Preliminary Draft

Heat and Inequality: A Theory of Vulnerability to Global Warming *

Jannik Reinbold† Thomas Steger‡

January 15, 2026

Abstract

Global warming reshapes the probability distribution of weather events, increasing exposure to heat along both the extensive and the intensive margin. Understanding the consequences of climate change requires studying the implications of such weather patterns. To advance this understanding, we propose an economic life-cycle model that structures the effect of heat on lifetime utility. Agents face mortality risk linked to stochastic temperature and respond through endogenous adaptation and health investment. These choices generate heterogeneous vulnerabilities to heat. We calibrate the model to U.S. data on health, income, and climate and show that global warming imposes regressive welfare losses that intensify with age, as poorer and older individuals face higher utility losses. In contrast, disbelief in climate change produces a progressive welfare pattern by reducing adaptation among richer agents. The paper highlights how differences in resources, physiological resilience, and beliefs jointly shape the unequal burden of global warming.

Keywords: *Climate Change, Weather Extremes, Heat, Mortality, Inequality, Adaptation, Expectations, Welfare, Life-Cycle Model, Deficit Accumulation Model.*

JEL Classification: *I14; Q54; D63; D15; J17.*

*We thank Martin Quaas and Kenneth Judd for valuable comments and suggestions.

†Leipzig University, Germany; DFG Research Training Group ECO-N; Email: reinbold@wifa.uni-leipzig.de

‡Leipzig University, Germany; CESifo, Munich; Halle Institute for Economic Research (IWH), Email: mtsteger@uni-leipzig.de