

Olympics in Brazil: Effectiveness of Prevention Measures Facing the Threat of a New Influenza Pandemic

OPINION

Maria Josycley Novais Landim Soares¹, Kécia silva Damasceno¹,
Pablo Pitta², Kamyla de Lellis Sousa Costa³,
Domingos Sávio Matos Dantas⁴, Modesto Leite Rolim Neto¹

- 1 Faculty of Medicine, Federal University of Cariri, UFCAR, Barbalha, Ceará, Brazil.
- 2 Faculty of Medicine, Estácio, FMJ, Juazeiro do Norte, Ceará, Brazil.
- 3 Federal Institute of Ceará, IFCE, Juazeiro do Norte, Ceará, Brazil.
- 4 General Hospital of Roraima, Boa Vista, Roraima, Brazil.

Abstract

Influenza A viruses, related to high morbidity and mortality worldwide, are involved in major pandemics since the 20th century. A new H1N1 epidemic is happening in Brazil where the Olympics will take place late this year. Being a tropical country, the Brazilian climate favours the propagation of the viruses. Therefore, other countries need to be alert to a possible pandemic dissemination of the viruses due to the high flow of people from different countries, and to consider ways of stopping such propagation. Methods of prophylaxis currently available and in circulation, including vaccine, anti-viral drugs and hygiene measures, do not have the desired effectiveness against pandemics. In view of the above scenario, it is essential to increase the surveillance and intervention on the part of health authorities of all the countries in the analysis of potential cases, and to adopt appropriate health measures in order to prevent further pandemic outbreaks.

Influenza A viruses are zoonotic pathogens capable of infecting human beings, birds, swine, and other mammals. They are responsible for recurrent epidemics and occasional pandemics which account for up to 5 million serious illnesses per annum and up to 500,000 deaths worldwide. [1, 2] These pathogens suffer mutations ranging from specific ones to large antigenic changes. This in turn brings about new viruses, making pandemic outbreaks more likely due to low immunity of human beings to the new subtypes brought forth. [3]

Four influenza pandemics have been documented since the beginning of the 20th century. The Spanish flu broke out in 1918, causing

Contact information:

Modesto Leite Rolim Neto.

✉ modestorolim@yahoo.com.br

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the death by H1N1 of about twenty to fifty million people worldwide. The origins of the virus have not been well established. In 1957, the Asian flu caused by the H2N2 subtype, which began in China, was responsible for four million deaths, mainly by viral pneumonia. In 1968, a pandemic was caused by the H3N2 subtype in Hong Kong. Lastly, a pandemic influenza caused by H1N1 broke out in Mexico in 2009 [1, 2, 3].

It is worth noticing that, although the pandemics which occurred in the twentieth century had in common the emergence of different antigenic subtypes of influenza which presented as a product of avian influenza, during the year of 2009 a new subtype H1N1 was detected, in which swine origin virus played a part [4, 5].

In the period from January to April 2016, the Ministry of Health of Brazil reported 2,467 cases of influenza, with 2,085 positive for subtype H1N1 and 444 deaths, 411 of these by the same subtype; the majority of cases were in the southeast of the country [6].

The Zika virus, which affected the Brazilian population after major international events, especially the World Cup, in 2014 found favorable conditions for dissemination through the *Aedes Aegypti* mosquito, quickly became an epidemic, even though it was not previously found in this country. Obviously, the Influenza A virus can also be spread from this country to others, as it is a pandemic virus [7, 8].

Therefore, in the case of a disease with high transmissibility and mortality, the strengthening of preventive measures must be a global public health priority, with vaccination being considered at the moment the most effective method. It is estimated that in the United States, the vaccine efficacy rate is around 59% in adults. Although being the most effective, in general terms, during a pandemic, it would not provide the same effectiveness, since its protection would not be durable and universal [9].

As a result, research is being undertaken to develop vaccines based on the subunits of the protein

of the virus. This work needs to continue by testing through clinical trials, so that these vaccines may be licensed for humans because they are more effective [10].

Another concern, identified in US studies, is that although there are programs that promote vaccination in the country, vaccination coverage is compromised because of barriers related to beliefs, knowledge and attitudes [11].

Another alternative would be the use of neuraminidase inhibitors, which has produced results that are controversial and variable. The meta-analysis of observational data of 2009 Influenza A (H1N1) suggests that in hospitalized patients, there is a significant reduction of mortality in adults by 25% in general, and by 62% if started during 48 hours since the onset of symptoms. [12]

Considering the options in dealing with a pandemic, it is necessary that the health authorities in each country instigate the adoption of educational measures of non-pharmacological prophylaxis with primary basis of basic hygiene measures, and promote immunization campaigns through vaccination. If a pandemic takes hold, these authorities must act in accordance with World Health Organization guidelines, incorporating measures to isolate affected patients, adopting quarantine for contacts, travel restrictions and social distancing in order to reduce the migration of the virus to people from other countries during major events like the Olympics, as well as, reducing the probability of mutations between influenza subtypes, because Brazil is a tropical country with climate favorable to the propagation of H1N1. [4]

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