

## Overview

[The Global Health Education and Learning Incubator at Harvard University](#) (GHELI) supports interdisciplinary education about world health through the production, curation, and dissemination of educational public goods. This exemplar work was a final project for “World Health: Challenges and Opportunities,” a General Education course at Harvard College taught by GHELI Faculty Director Sue J. Goldie. For this creative assessment designed with support from GHELI, students systematically analyze a societal health challenge they care about and create a “real world” product intended to influence policy or motivate change.

## Abstract

A website and collection of infographics shed light on the human health impacts of climate change.

## Artist

Sarah Cao (2023)

## Caption


The climate crisis is a major interdisciplinary global challenge with severe impacts on human health. One primary reason people do not always act in the most environmentally conscious ways, particularly here in the U.S., is because they do not feel that climate change will negatively affect them personally, and thus do not fully comprehend the urgency of the crisis. This product aims to raise awareness of the severity of the human health impacts of climate change and motivate changes in everyday behavior that both increase environmental friendliness and are accessible to everyone.

## Artist Lens

I created a collection of infographics and displayed them via the [website](#). Infographics are one of the easiest ways to spread information, especially in the age of social media, where one can post an infographic on Facebook, Instagram, etc., for their followers to see. Websites on their own cannot be shared so quickly and directly, as they require people to navigate to links and explore an often-complex network of pages.

However, climate change and health is a huge topic, and audiences might be more curious about or influenced by different aspects of the issue. Covering all the key points in a single infographic could be overwhelming. So I formed a set of guiding questions (i.e., “What is the climate crisis?”, “Why is it happening?”, “Who are the most vulnerable?”) and created many different graphics to answer them. While the infographics could stand alone as campaign products, I wanted to give audiences the choice to consider them all together or select what they want to learn more about. I therefore organized them via a website, making the layout as straightforward as possible so users could easily navigate to their primary area(s) of interest. I provided the option to download the graphics to share with others or use in personal campaigns.

Because a large portion of my intended message is that anyone can make a difference, I aimed to recommend relatively small changes and actions accessible to everyone. The intended target audience is the broader global community, and American audiences in particular. All the infographics raise awareness and inspire action, but



some lean more toward campaign use, as they highlight important facts and figures motivating action without much additional text. Others are more text-heavy and might be better as educational infographics. Each graphic includes a line saying “visit ourclimate-ourhealth.weebly.com for more information and how you can help” as a call to action and so viewers would know where to find the rest of the infographics in this collection.

[Watch Sarah Cao Reflection](#)

## Media

Digital

[View the Our Climate, Our Health Website](#)



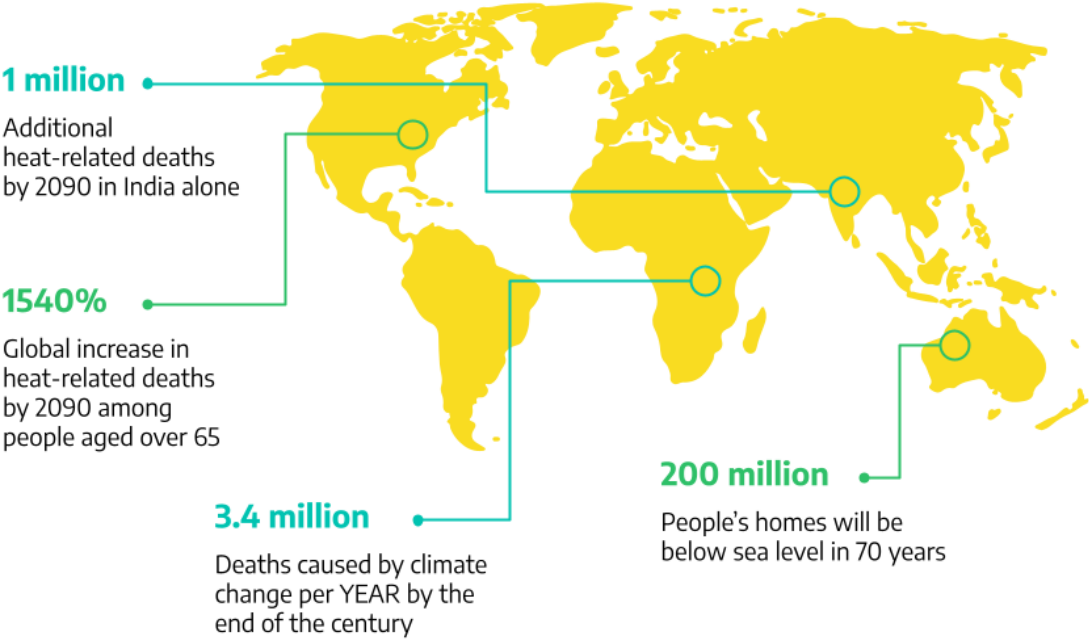
# Let's talk money

THE ECONOMIC COSTS OF ADVERSE HEALTH EFFECTS ATTRIBUTED TO CLIMATE CHANGE INCLUDE MEDICAL EXPENSES, CAREGIVING SERVICE COSTS, AND LOST PRODUCTIVITY

- Direct damage costs to health (i.e., not including costs in health-related sectors such as agriculture and sanitation) are estimated to be between **2-4 billion USD per year** by 2030
- Damage costs associated with additional extreme temperature-related deaths are projected to reach **140 billion USD per year** by 2090
- Nearly **2 billion labor hours** may be lost per year by 2090 due to the impacts of temperature extremes, costing an estimated **160 billion USD** in lost wages annually
- Without climate-resilient development, climate change may force an estimated **100 million people** into extreme poverty by 2030.

Visit [ourclimate-ourhealth.weebly.com](http://ourclimate-ourhealth.weebly.com) for more information and ways you can help.

# If no action is taken to fight climate change...



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# "CLIMATE CHANGE IS THE SINGLE BIGGEST HEALTH THREAT FACING HUMANITY"

-The World Health Organization



Climate change has been occurring rapidly over the last two centuries, largely driven by human activity. Its impacts include warming temperatures, rising sea levels, more intense natural disasters, and major human health consequences.



The average temperature of Earth's surface is now warmer than at any time in at least the last **100,000 years**. The last decade (2011-2020) was the **warmest on record**.

Hot days are associated with an **increase in heat-related illnesses**, including cardiovascular and respiratory complications, renal failure, negative impacts on fetal health, and preterm birth.



Between 2030 and 2050, climate change is expected to cause approximately **250,000 additional deaths** per year, from malnutrition, malaria, diarrhea and heat stress.

Climate change affects various social and environmental **determinants of health**, such as clean air, safe drinking water, and food & shelter security.



At least **155 million** people were pushed into food insecurity in 2020 due to extreme weather. This included **over 75 million children** under age 5 who displayed symptoms of **stunted growth**.

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signs of the island being brought back to me anyway, I am

# Climate Change and Health in the U.S.

The belief that America is safe from the impacts of climate change is false. *Here are the facts.*

## Climate change will increase weather-related deaths

Heat is the top cause of natural weather-related deaths in America. Floods are the second deadliest weather-related hazard.

## Impacts are noticeable already

The frequency of heavy precipitation events has already increased across the U.S., and is projected to continue increasing

## One example: drought in California

By late 2015, California had reached the fourth year of its most severe drought since becoming a state in 1850. The most drought-stricken counties reported various health consequences, including dust allergies, asthma, other respiratory issues, and acute stress.

## An expected future threat

Climate change is predicted to alter the geographic range and abundance of disease vectors, exposing more Americans to ticks that transmit Lyme disease and mosquitoes that spread West Nile, dengue, and Zika viruses.

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for more information and ways you can help.

# Climate Change:

## THE WORST OFFENDER VS THE MOST VULNERABLE

### WHO IS MOST RESPONSIBLE FOR THE DAMAGE?

**The United States has emitted more CO<sub>2</sub> than any other country to date.**

- At around 400 billion tonnes since 1751, the U.S. is responsible for 25% of historical emissions
  - This is twice more than China, the second largest national contributor, and more than the 28 nations of the E.U. grouped together
- Of 37 health systems analyzed in the global Lancet report, the U.S. had the most emissions per person- 50 times the emissions from the Indian health sector

### WHO IS MOST VULNERABLE TO THE CONSEQUENCES?

**Developing countries with weak health infrastructure will be the least able to cope without assistance.**

- People in low-income and disadvantaged communities and/or nations are least able to protect themselves against climate hazards
- Top countries at risk of climate disaster include Somalia, Afghanistan, Chad, and Syria
- While no one is safe from the risks, the people whose health is being harmed first and worst by the climate crisis are those who contribute least to its causes

# A PERSON'S VULNERABILITY TO CLIMATE CHANGE IMPACTS

*Depends on:*

## Exposure

For example, people who spend lots of time outdoors may be more exposed to extreme heat

## Adaptive Capacity

Ability to adjust or respond to climate hazards may depend on income, age, healthcare access, etc.

## Sensitivity

Some are more sensitive to climate hazards due to factors like age and health conditions

People living on coastlines are more vulnerable to storms and flooding. Those living in poverty may be less able to respond to extreme events. People with asthma are highly sensitive to changes in air quality. These are examples of particularly vulnerable groups.



## Climate change impacts: Who is most at risk?

While all people are vulnerable to the negative health effects of climate change, certain populations—largely the most disadvantaged—are disproportionately so:



Migrants or  
displaced persons



Low-income  
communities



Children



Pregnant, breastfeeding,  
or postpartum women



Communities of  
color



People with  
preexisting medical  
conditions



Older adults



Indigenous  
populations




People with  
disabilities



Vulnerable  
occupational  
groups

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# 5 EASY WAYS TO FIGHT CLIMATE CHANGE

## 1 REDUCE FOOD WASTE

Throwing food away also wastes resources used to grow, produce, package, and transport it. Plus, when food rots in a landfill, it produces methane, a powerful greenhouse gas. Cutting your food waste by shopping smart, composting scraps, and donating unused food can reduce your carbon footprint by up to 300 kilograms of CO<sub>2</sub>e per year.



## 2 SAVE ENERGY AT HOME, OR CHANGE YOUR ENERGY SOURCE

Switching from oil-, coal-, or gas-powered energy to renewable energy sources like solar, wind, and hydropower can reduce your carbon footprint by up to 1.5 tons of CO<sub>2</sub>e per year. Also try lowering your heating and cooling, switching to LED light bulbs and energy-efficient electric appliances, or washing laundry with cold water. Improving your home's energy efficiency, through better insulation for instance, can reduce your carbon footprint by up to 900 kilograms of CO<sub>2</sub>e per year.

## 3 EAT MORE VEGETABLES

Producing plant-based foods generally requires less energy, land, and water, and results in lower greenhouse gas emissions, compared to meat and dairy. Switching from a mixed to a vegetarian diet can reduce your carbon footprint by up to 500 kilograms of CO<sub>2</sub>e per year (or up to 900 kilograms for a vegan diet).



## 4 REDUCE, REUSE, REPAIR, & RECYCLE

Reuse, repair, and repurpose items, shop second-hand, recycle, and donate old items so others can reuse as well! Buying fewer things can also reduce your carbon footprint, as consumer goods cause carbon emissions at each point in production. When making purchases, consider a product's durability, sustainability, and ease of recycling.



## 5 CONSIDER YOUR TRAVEL

Aim to walk, bike, or take public transport on a daily basis, and carpool when possible. Living car-free can reduce your carbon footprint by up to 2 tons of CO<sub>2</sub>e per year. For longer distances, try to take a train or bus, or consider meeting virtually. Airplanes produce significant greenhouse gas emissions; taking one less flight can reduce your carbon footprint by nearly 2 tons of CO<sub>2</sub>e.



# 6 BENEFITS OF RENEWABLE ENERGY



Renewable energy refers to energy produced from sources that are naturally replenished and thus do not run out. Common types include bioenergy, geothermal energy, hydrogen, hydropower, marine energy, solar energy, and wind energy. Its benefits include economic, environmental, national security, and human health benefits.

01

Reduced carbon emissions and air pollution from energy production

02

Job creation throughout renewable energy industries

03

Increased U.S. energy independence

04

Enhanced reliability, security, and resilience of the nation's power grid

05

Increased affordability- many types of renewable energy are cost-competitive with traditional energy sources

06

Expanded clean energy access for remote or coastal communities

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## HOW ARE WE RESPONSIBLE FOR THE CLIMATE CRISIS?

Human activity has been the primary driver of climate change, largely through the burning of fossil fuels (such as oil, coal, and gas).

Burning fossil fuels results in the emission of greenhouse gases like carbon dioxide and methane that trap the sun's heat within Earth's atmosphere, thus causing climate change. Fueling cars with gasoline, heating buildings with coal, and clearing land or cutting down trees are all common sources of greenhouse gases.

The main sectors contributing to greenhouse gas emissions include:

- .....> **Energy**
- .....> **Transport**
- .....> **Industry**
- .....> **Agriculture & land use**

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Greenhouse gas levels are at their highest in

**4.5 MILLION YEARS**

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And the global hunger for energy is only expected to grow in the future.

Take action now

Visit [ourclimate-ourhealth.weebly.com](http://ourclimate-ourhealth.weebly.com)



**Myth:**  
**AMERICA HAS LIMITED ACCESS TO RENEWABLE ENERGY SOURCES.**

The U.S. has abundant renewable energy resources. The amount available is **100 times** that of the nation's annual electricity need.

There is large, untapped potential to convert renewable resources into electricity.

In 2020, the U.S. used only 0.2% of the total available renewable energy potential available for electricity production.

*Learn more about taking action to fight climate change at*

**[OURCLIMATE-OURHEALTH.WEEBLY.COM](https://ourclimate-ourhealth.weebly.com)**



# Why we must fight climate change

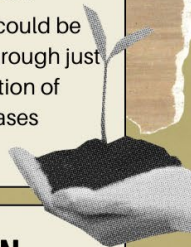
## **NOW**

A LOOK AT THE LIVES WE COULD SAVE



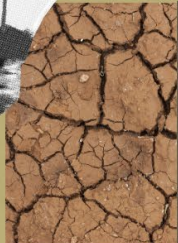
**1.3 MILLION**

premature deaths could be prevented in 2050 through just moderate mitigation of greenhouse gases



**7 MILLION**

premature deaths per year could be avoided by reducing air pollution



**91%**

Of projected climate-related deaths would be avoided by 2100 if the world limited Earth's warming to 1.5 degrees Celsius



**5.1 MILLION**

Diet-related deaths per year would be prevented by 2050 via a shift to more nutritious plant-based diets, which would also reduce global emissions & ensure a more climate change-resilient food system



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