

Promoting Health, Protecting Our Planet

PATHWAYS FOR PHILANTHROPIC IMPACT



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Introduction

Climate change is the greatest health threat facing humanity.¹ None of us will remain unscathed in the coming decades, and millions of people are suffering devastating consequences to their health and livelihoods today. Transforming the social, economic, and technological drivers of this crisis offers the greatest opportunity we have ever known to create health and wellbeing where there is now growing suffering. Philanthropy—which can be nimble, risk-tolerant, and transformative—can and must play a role in catalysing, accelerating, and scaling the massive transitions we need to protect our collective health from the threat of climate change. This report provides a strategic overview of where philanthropists and funders can make significant impact at the climate and health nexus.

It is important to note that while there are many efforts underway to understand, define, and address the inextricable linkages between climate change and health, there is no single, universally accepted framework through which to view the intersection. This report is not designed to provide a comprehensive overview of the field; rather, it is a tool. It is based on current evidence on the health impacts of climate change and informed by a group of global experts in climate and health research, financing, policy, and philanthropy to help funders set a course for action and start investing at this intersection with confidence. In addition, it offers insights for actors in government, financial institutions, and the private sector about how philanthropy can align with their own efforts to finance and enable the systems-level climate and health interventions we ultimately need to protect our health and our planet.

2023 is set to be the warmest year on record.

Source: “Hottest September on Record Puts 2023 to Be the Warmest Year Ever,” UN News, October 2023

The Climate Crisis Is a Health Crisis

The cascading ramifications of greenhouse gas emissions we are causing surround us, but they are most viscerally felt in their impacts on our health. The news is filled with reports of record-breaking damage inflicted by extreme weather: people fleeing drought-driven famine, villages swept away by floods, skies choked with smoke from raging wildfires, and cities sweltering under endless heat waves. Other dangers are more insidious, with more people affected by malnutrition due to reduced crop yields; lung and heart disease caused by polluted air; cholera from contaminated water; and malaria and dengue spread by proliferating mosquitoes, which serve as disease vectors.

In addition to causing injury and contributing to disease, climate change indirectly harms our health by making it harder to earn a living, degrading community infrastructure, and decreasing the accessibility and quality of essential services like health care and education.² The climate crisis also poses multifaceted dangers to mental health. Exposure to extreme weather and its resulting destruction can cause acute and lingering trauma. Damage to economic, social, and food systems creates chronic stressors like loss of income, displacement, and hunger that can have lifelong impact on our mental and physical wellbeing.³

While we are all affected, the causes and consequences of the climate crisis are not evenly distributed. Some countries and populations face more immediate and dire threats than others. Ninety-two per cent of global greenhouse gas emissions between 1850 and 2015 originated in wealthy, industrialised (primarily Western) nations, but it is low- and middle-income countries (LMIC)—which have contributed the least to the crisis—that are bearing the brunt of harm due to their geographical and economic status.⁴

Climate change multiplies the burden of existing social and economic inequities and injustices on marginalised groups who already lack access to adequate health services, including women, children, racial and ethnic minorities, Indigenous communities, migrants, people with disabilities, and those living in poverty.⁵ In addition, the economic losses associated with climate change increase pressure on families and communities challenged with the compounding effects of the COVID-19 pandemic, the international cost-of-living and energy crises, and escalating conflicts and wars.⁶ We are at a precipice where climate change threatens to reverse decades of gains in public health⁷ and poverty reduction.⁸

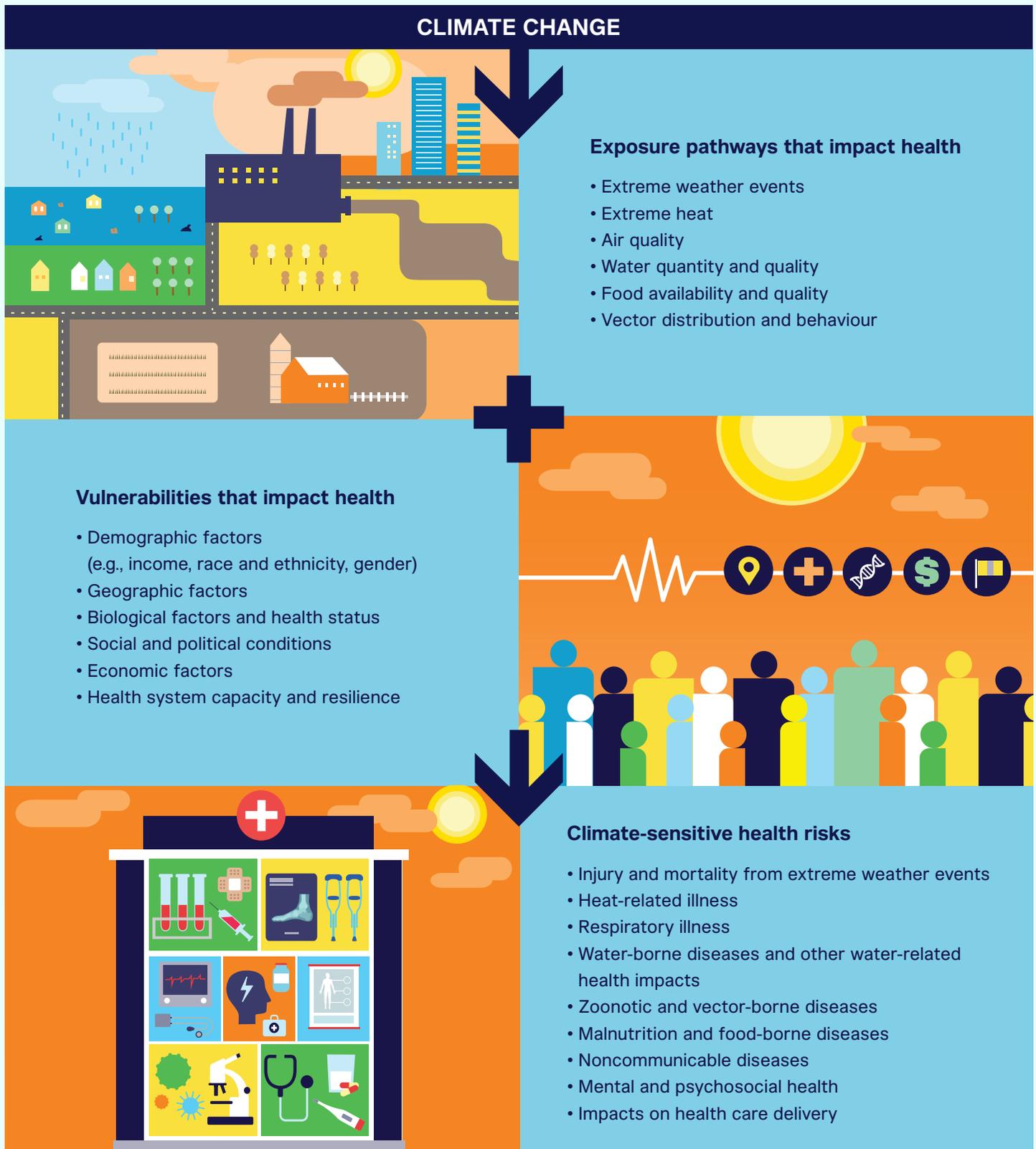


Community of Llupa, Huaraz, Peru, 2021. “We use our canal in this time of drought to irrigate our fields and for our animals. Now the swamps are disappearing, they are drying up.” Jose Pariamache, chief of the ALA, the association in charge of water for irrigating the fields, verifies the distribution of water.

Credit: Florence Goupil © Wellcome, Commissioned by the Wellcome Photography Prize

FIGURE 1

How Climate Change Affects Health



An Urgent Call for Collaborative Action

A global response to climate change that puts our health and wellbeing at its centre is essential to safeguarding a livable future. The connections between climate and health are well established; while we urgently need to scale up research and evaluation, we must act now.

To move at the speed and scale this crisis requires, the climate and health communities must break out of their respective silos and work as allies on the many win-win opportunities to reap climate and health benefits.^{9,10} Collaboratively solving climate and health challenges provides unprecedented opportunities to rethink how we could live in a society that is healthier, safer, and more equitable. The most effective approaches will be holistic and interdisciplinary, informed by the complex interconnections between climate change, environmental pressures, social and economic development, and physical and mental health.¹¹

Philanthropy is uniquely positioned to advance comprehensive and systemic change at the climate and health intersection by:

- Convening actors and ideas across diverse sectors and disciplines—such as government, businesses, and civil society, as well as global public health, environment, urban planning, and food and agriculture—locally, regionally, and globally.
- Prioritising funding for the needs of those who are most vulnerable to the health impacts of climate change.
- De-risking novel climate and health interventions, and investing in global public goods, to catalyse scaled public and private sector investment.

To fully unlock the potential of climate and health opportunities, the current level of philanthropic funding at the intersection must grow significantly.¹² Collaborative funding platforms can be particularly effective at bringing together donors with diverse interests to amplify the impact of philanthropy. Funders can also invest in regranteeing organisations specifically designed to provide deep subject-matter and/or regional expertise, and channel resources to the people and groups best positioned to accelerate on-the-ground progress on complex issues at the climate and health intersection.¹³

Without significant action, climate-related health consequences are projected to escalate.

By 2030

44 million

additional people pushed into poverty because of climate-driven health impacts

\$2–\$4 billion

in direct health costs incurred annually by climate change

Between 2030 and 2050

250,000

additional deaths per year from heat stress, malnutrition, malaria, and diarrhoea

By 2050

10 million

additional children afflicted by stunted growth due to climate-driven malnutrition

86%

of the world's population exposed to extreme heat

30%

increase in wildfires

1.2 billion

displaced due to climate change and natural disasters

Sources: "Health and Climate Change," The World Bank, August 2023; "Climate Change," World Health Organization, October 2023; "The Impact of Climate Change on Health: Reducing Risks and Increasing Resilience in the Era of COVID-19," EcoHealth Alliance, November 2021; "Number of Wildfires Forecast to Rise by 50% by 2100," World Meteorological Association, February 2022; "Global Health, Climate Change and Migration: The Need for Recognition of 'Climate Refugees,'" Journal of Global Health, March 2023

Targeting Win-Win Opportunities in Climate and Health

Only comprehensive, long-term efforts to reduce and remove greenhouse gas emissions across all sectors and decrease global warming can ensure widespread and enduring protection from climate-related health risks.

The goal of the 2015 Paris Agreement, a legally binding international treaty on climate change, is to limit global warming to well below 2 degrees Celsius, preferably to 1.5 degrees Celsius, compared to pre-industrial levels.¹⁴ Achieving this ambitious temperature goal will require us to achieve net-zero carbon emissions by mid-century—the point at which there is an overall balance between greenhouse gases produced and taken out of the atmosphere. This requires drastically and rapidly transitioning away from the use of polluting fossil fuels and protecting and enhancing the ability of nature—its vegetation, soils, and oceans—to absorb carbon dioxide.

Strategies to achieve net-zero emissions will address the root cause of the problem and save millions of lives, but some will measurably benefit health over the long-term because carbon dioxide impacts climate over its centuries-long lifespan in the atmosphere. However, for many of us, the consequences of global warming are irreversible; reducing climate-related health risks also requires addressing our vulnerabilities and ability to anticipate, minimise, respond to, and recover from the current impacts of climate change.¹⁵ Philanthropy needs to act on building health resilience and working toward net-zero.

This report highlights synergistic opportunities that provide the most direct route to alleviating the health impacts of climate change while advancing progress on reducing emissions.* These opportunities target one or more of the following impact goals:

- Reducing mortality, morbidity, and disease burden on individuals and societies from climate change-related health risks.**
- Reducing greenhouse gas emissions and addressing key drivers of greenhouse gas emissions in ways that have near-term benefits for health.
- Reducing vulnerability and bolstering resilience to the impacts of climate change in ways that benefit our health in the near term.

The opportunities do not fall into the silos of addressing either vulnerability factors or emissions; they do both. When we can protect our health and safety from the immediate threats of climate change, we are better equipped to make lasting reductions to greenhouse gas emissions, which in turn creates durable and universal improvements to global health.



Modelling scenarios of nine representative countries across income levels and regions showed that, in those countries alone, meeting Paris Agreement goals for limiting global warming could prevent an annual total of:

5.86 million

nutrition-related deaths

1.18 million

air pollution-related deaths

1.15 million

deaths due to physical inactivity

Source: “The Public Health Implications of the Paris Agreement: A Modelling Study,” *The Lancet Planetary Health*, February 2021

* Wellcome and Climate Lead are happy to direct funders to additional resources on catalysing sector- or systems-wide emissions reductions.

** See Figure 1 on p. 4 for more information about how the World Health Organization and other leading public and global health experts define climate-related health risks.

FOCUS ON

Climate Change and Health Inequity

Across the globe, we are not all equally vulnerable to climate-sensitive health risks. Health inequity — the unjust and preventable disparities in health and access to care — is exacerbated by climate change.¹⁶ The industrialisation and economic growth of wealthy nations in Europe and the U.S., made possible by centuries of resource extraction from South America, Africa, and Asia, and from Indigenous and Black communities, has resulted in a present state where people most burdened by health disparities are the same people most vulnerable to the impacts of climate change.¹⁷ Philanthropists can help confront and correct¹⁸ this history of colonialism, racism, and extractive economic systems that disproportionately harms some communities and countries.¹⁹

Low- and middle-income countries (LMIC) — which have contributed the least to climate change — are more vulnerable to health-harming

consequences, from famine and floods to diseases spread by insects and through dirty water and air.²⁰ Many LMIC are in the hottest regions of the planet, face greater exposure to rising temperatures, and frequently do not have adequate infrastructure, public services, and health systems to respond and adapt to the climate crisis.²¹

Within countries rich and poor, marginalised racial and ethnic groups, Indigenous Peoples, and migrants are more likely to live and work in environments with heightened climate and health risks, while lacking the power, resources, rights, and opportunities that promote health and wellbeing. These injustices often intersect with and are compounded by inequities based on gender, income, disability, and other factors.²²

For instance:

- The effects of climate change jeopardise women's health in many

ways, like temperature rise causing an increase in domestic violence;²³ air pollution affecting birth outcomes and maternal health;²⁴ and disasters disrupting access to services that protect sexual and reproductive health and rights.²⁵

- About 80 per cent of the global population most at risk from climate-worsened crop failures and hunger lives in Sub-Saharan Africa, South Asia, and Southeast Asia, where farming families are disproportionately poor and vulnerable.²⁶
- In the U.S., Black, Hispanic, and Asian communities are more likely to live in areas that heat to unsafe levels and are near sources of pollution and greenhouse gas emissions like factories, power plants, and highways. These health-damaging exposures are the result of past racist policies, such as redlining, and ongoing inequitable

Continued on p. 8.

How Philanthropy Can Help

There is enormous opportunity for funders to intentionally address the inequitable impacts of climate change on health by focusing on interventions that:

- Integrate and celebrate the voices and needs of those most impacted.
- Enfranchise marginalised populations to make decisions and lead solutions.
- Disrupt the positive feedback cycle between injustice and climate change, and shift the landscape of political, economic, and cultural power.²⁹

By considering equity and justice in climate and health action, philanthropy can purposely seek to minimise global suffering and rebuild our world into one that is healthy, safe, and livable for everyone. Throughout all five pathways for philanthropic funding, this landscape highlights opportunities to deeply and meaningfully invest in strategies that address climate change and health equity at the same time.



zoning policies that systematically disinvest in minority and low-income neighbourhoods.²⁷

- Indigenous Peoples, whose ways of life are more dependent on the lands they inhabit, are among the most

vulnerable to trauma and adverse mental health impacts triggered by increased frequency and severity of climate-intensified weather events, as well as the gradual impact of changing temperatures. Climate

change can also affect Indigenous Peoples' mental health through disruptions to infrastructure, sense of place, social environment, or displacement.²⁸

Pathways for Philanthropic Funding

To help climate and health funders connect big picture ideas to tangible actions that can be enabled and scaled through additional investment, this report describes philanthropic opportunities using the following terminology:

- **Pathways:** Overarching, systems-level opportunity areas where increased philanthropic funding could have a significant impact on climate and health goals.
- **Strategies:** Specific activities or approaches within a given pathway that philanthropic funding is well-suited to support.
- **Solutions:** Examples of philanthropically funded organisations or projects that are implementing strategies in the climate and health space, either on their own or collaboratively. The organisations and projects outlined in this landscape serve as illustrative examples and are not a comprehensive list. Climate Lead and Wellcome are available to guide funders to additional information and initiatives in their areas of interest.^{***}

Because the interdependencies between climate and health are so intricate, there is often overlap between pathways, strategies, and solutions. Indeed, funding them in combination is a particularly effective philanthropic strategy for driving systems-level change on this complex and multifaceted challenge.



Magaras, Siberia, Russia, July 2021. Timur Andreev piles the dried hay with a pitchfork. Hay is essential for surviving the long and harsh winter, for feeding cattle and horses. But many people have lost their fields to the fires and the worst drought in 150 years.

Credit: Nanna Heitmann /
Magnum Photos © Wellcome,
Commissioned by the Wellcome
Photography Prize

^{***} While Wellcome has partnered on this initiative to provide a tool for the philanthropic community highlighting examples of the broad pathways and strategies across climate and health action, its own climate and health funding predominantly supports research in addition to efforts to drive policy change and facilitate collaboration.

PATHWAYS FOR PHILANTHROPIC FUNDING	STRATEGIES
<p>Improve Living Conditions Affected by Climate Change</p>	<p>Protect Health From Extreme Heat Clean Up Polluted Air Address the Mental Health Impacts of Climate Change</p>
<p>Nourish People Through Low-Emission, Climate-Resilient Food Systems</p>	<p>Scale Up Productive, Resilient Farming Practices Improve Diets Reduce Food Loss and Waste</p>
<p>Foster Climate-Resilient, Low-Emission Health Systems</p>	<p>Deliver Climate-Resilient Health Care Improve the Sustainability of Health Care</p>
<p>Steward Nature So Societies Thrive</p>	<p>Save Lives and Enhance Livelihoods by Protecting Ecosystems Reduce Climate-Sensitive Infectious Disease Risk</p>
<p>Turn Evidence Into Action</p>	<p>Fill Critical Knowledge Gaps Support Broader, More Equitable Use of Evidence, Data, and Tools Influence Accountability and Compel Change</p>



PATHWAY 1

Improve Living Conditions Affected by Climate Change

Even in the absence of sudden disaster or disease, climate change undermines our health by disrupting the rhythms of everyday life. Working, learning, caring for children and family, maintaining comfortable homes, and enjoying recreation—all these activities are increasingly obstructed by the climate crisis. Climate change contributes to more intense and frequent heat waves, reduced air quality, water shortages, power outages, and interruptions to essential services like sanitation, transportation, medical facilities, and schools. These challenges compromise our ability to maintain physical health and increase anxiety, depression, and other mental health issues. Low-income and marginalised communities face greater climate-related declines in living conditions because they are more likely to live and work in areas where polluting industries are located and that are already marred by environmental degradation or deteriorating infrastructure.

By supporting strategies that improve living conditions critically affected by climate change, philanthropy can help build the foundation for resilience against climate-related health risks. Because so much of the infrastructure that supports daily life—from fossil fuel-dependent transportation systems to the cement and steel used for buildings—pollutes the environment and generates emissions, there is a dual opportunity to remake it to be more sustainable.

85% of all global air pollution comes from burning fossil fuels and biomass.

Source: "Climate and Air Pollution," Clean Air Fund

STRATEGY 1.1

Protect Health From Extreme Heat

Extreme heat is one of the most widespread climate-related threats to physical and mental health. It causes acute kidney injury, heatstroke, poor sleep quality, and adverse pregnancy outcomes like low birth weight and premature birth; and it exacerbates underlying cardiovascular and respiratory disease. Extreme heat restricts people's capacity to work, exercise, and socialise,³⁰ increases stress on water and energy supplies, and makes it harder to maintain the quality and safety of food and medicines that need to be cooled. It also worsens mental health symptoms and is linked to increases in suicides, aggression, domestic violence, and substance abuse.³¹

Climate change is increasing the length, intensity, and frequency of heat waves that expose people to unsafe temperatures.³² Between 2018–2022, we experienced an average of 86 days of health-threatening heat a year; 60 percent of these temperatures were more than twice as likely to occur because of climate change.³³ As recent, record-breaking heat waves in North America and Europe have shown, no country is immune. However, LMIC, particularly in South and Southeast Asia and the Middle East, face some of the most intense heat and have limited access to affordable cooling.

Innovations in cooling access and technology and improvements to urban infrastructure, combined with education and awareness to promote adaptive behaviours, can sustainably address the health risks of extreme heat. The most effective strategies will be tailored to specific populations and local conditions.

Philanthropy can help:

Expand access to clean cooling

Demand for air conditioning and refrigeration is expected to triple by 2050. The need will be highest for underserved and lower-income communities and countries that have the least access to cooling and are at most risk for heat-related health risks. Current cooling technologies are primarily powered by fossil fuel energy and emit high levels of greenhouse gases, including hydrofluorocarbons, which have hundreds of times the warming power of carbon dioxide.³⁴ Technological advances to develop more energy-efficient, less polluting, and affordable cooling methods can equitably and sustainably close the cooling access gap without continuing to increase emissions. These methods could include heat pumps and super-efficient air conditioners that don't rely on hydrofluorocarbon refrigerants, as well as passive cooling techniques such as improved building design.



Eugenia Kargbo, Africa's first Chief Heat Officer, is working to make Sierra Leone's capital thrive despite rising temperatures. Eugenia has installed public gardens, planted hundreds of thousands of trees, and installed canopies in three major open-air markets (Congo Market pictured) to protect women vendors from extreme heat, and she plans to do much more. The Chief Heat Officers programme was created by the Arsht-Rock Foundation and the Extreme Heat Resilience Alliance in 2021, with locally appointed officers championing healthy responses to heat in eight countries and globally.

Credit: Grace Kamanda / Wellcome

Example solutions: In India **Carbon-Free Buildings**, an initiative of the Rocky Mountain Institute, is working to accelerate highly efficient cooling technologies and cost-effective passive cooling measures, such as the use of paints that reflect the sun. The **Clinton Health Access Initiative** supports the acceleration of next-generation air conditioner uptake in emerging markets through advance market commitments, coordination, and accessible financing.

Reduce urban heat island effect

Urban heat islands occur when natural land cover is replaced with dense concentrations of pavement, buildings, and other surfaces that absorb and retain heat. This effect worsens heat-related illness and death and increases energy consumption (e.g., for air conditioning) and related emissions. Community-level heat risk can be reduced through climate-smart urban planning efforts, such as green infrastructure (e.g., green roofs and walls, urban forests, and parks) and blue infrastructure (e.g., planned water elements such as ponds, rain gardens, and canals), that absorb heat, sequester carbon dioxide, and enhance quality of life through improvements such as natural stormwater management, noise reduction, recreational space, and psychological benefits.³⁵ Paris, for example, created a network of cool “islands” that are 2 to 4 degrees Celsius cooler than surrounding streets thanks to water and vegetation.³⁶

Example solution: **Mahila Housing Trust** works on reducing the heat island effect in Indian cities by greening vacant lots. This approach also helps to provide more functional community spaces while helping to raise groundwater levels and enhance biodiversity.

Protect workers from extreme heat

Excessive heat makes some forms of work dangerous and restricts the ability of many people to earn a living. By 2030, more than 2 per cent of total working hours worldwide is projected to be lost every year because it is too hot to work or because workers have to work at a slower pace.³⁷ The most exposed workers include those in agriculture, construction, refuse collection, emergency repair, transport, tourism, and sport, but heat can also harm industrial workers in facilities with inadequate ventilation and climate control.³⁸ Multifaceted efforts that can help workers include regulations to adapt job requirements to extreme heat, workplace interventions (e.g., schedules that prevent work during the hottest part of the day or rest protocols), facility improvements, and increased awareness about the risks and symptoms of heat-related illness.

Example solutions: The **Environmental Defense Fund** in collaboration with the **la isla network** is examining the link between heat stress and rising rates of progressive and fatal kidney disease in labourers, particularly in tropical climates. Through evidence-based interventions, they are seeking to understand, treat, and prevent this disease, which primarily afflicts workers who often have poor access to health care.



Bangladeshi garment workers—80% of whom are women—often experience symptoms like headaches, fatigue, or nausea due to heat, significantly reducing productivity in the country’s main export sector that employs around 4.5 million workers.

Source: “Working on a Warmer Planet: The Impact of Heat Stress and Labour Productivity and Decent Work,” International Labour Organization, 2019

PHILANTHROPY IN ACTION

Clean Cooling

Credit: Clean Cooling Collaborative

As climate change increases occurrences of extreme heat, accessible, affordable cooling is becoming a matter of life and death. More air conditioning and refrigeration will be needed to keep homes, workplaces, and schools functional; prevent food from spoiling; and preserve the efficacy and safety of medicines. Yet cooling is fossil energy-intensive and most refrigerants rely on planet-warming hydrofluorocarbons (HFCs).

In 2016, a group of philanthropists joined forces to respond to this challenge. They pledged \$51 million to create an action fund for cooling in tandem with the signing of the Kigali Amendment—an international agreement to reduce the consumption and production of HFCs. The availability of this funding encouraged countries to commit to transitions away from HFCs under the ambitious timeline while meeting the cooling

needs of their people. The **Clean Cooling Collaborative (CCC)** provides countries with technical, policy, and financial support to scale up clean, energy-efficient cooling solutions with minimal climate impact.

While CCC is a global initiative, much of its grantmaking centres on four regions projected to contribute 75 per cent of cooling-related emissions between now and 2050: China, India, Southeast Asia, and the United States. It is focussed on reducing the need for mechanical cooling through improved building design and urban planning, innovating cleaner cooling technologies, and mobilising finance to increase cooling access for vulnerable communities.

Backed by philanthropy, CCC has invested more than \$70 million in 57 countries. It supports projects such as accelerating the global transition away from inefficient fixed-

speed room air conditioners to units that use 30 per cent less energy; catalysing the inclusion of cooling in more than 100 countries' climate action plans to reduce emissions; leading efforts to commercialise innovative room air conditioners that have five times lower climate impact than conventional air conditioners; helping to bring down the global warming potential of refrigerants used in new air conditioners and refrigerators; and successfully mobilising \$600 million in public and private finance to advance climate-friendly cooling for all.

CCC's efforts will reduce people's vulnerability to heat-related health risks and increase climate resilience, and its work to date is projected to deliver more than 4 billion tonnes of avoided carbon dioxide emissions by 2050.

STRATEGY 1.2

Clean Up Polluted Air

Air pollution outdoors and inside the home is now the world's fourth-largest risk factor for early death,³⁹ associated with nearly 7 million deaths around the globe every year.⁴⁰ Exposure to unsafe levels of pollutants result in strokes, heart diseases, lung cancer, and acute and chronic respiratory diseases including pneumonia. Air pollution also accounts for 20 per cent of newborn deaths worldwide, usually because of preterm birth and low birth weight, with most of these deaths occurring in LMIC. Babies who are born too soon or too small are more susceptible to infections and major chronic diseases throughout their lives.

Air pollution and climate change exacerbate each other, and they are both primarily caused by burning fossil and other dirty fuels which release greenhouse gases and toxic chemicals that harm health and destabilise the climate. Climate change-driven weather patterns, such as excessive heat and rain, can in turn increase levels of smog, mould, and pollen. The highest death rates from outdoor air pollution are in the Middle East and North Africa, China, Mongolia, India, and in parts of Sub-Saharan Africa and Eastern Europe. Death rates from household air pollution are highest in many Sub-Saharan African countries and some South and Southeast Asian countries.⁴¹ Like extreme heat, air pollution is a significant occupational hazard for many physical or outdoor workers, such as roadside traders, who often earn less and face dangerous levels of exposure.

Strategies that curtail fossil fuel use at household and sectoral levels in ways that create near-term reductions in air pollutants offer a massive opportunity to benefit climate and health.

Philanthropy can help:

Reduce indoor air pollution with clean cooking solutions and renewable energy access

Around 2.4 billion people—or a third of the global population—cook using open fires or inefficient stoves fuelled by kerosene, biomass (wood, animal dung, and crop waste), and coal, which contaminate household air.⁴² Approximately 770 million people do not have access to electricity in their homes and must rely on polluting devices and fuels, such as kerosene lamps.⁴³ Use of these fuels is concentrated in rural areas in LMIC, with women and children bearing the greatest health burden because they spend the most time in the home and on household chores. Poor indoor air quality also impacts health in high-income countries, where lack of circulation in buildings can trap pollutants from gas cookstoves and wood burners.

Strategies that bring renewable energy services, electrification, and clean cooking solutions to households have important implications for equity as they directly benefit the health of underserved communities.

In 2020, household air pollution was responsible for an estimated 3.2 million deaths, including more than 237,000 children under 5.

Source: "Household Air Pollution," World Health Organization, November 2022



Example solutions: Based in Kenya, **Mukuru Clean Stoves** manufactures efficient and reliable cookstoves from locally sourced waste metals and partners with local women business owners for distribution.

The **Clean Cooking Alliance** works globally, mobilising investment, policy, and consumer demand to achieve universal access to clean cooking by 2030.

Innovate and scale clean, affordable, and active transportation

City life in many parts of the world evokes images of grey air thick with vehicle exhaust. Most of the cars, trucks, and two- and three-wheelers that move people and goods are powered by oil and gas. The air pollution they generate is responsible for more than 350,000 premature deaths every year,⁴⁴ and the transportation sector produces 15 per cent of global carbon emissions and is growing.⁴⁵

Interventions that reduce transportation's reliance on fossil fuels will benefit climate and health, especially if combined with efforts to encourage active transport (e.g., biking, walking), since insufficient physical activity is the fourth leading risk factor for mortality. These include: electrifying not just cars and trucks, but also the two- and three-wheelers common in many LMIC⁴⁶ to reduce vehicle exhaust; improving safe, effective, and affordable low-emission public transportation to make mobility more equitable and accessible; and increasing the safety and appeal of active travel through urban policy and planning.

Example solutions: The **Drive Electric Campaign** is a multi-pronged global campaign to accelerate the passenger vehicle transition to electric and eliminate vehicle pollution in the near term. The **Equitable Transportation Fund** supports marginalised communities in the U.S. to advocate for equitable transportation planning and urban infrastructure that promotes healthy, active lifestyles—for example, safer conditions for walkers and cyclists in rural areas.

Reduce super-pollutant greenhouse gases

Black carbon, methane, ozone, and hydrofluorocarbons are short-lived climate “super-pollutants” that remain in the atmosphere for a much shorter time than carbon dioxide but have a more potent impact on near-term warming. Methane, for example, has more than 80 times the warming power of carbon dioxide in its first 20 years in the atmosphere.⁴⁷ These greenhouse gases are responsible for nearly half of current warming.⁴⁸ They cause respiratory and cardiovascular diseases, and they affect the health of plants and ecosystems on which we depend.

Reducing short-lived climate pollutants is critical to mitigating climate change and has immediate benefits for air quality and health.⁴⁹ For example, slashing methane emissions by 45 per cent by 2030 can prevent 0.3 degrees Celsius of global warming by the 2040s and bring near-term social, health, and economic benefits to vulnerable communities.⁵⁰



Almost 1 million stillbirths a year in low- and middle-income countries can be attributed to air pollution.

Source: “Estimation of Stillbirths Attributable to Ambient Fine Particles in 137 Countries,” Nature Communications, November 2022

Example solutions: The **Global Methane Hub** is a collaborative philanthropic effort that catalyses and accelerates action by governments, civil society, researchers, companies, and investors to reduce methane emissions in the three most methane-intensive sectors: agriculture, energy, and waste. The **Clean Air Fund** deploys philanthropic capital to a variety of interventions to reduce air pollution. Its Breathe Cities initiative partners with C40 cities (a coalition of mayors of leading cities committed to climate action) to enable 100 major cities to halve air pollution by 2030.

STRATEGY 1.3

Address the Mental Health Impacts of Climate Change

As well as physical health, climate change is affecting our mental health in multiple and compounding ways. Extreme weather events like floods and forest fires are associated with post-traumatic stress disorder and other mental health conditions such as depression and substance use disorders.⁵¹ Some prescription medications for mental health conditions can affect the body's ability to regulate temperature and increase risk of severe illness or death at high temperatures.⁵² Climate change also negatively affects the environmental, social, and economic determinants of mental health. For example, prolonged heat waves that affect crop and livestock yields threaten farmers' food security, livelihoods, and wellbeing.⁵³ And climate change-driven migration, mainly of men, leaves women behind with additional financial responsibilities, precarious agricultural jobs, and limited access to mental health support.⁵⁴

Current mental health care is not equipped to meet the impacts of climate change. In high-income countries, up to 50 per cent of people with mental health disorders receive no treatment, with this number increasing to 90 per cent in low-resource settings.⁵⁵ Developing new and expanded climate-informed mental health care interventions can build people's ability to cope with and navigate the challenges of a changing climate.

Philanthropy can help:

Provide acute mental health support after climate emergencies

Integrating mental health care into emergency response efforts will protect people from immediate harm while mediating the long-term trauma extreme weather events can cause.

Example solution: International Medical Corps provides emergency relief and long-term capacity building in the wake of natural disasters, including mental health care in countries where it is needed most.⁵⁶



More than 45% of children and young adults surveyed across 10 countries said their worries about climate change negatively affected their daily life and functioning.

Source: "Climate Anxiety in Children and Young People and Their Beliefs About Government Responses to Climate Change: A Global Survey," The Lancet Planetary Health, December 2021

Develop mental health interventions that work in a changing climate

The interactions between climate change and mental health are complex and under researched, though the consensus is clear: greater action on climate change can also improve mental health. Philanthropy can fund research to better understand and address these linkages, for example developing pharmacological and nonpharmacological treatments that take climate change into account.

Example solutions: Nigerian-based **SustyVibes** produces mental health research and locally relevant, climate-aware psychotherapy support through **The Eco-Anxiety Africa Project**.⁵⁷

In rural India, the suicide rate is twice as high as in urban areas, and this is exacerbated by frequent droughts and flooding.

Source: "Urgent Preventative Action for Climate-Related Suicides in Rural India," International Institute for Environment and Development, May 2023





PATHWAY 2

Nourish People Through Low-Emission, Climate-Resilient Food Systems

Climate change intensifies nutrition-related health risks. Warming temperatures, erratic rainfall, and extreme weather events reduce the quantity, quality, safety, and affordability of food. Reduced crop and livestock yields destroy livelihoods and cause food and financial insecurity. Rising carbon dioxide levels in the atmosphere lower the proportions of critical nutrients like protein, iron, and zinc in staples like rice and wheat.⁵⁸ And disrupted supply chains can lead to spoilage, scarcity, and decreased access to food. At the same time, current food systems contribute up to one-third of greenhouse gas emissions.⁵⁹ Livestock digestion and manure, excessive fertiliser and pesticide use, the clearing and conversion of land for farming, emissions-intensive food production processes, and food loss and waste all drive climate change.

Despite the food system's climate toll, more than 820 million people don't have enough to eat, and a staggering 3 billion people or more cannot afford a healthy diet.⁶⁰ In many countries the leading cause of death is low-nutrient diets lacking in healthy foods like whole grains, fruits, vegetables, and nuts and seeds.⁶¹ Together, unsustainable food systems and climate change create a vicious feedback loop that worsens all forms of malnutrition—including undernutrition, obesity, and micronutrient deficiencies—and related diseases, such as weakened immune function, diabetes, and cardiovascular disease.

If transformed, food systems have immense potential to optimise our health, improve equity, and help turn the tide on the climate crisis. We must find low-emission, climate-resilient ways to provide affordable, nutritious food for the world's undernourished today, and into the future for its growing

More than 1.8 million children in Somalia are likely to suffer from severe malnutrition in 2023 due to ongoing drought.

Source: "Somalia Calls for Help as 1.8 Million Somali Children Under 5 Experience Acute Malnutrition and Health Complications," World Health Organization, March 2023

population (an estimated 10 billion people by 2050⁶²). Philanthropy can help drive a holistic approach by funding strategies to increase food security, improve nutrition, and reduce emissions.

STRATEGY 2.1

Scale Up Productive, Resilient Farming Practices

In 2022, more than 250 million people faced acute hunger and required urgent food assistance in 58 countries. Climate change is the second leading cause (after conflict) of these types of global food crises, which primarily affect LMIC.⁶³ Improved farming practices can help ensure food systems equitably and sustainably feed more people; resist climate as well as political and economic shocks; improve nutrition; and reduce emissions.

Philanthropy can help:

Sustainably grow more and healthier food

Innovation and implementation of growing techniques such as crop diversification, reduced tilling, planting cover crops (like rye and clover) and trees, integrating drought-resistant crops and livestock, and increasing the efficiency of fertiliser and water use can restore key nutrients to soil and improve the yield and climate resilience of crops. Policies for agriculture and fisheries can be shifted from prioritising a high volume of a few crops (primarily used for animal feed) to a variety of foods that nourish people and enhance biodiversity.⁶⁴ And improving livestock management and pasture productivity can conserve ecosystems and free up land to cultivate more resource-efficient plant-based foods.

Example solution: Andhra Pradesh Community Managed Natural Farming helps farmers in India's tenth-most populous state implement natural farming practices in ways that align with local customs, practices, and needs. The project aims to reduce the costs of cultivation, enhance soil fertility, enhance yields, reduce risks, and protect farmers from the uncertainties of climate change by developing and promoting ecologically safe alternatives to chemical-based and capital-intensive agriculture.

Improve livelihoods of smallholder farmers

Smallholder farmers who have less than five acres of land make up a significant portion of the world's poor, and they produce about one-third of the global food supply on about one-quarter of the world's agricultural land.⁶⁵ They are on the front lines of the climate risks posed to food systems and health. Key steps to reducing smallholder farmers' vulnerability include helping them secure the rights to their land so they can better invest in it, gain access to finance and markets, and implement nature-friendly farming practices that benefit their livelihoods.



Dr. Carol Zavaleta-Cortijo originally planned to be a paediatrician, but while working in the Amazon, she saw firsthand how environmental changes were affecting the health of children and Indigenous adults. Today, she is investigating how biodiversity can improve nutrition through culturally sensitive interventions in the Amazon region. Born in a Quechua family in Peru, Carol's research at the Universidad Peruana Cayetano Heredia combines her medical training with her interest in Indigenous health. She is currently exploring how greater biodiversity can increase food security and nutritional resilience, protecting communities and food systems from the health impacts of climate change in Latin America.

Credit: Carlos Sánchez Navas / Wellcome

Example solution: One Acre Fund works directly with smallholder farmers across Africa—many of whom are women—to help them maximise harvests, feed their families, and increase their incomes. It provides affordable farm supplies, such as seeds and high-quality fertiliser, training, and access to farming technology. The organisation also equips farmers with resources and training to engage in agroforestry—the practice of planting trees alongside crops—which improves biodiversity and the health of soil, enhancing its ability to absorb carbon dioxide.

Shift away from harmful industrial farming practices

Since the 1960s, industrial farming has more than tripled agricultural production, increasing the availability of low-cost food and preventing global food shortages. However, its toll on health, the environment, and climate has since come to light. Industrial farming primarily produces crops like corn, soybeans, and wheat that are grown in large volumes, and supplies markets with foods low in nutritional value. These foods, which were previously more available to consumers in Western nations, are now contributing to rising levels of health issues like obesity, diabetes, and heart disease around the world. The overuse of synthetic pesticides, herbicides, and fertilisers exposes farm workers and consumers to harmful chemicals, pollutes the air, and creates runoff that contaminates sources of water.

The intensive nature of industrial animal farming can facilitate the rapid spread of diseases among livestock with potential to spill over into people through the food supply chain. In response, industrial farms overuse antimicrobials to promote growth and prevent disease, contributing to the rise of antimicrobial-resistant bacteria that threaten public health. Interventions that move industrial farming away from these harmful practices include educating consumers and farmers about health risks; promoting greater integration of farming practices that preserve natural resources and minimise environmental damage; and compelling more responsible use of antimicrobials and chemicals.

Example solution: The International Livestock Research Institute hosts an antimicrobial research hub to support LMIC to better understand and reduce the risks of agriculture-associated antimicrobial resistance and public health outcomes. The hub supports the development of evidence-based interventions that are locally relevant and applicable.



75% of the world's food is generated from only 12 plants and five animal species.

Source: "What Is Happening to Agrobiodiversity?" Food and Agriculture Organization of the United Nations, 1999

PHILANTHROPY IN ACTION

Transforming Food Systems Through Agroecology

As evidence builds about industrial agriculture's impact on health and the environment, agroecology is increasingly recognised as a critical way to protect people, conserve nature, and stabilise the climate. While there is some variation in how the concept is defined, in general agroecology seeks to harness natural processes to develop hardy and productive food production systems that promote biodiversity, soil health, and efficient resource use while minimising reliance on monocultures (growing one crop at a time on a field), synthetic fertilisers, and pesticides. Because agroecology encourages small-scale, community-based food production systems (including small farms, pastoralism, and Indigenous foodways), it can provide direct benefits to smallholder food producers and improve food access and security for rural communities and vulnerable groups in urban areas.

The **Agroecology Fund** views smallholder food producers and grassroots organisations and networks as essential but deeply under-resourced agents of change. It supports their efforts to sustainably increase agricultural yields, restore their rights and the landscapes in which they work, and build resilience. A donor collaborative comprising more than 45 funders, the Agroecology Fund applies a trust-based, participatory model built around the knowledge of grassroots advisors. It regrants philanthropic funding globally to a broad range of grassroots actors, including smallholder farmers; Indigenous Peoples- and women-led

organisations; fisheries organisations; community-based farmer associations and cooperatives; regional networks of farmer associations and consumers; national advocacy alliances; and international networks such as the Alliance for Food Sovereignty in Africa, International Indian Treaty Council, and La Via Campesina.

The Agroecology Fund supports a diverse array of activities spanning science, practice, and movement building. This includes promoting the recovery and conservation of soil health, recovery of degraded areas, sustainable management of forest and aquatic resources, operating agroecology training programs and seed banks, strengthening territorial markets and food supply chains,

piloting new models of research-based peer-to-peer agricultural education in farmer field schools, and advocating to shift public subsidies towards agroecology.

Since 2012, the Agroecology Fund has awarded more than \$20 million to collaborating organisations that are at the forefront of agroecology movements in more than 85 countries. Philanthropy is critical to empowering these grantees—who are often locked out of affordable sources of commercial capital and the political processes in which food system policy is forged—to scale agroecology up and out for a sustainable and equitable food-systems transformation.



Credit: Agroecology Fund

STRATEGY 2.2

Improve Diets

Diets are deeply cultural and vary by geography, so efforts to change them must be tailored accordingly. Western and wealthier countries eat more meat, highly processed foods, and added sugar. Several LMIC are transitioning to similarly unhealthy diets as the middle classes grow and these foods become more affordable while healthier, sustainable options are less accessible. Shifting to diets low in red meat and rich in fruits, vegetables, whole grains, and legumes could help prevent about 11 million deaths per year by 2050 and save trillions in annual health care and lost productivity costs. Fewer meat-producing animals also means less methane emissions from ruminants,⁶⁶ deforestation, and biodiversity loss; reduced water and energy use; and improved air quality.

Philanthropy can help:

Influence consumer demand and food norms

In countries with unsustainable, excess intake of meat, sugar, and processed foods, the uptake of nutritious, plant-based diets can be encouraged through evidence-based advocacy, communications, training, and education and outreach on the health, climate, and societal benefits of more balanced and plant-based diets. Interventions can focus on changing both individual behaviour as well as how the corporate sector markets and sells food. Issues of supply must also be addressed to ensure healthy and sustainable options are accessible and affordable.

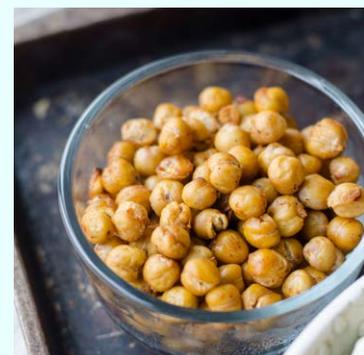
Example solution: Coolfood, a program of the World Resources Institute, helps companies commit to reduce their food-related greenhouse gas emissions and then works with them on enabling consumers to make healthier and more climate-friendly decisions. This includes simple changes like increasing choices and improving the appeal of plant-rich dishes, marketing the benefits of plant-based diets, and training chefs on how to prepare plant-rich meals.

Scale up innovation and commercialisation of nutritious alternative proteins

Innovation to develop meat alternatives has the potential to deliver large amounts of protein-rich food while reducing livestock emissions and pressure on land. While companies have made remarkable strides in developing novel technologies and breaking down production barriers, more research and advocacy is needed for alternative proteins to deliver the same nutrition as traditional proteins and outcompete meat on price, taste, and consumer interest and perceived health benefits.

The carbon footprint of the U.S. diet fell by more than 35% between 2003–2018, mostly due to Americans eating less meat and other carbon-intensive foods.

Source: “Declining Greenhouse Gas Emissions in the US Diet (2003–2018): Drivers and Demographic Trends,” *Journal of Cleaner Production*, June 2022



Example solution: The Good Food Institute supports open-access research, entrepreneurship, and policy development to improve alternative proteins, such as plant-based and cultivated meat, so consumers across the world can maintain or increase sustainable consumption of protein.

STRATEGY 2.3

Reduce Food Loss and Waste

Nearly one-third of all the food we produce is lost or wasted between farm and fork. Food loss and waste reduces the availability of food when hundreds of millions already do not have enough to eat. In addition, it causes around 8 per cent of global greenhouse gas emissions every year, including 12 per cent of annual methane emissions, which result from food rotting in landfills. Beyond contributing to climate change, landfill methane emissions expose vulnerable communities to foul odours, fires, and poor air quality.

Food loss and waste happen in every country, but food lost through production and supply chain processes is more prevalent in LMIC, and food waste at the retail or consumer level is more characteristic of wealthy countries. Policies and actions to reduce food loss and waste can significantly improve food security and nutrition and increase incomes in LMIC; decrease exposure to pollutants; and reduce climate impact. Prevention efforts offer greater benefits than those that recycle or recover nutrients from waste, because the resources dedicated to growing the food are not wasted. Given the globally interconnected nature of today's food systems, effective interventions must holistically address multiple aspects of production and consumption, and must be led locally and nationally, with coordination across regions.

Philanthropy can help:

Improve how food is produced, handled, and processed to prevent food loss

Today, around 14 per cent of all food produced for our consumption is lost to the consumer. These losses occur in the food value chain, and are mainly caused by inefficiencies in production, harvesting, post-harvest handling, transportation, and safe storage of produce. Perishable nutrient-rich foods such as fruits and vegetables, seeds and nuts, dairy products, meat, fish, and seafood are disproportionately susceptible. Measures to address food loss include developing and increasing access to low-emission cold storage and transport technologies; training in best practices to preserve and distribute food before it spoils; and improving infrastructure for rural food producers to access urban markets.



Food that we lose and waste could feed 1.26 billion hungry people every year.

Source: "Tackling Food Loss and waste: A Triple Win Opportunity," Food and Agriculture Organization of the United Nations, September 2022

Example solution: The non-profit **TechnoServe** works with local partners in Kenya to connect domestic buyers and sellers to safely repurpose produce that cannot be exported, thereby decreasing food loss and increasing access to affordable fruits and vegetables for low-income consumers.

Improve how food is sold and consumed to prevent waste

Seventeen per cent of food appropriate for our consumption is discarded by retailers and households. Measures to address food waste must occur at government, retail, and individual levels, and policymaking can regulate markets to incentivise more efficient selling and buying of food. Better training can improve how retailers store and handle food, while expanded infrastructure can increase safe and hygienic rescue of surplus food. And campaigns to change individual behaviour can promote waste-preventing actions like meal planning and shift consumption norms to encourage smaller, healthier portion sizes.

Example solution: The **Waste and Resources Action Programme (WRAP)** leverages policy, business innovation, and behaviour change to reduce food waste. WRAP catalysed 30 per cent reduction in household food waste in the U.K. and now aspires to accelerate progress towards cutting global food waste by 50 per cent by 2030, preventing up to 2.5 billion tonnes of carbon emissions annually (an impact roughly equivalent to eliminating the emissions of India).



Community of Llupa, Huaraz, Peru, 2021. “We plant fava beans to fight anaemia. It is called Shinti when we peel the beans, we remove the husk. We fight anaemia from our chacra [garden].” Margarita Jamanca, a farmer, poses for a portrait in her medicinal herb garden. Her youngest son suffers from anaemia, but she does not trust the food supplements from the Ministry of Health. Instead, Margarita uses the food and herbs she grows to help him.

Credit: Florence Goupil © Wellcome, Commissioned by the Wellcome Photography Prize



PATHWAY 3

Foster Climate-Resilient, Low-Emission Health Systems

Health systems—the workforce, facilities, and resources needed to deliver health care to populations—are on the front lines of climate change. Rising temperatures, more frequent and extreme weather events, and the cascading impacts on patterns of disease and social and economic determinants of health are creating unprecedented challenges. As health threats change, climate impacts can directly disrupt health systems' ability to provide critical care, while bringing with them the additional challenges of injury, displacement, and disease outbreak. The health impacts of climate change present an extra strain on already overburdened health care systems at a time when 4.5 billion people globally still lack access to the most basic services.⁶⁷ Inequality remains a fundamental challenge for the provision of critical health care; wealth, education, and urban living all predicate better health coverage, particularly in LMIC and among marginalised populations in high-income countries.⁶⁸

Health systems must be able to anticipate, respond to, cope with, and recover from the impacts of climate change to provide uninterrupted critical care. Furthermore, the health care sector is a substantial greenhouse gas emitter. If it were a country, it would constitute the fifth-largest emitter of carbon emissions.⁶⁹ Philanthropic funding can strengthen the ability of governments and health systems to deliver climate-resilient health care and galvanise the health care sector to demonstrate climate leadership by reducing its own emissions.

15% of waste generated by health care activities may be infectious, toxic, or radioactive.

Source: "Healthcare Waste—A Serious Problem for Global Health," Healthcare (Basel), January 2023

STRATEGY 3.1

Deliver Climate-Resilient Health Care

Current health systems, globally, are not equipped to forecast and manage the changing health risks driven by climate change or to deliver consistent care amidst climate disasters, and health professionals receive limited training in how to recognise and respond to such threats.⁷⁰ More focussed interventions are needed to prevent weak and less-resilient health systems from exacerbating the negative effects of climate change on people's health.⁷¹

Philanthropy can help:

Equip health workers and communities to face evolving health threats

Training health workers to anticipate, recognise, and treat the health impacts of climate change is central to delivering climate-resilient care. The trusted voice of health workers is a powerful tool in educating communities at a local level, ensuring people are informed and able to take appropriate actions to protect and maintain their families' health.⁷²

Example solutions: The International Federation of Medical Students Association develops resources for medical students and young medical professionals to understand climate-related health burdens and lead community workshops to share their knowledge. At a civil society level, the **Global Climate and Health Alliance**, formed in 2011, brings together health workers and their professional organisations. The alliance advocates for integrating health impacts in policy responses to climate change; supports and encourages the health sector to mitigate and adapt; and provides an important platform for clinicians and others to mobilise around the Paris Agreement, our global treaty on climate change.

Increase preparedness through advance warning

Early warning systems informed by disease surveillance data, environmental data, and modelling predictions are severely lacking in many high-risk regions but have tremendous potential to improve health. By forecasting storms, floods, wildfires, droughts, heatwaves, and vector-borne diseases, early warning systems save lives and money. Just 24-hour advanced warning of a storm or heat wave can reduce the ensuing damage by an estimated 30 per cent. For these reasons, the World Meteorological Organization and the United Nations Office for Disaster Risk Reduction launched the Early Warnings for All initiative, which outlines an action plan for all nations to be protected by advance-warning systems within the next five years. It calls for \$3.1 billion in public and private investment—including from philanthropy—over the next five years.⁷³



Community health volunteer **Parbati Bhat** has been supporting patients in western Nepal for nearly 40 years. But, as the country's changing climate brings mosquitoes and mosquito-borne diseases to her previously unaffected mountainous region, Parbati is treating malaria cases for the first time. She brings treatment and care to patients' doorsteps and teaches them about how to protect their health from new threats and the changing environment.

Credit: BBC Media Action's Living Climate Change film series, produced with support from Wellcome

Example solutions: **Clim-HEALTH Africa** is a virtual hub for sharing expertise and developing African climate and health communities' capacity to understand and integrate climate change challenges into policy, socio-economics, planning, and programming. One way it does this is by supporting the implementation and use of climate-based public health early warning systems across Africa. **Mercy Corps** is piloting the use of digital transactions to make pre-emptive cash transfers to pastoralists in the Horn of Africa when early warning systems indicate climate stresses.

STRATEGY 3.2

Improve the Sustainability of Health Care

Equitable, dependable, low-emission energy access is essential for public health delivery, allowing access to care and disease management in a changing climate. While uninterrupted service is the priority, health care policy and health service delivery can also lower emissions by deploying clean renewable energy, implementing sustainable procurement policies, switching to sustainable transport, and modifying how health care waste is managed.

Philanthropy can help:

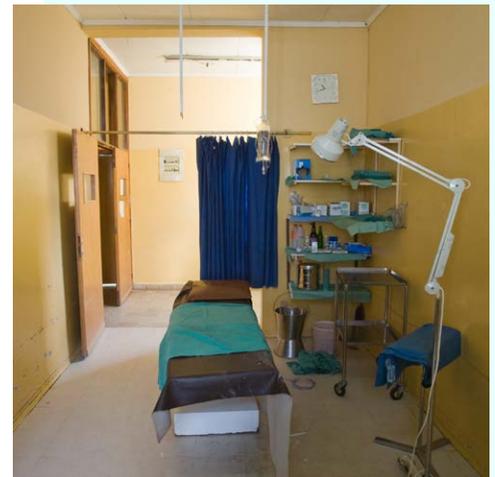
Power health care with decentralised clean energy

When health facilities lack or lose power, lives are at risk. For example, electricity enables health facilities to maintain perishable supplies and power life-saving technologies. Energy increasingly can be provided by decentralised, non-polluting technologies. Renewable energy mini-grids and grid extension projects, for example using solar energy with battery energy storage systems, provide uninterrupted access to health care but require increased investment from public and private sources, including philanthropy.

Example solution: The **SELCO Foundation** has scaled and implemented solutions in over 1,000 health care facilities across India by shifting to sustainable, energy-efficient equipment and buildings, thus delivering health care to those who often lack access.

Reduce emissions in the health care sector

As much as 70 per cent of the climate pollution associated with the health care sector comes from its supply chain: products and services needed for operations, including gloves, gowns, anaesthetic gases, transportation, and waste management. Reducing pollution from the production of pharmaceuticals, plastics, medical devices, and equipment is feasible today, and the sector's significant purchasing power can be leveraged.



An estimated 26% of health care facilities across Sub-Saharan Africa have no access to electricity and of those that do, only 28% have access to reliable electricity.

Source: "Access To Modern Energy Services For Health Facilities In Resource-Constrained Settings: A Review Of Status, Significance, Challenges And Measurement," World Health Organization, March 2015

PHILANTHROPY IN ACTION

Transforming Health Care To Heal Patients and the Planet

Despite its mission to protect and promote health, the health care sector currently emits greenhouse gases equivalent to 514 coal-fired power plants each year. The organisation **Health Care Without Harm (HCWH)** was the first to present a global picture of health sector emissions in its 2019 *Health Care's Climate Footprint* report, and to chart a path to net-zero health care. Its core strategies include: reducing the sector's carbon footprint; fostering climate-resilient health systems; mobilising doctors and nurses to address climate change as a public health issue; and advocating for solutions that accelerate a just transition to clean, renewable energy.

HCWH works through partnerships with U.N. agencies such as the World Health Organization, U.N. Development

Programme, and U.N. Framework Convention on Climate Change; with national governments on every continent; and through its Global Green and Healthy Hospitals Network of nearly 1,900 institutional members, representing 70,000 hospitals and health facilities in 84 countries. Examples of progress shared by members include:

- **George Regional Hospital**, a rural facility in Western Cape, South Africa, is shifting to on-site treatment of medical waste, enabling it to reduce greenhouse gas emissions as well as incineration of medical waste, a major environmental justice and health issue in the region.
- **Aravind Eye Care**, serving the Tamil Nadu region of India, is reducing greenhouse gas emissions

through the use of satellite-assisted telemedicine centres, which offer the additional benefit of providing subsidised primary eye care to peri-urban populations who previously did not have eye care facilities in their region.

- **Hospital San Rafael de Pasto**, a mental health facility in Colombia, is implementing solutions such as substituting fuels and using renewable energy for drying hospital linens, enabling it to reduce energy use, greenhouse gas emissions, and occupational risks.

HCWH leverages philanthropy to scale its work; it ultimately seeks to transform health care worldwide so that it reduces its environmental footprint and becomes a leader in protecting people's health from climate change.





PATHWAY 4

Steward Nature So Societies Thrive

Our health is inextricably linked to the health of our natural environment. We depend on nature for clean air and water; rich soil and pollinators that yield diverse sources of food and medicine; and ecosystems (i.e., communities of organisms and all aspects of their environment) that offer protection from extreme weather and regulate the proliferation of disease vectors (like mosquitoes). Moreover, nature—from forests and peatlands to mangroves and oceans—plays a crucial role in regulating the climate by sequestering approximately half of all the carbon dioxide we emit.

Many of our activities—like deforestation, land-use conversion, habitat destruction, resource extraction, and pollution—are degrading nature at an unprecedented rate, with serious direct and indirect consequences for health globally. Zoonoses (diseases transmitted from animals to people) and diseases spread by dirty water and vectors (like mosquitoes and ticks) infect us more quickly and widely. Environmental stressors—such as floods, drought, extreme heat, and sea-level rise (which contaminates farmland and potable water sources)—occur more frequently and inflict more damage. Indigenous Peoples and local communities that directly rely on land are losing sources of food and livelihoods. And limited access to natural environments is increasing mental health challenges. The destruction of ecosystems which store the most carbon, like tropical rainforests, releases previously stored greenhouse gases into the atmosphere, which further exacerbates climate change and its health impacts.⁷⁴

Halting and reversing our overexploitation of the natural environment is a keystone that will underpin thriving, climate-resilient societies and climate stability, and more research is needed to fully understand the relationship between biodiversity and our health. Philanthropy can support this

Pollinators provide us with one out of every three bites of food we eat.

Source: "Protecting Pollinators," Environmental Protection Agency (EPA), June 2019

knowledge generation and simultaneously advance strategies that protect, restore, and leverage nature's capacity to nurture health and wellbeing over the near and long terms.

STRATEGY 4.1

Save Lives and Enhance Livelihoods by Protecting Ecosystems

The more intact and biodiverse an ecosystem is, the better it can resist stressors and provide health and socioeconomic benefits on which we rely. For example, old growth forests resist wildfires better than forests that have regrown after timber harvest or agricultural clearing. Undamaged tropical rainforests are called “the lungs of the earth” because they absorb huge amounts of carbon dioxide;⁷⁵ they also are home to half of all the plants and animals on the planet. Wetland habitats serve as a sheltered breeding ground for fish that we eat; naturally filter water; and retain and control flood waters. And coral reefs and mangroves can prevent coastal erosion caused by sea level rise. Protecting the integrity of critical ecosystems strengthens their capacity to provide life-sustaining services, builds our resilience to climate-related health risks, and reduces greenhouse gas emissions.

Philanthropy can help:

Enfranchise Indigenous Peoples and local communities to safeguard the ecosystems that sustain them

Indigenous Peoples and local communities (IPLC) live on and manage more than half of the world's land⁷⁶ and have been effective stewards of some of the world's most biodiverse regions for generations.⁷⁷ Many of these communities rely on their surrounding ecosystems for food, medicine, materials, economic livelihoods, and cultural practices. They have developed sustainable resource management practices over generations. However their health and livelihoods are under threat from land loss, environmental degradation, and marginalisation of their traditional knowledge and culture. Interventions that value, enfranchise, and leverage these communities' capacity to protect themselves and steward their natural surroundings can deliver durable and equitable conservation. These could include providing local groups with incentives that enable them to participate in community-wide conservation efforts; or supporting Indigenous communities to secure land rights to areas they have stewarded for centuries.



Daniel Kobei has dedicated his life to defending the rights of Indigenous Peoples. Daniel is the founder and executive director of the Ogiek Peoples' Development Program (OPDP), an organisation that promotes the human and land rights of the indigenous Ogiek in Kenya. In 2017, Daniel led the Ogiek to win a landmark case against the Government of Kenya, gaining official recognition of their rights to live in Mau Forest. The OPDP promotes the role of Indigenous Peoples in climate action, and it encourages women and young people to get involved in environmental protection. Daniel is also a member of global transdisciplinary research network Land Body Ecologies, supported by the Wellcome Hub Award, to explore the deep interconnections between mental health and ecosystem health.

Credit: Ogiek Peoples' Development Program

Example solution: Rights and Resources Initiative advances legal recognition and securing of land rights for IPLC, particularly women, through evidence building and advocacy. It develops new financing mechanisms that channel resources directly to groups on the ground. This enables IPLC to manage ecosystems for their health and livelihoods while protecting them from rights rollbacks, land grabbing, and criminalisation.

Restore and sustainably manage nature to protect communities from hazards

Natural systems that protect communities from climate and weather hazards are often more resilient and cost-effective than engineered structures, which can have limited life spans, rigid usability, and cause unintended damage to nature and health. They also provide other benefits, like food and clean water, that foster community resilience.⁷⁸



Example solutions: The **Forests, People, Climate** collaborative seeks to end tropical deforestation by 2030. Promoting just and sustainable rural development, the collaborative seeks to ensure forests can continue to provide critical nature services including water filtering and flood and erosion control, while supporting IPLC. The **Global Mangrove Alliance** conserves and restores mangrove ecosystems, which are being lost at an alarming rate. Intact, these intertidal forests provide a source of income for local fishing communities; protect against storm surges and saltwater incursion; provide a biodiverse habitat for plant and wildlife; and sequester more carbon than any other type of forest.



Nature-based solutions have the potential to reduce the intensity of climate change and weather-related hazards by at least 26%.

Source: "Working With Nature To Protect People: How Nature-Based Solutions Reduce Climate Change And Weather-Related Disasters," International Federation of Red Cross and Red Crescent Societies (IFRC) and World Wide Fund For Nature (WWF), June 2022

PHILANTHROPY IN ACTION

Breaking the Harmful Cycle of Poverty and Deforestation



Credit: Marcelo Salazar/Health in Harmony

As much as 80 per cent of the world's remaining biodiversity lies within land owned, occupied, or used by Indigenous Peoples and local communities (IPLC). When these communities have full control over their land, forests are more likely to remain intact and act as critical natural sinks that absorb carbon dioxide emissions. However, IPLC often lack formal rights over their lands and natural resources; face multiple barriers to participating fully in the formal economy, political processes, and decision making; and do not fully benefit from public investments in basic services and infrastructure.⁷⁹ Poverty, food insecurity, and the need for health care sometimes force these communities to degrade their environments or leave their land altogether, making it a target for unsustainable exploitation like large-scale cattle ranching or mining operations.

Health in Harmony incentivises IPLC in Indonesia, Madagascar, and Brazil to protect surrounding critical forests by providing them with affordable health care services and supporting livelihoods. Launched in Indonesia in 2007, the organisation is primarily women-led and community-based. Health in Harmony's local staff work closely with IPLC, employing a method it calls "radical listening"—asking communities what they need to protect their environment, and investing precisely in their solutions to protect human and ecological health. These could include offering discounted health services for commitments to protect the forest, employing locals as forest rangers, or helping widows become economically independent by providing them with goats as a source of income.

The Chainsaw Buyback program in Indonesia enabled Pak Karim to

trade his chainsaw for an alternative livelihood as a fisherman. Since joining the program in 2018, Pak has become a successful businessman, able to support and feed his family, and a forest guardian, educating fellow community members in his village about programs like these.

With philanthropic support and through partnership with local groups and governments, Health in Harmony works alongside 135,000 IPLC protecting over 8.8 million hectares of high-conservation-value rainforest. In 2022 alone, the organisation facilitated 23,755 patient visits, supported 3,130 livelihoods, and helped reforest 111 acres. This people- and health-focussed approach helps break the harmful cycle of poverty, illegal logging, and increased climate emissions.

STRATEGY 4.2

Reduce Climate-Sensitive Infectious Disease Risk

Climate change and environmental damage are changing how diseases are spread by insects, animals, and dirty water. Milder winters, warmer summers, and fewer days of frost are extending the geographical range and active seasons of mosquitoes and ticks that spread viruses that cause malaria, Lyme disease, and Zika.⁸⁰ Habitat loss for wildlife and human migration are bringing people in closer proximity to animals, increasing the spread of existing zoonoses like rabies and Ebola, and heightening the risk of introducing new ones.⁸¹ And contamination of fresh water supplies caused by unsustainable activities and natural disasters are increasing incidences of waterborne diseases like cholera, dysentery, and hepatitis. Protecting ecosystems and promoting biodiversity will broadly reduce the risk of climate-sensitive infectious diseases, and additional targeted interventions can decrease illness and mortality for vulnerable populations in the near term.

Philanthropy can help:

Decrease the need for risky interactions with nature

Rural, poor, and marginalised communities that rely on biodiverse habitats to provide basic material needs and generate income are sometimes pushed into risky activities—such as deforestation, bushmeat trade and consumption, and wildlife hunting⁸²—that increase the risk of spillover events, when diseases jump from one species to another.⁸³ By providing resources for alternative livelihoods and greater economic opportunity, and education and tools that help reduce the risk of harm, we can prevent exposure to dangerous diseases and improve quality of life while protecting nature and reducing emissions.

Example solution: Preventing Pandemics at the Source supports research and advocacy on the linkage between habitat destruction and increased pandemic risk. It facilitates better health care and alternative livelihoods for communities living close to wildlife habitats with the goal of ending deforestation, regulating wildlife trade, improving animal husbandry, and enhancing surveillance for zoonotic viruses.

Manage vector-breeding and transmission of disease

Mosquitoes are a central vector of dangerous infectious diseases including malaria and dengue, and climate change means they can now live where they previously couldn't, expanding the spread of disease. Sustainably controlling their ability to breed and infect people is a critical opportunity for health. The elimination of breeding sites in homes and public spaces like parks and schools can reduce the presence of these disease-vectors. Mosquitoes can

Two-thirds of known human infectious diseases are shared with animals, and most recently emerging diseases, including the COVID-19 pandemic, are associated with wildlife.

Source: "Host Range and Emerging and Reemerging Pathogens," *Emerging Infectious Diseases*, December 2005



also be controlled through responsible land management. Research suggests that, while the transformation of arable land into rice irrigation creates new habitats for mosquitoes that transmit malaria, shifting rice cultivation methods to alternate wet and dry irrigation inhibits the growth of young mosquitoes, while also saving water and reducing methane emissions.⁸⁴ Innovative interventions are also underway to harness natural methods to limit the ability of vectors to carry and pass on infectious diseases.

Example solution: The **World Mosquito Programme** breeds mosquitoes containing *Wolbachia* bacteria, which is completely safe for people but blocks the ability of mosquitoes to transmit viruses to us. Once these *Wolbachia*-containing mosquitoes are released in affected areas, their transmission of deadly viruses like dengue, Zika, chikungunya, and yellow fever is reduced.⁸⁵



If nothing is done about climate change, Zika virus will threaten an additional 1.3 billion people by 2050, and dengue fever could impact 60% of the world's population by 2080.

Source: "The Increasing Burden of Dengue Fever in a Changing Climate," The Rockefeller Foundation, November 2022

FOCUS ON

Safeguarding Water Access and Quality



An estimated 2 billion people lack access to safe drinking water,⁸⁶ and half the world's population cannot access sufficient, reliable sources of water of appropriate quality to meet their needs.⁸⁷ Climate change and its drivers, including many emissions-intensive practices that pollute water with toxins, are making clean, fresh water even more scarce. Floods, drought, disappearing glaciers and ice caps, and rising sea levels—all worsened by climate change—can deplete fresh water supplies and contaminate them with salt, sewage, sediment, and organisms that can cause disease. Damage to ecosystems such as wetlands and forests reduces their ability to serve critical functions like preventing erosion, storing and filtering water, and regulating water flow.⁸⁸

Water pollution and shortages endanger our health in myriad ways, with the effects concentrated in low- and middle-income countries. Waterborne diseases like cholera, typhoid, dysentery, and hepatitis A—which already kill more than 3.4 billion people every year, many of them children—are increasing in incidence.⁸⁹ Less water for agriculture (which uses roughly 70 per cent of all freshwater globally) and threatened aquatic environments strain the livelihoods of farming and fishing communities and put pressure on food supplies around the world.⁹⁰ Power grabs and weaponisation of dwindling water supplies intensify inequity, escalate violent conflict, and force migration.⁹¹ Women—typically responsible for water collection—are even more vulnerable to abuse,

attack, and exhaustion as they must travel farther in search of water.⁹²

With only 0.5 per cent of water on Earth being available, usable fresh water, immediate action is needed to protect this most precious of resources. Philanthropy can play an important role in advancing interventions that cut across all pathways described in this report, such as:

- Improved water distribution, sanitation, and hygiene infrastructure to reduce disease spread and minimise environmental impact.
- Sustainable agricultural practices to reduce water use and toxic runoff.
- Protection and management of wetlands, coastal areas, and watersheds to buffer against climate hazards and replenish groundwater supplies while storing carbon dioxide.
- Early warning systems for water-related hazards like floods and droughts to reduce risk.
- Further research and innovation on technologies that improve water use efficiency and make alternative water sources, such as wastewater recycling, more cost-effective and scalable.

Interventions to address the impact of climate change on water will require cooperation between communities, governments, and industries, and the most effective will centre the needs of those most affected. Integrating local and Indigenous knowledge and perspectives can enhance the legitimacy and adoption of these measures and ensure they are equitable and just.⁹³



PATHWAY 5

Turn Evidence Into Action

Effective climate and health action must be underpinned by sound research and data, and approaches that foster collaboration between governments, academia, civil society, funders, and the private sector. While we must act based on what we know now, significant evidence gaps remain, for example about how climate change affects issues like maternal and child health, respiratory infections, and nutritional deficiencies in countries with higher disease burdens. Furthermore, the effects of climate change on mental health, the effects of agricultural shifts, and the health impacts of climate-driven displacement remain largely unexplored.⁹⁴

In addition, evidence generated in and for climate-vulnerable populations or grounded in their needs and lived experiences is insufficient and often inaccessible to local communities. Through co-production, research, data, and tools can be made relevant to local contexts to ensure that decision-makers can make the best choices for the constituents they represent. Equipping grassroots actors and civil society with evidence and strengthening their capacity to lead change are crucial to galvanise public support and assure adoption of climate and health interventions that outlast political tumult and change.

Philanthropy can support efforts to fill gaps in research and co-create tools where they are needed most; build capacity in underrepresented regions; and mobilise widespread scaling of climate action by strengthening advocacy, cross-sectoral collaboration, and social movements. At the national level, while more country governments are developing Health National Adaptation Plans (HNAPs) to prepare for changing health risks, philanthropy can help fill funding gaps for implementing these plans, including by supporting multilateral organisations.

79% of studies on climate and health published between 2013–2019 with identified place names focus on high-income and upper middle-income countries.

Source: "Systematic Mapping of Global Research on Climate and Health: A Machine Learning Review," *The Lancet Planetary Health*, July 2021

STRATEGY 5.1

Fill Critical Knowledge Gaps

There is an urgent need to increase and diversify research funding to deepen our awareness and understanding of the interdependencies between climate and health, particularly in under-resourced regions⁹⁵ and those most affected by the health impacts of climate change. Consequently, datasets, tools, and best practices may not serve local and regional needs.

Philanthropy can help:

Advance research by and for underrepresented groups

Channelling funding and support to LMIC and prioritising transdisciplinary research that is co-produced with underrepresented groups will help ensure that strategies and policies meet the needs of these groups, which generally face the greatest climate-driven health risks.

Example solutions: The **Science for Africa Foundation** supports scientists and the research ecosystem across the continent. It directly funds African-led research priorities and innovation and fosters an environment for interdisciplinary collaboration between clinicians, scientists, civil society, and policymakers across the climate and health spectrum. The **African Climate Foundation** is an African-led grantmaker focussed on unlocking climate action and sustainable development on the continent. It contributes to the creation of a local, multidisciplinary evidence base, funding researchers and other actors critical to supporting action, such as civil society organisations, communications experts, and journalists.

Generate data that better serve local communities

The health risks of a changing climate are diverse and influenced by myriad geographic, demographic, and socio-economic factors. Data generation must reflect local contexts and needs to be used effectively by policy- and decision-makers. Weather and climate data, for instance, must be location specific to accurately inform climate risk assessments, scenario modelling, and development of disaster responses.

Example solution: The **Lancet Countdown** ensures policymakers have access to the high-quality, evidence-based guidance they need to make climate and health decisions. Its regional centres in Asia, Europe, Small Island Developing States, and South America support geographically dispersed data collection and analysis.



Dr. Abi Deivanayagam is a public health doctor, researcher, and campaigner for climate and health justice. She co-founded the Envisioning Environmental Equity (EEE) Collaborative, a group that promotes an anti-racist approach to climate change and health in most affected areas. EEE aims to centre justice in the climate and health movement and remedy the colonial roots of this crisis. The Collaborative has produced films, comics, podcasts, research, and workshops to spotlight visions of a decolonised climate future. These pieces were developed by and with young people from minoritised communities in Brazil, the Philippines, and Uganda, and aim to generate a more cohesive and engaged movement within frontline communities that face discrimination.

Credit: Jane MacNeil / Wellcome

Expand evidence about what works

Evaluation of existing climate and health interventions is critical, since building a body of evidence and best practices on the effectiveness and scalability of interventions will inform and guide policy- and decision-making. Philanthropy plays a critical role by dedicating funding to evaluation and committing to open dissemination of all results, positive and negative. An equity-focussed approach, such as incorporating local communities' perspectives and traditional knowledge into evaluations, further ensures that interventions are locally relevant.

Example solution: The **International Centre for Diarrhoeal Disease Research, Bangladesh** generates research to solve pressing public health problems—including those related to climate change—facing LMIC. Based in Dhaka, it develops innovative approaches and generates rigorous evidence to influence health policy and practise in Bangladesh and globally.

STRATEGY 5.2

Support Broad and Equitable Use of Evidence, Data, and Tools

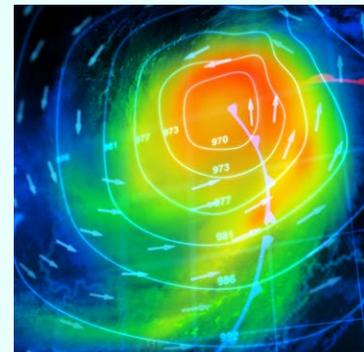
An academic journal article can only improve health if we are able to apply its findings. Valuable data and disease outbreak predictions won't reach those who desperately need them unless we factor access and usability into tool development and design. The climate and disease modelling field, for example, has been dominated by institutions based in North America and Europe. To make systems more accurate and relevant to local needs, they must be developed and deployed at the regional, country, and community levels.

Philanthropy can help:

Strengthen local modelling capacity and implementation

Many regions that are vulnerable to climate- and health-related risks lack environmental data and tools that inform early warning systems. They need local infrastructure to collect weather and climate data and increased understanding of how to use this data to address climate-health threats.⁹⁶

Example solutions: **Grand Challenges** initiatives bring philanthropic funders together to use innovation to address specific problems; a recent funding call will support the growth of the African modelling ecosystem and accelerate the translation of modelling outputs into meaningful policy and programmatic impact.⁹⁷ Brazil-based **Alert-Early System of Outbreaks with Pandemic Potential** uses artificial intelligence to analyse digital health and environmental data to predict outbreaks so health authorities can prepare for or prevent public health emergencies.



Combining disease modelling and weather forecasts in Yemen allowed humanitarian aid groups to predict where cholera outbreaks would spread and more effectively target their work.

Source: "NASA Investment in Cholera Forecasts Helps Save Lives in Yemen," National Aeronautics and Space Administration, August 2018

Increase access to and use of evidence

Activities that support evidence synthesis and dissemination must complement research and evaluation. Measures to promote cross-boundary data sharing and improve researchers' capacity to rapidly communicate findings help bridge research and practice, facilitating policy dialogue and strengthening government capacity to understand and use evidence at a pace commensurate with the urgency of the climate crisis.

Example solution: The Africa Population and Health Research Center, which generates Africa-led and -owned evidence to inform responses to critical challenges facing the continent, supports a cohort of researchers who engage with policymakers to shape relevant policies and programs. It is currently leading a consultation on transdisciplinary approaches to climate and health research and action.

STRATEGY 5.3

Influence Accountability and Compel Change

People are increasingly concerned about climate change,⁹⁸ and research suggests that emphasizing the consequences to health and wellbeing may be more effective at driving climate action than narratives that focus on broad environmental or economic impacts.⁹⁹ There is an opportunity to capitalise on this increased awareness by integrating health stories and evidence to support holistic, cross-sector collaboration that drives and demands action. Philanthropy can enable the durable social movements, coordinated advocacy, and persuasive communications campaigns needed to compel governments, businesses, and leaders to live up to their commitments and further catalyse change.

Philanthropy can help:

Build grassroots movements and use strategic litigation to hold polluters accountable

An informed and emboldened public can pressure governments, businesses, and community leaders to act on issues that undermine public health and ensure political commitments are met. An effective tool to hold polluters accountable is climate litigation that centres the stories and experiences of affected communities.

Example solutions: The Centre for International Environmental Law and the Foundation for International Law and the Environment support lawyers within countries to challenge economic and political decisions that put the environment and public health at risk.

Youth activists in Montana won a landmark lawsuit in August 2023 when a judge ruled that the state violated their right to a “clean and healthful environment” by promoting fossil fuel development without considering the impact on climate change.

Source: “Young Activists in Montana Win Landmark Climate Lawsuit Against State,” PBS NewsHour, August 2023



Unify action around climate and health

Convening the growing climate and health community and fostering collaboration between stakeholders is foundational for rallying coordinated action and developing harmonised and holistic solutions.

Example solutions: **Amref Health Africa**, the continent's largest health non-governmental organisation, is now leading efforts to build awareness and alignment about the health impacts of climate change by working with and convening key regional partners to develop a unified pan-African position on climate and health. **Healthy Food, Healthy Planet** is a European collaborative that challenges the status quo of consuming animal-sourced foods and responds to citizens' calls for healthy, sustainable food environments. It employs advocacy, strategic communications, and campaigns aimed at groups such as food retailers and investors, as well as policymakers at sub-national to European Union levels.

Harness the power of stories and media

Health-centred narratives can be powerful tools to convey the immediate threat of the climate crisis. Media and strategic communication campaigns can leverage these narratives to capture public attention, change mindsets, and motivate individual behaviours and action to address climate and health problems. They can also amplify stories from people whose health is most at risk, providing a platform for frequently marginalised messengers and reaching previously overlooked audiences.

Example solution: Indigenous-led non-profit **Children of the Setting Sun** creates and amplifies stories from Indigenous communities, many of which emphasise respect and gratitude for the land and a call for restoration. Through narrative and film media, it empowers individuals and communities to reverse environmental degradation and protect our planet.



Yakutia, Russia, July 2021.

A firefighter covers his face with a wet towel to protect from toxic smoke during a “controlled burn” where fire is set on purpose to create a “black line,” back burning with the hope to be able to stop a wildfire that is already in progress. The smoke makes it difficult to breathe. Smoke in Yakutia is an extreme category of “airpocalypse,” which is defined as “immediate and heavy effects on everybody.” Pollution has been registered more than 17 times worse than the average in even the most polluted cities of India and China.

Credit: Nanna Heitmann /
Magnum Photos © Wellcome,
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Photography Prize

PHILANTHROPY IN ACTION

Strengthening Community Power To Fight Climate Change and Health Disparities

More than three-quarters of Latinos/as/es in the United States say they have personally experienced the impacts of climate change. The majority of Latinos/as/es live in states and territories that have been hit hard by natural disasters worsened by climate change—California, Texas, Florida, and Puerto Rico. In addition, many Latino/a/e communities are located in close proximity to polluting sources like coal plants or oil and gas sites. Disproportionate exposure to dirty air puts these communities at risk for a host of health ailments, including respiratory illnesses, cardiovascular disease, anxiety, depression, preterm birth, and impaired foetal growth. Latino/a/e children in the U.S. are also twice as likely than non-Latino/a/e white children to die from asthma.

Recognizing that climate change action and environmental justice can only be achieved by addressing racial justice and social equity issues and growing an inclusive and equitable movement, **GreenLatinos** brings together Latino/a/e environmental and conservation leaders fighting against climate change and environmental degradation that intensifies systemic injustices. It convenes public health sector leaders, academia, grassroots activists on the front lines, government officials, and more. By mobilising Latino/a/e constituents, for example through its Climate Justice and Clean Air Collective, GreenLatinos is strengthening these communities' ability to push for climate justice and



Credit: Methane Partners Campaign

clean air campaigns and policies at the state and federal levels.

Among the many campaigns GreenLatinos leads, the Climate Justice and Clean Air team is a member of the Methane Partners Campaign, a coalition working to reduce methane pollution from oil and gas operations. It advocates for passing strong rules at the federal level that address climate- and health-harming methane leaks from active oil and gas production facilities. Reducing leaks from the oil and gas sector is a critical step as GreenLatinos works to curb the expansion of oil and gas and calls for a just transition to clean

energy sources. The GreenLatinos Climate Justice and Clean Air team also plays a vital role in the National Ambient Air Quality Standards coalition, advocating for stricter federal pollution standards.

GreenLatinos focusses on reducing air pollution and protecting vulnerable communities from its harmful impacts, which disproportionately harm the Latino/a/e community, especially in areas like Los Angeles and Houston. Philanthropic support enables GreenLatinos to expand investment in Latino/a/e communities to reduce the health disparities exacerbated by climate change and poor air quality.



Closing

The health of people and of our planet are deeply interconnected, and climate change is a grave danger to both. The evidence is irrefutable, not only in research findings and statistics, but in the lived experiences of millions around the world who are suffering today. Some communities and countries are disproportionately burdened by the health consequences of climate change due to long standing inequities and injustices, but all of us are vulnerable. Our survival and wellbeing are on the line.

A health-centred response to climate change that is immediate, ambitious, and global will save and improve countless lives. As this report highlights, we can act now with a diversity of interventions and tools that will alleviate harm from and build resilience to climate-sensitive health risks while reducing greenhouse gas emissions. This multi-pronged approach is necessary to create equitable and enduring improvements to global health.

The climate and health nexus presents a profound opportunity for action, leadership, and impact from philanthropy. As catalysts and conveners, disruptors and risk-takers, philanthropists are distinctly positioned to spark and accelerate the change we need to secure a healthier, safer, more just future for all.

“The choices and actions implemented in this decade will have impacts now and for thousands of years.”

Source: “Headline Statements, AR6 Synthesis Report,” Intergovernmental Panel on Climate Change, 2023

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Annie Milgin, a Nyikina elder, expresses her concern about the declining accessibility of bush tucker (traditional foods) that she has witnessed on Country over the past decade. “When we go out on Country, we know there’s food there to provide for us and some are no longer there. We not finding the Koongarra (gooseberry tree) anymore. Doctors say you gotta have your healthy mangarri (food)—bush tucker is best food and best medicine for our body.” For tens of thousands of years, the Nyikina people have eaten from the land. However, this is becoming increasingly difficult with the impact of agricultural practices, resource extraction, and climate fluctuations within the region.

Credit: Isabella Moore © Wellcome, Commissioned by the Wellcome Photography Prize

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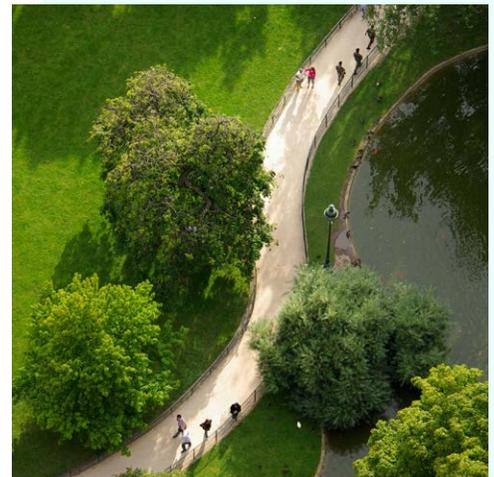
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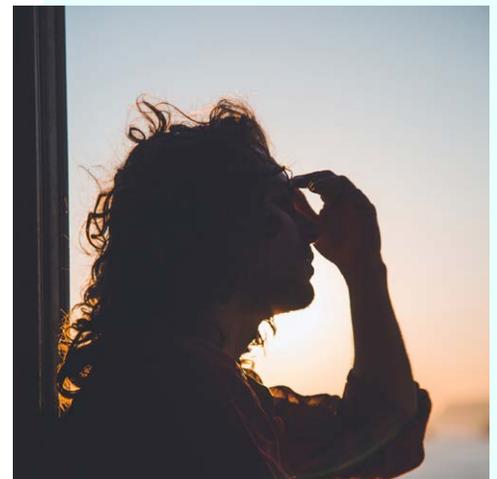
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37% of warm-season, heat-related deaths across 43 countries between 1991–2018 can be attributed to human-caused climate change.

Source: “The Burden of Heat-Related Mortality Attributable to Recent Human-Induced Climate Change,” *Nature Climate Change*, May 2021

Appendices

APPENDIX A: TERMINOLOGY

Adaptation

Climate change adaptation refers to actions that help reduce vulnerability to the current or expected impacts of climate change—such as extreme weather, natural disasters, sea-level rise, biodiversity loss, or food and water insecurity.

Climate-sensitive health risks

The potential harms to health as a result of climate change include death and illness from increasingly frequent extreme weather events; the disruption of food systems; increases in diseases transmitted by food, water, and vectors like insects, birds, and other animals; and mental health issues. In addition, climate change undermines many of the social and economic determinants for good health, such as livelihoods, equality, and access to health care and social support structures. Climate-sensitive health risks are disproportionately felt by the most vulnerable and disadvantaged, including women, children, ethnic minorities, poor communities, migrants or displaced persons, older populations, and those with underlying health conditions.

COP

The Conference of the Parties (COP) is the annual United Nations conference dedicated to climate change. The COP has been organised under the U.N. Framework Convention on Climate Change (UNFCCC) since 1995; at COP21, in 2015, the Paris Agreement (see definition) was signed. The conference now brings together all nations who are Parties to the Convention and those who are Parties to the Paris Agreement to discuss their actions to combat climate change and further establish legally binding agreements to support climate action.

Equity

Everyone has what they need, and those most vulnerable to climate impacts and least able to cope are not left behind. In the global climate discourse, equity is linked to “common but differentiated responsibility,” an acknowledgement among nations that high-income countries contributed more to climate change through decades of industrialization, and should have greater responsibility for mitigation than low- and middle-income countries.

Greenhouse gases

Greenhouse gases trap heat from the sun in our planet’s atmosphere, keeping it warm. Since the dawn of the industrial era, human activity has led to the release of dangerous levels of greenhouse gases, causing global warming and climate change. The main human-caused greenhouse gases are carbon dioxide, methane, nitrous oxide, and fluorinated gases used for cooling and refrigeration.

Indigenous Peoples and Local Communities (IPLC)

Indigenous Peoples comprise ethnic groups descended from and identifying with the original inhabitants of a given region. Indigenous Peoples, Afro-descendant groups, pastoralists, hunters and gathers, and other types of local communities have collectively held and managed their traditional lands for many years; many groups steward their land and natural resources sustainably, as they serve as primary sources of food, medicine, fuel and construction materials, as well as employment, income, welfare, security, culture, and spirituality.

Following devastating floods in Pakistan in 2022, nearly 900 health facilities were damaged. This limited access to vital medicines and care at the same time as the country faced new outbreaks of diarrhoeal diseases, malaria, and dengue virus.

Source: “Pakistan Floods: Impact On Food Security And Health Systems,” The Lancet, September 2022



Low- and middle-income countries (LMIC)

Categorisation as a low- and middle-income country is derived from the World Bank's grouping of countries as low-, lower-middle, and upper-middle income based on gross national income per capita. A list of LMIC can be found on [Wellcome's website](#).

Mitigation

Climate change mitigation refers to actions taken to reduce or prevent greenhouse gas emissions, or to enhance carbon sinks that remove these gases from the atmosphere. Mitigation can be achieved by transitioning to renewable energy sources like wind and solar, using energy more efficiently, adopting low carbon or carbon-free transportation modalities, promoting sustainable agriculture and land use, and changing production and consumption models and diet behaviours. Enhancing carbon sinks can be achieved by restoring forests, wetlands, and marshlands, maintaining soil health, and protecting terrestrial and marine ecosystems.

Multilateral organizations

Multilateral organisations, such as the United Nations and its agencies (World Health Organization, United Nations Development Programme, UNICEF, etc.), bring together nations to address common issues. While predominantly funded by national governments, philanthropy also supports multilateral organisations and helps address funding gaps.

Paris Agreement

The Paris Agreement, adopted by 196 countries in 2015 at COP21 and entered into force in 2016, is a legally binding international treaty aiming to limit global warming to well below 2 degrees Celsius, preferably to 1.5 degrees Celsius, compared to pre-industrial levels. The Paris Agreement is a landmark achievement in international cooperation on climate change because it is a binding agreement for all parties to scale efforts to combat climate change and adapt to its effects.

Resilience

Resilience is the capacity of a community or environment to anticipate and manage climate impacts, minimise their damage, and recover and transform as needed after the initial shock.

Sequestration

Carbon sequestration is the process of capturing and storing carbon dioxide from the atmosphere. Lands, oceans, and coastal sinks naturally sequester human-caused emissions. The developing field of carbon dioxide removal is working to identify natural and technological systems that can draw carbon from the atmosphere and store it.

Vector-borne disease

Vectors are living organisms that can transmit infectious pathogens between humans, or from animals to humans. Many vectors are bloodsucking insects, which ingest disease-producing microorganisms during a blood meal from an infected host (human or animal) and later transmit it into a new host. Vector-borne diseases are the human illnesses caused by parasites, viruses, and bacteria that are transmitted by vectors.



People in Africa, South Asia, South and Central America, and small island states are 15 times more likely to die from climate disasters.

Source: "Disasters and Inequality Are Two Sides of the Same Coin," World Meteorological Association, October 2023

Zoonosis

A zoonosis is an infectious disease that has jumped from a non-human animal to humans. Zoonoses can be transmitted by bacteria, viruses, or parasites, or by unconventional agents, and they can spread to humans through direct contact or through food, water, or the environment. Zoonoses comprise a large percentage of all newly identified infectious diseases, including coronavirus disease, as well as many existing ones, such as Ebola, rabies, and HIV.

Sources: The Climate Dictionary: An Everyday Guide to Climate Change, United Nations Development Programme, February 2023; World Health Organization; World Resources Institute

APPENDIX B: ADDITIONAL RESOURCES

“The 2023 Report of the Lancet Countdown on Health and Climate Change: The Imperative for a Health-Centred Response in a World Facing Irreversible Harms,” The Lancet, November 2023

“Climate Change and Health Research: Current Trends, Gaps and Perspectives for the Future,” World Health Organization (WHO), November 2021

“Climate, Equity, and Justice: A Guide for Philanthropists,” Climate Lead, April 2023

“Climate Philanthropy: A Guide for Action,” Climate Lead, October 2023

“COP26 Special Report on Climate Change and Health: The Health Argument for Climate Action,” World Health Organization (WHO), October 2021

“Pathways to a Healthy Net-Zero Future,” Lancet Pathfinder Commission, November 2023

“The Philanthropic Roadmap to Decarbonizing Buildings: A Landscape Analysis,” Climate Lead, April 2022

“The Power of Collaborative Philanthropy: Giving Together to Address the Climate Crisis,” Bill & Melinda Gates Foundation and Climate Lead, July 2023

“Sixth Assessment Report,” Intergovernmental Panel on Climate Change (IPCC), March 2023

“Time to Adapt: Accelerating Climate Adaptation for Health Equity—Catalyzing Solutions for Community Action,” Collective Minds Climate Council, September 2023

“Transforming Food and Agriculture to Benefit People and the Planet,” Climate Lead, May 2023

Human-caused methane emissions contribute to the formation of ground-level ozone, a dangerous air pollutant that causes approximately 1 million premature deaths per year globally.

Source: “Methane Emissions Are Driving Climate Change. Here’s How to Reduce Them.” U.N. Environment Programme, August 2021





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