



Heat waves and health impacts in the northern part of Senegal: implementation of an early warning system to support Health National Adaptation Plan (HNAP)

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The Sahelian zone of Senegal experienced heat waves in the previous decades, such as 2013, 2016 and 2018 that were characterised by temperatures exceeding 45°C for up to 3 successive days. The health impacts of these heat waves are not yet analysed in Senegal although their negative effects have been shown in many countries. This study analyses the health impacts of observed extreme temperatures in the Sahelian zone of the country, focusing on morbidity and mortality by combining data from station observation, climate model projections, and household survey to investigate heat wave detection, occurrence of climate-sensitive diseases and risk factors for exposure. To do this, a set of climatic (temperatures) and health (morbidity, mortality) data were collected for the months of April, May and June from 2009 to 2019. These data have been completed with 1246 households' surveys on risk factor exposure. Statistical methods were used to carry out univariate and bivariate analyses while cartographic techniques allowed mapping of the main climatic and health indicators. The results show an increase in temperatures compared to seasonal normal for the 1971–2000 reference period with threshold exceedances of the 90th percentiles (42°C) for the maxima and (27°C) the minima and higher temperatures during the months of May and June. From health perspective, it was noted an increase in cases of consultation in health facilities as well as a rise in declared morbidity by households especially in the departments of Kanel (17.7%), Ranérou (16.1 %), Matam (13.7%) and Bakel (13.7%). The heat waves of May 2013 were also associated with cases of death with a reported mortality (observed by medical staff) of 12.4% unequally distributed according to the departments with a higher number of deaths in Matam (25, 2%) and in Bakel (23.5%) than in Podor (8.4%) and Kanel (0.8%). The morbidity and mortality distribution according to gender shows that women (57%) were more affected than men (43%). These health risks have been associated with a number of factors including age, access to drinkable water, type of fuel, type of housing and construction materials, existence of fan and an air conditioner, and health history. The heat wave recurrence has led to a frequency in certain diseases sensitive to rising temperatures, which is increasingly a public health issue in the Sahelian zone of Senegal. The main scientific evidence and findings generated from this research initiative support the adaptation options of health national adaptation plan (HNAP)

with the implementation of an early warning system for local communities and health system workers.

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