

# Infection of society

As diseases have evolved to exploit the holes in our defences, including weaknesses in society, we have to reconsider our way of life, otherwise they will continue to haunt us

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When people die in a terrorist attack, it automatically makes front-page headlines in the newspapers. But every year, hundreds of people die on the roads of France and nobody takes any notice. Death and mutilation are horrible in both cases, but the latter, although it takes place every day everywhere in the world, is simply accepted as a fatality, as a price that we have to pay for mobility. Why are our societies so cynical when it comes to death and suffering? Why do we weigh deaths differently in our imagination? And it is not just car accidents. AIDS spreads like wildfire in Africa and Southeast Asia; tuberculosis is back with a vengeance; malaria claims millions of lives each year in the developing world; and what is our public reaction to this immense amount of human suffering? Almost nothing, except for an editorial here and there. And the money that we spend on public health and disease research is marginal compared with what we spend on weapons to kill each other.

Diseases have evolved over millenia to exploit weaknesses in our defences. Now, for the first time, we have the tools to fight them successfully—vaccines, antibiotics and good hygiene—and biological research promises even more. But diseases still claim millions of lives in the developing world, and are about to make a comeback in the developed world, too. The reason for this recent development is not that we have run out of effective vaccines or medications; it is a societal shift such that we value the individual more than the community, which creates the new weaknesses that bacteria and viruses can exploit. In fact, there is a strong connection between diseases and society, and if we do not recognize this link, we will forever have new and increasingly virulent diseases to face.

**Our infections mirror our primary interests, and our way of life**

Since antibiotics were discovered just over half a century ago, we have suddenly, in the course of only one generation, forgotten the terrible burden that infectious diseases present—at least those of us who are lucky enough to live in the developed world. But this sense of security is an illusion. We do not know how to cure most viral diseases, and bacteria are returning in force, increasingly able to circumvent our remedies. Louis Pasteur and Robert Koch, who first discovered disease-causing microbes, advocated Jenner's vaccine method and the idea of hygiene, well before antibiotics. But that is, surprisingly, long forgotten today: public health is in decline even in rich countries (Garrett, 2000), and vaccination rates are dropping because parents, for various reasons, increasingly choose not to vaccinate their children.

Diseases caused by microbes and viruses do not develop at random. Somebody sneezes in the subway and one week later, the whole town suffers from flu. AIDS, by contrast, is so poorly contagious that, as a disease, it should never have existed. The only reason why the virus is spreading exponentially is not its virulence, but the psycho-sociological factors linked with lifestyle and behaviour. Fifteen years ago, *Listeria monocytogenes* suddenly made the headlines as an emerging scourge, although it was nowhere near as infectious as flu. It was almost forgotten for a while, because the entire food chain was altered to prevent *Listeria* infection. Unfortunately, the drastic measures motivated by profit-driven controls on exports failed to take into account the complex microbial ecology of dairy products, potentially allowing the disease to appear again in force. Today, the H5N1 chicken flu reappears regularly in Hong Kong. A human version of another avian strain caused the largest epidemic in recent history, killing more than 20 million people after the First World War, with a mortality rate of 25%. Any outbreak of avian flu now triggers the slaughter of millions of

chickens in Hong Kong, but the only effective prevention—establishing a controlled slaughtering system, and prohibiting the sale of live chickens at the markets in Hong Kong—cannot be implemented, simply because people traditionally like to eat freshly killed chicken. This shows vividly that it is impossible to separate infectious diseases from our lifestyle or from the structure of our societies, and above all, from venal considerations. Our infections mirror our primary interests, and our way of life.

**In a nutshell, our perception of danger has nothing to do with reality**

It is difficult to discuss the origin and spread of diseases, in particular AIDS, because this disease is so deeply rooted in our present social perception. In practice, we are even prohibited to speak about it freely, unless we use a pre-established code, with a specific vocabulary—typical 'politically correct' language. Nevertheless, to understand how HIV spreads, it is essential to speak freely. First, about blood. And second, about sexuality. But we do not instigate this necessary debate and, as a result, the disease is now spreading like wildfire in the poorest countries. And nobody really seems to care, at least none of those who are in a position to make a difference. Yes, of course, we have non-governmental agencies to deal with AIDS in the developing world, as a pretext to salvage what is left of our moral consciousness. But the simple ideas of responsibility, or even of duty, are no longer valid in this era. As a sign of the aberration that we have now reached, some demonstrate against AIDS as if it were a social partner!

The basic problem underlying the fact that we are obviously unable to deal with AIDS is the structure of our society. Everyone wishes to promote his or her rights, regardless of whether this is at the expense of others. We are living in a world that is dominated by the American 'way of life', in which



the democracy of the infantile ego (not so long ago known as the right of the strongest) is the rule. Truly poor countries have absolutely no power in this world, while the pressure applied by opportunistic collections of individual egos is destroying social structures, as Alexis de Tocqueville remarked with prescient despair a century and a half ago. Of course, social structures are built primarily on kinship. They are, therefore, intimately associated with the control of matrimonial alliances and, accordingly, of sexual behaviour, in parallel with recognizing the dignity of others. In Africa, initiation ceremonies used to teach young people that they ought to follow the old customs, while they had to recognize that they differed from their tribal African neighbours. This created a distance that was enough to maintain many languages, and, in the case of AIDS, to keep the virus at bay by preventing indiscriminate sexual promiscuity.

But we have managed to destroy most traditions in Africa, and it will be impossible to go back. Several hundred old languages—real tongues, not dialects—have disappeared since Europeans colonized the continent. The old social structures are dissolving as people, threatened by famine, war, civil unrest or simply in search of jobs, move around the continent. So, how can we deal with the explosion of AIDS? Sad to say, we will have to tolerate its spread, unless it becomes an explicit

menace to our own Western societies. Some developing countries have found appropriate solutions tailored to their situation, but, unfortunately, the cynical developed world will not be worried at all by the AIDS explosion elsewhere. Without a profound change in our own societies, we will keep letting the infected die, because their existence is so remote from our own lives. We are far from understanding the nature of the disease, but the fear of it is disappearing from our own societies because it is no longer immediately deadly. So strong is our need to do what pleases us, without reflection or restraint, that we again see an increase in unprotected sex in our societies, particularly among homosexuals, who are most at risk of becoming infected by HIV. The cause is always the same: our egos are the only value. Social groups no longer consist of fraternities, but of collections of individuals, motivated by the same egotistical short-term interests.

Let us come back to blood again, because it is the route used by most diseases to propagate. Diseases have evolved to co-exist with their host by the concomitant evolution of predator and prey. Human blood, which is the universal flood that links our organs, is therefore a potential vector for a wide range of diseases. We find that the closer phylogenetically an animal is to man, the more prone it

is to carry infectious bacteria or viruses that can easily jump the species gap by a small and rapid series of mutations. Interestingly, we believe today that this explains how HIV gained the ability to infect man, after man started feeding on 'bush meat' that includes monkeys and apes. But we have learned nothing from this experience. Again, we see the immense egoism of the individual—while public concern focuses on the potential dangers of genetically modified plants, society does not question the efforts made to 'humanize' animals to make them sources of organs that could be transplanted into humans (xenotransplantation). It is not difficult to foresee that animal (retro)viruses lurking in the substituted organs, when placed in the bloodstream of the host, could occasionally be expressed and eventually multiply and mutate or recombine with host viruses. Thus, a new virus species would be generated that could eventually infect the human population even more virulently than HIV. HIV has proved to us that this is not a far-fetched idea, invented by some reactionary Cassandra, but a concrete fact (Peeters *et al.*, 2002). There is a simple way to test this hypothesis: study the causes of morbidity and mortality in butchers and in the personnel of slaughterhouses (Bethwaite *et al.*, 2001), and compare those data with similar data for postmen, for example. I have proposed such a study for years to various agencies, without any success—nobody wants to do it.

**We have to teach our societies to reconsider our values—it is not the purse that is important, it is lives**

In a nutshell, our perception of danger has nothing to do with reality. Although we fear most what we perceive as artificial, such as radiation, or unfamiliar, such as genetically modified crops, we underestimate or even tolerate the dangers that come from what we think is natural. Or, to put it the other way, the nearer a potential threat is to us, the more serious it seems to be. Vaccinations in the developed world are dropping below the critical level required to achieve 'herd immunity' because more and more parents are not willing to take the risk of the side effects of vaccines, even if they are low. The threat of an epidemic of a disease that

would certainly affect their unvaccinated children, however, seems to be too far removed from these well-meaning parents to be taken seriously. The question of what is a tolerable level of infection, alas, is improperly asked. It is not a medical problem, but a social one, and thus asks for political intervention—in its noble meaning—as a consequence.

**T**his view is fairly pessimistic, and we could stop here. The idea of what is 'tolerable' is an archaic one, stemming from the time when people valued liberty, equality and fraternity. These ideas are still familiar to social groups that not only cherish the freedom of the individual, but also respect others and consider a sense of responsibility and duty as essential for the survival of the group. Unfortunately, ideas of equality and fraternity seem almost grotesque today, when the decision to share responsibility or enjoy personal liberty is increasingly made in favour of the latter, disregarding the fate of others. But could we not try to suppress this infantile and overpowered ego that dominates all those societies who subscribe to the American way of life? We all know the answer. Many a passer-by has been badly hurt, or even killed, in a robbery, because he or she defended their purse, not thinking of his or her life. This now seems to be an ordinary reaction, although it is perfectly stupid. We have to teach our societies to reconsider our values—it is not the purse that is important, it is lives.

We need to trap our societies with their own defects: nothing will happen without financial or economic pressure. At the start of the industrial revolution, accidents in the workplace claimed the lives of, or maimed, many workers. Nowadays, the number of work-related accidents is extremely low. This undeniable success is not due to a heightened social awareness among factory owners, but rather it is driven by the premiums that have to be paid to insurance companies to cover the cost of an accident. Similarly, it should be fairly easy to eliminate nosocomial infections. All that is necessary is to enforce that doctors, and in particular the heads of medical services, wear gloves, blouses and caps, and that they wash their hands when they go from one patient to another—something that Ignaz Semmelweis advocated more than a century ago. This

is, unfortunately, not the current practice, but would be much more beneficial than attacking them for diagnostic errors. Errors in diagnosis are always possible—even inevitable—and certainly much less severe for the community than nosocomial diseases. Here, again, we see the trace of the tyranny of the individual: the many court trials that doctors are now facing are not usually motivated by the interest of the community, but only by the interest of isolated individuals.

**...if we are not able to recreate the much needed sense of fraternity [...] then the microbes that we thought we had controlled will haunt us again**

**T**he Black Death stopped being a scourge when, after the implementation of sanitary cordons, soldiers had orders to fire on 'rich' people trying to cross the cordon. Using corruption, the rich were able to cross these lines and propagated the disease much more efficiently than rats ever did. We have not learned since. When plague broke out in Surat, India, in 1994, 80% of the city's doctors, and most of its officials, were the first to flee (Garrett, 2000), thus spreading the disease to other parts of India, disregarding both their duties as physicians and the basic principles of public health. Again, the enforcement of sanitary cordons and public hygiene would have stopped the outbreak much earlier, but there was no incentive to do so. Many infectious diseases are now under control, thanks to vaccination, but one begins to hear of court trials that question the role of vaccination in public health. We tolerate the fact that the disease may affect the majority, whereas it seems intolerable for the individual to face the low risk of side-effects. In the early days of vaccines, public health officials had the means to enforce vaccination, or even quarantine infected individuals, but the ensuing legal battles and an exaggerated interpretation of the individual's civil liberties did away with that. If vaccination rates drop further, we will soon be as vulnerable to these diseases as we were before vaccines were introduced.

These behaviours are difficult to change, however. In the 1970s in Ivory Coast, my late friend Hilaire Tiendrébéogo proposed to create a movie as the subject

of his medical thesis, based on the actions of ordinary peasants, to explain to African people why they should implement hygiene in their villages. It would include an anthropological analysis of the current behaviour of village people. To clean out evil spirits, people perform rituals that could well be used to clean out microbes if the places that microbes inhabit were associated with places where spirits live. It would also encompass practical demonstrations of the link between propagation of 'invisible' entities and disease. Unfortunately, he had to abandon his well-advanced project for a more conventional one, because his superiors found that this was not fit for the thesis of a medical doctor.

The general consequence of the inertia created by venal interests and the existing strata in society is that rules are badly needed for the collective good. If we do not react fast enough, if we are not able to recreate the much needed sense of fraternity—and we are all equal when it comes to disease and death—then the microbes that we thought we had controlled will haunt us again. Unfortunately, a large number of deaths will probably be the price we have to pay to understand, finally, that true democracy is not representing the freedom of the individual, but that of the City.

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