

Acting in the South to fight zoonoses is an urgent necessity

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The scale of the health crisis linked to the emergence and wide spread of the SARS-Covid-19 virus is unprecedented for some people, impacting and shocking for all. The virus strikes all the countries of the world indifferently and has led today to the confinement of nearly half of the population for protection and to limit its spread.

However, this crisis and its geographical scope are not so surprising.

Historically, in the biological world, pathogens - whether viruses, bacteria, fungus or others - have always been circulating between animals and humans. At least 75% of pathogens emerging in humans are found to be of animal origin, therefore there is nothing abnormal about these natural biological phenomena. Our history is marked by successive crisis with more or less dramatic consequences for the human species: the Spanish flu wrought havoc in 1918 (20 to 50 million deaths), the Hong-Kong flu in 1969, with more than 1 million deaths (40,000 in France), the SARS epidemic in Asia (another coronavirus) in 2002-2003 - quickly circumscribed, or the EBOLA epidemic between 2013 and 2014 (more than 12,000 deaths and a lethality rate of up to 90% in humans) are some examples.

Nature and wildlife are reservoirs of these pathogens. Of varying severity, these zoonoses (diseases or infections transmitted from animals to humans and vice-versa), will therefore continue to develop, without us always being aware of it. Owing to the distance and scant media attention, who among us has heard of the epidemic of Crimean-Congo hemorrhagic fever -which appeared last January in central Mali - transmitted by cattle herd? Farmers were infected by tick bites with a high mortality risk. With the mobilization of national and international institutions such as AVSF, the Malian Veterinary and Human health services acted quickly to ensure that all the measures required to avoid major damage were put in place: deticking of animals and people, supervision of animal slaughter practices and raising awareness among farmers. This time, the zoonosis was quickly circumscribed - but as the Covid-19 epidemic shows, the "emergence" of certain zoonoses is more difficult to control and can result in a very rapid increase in the number of infected and sick people.

Zoonoses are not more numerous but human activity makes their impact stronger!

If zoonoses are more publicized than in the past and logically generate anxiety and fear, it remains difficult to say whether they are on the rise but their impacts could be more acute: the probability of crossing the species barrier between animals and humans has increased due to human activities disrupting the environment, and globalization has enabled the virus to spread across borders more quickly.

We certainly have little control when viruses present in nature, silently and surreptitiously, adapt, mutate and transform, until at some point they manage to cross the species barrier. But human activity has always been a major factor in the emergence and the spread of zoonoses.

It is true that medical progress is making us live longer, even if unevenly provided between regions of the world. But with this increase in life-expectancy comes a gradual decline in our immunity to external pathogens. The eradication of several diseases in certain countries also makes us more fragile if the disease comes to resurface, as is the case of European countries with foot-and-mouth

disease (dreaded viral disease of livestock still present in many African and Asian countries), or creates dependence on immunity acquired through vaccination (thus measles, eradicated from Western countries, recreates new epidemics due to the drop in vaccination in these same countries). Like human medicine, advances in veterinary medicine make it possible to fight effectively in some countries against dangerous zoonoses such as brucellosis or tuberculosis, or to fight against animal diseases with dramatic consequences on local economies, such as foot-and-mouth disease or the plague of small ruminants.

Conflicts around the world are also not without impact on the emergence and spread of zoonoses, through the massive displacement of populations and animals that they cause and the concomitant degradation of human and veterinary health services.

Finally, climate change is modifying the distribution areas of species considered as reservoirs, very often at the origin of zoonoses (bats, rodents, monkeys, etc.) and vectors (e.g. mosquitoes) which can transmit zoonotic viruses (ie : Chikungunya or West Nile).

Also at stake: unsuitable agricultural and livestock production systems and marketing channels!

All over the world, the increase in human and animal population densities is creating more promiscuity between humans but also between humans and animals. The more people, the more animals are needed to feed them. However, the intensification of farming systems (cattle, poultry, etc.), the concentration and densification of animal populations over the past and present century have increased the risk of transmission of these zoonoses and their consequences. If it is undoubtedly, migratory birds, by nature difficult to control, would have contaminated farmed poultry, the avian influenza epidemic (H5N1) appeared in Asia in 2003, then spread to Europe and France in 2006, has grown considerably around the world due to the concentration of poultry in intensive industrial farming systems and farms, and integrated chains in which the movement, transport and circulation of animals (purchase of chicks, sale of poultry, etc.) are by far the main cause of disease spread within a region, a country, or between countries.

In addition, population growth goes hand in hand with increasing food demand and the need for large tracts of arable land. However, in many continents, decisions to intensify agricultural and livestock farming systems were most often made at the expense of ecosystem protection, in particular by encroaching on forest areas which host many reservoir species or vectors of zoonoses. Contacts have increased between humans, domesticated animals and wild fauna; some species have found in more direct and closer contact with village and rural communities. And in addition to more frequent contaminations, increased supplies of this wild fauna are ultimately found on food market stalls, not always or insufficiently controlled at the sanitary level...

Globalization further exacerbates the effects of zoonoses

The globalization of trade, the development of air transport and the rapidity of human and animal movement naturally increase the spread of these zoonoses. They put a strain on our collective ability to quickly control and curb the arrival of contaminated humans or animals in areas previously unaffected.

The Covid-19 epidemic, which exploded to become a pandemic, is now questioning not only our production models, but also the exchange of agricultural and animal products on local and international markets: the excessive specialization of certain territories makes them dependent on international trade, with too often an unfair competition on the markets that is detrimental to peasant economies but also the health of all. If we still need international trade in food products, at

least because we do not all produce the same foodstuffs at the same latitudes, the excessive dependence of certain countries of the South on food import weakens their resistance and resilience in the event of a pandemic, beside weakening their own capacity to feed their population and support their family agricultures.

In the South, strengthen community-based health care and epidemiological surveillance services.

The current Covid-19 pandemic reminds us, if need be, of the interdependence that exists on the one hand between all our countries, whether developed, emerging or developing and between human health, animal health and the preservation of our environments on the other. Of course, we cannot always prevent the emergence of certain zoonoses. However, we can ensure increased vigilance to timely detect such occurrences.

The pandemic highlights how fundamental it is to consolidate, everywhere, animal health systems that are well integrated to human health services, that are capable of gathering timely, frequent and reliable epidemiological information and to take the necessary sanitary measures in time. This can be done with the support of strong and competent public Veterinary Services, private practitioners (veterinarians or technicians), and finally breeders sensitized to sanitary issues. However, in some developing countries, public and private veterinary networks remain too often dramatically insufficient. In such situations, strengthening animal health, veterinary control and epidemiological surveillance systems as close as possible to farmers and rural communities, which are often isolated and vulnerable, becomes more than ever a priority. This is the role of the "Community Animal Health Auxiliaries" who have been trained for many years by NGOs such as AVSF and public institutions around the world. They are village breeders, chosen by their peers and trained to provide basic health care to domestic animals in their community. They generally act under the supervision of a private veterinarian and in close coordination with existing public veterinary services. Detect early to act quickly: this is indeed a crucial role for these breeders, acting like crucial links in the chain of epidemiological surveillance and disease detection at the local level. This role is all the more important since they also contribute to lower mortality and to improve the productivity of familyfarms, in often very vulnerable economies.

Promoting agroecology and family-farming and livestock systems respecting biodiversity and the environment

All over the world, the agroecological transition of farming and livestock systems is no longer an option: it is necessary to achieve increased performance of family farms - and of all forms of agriculture – be it in terms of production, economic results or positive impact on the environment. It is also essential to consolidate their autonomy and resilience in the face of climatic or economic shocks. Finally, it is necessary to protect us all from latent health risks. At each crisis, the world's agricultural systems are questioned: it becomes urgent to leave production methods that are detrimental to nature and ecosystems, as well as agro-industrial models that are destructive and dangerous for public health. Sometimes still considered as outdated in some countries, familyfarming system must today be promoted and supported: not only because they already provide more than 70% of our food and guarantee employment all over the world, but also because they are best able to take advantage of the natural processes and regulations of ecosystems for plant production and livestock farming, and to preserve forest areas and biodiversity. By doing so, these types of agriculture will contribute not only to the fight against climate change, but also against the health risks linked to animal diseases.

Fighting against the concentration of livestock farming and moving away from intensive production practices requires supporting small-scale farms and contributing to the continuous improvement of

their practices: preserving and enhancing hardy breeds, preserving and developing ethnoveterinary practices, managing livestock effluents to preserve the environment and prevent the spread of diseases, etc. Even if free-range farming does not always protect against contamination by wild animals such as migratory birds or wild boars, family-sized farms present less risk of multiplication and spread of pathogens than concentration farms, owing mostly to the fact that they introduce fewer animals of different origins, and in addition to the fact that they better respect animal welfare.

In Asia, Cambodia and Vietnam, AVSF has been able to demonstrate the relevance of biosecured pig and poultry farming using simple and inexpensive methods. The technical models proposed recommend a strict and complete application of different biosecurity measures at the family farm level, to prevent and control animal epidemics such as Newcastle disease for poultry, or Classical Swine Fever for pigs: prevention (vaccinations, antiparasite treatments...), diagnostic recognition and control of diseases, control of contacts with neighbouring livestock (fences, improved habitats, ...), secure animals supply (farms with known health status, controlled circuits, traceability, ...), etc.

Relocating trade and securing markets

The world's agricultures must finally emerge from unbridled trade on international markets, moreover under conditions of competition often unfair to family agriculture, which exacerbate public health risks, weaken the countries' food sovereignty and their resilience to economic, climatic or health shocks. Whenever possible, both in the North and in the South, limiting long-distance trade movements, relocating trade and promoting local national markets will be the avenues to be explored, while strengthening local ad-hoc sanitary and veterinary control mechanisms on these markets.

Educate, train and work together to improve human, animal and environmental health

The Covid-19 pandemic has become a global issue and has reached the forefront of globalized information. Despite its dramatic nature, it is demonstrating, more than any other challenge to policymakers and the public at large, the importance of the prevailing links between ecosystems transformation, animal diseases and public health. More than ever, there is an urgent need for an integrated approach to health and in the decompartmentalization of collaborations between all public and private stakeholders in human health, animal health, environmental management and food production.

For us, agronomists and veterinarians who hold dear the value of solidarity, it is also by working as close as possible with often isolated rural communities of the South, experiment together and develop farming and breeding practices as well as marketing methods towards greater economic, environmental sustainability and health security. Supporting the family-farm system in the South - so that they can live with dignity from their land and their animals - and promoting public and private technical and health support services in fragile countries, is therefore not only an act of solidarity: it is by acting there as well that we will tomorrow win, or not, the battle against zoonoses.

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