In this research we designed, developed and calibrated a new heat wave impact-based forecasting system, which incorporates both impact of heat waves on human health and likelihood of the event. The new system utilizes probabilistic forecasts of daily maximum temperature ($T_{\text{MAX}}$) and daily maximum perceived temperature ($P_{\text{MAX}}$). The alerts are assigned using 4 color scheme according to 4x4 risk matrix. The probabilistic forecasts are based on Limited-area ENsemble prediction System (LENS) that is run by KMA using Met Office Unified Model. The final products are maps providing alerts for 165 regions around South Korea for three days ahead. A preliminary evaluation of LENS shows cold bias for both daily $T_{\text{MAX}}$ and daily $P_{\text{MAX}}$. Therefore, before applying LENS in impact-based forecast, a suitable bias-correction technique has to be applied. We used adaptive decaying averaging technique to correct predicted variables. The results show significant improvement in ensemble forecast accuracy, as well as probabilistic forecast reliability. Thresholds for impact axis in risk matrix were decided upon epidemiological, physiological and climatological studies. In order to calibrate the system, several configurations of likelihood axis were examined against heat related morbidity. Overall, the alerts issued by the system show high correlation with morbidity data.

**Key words:** Bias-correction, EPS, daily maximum temperature

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