

## Climate Change: The Global Consequences of Extreme Weather and the Injustice That Lies Therein

### Essay Summary

In my essay, I have chosen to focus on what I feel is a topical issue representing one of the consequences of climate change which has an array of serious ramifications itself. Extreme weather is becoming a more and more frequent occurrence globally, affecting a vast number of people through a variety of means. These means are not merely through direct consequences, such as casualties in a wildfire or a flood, but through long-lasting effects which perpetuate a global deterioration in health. Another aspect of climate change which I have chosen to highlight is the way in which it disproportionately affects people who are both least responsible for it and most at a disadvantage with regard to protecting themselves against its sequelae; the most impoverished countries and people, who are hardest hit by climate change, contribute far less to it than high-income groups and are most poorly equipped to face it. From each of the extreme weather-related consequences I discuss in my essay, the injustice is clear. It is clear that with younger generations comes an ever-growing effort in the fight against climate change, and this is inspiring to see. It is my hope that with increased education around climate change, and upon seeing the youth of today lead a movement which strives to create a sustainable future for the Earth's forthcoming generations, everyone, whether young or older, will take whichever steps they can in order to join the fight against an entity which we cannot let defeat us.

### Essay

#### Introduction

The environmental consequences of climate change are at least vaguely known to most of us: higher sea levels, rising temperatures, melting ice caps... What is less well-known is the effect of these changes on our health, both short and long term. If climate change continues at its current rate, the pressures that it will place on healthcare providers will be tremendous, and with healthcare systems such as the NHS already under strain, the question arises: are we adequately equipped to face these pressures? Within the ignorance around climate change-associated health consequences is another poorly acknowledged aspect of climate change: the injustice whereby the people who are hardest hit by climate change are those who are both least responsible for it and most poorly equipped to deal with it. Low socioeconomic status prevents countries and its inhabitants from putting protective measures in place, and it is these same countries and people that have a paradoxical lack of access to medical care. Considering this inequality, it is painfully ironic that the per capita carbon emissions by low-income groups, who are disproportionately affected by climate change, pale in comparison to middle- and high-income groups (Carbon Dioxide Information Analysis Center, 2014).

My essay will focus on what I feel to be one of the most important consequences of climate change: extreme weather – a current and serious problem associated with high mortality for many different reasons, and subject to the injustice I mentioned above.

What is climate change?

The term 'climate change' describes alterations in the Earth's climate systems, which include the planet's water cycle, landscape, atmosphere and average weather conditions over a long period of time; it is reported by the World Health Organization (WHO) as the greatest challenge of the 21st century. (Werndl, 2016; Campbell-Lendrum et al., 2018). Climate change is embodied in a multitude of ways, each of which poses distinct risks to our planet's ecosystems. The progression of climate change in recent decades can be attributed mainly to fossil fuel consumption for power, industry or transport, leading to higher emissions of carbon dioxide which traps heat within the Earth's atmosphere (the greenhouse effect) and subsequently causes global warming; other drivers include deforestation and pollutants such as methane and nitrous oxide, which are commonly emitted by agricultural processes (Melillo, Richmond and Yohe, 2014; Campbell-Lendrum et al., 2018). Global warming describes the Earth's gradually rising temperature, however not all of the effects of climate change have such an insidious onset. Extreme weather related to climate change – temperature lows, temperature highs, ensuing natural disasters – is becoming an increasing concern, with events occurring more and more frequently and the deaths they cause, both directly and indirectly, on the rise and projected to continue to do so (Haines, Kovats and Corvalan, 2006; Melillo, Richmond and Yohe, 2014; The World Health Organisation, 2014). Globally, the weather-related effects of climate change vary depending on geographical location and surrounding landscape. For example, proximity to bodies of water (such as in coastal areas, or cities with large rivers running through them) heightens a location's risk of flooding, while regions in which ice predominates are threatened by its melting, and forested areas may be subject to wildfires (Melillo, Richmond and Yohe, 2014).

#### Extreme Weather: Heatwaves

Heatwaves, defined as prolonged periods of excessively hot weather, are occurring more frequently and reaching higher temperatures than ever recorded (with human activity thought to have markedly increased the risk of extreme heat waves); this summer, temperatures in France soared to an astonishing national high of 46°C, and they were not alone – Belgium, Germany, the Netherlands, the UK and several American states are among some of the locations to have set similar records this year (Haines, Kovats and Corvalan, 2006; Lai et al., 2012; Melillo, Richmond and Yohe, 2014). Heatwaves are associated with significant mortality, especially in vulnerable populations. Poverty increases the mortality associated with heat exposure; impoverished areas, especially in developing countries, are less likely to have access to luxuries such as air conditioning or even basic commodities such as water (McGeehin and Mirabelli, 2001; Healy, 2005). This is exemplified by the fact that in America, being an immigrant worker compared with an American citizen increases your risk of dying from heat exposure by three times, and in 2018, the heatwave in Quebec claimed only the lives of Montreal residents who were not lucky enough to have air conditioning (Fleming et al., 2018). Urban landscapes are particularly susceptible to heat, a phenomenon that is exacerbated by larger populations in these areas compared with rural ones (Lai et al., 2012). This is further worsened by overcrowding, an aspect of many impoverished communities – and how likely are slums, ghettos or homeless shelters to have air conditioning?

#### Extreme Weather: Drought

In addition to directly causing mortality, heatwaves cause damaging effects through indirect means such as drought. Drought is particularly detrimental to agricultural land,

where it causes crop failure and consequently undernutrition, especially in children (Melillo, Richmond and Yohe, 2014; Smith et al., 2014; The World Health Organisation, 2014). Moderate undernourishment in children has been shown to increase likelihood of all-cause mortality by 1.6 times, whereas severe undernourishment quadruples all-cause mortality in children; the number of children under five projected to die in 2030 due to undernourishment is over 95,000 (Black et al., 2008; The World Health Organisation, 2014). The geographical regions most affected by this – as you may expect given the reliance on crops in these areas, both for nutritional and economic reasons – are sub-Saharan Africa and south Asia (The World Health Organisation, 2014). The fact that poor nutrition is worsened by infectious diseases such as diarrhoeal illnesses (for example, cholera) and malaria, which are more prevalent in these locations already and are independently increased by climate change through higher temperatures and more rainfall, merely perpetuates the occurrence of poor health in these parts of the world (Haines, Kovats and Corvalan, 2006; Bezirtzoglou, Dekas and Charvalos, 2011; The World Health Organisation, 2014; Narain, 2016). In addition, undernourishment is associated with higher rates of chronic disease, causing lasting damage, for example in the subsequent ability of a person to earn a living (Victora et al., 2008). Where there are forest landscapes, prolonged periods of drought are accompanied by wildfire risks, and climate change has already begun to cause a lengthening of the fire season, with larger and more powerful wildfires throughout (Melillo, Richmond and Yohe, 2014; Howard and Huston, 2019).

In 2018, California experienced its largest and deadliest wildfires to date, burning over 459,000 acres and killing 86 people respectively. As with heatwaves, in addition to wildfires being a direct cause of death, they cause harm in indirect ways. One such way is the smoke produced by the fires, which increases air pollution both around and downwind from the site of the fire (Melillo, Richmond and Yohe, 2014; Howard and Huston, 2019). Smoke exposure from wildfires exacerbates pre-existing respiratory conditions such as asthma and bronchitis, causes people to seek medical attention putting a strain on healthcare providers, and is associated with cardiovascular- and respiratory-related hospitalisation and increased respiratory mortality (Henderson and Johnston, 2012; Melillo, Richmond and Yohe, 2014; Howard and Huston, 2019). Again, the most susceptible groups include people of low socioeconomic status due to their increased likelihood of having chronic respiratory diseases (Lai et al., 2012; Pleasants, Riley and Mannino, 2016).

#### Extreme Weather: Floods and Storms

The global rise in sea levels is effectuated by two main factors. Firstly, the gradual rise in sea temperatures causes thermal expansion of water; the second important contributor arises from the melting of land-based glaciers and ice sheets (Mimura, 2013; Melillo, Richmond and Yohe, 2014). Together with the increasingly frequent and intense precipitation events that climate change brings, these changes cause the occurrence of more intense floods and storms (Melillo, Richmond and Yohe, 2014). Naturally, coastal areas are at risk – particularly those in low-income countries, which are 225 times more vulnerable to flooding events than high-income countries due to poor warning systems and a lack of defences (Haines, Kovats and Corvalan, 2006; Mimura, 2013; Melillo, Richmond and Yohe, 2014; The World Health Organisation, 2014). Estimates suggest that 12,000 people die every year from flood-related disasters (The World Health Organisation, 2014). Storms too can cause severe flooding and carry devastating consequences: in 2017, Hurricane Harvey was recorded as the wettest Atlantic storm in history and the deadliest hurricane to ravage Texas in nearly one hundred years. Over sixty inches of rain were

deposited and the hurricane claimed more than a hundred lives (Blake and Zelinsky, 2018). The indirectly detrimental effects of water-related disasters include an increased incidence of water-borne illnesses, including leptospirosis, cryptosporidium and cholera; the risk of disease outbreak following natural disasters is significantly higher in developing countries, due to pre-existing prevalence of diarrhoeal diseases and inadequate sanitation (Curriero et al., 2001; Ahern et al., 2005; Patz et al., 2008; Bezirtzoglou, Dekas and Charvalos, 2011; Semenza et al., 2012; Melillo, Richmond and Yohe, 2014; Fredrick et al., 2015).

#### Extreme Weather: Mental Health

Natural disasters, as well as having an acute effect, can take lasting tolls on the mental health of those affected (Davidson and McFarlane, 2006). Hurricane Katrina has been shown in studies to have had a significant negative impact on victims' mental health, causing increased rates of anxiety, post-traumatic stress and suicidality in residents of the affected areas (Mills, Edmondson and Park, 2007; Kessler et al., 2008). Similar observations have been made for floods, heatwaves and wildfires (Fewtrell and Kay, 2008; Hansen et al., 2008; Brown et al., 2019). Low socioeconomic status is a recognised risk factor for developing mental health problems after disasters (Goldmann and Galea, 2014). One reason for this may be the difficulty that people with low incomes experience in trying to rebuild their homes after they have been displaced from them and their houses destroyed; they may not have the money to rebuild or relocate, and often do not have insurance to aid them. It remains very difficult for impoverished communities to recover from natural disasters (Harnett, 2018).

#### Conclusion

Climate change is a profoundly concerning topic and represents a socioeconomic burden with enormous costs to society both economically and with regard to morbidity and mortality. I have focussed on the extreme weather-related effects of climate change and tried to give a sense of how broad the range of consequences can be – from direct casualties, to poor nutrition, chronic disease, mental health problems and the spread of water-borne illness. This is but a small snapshot of the array of damaging effects that climate change is having on our planet; to mention any more would be out with the scope of this essay. Climate change can affect anyone, though the saddening truth is that climate change discriminates – and it is the most impoverished countries, areas and people that carry the biggest weight of what should be a communal burden. It seems a cruel injustice that the people most bearing the brunt of climate change are those who have contributed the least to its forces. If nothing else, climate change will widen the income gap and bolster the cycles that perpetuate inequality. We are all responsible for protecting the future of our planet and its inhabitants, and despite the multifactorial nature of climate change, we can all take action to prevent its worsening. Let us all be more conscious of our carbon footprints – air travel, driving, water and electricity usage, meat consumption and waste are all contributors to greenhouse gas emissions; a reduction in one or multiple of these is a small but meaningful step away from more and more devastating consequences of climate change.

## Biography

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