

## A week after our first discussion, how did the situation evolve in French Guiana?



*Kaw Marsh Nature Reserve, French Guiana*

French Guiana officially entered stage 2 of the Covid-19 epidemic on Saturday 4 April, which means that the virus is circulating and grouped cases are now present on the territory. This is a logical development, due to the acceleration of the pandemic in South America (10,360 cases and 444 deaths in Brazil on April 4) and the absence of preventive treatment or vaccine.

But French Guiana is so far the least affected overseas French department with 68 cases tested positive and only one patient in intensive care, on April 5.

This proves that the confinement, imposed at the same time as in Metropolitan France, has been beneficial. Flights have been sharply reduced (from 6,000 passengers to 150 per week), enabling a significant reduction in the number of imported cases.

Uncertainty now comes from the border regions. One death has been reported in Suriname and two others in the neighbouring Brazilian state of Amapa, but there is no visibility on the number of people infected. We can hope that border closures will be sufficient to contain the spread.

## And what about the Institut Pasteur?

I can count on an engaged team, despite more stress. We are continuing the screening tests that we were able to launch in mid-February. We benefited from the transfer of techniques by the support of the Institut Pasteur International Network.

A week ago, we started an epidemiological study that aims to better understand the extent of Covid-19 transmission within a family and estimate the proportion of asymptomatic forms of the virus that remains poorly informed to date. 300 household contacts of confirmed non-hospitalized cases will be followed up clinically, virologically and serologically. These results will help to adapt the recommendations concerning the isolation of contagious cases. This study will also make it possible to study the possible impact of climate (temperature and humidity) on the transmission of Covid-19.



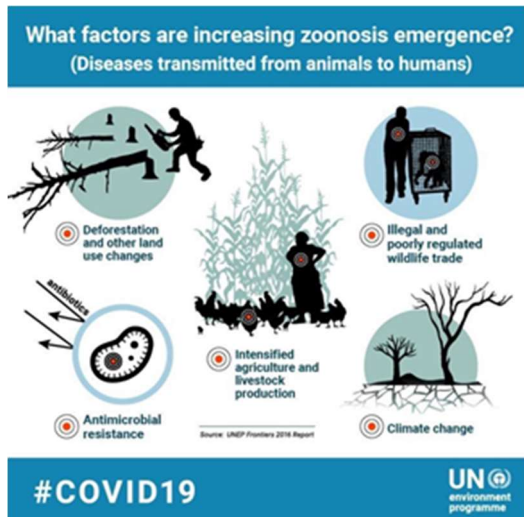
*Virology Laboratory, Institut Pasteur of French Guiana*

## Emerged in China, the Covid-19 pandemic is said to have originated in a virus transmitted from wild animals to humans. Is this a new phenomenon?

"Zoonosis" means any disease or infection which is naturally transmissible from animals to humans, between animals and humans, either through direct contact or indirectly, through food (especially when preparing food and cutting meat) or a vector. According to [the World Organisation for Animal Health](#), 60% of infectious human diseases are zoonotic. Concerning Covid-19, the genetic sequencing of the virus has shown a very high homology (96%) with that of a bat, a species endemic to south-west China and, to a lesser extent (90%), with a coronavirus found in pangolin. Furthermore, a protein of the current virus, called "protein S", is very close to that of the virus discovered in this animal. This protein plays an essential role in the binding of the virus to the receptor of a human cell. It would therefore appear that this new coronavirus (Covid-19) originated in the bat but has acquired a portion of the pangolin virus genome, making it able to enter human cells more easily. It has adapted to humans and is capable of being widely transmitted from person to person.

*60% of existing human infections diseases are zoonotic."*

Understanding the origins and transmission of these diseases is therefore complex, and there is no vaccine for the time being. What is certain is that the bat, like the pangolin, is a reservoir for the virus. Bats live for long periods of time and in communities, which encourages transmission between them. They also have an immune system that allows them to control the virus and not get sick, as a kind of innate immunity. The SARS epidemic in the early 2000s was already originating from both China and the bat with an intermediate host which was the civet. Rabies, for example, transmitted by dogs or bats, is older but is still responsible for tens of thousands of deaths each year, despite the existence of a vaccine. **Zoonoses are therefore not a recent phenomenon. What is new is the increase in their frequency.**



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## We've been living with bats for centuries... What's changed?

Our relationship with nature! Bats have always lived in nature, often in caves; any damage to their environment increases the risk of transmitting the viruses they carry to other animals and to humans. For example, deforestation for mining or agricultural activities or population growth endanger the natural habitats of wild animals and bring them closer to domestic animals and humans. And I don't forget the capture and trade of some of these wild animals for consumption.

Researchers at the Institut Pasteur have just published [a study](#) on the viruses present in bats in French Guiana. 51 viral families capable of infecting a highly variable panel of hosts (eg. bacteria, plants, insects and vertebrates, etc.) have been identified, including 14 families linked to mammals.

*"The more we disturb nature, the greater the risk of transmission of pathogens between animals and humans. That's what we're experiencing today."*

Changes in bats' natural habitats also alter their behaviour. For example, our researchers have observed in Guyana that vampire bats are more likely to attack domestic animals when their natural habitat is disturbed. A strong link therefore exists between the disturbance of the habitat of reservoir animals and changes in animal behaviour that promote the interspecies transmission of micro-organisms such as viruses.



*Bat capture and swabbing by researchers at the Institut Pasteur in French Guiana.*



### Does climate change also increase these risks?



mosquitoes that proliferate in stagnant waters and swamps.

Yes, just as globalization increases the spread. Take freshwater, for example: it is already known to carry many parasites, viruses and bacteria that cause diseases ranging from acute gastroenteritis to cholera in humans. The impacts of climate change - forest fires, floods, drought - are aggravating factors in the modification of natural habitats and thus the emergence of zoonotic diseases. As animals migrate, new chains of transmission emerge.

This is in addition to the development of other infectious diseases, those transmitted by



Thanks Mirdad and see you next week!

*Interview by Marie-Cécile Grisard*

*Credit photo : Ronan Liétar – l'Amazone / Institut Pasteur of French Guiana*