



MI FluFocus

Influenza Surveillance Updates
Bureaus of Epidemiology and Laboratories

Michigan Department
of Community Health



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Current Influenza Activity Levels:

- **Michigan:** No activity
- **United States:** Reporting has concluded for the 2009-2010 influenza season

Updates of Interest:

- **International:** Influenza activity is currently most intense in the temperate areas of the Southern Hemisphere and southern Asia.

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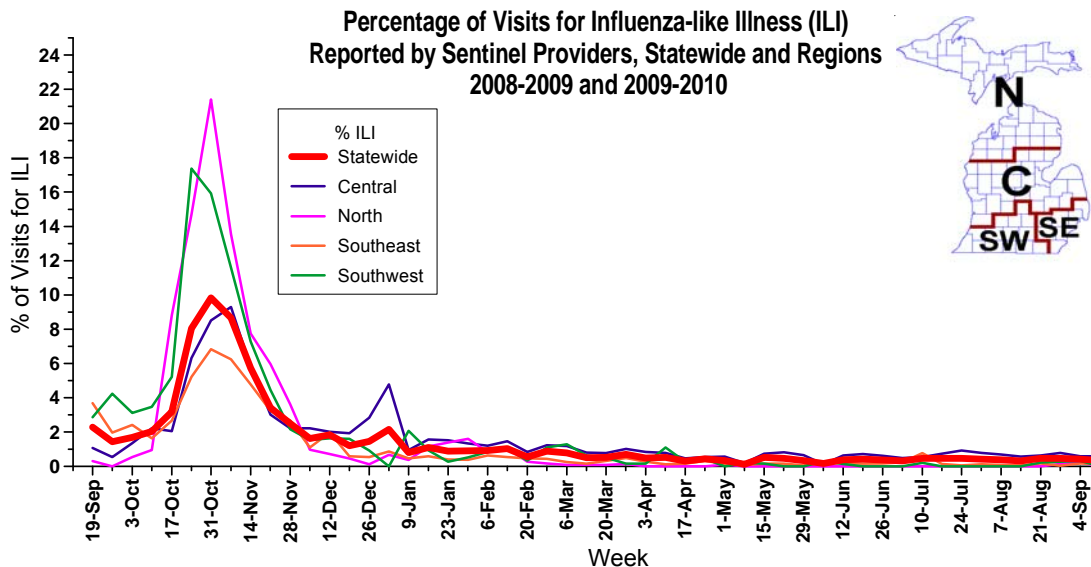
Influenza Surveillance Reports

Michigan Disease Surveillance System: MDSS data for the week ending September 11th indicated that aggregate influenza case reports increased slightly above baseline summer levels. Individual reports, including influenza and 2009 novel influenza cases, remained near the previous week's reported levels of little to no activity. Aggregate influenza cases and individual influenza cases are similar to levels seen during the same reporting period in 2009.

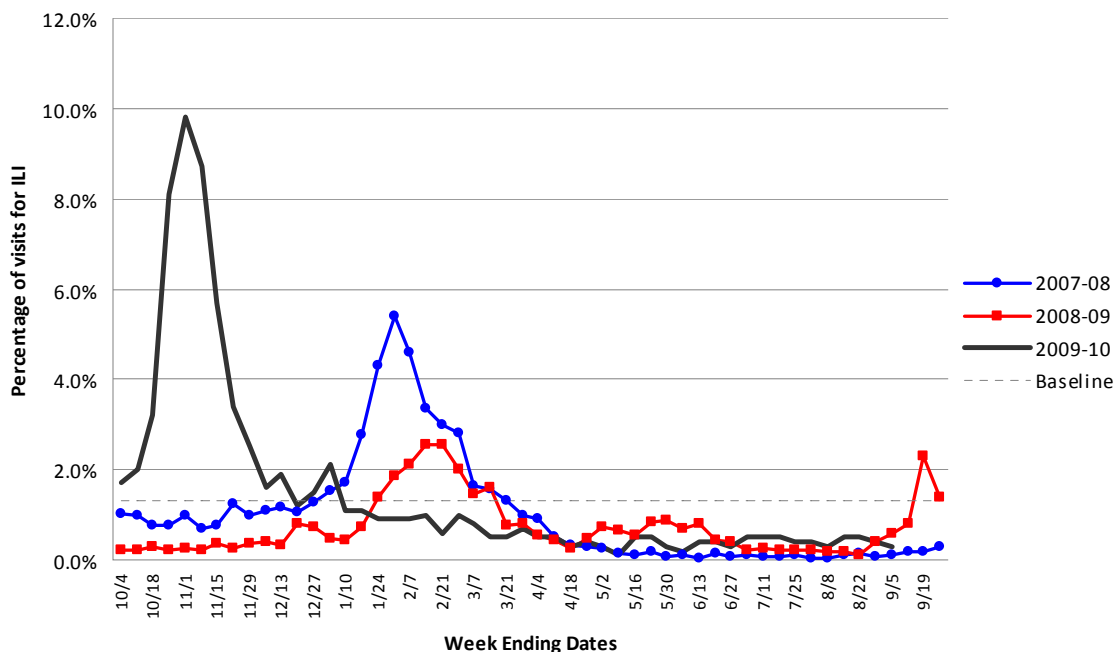
Emergency Department Surveillance: Emergency department visits from constitutional complaints decreased slightly, while respiratory complaints increased, compared to the previous week's levels. Both constitutional and respiratory complaints are at similar levels compared to the same time last year. In the past week, there was one constitutional alert in the SW Influenza Surveillance Region and eleven respiratory alerts in the SE(4), SW(2), C(2) and N(3) Regions and two statewide respiratory alerts.

Over-the-Counter Product Surveillance: Over the past week, OTC product sales remained similar to last week's levels, except for chest rubs, which increased slightly, and thermometers, which decreased slightly. When compared to this time last year, sales of chest rubs and cough/cold medications are increased, thermometer sales are slightly decreased, and sales of children's electrolytes are similar.

Sentinel Provider Surveillance (as of September 16): During the week ending September 11, 2010, the proportion of visits due to influenza-like illness (ILI) remained at low levels at 0.3% overall. Twenty-five patient visits due to ILI were reported out of 7,493 office visits. Twenty-five sentinel sites provided data for this report. Activity slightly decreased in three surveillance regions: Southeast (0.1%), Southwest (0.0%) and North (0.0%); and remained the same in the Central (0.6%) surveillance region. Please note these rates may change as additional reports are received.



**Percentage of Visits for Influenza Like Illness (ILI) Reported by the US Outpatient
Influenza-like Illness Surveillance Network (ILINet) - Michigan, 2007-2010**



As part of pandemic influenza surveillance, CDC and MDCH highly encourage year-round participation from all sentinel providers. New practices are encouraged to join the sentinel surveillance program today! Contact Cristi Carlton at 517-335-9104 or CarltonC2@michigan.gov for more information.

Laboratory Surveillance (as of September 11): During August 29-September 11, no influenza isolates were identified at the MDCH Bureau of Laboratories. For the 2009-2010 season (starting on October 4, 2009), MDCH BOL has identified 614 influenza isolates:

- 2009 Influenza A (H1N1): 610
- Influenza A (H3): 3
- Influenza B: 1

Seven sentinel laboratories reported for the week ending September 11, 2010. All laboratories (SE, SW, C, N) reported no influenza A or B positive test results, with very few specimens being tested.

Michigan Influenza Antigenic Characterization (as of September 16): One 2009 H1N1 influenza A virus from Michigan has undergone further characterization at the CDC. This virus was characterized as A/California/07/2009 (H1N1)-like, which is the recommended strain for the H1 component of the 2010-11 Northern Hemisphere vaccine.

Michigan Influenza Antiviral Resistance Data (as of September 16): MDCH has received 34 results for antiviral resistance testing for the 2009-2010 season. All of the specimens tested were pandemic 2009 influenza A (H1N1) viruses. Of these results, two viruses have shown resistance to oseltamivir. The first virus was obtained in November 2009 from a 3 year old child from the SE Region with an underlying immunosuppressive condition and had a multiple courses of oseltamivir prior to specimen collection. The second virus was obtained in December 2009 from a 52 year old from the SE Region with an underlying immunosuppressive condition and chronic pulmonary infection; laboratory testing has confirmed that this mutation occurred within the patient during his illness. The 34 specimens tested were distributed as follows: 9 Southeast, 8 Southwest, 9 Central, 2 North, 6 unknown.

Antiviral resistance testing takes months to complete and cannot be used to guide individual patient treatment. However, CDC has made recommendations regarding the use of antivirals for treatment and prophylaxis of influenza. The guidance is available at <http://www.cdc.gov/H1N1flu/recommendations.htm>.

Influenza-Associated Pediatric Mortality (as of September 16): Five 2009 H1N1 influenza-associated pediatric mortalities (SE(3), SW, N) have been reported to MDCH for the 2009-2010 influenza season.

***CDC has asked states for information on any pediatric death associated with influenza. This includes not only any pediatric death (<18 years) resulting from a compatible illness with laboratory confirmation of

influenza, but also any unexplained pediatric death with evidence of an infectious process. Please immediately call MDCH to ensure proper specimens are obtained. View the complete MDCH protocol online at http://www.michigan.gov/documents/mdch/ME_pediatric_influenza_guidance_v2_214270_7.pdf.

Influenza Congregate Settings Outbreaks (as of September 16): Seven congregate setting outbreaks with confirmatory novel influenza A H1N1 testing (2SE, 3 SW, 1C, 1N), and three outbreaks associated with positive influenza A tests (2C, 1N) have been reported to MDCH for the 2009-2010 influenza season. These are 8 school facilities and 2 long term care facilities. Human metapneumovirus was confirmed in one outbreak in a long term care facility (SW) in February. Adenovirus was confirmed from one outbreak in an elementary school (SW) in May.

During fall 2009, 567 influenza-related school and/or district closures in Michigan (Public Health Preparedness Region 1 - 55, Region 2N - 4, Region 2S - 8, Region 3 - 54, Region 5 - 153, Region 6 - 100, Region 7 - 109, Region 8 - 84) were reported.

National: To access previous Center for Disease Control and Prevention weekly surveillance reports, visit <http://www.cdc.gov/flu/weekly/fluactivity.htm>.

International (WHO Update 116 [edited], September 10): Influenza activity is currently most intense in the temperate areas of the Southern Hemisphere and southern Asia.

India is still experiencing a country-wide outbreak of H1N1 (2009) with active transmission and a substantial number of fatal cases in several states across the country.

Chile reported on a sharp increase in respiratory disease activity in the last two weeks. All age groups are affected but the age groups below 65 years appear to be more affected than the older population. The level of activity in Chile in September is very unusual for this time of the year, as the country usually experiences a peak of respiratory disease in June and July. H1N1 (2009) virus has been the most commonly detected influenza virus so far this season but in the recent weeks there has been a shift towards influenza virus type B and influenza A (H3N2), with a decreasing proportion of H1N1 (2009) viruses. Respiratory Syncytial Virus transmission has also been widespread and intense, primarily affecting young children.

Australia has reported increasing influenza activity throughout August and September, though recently, the numbers of patients seen in emergency departments for influenza-like illness seem to have leveled off in parts of the country. Overall, influenza activity is well below the activity observed in the winter of 2009. The most commonly identified influenza virus in Australia is H1N1 (2009), though influenza type B is also being detected.

In New Zealand, influenza activity has decreased in the last week of August, although activity is still well above baseline levels and with significant regional differences. The majority of influenza detections have been characterized as H1N1 (2009). Levels of influenza transmission in 2010 are below 2009 levels nationally but have exceeded 2009 in some localized areas of the country.

In Africa, the Central African Republic reported on their first ever detection of H1N1 (2009). South Africa observed a decrease in detection rate of influenza viruses in outpatients seen for respiratory disease for the second week in a row. Influenza type B has been the most commonly detected influenza virus throughout this winter season in South Africa though in recent weeks the proportion of H1N1 (2009) viruses has increased and a small, decreasing number of influenza A (H3N2) continues to be detected.

Map of International Activity (CDC): A Map of International Co-circulation of Seasonal Influenza is available online at <http://cdc.gov/flu/international/map.htm>.

Weekly reporting of influenza activity to the CDC has concluded for the 2009-2010 season.

For additional flu vaccination and education information, the MDCH *FluBytes* newsletter is available at http://www.michigan.gov/mdch/0,1607,7-132-2940_2955_22779_40563-125027--,00.html.

Novel Influenza Activity and Other News

WHO Pandemic Phase: Post pandemic - Influenza disease activity has returned to levels normally seen for seasonal influenza. It is expected that the pandemic virus will behave as a seasonal influenza A virus. It is important to maintain surveillance and update pandemic preparedness/response plans accordingly.

National, Infection Control (Interscience Conference on Antimicrobial Agents and Chemotherapy press release, September 12): Hand washing or hand disinfection is commonly recommended for prevention of viral respiratory disease. These recommendations are based largely on studies that demonstrated the feasibility of transmission of infection by direct contact. There have been only limited efforts to demonstrate the efficacy of this intervention in the natural setting. Application of organic acids to the hands in the experimental setting results in persistent virucidal activity against the rhinoviruses that prevents infection for several hours after the application. This study evaluated the efficacy of organic acids in an ethanol-based hand sanitizer for the prevention of rhinovirus-associated colds. The occurrence of influenza A (H1N1/2009) infection in the study population allowed concurrent assessment of the effect of this virucidal hand treatment on the incidence of influenza infection and illness.

Two hundred twelve volunteers were randomized either to use the hand sanitizer with enhanced antiviral activity (116 volunteers) or no intervention (96 volunteers). The volunteers assigned to the hand treatment used the hand sanitizer every three hours while they were awake for ten weeks between August 25 and November 9, 2010. All volunteers had specimens collected each week for the detection of rhinovirus and influenza virus. Whenever the volunteer had symptoms of a cold they had two additional specimens collected for detection of virus. Volunteers who were assigned to the hand treatment were seen twice each week for the first 5 weeks and then once each week thereafter to evaluate compliance with the treatment by weighing the bottles of sanitizer. 80% of the volunteers were considered compliant based on completion of all study visits and use of at least 725 grams of sanitizer (an average of 80 gm/week). The overall incidence of common cold illness was decreased from 89/100 subjects in the no treatment group to 60/100 volunteers in the hand sanitizer group ($p < 0.05$). There was no significant effect; however, on the incidence of rhinovirus infection or rhinovirus-associated illness. Similarly, there was no significant effect on influenza infection or influenza-associated illness.

The results of this study suggest that hand transmission may be less important for the spread of rhinovirus than previously believed. The study also directly assesses the impact of hand disinfection on the transmission of influenza virus. This study suggests that protection from infection with these viruses may require increased attention to aerosol transmission of virus.

This study was directed by Dr. Ronald B. Turner at the University of Virginia in Charlottesville. The study was funded by the Dial Corporation.

National, Pandemic (MMWR 59(35);1131-1134, September 10): During the 2009 influenza A (H1N1) pandemic, child care center and school dismissals (i.e., temporary closures) were common and occurred in the majority of states across the United States. However, little is known about the economic and social problems parents face during such dismissals. To learn more about parents' attitudes and experiences after short-term school dismissals related to H1N1, CDC and the Harvard Opinion Research Program (HORP) conducted a randomized telephone poll of 523 parents from 39 states whose child care center or school had been closed temporarily in response to H1N1. This report summarizes the results of that poll, which found that 90% of parents agreed with the dismissal decision, and 85% believed dismissal effectively reduced influenza transmission. In most cases (58%), dismissal lasted ≤ 3 days. Overall, most parents did not report adverse effects related to dismissals of short duration. Only 3% of respondents said dismissal was a major problem, and 75% reported that it was not a problem. Approximately 20% of parents reported that an adult in the household missed work because of the dismissal, and 19% had a child who missed a free or reduced-cost lunch, but only 2% and $< 1\%$, respectively, said these were major problems. The findings in this report underscore that when making a decision to close child care centers or schools, public health officials should consider the acceptability of the resulting disruption to students, families, and communities.

The full article is available online at

http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5935a2.htm?s_cid=mm5935a2_w.

National, Pandemic (Biosecurity and Bioterrorism: Biodefense Strategy, Practice, and Science abstract; September 8): Monica Schoch-Spana, Nidhi Bouri, Kunal J. Rambhia, Ann Norwood. Biosecurity and Bioterrorism: Biodefense Strategy, Practice, and Science. September 2010, 8(3): 243-254.

At the outset of the 2009 H1N1 influenza ("swine flu") pandemic, Mexican nationals and Mexican commodities were shunned globally, and, in the United States, some media personalities characterized Mexican immigrants as disease vectors who were a danger to the country. We investigated instances in the U.S. of stigmatization of Latino migrant and seasonal farmworkers (MSFWs) and developed guidance for officials in curtailing its effects. At the same time, we explored social factors that make farmworkers more vulnerable to influenza infection and its complications, including high rates of underlying medical conditions, limited access to health care, and certain circumstances that interfere with the ability to implement community mitigation measures. This article reviews study findings and concludes with advice to policymakers and practitioners on the need to mitigate stigmatization in future outbreaks, to create public health preparedness systems that better protect migrant and seasonal farmworkers, and to undertake larger reforms to reduce institutional conditions that render farmworkers at greater risk for morbidity and mortality during health emergencies.

International, Human (CIDRAP, September 7): Finnish researchers reporting in *Clinical Infectious Diseases* found that oseltamivir (Tamiflu) administered within 24 hours of seasonal influenza symptoms provided "substantial benefits" to children 1 to 3 years old. The scientists studied 408 children randomly assigned to oseltamivir (203 children) and placebo (205) groups. Of those, 79 contracted lab-confirmed influenza A and 19 had influenza B. Among those with influenza A, oseltamivir treatment started within 24 hours shortened the course of illness by 3.5 days (3.0 vs 6.5 days) in all children and by almost 4 days (3.4 vs 7.3) in unvaccinated children. It also reduced parental work absenteeism by 3.0 days but had no effect for those with influenza B. Also, when oseltamivir was started within 12 hours of symptom onset, it decreased the incidence of otitis media by 85%, but no significant reduction was seen with treatment started within 24 hours.

International, Human (CIDRAP, September 15): Researchers have found that co-infection with oseltamivir (Tamiflu)-resistant seasonal H1N1 influenza and Tamiflu-susceptible pandemic 2009 H1N1 could produce reassortant viruses resistant to the common antiviral drug. The scientists, from St Jude Children's Research Hospital in Memphis, Tenn., and New Zealand and Australia, tested more than 1,000 pandemic H1N1 viral cultures for oseltamivir resistance using fluorometric-inhibition assay and polymerase chain reaction (PCR). In doing so, they discovered 11 cases of co-infection with oseltamivir-resistant seasonal H1N1, plus two samples that indicated co-infection on PCR but could not be confirmed. All samples were collected before pandemic vaccine was available. The authors conclude, "Although influenza co-infections are rare, we have shown that they occurred during the first stage of a pandemic when seasonal strains cocirculated. This cocirculation poses a risk for further reassortment for the pandemic strain, which could result in a new pandemic strain. Of particular concern is the potential generation of an oseltamivir-resistant pandemic strain."

The entire study is available online at <http://www.cdc.gov/eid/content/16/10/1618.htm>.

International, Swine (PLoS ONE abstract, September 7): Cong Y, Wang G, Guan Z, Chang S, Zhang Q, et al. (2010) Reassortant between Human-Like H3N2 and Avian H5 Subtype Influenza A Viruses in Pigs: A Potential Public Health Risk. *PLoS ONE* 5(9): e12591.

Background: Human-like H3N2 influenza viruses have repeatedly been transmitted to domestic pigs in different regions of the world, but it is still uncertain whether any of these variants could become established in pig populations. The fact that different subtypes of influenza viruses have been detected in pigs makes them an ideal candidate for the genesis of a possible reassortant virus with both human and avian origins. However, the determination of whether pigs can act as a "mixing vessel" for a possible future pandemic virus is still pending an answer. This prompted us to gather the epidemiological information and investigate the genetic evolution of swine influenza viruses in Jilin, China.

Methods: Nasopharyngeal swabs were collected from pigs with respiratory illness in Jilin province, China from July 2007 to October 2008. All samples were screened for influenza A viruses. Three H3N2 swine influenza virus isolates were analyzed genetically and phylogenetically.

Results: Influenza surveillance of pigs in Jilin province, China revealed that H3N2 influenza viruses were regularly detected from domestic pigs during 2007 to 2008. Phylogenetic analysis revealed that two distinguishable groups of H3N2 influenza viruses were present in pigs: the wholly contemporary human-like H3N2 viruses (represented by the Moscow/10/99-like sublineage) and double-reassortant viruses containing genes from contemporary human H3N2 viruses and avian H5 viruses, both co-circulating in pig populations.

Conclusions: The present study reports for the first time the coexistence of wholly human-like H3N2 viruses and double-reassortant viruses that have emerged in pigs in Jilin, China. It provides updated information on the role of pigs in interspecies transmission and genetic reassortment of influenza viruses.

The full article is available online at

<http://www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0012591>.

International, Avian (CIDRAP, September 13): Reversing a trend that began in 2007, the number of countries affected by H5N1 avian influenza and the number of reported H5N1 outbreaks in birds have increased this year, the United Nations Food and Agriculture Organization (FAO) says.

Sixteen countries (plus Hong Kong) had H5N1 outbreaks this year through August, compared with about 11 in all of 2009, according to charts in the Sep 2 issue of *FAO AIDE News*, a bulletin that reports periodically on avian flu.

In the first 6 months of this year, 390 H5N1 outbreaks were reported, versus 297 for all of 2009, the FAO said. However, those numbers do not include Indonesia, which reports the majority of H5N1 poultry outbreaks worldwide, because Indonesia, unlike other countries, counts outbreaks at the village level rather than the household level, the report says.

The FAO cautioned that the number of outbreaks is more subjective than the number of affected countries, because it is strongly influenced by such variables as the case definition, awareness level, and effectiveness of surveillance. In particular, the report says a big increase in reported H5N1 outbreaks in Egypt this year "is most likely the result of improved surveillance through the effectiveness of the CAHO [Community Animal Health Outreach] programme." (It says Egypt has had 264 poultry outbreaks this year, compared with 71 for the same period last year, but does not specify which months those numbers cover.)

The peak month for outbreaks this year was February, with close to 150, which was well above last year's 1-month peak of about 70 outbreaks, also in February, according to the FAO report. The report cites Egypt's increased surveillance as the main explanation for the increase. In 2008 the monthly peak occurred in January at slightly over 150 outbreaks.

The FAO also reports that H5N1 outbreaks have occurred this year in several countries where the disease was thought to have been eliminated: Cambodia, Israel, Laos, Myanmar, Nepal, and Romania. The only country newly affected by the virus so far this year is Bhutan.

As for H5N1 outbreaks in Indonesia, the FAO does not list specific numbers of outbreaks reported, but a chart shows that Indonesia has had the majority of reported outbreaks every month since April 2009.

"The high number of reports each month is partially explained by the implementation of the Participatory Disease Surveillance and Response (PDSR) 1 programme that targets village poultry production systems (mainly backyard) and reports evidence of virus circulation in the village," the report states. PDSR officers visited 1,780 Indonesian villages in June and found H5N1 in 45 of them (2.5%), the FAO says.

Sixty-three countries and territories have had outbreaks since 2003, the report notes.

Michigan Wild Bird Surveillance (USDA, as of September 16): For the 2010 season (April 1, 2010-March 31, 2011), highly pathogenic avian influenza H5N1 has not been recovered from 15,963 samples tested nationwide, including 677 Michigan samples (5 live bird, 658 hunter-killed birds, 15 morbidity/mortality). For more information, visit <http://wildlifedisease.nhii.gov/ai/>.

To learn about avian influenza surveillance in Michigan wild birds or to report dead waterfowl, go to Michigan's Emerging Disease website at <http://www.michigan.gov/emergingdiseases>.

International Poultry and Wild Bird Surveillance (OIE): Reports of avian influenza activity, including summary graphs of avian influenza H5N1 outbreaks in poultry, can be found at the following website: http://www.oie.int/download/AVIAN%20INFLUENZA/A_AI-Asia.htm.

For questions or to be added to the distribution list, please contact Susan Peters at PetersS1@michigan.gov

Contributors

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Table 1. H5N1 Influenza in Humans - Cases up to August 31, 2010. http://www.who.int/csr/disease/avian_influenza/country/cases_table_2010_08_31/en/index.html. Downloaded 9/1/2010. Cumulative number of lab-confirmed cases reported to WHO. Total cases includes deaths.

Country	2003		2004		2005		2006		2007		2008		2009		2010		Total	
	cases	deaths	cases	deaths	cases	deaths	cases	deaths	cases	deaths	cases	deaths	cases	deaths	cases	deaths	cases	deaths
Azerbaijan	0	0	0	0	0	0	8	5	0	0	0	0	0	0	0	0	8	5
Bangladesh	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0
Cambodia	0	0	0	0	4	4	2	2	1	1	1	0	1	0	1	1	10	8
China	1	1	0	0	8	5	13	8	5	3	4	4	7	4	1	1	39	26
Djibouti	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0
Egypt	0	0	0	0	0	0	18	10	25	9	8	4	39	4	22	9	112	36
Indonesia	0	0	0	0	20	13	55	45	42	37	24	20	21	19	6	5	168	139
Iraq	0	0	0	0	0	0	3	2	0	0	0	0	0	0	0	0	3	2
Lao PDR	0	0	0	0	0	0	0	0	2	2	0	0	0	0	0	0	2	2
Myanmar	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0
Nigeria	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	1	1
Pakistan	0	0	0	0	0	0	0	0	3	1	0	0	0	0	0	0	3	1
Thailand	0	0	17	12	5	2	3	3	0	0	0	0	0	0	0	0	25	17
Turkey	0	0	0	0	0	0	12	4	0	0	0	0	0	0	0	0	12	4
Viet Nam	3	3	29	20	61	19	0	0	8	5	6	5	5	5	7	2	119	59
Total	4	4	46	32	98	43	115	79	88	59	44	33	73	32	37	18	505	300