

NATURE AND HEALTH

EMERGING KNOWLEDGE INFORMS NEW POLICY DIRECTIONS

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Equitable healthcare requires equitable access to nature



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When you are young, you want to see the world.

I know that I did. I thought the best way to do that would be to become an astronaut and see the world from space. However, with the prevailing sentiments around race in the 1960s, there was no chance for a young Black kid from St. Louis, Missouri, like me, to see the world that way. So I found another way to see the world, the natural world, and that was by joining the Boy Scouts.

My uncle was a troop leader and took our segregated troop outdoors. It was invigorating, exciting, and even liberating. All of the societal barriers and constraints on what Black children could do didn't exist in the outdoors. Boy Scouts gave me an abiding love for the natural world and a fierce determination to protect the earth's natural resources.

The health of the planet and the health of people are inextricably linked. In the 1980s, E.O. Wilson introduced the concept of biophilia, which essentially says that we as human beings have an innate affinity for other living things.¹ We are intrinsically connected to the natural world. It's who we are.

When I became an adult and a physician, I came to see that the future of our planet depends upon us instilling that same abiding love and fierce determination to protect our natural resources in every member of the next generation. Twenty years ago, I joined the board of NatureBridge, an organization dedicating to creating the next generation of environmental stewards by educating them about our national parks.

Dr. Stephen Lockhart on Clouds Rest, Yosemite National Park | DR. STEPHEN LOCKHART



> *The health of the planet and the health of people are inextricably linked*

While my childhood in 1960s segregated St. Louis certainly had many hardships and constraints, one privilege I did have, thanks to my uncle, was access to the natural world. Many children—especially those from minority groups and low socioeconomic classes—still lack equitable access to nature and the outdoors.

The restrictions come in part from limitations on where people live. Housing redlining may no longer be allowed, but housing segregation still exists, and the most low-income and segregated communities often have the least access to nature.

It's not only where people live but also where they are welcomed. Acknowledging the generations of systemic racism, discrimination, and inequality in our park systems is a first step. We need to redefine what our parks mean and make them more accessible, so that everyone can feel welcome and represented in these beautiful places that we all should enjoy.

Access to green space isn't just an issue of quality of life. It should be a recognized social determinant of health (SDOH), along with nutrition, housing, and transportation. We know that access to green space correlates with better health outcomes. An ecological study in New York City found that children living in areas with more street trees have a lower prevalence of asthma.² Another study showed that simply having more tree cover in a neighborhood led to as much as a 13% improvement in student outcomes.³ And there are numerous, widely cited studies on the physiological and mental health benefits of spending time in nature.

Researchers have found that park prescription programs, with or without a guide, can decrease stress in low-income patients and can promote healthier lifestyles, while increasing access and utilization of parks.⁴ For example, a cancer institute in Atlanta offers forest therapy for newly diagnosed cancer patients.⁵

NatureBridge, educating children about our national parks. | [NATUREBRIDGE](#)



> *It's not only where people live but also where they are welcomed*

As chief medical officer of Sutter Health, one of California's leading health systems, I have learned a lot about the populations we serve. There are inequities across the system that are hard to vanquish. The access to nature that I was lucky enough to experience as a child is not afforded to all children that Sutter Health cares for.

Sutter serves one of the most demographically and geographically diverse regions in the nation. As a large integrated healthcare delivery network, we serve more than 3 million patients across 22 northern California counties, including urban, suburban, and rural communities.

Three years ago, Sutter created an Advancing Health Equity team, which I lead as chief medical officer, to begin addressing health disparities in a systematic and data-driven fashion.

Our first step was to create a novel metric to identify and quantify disparities within health systems and develop targeted interventions to enhance equity.⁶ Sutter's Health Equity Index (HEI) is the first implemented health equity metric that uses real-time health system data combined with external demographic, prevalence, and utilization statistics to identify disparities, reveal their underlying causes, and pave the way for targeted interventions. In order to solve any problem, you need to first measure it. Using the HEI, we are uncovering disparities in health outcomes, including disproportionately higher rates of emergency department visits for asthma among African American patients, and we are designing targeted interventions to address this.

One area we have yet to study is the equity of access to the outdoors, which we know is a determinant of health. Although we believe such inequities exist and impact health, we don't yet have good metrics to identify and quantify the problem, which are key to solving it. As we work to address healthcare disparities, we must also talk about access to nature and protecting the environment.

Our next step in addressing health equity is to develop tools to assess environmental factors and their specific impact on health outcomes. We could create a healthcare metric like the HEI, an environmental health equity index, to identify and quantify lack of access to green space and nature, and its potential impact on health outcomes and specific disease states. To achieve this, we could capture environmental access utilization by race/ethnicity; quantitatively define access to green open space, air quality, and other factors; and correlate that with a given health outcome (e.g., asthma).

Like the HEI that we have already developed, the environmental HEI could be used to identify and quantify disparities in health outcomes and provide additional insight into the role that environmental factors play.

We could apply the environmental HEI to deepen our understanding of what we have already observed in our communities. We know that inequitable access to nature, environmental factors, and impact of climate change all contribute to poor health outcomes. Take the example of asthma. If we identify a geographical area with a larger than expected burden of disease, we can ask such questions as: what part of this burden is attributable to environmental effects versus health effects (e.g., lack of treatment, access to care, or access to medicine)?

With the current HEI, we quantified the impact of healthcare access on equitable outcomes. We measured something that we believed should be impacted by access to healthcare, and hypothesized that if we improve access in a culturally appropriate way, outcomes would improve. The HEI requires both publicly available data and internal healthcare system data. Externally sourced demographic and prevalence data are generally available from census datasets and public health or government institutions. Similarly, development of an environmental HEI will require data that create a full picture of the both the surrounding



San Francisco Bay from Divisadero Street in the Pacific Heights neighborhood of San Francisco. | SUTTER HEALTH

environment (e.g., distance from parks and green space), as well as ease of access and cultural barriers to its use. To move us in this direction, healthcare organizations across the country, including government and payers, need to include “access to nature” as an additional SDOH.

There is a substantial body of research and applied epidemiological studies supporting environmental factors being incorporated in SDOHs, such as the distinguished “Climate Change, Health and Equity Initiative” by the Kresge Foundation. If we are going to try to lower healthcare costs and improve outcomes, we simply cannot ignore the contribution green spaces can make. According to a study in JAMA (the Journal of the American Medical Association), every dollar spent on park trails can save three dollars in healthcare costs alone.⁷ That is a tremendous return on investment.

Climate change is an existential threat to the very environment that we wish to use to promote human health. There is now a growing awareness within the medical community of the need to mobilize healthcare institutions and policymakers to address climate change.

Calling for a stronger public health infrastructure, the American College of Physicians (ACP) concluded that careful consideration must be given to environmental health and climate change among other social determinants, which can impede achievement of good health. The ACP characterized environmental impacts as an “immediate, grave, and growing threat.”⁸

Several pediatricians presented their rationale for including climate change as an additional SDOH, highlighting the impact it will have on child

> COVID-19 ripped the Band-Aid off of the structural inequities in our society and our healthcare system

health, particularly in low income and minority communities.^{9,10} As California Surgeon General Nadine Burke Harris, MD, MPH, observed when she was a pediatrician in the Bayview-Hunters Point neighborhood of San Francisco, adverse childhood experiences can impact long-term health outcomes for children. Environmental factors can have a large impact on health, increasing the risk for chronic disease, asthma, heart attack, and anxiety disorders.

Now is the time. We can't wait. Systemic racism and environmental injustice have left the same at-risk communities of color to absorb a triple whammy of climate change, disproportionate burden of chronic disease, and the impact of the COVID-19 pandemic. COVID-19 ripped the Band-Aid off of the structural inequities in our society and our healthcare system. We recently published

the findings that African Americans COVID-19 patients within the Sutter network were nearly three times more likely to be hospitalized than their non-Hispanic white counterparts, and they delay accessing care until they are sicker and more likely to develop more severe illness, requiring hospitalization and ICU (intensive care unit) care.¹¹

We are seeing the impact of climate change in the communities Sutter serves and it means our work is intimately connected to the larger issues of environmental change and destruction of nature around the world. As the medical journal *The Lancet* noted, response to climate change could be the greatest global health opportunity of the 21st century.¹² We have seen the dire impacts of climate change in northern California. Thick wildfire smoke encased California for weeks in August and early September 2020 and air quality hit toxic levels, which contributed to 1,200 deaths that would not otherwise have happened and 4,800 additional emergency department visits.¹³

We serve populations that have built-environment inequities and natural-environment injustices, and, after the impacts of climate change are factored in, it makes it extremely challenging to achieve good health outcomes.

But there are measures that can be taken. The current pandemic, with its unexpected positive impacts on the quality of life of urban inhabitants (e.g., less traffic, improved air quality, greater awareness of the surrounding environment), has presented unprecedented opportunities for cities to integrate green components and open spaces into their urban renewal plans. The clear priority of the United Nations Environment Program and current programs being implemented in the European Union focus on the decarbonization of cities through elimination of source pollutants. Innovative urban renewal projects focus on net-zero energy projects, more open space, and urban forestation.¹⁴ Tremendous strides are being made in many cities, including a renovation of their

Smoke from large wildfires has affected air quality over most parts of California in recent years. This was the view from the front entrance of Sutter Santa Rosa Regional Hospital during a 2017 wildfire. | SUTTER HEALTH



transportation corridors and a lessening of their traffic impact on the urban environment. For example, Seattle has announced that 20 miles of streets will be permanently closed to cars.¹⁵

Sutter has a dedicated sustainability initiative to reduce the carbon impacts of its operations across the board. COVID-19 has helped us to realize that not every meeting needs to be in person, and we shifted to virtual meetings. We’ve also learned that in many circumstances, telehealth is a viable option for providing convenient, accessible, and seamless care. During the pandemic, Sutter Health significantly expanded telehealth—video visits increased by 32,000% over a two-month period—and this has allowed us to reach many traditionally

underserved communities who may otherwise struggle to access the treatment they need. Many Sutter Health employees working in non-direct patient care have embraced working from home, and Sutter plans to continue this option for the foreseeable future.

One community we serve in San Francisco, Bayview-Hunters Point, could greatly benefit from better access to green space. This “health-vulnerable zip code,” hosting the city’s largest African American population, was cited as having among of the highest rates in the city of preventable hospitalizations related to air pollution and high levels of asthma and respiratory conditions.^{16,17} Home to a federal superfund site,

Cleanup sign at Hunters Point Shipyard, a Superfund site. | TODD LAPPIN / FLICKR / CREATIVE COMMONS



> *It is time to stop thinking of equitable access to nature and green spaces as simply something that is nice to have*

Hunters Point Shipyard, the neighborhood is a highly contaminated area with heavy industry and toxic environmental pollution, and residents suffer disproportionately from many adverse health outcomes, including infant mortality, congestive heart failure, hypertension, emphysema, asthma, and cancer.¹⁸ In the case of Bayview, there may be a solution soon. The city of San Francisco is considering funding the India Basin Park on the waterfront in hopes of making the area more accessible for the community. The city's Department of Recreation and Parks owns the land and hopes to involve a diverse group of community members in the planning process: designing the park, creating public art, and developing outdoor nature youth programs. They have hired an equitable development program manager to define and address key issues as part of the plan to make the development more inclusive for the Black community in Bayview.¹⁹

It is time to stop thinking of equitable access to nature and green spaces as simply something that is nice to have. It is essential to health and our public policies must address these disparities. Right now, we all share in the costs that derive from not addressing environment as an SDOH in our public policies. Because of inequities in access to nature and protection for the environment, we pay for chronic disease management, higher rates of cancers, behavioral health issues such as depression, and more. Widening the lens further, we see the cost to society of global warming, as well as the human cost of losing many people before they would have died had they had equitable access to a healthy environment.

The COVID-19 pandemic only underscores the urgency of addressing access to nature and a healthy environment as an SDOH. Addressing environmental inequities as part of the decarbonization of cities and green urban renewal initiatives will greatly improve overall health of the people in our communities moving forward.

A challenge that we are fairly late in addressing is to understand that human health and environmental health are linked. Now that the more serious impacts of global warming, pollution, and lack of access to nature are obvious, we are recognizing the need for policy changes to protect our environment as a way to protect ourselves. The time is now to rebuild public health infrastructure in an equitable way, with access to nature built in, to have a truly resilient public health infrastructure ready to address the next challenge.

We don't have time to wait for someone else to take the lead on this. It is now up to each of us to take personal responsibility for leading the changes needed to protect planet and people.

Endnotes

1. Wilson, E.O. 1984. *Biophilia*. Cambridge, MA: Harvard University Press.
2. Lovasi, G.S., et al. 2008. Children living in areas with more street trees have lower prevalence of asthma. *Journal of Epidemiology and Community Health* 62(7): 647–649.
3. Sivarajah, S., et al. 2018. Tree cover and species composition effects on academic performance of primary school students. *PLoS One* 13(2): e0193254.
4. Razani, N., et al. 2018. Effect of park prescriptions with and without group visits to parks on stress reduction in low-income parents: SHINE randomized trial. *PLoS One* 13(2): e0192921. <https://doi.org/10.1371/journal.pone.0192921>
5. Kalaichandran, A. 2018. Take a walk in the woods. Doctor's orders. *New York Times*, July 12. <https://www.nytimes.com/2018/07/12/well/take-a-walk-in-the-woods-doctors-orders.html> (accessed October 4, 2020)
6. Pressman, A., S. Lockhart, J. Petersen, S. Robinson, M. Moreno, and K.M.J. Azar. 2019. Measuring health equity for ambulatory care sensitive conditions in a large integrated health care system: The development of an index. *Health Equity* 3(1): 92–98.

7. Wang, G., et al. 2005. A cost-benefit analysis of physical activity using bike/pedestrian trails. *Health Promotion Practice* 6(2): 174–179. <https://pubmed.ncbi.nlm.nih.gov/15855287/>
8. Butkus, R., et al. 2020. Envisioning a better U.S. health care system for all: Reducing barriers to care and addressing social determinants of health. *Annals of Internal Medicine* 172(2 Suppl): S50–S59. <https://www.acpjournals.org/doi/10.7326/M19-2410>
9. Ragavan, M.I., et al. 2020. Climate change as a social determinant of health. *Pediatrics* 145(5).
10. Krugman, S. 2020. Addressing climate change as a pediatrician. *The American Academy of Pediatrics Journals Blog*, April 14. <https://www.aappublications.org/news/2020/04/14/addressing-climate-change-pediatrics-4-14-20> (accessed October 4, 2020)
11. Azar, K.M.J., Z. Shen, R.J. Romanelli, S.H. Lockhart, K. Smits, S. Robinson, S. Brown, and A.R. Pressman. 2020. Disparities in outcomes among COVID-19 patients in a large health care system in California. *Health Affairs*, May 21, 39(7).
12. Watts, N., et al. 2015. Health and climate change: policy responses to protect public health. *The Lancet* 386(10006): 1861–1914.
13. Smith D. 2020. ‘These are hidden deaths.’ Over 1,000 likely died early due to California’s wildfire smoke. *Sacramento Bee*, September 23. <https://www.sacbee.com/news/california/fires/article245947495.html> (accessed October 4, 2020)
14. McLeod, W. 2020. Post-COVID recovery & climate change. *Carbon Creed*, September 27. <https://carbon.substack.com/p/un-climate-week-arrives-our-common> (accessed October 4, 2020)
15. Milman, O. 2020. Why some US cities are plotting a ‘green recovery’ after the pandemic. *The Guardian*, September 18. <https://www.theguardian.com/world/2020/sep/18/us-cities-plot-green-recovery-after-pandemic> (accessed October 4, 2020)
16. San Francisco Department of Public Health. 2017. *San Francisco’s Climate and Health Adaptation Framework*. https://sfclimatehealth.org/wp-content/uploads/2018/12/SFDPH_ClimateHealthAdaptFramework2017a.pdf (accessed October 4, 2020)
17. Bay Area Air Quality Management District. 2014. *Improving Air Quality & Health in Bay Area Communities. Community Air Risk Evaluation Program Retrospective and Path Forward (2004–2013)*. https://www.baaqmd.gov/~/media/files/planning-and-research/care-program/documents/care_retrospective_april2014.pdf (accessed October 4, 2020)
18. Bayview Hunters Point Mothers Environmental Health & Justice Committee, Huntersview Tenants Association, and Greenaction for Health & Environmental Justice. 2004. *Pollution, Health, Environmental Racism and Injustice: A Toxic Inventory of Bayview Hunters Point, San Francisco*. <https://greenaction.org/wp-content/uploads/2019/06/thestateoftheenvironment090204final.pdf> (accessed October 4, 2020)
19. Coale, K. Is this the Bayview’s big park moment? *Bay Nature*, September 8. <https://baynature.org/2020/09/08/is-this-the-bayviews-big-park-moment/> (accessed October 4, 2020)



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