

Urban morbidity in summer: ambulance dispatch data, periodicity and weather

Research Article

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Abstract: Over recent years the impact of weather on human health has become more severe, especially for people living in urban areas. Even though many studies have analysed the impact of weather on human mortality, few have quantified the impact of heat on morbidity, including ambulance response calls. In this study, 13,354 calls collected in the city of Florence (Italy) during summer were analyzed by month, day of the week, hour, and time slot of the day. An objective air mass classification was used to classify days and time slots with similar weather characteristics and a multiple variable analysis was applied to evaluate the relationship between emergency calls and weather. A positive trend was observed in the morning and a negative one during the night for all emergency calls, but only for food poisoning and alcoholic diseases. Calls for cardiovascular events increased in the morning and on hot days. Calls for psychiatric disorders rose significantly with temperature during the afternoon. The total number of calls and those for alcoholic diseases rose during the hottest nights. Our results, which show a clear relationship between ambulance response calls, periodicity, and weather, could contribute to an understanding the impact of weather on morbidity.

Keywords: *Biometeorology • Weather • Health • Periodicity • Summer • Italy • Emergency calls • Ambulance response calls • Morbidity • Urban health*

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1. Introduction

The negative impact of climate change on human health is higher during the summer period, when additional heat-related deaths outweigh the extra winter deaths [1]. This is particularly evident in urban environments resulting from the Urban Heat Island effect and because of the high number of people living there: people living in urban areas are more susceptible to heat than those living in rural environments [2,3]. Heat Related Illness (HRI) includes a broad spectrum of diseases [4]: from a public health perspective, detecting HRI in the early stages of illnesses before they lead to more serious outcomes could enable early intervention, thereby reducing the associated morbidity and mortality [5-8].

Many studies have investigated climate change and extremes on a very large scale or at national levels [9,10], but few have been done on a local scale [11,12]. It should be noted that healthcare systems usually deal with locals, so it is very important to study the adaptation of citizens to the local climate. Studies on the relationship between emergency department (ED) admissions and weather conditions could contribute to the organization of ED via the predicting of fluctuations in the rates of ED use [13-16]. Most of these studies have analyzed the effect of weather by taking only the impact of a single weather variable into account, generally the air temperature, and by considering the weather as a univariate phenomenon. Because weather is the result of complex interactions among different variables, some authors have proposed studies of the relationship

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