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Health Inequalities Associated with Climate Change: An Urgent Public Health Concern

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Abstract

Climate change is negatively affecting human health and is well documented. Annually, over 8 million people die of fossil fuel air pollution worldwide. If no action is taken to mitigate the effects of climate change morbidity and mortality will continue, especially vulnerable marginalized populations (African Americans, Hispanics, Asians) that contribute the least to greenhouse gas emissions and pollution. This is propelled primarily through consumption of fossil fuels and carbon emissions. Climate change has proven challenging and effective policies are needed to mitigate the adverse effects on communities. Public health officials must advocate for continued systemic change that advances environmental justice and health equity. If no action is adopted, then over the next few decades increases in morbidity and mortality will continue to rise.

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Introduction

Climate change is negatively affecting human health and is well documented [1]. Annually, over 8 million people die of fossil fuel air pollution worldwide [2]. If no action is taken to mitigate the effects of climate change morbidity and mortality will continue, especially vulnerable marginalized populations (African Americans, Hispanics, Asians) that contribute the least to greenhouse gas emissions and pollution [3,4]. This is propelled primarily through consumption of fossil fuels and carbon emissions. In the United States, greenhouse gas emissions are growing more rapidly than the economy [5].

Reduction of greenhouse gas emissions

At present, the average global temperature is approximately 1.5°C above preindustrial temperatures. Greenhouse gas emissions must be reduced by 2025 and 43% by 2030 if the goal is to limit global warming to 1.5°C [6]. Concentrations of atmospheric carbon dioxide which is the primary source of greenhouse gas has steadily increased from 280 ppm in the preindustrial era to 410 ppm today (National Centers for Environmental Information, 2018). Other atmospheric pollutants include methane and black carbon that are responsible for global warming [7].

Greenhouse gas emissions increase energy to the climate system that may lead to increases in extreme weather, such as heat waves, floods and droughts that can impact human health [8].

In the United States, climate change due to greenhouse gas emissions are also due to disparities in political influence and income [9]. Affluent communities shield themselves from the harmful effects of industrial pollution due to political power.

Such geographic separation from disadvantaged communities also results in greater exposure of air pollutants in disadvantaged communities [10,11]. The leads to greater rates of health problems, such as cardiovascular, respiratory, and other diseases resulting in increased visits to emergency departments and hospitalizations [12].

Health inequalities due to fossil fuel consumption

Other causes of climate change that differentially impact disadvantaged communities and marginalized populations are due to the extraction and use of fossil fuels. One example is neighborhoods close to refineries, ports and gas and oil extraction sites [13,14]. Drilling and extracting oil and gas from the ground exposes residents of communities to air pollution that increases the risk of health-related problems, such as respiratory and cardiovascular disease, depression and poor birth and developmental issues [15-17]. On a global scale, it is estimated that air pollution is responsible for over 6.5 million deaths annually [18]. In the United States, approximately 58% of all deaths are due to fossil fuel consumption, especially traffic, power production and industry [19].

Sea-level rise, flooding, storms, and heavy precipitation contribute to flooding [20]. Recent examples were Hurricanes Harvey, Katrina, Sandy, and Maria that impacted low-income communities and people of color who were living in low lying flood zones [21]. Not only did the hurricanes result in health problems, but impacted community infrastructure, such as wastewater treatment facilities, the local water supply, and community wells. This resulted in unsafe drinking water and poor sanitation that could result in infectious diseases [22,23,24]. The World Health Organization (WHO) estimates that during the period 2030 to 2050, there will be an increase in climate-related deaths due to increases in dehydration from diarrheal diseases, malaria, and dengue. Furthermore, the World Bank predicts that without effective and sustained control of climate change, greater than 100 million people will experience extreme poverty by 2030 [25]. The risks will be greater for low-income and marginalized populations.

Medical problems, including death have been associated with increased land temperatures most notably among Black, Hispanic, and Asian neighborhoods living in urban communities that lack tree canopies [26]. This is due to “heat-island” effects from impervious surfaces such as cement buildings, roads and sidewalks that do not dissipate heat and increase temperatures [27].

This is further magnified due to lack of resources for air conditioning and other temperature reducing technology that predisposes individuals to heat-related medical problems, including death [28].

Public health intervention and climate change

Climate change has proven challenging and effective policies are needed to mitigate the adverse effects on communities. Although a spirited discussion about climate change mitigation policy is beyond the scope of this paper, public health officials must advocate for continued systemic change that advances environmental justice and health equity. Examples of policy mitigation are zero-emission and pollution-free clean air and energy and safe drinking water. It is estimated that a reduction in greenhouse gas emissions could result in a decrease of 1.3 million deaths by 2050 [29]. A study conducted in the United States predicts that a reduction in particulate matter and ozone levels could result in a decrease of 175,000 deaths due to clean air policies [30].

Combining decarbonization with these policies may increase public support for climate change mitigation [31].

Conclusion

The urgency of mitigating climate change calls for implementing effective policy. If no action is adopted, then over the next few decades increases in morbidity and mortality will continue to rise. Vulnerable communities will be differentially affected because of climate change. Public health policies to decrease greenhouse gas emissions will decrease the magnitude of health risks.

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