

Epidemiology and Surveillance System of Human Influenza Viruses

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Human influenza viruses have many subtypes, continuous and fast evolutionary changes, short incubation period, and capability of wide spread. To avoid regional epidemics and pandemics, surveillance becomes the most effective prevention and control measure. The commonly implemented influenza surveillance systems are: (1) clinical surveillance, (2) virological surveillance, and (3) serological surveillance.

Influenza viruses spread rapidly through respiratory droplet transmission and contact transmission. Important factors involved in the transmissibility of influenza viruses include the density of susceptible population, level of herd immunity, and molecular sequences of influenza viruses. Thus specimen collections, virus isolations and sequence analysis play an important role in influenza surveillance. Influenza symptoms include fever, myalgia, headache,

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sore throat, nonproductive cough, rhinitis and fatigue and sometimes it will lead to serious complications and even deaths. The symptoms vary among different age groups and types or subtypes of the influenza viruses. In Taiwan, vaccination program of influenza is free for high risk groups including healthcare workers. Notably, human influenza virus surveillance should integrate clinical symptoms, epidemiological characteristics, types/subtypes of influenza viruses and variations in their nucleotide and amino acid sequences plus carbohydrate components. Based on these valuable data, we can understand whether the novel influenza virus has entered into Taiwan or whether the outbreak is due to vaccine failure. To meet possible future challenges of novel influenza, we have developed our hospital emergency department-based syndromic surveillance since 2003.

Influenza surveillance involves national, regional and global systems. International collaboration on early detection and immediate prevention and control measures will be our future efforts.