

A Review Assessment of Health and Economic Impacts of Global Heat Waves

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Anthropogenic climate change has caused an increasing number of extreme weather events, such as flood, hurricane and heat waves. Compared with flood resulting in huge capital damages, capital damages by long-term environmental stress including heat waves can be negligible while the negative impacts on human beings can be substantial. Heat waves in Europe during 2003 caused over 15,000 deaths, highlighting the significance of disaster risk studies on heat waves and more comprehensive understanding of heat effects on labor and entire economic systems. However, existing heat wave studies mostly focus on the relationship of either heat-health or heat-productivity but few can be found to integrate heat exposure, health effects and productivity loss into economic impact evaluation. Even so, measurements are generally based on individuals' compensations at microeconomic level. We suggest such method is insufficient to reflect the impacts on national economy because the important interrelationships among sectors are neglected. By reviewing substantial heat wave studies, our paper provides a comprehensive view over heat effects on human beings, including both physiological (mortality and morbidity mainly due to respiratory and cardiovascular diseases) and sub-clinical effects (absenteeism: reduced work capacity and presenteeism: work productivity loss). Also, by viewing labor as factor input in production process, the paper also propose a way to feed these effects back into economic impact assessment via which sector interrelationships can be captured. Finally, we emphasize the importance in: 1) Sub-clinical effects can be analogous with physiological effects and they can cause the disruptions for economic activities; 2) Differentiating work capacity loss from productivity loss; 3) Integrating health or impact assessment studies into disaster risk analysis. These can be crucial for the public, healthcare sector and policymakers in understanding heat waves, providing protective infrastructure and developing better climate adaptation strategies.