aging process and the drug scourge. Consequently, both people-based and place-based strategies are necessary to successfully intervene in North Carolina's death crisis.

Two demographic groups are clearly at risk of premature deaths due to substance abuse: prime working age white males with less than a college education and Native Americans. While the state has a drug abuse intervention action plan, targeted efforts to stem the tide of premature deaths among these two demographic groups are urgently

needed—not solely as a public health intervention but also as a strategic workforce and business imperative. And, building on the lessons learned from the COVID-19 pandemic, we must target these two groups with trusted messages from trusted messengers that are rooted in the best available scientific evidence about culturally appropriate interventions and treatment modalities (Johnson, Bonds, and Parnell, 2021b,c).

Among the five community types identified in North Carolina, death rates are high in three: dying, natural growth (military communities), and migration magnets where growth is limited to isolated pockets or specific areas within constituent counties. Across and within these three county types are communities and neighborhoods with aging and vulnerable populations, a dearth of employment opportunities, deteriorating infrastructure, a host of life threatening locally unwanted land uses, and limited access to high quality health care. And many of the vulnerable households in these communities live in houses that are “unaffordable,” meaning housing costs exceed 30% of their income (Rosenfeld, 2023).

Geographic Information Systems (GIS) should be used to identify these “communities of despair” and a whole community health approach aligned with the social determinants of health must be implemented, leveraging available state dollars from the opioid settlement (Johnson, Bonds, & Parnell, 2022). In addition, especially in dying counties, expanding Medicaid and leveraging AARP's age-friendly infrastructure interventions will contribute to greater longevity and reduce the debilitating health effects of caregiving, which is a major workforce issue (Henderson and Johal, 2022; Kalita, 2022; AARP Livable Communities, 2014).

5 For the first time in history, as we have shown elsewhere (Johnson, Bonds, & Parnell, 2021a; Johnson, Parnell, & Bond, 2024), the U.S. non-Hispanic white population decline by -5.1 million during the 2010s and by another -1.6 million between April 1, 2020 and July 1, 2022. The decline spanned all four U.S. regions and 35 states. Only 15 states plus the District of Columbia experienced white population growth during the 2010s (Johnson, Bonds, & Parnell, 2021a).

Finally, incentive programs to encourage people, including both return and international migrants, to relocate to dying counties also should be developed—as an enlightened workforce development strategy to attract industry and commerce as well as mission driven entrepreneurial ventures that improve community health and wellbeing (Johnson, Bonds, & Davis, 2023).<sup>6</sup> Communities with declining and slow growing populations in other states and regions of the country have reported successes with such people-based incentive programs which are pursued along with business recruitment initiatives (Berger, 2022; Bloom, 2021; Kelly, 2021). The migration incentives include, as we have shown elsewhere (see Table 6 in Johnson, 2021a), relocation expenses, tax credits, forgivable mortgages, student loan repayment, cash, and land. Such incentives, properly marketed in the current remote work environment, can potentially breathe new life in North Carolina communities caught in a downward spiral of deaths of despair.

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6 For local government officials, we have created a roadmap for creating inclusive entrepreneurship and small business ecosystems that promote both traditional business development and social purpose venture creation in North Carolina's most economically distressed communities (see Johnson, Bonds, & Davis, 2023).

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