Environmental Health and Cumulative Impact in Robeson County, NC

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Robeson County, North Carolina has a significant number of environmental and health stressors. It is a community overburdened by environmental polluters that have exacerbated low health outcomes. The environmental and health status of the county is linked to its economic conditions. The North Carolina Department of Commerce designates Robeson as a Tier 1 County,[1] which means the county is economically distressed at a level that warrants intervention. The desperation embedded in the lack of economic stability acts as a catalyst for the political leadership to cling to any economic opportunities that might promote job growth. This desperation has led to the acceptance of dirty industries that pollute the land and air. The ecosystem can handle *some* pollutants. However, Robeson County has a high concentration of polluting industries that have created a harmful, cumulative impact on the health of the citizens and thee environment. These cumulative effects of diverse polluting industries are considered the most dangerous.[2] Given that Robeson County is the most racially diverse rural county in the country, this is particularly problematic since communities of color suffer disproportionately from environmental hazards and already experience worse health outcomes.[3, 4]

In this report, we discuss environmental health and identify and examine the link between the sources of pollution and health outcomes in Robeson County. We then explain cumulative impact under the National Environmental Policy Act (NEPA), Title 6 of the

Civil Rights Act, and their established role in regulatory deliberations and decision-making. This report exhibits the detrimental effect the cumulative impacts of pollution have on residents' health. This report also demonstrates that Robeson County is an overburdened community that cannot afford to host additional industrial development that emits significant hazardous and toxic chemicals into its air and water.

Environmental Health in Robeson County

Environmental health examines the "interaction of people and their environment. The food people eat, the air they breathe, and the water they drink all influence [their] health".[5] Evaluating the environmental health of a community is two-fold; it entails: (1) identifying environmental sources and hazardous agents, and (2) limiting exposures to hazardous agents in air, water, soil, food, and other environmental media or settings that may adversely affect human health.[6] This report examines the environmental hazards, particularly the sources of pollution, in Robeson County and the health of Robeson County residents, as scientific evidence demonstrates the link between certain poor environmental conditions and adverse health outcomes.[7]

The University of Wisconsin Population Health Institute, in collaboration with the Robert Wood Johnson Foundation, calculates a County Health Rankings system for all the States in the United States.[8] This ranking is based on health factors (such as environmental, social and economic conditions) and health outcomes (such as lifespan and self-reported health status).[8] According to the 2019 report, out of all 100 counties in North Carolina (with 1 indicating the healthiest), Robeson County ranks 100th in health factors, 100th in health outcomes, and 100th in quality of life.[8] Additionally, a report by the NC Climate and Health Program states that Robeson County is one of four counties

with the highest rates of emergency department visits for heat-related illness (HRI) in the state.[9] HRI is a concern in North Carolina as a result of the increase in frequency and intensity of extreme heat events due to climate change.[9] This report explains "impacts of HRI are expected to be felt more in underserved communities of North Carolina where, along with a disproportionate burden of respiratory and cardiovascular disease, residents have limited capacity to adapt to warming temperatures."[9] Such is true of Robeson County.

In addition, the CDC states that violence, a significant problem in Robeson County, is a public health issue.[10] According to 2016 crime data from the Federal Bureau of Investigation (FBI), Lumberton was ranked the most dangerous city in North Carolina and the fourth most dangerous in the entire country.[11, 12] There were 393 violent crimes in Lumberton in 2016, and residents had a 1 in 55 chance of being assaulted, raped, or killed.[11] Additionally, according to the State Bureau of Investigation (SBI)'s annual reports from 2014-2017, Robeson County was the most violent county in North Carolina, with the highest property, violent, and overall crime rates in the state.[13,14] Only recently, according to the 2018 study, Robeson County moved to fifth in the state with the overall crime rate at 4,226.7 per 100,000 (still much higher than the statewide crime rate at 2,763.2).[15]

Scientific studies show that poor air quality is linked to premature death, cancer, and long-term damage to the cardiovascular and respiratory systems.[7] Therefore, it is crucial to document and understand air pollution in the county to better understand the reason behind the community's health outcomes. The North Carolina Department of Environmental Quality (NCDEQ) offers an estimate of sources of pollutions in the state

through its Community Mapping Tool.[16] NCDEQ does not include the degree of the polluting source, nor do they guarantee that they have captured one hundred percent of all sites.[16] Table 1 displays all known registered sources of pollution in Robeson County, retrieved from the NCDEQ Community Mapping Tool.

Table 1: Pollution Sources in Robeson County[16]

Type	No.
Animal Operation Permits	65
NPDES Storm water Permits	90
NPDES Wastewater Treatment Facility Permits*	12
Coal Ash Structural Fills (CCB) (Closed)	4
Permitted Solid Waste Landfills	16
Inactive Hazardous Sites	16
Pre-Regulatory Landfill Sites	11
Hazardous Waste Sites	20
Underground Storage Tank Incidents	272
Above Ground Storage Tank Incidents	70
Underground Storage Tank Active Facilities	202
Petroleum Contaminated Soil Remediation Permits	2
Land Use Restriction and/or Notices	55
Mining Permits	23
TOTAL	**858**

* Data for six of these facilities was retrieved from the NCDEQ Environmental Justice Snapshot Report on the Active Energy Renewable Power Proposed Facility. The other six include facilities in St. Pauls, Red Springs, Maxton, Pembroke, Rowland, and Fairmont

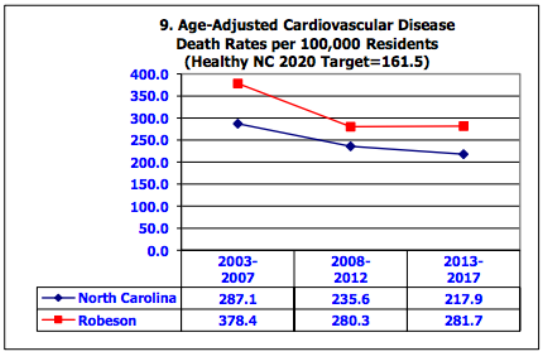
Knowing that these data are likely an underestimate, the statistic of 858 sources of strictly air pollution in one county is stunning. In Table 2 below, several other related environmental health indicators are displayed, comparing Robeson County to the overall state of North Carolina. This data comes from the "Community Health Needs Assessment", which is conducted every four years by the Healthy Robeson Task Force in conjunction with the Robeson County Health Department and Southeastern Regional Medical Center.[5] The most recent report was published in 2017. Currently, the 2021 report is being compiled.

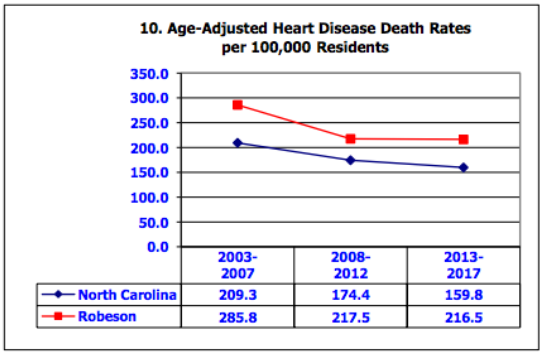
Table 2: Environmental Health Indicators of Robeson County vs. Statewide[5]

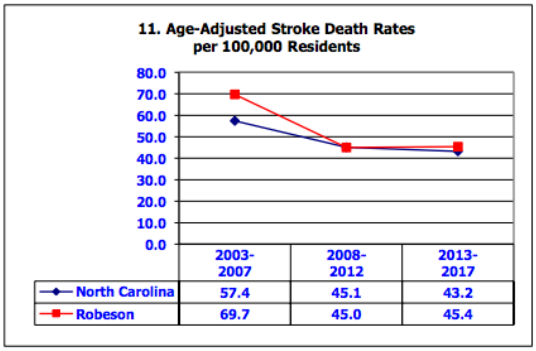
		Robeson County	North Carolina
1	Percentage of days exceeding standards of air quality particulate matter 2.5	1.02	0.48
2	Number of days exceeding standards for ozone	2	0.27
3	Percent of population within one-half mile of a park	8.5	20.8
4	Recreation and Fitness Facilities per 100,000 population	7	11

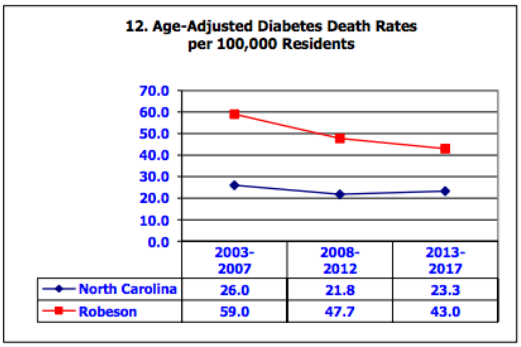
The indicator in row one (percentage of days with particulate matter 2.5 levels above the National Ambient Air Quality Standard - 35 micrograms per cubic meter - per year), is significant because this level of "poor air quality contributes to respiratory issues and overall poor health."[5] Both indicator one and two show that Robeson County experiences disproportionately high rates of harmful environmental conditions compared to North Carolina as a whole. The third and fourth indicators are relevant because they encourage physical activity and other healthy behaviors.[5]

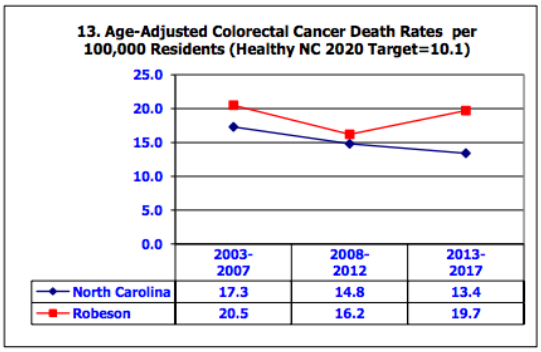
In addition to the aforementioned environmental health indicators above, Robeson County overall experiences much worse health outcomes than the state of North Carolina.[17] The graphs below compare the incidence and death rates for various diseases between Robeson County and North Carolina overall.

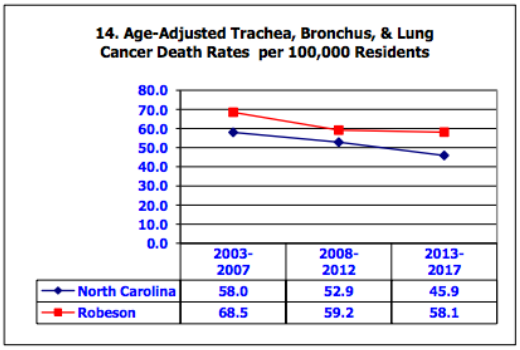


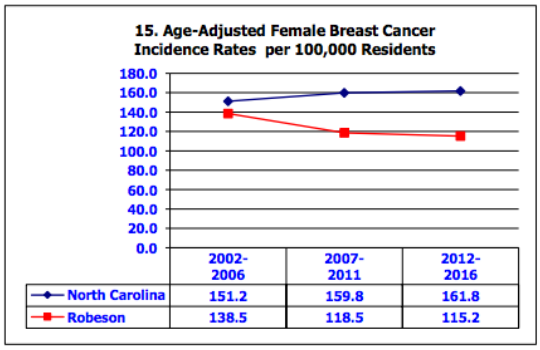


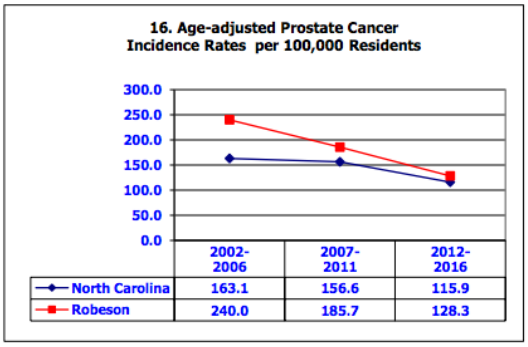












Source: *North Carolina Statewide and County Trends in Key Health Indicators: Robeson County*. North Carolina Department of Health and Human Services – Division of Public Health/State Center for Health Statistics https://schs.dph.ncdhhs.gov/data/keyindicators/reports/Robeson.pdf

As seen in the graphs above, the residents of Robeson County experience incidence and death rates for stroke, most types of cancers, cardiovascular disease, and diabetes at higher rates than North Carolina.[17] The top five causes of death in Robeson County are heart diseases, cancer, Alzheimer's disease, chronic lower respiratory diseases, and diabetes mellitus, majority of which are experienced at higher rates in the county than in North Carolina.[5] It is important to note that cancer, heart disease, respiratory diseases, and diabetes are some of the most common environment-related illnesses.[18] In addition to the data in the graphs above, the rate of preventable hospital admissions in Robeson County is 9,949 per 1,000 people, more than twice the rate for

North Carolina (4,680.0 per 1,000).[19] In Robeson County, the percentage of babies born with low birth weight is 11.8% versus 9% for the state.[19] The infant mortality rate in Robeson County for 2018 was 8.8 per 1,000 live births, compared to 6.8 for North Carolina.[20] The child death rate (ages 0-17 years) in Robeson County for 2018 was 94.7 per 100,000 residents, as opposed to 54.5 for the state.[21] Furthermore, life expectancy in Robeson County for 2016-2018 was 73.2 years, while North Carolina's was 77 years.[22] Even when compared to other economically deprived counties in North Carolina, Robeson has higher death rates for heart disease, Alzheimer's, and diabetes.[5]

Table 3: Top Five Causes of Death for Robeson County (2015)

Rank	Cause	Robeson County	North Carolina
1	Diseases of the heart	24.2%	20.7%
2	Cancer	19.0%	21.7%
3	Alzheimer's disease	5.6%	4.3%
4	Chronic lower respiratory diseases	5.1%	5.9%
5	Diabetes mellitus	5.0%	3.1%

Cumulative Impact of NEPA

The Council on Environmental Quality's (CEQ) regulations under the National Environmental Policy Act (NEPA) mandates the responsibility to consider direct, indirect, and cumulative impacts in environmental analyses.[23] Cumulative impact is defined as the combined, incremental effects of past, present, and future human and natural activities on a natural resource, ecosystem, or human community.[23, 24] The U.S. Environmental

Protection Agency (EPA) states that cumulative impacts "pose a serious threat to the environment," as they can result in the degradation of important resources, not to mention the community and health of its residents, and therefore must be assessed.[24] From the perspective of scientists, assessing the cumulative impact of pollution is the best method for environmental analysis.[25]

A region's sources of pollution must be assessed collectively rather than individually to truly understand their effects. For instance, all gas stations are a source of air and ground pollution.[26] Individually, the polluting output of a single gas station is insignificant in accordance with federal and state standards. However, the cumulative impact of many gas stations in a highly concentrated area becomes critical. Unfortunately, federal and state pollution standards do not address cumulative impact even though science demonstrates that it is the best method to assess pollution within a geographic region.

Robeson County in North Carolina is a prime example of the consequences of cumulative impacts. The county contains much dirty industry and many environmental hazards. Whether or not each of the 858 pollution sources (see Table 1) individually induces much harm, collectively they have created an unsafe environment and poor state of wellbeing for residents.[16,24] Given the prevalent sources of environmental degradation, including but not limited to, natural gas infrastructure, biomass industry, and poultry processing facilities, it is no coincidence that Robeson County ranks last out of all 100 counties in North Carolina for health outcomes.[8,27,28,29,30,31] The county undoubtedly is an overburdened community.[32] Two-thirds of the residents are people of color, with Indigenous peoples forming about one-third of the county population, and these minorities disproportionately suffer from environmental and public health risks.[33] The county

residents experience infant mortality, cancer incidence and mortality, heart disease, and diabetes at rates much higher than those at the state-level.[17] These adverse health effects are correlated with the dangerous amount of air pollution, as particulate matter has been classified as a cause of lung conditions, heart attacks, asthma, low birth weights, and possibly premature death.[3,18,34,35] The fragile environmental and health conditions have prevailed for far too long.

To remedy the harm thus far and secure a safer future for Robeson County, cumulative impact must be regularly assessed and considered during the review of environmental projects and permit applications in Robeson County. These cumulative effects must be scoped and their impacts on the environment and people analyzed.[36] There is no excuse for neglect as there are many readily available resources that explain guidelines by which to analyze these effects, such as the CEQ's "Considering Cumulative Effects under the National Environmental Policy Act."[36] Upon assessing cumulative impacts, we advocate for the CEQ's guidelines on using the cumulative effects analysis to develop alternatives for an Environmental Assessment (EA) or Environmental Impact Statement (EIS).[36] Ultimately, it is imperative to value the people of Robeson County, the pricelessness of their health, and the struggle they have endured as a result of the cumulative impact of much environmental degradation.

Title 6 of the Civil Rights Act

In addition to cumulative impact, it is important to take into consideration Title 6 of the Civil Rights Act. Many studies, including a 2018 report by the EPA, have proven that communities of color and low-income households are much more likely to live near

polluters and be burdened by exposure to polluted air and fine particulate matter.[37,38] This is unacceptable, given the consequences of the enormously detrimental impact this has on these minority populations. Not only is it unacceptable, but unlawful under the Civil Rights Act. Title 6 of the Civil Rights Act prohibits states (and other recipients of federal financial assistance) from discriminating on the basis of race or color for programs that affect human health or the environment.[39] Robeson County is the most racially diverse rural county in the whole country, has hundreds of sites of pollution, and has the worst health outcomes in the state. Therefore, Title 6 must be considered in current and future reviews of environmental projects and permits to protect residents from environmental racism.[4]

Summary and Conclusions

The report employs the current and preeminent conceptual framework for the assessment of pollution and cumulative impact on environmental health..[25] Clearly, the current scientific deliberations have concluded that the assessment of individual sources of pollution is a woefully inadequate enterprise. Due to the current scientific thinking and the undeniable link between environmental polluters and adverse health effects, this report addressed three critical areas:

1. A discussion of environmental health, which included data on pollution sources, the health outcomes of the county in comparison to the state, and the connection between environmental hazards and health conditions.

2. CEQ's regulations under NEPA require that cumulative impacts be assessed, analyzed, and considered. Cumulative impacts are severely dangerous to communities, and such is evident in Robeson County.

3. Title 6 of the Civil Rights Act prohibits states from discriminating on the basis of race or color for programs that affect human health or the environment. Communities of color and low-income areas (such as Robeson) are much more likely to live near polluters and breathe polluted air. Title 6 must be considered to protect its residents of environmental racism.

Robeson is an overburdened community with a disproportionate number of environmental and public health stressors. No further permits should be issued for polluters who emit a significant amount of hazardous materials and cause further harm to the public health and environmental quality of Robeson County.

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