

## **What can be inferred from studies assessing the effect of climate on Covid-19?**

Press release from the French National Academy of Medicine  
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The Covid-19 epidemic outbreak occurred in mid-winter. Will it be held back by the summer season, such as influenza or other coronaviruses? Several studies show that rising temperature and humidity affects the viability of the virus and reduces the number of infections <sup>[1,2,3,4,5,6]</sup>. The extent of this correlation could be quantified, with a 1 degree increase in temperature being associated with a 3.1% decrease in new cases and a 1.2% decrease in deaths <sup>[2]</sup>.

In order to confirm these data, a survey (submitted for publication) was carried out under the aegis of the National Academy of Medicine from a network of 19 doctors, pharmacists and health managers practicing either in temperate zones (France and Italy), the intertropical African zones (Senegal, Côte d'Ivoire, Burkina Faso, Mali, Togo, Gabon) or in the French DOM/TOM (Guadeloupe, Martinique, Réunion, Mayotte, St Martin, St. Barthélémy, New Caledonia).

The aim was to study the influence of temperature on Covid-19 attack rates by comparing data from intertropical areas with those from European countries. Each local correspondent established weekly records from the first reported case by distinguishing (i) confirmed cases according to the definition of Santé Publique France <sup>[7]</sup>, (ii) "imported" cases, (iii) "native" cases allowing the dissemination index [native cases /reference population] to be established, (iv) the number of hospitalizations and (v) the number of deaths. Average weekly temperatures, expressed in degrees Celsius, were recorded, as well as the population densities, the bulk arrival of sick travelers, the possible intake of chloroquine and compliance with containment measures.

The results of this survey show that the spread index of 2.67 in Europe for an average temperature of 11.2°C, fell to 0.03 in sub-Saharan Africa where the average temperature was 34.8°C. They confirm observations that warm climates have a reducing effect on the "SARS-CoV-2 transmission" and support the hypothesis of a seasonal influence of climate on the Covid-19 epidemiology in temperate countries.

### **Based on this preliminary data, the Academy of Medicine as of now recommends:**

- to integrate the climate factor into the epidemic modelling and to take into account weather forecasts by the decision-making bodies relating to the management of the Covid-19 health crisis;
- not to overlook the risk of a Covid-19 outbreak, in particular in metropolitan France, especially if the circulation of SARS-CoV-2 persists in the Southern Hemisphere during summer, by strengthening surveillance, prevention and response capacities as early as September.

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1 Sobral MFF et al. Association between climate variables and global transmission of SARS-CoV-2. *Sci Total Environ.* 2020 ; 729 : 138997.

2 Wu Y et al. Effects of temperature and humidity on the daily new cases and new deaths of COVID-19 in 166 countries. *Sci Total Environ.* <https://www.sciencedirect.com/science/article/pii/S0048969720325687#!>

3 Chan KH et al. Effects of Temperature and Relative Humidity on the Viability of the SARS Coronavirus . *Adv Virol.* 2011;2011:734690. <https://doi.org/10.1155/2011/734690>

4 Abdullahi IN et al. Exploring the genetics, ecology of SARS-CoV-2 and climatic factors as possible control strategies against COVID-19. *Infez Med.* 2020 Ahead Of Print Jun 1;28(2):166-173.

5 Prata DN et al. Temperature significantly changes COVID-19 transmission in (sub)tropical cities of Brazil *Sci Total Environ.* 2020 ; 729, 1338862 <https://www.sciencedirect.com/science/article/pii/S0048969720323792>

6 M.J. Araujo, B. Naimi – Spread of Sars-CoV-2 Coronavirus likely to be constrained by climate.

<https://doi.org/10.1101/2020.03.12.20034728>.

7 <https://www.santepubliquefrance.fr/surveillance-syndromique-sursaud-R/documents/bulletin-national/2020/bulletin-national-d-information-oscour-du-7-avril-2020>