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Assessing Present-Day and Future Perspectives of Climate Impact on Thermal Stress Risks in Korea from 1km High Resolution Scenarios

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Among the various thermal stress indices, apparent temperature (AT) is closely related to public health indicators, and consequently is widely used by weather agencies around the world. Therefore, in this study we estimate the changes in AT and contributing components in Korea as a whole and in five major cities (Seoul, Gwanju, Daegu, Daejeon, and Busan) using national standard climate scenarios based on the coupled model inter-comparison project (CMIP6). In the present day, high AT occurs in major cities due to high temperature (TAS) and relative humidity (RH). Our findings reveal that even when TAS is relatively low, large AT occurs with higher humidity. Notably, in future warmer climate conditions, high AT may first appear in the five major cities and then extend to the surrounding areas. An increase in TAS and RH during the pre-hot season (March to June) may lead to earlier occurrence of thermal risks in future warmer climate conditions and more frequent occurrence of high thermal stress events. Our study can serve as a reference for future information on thermal risk changes in Korea. Considering those who have not adapted to high temperature environments, our findings imply that thermal risks will become more serious and that heat adaptation strategies will be needed during the pre-hot season under future warmer climate conditions.