



Investigation of H1N1 Influenza Outbreak in a Church in Kaohsiung City

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On the afternoon of July 22, 2009, the Fifth Branch of Taiwan Centers for Disease Control (Taiwan CDC) received a telephone report from the Department of Health of Kaohsiung City Government that several members of a church training program started to show signs of fever and coughing. Investigation was immediately started by the Department of Health of Kaohsiung City Government and 12 cases of respiratory infection were reported through the symptom surveillance system that night. Eight of these cases were tested positive for the novel influenza A (H1N1) by the Research and Diagnostic Center of Taiwan CDC. This incident had a total of 114 cases and is the first outbreak of novel influenza A (H1N1) in Southern Taiwan.

The outbreak occurred in a church in Kaohsiung City during a Christian training program. The program's activities were arranged to start from July 20, 2009 and last for a week. The participants were high school students and counselors from around the country. Although the activities do not start until the 20th of July, several of the counselors were already starting to

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prepare on July 16. The students started to move in on the 19th of July. All of the participants were accommodated in the church's dormitory. The building has 3 floors with the participants living on the second and third floor. Every general room can accommodate six people and large room 12 people. The program's activities were held only on the three floors of that building. Although some of the small group activities were held in different rooms in the building, all 202 participants attended in the large group activities on the second floor hall.

The results of the investigation show that some of the participants were already starting to show respiratory symptoms on the 18th of July. However, only after the students started to move into the dormitory on the 19th did the numbers of afflicted persons increase until the highest number on July 22 (Figure 1). Health officials received the report of this outbreak

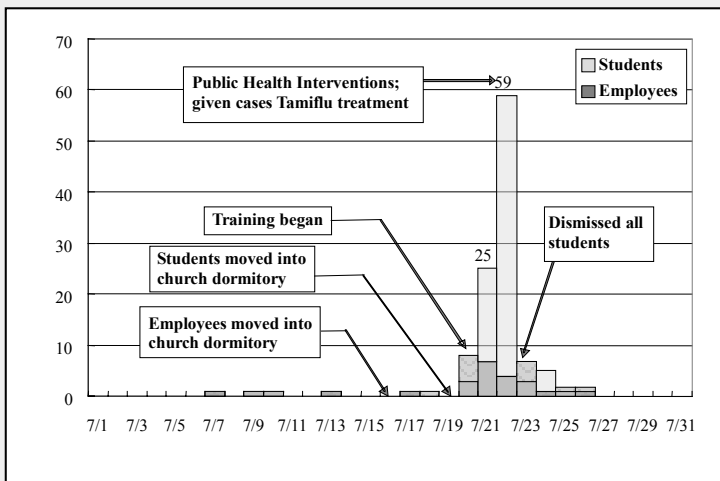


Figure 1. Number of of respiratory infection cases attending a church training program in Kaohsiung City, by date of onset



of respiratory infection at this time and started investigation. On the day of the report (July 22), 4 participants sought medical assistance at hospital A in Kaohsiung City. The other 25 participants sought medical assistance at hospital B in Kaohsiung City. Due to the fact that there were many persons afflicted with influenza-like symptom, the doctors took rapid influenza diagnostic tests. After being notified that 4 of the 25 persons were tested positive for Type A influenza, the Department of Health of Kaohsiung City Government organized an investigation group that sent health officials and doctors to the church to investigate the incident in order to confirm the scale of the outbreak and proceed with preventive measures. On that day, 12 specimens were collected from 12 participants and sent to the Research and Diagnostic Center of Taiwan CDC for real-time PCR swine H1 testing. The results show that 8 of the specimens were positive for the novel influenza A (H1N1) virus. Therefore, it is confirmed that the H1N1 virus is the pathogen of this outbreak of respiratory infection. Those cases with tested negative were not tested for other viruses.

In prevention of the spread of the outbreak, the activities for the program were canceled on July 22. At the same time, the building was disinfected. Health officials also provided face masks for those with respiratory symptoms. The participants with/without respiratory symptoms were also separated from each other. On July 23, the health officials conducted health education for all the participants. The persons showing respiratory symptoms should take medication for a concessive five days and those that did not display symptoms were to conduct self-monitoring for seven days. That afternoon, all the participants were dismissed to return to their residencies. The list of participants was sent to other

branches of Taiwan CDC by Fifth Branch for further monitoring.

The investigation looks back until July 1st and the clinical definition of a novel influenza A (H1N1) case was defined by any one of the following symptoms: fever (ear temperature $\geq 38^{\circ}\text{C}$), sore throat, sore muscles, coughing, or runny nose. Those that were also tested positive for the real-time PCR swine H1 were classified as a confirmed case. Those that only fit the clinical description were classified as a suspected case. Until August 1, a total of 114 cases were found (106 suspected cases and 8 confirmed cases) with an attack rate of 56% (114/202). The age span of the 114 cases was between 15-33 with 61 males and 53 females. Among the cases, 89 were students and 25 were counselors. The main symptoms included fever 63% (72/114), coughing 83% (95/114), sore throat 45% (51/114), runny nose 5% (6/114), myalgia 71% (81/114), diarrhea 8% (9/114), headaches 57% (65/114), and conjunctivitis 2%(2/114).

In source investigation, a total of 6 cases (5 counselors and 1 student) were found to show symptoms when moving into the church with onset dates of July 7, 9, 10, 13, 17, and 18 (the last case was a student). Although specimens were collected from the first 3 cases (the specimens were collected over ten days after the onset date, and they all tested negative), it is impossible to confirm if these 6 cases were infected with H1N1 or not. However, we highly suspect that these cases (especially those which had later onset dates) induced the church outbreak of the novel influenza A (H1N1). No matter which case was the source of the outbreak, none of the cases had history of traveling abroad recently; therefore it is concluded that a participant was infected in the community with the H1N1 virus and then transmitted it to the participants, resulting in



the outbreak. This is also the reason for the cancellation of the rest of the program's activities.

In disease control, due to the fact that during the time of the outbreak, Kaohsiung City was holding the World Games, health officials acquired permission from the Health Command and Coordination Center of the World Games to use Tamiflu for the cases but without preventive prescriptions to other participants. This is the first case from June 19 when H1N1 was removed from the list of category one notifiable diseases that Tamiflu was used for mild cases of the novel influenza A (H1N1) (with or without laboratory confirmation). In this investigation, a whole-scale specimen collection was not conducted and only 15 participants were tested for real-time PCR swine H1 (12 specimens were sent on July 22; 3 on July 23). Among these cases, 8 were tested positive and 3 of the 7 negative cases were collected ten days after the onset date. Although we regard those cases that fit the definition to be confirmed H1N1 cases and prescribed medication (a total of 96 persons took Tamiflu, and 94 of these took it within 48 hours of onset), we cannot eliminate the possibility that several cases were infected by other pathogens. Despite this, all the cases recovered during the follow-up period. The church's activities were dismissed on July 23, following the advice of the health officials. The participants then returned to their residences and monitored by different branches of Taiwan CDC. A total of 12 cases were inflicted after returning home including one case who caused another outbreak in another area. None of the cases from the church's outbreak had any complications or were hospitalized.

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