Characteristics of Heat Waves From a Disaster Perspective

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In September 2018, heat waves were declared to be a type of natural disaster by the Framework Act on the Management of Disasters and Safety. The present study examined the characteristics of heat waves from the perspectives of meteorological phenomena and health damage. The government’s efforts to minimize the damages incurred by heat waves are summarized chronologically. Furthermore, various issues pertaining to heat waves that are being raised in our society despite the government’s efforts are summarized by analyzing big data derived from reported news and academic articles.

Key words: Climate change, Extreme heat, Heat stroke, Government, Policy

In Korea, a period is defined as a heat wave if the daily maximum temperature is 33°C or higher, according to the heat wave special report issued by the Korea Meteorological Administration (KMA). In Korea, between 1981 and 2010, heat waves averaged 10.1 days annually, based on observations made at 45 weather stations distributed throughout the country. The highest number of heat wave days (31.5) occurred in 2018. The average annual duration of heat waves was 8.2 days in the 1980s, but increased to 10.4 days in the 1990s and 10.2 days in the 2000s; in the 2010s, the duration of heat waves increased even more sharply to an average of 15.5 days. In 2018, the highest temperature in Korea’s meteorological history, 41.0°C, was recorded in Hongcheon.

The most serious type of damage incurred by heat waves is to health. Health damage caused by heat waves can be divided into 2 categories. The first category comprises heat-related illnesses (HRI) directly caused by high temperatures, such as heat stroke. In Korea and Japan, heat wave damage statistics present the number of people who suffered from these diseases. Due to the impossibility of monitoring HRI throughout the entire nation in real time, data collected from emergency medical institutions (in Korea) and emergency transportation services (in Japan) are monitored. During the extraordinary heat wave summer (spanning from May 20 to September 10) of 2018 in Korea, the number of heat-related deaths reported by the Korea Centers for Disease Control and Prevention (KCDC) in real time was 48, and a year later, the final total number of heat-related deaths revealed in Statistics Korea’s cause-of-death statistical report was 147. The second category of health damage caused by heat waves includes cases in which an underlying disease is exacerbated by the indirect effects of high temperatures. This type of damage is most frequently estimated by calculating the excess mortality attributable to heat waves that occurred during the heat wave period. In the United Kingdom and France, the number of excess deaths is used to gauge the overall amount impact of a heat wave. This value can only be estimated after the completion of data collection pertaining to the number of deaths in the population; thus, the calculation process takes several weeks in the United Kingdom and 1 to 2 years in Korea. In Korea, during the heat wave in 1994, 92 people died of HRI [1], and 3384 excess deaths were recorded [2]. From the perspective of natural phenomena, heat waves oc-
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Due to the high volume of emergency situations in emergency rooms, there is a high possibility that reports of HRI may have been overlooked in certain situations.

In the past, research papers on heat waves were primarily concerned with identifying the meteorological mechanisms of heat waves and analyzing the effects of climate change. However, over the prior 5 years, the number of papers dealing with the effects of governmental policies regarding heat waves on the population has dramatically increased. Specifically, topics such as urban environmental factors that aggravate the heat wave phenomenon (e.g., the heat island effect) [4,5], community characteristics that aggravate heat wave damages (e.g., local deterioration) [6,7], and the effects of central and local government policies on reducing heat wave damages [8,9] are being investigated.

Since heat waves have been classified as natural disasters, discussions on policies to reduce heat wave damages have become widespread. As mentioned above, heat waves significantly differ from other natural disasters both in terms of their meteorological characteristics and the damage to health that they inflict. Therefore, the strategy of establishing countermeasures against heat waves by imitating policies for other natural disasters has limitations. In order to devise appropriate countermeasures against heat wave disasters, scientific research to support the implementation of these countermeasures is essential.

Ethics Statement

This paper is a perspective so it did not need ethical consideration.
CONFLICT OF INTEREST

The authors have no conflicts of interest associated with the material presented in this paper.

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