

## A Description Analysis of Mortality Rate of Human Infection with Avian Influenza A(H7N9) Virus in China

**Authors :** Lei Zhou, Chao Li, Ruiqi Ren, Dan Li, Yali Wang, Daxin Ni, Zijian Feng, Qun Li

**Abstract :** Background: Since the first human infection with avian influenza A(H7N9) case was reported in China on 31 March 2013, five epidemics have been observed in China through February 2013 and September 2017. Though the overall mortality rate of H7N9 has remained as high as around 40% throughout the five epidemics, the specific mortality rate in Mainland China varied by provinces. We conducted a descriptive analysis of mortality rates of H7N9 cases to explore the various severity features of the disease and then to provide clues of further analyses of potential factors associated with the severity of the disease. Methods: The data for analysis originated from the National Notifiable Infectious Disease Report and Surveillance System (NNIDRSS). The surveillance system and identification procedure for H7N9 infection have not changed in China since 2013. The definition of a confirmed H7N9 case is as same as previous reports. Mortality rates of H7N9 cases are described and compared by time and location of reporting, age and sex, and genetic features of H7N9 virus strains. Results: The overall mortality rate, the male and female specific overall rates of H7N9 is 39.6% (608/1533), 40.3% (432/1072) and 38.2% (176/461), respectively. There was no significant difference between the mortality rates of male and female. The age-specific mortality rates are significantly varied by age groups ( $\chi^2=38.16$ ,  $p < 0.001$ ). The mortality of H7N9 cases in the age group between 20 and 60 (33.17%) and age group of over 60 (51.16%) is much higher than that in the age group of under 20 (5.00%). Considering the time of reporting, the mortality rates of cases which were reported in the first (40.57%) and fourth (42.51%) quarters of each year are significantly higher than the mortality of cases which were reported in the second (36.02%) and third (27.27%) quarters ( $\chi^2=75.18$ ,  $p < 0.001$ ). The geographic specific mortality rates vary too. The mortality rates of H7N9 cases reported from the Northeast China (66.67%) and Westeast China (56.52%) are significantly higher than that of H7N9 cases reported from the remained area of mainland China. The mortality rate of H7N9 cases reported from the Central China is the lowest (34.38%). The mortality rates of H7N9 cases reported from rural (37.76%) and urban (38.96%) areas are similar. The mortality rate of H7N9 cases infected with the highly pathogenic avian influenza A(H7N9) virus (48.15%) is higher than the rate of H7N9 cases infected with the low pathogenic avian influenza A(H7N9) virus (37.57%), but the difference is not statistically significant. Preliminary analyses showed that age and some clinical complications such as respiratory failure, heart failure, and septic shock could be potential risk factors associated with the death of H7N9 cases. Conclusions: The mortality rates of H7N9 cases varied by age, sex, time of reporting and geographical location in mainland China. Further in-depth analyses and field investigations of the factors associated with the severity of H7N9 cases need to be considered.

**Keywords :** H7N9 virus, Avian Influenza, mortality, China

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