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**POTENTIAL IMPACT OF CLIMATE ON NOVEL CORONA VIRUS (COVID-19) EPIDEMIC.**

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The Covid-19 epidemic outbreak, which initially spread across China's Hubei province (1), is currently hitting Italy, with an epicenter in the provinces of Lodi, Cremona, and Piacenza (LCP). The diffusion of the infection appears to have occurred faster in Hubei (Fig. 1) in comparison with LCP, which seems to be reaching now its peak in the epidemic, despite the stricter preventive measures adopted by the Chinese government. This apparent difference in kinetics could be explained by different biological characteristics of the virus strains or the host population. Besides, the number of recorded cases is only a fraction of total infected individuals, since a large number of oligosymptomatic cases may remain undetected, and differences in screening policies may have contributed to differences in daily incidence estimates. It is also possible that climatic factors contributed to the evolution of the epidemic in the two areas (2). The number of new cases in Hubei decreased at the same time of an increase in average daily temperatures; furthermore, temperatures in LCP area at the time of the development of the epidemic (beginning of March) were higher than those recorded in Hubei between January and February (Figure 1). The trend toward a rise in Italian temperatures in the subsequent days could have helped in containing the epidemic.

In order to verify the hypothesis of temperatures playing a role in the modulation of the epidemic spread of Covid-19, we retrieved data on the total number of recorded cases per million inhabitants (as of March 9th) in each Country (3), and data on average temperatures (4). In a linear regression model weighted for population size, the number of cases per million inhabitants, excluding China's People Republic, showed a significant inverse correlation ( $r=-0.23$ ,  $p=0.001$ ) with average temperatures in February. The possible impact of climatic factors on the transmission of Covid-19 infection is potentially very relevant. If the viral infection was inhibited by higher temperatures, a spontaneous slowdown of the epidemic could be expected in

the Northern hemisphere in the next weeks, whereas risks could be increased in the Southern hemisphere.

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**Figure 1** – Number of new recorded cases (bars) and average temperatures (line) every two days in Hubei province and Lodi/Cremona/Piacenza area.

