

## PRIORITIZING LIFE AND HEALTH IN A CHANGING CLIMATE THROUGH INNOVATIVE INSURANCE SOLUTIONS

### Abstract

*Climate change is one of the largest and most important health hazards humanity has ever faced. The World Economic Forum's Global Risks Report 2021 has placed environmental degradation as one of the five most damaging global risks every year for the past decade.<sup>1</sup>*

*During the past several years, the earth's changing climate, the pace of which has been accelerating, is becoming more broadly acknowledged as both an environmental and a public health crisis. Its natural as well as man-made drivers, and the exposures and vulnerabilities they create, are becoming more widely understood and recognized as risk factors needing both attention and mitigation.*

*Countries and companies around the world are accelerating their exploration of how best to take the necessary steps to successfully transition their economies into greater environmental sustainability. The insurance industry is also adapting, developing environmentally sustainable business models and using robust, forward-looking methodologies to analyze climate change's impacts.*

*Could the life insurance industry play a more significant and active role in mitigating climate change? Moreover, could the industry create the much-needed culture and awareness that might guide current customers and applicants toward steps they can take to reduce their carbon footprints?*

*The answer, clearly, is yes. To Matt Blakely, RGA's Vice President, Corporate Responsibility and Sustainability, the current historic moment is pushing companies, communities, and indeed countries, to act. Insurers, he says, need to adapt to the changing climate, but also to recognize the opportunities being presented to take big steps that can stop, and perhaps even reverse, climate change's acceleration.*

*This article explores the evolving nature of climate change analytics, and outlines and cites the opportunities to design innovative life and health insurance solutions for environmentally aware and carbon-conscious applicants that can benefit both humans and nature.*

### Introduction

Climate – that is, average long-term trends in weather – is remarkable. It impacts air, water, food, and shelter – the fundamentals of human existence – and the effects of its changes over the past several decades are clear and observable on every continent (including Antarctica) and in every human cell.

Health impairments connected with climate change include heat- and pollution-related respiratory and cardiovascular diseases, injuries, infectious diseases, and the physical and mental health of populations experiencing displacement and forced migration due to floods or drought.

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These impacts have shown remarkable variability, not just between the general population and vulnerable groups, but also among different geographies, ethnicities, and socioeconomic groups. Everyone on the planet will likely face increasing and more widespread climate change-driven impacts on mortality and morbidity in the future.

Since the year 1900 – considered the end of the pre-industrial period – the earth’s average temperature has risen by slightly more than 1°C. The Paris Agreement, ratified in 2016 (coincidentally one of the warmest years on record), set a goal of restricting the average global temperature rise from 1900 to 2100 to well below 2°C and pursuing efforts to limit the actual increase to no more than 1.5°C. This goal was reaffirmed at the recent COP26 global climate summit in Glasgow, with a statement that read “Secure global net-zero by mid-century and keep 1.5 degrees (Celsius) within reach.” (Reaching net-zero means that the amount of greenhouse gases produced are counterbalanced by the amount removed from the atmosphere.)

Over the past few decades, climate change’s warming trend has accelerated substantially. Because of this, the insurance industry now needs to navigate a complex and evolving business environment. Not just countries, but companies as well, are working actively to transition into reducing net carbon emissions safely and sustainably. This transition has risks, including legal and public policy changes, reputation and market risk, and possible disruptions in existing business, governmental, and economic systems, as new frameworks and supporting technologies are developed, tested, and adopted.

Insurers have responded by moving to actively monitor and assess local and global climate risks on an ongoing basis. In 2016, not surprisingly, this work accelerated, with insurers increasingly focusing on developing sophisticated stress models to estimate climate change’s many impacts and assess how actively governments around the world are responding.

Insurers are also engaging with regulators by sharing knowledge and expertise to answer important questions regarding available best practices, tools, and methodologies. This enables a better general understanding of the complex and synergistic nature of climate change risks and of their potential consequences for humanity.

While the current state of climate change could bring about important challenges to the insurance industry,

it is also creating opportunities for insurers to play an instrumental role in helping societies adapt to and mitigate the potential short- and long-term health risks and impacts.

### Short- and Long-Term Health Risks

Climate and human health are profoundly intertwined. The negative health effects of increasingly volatile weather patterns and events, such as higher frequency and severity of heat waves and more extreme global surface temperatures, can be both direct and indirect. They can range from greater potential for food and water shortages and contamination to increased capacity for the spread of vector-borne (particularly water-borne) diseases and more air pollution.

These effects are deeply synergistic, in that they cascade into a feedback loop that has strengthened over the years and continues to worsen conditions. Indeed, the 2020 report of The Lancet Countdown, an international collaboration that tracks the climate’s emerging health profile, emphasized that climate change’s impacts, and its developing exposures and vulnerabilities, are worsening.<sup>1</sup>

#### Heat and Health

Non-optimal atmospheric temperatures – that is, extreme highs and lows – are known to be associated with a substantial morbidity and mortality burden. And the changes in non-optimal temperature trends due to climate change are creating definite shifts in the burden.

A large mortality study published in July 2021 in *The Lancet* used ambient temperature data from 750 locations in 43 countries to assess the mortality and morbidity burden over a 20-year period (2000 to 2019). The researchers determined that more than five million extra deaths per year (i.e., 9.43% of global mortality) could be attributed to abnormally cold and hot temperatures.<sup>7</sup>

Interestingly, the increase in heat-related mortality and the decrease in cold-related mortality yielded a net reduction in mortality for the period.<sup>7</sup>

Global warming may slightly reduce the number of temperature-related deaths, largely because of the lessening in cold-related mortality, albeit with significant geographical variations. Long-term, the mortality burden is expected to increase because hot-weather-related mortality will continue to increase.



Globally, the past seven years have been the hottest since such recordkeeping began in the 1800s, with 2021 tied with 2016 as the hottest years on record.<sup>6</sup>

The consequences of human exposure to extreme heat are well-documented and understood. It can cause heat exhaustion and heatstroke, acute and chronic kidney disease, and exacerbate lung conditions such as asthma and cardiovascular conditions such as heart failure. Extreme heat exposure also has known mental health impacts, ranging from depression and anxiety to increased risk of interpersonal and collective violence.

People older than age 65 (especially those with comorbidities), the socioeconomically challenged, and communities lacking access to fresh water and a basic electricity infrastructure, are especially vulnerable to the effects of climate change.

Two of the more worrying statistics in the 2020 Lancet Countdown report were that vulnerable populations globally experienced an additional 475 million heatwave events in 2019, and that since 2010, there had been a 53.7% increase in heat-related mortality among those older than age 65. Indeed, 296,000 estimated heat-related deaths were registered in 2018, the majority of which were in Japan, eastern China, northern India, and central Europe.<sup>1</sup>

These trends continued in 2020, with the 2021 Lancet Countdown reporting a new high of 3.1 billion more person-days of heatwave exposure among people

older than age 65 and a record high of an estimated 345,000 deaths in 2019. People facing social disadvantages, older than 65, or under one year of age, were the most impacted by the record-breaking temperatures, which topped 40°C in North America's Pacific Northwest region in June 2021.<sup>6</sup>

The impact of high atmospheric temperatures on mortality vary by region, both within and between countries, but can be modified by local physical infrastructure factors such as availability of urban green space, increased access to cooling measures such as air conditioning, and social policies that include outreach programs to protect the vulnerable.<sup>2</sup> A recent meta-analysis by a group of U.S. researchers highlighted that human vulnerability to extreme heat events can vary, depending on time of year, geographic location, and available physical infrastructure. The analysis, which used historical mortality and temperature data from 208 U.S. cities to quantify observed changes in heat vulnerability from 1973 to 2013, found that many communities had adapted to climate change, which yielded substantial drops in estimated heat-related mortality. The researchers assumed a 2°C increase in mean temperature since 1900, and found that modifying measures caused projected U.S. mortality to fall by more than 97% for 2003-2013 data compared with 1973-1982 data. Importantly, the researchers also concluded that if the pace of climate change continues to accelerate, the capacity of communities





to adapt to it could reach a limit, which would mean that needed infrastructure changes may not be able to be implemented quickly enough to reduce vulnerability.

Another important consideration is that certain adaptive cooling measures – specifically, use of air conditioning – could substantially increase emission levels of carbon dioxide (CO<sub>2</sub>) and fine particulate matter. As these are considered the two main culprits of global warming, increased use of adaptive cooling measures could further accelerate global warming and health impairment trends.

### Emissions and Health

Multiple studies cite air pollution as the world's fifth leading mortality risk factor, after poor diet, high blood pressure, tobacco use, and high blood sugar.

The third principal component of air pollution, in addition to fine particulate matter and CO<sub>2</sub>, is methane. The 2021 Lancet Countdown Report states that atmospheric CO<sub>2</sub> concentrations have reached a concerning milestone, as they are now 50% higher than in the pre-industrial era.<sup>5</sup>

More than one million deaths occur every year due to particulate matter from coal-fired power plants. PM<sub>2.5</sub>, considered the most dangerous type of fine particle, is composed of sulfates, nitrates, and black carbon (i.e., soot). These particles can penetrate deep into lungs and affect the cardiovascular system. Prolonged exposure can lead to increased incidence of and mortality from ischemic heart disease and stroke, dementia, chronic obstructive pulmonary disease (30% of worldwide COPD mortality is air pollution-related), end-stage kidney disease, and cancers of the lung, larynx, pancreas, and breast.

CO<sub>2</sub>, which comes primarily from burning fossil fuels, is a major component of greenhouse gases (GHGs). Fossil fuel use, whether coal, oil, or natural gas, contributes 73% to all GHGs,<sup>3</sup> and the Intergovernmental Panel on Climate Change (IPCC) has determined that fossil fuels are today the major cause of rising average global temperatures.

The third type of emission, methane, stems from current animal agriculture practices, and are responsible for 20% to 30% of all GHG emissions. GHGs are made up of water vapor, CO<sub>2</sub>, methane, nitrous oxide, and ozone. Methane emissions from meat and dairy livestock, the principal sources, grew

by 16% from 2000 to 2017, with 93% coming from ruminants (cud-chewing animals such as cattle, buffalo, sheep, and goats).

Wildfires, another contributor to atmospheric emissions, and droughts, which create the conditions for wildfire susceptibility, have also been increasing dramatically. Nearly 60% of countries around the world had an increase in the number of days people were exposed to very high or extremely high fire danger in 2017-2020, compared with the years 2001-2004. In addition, 72% of countries had increased human exposure to wildfires across the same period.<sup>6</sup>

Wildfires are a crucial element in the climate change feedback loop: rising atmospheric temperatures lead to drier vegetation, which leads to more fires ignited by lightning storms, which increases particulate matter emissions, including CO<sub>2</sub>, which plays a role in the rising global temperature. This feedback loop is generating poorer air quality and is having significant human health consequences, including increased incidence of injury and of non-infectious diseases such as cardiorespiratory conditions and cancers.

### Shifting Perspectives

Exposure to climate change's impacts is already yielding numerous negative health consequences. A key to managing and hopefully reducing climate-related mortality and morbidity may be to prevent further degradation of the environment.

To avoid climate change's worst health consequences, researchers agree that global average temperature must not rise more than 1.5°C between 1900 and 2100. To achieve this, researchers have stated that GHG emissions must halve by 2030 and reach net zero by 2050. This means emissions must be reduced by 7.6% annually. This may seem almost impossible, but COVID-19 showed it could be done: GHG emissions fell by 5.8% in 2020, according to the Lancet Countdown 2021 report,<sup>6</sup> producing the lowest annual amount of such emissions in at least three decades.

Although this dramatic decline was almost entirely attributable to the pandemic-driven economic contraction and not to any specific climate-associated proactive measures, it demonstrated that under extreme circumstances, countries can substantially and successfully modify emissions generation. The decline was, unfortunately, short-lived: emissions rose in 2021.<sup>6</sup>



By placing health and wellness at the center of climate change mitigation and adaptation policies, remarkable benefits may be achieved. A February 2021 study by Hamilton et al., offered a glimpse into the future by modeling how certain wellness-related actions aimed at mitigating GHG emissions in nine selected countries (Brazil, China, Germany, India, Indonesia, Nigeria, South Africa, U.K., and U.S.), such as eating less agriculturally-produced meat, increasing consumption of fruit, vegetables, and plant-based protein sources, and engaging in more individual physical activity, could substantially improve human health while also improving the environment.<sup>3</sup>

The Hamilton study compared the potential health effects of maintaining the Current Pathway Scenario (CPS) (i.e., no change in the nationally determined commitments toward mitigating climate change) with a Sustainable Pathways Scenario (SPS), in which countries adhere more closely to achieving the goals of the Paris Agreement and prioritize human well-being. The researchers determined that such a shift could generate, by 2040, an annual reduction in the nine countries of 1.18 million air pollution-related deaths, 5.86 million diet-related deaths, and 1.15 million deaths due to physical inactivity.<sup>3</sup>

Diet is one of the leading risk factors for premature death globally. Diets high in red meat have been shown to be a factor in mortality from neoplasms and diabetes mellitus. In addition, the 2021 Lancet Countdown reported that excess red meat consumption contributed to an estimated 842,000 deaths in 2018, a 1.8% rise from 2017.<sup>6</sup> Consuming more plant-based foods and reducing consumption of red meat and processed foods can improve the environment (by reducing agricultural emissions) as well as human health. As for physical activity, the projected reduction of mortality from more walking and cycling was remarkable: 1.15 million deaths in all nine countries could be avoided in 2040 by following the SPS.

### **What Can Life Insurers Do?**

For life insurers, ongoing monitoring and analyses of climate data and trends will enable companies to assess climate change's current and potential impacts on mortality and morbidity. This data will impact everything from product design, pricing, in-force management, and underwriting new business, to operating models, risk management practices, and investment assets. Climate-focused transitions can create stranded assets, and can also create new opportunities for investment that will ensure insurance companies have the capital to pay future claims.

The next 10 years are seen by climate researchers as critical in determining how climate change-focused adaptation and mitigation efforts can be increased by finding robust and reliable solutions to enable successful transitions by both countries and companies to a lower carbon emissions future.

The current pandemic is a reminder that health depends on climate, and a healthy and biodiverse ecosystem is an essential component of wellness. The planet is currently undergoing a biodiversity crisis, with approximately one in every eight species under threat of extinction. Fortunately, the future of human and environmental health can be shaped by actions taken now.

### **Finding Solutions**

As the life insurance industry carefully navigates its transition toward a more sustainable ecological posture, it is becoming apparent that the industry's understanding of climate-driven risks must continue to improve. Fortunately, the evolving framework for these transitions is helping to clarify and possibly strengthen the industry's role, as it is generating

opportunities to develop new types of insurance products and to promote the transformations needed to mitigate climate change.


Some opportunities could include:

- Linking the consumer and the climate as “co-beneficiaries” by addressing climate change and human well-being simultaneously
- Developing green insurance products that benefit the applicant and the environment
- Engaging with applicants to drive and incentivize positive behaviors for a more sustainable future
- Committing to net-zero asset portfolios backing life insurance liabilities

How can life insurers play a role in influencing societal behavior and thereby improve the state of the natural world?

Life insurers currently have an unprecedented opportunity to take certain steps that could make a real difference in the planet’s environmental future. Creating innovative products that can educate, encourage, empower,

and incentivize environmentally conscious applicants could be key to cultivating a healthier ecosystem and a more sustainable future. Combining the passion for environmental sustainability on the part of many current and potential customers with the industry’s extensive expertise in underwriting and actuarial science can result in products designed to benefit both applicants and the environment, and ultimately play a strategic role in improving the health of Planet Earth and all living organisms upon it.

Taking steps such as developing and implementing business and investment models that incorporate environmental sustainability and creating insurance solutions that focus on improving personal and environmental health can also yield a brighter and more sustainable future. 

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