SAHARAN DUST: ANUNDER-STUDIEDBUT SIGNIFICANT SOURCE OF AIR POLLUTION IN WEST AFRICA

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Recently, the World Health Organization's International Association for Research on Cancer (IARC) classified outdoor air pollution as carcinogenic to humans and now puts air pollution in the same category as tobacco smoke, UV radiation and plutonium. Exposure to ambient fine particles was recently estimated to have contributed 3.2 million premature deaths worldwide in 2010 (Straif et al., 2013). The ambient air across the globe is polluted by emissions from motor vehicles, industrial processes, power generation, household combustion of solid fuel, and other sources. Dust storms lead to particulate levels (PM_{10} concentrations) that exceed internationally recommended levels especially in West Africa (Ozer, 2005; Ozer et al., 2007) but this source of air pollution is under-studied, particularly in the literature devoted to human health impacts (de Longueville et al., 2013). This can be explained by the scarcity of information about air quality relating to the African continent (WHO, 2012). However, the use of proxy data allows us to draw an alarming situation for populations living in West African cities. This study aimed to estimate the impacts of Saharan dust storms on air quality and the potential effects on the human health in Niamey. Moreover, the analysis of a temporal serie (1947-2006) allowed to follow the PM_{10} concentration evolution during a long time period. PM_{10} concentrations were estimated from horizontal visibility data recorded in Niamey based on the relation established by d'Almeida (1986). During the dry season (from November to March), the mean seasonal PM_{10}concentration is higher than 100 $\mu g \cdot m^{-3}$ on the whole period (1947-2006) with an important interannual variability (mean seasonal PM_{10} concentrations of 13.3 $\mu g.m^{-3}$ in 1952 and 342.7 $\mu g.m^{-3}$ in 1984) and a break point in the early 1980s. Based on the Air Quality Index (AQI)developed by USEPA as a tool to provide timely and easy-to-understand information on local air quality and whether it poses a health concern (USEPA 2006), results showed that, in the recent years (2002-2006), mineral dust accounts for 68annual daily exceedances of the 50 $\mu g.m^{-3}PM_{10}$ limit value, indicating a likelihood of health impacts. Between 1947 and the mid-80s, a significant increase of the number of hazardous days (PM_{10}concentrations >420$\mu g.m^{-3}$) and in the same time a significant decrease of the number of safe days (PM_{10}concentrations < 50$\mu g.m^{-3}$) were observed. Since 2000, strong health impacts can affect population 1 day on 3during dry season (PM_{10}concentrations >150 $\mu g \cdot m^{-3}$). In the light of the disproportionate levels of PM_{10} concentration recorded in city near the Sahara and the significant health impacts demonstrated in other parts of the world (de Longueville et al., 2013), new research is urgently needed to quantify the contribution of this source of pollution on mortality and morbidity of West African populations.