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## Volume 12, Issue 5/2010 - Crisis Management

### Managing the AH1N1 Crisis

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**When the first cases of AH1N1 appeared in Mexico, the world watched as Mexican hospitals worked to get the crisis under control. The huge influx of patients meant strains on staff and resources. At the same time, the general public was beginning to panic. This article details how hospitals coped with the first wave of influenza and how they prepared for the anticipated, stronger, second wave of the virus.**

The influenza outbreak observed during 2009 in several cities of Mexico affected the fragile intensive care system and the health system in general. During the first wave, our highly demanded intensive care units (ICUs), nearly always full of patients, were under further demand from patients suffering from the epidemic. In hospitals, especially within ICUs and ERs, there were insufficient supplies to attend to the increasing number of patients with flu and there was a lack of diagnostic tests and antiviral treatments.

Our primary concern at that time was the knowledge that there were not enough ventilators available for all patients who would require ventilatory support. Additionally, there were concerns regarding the health workers who were highly exposed to the virus. ICUs were not designed with negative pressure rooms, doctors and nurses were not trained to attend patients with highly transmissible infections and there was a lack of proper safety equipment to protect them during patient care in the ICU. There was a high probability, given these problems, of this epidemic causing the total failure of the healthcare system.

#### Drastic Measures

Due to this crisis situation, we sent out a call for help to some colleagues, mainly those who had previous experience with SARS, in an attempt to get specific recommendations on appropriate measures of protection, supplies and equipment that we would require. Mexican health authorities took drastic measures to efficiently control the epidemic. On the 17th of April the Health Secretary declared an epidemiological alert for influenza, by the 24th schools and universities were closed, by the 1st of May other non-essential activities were suspended. Finally on the 6th of May, all activities were reassumed. The first wave was considered from March 23rd to May 15th and there were 2,895 confirmed cases, with a mortality rate of 2.3 percent. However, the mortality rate in wards and the ICU reached 41 percent. During this period of the outbreak there was an overwhelming feeling of fear and hopelessness when patients crowded the ER and there were mass transfers into ICUs. Life changed in Mexico, as did the way of treating community-acquired pneumonia in the ICU. The challenge was to control our procedures in preparation for a biological crisis in the ICU through an effective action plan. The Secretary of Health, together with a multidisciplinary team, worked to map out directives on the minimum equipment and supplies required for ICUs to guarantee medical attention for severely ill patients under these extreme circumstances.

#### Raising Awareness

News of the spread of influenza was heavily reported in the media, there was a national awareness about the risk of a new hit of influenza AH1N1 and for that reason there was a nationwide campaign to show the population how to act in case of an epidemic, and how to prevent transmission. An important media campaign was run to make the population aware of the symptoms of influenza AH1N1 and to recommend more rapid medical attention in case of flu symptoms. Authorities in every level of the health system worked to promote sanitary measures such as hand washing, covering the nose mouth while sneezing and vaccination campaigns. There was a national campaign for immunisation with influenza vaccines and an important investment in equipment to protect healthcare workers (glasses, N95 masks, gowns, and gloves) (figure 1). Specific clinical guidelines to standardise admission and treatment in the ICU were distributed to ICUs in both public and private hospitals ([www.salud.gob.mx](http://www.salud.gob.mx)). There was an intense activity nationwide with numerous educational meetings regarding influenza AH1N1. Symposia, forums, expert meetings, videoconferences, mechanical ventilation workshops were organised across Mexico.

#### Controlling the Situation

Healthcare institutions formed special teams to take control of the situation. According to the demand for medical attention, hospitals designed a specific triage system to identify patients with flu and every new case of influenza was notified to the Federal Health Secretary. Specific processes for medical attention were redesigned in every emergency department, ICU and hospitalisation ward to manage these highly demanded services. There were specific areas in the wards to concentrate patients with influenza.

Innovative strategies to attend patients during the pandemic were observed such as the use of telepresence with robots at suburban hospitals. The intention of the programme was to cover more hospitals with specialised physicians. The telepresence programme, using robots directed by remote control via wireless internet, was used for the first time in a biological crisis. This novel programme assisted three suburban hospitals in the State of Mexico, acute care facilities including emergency room, ICUs, and isolated areas for influenza. This programme showed that it is feasible to provide assistance from highly specialised physicians to distant communities during an outbreak of influenza. Also, a specific supply chain for antivirals, vaccines, safety equipment was designed for the network of hospitals.

## The Second Wave

As expected, the magnitude of the second hit of the outbreak of Influenza AH1N1 was harder than the spring outbreak. Despite preparation for this second hit, ICUs and wards designed for influenza patients were over-subscribed, including those located in suburban cities. However, the health system was better prepared and the action plan worked in most hospitals. ICU patients were treated according to the recommendations made by the panel of experts. The ICUs were occupied with infected patients and specific areas of hospitals were isolated to receive patients with moderate symptoms. According to epidemiological reports in Mexico during the outbreak, the acute respiratory distress syndrome (ARDS) was very aggressive and patients were mechanically ventilated with high needs of airway pressures and FiO<sub>2</sub>. For that reason there was an important investment in mechanical ventilators to cover the expected demand and acquisition of equipment for special treatment of ARDS like High Frequency Oscillatory Ventilators (HFOV) and Extracorporeal Membrane Oxygenators (ECMO) (Figure 2).

## Conclusion

One year after the experience of our first biological epidemic, we feel that Mexico is closing the cycle. The swine flu pandemic was less aggressive than expected; the number of people that died was relatively low compared with the much higher number of infected people. Perhaps such unexpected low mortality was due to a good response to the challenge of a pandemic. The use of telecommunications, news, research, knowledge of epidemics, biotechnology and better equipment in ICUs, antibiotics, antiviral, vaccines, mechanical ventilators, and the importance of being prepared for disaster, might have been the strongest contributors to such a low mortality rate.



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