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## Minimum rest time for outdoor workers exposed to summer heat stress in South Korea

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Continuous work in high-temperature environments can lead to occupational injuries, illnesses, and even deaths. Thus, mandatory rest time for appropriate heat management programs must be provided for the safety of workers. In this study, we figured out the minimum rest time for the heat safety of outdoor workers in South Korea. To quantitatively calculate the minimum rest time, the wet-bulb globe temperature (WBGT) index estimated by 27 synoptic weather stations in South Korea and the national work-rest regimens were used. We assumed that the minimum rest time is the same as the rest time of the work-rest regimens recommended by the WBGT. To examine the intra-seasonal evolution patterns of the minimum rest time, summer seasons are divided into several sub-periods. The average of the hourly WBGT values during summer months from June to August (2009–2018) shows that outdoor workers with a moderate workload (200–350 kcal/h) are exposed to heat stress during approximately 30% of their daytime working hours (06:00–18:00). In the whole summer period, the minimum rest time required for each hour was about 5 minutes for moderate work. But in the mid-summer period from late July to early August, the daily minimum rest time for moderate workload noticeably increases to 20 minutes of mid-day (11:00–15:00). Regionally, no significant increase in rest time was found in areas with high urbanization rates.