

Changes in our environment and epidemics are linked to human activity

Entretien avec Jean-François Mattei • président de l'Académie nationale de médecine, ancien président de la Croix-Rouge française, membre de l'Institut de France (Académie des sciences morales et politiques), ancien ministre de la Santé

The global health crisis caused by the coronavirus epidemic has confirmed that most modern epidemics are caused by cross-species virus transmission between wildlife and humans. According to Jean-François Mattei, since epidemics are the result of the imbalance caused by humankind to ecosystems which had been preserved until now, there is an urgent need to consider the environment and human health as being inextricably linked.

Humanitarian Alternatives – *How were we able to ignore all the scientific warnings which had for so long been raising the spectre of a new pandemic?*

Jean-François Mattei – For several years, fuelled by the incredible progress of an unprecedented scientific revolution, we have been devising projects to match our ambitions. Genetics, artificial intelligence, algorithms and an array of other techniques have been on the agenda. We were discussing human enhancement, which molecular engineering seemed to be bringing within reach; humans whose performance and qualities would be enhanced, an indestructible human who would be immortal. We were already imagining a much-heralded posthumanism, in a reinvented world extending to other planets, finally conquered. The world seemed too small to us and had practically become a village which could be traversed in under thirty-six hours. We were possessed by a feeling of unrivalled power before a virus from Asia came along, a rival that would prove even more ambitious than us.

The new coronavirus invaded the planet, sowing anguish and consternation, causing countless people to fall ill and hundreds of thousands to die. Disconcerted, we realised that we were defenceless against it. We had no vaccines or proven treatments that could be used to combat it. However, the risk of a pandemic had been identified very early on in studies on bioterrorism¹. Subsequently, the concept of pandemic appeared in the *Livre blanc sur la défense et la sécurité nationale de 2008* [2008 White Paper on Defence and National Security] with greater emphasis being placed on it every year². However, the suggested

¹ Report on bioterrorism by Professor Didier Raoult submitted to the Minister of Health and Minister of Research on 17 June 2003.

² 2008 White Paper on Defence and Security: "Over the next fifteen years, the emergence of a pandemic is

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recommendations were never acted upon, confirming that our health system does not prioritise prevention and forward planning³. We therefore lacked everything needed to fight the battle, apart from the unwavering commitment of the men and women who have made it their job to combat the disease in all circumstances. Coronavirus has brought us back down to earth with a bump. Far from a sense of pride about our knowledge and technology, we have discovered that we were both ignorant and powerless, and we have had to fight for our lives. Before our very eyes, the world turned out to be different as death loomed over us.

H. A. – *Nevertheless, changes to the environment should have alerted us to what was happening...*

J.-F. M. – Obviously, but we didn't want to see them and we refused to believe them. Yet, the wilderness was retreating in the face of demographic growth. The continuous emergence of megacities with their road extensions and industrial sites was leading to constant population movements. As for global warming, many people shared the view that decisions should be made in due course because only the present mattered. Even the deadly heatwaves barely resulted in a change of course. Nothing changed because the forward march of progress could not be slowed. Confident in our intelligence, we were talked into finding the solution only when it was necessary. We were blind to this promise of darker times, to this forecasted end.

Some observers had started to sound the alarm. The younger generation looked worriedly at the world because their future was in jeopardy. This generation realised that their environment was under threat if the warning was not heeded and if action was not taken as quickly as possible. These climate change whistleblowers called for widespread mobilisation because there was a lot at stake.

H. A. – *What share of the responsibility should we take for spreading the epidemic?*

J.-F. M. – The history of epidemics and pandemics shows that in most cases they are caused by humans. Humans have come into contact with wildlife because their repeated incursions have destroyed ecosystems that were once preserved. In fact, wild animals are both virus

plausible. Whatever its origin, natural or malicious, the methods for dealing with its consequences will be identical from the point of view of protecting the population. The kinetics of a highly-contagious and highly-lethal pandemic would extend over a period of several weeks to several months, in a series of waves spaced over time. By virtue of its scale, duration, geographical extent and indiscriminate nature, such a crisis is likely to jeopardise the normal functioning of the country and its institutions." This white paper raises awareness about targeting the health monitoring and warning system on the threat, ongoing investments in research, development and production of potential treatments, contingency planning for national life under a pandemic, raising early awareness in the general population, training and exercises for response teams, setting up national stockpiles to meet the main health threats and, lastly, contributing to the action of competent international agencies. In the event of an outbreak of pandemic disease, the aim would be to prevent a health crisis degenerating into a humanitarian, economic, security or even institutional crisis...

³ Jean-François Mattei, *Santé. Le grand bouleversement*, Les Liens qui Libèrent, 2020.

reservoirs and transmitters and the source of most emerging infectious diseases. For instance, bats are known to harbour a number of viruses and are reservoirs of coronavirus and in some cases, Ebola. Transmission to humans can take various forms, notably via hunting and at food markets where wild animal meat is sold. Civet cats were identified as being the intermediate vector in the SARS (Severe Acute Respiratory Syndrome) epidemic in 2002-2003, while pangolins are suspected for Covid-19. In the past, chimpanzees were thought to have transmitted HIV-AIDS to humans. A significant virus population is constantly in circulation and, at some point, it manifests itself when viral transmission crosses the species barrier because of new contact between humans and animals. The virus then infects humans, reproduces and causes a disease, which may be serious such as Covid-19, after SARS and Middle East respiratory syndrome (MERS-CoV, 2003). Research has been going on for years into the pathogens found in animals around the world that are likely to infect humans⁴. Such research has found that cross-species transmission is two to three times more frequent than forty years ago because of increased proximity between humans and animals. This sort of research highlighted that a pandemic was foreseeable but did not generate the necessary interest or response. Indeed, a flawed understanding of the diversity of viral threats explains why we are defenceless against the diseases that they cause. Humankind's responsibility does not end there because the farming of domestic animals is another source of such infections. The population explosion has created new food needs and has led to domestic animals being farmed in industrial conditions far removed from the natural processes, which can also cause zoonotic diseases that can be transmitted to humans. For example, avian influenza virus H5N1 occurs in birds and is pathogenic for humans. The emergence of a form that can be transmitted from person to person would open the door to a pandemic. Similarly, Bovine spongiform encephalopathy (BSE) caused by a prion (misfolded protein) spread to humans and caused a serious neurological condition⁵. Zoonotic diseases are therefore an emerging problem the dangers of which have not been sufficiently understood. It is time that we realised that an epidemic or even a pandemic is now occurring about every three years and we need to be prepared for it. Forward planning determines the effectiveness of the response.

The same applies to global warming which has clear effects on human health. Tiger mosquitoes (*Aedes albopictus*), the source of Chikungunya, are becoming established and developing in Southern Europe, just like the mosquitoes responsible for malaria, Dengue fever and Zika virus, which are extending their range to new areas with more accommodating temperatures⁶. Obviously, changes in our environment and epidemics are linked to human activity.

H. A. – *The spread of the epidemic has forced us to think about the “post-coronavirus*

⁴ Dennis Carroll et al., “The Global Virome Project”, *Science*, vol. 359, issue 6378, 23 February 2018, pp. 872-874.

⁵ Jean-François Mattei (*rapporteur [reporter]*), *De la « vache folle » à la « vache émissaire »*, Assemblée nationale, rapport n° 3291, 1997.

⁶ David Wallace-Wells, *La Terre inhabitable* (transl. Cécile Leclère), Robert Laffont, 2019.

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world". In your opinion, what individual and collective measures need to be taken to prevent this sort of health crisis from happening again?

J.-F. M. – The links between pandemics and environmental changes should lead us to change our lifestyles by redefining our human values. The first value is clearly solidarity. Yet, it is clear that there was no global dialogue about the risk of a pandemic even though pandemics are inherently global events that need to be tackled together when they occur. Although epidemics strike worldwide, they also reveal considerable inequalities between countries. Health systems are sometimes fragile and can collapse under the pressure of an epidemic, as demonstrated by the Ebola epidemic in some African countries in 2014. It is one thing for each country to have its own health and social welfare system, but things should be completely different when defining a common strategy to curb a pandemic because bacteria, like viruses, do not respect borders. An encouraging sign would be full sharing of data and experiences by the countries hit by Covid-19 as this alone would enable all the lessons to be learned together. Everyone understands that this is crucial.

While it is difficult to predict the future, some assert that nothing will ever be the same again. Consequently, this could mark the end of post-modern thinking based on the present and individualism⁷. Concern for the environment and the danger of pandemics could reverse these reference points and lead us to work together sustainably to achieve shared goals. This is now a requirement for humanity. Respect for the environment in which humans live determines human health and, to a large extent, the joy of living. It is high time that we take action.

Translated from the French by Gillian Eaton

Biography • Jean-François Mattei

President of the *Académie nationale de médecine* and a member of the *Institut de France (Académie des Sciences Morales et Politiques)* and former Minister of Health, Professor Jean-François Mattei was a Paediatrician before specialising in genetics. His work has led him to be involved in bioethics and he has gained recognition both in France and abroad for his research. He was President of the French Red Cross from 2004 to 2013, and in 2013 he launched the French Red Cross Endowment Fund (now the Foundation), which he headed from 2013 to 2017. He has been a member of the *Institut de France* since 2015 (*Académie des sciences Morales et Politiques*) and was made a Knight of the Legion of Honour in 2004. He is the co-founder of *Humanitarian Alternatives*.

⁷ Henri Mendras et Laurence Duboys Fresney (coll.), *La Seconde Révolution française (1965-1984)*, Gallimard, coll. « Bibliothèque des Sciences humaines », 1988.

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