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Declaring an emergency is a dirty work, but someone has to do it. When facing a serious threat to global public health, even if complete evidence is lacking, someone has to take the responsibility to push the red button that activates a chain of coordinated actions (such as cooperation among states and research on vaccines). Choosing to do this, the risk of giving a false alarm is unavoidable. On the other side, one could decide to wait until something more is known, with the awareness that, in this way, it is possible to act when it is too late. Facing the diffusion of Zika virus in Latin America, Margaret Chan, WHO director general ? at least for the third time in few years ? found herself in front of that button, while experts couldn?t provide her with sure answers to her most relevant questions.

**PHEIC is not for the virus**

Uncertainty is common [17] in the first phases of an infectious outbreak on which little is known. But Zika is not a new emerging virus, such as influenza A(H1N1), which caused swine flu, H5N1 of bird flu, SARS or MERS. It has been known by experts for at least 50 years, even if nobody took too much care in studying it, nor investing on a vaccine, since it has always seemed completely innocuous: infected people are mainly asymptomatic and only some of them undergo a week of mild fever, joint aches and a skin rash. The scarce funding available for tropical neglected diseases needed to be used for much more important purposes than this.

It wasn?t the ?explosive? spread of the virus, therefore, to convince the 18 members of the WHO Emergency Committee that a raise in the level of alarm was needed, but the concurrent warning of a suspect growing number of malformations and neurological syndromes indicated by Brazilian health authorities. This circumstance still needs to be clarified by researchers, but claimed for attention by the WHO. While the Zika virus, which infected more than 1 million people in more than 30 countries in the last year, made

no victims neither cause severe illness, the possibility of a widespread increase in birth defects ? along with the fear that Guillain Barrè paralysis could be evoked by the virus ? was the real cause of alarm.

«*After a review of the evidence, the Committee advised* ***that the recent cluster of microcephaly cases and other neurological disorders reported in Brazil****, following a similar cluster in French Polynesia in 2014, constitutes an ?extraordinary event? and a public health threat to other parts of the world*» declared Margaret Chan on February 1st, clarifying that the Public Health Emergency of International Concern (PHEIC) does not regard Zika directly, but the rapidly growing number of cases of microcephaly and neurological disorders recorded in Brazil. According to the WHO experts, the temporal and spatial association between these records and the epidemic is a strong reason for suspect, but at the moment nobody can either confirm nor deny that a real increase in microcephaly cases exists and that it is caused by the virus.

**Some experts raise doubts**

Those who raise doubts have their good reasons to do this. First of all, microcephaly is not a specific disease, but only a sign that something went wrong in the development of brain and skull. This can be caused by several, different factors. The definition itself is tautological: we talk about microcephaly when the circumference of the baby?s skull is less than the third percentile. In other words, in a population of 100 children, only 3 should have a value equal or lower than this. From this, one can easily deduce that in each country approximately 3% of newborns would present such an anomaly. Out of about 3 millions babies born in Brazil each year, then, the number of microcephalic babies at birth should be around 90,000: much more than the 3,500-4,000 cases cited by Brazilian authorities as possible consequences of the Zika infection.

Since microcephaly usually does not have serious consequences, even on the

neurological development, this birth defect is underreported in all the registries of malformations, all over the world. The baseline prevalence on which the 20-fold increase is calculated could therefore be considered unreliable, in Brazil as it would probably be in Europe and in the United States. Since a possible association with Zika infection was suggested, on the contrary, surveillance has been improving, and all cases are currently being reported. Experts call this a ?confirmation bias?. In addition to this, a concurrent infection of the mother by Zika during pregnancy is not a proof of guilt, given the widespread diffusion of the epidemic in the last months. It would be like associating a birth defect with a cold in pregnancy: such a common case that could have no meaning at all.

**A precautionary choice**

Much more worrying than these epidemiological facts were findings suggesting a viral transmission from mother to foetus: Zika virus was found in the amniotic fluid of some women and in the brain tissue of two babies dead at birth because of severe microcephaly. Such evidence cannot be overlooked, because it shows that virus can pass the placental barrier, but again it does not represent a proof that the virus is the real, or only, cause of the birth defect. A hypothesis about the concurrent action of dengue and Zika viruses has been raised, for example, among others. In the Zika family there are not other viruses commonly causing malformations, such as rubella, but some other viruses are causing encephalitis. Even if there is no smoking gun, then, caution is due. The real issue at stake could be the health of hundreds of thousands of children who are going to be born in Latin America in the following months, but the threat could reach many other temperate areas, if the infection will keep on running as it is doing now.

A global effort to stop it is therefore needed, especially by helping afflicted countries in their fight against mosquitos, by recommending

people further care in protecting themselves from mosquitoes? bites, by warning women who are going to start a pregnancy, either to postpone it or to avoid moving to involved areas, if they are already pregnant and they can. WHO is right in not advising generally against travels, because such a recommendation would make even worse the situation of afflicted countries, especially in view of 2016 Brazil Olympic Games. The actual risk of Zika, in fact, except for pregnancy, is much lower than that of many other diseases, such as A(H1N1) swine flu, which is causing hundreds of deaths all over the world, Brazil included.

**The real risk is different from what we perceive**

Despite evidence, public perception of risk related to Zika is high. Should we blame media for this? Not only. The science of risk communication teaches that we all perceive a threat as bigger or smaller because of several factors that have nothing to do with the real thing. In this case, our perception of risk is inflated by the exotic origin of the danger and by the fact that it addresses mainly weak targets, such as newborns. The uncertainty around the risk of microcephaly, instead of reducing our anxiety, amplifies it, making it bigger than flu that, even if much more severe, is very familiar to everybody since infancy.

To communicate such an uncertainty [17] at the beginning of an epidemic is always a hard task. Authorities are hardly trying to do it: in every speech, document and press release they highlight that scientific evidence of a linkage between Zika virus and microcephaly is still lacking, and that every recommendation about this is given ?out of an abundance of caution?, as the CDC wrote. But this is not enough. We all should hope that a causal association between such a widespread factor as Zika virus and birth defects will be soon denied. But, if this happens, instead of celebrating, the WHO might undergo suspects, as during 2009 swine pandemic, that it declared the alarm in order to favour big

pharma, pushing it to search for a vaccine. Such conspiracy theories are already circulating on the web. On the other hand, if the international agency had taken time, waiting for further evidence, it would have been accused of ignoring the lessons coming from ebola epidemic in Western Africa, where the delay of the international intervention cost thousands of deaths and had a terrible impact on socioeconomic life in the affected countries. Both the choice of intervening, in one case, and of procrastinating, in the other, were deemed big mistakes that discredited the WHO and undermined public trust in health authorities.

In this lose-lose game, WHO has decided to bet on caution, instead of running the risk of being accused of a negligence that, in the worst scenario, would have had a terrible impact: if Zika will keep on spreading in the following months, and the association with birth defects will be confirmed, the stakes are a much bigger ?thalidomide case [18]?, which could sign the current generation, especially in low and middle income countries. Even if this scenario is not very likely, its consequences are too serious to be overlooked. On the other hand, an overestimate of the epidemic impact could bring a heavy burden as well. The first one is easy to imagine, and it is the economic crisis that could follow in countries, such as the Caribbean ones, whose GNP is mainly based on tourism.

TELL ME [19] was an EU-funded project on communication during epidemics that showed how ?exotic? outbreaks can spark stigma against people and goods coming from the affected areas, or even only related to them in a very remote way. Another EU-funded project called ASSET, [20] which aims to bring Science-in Society issues into the public debate on epidemics, highlights that Zika is mainly threatening female gender [21] and pregnancy, themes often neglected in research on infectious diseases.

Finally, each epidemic carries ethical aspects [22], as well. They are usually related to

personal freedom, such as the issue of quarantine, but, in this case, the impact of a false alarm could be even bigger: recommendations of postponing pregnancies are given in countries where birth control is very far away and abortion is legally admitted in very limited cases. Even if countries such as Columbia have recently widened indications for legal abortion to Zika infection, the real possibilities of access remain low. If we had a spike in clandestine abortions, possibly made in very bad conditions, the number of these victims could easily exceed those caused by Zika.

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