

This study was funded by the US Department of Defense Global Emerging Infections Surveillance and Response System.

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DOI: 10.3201/eid1601.091010

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## Age-based Human Influenza A Virus (H5N1) Infection Patterns, Egypt

**To the Editor:** In April 2009, a representative of the World Health Organization in Cairo voiced concern about the changing age-based pattern of human influenza A virus (H5N1) infection in Egypt (*1*). From March 2006 through July 2009, a total of 83 persons in Egypt were confirmed to have human influenza A (H5N1); the patients' ages ranged from >1 year to 75 years (*2*). However, from December 2008 through July 2009 in Egypt, 28 of 32 human infections were in children ≤8 years of age.

The frequency of human influenza A virus (H5N1) infections parallels the pattern for seasonal influenza. Thus, for analytical purposes, virus subtype H5N1 infections in Egypt can be grouped into 12-month periods, beginning with August of 1 year and ending in July of the following year.

The results for 1-way analysis of variance indicate that the age at time of virus subtype H5N1 infection in Egypt differs significantly among these 4 periods (Kruskal–Wallis test statistic = 20.732,  $p < 0.0004$ ).

Further analysis shows that persons infected from August 1, 2008 through July 31, 2009, were much younger than those infected in the preceding 12-month period (Mann–Whitney U test statistic = 328.500,  $p < 0.001$ ). The median age of the 12 confirmed case-patients from August 1, 2007, through July 31, 2008, was 23.5 years, but the median age of the 33 confirmed case-patients from August 1, 2008, through July 31, 2009, was 3.0 years. The Table shows the distribution of case-patients by age group, the median age of each group, and the case-fatality ratio (CFR) for the 4 seasonal 12-month periods.

This recent rise of subtype H5N1 influenza cases among children represents a major change in the pattern of human influenza A virus (H5N1) infections in Egypt compared with the pattern for earlier influenza seasons. Confirmation reports by the World Health Organization generally indicate associations with dead and sick poultry for these recent cases among children. The cultural patterns and customs of poultry husbandry have not changed in Egypt since the first human cases of influenza A (H5N1) were confirmed in 2006; thus, it is not clear why more children have been infected since December 2008. One explanation may be the increased recognition of the clinical signs of nonfatal influenza A (H5N1) among children and increased confirmation by laboratory testing. The lack of influenza A virus (H5N1) infection among the infected children's parents and caregivers suggests that the virus is still not easily transmissible among humans in Egypt.

Not only has there been a recent increase in infections of influenza A (H5N1) among children, but there has also been a recent decline in deaths

Table. Age groups, median ages, and case-fatality ratios for influenza A (H5N1) case-patients, by influenza season, Egypt\*

Influenza season, August–July	No. case-patients by age group, y						Total no. case- patients	Median age, y	Case-fatality ratio
	1–8	9–20	21–30	31–40	41–74	≥75			
2005–06	4	4	3	2	0	1	14	18.0	42.8
2006–07	13	5	4	2	0	0	24	6.5	37.5
2007–08	3	2	5	1	1	0	12	23.5	58.3
2008–09	28	1	1	3	0	0	33	3.0	15.1
Total	48	12	13	8	1	1	83	—	—

\*Age at date of clinical sign onset; data from the World Health Organization (2).

among confirmed infected persons. From 2006 through 2008, the annual CFR for influenza A (H5N1) in Egypt ranged from 36% to 55% (3). Since January 1, 2009, the CFR in Egypt has been 11%. The recent increases in infections among children coupled with a decrease in the CFR in the most recent 12-month period suggests that the strain of influenza A virus (H5N1) now circulating in Egypt may be becoming less virulent as it continues to spread among young children, a segment of the population that is highly vulnerable to influenza infections (4,5).

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DOI: 10.3201/eid1601.090560

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## Imported Chikungunya Virus Infection

**To the Editor:** Chikungunya is a disease caused by an arboviral alphavirus transmitted to humans by *Aedes* mosquitoes (*Aedes aegypti*, *Ae. albopictus*). Symptoms include fever, myalgia, rash, and joint pain (which can last for several months) (1). During the 2005–2006 epidemics on Reunion Island, clinical manifestations such as severe hepatitis, severe maternal and fetal disease, and meningoencephalitis not described previously were observed (2). Occurring in an immunologically uninfected population, this outbreak spread quickly, infecting approximately one third of the population (266,000 of 775,000 inhabitants) (2). The case-fatality rate on Reunion Island was estimated to be 1/1,000 cases, with excess deaths observed mainly among persons ≥75 years of age (3).

Chikungunya disease is endemic to western, central, eastern, and south-

ern Africa; on Indian Ocean and west Pacific Ocean islands; and in Southeast Asia (1). Before 2005–2006, no outbreak of this disease had been described on islands in the Indian Ocean (Comoros, Mayotte, Madagascar, Reunion Island, Mauritius, and Seychelles). Since the epidemic on Reunion Island, many imported cases caused by this arbovirus have been reported elsewhere in areas where the disease is not endemic, particularly in Europe and the United States.

The main competent vector of chikungunya virus, a mosquito, *Ae. albopictus*, is indigenous to Southeast Asia and some islands of the western Pacific and Indian Ocean. The mosquito spread to the eastern Pacific, the Americas, Central Africa (Nigeria, Cameroon, Equatorial Guinea and Gabon), Europe, and the Middle East (4,5). Entomologic studies have shown that *Ae. albopictus* mosquitoes can now be found in the southeastern part of the United States, Mexico, Central and South America, the Caribbean, the Middle East, Japan, and southern Europe (Spain, Italy, Bosnia-Herzegovina, Croatia, France, Greece, the Netherlands, Serbia and Montenegro, Slovenia, Switzerland, and Albania) (4,6). This mosquito has also been intercepted in Australia's seaports and is now established in northern Queensland (7).

*Ae. aegypti* mosquitoes are indigenous to Africa and disseminated around the tropical and subtropical regions. The southeastern United States, the Middle East, Southeast Asia, Pacific and Indian islands, and northern Australia are also infested by this mosquito. In continental Europe, it