Infant Mortality and Life Expectancy: The Inequitable Loss of Potential Life

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Differences in life expectancy between racial and other subgroups of the population indicate inequities in the community. There are both societal and physical factors—including racism, poverty, and access to care—that must be resolved to increase and equalize life expectancy and decrease the infant mortality rate.

Introduction

Healthy North Carolina is a set of health indicators and goals released by the North Carolina Department of Health and Human Services (NCDHHS) each decade since 1990. The "Healthy North Carolina 2030" report (Healthy NC 2030) utilizes a population health model that consists of 21 health indicators that are grouped as Health Outcomes, Health Behaviors, Clinical Care, Social and Economic Factors, and Physical Environment [1]. Here we focus on two Health Outcomes: infant mortality and life expectancy.

Infant mortality is defined as the rate of infant deaths per 1000 live births in a country, state, county, city, or region. In the United States, the infant mortality rate in 2020 was 5.4 deaths per 1000 live births, reaching an all-time low [2]. However, France and the UK (countries with a similar Gross Domestic Product to the United States) have a much lower infant mortality rate, at 3.8 deaths per 1000 live births [3].

There are a multitude of factors affecting infant mortality rates, with the top five being: birth defects, preterm birth, sudden infant death syndrome, injuries, and maternal pregnancy complications [4]. Many of these causes are directly affected by socioeconomic status, race and ethnicity, and other community factors represented in the Healthy NC 2030 indicators [1]. While there are many factors that can contribute to higher infant mortality rates, the inequities are clear. Infant mortality rates for non-Hispanic-Black and non-Hispanic Native Hawaiian or other Pacific Islander infants in the United States were 10.6 and 8.2, respectively, in 2019, while the non-Hispanic White and non-Hispanic Asian infant mortality rates were 4.5 and 3.4, respectively [5].

If a child lives past the age of one, we begin to measure life expectancy. Life expectancy is defined as the number of years that an individual can expect to live once they have reached a certain age. Life expectancy is not a linear trend and changes as individuals reach various ages. Life expectancy is calculated using life tables from specific periods of time. These life tables show the potential number of years a group of people who reach a specific age can expect to live if the mortality trend stays the same throughout the rest of their lives [6]. Life expectancy in this article refers to the number of years an infant can be expected to live at birth.

While life expectancy has increased greatly over the past decades with improved access to health care and medical advances, the United States still falls behind other high-income countries, falling from number 3 in life expectancy among high-income countries in 1960 to number 10 in 2016 [7]. While this decline alone is astounding, the decline is even more stark for women in the United States. Life expectancy for American women is now 2.5 years lower than for women in other high-income countries. The current life expectancy for both sexes in the United States is 77.0 years as of 2020 [2]. This suggests that at birth, an individual can expect to live to 77 more years. For men, this is a decrease of 2.1 years from 2019 to 2020, and for women it is a decrease of 1.5 years [2].

Beyond gender differences, there are also stark racial and ethnic differences in life expectancy. In 2019, the life expectancy of non-Hispanic Asian and Hispanic populations was the highest, at 85.6 and 81.9 years, respectively, while non-Hispanic Whites had a similar life expectancy, at 78.8 years [1]. Conversely, non-Hispanic Black populations and non-Hispanic American Indians and Alaska Natives had a life expectancy of 74.8 and 71.8 years, respectively [1]. This means a non-Hispanic Black infant can expect to live three years less than their non-Hispanic White counterpart and an astounding 7.1 and 10.8 years less than their Hispanic and non-Hispanic Asian counterparts, respectively.

While the data for 2019 and 2020 are clearly affected by the COVID-19 pandemic, the disparities in the data tell a disheartening story about the health and well-being of the US population.

Context and Background for Infant Mortality and Life Expectancy as Healthy NC 2030 Indicators

Infant mortality can be used as a pseudo-measure of the health of a community, the inequalities and disparities within the community, and the health of future generations [1]. Infant mortality is also a measure of maternal health, as well as other factors, such as education status, prenatal care, and socioeconomic status. Infant mortality rate alone does not fully describe the racial disparity between the most populous groups in North Carolina. For this reason, the Black/White disparity ratio is used to quantify the disparity between Black and White infants. Healthy NC 2030 set an aggressive target of lowering infant mortality in North Carolina from 6.8 deaths per 1000 live births in 2018 to 6.0 deaths per 1000 live births by 2030, and a goal of lowering the Black/White disparity ratio from 2.4 in 2018 to 1.5 in 2030 [1]. In 2020, infant mortality increased to 6.9 deaths per 1000 live births and the gap between Black and White babies increased to 2.7, indicating that Black/African American North Carolinians experience over two and a half times more infant deaths than White/Caucasian North Carolinians. The Black/African American and American Indian infant mortality rates in North Carolina for 2018 were 12.2 and 9.3, respectively, while the infant mortality rates for White and Hispanic infants for 2018 were 5 and 4.8, respectively. In 2020, Black infant mortality rates increased to 12.8 while American Indian rates dropped to 3.3. At the same time, the White infant mortality rate decreased to 4.7 and the Hispanic/Latinx rate increased to 5.8. The gap between Black and White infants remained consistent at 2.7 (Unpublished data, Preliminary Report for the State Health Improvement Plan from the State Center for Health Statistics, 2022).

While health factors such as preconception health, obesity, and other comorbidities impact infant mortality rates, societal factors such as access to health care, housing, and education, as well as systemic racism, also have profound effects. Typically, as health and societal factors improve, health outcomes improve. However, an increase in prenatal care, socioeconomic status, or education does not necessarily increase health outcomes for Black women or their children [8].

Like infant mortality, life expectancy is also a pseudo-measure of community health. It also varies greatly by geography, gender, race, and ethnicity. Healthy NC 2030 set a goal of improving life expectancy from 78.0 years in 2018 to 82.0 years in 2030. In 2020, the life expectancy in North Carolina decreased to 76.4 years. Life expectancy decreased consistently across all gender and racial groups (Unpublished data, Preliminary Report for the State Health Improvement Plan from the State Center for Health Statistics, 2022). However, the steepest decreases were experienced by Black and American Indian residents, with a decrease of one year. This disparity is likely explained by disparate impact of COVID-19 in certain communities. The US life expectancy decreased by 1.87 years overall during this same period with a decrease of 3.22 years for Black populations [9]. Relatively speaking, North Carolina COVID-19 equity initiatives led to a smaller widening of the racial life expectancy gap than the United States as a whole.

Life expectancy provides insight into the health of the nation over time and areas where interventions or policy changes are needed.

Potential Levers for Change

The statistics of infant mortality in North Carolina are not indicative of the effort that has been applied to lower infant mortality rates. However, systemic factors such as poverty, access to care, systemic racism, and housing require a multi-pronged approach that efforts to lower infant mortality alone cannot resolve. Specific policy efforts are needed to create and maintain affordable housing, provide job training and education, and provide access to low- or no-cost health care.

Several efforts are ongoing in North Carolina to specifically address infant mortality. Most recently in 2015, funding from the North Carolina General Assembly highlighted the urgency of reducing infant mortality in the counties with the highest rates through partnerships with local health departments and NCDHHS [10]. Further, the state has taken a broader approach to perinatal and preconception health in recent years through various efforts, including partnership with organizations like the March of Dimes. Significant efforts have also been made in North Carolina to address maternal mortality and maternal health [10].

The COVID-19 pandemic undoubtedly had an impact on both infant mortality and life expectancy for North Carolinians. The economic downturn due to COVID-19 has been predicted to cause excess infant deaths [11]. Factors like increased reliance on telehealth and the digital divide will likely prove to be pivotal in both the increase in infant mortality and decrease in life expectancy and in understanding how the inherent racial and economic disparities in access to health care affect both [12].

Beyond mitigating the effects of the COVID-19 pandemic, levers for improving infant mortality rates and life expectancy include expanded access to health insurance, improved preconception health for both men and women, access to and use of prenatal care, and reduced maternal obesity and tobacco use before, during, and after pregnancy. Any improvement of any of the other indicators of health noted in Healthy NC 2030 is likely to have a significant impact on both infant mortality and life expectancy.

In North Carolina, local public health plays a critical role in efforts to decrease infant mortality, increase life expectancy, and decrease health equity gaps. Additionally, local public health also plays many other roles and serves as the first line of defense during public health emergencies. Beyond supporting local public health, it will be critical to identify public-private partnerships that can also implement these levers of change.

For all of the efforts to reduce infant mortality and increase life expectancy, a significant question arises as *Roe v Wade* has been overturned: "What now?" North Carolina did not have any trigger laws that went into effect when the Supreme Court made its decision. Further, Governor Roy Cooper has signed an executive order, Order No. 263, protecting access to reproductive health care services in North Carolina [13]. However, the future is uncertain. Studies have shown that inadequate access to contraceptives and abortion care increases the risk of maternal and infant mortality and further increases the probability of families living in poverty [14].

Efforts to close racial and socioeconomic gaps in light of the pandemic have highlighted the need for sufficient data [15]. North Carolina was and is not immune to the challenges of data collection. To this end, a new Health Equity Data Consortium has been formed as a partnership between NCDHHS and North Carolina historically Black colleges and universities and other minority-serving institutions, as well as community-based organizations, with the goal of developing a sustainable infrastructure for the collection and analysis of health equity data. Efforts like this consortium will help to better leverage other resources by ensuring that fully representative data are available for the planning, implementation, and evaluation of policies, programs, and interventions to improve life expectancy.

In This Issue

This issue explores the gamut of infant mortality and life expectancy, from better defining these terms to understanding the impact of efforts to improve them, and of the COVID-19 pandemic.

In the Data and Trends section, Sugg and coauthors take a deeper dive into the spatial disparities and inequalities inherent in life expectancy in North Carolina, highlighting the importance of quantitatively tracking life expectancy as a population health metric [16]. Jenkins and coauthors introduce the Social Vulnerability Index in the context of life expectancy and locality, highlighting the need for better and more inclusive data and data analysis resources to increase life expectancy [17]. Jones-Vessey and Cobb delve further into North Carolina's failure to consistently reduce infant mortality due in large part to systemic racism and other inequities [18].

In the Policies and Programs section, authors introduce recent policy and program initiatives that promote the care and protection of the most vulnerable, including both the physical and behavioral health of children, from the perinatal period to adulthood. This includes maternal health care in an extended postpartum period, as well as the care of adults after incarceration. Johnson and colleagues highlight the enormity of factors affecting perinatal health, the successes of the 2016–2020 state Perinatal Health Strategic Plan implementation, future plans, and other policy initiatives toward improving perinatal health [19]. Avram and Swartz

provide an update about the promise of expanded postpartum Medicaid coverage, recently passed in North Carolina [20]. Hatcher shares an update on the work of the Child Fatality Task Force toward reducing infant mortality, suicide rates, and gun deaths through the advancement of public policy [21]. Baker and coauthors describe the North Carolina Formerly Incarcerated Transition (NC FIT) Program, which is aimed at reducing the high mortality rate of previously incarcerated individuals in our state [22].

In the Outcomes section, Phelps and coauthors take a more specific look at health outcomes related to cardiovascular disease (CVD), a leading cause of death, as the incidence of CVD and related mortality and morbidity continue to increase [23]. Phelps shares the inequities of CVD as well as challenges, successes, and the potential to reverse the CVD trend. Relatedly, in an interview, Dr. Thomas White shares his experience with CVD as a family physician and lipidologist, including insightful thoughts about the factors affecting the CVD trend and the future of CVD in North Carolina [24]. In a second interview, Dr. Jennifer Carroll, a medical anthropologist and harm reductionist, discusses the meaning and context of "deaths of despair" in North Carolina, as our state, like many other states, faces increased substance abuse, overdose deaths, and suicide [25].

Finally, in a Running the Numbers column, Geary and colleagues describe disparities in motor vehicle traffic deaths and injuries in North Carolina, particularly among the American Indian population [26].

Closing Remarks

Life, liberty, and the pursuit of happiness are unalienable rights proclaimed by the Declaration of Independence [27]. Translated in the context of health: everyone should have the same potential for life. There are a multitude of factors, both societal and clinical, that affect one's potential for life. Policies and programs to improve these factors will only be successful if the underlying systemic issues are addressed. **NCMJ**

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