

Can an Equity Index Promoting an Environmentally 'Just' City Help Us Beat Pandemics, Address Injustice, and Prepare Us for Climate Change?

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The biggest challenges facing the world today—from climate change to the COVID-19 pandemic to racial injustice—are multifaceted and intersectional, resulting from and contributing to issues across multiple sectors of society. However, the policy tools that we traditionally use are sectoral and top down, dealing with individual aspects of the problems rather than approaching them holistically or successfully integrating community input. We propose the development of community-informed policy tools to support more equitable and just solutions through the understanding and integration of the various inter-related factors that make communities both vulnerable and resilient. In this paper, we discuss the factors that contribute to inequalities related to COVID-19 and describe how an index we developed for more equitably distributing green stormwater infrastructure in Philadelphia could be repurposed to provide an integrated perspective on inequities to enable need-based interventions to address the pandemic, reinvest in communities, and prepare for additional future challenges.

We have never had justice or equity in American cities and regions. We are a country defined by racial segregation, unequal opportunities, and risks: where you live in a city or region makes an enormous difference in the educational opportunities your kids have, your health, how you are treated by the police, and ultimately how long you live. Environmental, social, and economic injustice has meant that African-Americans and other people of color living in many of America's disinvested urban neighborhoods face

Highlights

- **Racial disparities in coronavirus deaths highlight the life and death consequences of environmental injustice.**
- **Intersectional and community informed policy tools are urgently needed to identify the most vulnerable communities for targeted interventions.**
- **The compounding effect of environmental, social, and economic inequities must be taken into account when developing policies to address issues such as climate change and the COVID-19 pandemic.**

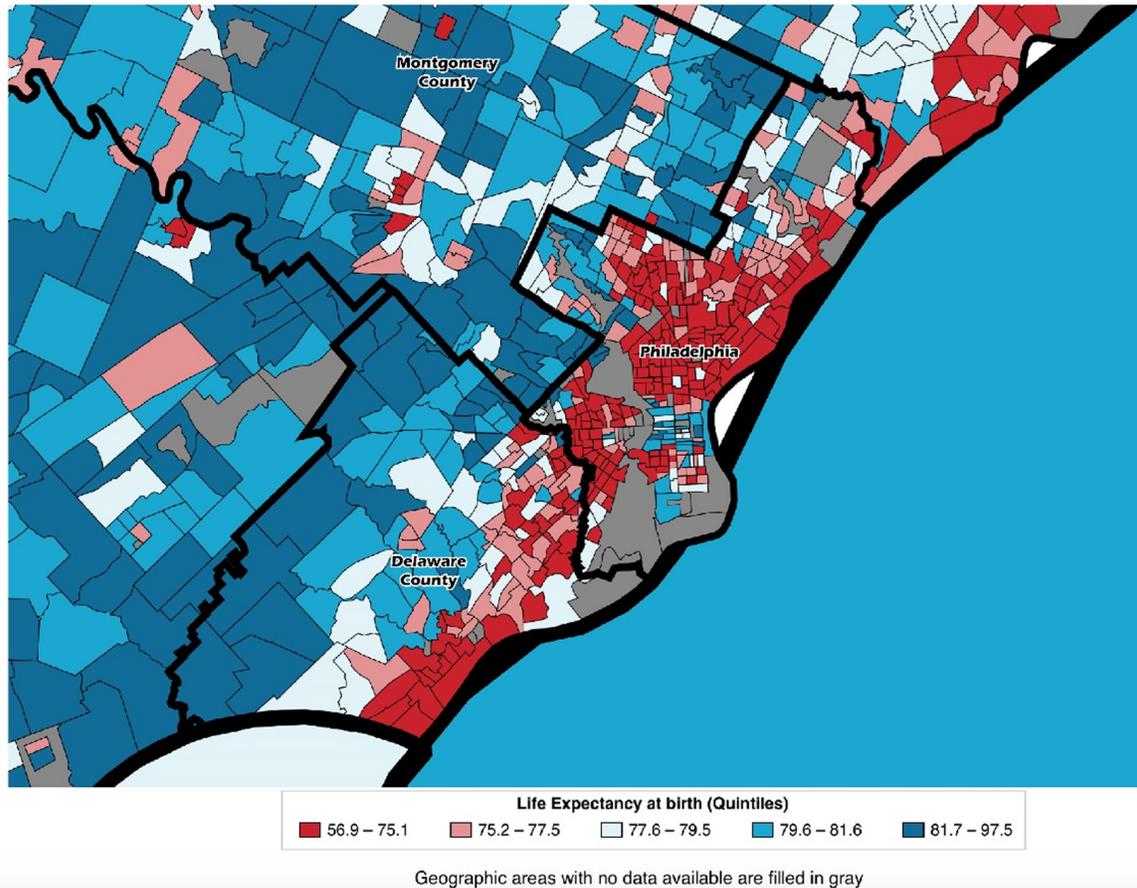


Figure 1: Difference in Life Expectancy at Birth by Census Tract in the Philadelphia Metropolitan Region (labels added for clarity). Source: <https://www.cdc.gov/nchs/data-visualization/life-expectancy/>

significant challenges including long-term exposure to environmental toxins and air pollution, aging infrastructure, inadequate housing, lack of access to employment, extreme heat, and lack of access to protective amenities that mitigate harm such as open space, parks, tree canopy, healthy food, medical care, and safe schools and streets.¹ These challenges, in turn, negatively affect the physical, emotional, and economic health and well-being of vulnerable populations.

Philadelphia, the “poorest big city in America” with 24.5 percent of its population living in poverty, is highly unequal.² The City’s Health Explorer website highlights the racial disparities in health.³ Life expectancy varies widely depending on the zip code you live in, this is known as the “zip code gap” where Philadelphia residents of higher income Society Hill shockingly have a 20 year longer life expectancy than residents of lower income Strawberry Mansion.⁴

This geographic pattern of inequality can be seen in Figure 1, which shows variations in life expectancy by census tracts. These inequities in life expectancy are replicated in cities and regions across the U.S.

If we use equity as a lens and zoom out to a regional scale, the “zip code gap” for life expectancy at birth in the region is stark: people who live in richer suburban areas right outside the city or even in higher income parts of the city are expected to live to 81.7-97.5 while for many Philadelphians, many of whom are low-income and people of color, the range is between 56.9-75.1.

The data about inequality and injustice have been there for a long time; however, until now the urgency and remedial policy action have not. Perhaps that is because as a society we have normalized these conditions: low-income people, particularly people

of color die younger and at a higher rate, but they do so quietly and largely without media attention. Government officials have paid lip service to these concerns, but have not taken the necessary large-scale and comprehensive action we need to right this wrong. COVID-19 has unmasked these problems and brought them to the attention of many more people, who have taken to the streets across the world to protest injustice and racism following the deaths of Ahmaud Arbery, Breonna Taylor, and George Floyd at the hands of white vigilantes and the police. They are demanding Defunding the Police and reinvesting in the funding of the protective measures that communities need: schools, parks, healthcare, clean air, and job training. They are calling attention to what the data have shown us for years: inequality and injustice are a function of public policy decisions about investments we make and do not make and the living conditions in neighborhoods that we accept as normal.

The coronavirus crisis has laid bare how devastating the impact of systematic environmental injustice, divestment, segregation, and racism in American cities is and our collective and urgent responsibility to address it. In Philadelphia, African-Americans make up 44% of the city's population and 45% of COVID-19 cases, but 51.5% of COVID-19 deaths.⁵ Philadelphia's pattern is not unique, and is, in fact, less unequal than some other parts of the country. In Chicago, African-Americans are 30% of the city population but 45.5% of the COVID-19 deaths.⁶ In Louisiana, African-Americans make up 32% of the population but 70% of the COVID-19 deaths.⁷ While many commentaries have noted racial disparities in underlying health conditions that make people particularly vulnerable to COVID-19, the Louisiana case highlights the explicit environmental justice connection to COVID-19: residents of "cancer alley," an area long decried by environmental justice advocates for the high presence of polluting industries in Black communities, experienced much worse outcomes.⁸ We see in the recent protests across American cities that injustice and inequity in COVID-19 compounds existing inequality and injustice.

The coronavirus exposes in stark terms why there is a need to address inequity in American cities

and regions: African-Americans are dying from coronavirus at a much higher rate than whites, likely because of preexisting health conditions caused by environmental injustices and the effects of systematic and persistent racism, exclusion, and inequality. We must respond with a sense of urgency that has so far been lacking in policy responses to racial health disparities. In the starkest terms, the coronavirus has highlighted how environmental injustice is not just inconvenient and unpleasant: it makes certain communities more vulnerable and it literally kills their residents. While there are many factors that contribute to these disparate health outcomes, including discrimination, disparities in other medical conditions that contribute to COVID-19 mortality, access to healthcare, and economic inequalities, unequal exposure to pollutants that affect respiratory health and other issues of environmental justice must also be recognized as contributors.

Waking up to this fact is particularly urgent not just in responding to the current crisis, but also in addressing future threats. Climate impacts just around the corner will similarly disproportionately impact the most vulnerable among us: people of color and low-income residents living in vulnerable urban areas. We know that the urban heat island impact (UHI) make urban areas much hotter in summer months (and without air conditioning this may lead to higher rates of mortality). In Philadelphia, the Office of Sustainability has found that certain neighborhoods can be up to 22 degrees hotter in the summer.⁹ The Philadelphia Heat Vulnerability Index highlights that the hottest areas of the city are the low-income communities of color, which often lack protective infrastructure such as air conditioning to "weather" the climate impacts.¹⁰

To redress inequity and promote justice and climate resiliency, first we need to develop community-informed policy tools to identify inequity in a systematic and community driven way. We authored a paper in 2016 called *Developing a Green Infrastructure Equity Index to Promote Equity Planning*.¹¹ We used a Rawlsian approach to justice arguing that no matter where you live you should have access to green space and socio-economic and environmental conditions that promote a healthy life. The idea behind John Rawls' approach to justice is

that if you did not know where you would be born, you would want all places to provide a similar level of amenities and opportunities.¹²

As citizens and policy-makers, we should never look at the maps of social, economic, and environmental vulnerability and environmental injustice and be OK with them. We argued in the 2016 paper and a subsequent 2018 paper, that the City of Philadelphia should be proactively working with communities to identify which variables are important for determining need and thus for assessing equity and targeting interventions. Then, using GIS mapping tools in a community setting, we propose identifying “equity voids”.¹³ Once these voids are identified, community residents and government officials can start a dialogue about how to identify planning and infrastructure investment opportunities to address the “equity voids” and redress injustice. Given that we know that trees, green space, and pervious surfaces can play a protective role in climate resiliency, we advocate using this method as a way to prioritize investments in green infrastructure development so that the City can focus scarce resources on improving the living conditions of the neediest residents and readdressing systematic exclusion and racism.

Though we developed our index with a focus on planning for green infrastructure development, the approach and framework can be easily adapted and applied to issues such as coronavirus and climate change and racial injustice. The most important elements are identifying the varying factors that contribute to vulnerability, recognizing the intersectional nature of vulnerability in which multiple factors can interact with and compound each other to increase risk, applying a spatial lens to understand the landscape, and allowing community members to inform decision-making as to the most appropriate means of addressing these inequities.

For example, in the case of coronavirus, it is not enough to focus only on health disparities and environmental exposures, but risk should also consider reliance on public transit, employment in the service sector or other essential services, and number of people in households, three factors that may contribute to a person’s exposure to the virus and ability to practice protective measures such as social

distancing. These must be considered in terms of where risk factors coincide in space, recognizing that both the spread of the virus and several of the factors contributing to vulnerability are tied to characteristics of the home and the neighborhood. While a spatial lens can help identify the areas that are most at risk, it is further imperative that community members be part of the conversation of how to address these concerns to ensure that proposed programs are feasible and meaningful for the populations they aim to help.

Consider, again, extreme heat. While the urban heat island effect is seen as an “urban” issue with cities being hotter than their surrounding suburbs, it is well established that neighborhood microclimates result in disparities across the city, with the greatest vulnerability often seen in poorer communities lacking the tree canopy and large green spaces that provide cooling in wealthier, greener neighborhoods. This concern is compounded for poor residents who lack air conditioning or who cannot afford to turn it on for fear of its impact on their electric bills. This issue will only be exacerbated in the future by both the generally higher temperatures and more frequent extreme temperatures anticipated due to climate change. The city response included opening 91 spraygrounds and distributing “cooling kits”, a response that seems to have prevented the worst outcomes, as no heat deaths were reported in July 2020.¹⁴

What the coronavirus has also highlighted is the way in which the policy problems we face are not simple issues with a single cause and effect. Instead they are complex systems in which a history of discrimination and disinvestment combines with current environmental, health, and economic disparities to compound vulnerabilities. We will never be able to adequately address these inequities unless we develop a community informed policy approach that is equally comprehensive. Despite the fact that urban governance is divided sectorally into the Streets Department, Department of Parks and Recreation, the Philadelphia Water Department, SEPTA, Philadelphia School District, and other departments, our approaches to creating community resiliency cannot be siloed. We must instead take an expansive view using the data we have about communities to consider

the full lived experiences of Philadelphia residents, hear their stories, and take them into account as we target our policy interventions. In a post-COVID-19 world, this will be especially important because cities will have fiscal deficits. We will need to target funds for protective infrastructure that redresses inequities and prepares us for the climate challenges ahead. If we take this approach, identifying our vulnerable communities and designing interventions to address disparities, we will begin to lay the groundwork for a healthy and more equitable future for all Philadelphians.

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