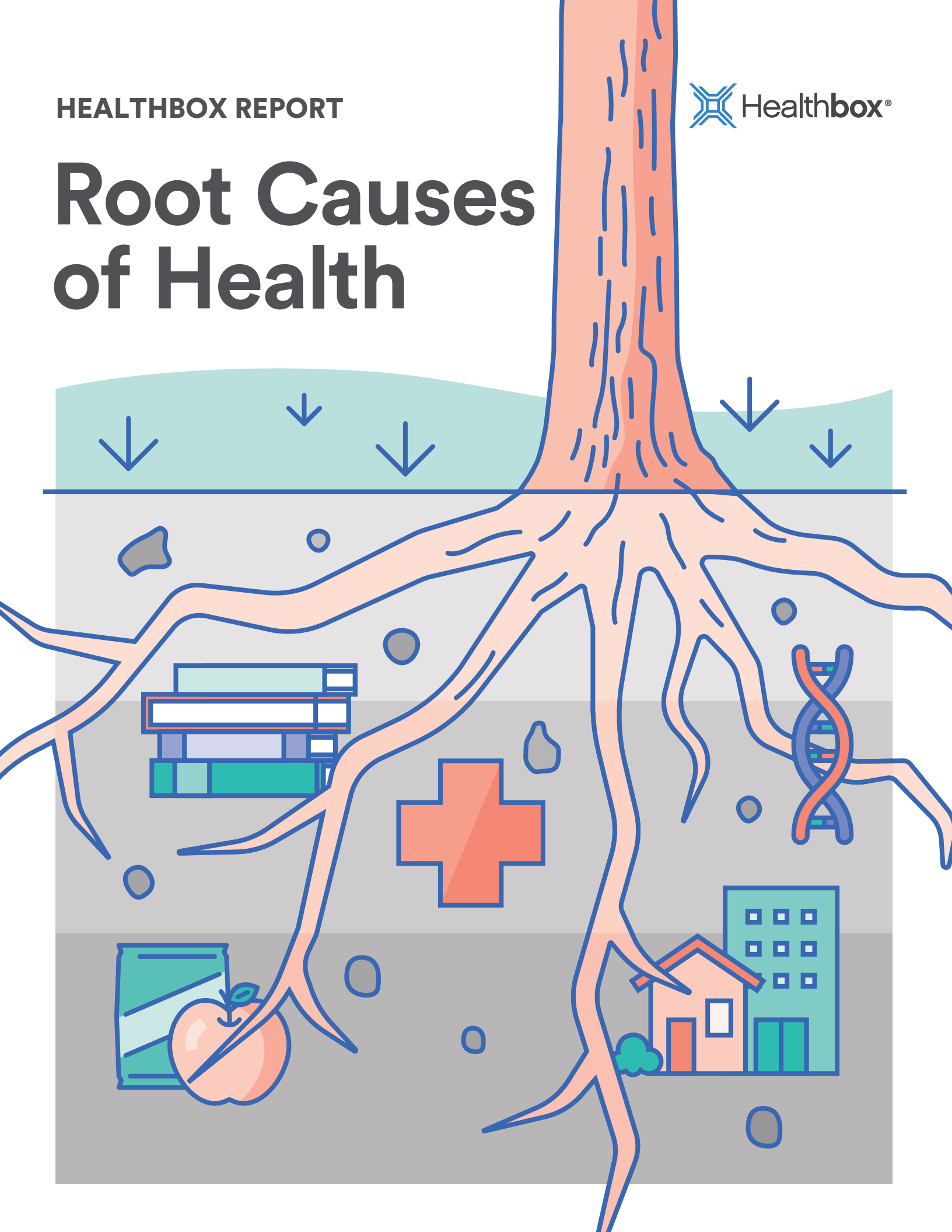
HEALTHBOX REPORT

Healthbox®

Root Causes of Health



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Introduction: Social Determinants

While the U.S. spends a significant portion of its GDP on healthcare, amounting to nearly twice that of other high-income countries,[1] disparities in health outcomes are continuing to increase. This is an unsustainable trend, both at the individual and national level. In order to reverse it, we have to look at the ways that we've previously thought about health, identify which factors contribute to a healthy society, and effectively take steps to create change in population health. Research shows that "although healthcare is essential to health, it is a relatively weak health determinant," only making up about 20% of the factors that determine one's health.[2] Stakeholders across the industry are looking to better understand and address the other 80%, which can be grouped within a category commonly known as the social determinants of health (SDOH).

Defining Determinants of Health

SDOH are defined as "the conditions in which people are born, grow, live, work, and age… shaped by the distribution of wealth, power, and resources at global, national, and local levels."[3] They are also defined as "factors that contribute to a person's current state of health [that may be] biological, socioeconomic, psychosocial, behavioral, or social in nature."[4] SDOH are complex. They are so complex that there is no consensus on the way they are defined. The World Health Organization classifies SDOH as just that- social- with factors such as employment conditions, social exclusion, access to public health programs, and healthcare affecting a person's overall health and wellbeing. The CDC generally recognizes five domains contributing to a person's state of health: biology/ genetics, individual behavior, social environment, physical environment, and health services. Finally, the Kaiser Family Foundation recognizes the following domains as factors affecting SDOH: economic stability, neighborhood and physical environment, education, food, community and social context, as well as the healthcare system. Without a consistent way to discuss SDOH and identify them in our communities, we face the challenge of not knowing where to begin for a collective approach to solving health issues at their root.

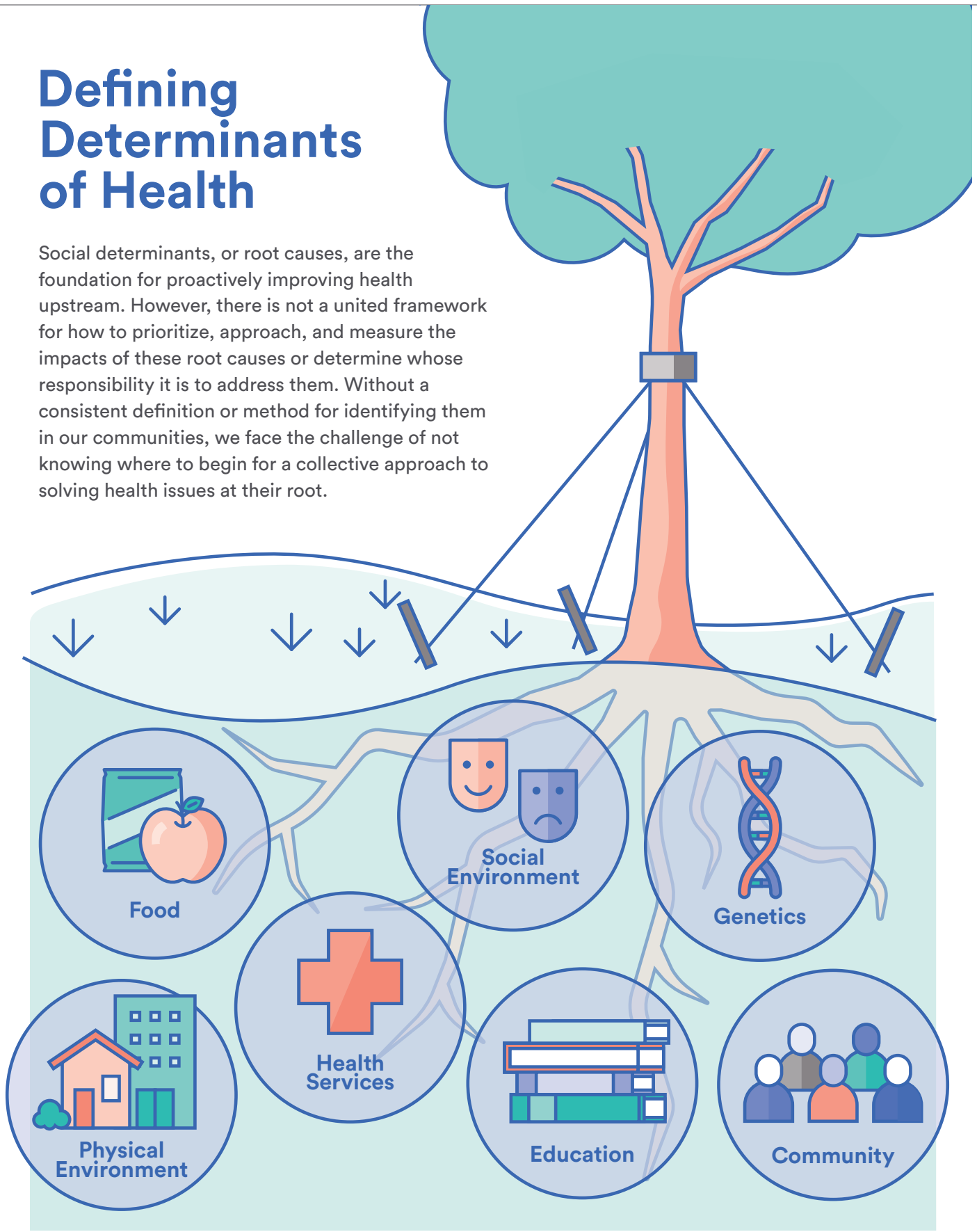
> **"At first when we approached the [Child Opportunity Index] project, we thought we were talking about health equity, but what we found was we were talking about racial equity and that we need to put racism and racial inequity at the center of the conversation."**
>
> **Stacy Lindau,**
> Founder, NowPow

Healthbox has thoroughly examined the various definitions and frameworks that exist, and we have not found one sole definition that rises above the rest. However, based on our research and discussions with key stakeholders in the industry, we decided to add both policy and race to our list of domains due to the profound impact they have on our lives and on one's health opportunities. Research shows that race, place, and health are deeply intertwined. We cannot try and solve health inequity without acknowledging that racism is a key root cause of health disparities. For example, despite having the same socioeconomic status or education level,[5] black mothers and black babies die at three to four times[6] the rate of non-Hispanic white mothers. A Chicago Department of Public Health study, the Child Opportunity Index, that measured various social determinants to assess child opportunity areas found that one in two African American and Hispanic children live in low child opportunity areas compared to 1 in 50 white children. Not all children are exposed to the same type of stressors and hardship. The daily stress of racism has a multigenerational impact that cumulatively and directly impacts one's health and can even change the way genes are expressed.

1 *https://jamanetwork.com/journals/jama/article-abstract/2674671*
2 *Booske, et. al. 2010. County Health Rankings Weighting Methodology*
3 *http://www.who.int/social_determinants/sdh_definition/en/*
4 *https://www.cdc.gov/socialdeterminants/*
5 *https://www.americanprogress.org/issues/early-childhood/reports/2018/02/01/445576/exploring-african-americans-high-maternal-infant-death-rates/*
6 *https://www.cdc.gov/grand-rounds/pp/2017/20171114-maternal-mortality.html*

Defining Determinants of Health

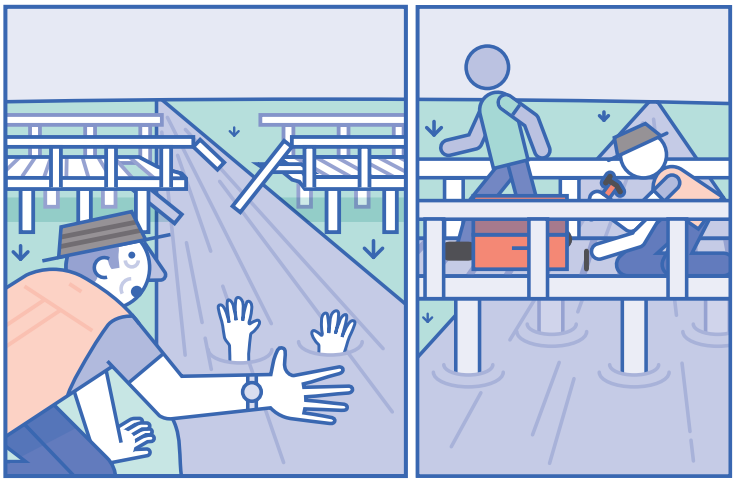
Social determinants, or root causes, are the foundation for proactively improving health upstream. However, there is not a united framework for how to prioritize, approach, and measure the impacts of these root causes or determine whose responsibility it is to address them. Without a consistent definition or method for identifying them in our communities, we face the challenge of not knowing where to begin for a collective approach to solving health issues at their root.



At Healthbox, we do not believe that this complex problem has a simple solution, but we do believe that we all have a role to play in being part of the solution. As part of this report, we aim to reframe the way we think about social determinants by acknowledging that there is nothing social about these issues but that they form the foundation, or the roots, of health. Thus, from this point forward this report will address SDOH as "root causes of health," or "root causes" for short. We have researched the many ways in which organizations have attempted to mitigate the effects social determinants have on individuals and populations and are excited to highlight several key interventions and technologies in this report. The most effective interventions arose out of unlikely partnerships that addressed the effects of root causes upstream, or at the start of the problem, rather than downstream or on a case-by-case basis. This report aims to explore the different ways both conventional and unconventional partnerships along with technology can impact health outcomes at the root level, challenge the way we think about what health means, and bring to light the actionable ways in which we can collectively take responsibility to bring about change.

History

While discussions around the root causes of health have only gained significant attention recently, the knowledge that social and environmental factors significantly influence population health has been reported on and spoken about in the medical community since at least the 19th century. Victor Virchow, a German scientist and physician, was one of the earliest advocates for addressing root causes as a means to prevent the spread of disease. In 1848, he published a paper on the role that poverty and the political economy had on contributing to the plague epidemic in Prussia. During the same period, Friedrich Engels, a German philosopher, wrote a book detailing the links between high mortality and poverty for the working class in England and highlighted the health disparities between those in different classes as well as those living in rural vs. urban regions. Since the mid-1800s when the term "social medicine" emerged, considerable time and resources have been spent examining the ways that social influences impact health and how to best approach these factors to mitigate health risks. However, as both the political and healthcare landscape have shifted over time, so too have our definitions and understanding of what healthy means and where health takes place. The varying and complex frameworks for root causes of health have created confusion on how to prioritize them and have left stakeholders wondering who is responsible for solving these complex issues.



Case Study: A Fishing Parable

A man was fishing in the river when he noticed someone was drowning. He pulled them out and attempted to resuscitate them. Shortly afterwards, he noticed another person in the river and saved them too. He then noticed another, and another and another. Soon he was exhausted and realized he would not be able save all of the drowning people. He went further upstream to find out why all these people were falling into the river.

On arriving further upstream, he discovered a broken bridge was causing people to fall into the river. He decided he would fix the bridge and stop others from falling in rather than fishing them out one by one, or letting them drown when he wasn't there to save them.

The aim of public health is simply to work upstream, or fix the bridge. Health systems, by their nature, are mainly focused on helping those who are drowning, or ill. When framed in this way, preventing illness before it occurs seems vital.[7]

[7] *https://upstreamthinking.wordpress.com/upstream-story/*

Who Bears the Burden of Affecting Change?

The majority of physicians generally believe that root causes matter for their patients. However, they do not believe that it is their responsibility to address them.[8] Compounding this, many physicians do not feel well-positioned to address factors outside of a person's direct health status, even among those who indicated that physicians and insurers should address root causes.

Meaningfully addressing root causes without adding to physician burden depends on channeling sufficient commitment and resources toward programs and policies that help physicians incorporate these social considerations in their practices.[9]

When asked who is best positioned to help patients, most physicians indicated that it would be someone outside of the medical practice; however, some indicated that medical and administrative staff could be better positioned for the task. Diffusion and distribution of responsibility is common when considering root causes of health, not only among healthcare practitioners. The burden of addressing root causes of health should not fall on physicians and clinical staff alone. Insurers, employers, large corporations, community, public health, and philanthropic organizations - all individuals - should bear the burden and work together to improve population health.

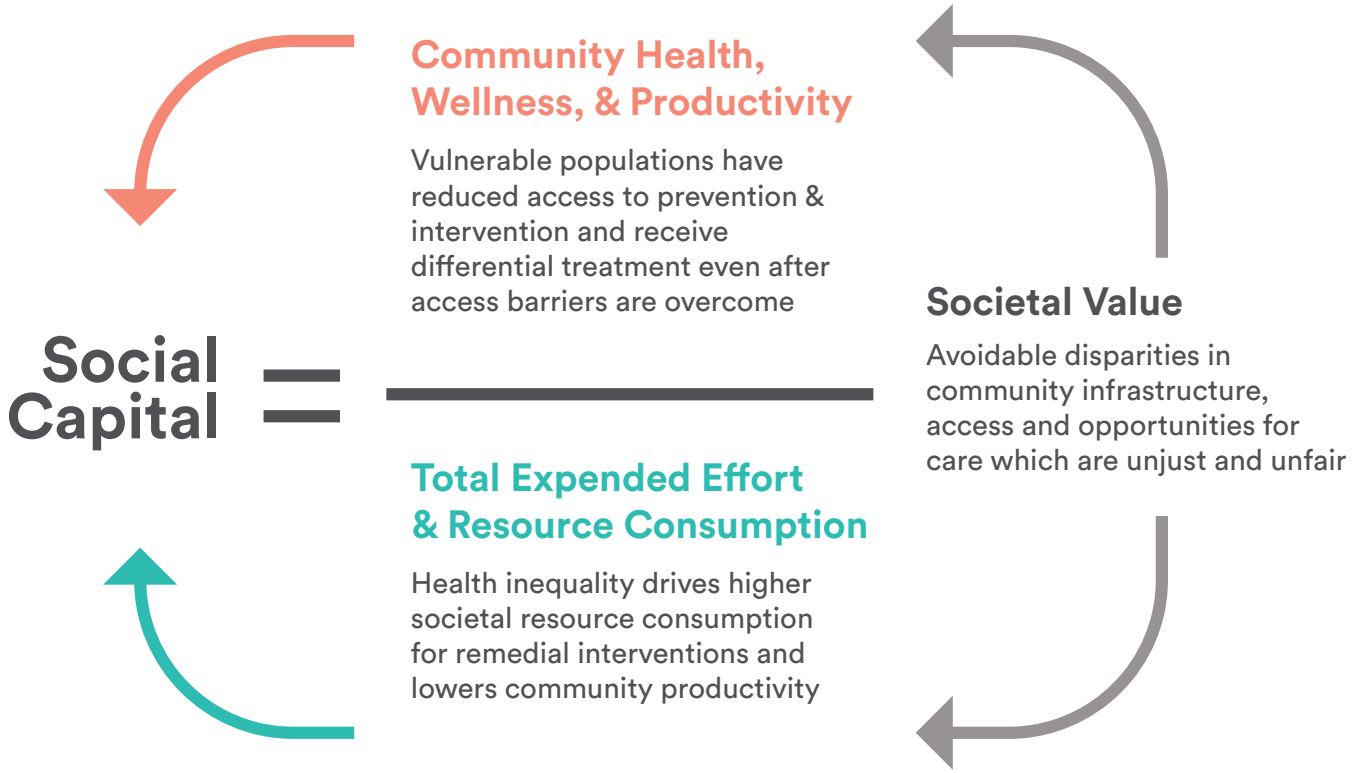
Your Zip Code and Your Health

Your zip code can affect you more than your genetic code. For example, for people living in the Chicago Loop, life expectancy is about 83 years. On the other hand, those living 3 train stops south of downtown, in Washington Park, have a life expectancy of only 69 years. The gap in life expectancy between these two neighborhoods is larger than the life expectancy gap between the U.S. and Honduras.

[8] *https://tinyurl.com/ybrqa5o4*
[9] *https://www.ajmc.com/newsroom/social-determinants-of-health-are-important-but-who-is-responsible-for-addressing-them*

Breaking the Cycle

Root causes, due in part to the "social determinants" moniker they bear, are often regarded as a "soft science." They are not considered on par with other factors affecting health that are measurable, diagnosable, treatable, or preventable by a physician or some other medical intervention. There is a growing interest in exploring the roles healthcare organizations and technology can play in affecting root causes. The majority of the time, the burden of affecting change falls upon philanthropy and public health as a default. While philanthropic and public health organizations have and will continue to do a great deal in addressing root causes, they alone cannot completely break the cycle of inequity which leads to these great health disparities amongst populations.



While many organizations outside of healthcare can also play a significant part in alleviating the burdens and stressors experienced by disadvantaged populations, the focus of this report is on the healthcare and technology aspects.

Technology and Root Causes

New technologies are constantly emerging to address healthcare challenges, but what if we can leverage technology to mitigate these challenges before they arise? A **Patchwise Labs** report predicts that the adoption of social technology will triple over the next five years and spur a wave of commercialization over the next three years. Tools that analyze root cause data combined with traditional (clinical) sources can be used to build predictive models that "inform more appropriate upstream prevention."[10] While some may worry that upstream prevention will reduce the need for new and existing technology to manage health, this is in fact an opportunity to incite innovation to address a new set of needs, challenging us to think proactively about the ways in which we can affect health through technology.

As an example, we can use predictive analytics to stop healthcare crises before they start. By looking at metrics that correlate with risk for lead paint, mold, food establishments most likely to have health violations, or even factors contributing to pollution in the water supply, health workers can use data to prevent outbreaks before they happen.

Many organizations are already beginning this type of work. **NowPow**, a community mapping software platform, collects data about neighborhoods in the Chicago area and is able to provide a detailed list of resources for its residents. **Circulation** uses technology to improve community access to transportation to medical appointments while **PillPack** sorts medication by dose and delivers it straight to the patient reducing barriers such as mobility or access for rural patients. Similarly, **NURX** is an app that addresses what health policy analysts call "contraceptive deserts," by delivering birth control pills and other contraceptives to women who live in rural areas. **Triggr health** uses data and machine learning to help patients recovering from substance abuse predict regressive behavior. Solutions such as these are constantly emerging in the digital tech space. While many of them work on the individual level, others partner with communities and other organizations to proactively improve public and population health.

One unique project with this goal is the Chicago-based **Array of Things (AoT)**. AoT placed nodes around the city which collect urban data that can be used by others to track what is happening in a given community. Sensors in the nodes pick up on light, air and surface temperature, vibration, carbon monoxide, ozone, sound intensity, and traffic markers, among others, to date, with more markers being added. This data could be leveraged to anticipate salting roads before a snowstorm, assessing periods of high pollution, predicting earthquake patterns, and even reducing traffic by warning commuters about congestion to incentivize use of public transportation.

Digital tech companies are not the only stakeholders who are able to move the lever to make change. While the above examples represent rising innovative tech solutions addressing root causes, in the next section, we highlight health systems, communities, and previously established companies leveraging innovative partnerships to tackle healthcare challenges.

[10] *https://www.patchwiselabs.com/store/sdoh2018*

Partnerships Impacting Root Causes

Organizations such as **Geisinger Health System**, **ProMedica**, **Kaiser Permanente**, the **University of Illinois Hospital**, and the **Accountable Care Community (ACC)** of Akron, Ohio are taking a new approach to healthcare. As health systems, the first three work downstream by definition. However, they, along with the ACC and many others, have begun to develop strategies to partner with community stakeholders to look at upstream root causes of health.

In an attempt to provide nutritional guidance and support food insecure patients, **Geisinger Health System** launched their **Fresh Food Farmacy** in the Summer of 2016. This intervention targets diabetic and prediabetic patients and encourages them to use food as medicine, focusing on the concepts that diet and exercise are just as important as medication in regulating blood sugar and managing diabetes. The health system acknowledges, however, that many individuals experiencing chronic conditions may not have access to healthy food, places to exercise, or education about the benefits they entail. Using the "food as medicine" approach, the Fresh Food Farmacy gives patients a prescription for the Farmacy, which provides care management, diabetes education, and consultations with dietitians and pharmacists in addition to online wellness courses, cooking and nutrition classes, and health coaching. Furthermore, Geisinger uses **Community Health Assistants (CHAs)**, non-licensed professionals who are trained to assess patient needs and direct them to the right community programs to "obtain optimal health outcomes and remain safe in the community." The clinical results of this attempt speak for themselves. Within 12 months of receiving a food prescription, patients saw their HbA1C levels drop more than two points, compared with adding an additional diabetes management medication, which averages a 0.5 - 1.2 point drop.

ProMedica also creatively tackles hunger as a health issue. The health system works with community agencies, faith-based organizations, small local businesses, and government leaders to move the lever on hunger as a root cause of health.[11] Some of the health system's initiatives include food security screenings for every inpatient admitted to the hospital, a food reclamation service to safely repackage unserved food from restaurants in the Toledo area, a summer meal sponsorship in the **Children's Hospital**, and the **"Veggie Mobile"**, a solution which addresses access to local, healthy, and affordable food in food deserts throughout **Lenawee County, Michigan**. In addition, ProMedica is a founding member of **The Root Cause Coalition**, working "to reverse and end the systemic root causes of health inequities for individuals and communities through cross-sector partnerships." In October 2017, this coalition brought together more than 450 cross-sector leaders for a second annual summit on the social determinants of health. Representatives from health care, the nonprofit sector, and the faith community along with researchers, clinicians, government and business leaders, and educators came together to share best practices, offer community connections, resources, and further the discussion on how to implement "real, sustainable, community-focused interventions."

Kaiser Permanente took on an ambitious project to improve the lives of their community by pledging $200M to fight homelessness through investments in new housing and community needs for low-income residents of **Santa Cruz County** in California. The goal of this investment to "foster new relationships between cities and companies to address a growing homeless population" puts decision making about investments into the hands of a panel of medical and financial professionals from the organization, basing their decision on social and financial impacts of the investment. Financial gains from this endeavor will be reinvested back into the initial fund. In a similar effort to improve housing, in January, 2018, the **University of Illinois hospital** invested $250,000 to extend its pilot program in partnership with the **Center for Housing and Health** in Chicago to provide chronically homeless patients permanent housing to improve their health and reduce their costly emergency room visits. Results from the 2015 pilot showed that "the average monthly health care cost per client in the pilot dropped 18 percent after they were provided with permanent housing, to $4,785 from $5,879."[12]

[11] *https://www.promedica.org/pages/service-to-the-community/come-to-the-table.aspx*
[12] *http://www.chicagotribune.com/business/ct-biz-hospitals-house-homeless-0114-story.html#*

Partnerships Impacting Root Causes

A unique example can also be found outside of any healthcare organization in **Akron, Ohio**. The ACC in Akron leveraged three health systems that covered 80-90% of the patient population along with 70+ organizations including the local public health districts, employers, the **Chamber of Commerce**, housing groups, public parks, and city planners to gather metrics around diabetes and collectively create interventions to address the disease. Some initiatives by the ACC included working with the **Akron Metropolitan Transportation System** to transform local roads into **"complete streets"**, an assessment of the health impact of the **Akron Marathon**, and faith-based partnerships in the community with the **University of Akron** to improve health education and screenings in the community. In just over two years after the initiative began, the average cost per month of care for individuals with diabetes was reduced by more than 10 percent per month, and patients saw lower BMI scores, lower counts of HbA1C, reduced cholesterol levels, lower amputation rates, weight loss, and a decrease in both emergency department and hospital visits, along with an increase in job creation.

These bold initiatives demonstrate that success is possible with thoughtful interventions and the right partners. Despite these successes, it has been difficult for other such initiatives to get off the ground. Social innovation is a risky endeavor, one that will take a significant amount of cultural change and a shift in the way we think about healthcare to create better incentives for partnership and involvement.

Considerations and Limitations

As reported by Patchwise Labs, the three biggest challenges for social innovation in healthcare are uncertainty around how to approach measurement, risk adjustment, and payment. “In communities across the country, it remains mostly unclear what performance, payment, and accountability look like for non-clinical care. The unifying thread across these issues is data.” With the complexity of capturing a complete picture of social risk factors along with the overall uncertainty about which systemic aspects will most significantly impact ROI once addressed, it’s difficult for tech solutions to determine which metrics are most important to capture and how to report them in a way that incentivizes stakeholders to invest in their solution.

As we shift to a model of value-based care, it is important to address the incentives for physicians to work with only certain populations. Since patients with more social risk factors have poorer health outcomes regardless of provider quality, physicians are rightfully concerned that they will be penalized for caring for socially disadvantaged patients. According to an article published in the New England Journal of Medicine, “a number of studies have demonstrated that value-based payment programs disproportionately penalize providers that serve poor people.”[13] If payment models fail to adjust for social risk factors’ effects on health outcomes, this may incentivize providers to only see patients of a certain socioeconomic status to prevent their bottom line from being unfairly impacted.

Data can be used in both positive and negative ways. The more information that is collected about a patient, the easier it is to make decisions about their health. To date, population health management efforts by insurers have created wellness programs and initiatives to promote healthy behavior. At the same time, patient advocates worry that just as information which flags good behavior leads to incentives, bad behavior could result in penalties. Analytic tools can be used to provide information that could aid insurers in making policy decisions that save them money by denying care to patients.

Lack of cohesion on both these definitions and incentives makes it difficult for stakeholders to know how to measure the impacts root causes have on health and root cause-based interventions on health outcomes.

[13] *https://www.nejm.org/doi/full/10.1056/NEJMp1715455*

Conclusion: Next Steps for Healthcare

Health exists well beyond the four walls of a clinic or within a prescription bottle; it encompasses so much more than a patient's personal choices or interactions with a provider. With clear evidence showing how profoundly social and environmental factors directly determine one's health status and health opportunities, there is increasing prioritization of tackling healthcare challenges at the root level and broadening our perspective of where health takes place, thus re-examining where we can intervene to improve population health. While deciding on a single definition for root causes of health or implementing one of the technologies outlined above will not make health system complexities disappear overnight, taking a collective upstream approach to improving healthcare challenges holds serious potential to significantly reduce existing health inequities. Data and technology allow changemakers the ability to better understand the populations they serve and to identify areas of greatest need; however, even more power lies in forming partnerships to develop innovative solutions and more broadly leverage these tools to influence community health. As we shift to value-based care models and patient-centered solutions, we should be asking how these shifts in care delivery influence our incentives and challenge policies that do not put patient health first. As author Alice Hoffman said, "Once you know some things, you can't unknow them; it's a burden that can't be given away." Equipped with the awareness and knowledge the root causes framework provides and of the avoidable disparities that exist, it should be a goal of the healthcare community to more justly and effectively allocate resources to areas of greatest need and to build communities that truly allow for all people to make healthy choices.

About Healthbox

Healthbox is a healthcare innovation services firm that leading organizations trust with decisions on when and how to build, buy, or partner. Founded in 2010, we were the first to combine investing experience and consulting services in a way that is strategic, objective, and actionable for providers, payors, and others across the industry. Our unique perspective and expertise drives innovation from inside organizations and out to produce lasting impact with our partners. We are proud to work with healthcare leaders who share our passion for building, harnessing, and advancing solutions to empower the reinvention of healthcare.