

Coronavirus: “A poisoned gift.” Comment about an article explaining 20th-century pandemics

INTRODUCTION

In the face of the pandemic we are experiencing, we can make use of the recommendations and authorized information provided by the National Ministry of Health of Argentina and other authorities, but I believe that a comment about an article recently published in *Le Monde Diplomatique* can help pediatricians to better understand the origin of this epidemic and of other epidemics the world has faced in recent times.

“The explanation of the growing human vulnerability to pandemics should not be looked for in animals, but in a deeper cause: an accelerated destruction and manipulation of nature” (Sonia Shah).

In the 20th century, why has humanity suffered (and still suffers) large-scale pandemics or epidemics caused by infectious agents that had never been previously identified? The answer to this question can be found in an article recently published by Sonia Shah,¹ who is a journalist, a researcher, and an author of books on science, human rights, and international politics. It is worth mentioning her book *The Body Hunters: Testing New Drugs on the World's Poorest Patients*, which was highly praised and granted an award by *The New England Journal of Medicine*. The phrases in quotation marks are exact copies of her article.

In the 20th century, hundreds of pathogens emerged or re-emerged in regions where they had never been previously observed, which sometimes led to devastating epidemics or pandemics. “Far from blaming pangolins or bats, the cause of these trends should be looked for in three phenomena: deforestation, urbanization, and rampant industrialization”.

Close encounters

Under this subtitle, the author starts identifying three large groups of diseases. One of them is made up of viruses such as the human immunodeficiency virus (HIV), the Ebola virus, in West Africa; the Zika virus, in the Americas; the Nipah virus, in Malaysia and Bangladesh; the Marburg virus, in West Africa, etc.—most of which come from wild animals. But this does not mean that these animals are particularly

infected by pathogenic germs. On the contrary, they have lived together with these germs for hundreds of thousands of years; the problem is that deforestation forces them to reduce their habitat to small areas which are not covered by human settlements.

These close and repeated encounters between wild animals and human beings make viruses pass from the former to the latter at a rate that would have never been possible before and, in this passage to humans, viruses stop being benign and turn into fatal pathogens. For example, “the Ebola virus came from recently deforested areas in Central and West Africa. When forests were cleared, bats were forced to switch to trees in our gardens and our farms”. From then on, it is easy to imagine how a human being can come into contact with the virus, for instance, by eating a fruit which was licked by a carrier bat. This phenomenon is known as **transmission across species barriers** and, if it happens frequently, it can allow interspecies transmission of germs that are benign in wild animals, but mutate and turn into pathogens in human beings.

The second group encompasses mosquito-borne diseases. In this case, the spread of “diseases is not due to habitat loss but to its transformation”. In fact, deforestation makes the layer of dead leaves on the ground and the roots of trees disappear, leaving an unprotected soil parched by sun exposure, which favors the formation of puddles in which mosquitoes can easily multiply. According to a study conducted in twelve countries, the author mentions that “vectors of human pathogens in deforested areas are twice as common than in intact forests”.

The third group of diseases results from changes in the population sizes of some species. Habitat destruction in North America resulted in a reduced population of some birds (which are poor vectors of the West Nile virus) and a relative overpopulation of other birds (which are excellent vectors of such virus). This increases the likelihood that a mosquito will first bite an infected bird and then a human being. The author explains that, in the Northeastern United States, deforestation forced animals out of their habitats, such as weasels (which contributed to keep tick population under control), while other species such as white footed mouse and deer, which are excellent tick carriers, continued

to thrive, resulting in an increased spread of tick-borne diseases, such as Lyme disease, which was first diagnosed in 1975 in the United States, with many cases reported to date.

Meat consumption

The risk of emergence of new diseases not only increases due to the loss of habitats, but also due to the way those losses are replaced. In order to breed and feed cattle for slaughter, human beings have destroyed an area equivalent to that of Africa. In this context, many animals are sold in wet markets, where animals from different species, which would have never been in contact in the wild, live next to each other, resulting in a situation where viruses can easily transfer from one species to the other. "It was in this type of markets that the coronavirus which caused the severe acute respiratory syndrome (SARS) emerged, and this may also be the source of the new coronavirus that is currently threatening us".

"But the situation resulting from the industrial meat production system is even much more serious. Thousands of animals are crammed together (in feedlots, etc.) before they end up in the slaughterhouse; these conditions are ideal for the reproduction of microorganisms and their transformation into fatal pathogens. For example, the avian influenza virus is hosted in water birds, but wreaks havoc when entering poultry farms, for it gets much more virulent. One of its strains, H5N1, can be passed on to humans and kills more than half of those infected. In 2014, in the United States, tens of millions of poultry were sacrificed to stop the spread of one of its strains".

The mountains of excrement produced by animals when crammed together cannot be absorbed by the ground and create optimum conditions for microorganisms, such as *Escherichia coli*, which contaminates waters and food,² and causes bloody diarrhea, sepsis, and hemolytic uremic syndrome, which is so prevalent in Argentina. "In the United States, 90 000 people are infected every year with *Escherichia coli*".

Origin of pandemics

The mutation of animal microbes into human pathogens is not new. It first occurred in the Neolithic period, about 10 000 years ago, when humans started growing plants and domesticating animals. "Here lies the origin of the poisoned gifts these animals have given us: we owe measles, smallpox, and tuberculosis to the cows, whooping cough to the pigs, and flu to the ducks".

"European colonial expansion further intensified this process", claims the author. In the Belgian Congo, urbanization and the construction of railways allowed macaque lentivirus to adapt even better to humans and become HIV. In Bangladesh, the British penetrated the Sundarbans wetland, exposing its inhabitants to water bacteria. One of them turned into *Vibrio cholerae*, decimating populations in repeated epidemics, the last of which was in Haiti.

What to do

In order to reduce the risks of these trends, the author proposes the following conceptual bases:

Allowing animals to keep their habitats: in this way, germs will stay in animals instead of passing on to human beings.

Continuously researching ways in which microorganisms mutate more easily, "eliminating in a timely manner those that show signs of adaptation to the human body and intervening before they spread". According to the author, unfortunately, the United States Government ended programs which were investigating potentially pathogenic strains similar to the coronavirus and, what is even worse, announced plans to cut its contributions to the World Health Organization (WHO) by 53 %. There is no doubt that the author lets us know that politics is not external to human health, but instead inextricably linked to it.

Lastly, the author quotes the epidemiologist Larry Brilliant: "Virus outbreaks are inevitable, epidemics are not". ■

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