

## H1N1 Influenza Pandemics 2009: From Myths to Facts

It is not exaggeration to say that the official declaration of H1N1 influenza pandemic in the June of 2009, by the World Health Organization (WHO), was the most important medical news in the past year.<sup>1,2</sup> Accordingly, after a short time, this pandemic became the most important health issue in almost every part of the world.<sup>3</sup> Now, in the anniversary of this event, it is worth standing and looking back at what has taken place through the past year.

By the year 2005, WHO asked all the member states to develop a pandemic preparedness plan.<sup>4</sup> This plan was supposed to be a holistic statement including public health measures, awareness plans, education of health workers at all levels, capacity building in the health care facilities and a framework for intersectoral collaboration.<sup>5,6</sup> Several evaluations at the beginning of this pandemic revealed that, even in those countries that have developed their national preparedness plan, these plans were far from the initial goals and few visible and measurable actions were implemented before pandemic.<sup>7,8</sup> By the announcement of the H1N1 2009 pandemic, countries tried to compensate this shortcoming by focusing on issues like purchasing antiviral drugs and vaccines, closing schools, and developing strategies for banning public gatherings.<sup>9,10</sup>

There has been a great deal of debate on what pharmacological and non-pharmacological intervention can be effective in fighting against this pandemic.<sup>11,12</sup> Debates were mainly due to a misunderstood concept toward the dynamic nature of this pandemic at different stages. In other words, measures effective at one stage may not have any effect on the other stages and decisions should have been taken according to the stage of pandemic, available resources and proposed goals.<sup>13,14</sup>

Such controversial issues drew the attention of scientists to the new aspects of H1N1 influenza and provided a forum for scientific discussions. Through the last year, there was a drastic surge in the quantity of scientific materials related to influenza. For example, by the end of 2009, the number of indexed articles on influenza in Pubmed reached 4841 cases, which showed nearly a 59% growth, and surely more articles are on the way.<sup>15</sup>

Among the investigated topics, the origin of this virus could receive a great attention. For instance, Gibbs

et al. in a challenging article casted doubt on the natural origin of this virus. They believed that such a gene arrangement might be made in a laboratory or so.<sup>16</sup> Other investigators refused Gibbs's claim.<sup>17,18</sup> As an example, Khiabani et al., by analyzing the re-assortment phenomena through several statistical techniques, indicated that re-assortment patterns in swine viruses had been similar to the previous results found in human viruses.<sup>19</sup>

Meanwhile, very soon it became apparent that this pandemic has several different features with the usual seasonal flu. The affected age group was found to be younger with a special tendency for severe disease in pregnant ladies and the infectivity rate was found to be higher.<sup>20-22</sup> All of these features provided a pronounced fear,<sup>23</sup> although this initial fear gradually had vanished and been replaced by uncertainty toward the available therapies and vaccines.<sup>24,25</sup>

Up to early June 2010, more than 18000 mortalities attributed to this pandemic have been reported worldwide.<sup>26</sup> This reflects that a remarkably lesser death toll occurs annually due to seasonal flu which is estimated to be about 250000 to 500000 in each year.<sup>27</sup> Most of the current available data indicate that the pandemic 2009 H1N1 virus infection has on average less severity than seasonal flu. A recent study comparing pandemic H1 N1 flu and seasonal influenza A viruses in family contacts revealed that both infections had similar viral-load dynamics, severity of clinical illness, and transmissibility.<sup>28</sup>

Clarification of these figures leads to different reactions among public health experts, politicians and also in mass media. Some even claimed that the pandemic was a fake phenomenon.<sup>29</sup> The pressure became more severe after November 2009 when the pandemic started to taper off. The way that both health professionals and the public provided the pandemic information was criticized by some experts and WHO was accused of producing "fear and confusion" rather than what was really needed.<sup>30</sup> In response to these reactions, WHO insisted that pandemic was real and even in a recent statement the director general of WHO said "we are still in the pandemic".<sup>31</sup> At the same time, WHO appointed a group to investigate on whether their plans and actions at all levels were appropriate.

According to WHO, countries should maintain their vigilance for this pandemic.<sup>32</sup> The appointed experts would review the result of epidemiologic findings in the current flu season in the southern hemisphere to see whether the pandemic H1 N1 is still in circulation or not. Currently, the virus is reported to be most active in south East Asia and Caribbean's. Therefore, it is clear that pandemic H1N1 virus is still present even if we are not in the peak of the pandemic.<sup>33</sup>

Pandemic announcement had its own costs and harms. Although social fears and impairment in the social functioning of the subjects cannot easily be measured, seemingly the social costs and psychological adverse effects of this event exerted its toll on health care systems.<sup>34,35</sup> Large social and religious gatherings were among the targets for this psychosocial insult. A crystal clear example of such a gathering was Hajj, the largest religious ceremony in the world, in which 3 million people from more than 90 countries congregate in Mecca. A great level of stress was imposed on pilgrims as they suffered from a strong personal phobia about the potential disabilities and death resulting from catching H1N1 influenza.<sup>36</sup> Furthermore, they were accused of spreading the disease through the world.<sup>37</sup> Although this worry had led to a vast preparedness programs, as well as several restrictions for pilgrims and their families, H1N1 influenza has never proved to be a real threat for this ceremony. Some official reports confirmed that the morbidity and mortality attributed to the flu in the Hajj ceremony of 2009 was obviously lesser than previous years.<sup>38</sup> This considerable reduction of flu burden might be related to the preparedness programs, but the great bulk of these programs concluded education of pilgrims rather than chemoprophylaxis or vaccination.

Coming to health care systems and the way they face this pandemic, it should be noted that during 2009 H1N1 pandemic a great deal of emphasis was placed on the mass vaccination and there was a pronounced lack of holistic vision in preventive strategies.<sup>39,40</sup> Such an emphasis had led to enormous waste of money in several countries. Indeed, the mentioned declaration enforced the governments to buy remarkable doses of vaccine. France, for example, spent over 600 million Euros on 94 million doses of vaccine, most of which have not been used.<sup>41</sup> This scenario was seen in other countries as well, even those countries with lesser financial capabilities.<sup>42</sup>

These economic impacts made some skeptics to say that "the only people to benefit from this pandemic were the pharmaceutical companies". Although

WHO denied any influence from pharmaceutical companies, it seems that, finally, the companies were the main winner of this pandemic rather than people at risk for developing flu.<sup>43</sup>

While vaccination, as a key preventive strategy, could not satisfy all the expectations and millions of doses of H1N1 vaccine expired unused on shelves, public health information and reinforcement of primary health care system received lesser degree of attention by health policy makers and authorities.<sup>44,45</sup> The great social interest toward administration of H1N1 vaccine at the initial stages of the current influenza pandemic and marked changes in the people's tendency to receive vaccine, just several months later,<sup>46</sup> might be explained through the mentioned tunnel vision toward restriction of the pandemic and ignorance of social determinants of health.

What really happened in this pandemic was a high level of infectivity of a mild flu. Our study in Southern Iran revealed that about two thirds of people were tested positive for the presence of polyclonal antibody against 2009 H1N1 virus in November 2009. This means just before wide vaccine availability most of the people had developed immunity.<sup>47</sup>

Accordingly, certain lessons should be learned from this one-year endeavor to enhance our capability to handle similar global health issues. The most important message of this pandemic was inability of the health systems to give a proper response to newly developed health threats like pandemics and epidemics. For this inappropriate approach several etiologies can be defined. In the first explanation, health policy makers are relatively alleged, as they might overlook the capabilities of primary health care system to play crucial role in preventive programs.<sup>45</sup> In contrast, the second description points to the rigid structure of these systems which cannot be flexible enough to respond to new demands. In other words, we need an intelligent health care system which has potential abilities to rearrange its compartments to face new issues. Such a postulated health care system can immediately set action plans on general population through its social and cultural penetration. The most effective measures in controlling pandemic are possible only through intersectoral cooperation of health system with other allies.<sup>48</sup> It is the health system which should find the most critical points for intervention and to convince those responsible to cooperate.

The next lesson is that media can be a double edge sword in health issues. At one side, they can lead people toward a logical health related decision, such as getting more information from reliable sources or

playing a role in education of others. The other side is mass production of social fear and stress. Therefore, health policy makers should see the media as one of the members of their team, who need to be informed about the realities of health issues and socioeconomical consequences of wrong health related news.<sup>49</sup>

We should take this momentum as an opportunity to be prepared better for other pandemics and epidemics. Health systems should review their activities in response to this pandemic and every effort should be made to be more ready for the next event. Who knows what would be the next threat severe, acute respiratory syndrome, H5N1, H1N1, new viruses, new bacteria or a tornado!

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