

# Influenza Pandemic AH1N1v/2009 – early experience and autumn perspectives

P. CROVARI, R. GASPARINI

Department of Health Sciences, Genoa University, Italy

Between end of March and early April 2009, a novel influenza A H1N1 virus of swine origin spread in Mexico and in the United States of America [1]. Within a few weeks, the virus was circulating throughout the world (118 Countries by 29<sup>th</sup> June). Since its transmission is direct from man to man, the WHO raised a pandemic alarm, initially at level 4 and, soon after, at levels 5 and 6 (11.6.2009).

This virus has the potential to cause the first influenza pandemic of the XXI<sup>st</sup> Century.

The first few months of observation and research have highlighted some important points, especially concerning the agent at work and its origin. The data that have been collected indicate that the new viral strain has originated from reassortments, occurring in swine, between two viruses, which had been present in the same animal for some time [2, 3]:

- A swine strain, AH1N1, derived from a triple reassortment, exhibited in its genome segments of RNA of human and avian origin. This virus has circulated in American pigs for approximately 10 years, without creating any particular problems to either swine or man [4].
- Another swine strain, AH1N1, of the Euro-Asiatic lineage, has caused limited outbreaks in European and Asian pig farms for some time.

Even if the origin and characterization of the new virus has been characterized, the mechanism leading to it being adapted to man still remains to be defined.

Some useful information has also been generated on the possible severity of the pandemic.

Even if the data collected so far relate to a limited number of cases, according to the evaluation parameters indicated by WHO [5, 6] this pandemic should be of “moderate” severity.

It is likely that a virus, similar to the new H1N1, had previously circulated in the world population during the thirties and fifties of last century. Accordingly, approximately 30% of subjects over 60 years of age have detectable antibodies against the novel virus [7]. It has also been found that vaccination with the seasonal trivalent vaccines (containing AH1N1 virus strains, which circulated in the first few years of this century) has not provided protection against the new viral variant [7].

The novel virus is sensitive to neuroaminidase inhibitor drugs (Tamiflu and Relenza) and resistant to M2 inhibitors (Amantadanes) [8]. From this point of view, the new H1N1 variant is clearly different from the seasonal H1N1 strains, that was resistant to Tamiflu (99%) and sensitive both to Relenza, and M2 inhibitors [8].

From an epidemiological perspective, different scenarios have been observed. In North America an epidemic peak of the disease occurred end of Spring-early in Summer, with a pattern similar to a seasonal peak. Now the epidemic continues to increase in the Western area of the United States, but has started to decrease in several other areas [8]. In Europe, even if cases have been recorded in almost every Country, a community spreading and, consequently, an epidemic peak, has been observed only in the United Kingdom [9]. In the Southern Hemisphere (Argentina, Chile, Australia, etc.), where winter is just starting, the H1N1v influenza is rapidly spreading [10].

It will be important to follow the course of this “new” influenza in countries in the Southern hemisphere, where the climate factor plays in favour of the virus, as it could offer useful information applicable to issues that at present are unresolved.

- Will the new H1N1 strain replace on the epidemiological scene the strain that has circulated until now (and which is present in the seasonal vaccine)?
- Will adaptation of the new virus to man remain unchanged, i.e., will its “reproduction rate” increase with time?
- Will the severity of the pandemic, and in particular its case fatality ratio, increase with the increase in human transmission of the virus and the spread of the disease?
- Will the sensitivity of the new virus to the antiviral drugs remain unchanged?
- Who will win the race between the virus and the producers of its specific vaccine, so that at least in some areas of the World, a significant amount of the population could be immunized prior to the epidemic wave?

If there are no sudden changes, which are always possible with influenza viruses, it is quite likely that the Autumn-Winter of 2009-2010 will represent a test bench for the Northern Hemisphere, not only for the pathogenic potential of the novel H1N1, but also for the capability of developed countries to face a new influenza pandemic. In this respect, we must consider that, for the first time in history, many countries face an influenza pandemic (a) with a detailed plan of preparedness and control, (b) with new arms, such as anti-viral drugs and vaccines, and (c) a sophisticated communications system. The risk of using our arms improperly requires a truly global approach to this global challenge.

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