

## **WEB APPENDIX**

### **Hospitalization Fatality Risk of Influenza A(H1N1)Pdm09: A Systematic Review and Meta-Analysis**

We included 182 estimates of the HFR from 179 published articles in our systematic review [1-179], reporting a total of 150,104 hospitalized cases and 6,935 deaths. This appendix provides additional information on the model and data.

## Web Appendix

We used a linear regression model by assuming a linear relationship between the arc-sine of the HFR and the predictors in the model. For study  $i$ , observed HFR,  $Y_i$  is model as:

### Fixed-effects model

$$Y_i = \theta_i + e_i$$

where  $\theta_i$  represents the true HFR,  $e_i \sim N(0, \sigma_i^2)$  represents the sampling error, and  $\sigma_i^2$  represents the sampling variance.

### Random-effects model

$$Y_i = \mu + u_i + e_i$$

where  $\mu$  represents the average true HFR,  $u_i \sim N(0, \tau^2)$  represents the random error of study  $i$ ,  $\tau^2$  represents the between-study variability,  $e_i \sim N(0, \sigma_i^2)$  represents the sampling error, and  $\sigma_i^2$  represents the sampling variance.

### Mixed-effects model

$$Y_i = \beta_0 + \beta_1 \times HOSP_i + \beta_2 \times GDP_i + \beta_3 \times GEOG_i + u_i + e_i$$

where  $HOSP_i$  represents the hospital type of study  $i$  where 1 = community hospital, 2 = referral hospital and 3 = multicenter,  $GDP_i$  represents the gross domestic product per capita (US\$) where 1 = <5,000, 2 = 5,000-35,000, 3 =  $\geq 35,000$ , and  $GEOG_i$  represents the geographical region in study  $i$  where 1 = North America, 2 = Europe, 3 = Central/South America, 4 = Asia, 5 = Australia/New Zealand and 6 = Others.  $\beta_0$  represents the intercept.  $\beta_1, \beta_2, \beta_3$  denotes how the average true HFR changes for a one unit increase in  $HOSP_i, GDP_i, GEOG_i$

respectively.  $u_i \sim N(0, \tau^2)$  represents the random error between studies,  $\tau^2$  represents the between-study variability,  $e_i \sim N(0, \sigma_i^2)$  represents the sampling error, and  $\sigma_i^2$  represents the sampling variance.

We investigated the influence of the model selection. Similar results on the meta-regression were found when fitting to a Poisson regression model instead of a linear regression model. However, for easy interpretation of the results, we preferred to use a linear model.

**Web Table 1: Articles excluded after reading full-length text**

First author	Journal	Year	Title	Reason for exclusion
Adalija, A. A.	JAMA	2011	Comparing severity and outcomes for seasonal and 2009 H1N1 infections	Letter, not an original study.
Ahmad, M. A.	Chest	2010	Clinic-epidemiologic comparison of H1N1 RT-PCR-Positive and RT-PCR-negative pneumonia during the 2009-2010 pandemic in the Mansoura University Hospitals, Egypt	Conference abstract.
Alevra, S.	Acta Paediatr, Int J Paediatr	2010	Review and analysis of cases related to the novel influenza virus a(H1N1)	Conference abstract.
Alsadat, R.	Avicenna J Med	2011	Characteristics and outcome of critically ill patients with 2009 H1N1 influenza infection in Syria	Insufficient information provided in the article to extract a HFR.
Al-Tamimi, K.	Ann Thorac Med	2011	Clinical characteristics and outcomes of hospitalized patients with influenza A (H1N1) infection in Al-Amiri Hospital, Kuwait	Conference abstract.
Altmann, M.	Emerg Infect Dis	2011	Severe cases of pandemic (H1N1) 2009 in children, Germany	Only severe cases studied.
Altmann, M.	Emerg Infect Dis	2012	Unchanged severity of influenza A(H1N1)pdm09 infection in children during first postpandemic season	Insufficient information provided in the article to extract a HFR.
Archer, B. N.	Euro Surveill	2009	Interim report on pandemic H1N1 influenza virus infections in South Africa, April to October 2009: epidemiology and factors associated with fatal cases	Insufficient information provided in the article to extract a HFR.
Arnold, F. W.	Respir Med	2013	Mortality differences among hospitalized patients with community-acquired pneumonia in three world regions: Results from the Community-Acquired Pneumonia Organization (CAPO) International Cohort Study	Insufficient information provided in the article to extract a HFR.
Ataman Hatipoglu, C.	Clin Microbiol Infect	2011	Evaluation of epidemiological, clinical and laboratory characteristics of pandemic influenza A (H1N1) cases in a tertiary case hospital in Turkey	Conference abstract.
Attie, S.	Critical Care Medicine	2009	Severe influenza H1N1-2009 pneumonia patients on mechanical ventilation (MV)	Conference paper, not an original study.
Azziz-Baumgartner, E.	PLoS One	2012	Mortality, severe acute respiratory infection, and influenza-like illness associated with influenza A(H1N1)pdm09 in Argentina, 2009	Insufficient information provided in the article to extract a HFR.
Babak, A.	Clin Microbiol Infect	2010	Epidemiological and clinical characteristics of influenza A (H1N1) V infection in Isfahan, Iran, July-October 2009	Conference abstract.
Bai, L.	Chest	2011	Clinical features of pneumonia caused by 2009 influenza A(H1N1) virus in Beijing, China	Insufficient information provided in the article to extract a HFR.
Bai, L.	Int J Infect Dis	2010	Clinical features and 3-month follow up study of pneumonia caused by influenza A (H1N1) virus in Beijing, China	Conference abstract.
Baigalmaa, J.	Western Pac Surveill Response J	2012	Analysis of fatal outcomes from influenza A(H1N1)pdm 09 in Mongolia	Insufficient information provided in the article to extract a HFR.
Balaganesakumar, S. R.	J Postgrad Med	2013	Risk factors associated with death among influenza A (H1N1) patients, Tamil Nadu, India, 2010	Insufficient information provided in the article to extract a HFR.
Balandin Moreno, B.	Intens Care Med	2010	Influenza a (H1N1) flu in critically ill: Clinical study of 12 cases and evolution	Conference abstract.
Barrett, N.	Acta, Paediatr, Int J Paediatr	2010	Demographics, clinical characteristics and outcome of hini patients in an Irish pediatric setting	Conference abstract.

Belongia, E. A.	JAMA	2010	Clinical characteristics and 30-day outcomes for influenza A 2009 (H1N1), 2008-2009 (H1N1), and 2007-2008 (H3N2) infections	Less than 20 hospitalized cases included in the study.
Bhatt, K. H.	J Assoc Physicians India	2012	Study of clinical profile in patients with H1N1 influenza in Surat district, June 2009-March 2010	Insufficient information provided in the article to extract a HFR.
BinSaeed, A. A.	Ann Saudi Med	2010	Characteristics of pandemic influenza A (H1N1) infection in patients presenting to a university hospital in Riyadh, Saudi Arabia	Insufficient information provided in the article to extract a HFR.
Bolotin, S.	PLoS One	2012	A new sentinel surveillance system for severe influenza in England shows a shift in age distribution of hospitalised cases in the post-pandemic period	Insufficient information provided in the article to extract a HFR.
Bogoch, I. I.	JAIDS	2011	HIV-1 and 2009 H1N1 influenza a in adults	Letter, not an original study.
Bramley, A. M.	Influenza Other Respi Viruses	2012	Intensive care unit patients with 2009 pandemic influenza A (H1N1pdm09) virus infection - United States, 2009	Insufficient information provided in the article to extract a HFR.
Bumpenkiatigul, N.	J Med Assoc Thai	2012	Pandemic influenza (H1N1) 2009 of pediatric patients at Thammasat University Hospital	Less than 20 hospitalized cases included in the study.
Butsashvili, M.	Influenza Res Treat	2012	Influenza-associated mortality in Georgia (2009-2011)	Insufficient information provided in the article to extract a HFR.
Cardenosa, N.	Hum Vaccin	2011	Epidemiological analysis of severe hospitalized 2009 pandemic influenza A (H1N1) cases in Catalonia, Spain	Only severe cases studied.
Cardoso, Y.	J Infect Dis	2012	Characteristics of patients with influenza-like illness, severe acute respiratory illness, and laboratory-confirmed influenza at a major children's hospital in Angola, 2009-2011	Insufficient information provided in the article to extract a HFR.
Carneiro, M.	Infect Control Hospital Epid Int J of Infect Dis	2011	The influenza A/H1N1 pandemic in southern Brazil	Letter, not an original study.
Carvalhanas, T. R. M. P.	Int J of Infect Dis	2010	Epidemiological profile of the A (H1N1) pandemic influenza in the state of Sao Paulo, Brazil, for the April-September 2009 timeframe	Conference abstract.
CDC	MMWR Morb Mortal Wkly Rep	2009	Intensive-care patients with severe novel influenza A (H1N1) virus infection - Michigan, June 2009	Insufficient information provided in the article to extract a HFR.
CDC	MMWR Morb Mortal Wkly Rep	2010	Deaths and hospitalizations related to 2009 pandemic influenza A (H1N1) - Greece, May 2009-February 2010	Insufficient information provided in the article to extract a HFR.
Chacko, J.	Indian J Crit Care Med	2010	Critically ill patients with 2009 H1N1 infection in an Indian ICU	Insufficient information provided in the article to extract a HFR.
Chang, Y.	Respirology	2009	Comparison of adult patients with H1N1 09 and seasonal influenza hospitalized during protect phase in Australia	Conference paper, not an original study.
Cheng, A. C.	Med J Australia	2012	Hospitalisation with confirmed influenza in a sentinel surveillance system in 2010 and 2011	Conference paper, not an original study.
Chien, J. M.	Ann Acad Med Singapore	2010	Severe infection with H1N1 requiring intensive care--lessons for preparedness programmes	Insufficient information provided in the article to extract a HFR.
Chien, Y. S.	J Infect	2010	Predictors and outcomes of respiratory failure among hospitalized pneumonia patients with 2009 H1N1 influenza in Taiwan	Only severe cases studied.
Cho, W. H.	Korean J Intern Med	2011	Outcome of pandemic H1N1 pneumonia: clinical and radiological findings for severity assessment	Insufficient information provided in the article to extract a HFR.

Choi, W. I.	Int J Tuberc Lung Dis	2011	Clinical characteristics and outcomes of H1N1-associated pneumonia among adults in South Korea	Insufficient information provided in the article to extract a HFR.
Choi, W. J.	Scand J Infect Dis	2010	Clinical characteristics of pneumonia in hospitalized patients with novel influenza A (H1N1) in Korea	Insufficient information provided in the article to extract a HFR.
Cholewinska, G.	Przegl Epidemiol	2010	Influence of concomitant illness on clinical manifestations and severity of A/H1N1 influenza infection among patients hospitalized in the Hospital of Infectious Diseases in Warsaw—clinical cases	More complete report of the study published elsewhere [45].
Chowell, G.	N Engl J Med	2009	Severe respiratory disease concurrent with the circulation of H1N1 influenza	Insufficient information provided in the article to extract a HFR.
Chowell, G.	PLoS Curr	2012	Recrudescence wave of pandemic A/H1N1 influenza in Mexico, winter 2011-2012: Age shift and severity	More complete report of the study published elsewhere [23].
Chowell, G.	PLoS One	2012	Epidemiological characteristics and underlying risk factors for mortality during the autumn 2009 pandemic wave in Mexico	More complete report of the study published elsewhere [23].
Chowell, G.	BMC Infect Dis	2012	Impact of antiviral treatment and hospital admission delay on risk of death associated with 2009 A/H1N1 pandemic influenza in Mexico	More complete report of the study published elsewhere [23].
Chudasama, R. K.	Indian J Crit Care Med	2010	Correlates of severe disease in patients admitted with 2009 pandemic influenza A (H1N1) infection in Saurashtra region, India	More complete report of the study published elsewhere [47].
Chudasama, R. K.	J Infect Dev Ctries	2010	Hospitalizations associated with 2009 influenza A (H1N1) and seasonal influenza in Saurashtra region, India	More complete report of the study published elsewhere [47].
Chudasama, R. K.	World J Pediatr	2012	Clinical and epidemiological characteristics of 2009 pandemic influenza A in hospitalized pediatric patients of the Saurashtra region, India	More complete report of the study published elsewhere [47].
Cilloniz, C.	J Infect	2012	Bacterial co-infection with H1N1 infection in patients admitted with community acquired pneumonia	Insufficient information provided in the article to extract a HFR.
Collado, M.	Int J Infect Dis	2010	Demographic and epidemiological characteristics of influenza in HIMA, San Pablo Caguas Hospital, Puerto Rico	Conference abstract.
Corral, J.	Am J Respr Crit Care	2010	Multicentric study of hospitalized patients affected by H1N1 influenza in mar del plata, argentina, during the june to august 2009 period	Conference abstract.
Crisinel, P. A.	Eur J Pediatr	2012	Comparison of clinical presentation of respiratory tract infections in H1N1/09-positive and H1N1/09-negative patients	Insufficient information provided in the article to extract a HFR.
Crum-Cianflone, N. F.	Clin Infect Dis	2009	Clinical and epidemiological characteristics of an outbreak of novel H1N1 (swine origin) influenza A among United States military beneficiaries	Less than 5 hospitalized cases included in the study.
Cui, W.	BMC Infect Dis	2010	Factors associated with death in hospitalized pneumonia patients with 2009 H1N1 influenza in Shenyang, China	Insufficient information provided in the article to extract a HFR.
Cunha, B. A.	Eur J Clin Microbiol	2010	Non-specific laboratory test indicators of severity in hospitalized adults with swine influenza (H1N1) pneumonia	Letter, not an original study.
Curcio, D.	J Chemotherapy	2010	Ventilator-associated pneumonia in patients with 2009 pandemic	Only severe cases studied.

Dalton, C. B.	Med J Australia	2010	influenza a (H1N1) infection: An observational study Comparison of adult patients hospitalised with pandemic (H1N1) 2009 influenza and seasonal influenza during the "PROTECT" phase of the pandemic response	Letter, not an original study.
Dabanch Pena, J.	Int J Infect Dis	2010	Clinical spectrum of disease. Influenza AH1N1 2009	Conference abstract.
Dabanch, J.	Emerg Infect Dis	2011	Age as risk factor for death from pandemic (H1N1) 2009, Chile	Insufficient information provided in the article to extract a HFR.
Dawood, F. S.	Pediatrics	2011	Children with asthma hospitalized with seasonal or pandemic influenza, 2003-2009	Only asthmatic cases studied.
Dawood, F. S.	J Infect Dis	2013	Complications and Associated Bacterial Coinfections Among Children Hospitalized With Seasonal or Pandemic Influenza, United States, 2003-2010	Insufficient information provided in the article to extract a HFR.
Delgado-Rodriguez, M.	J Antimicrob Chemother	2012	Prognosis of hospitalized patients with 2009 H1N1 influenza in Spain: influence of neuraminidase inhibitors	More complete report of the study published elsewhere [56].
De Ita, J. R.	Intens Care Med	2011	Characteristics in pediatric patients with H1N1 influenza admitted to a third level hospital during the pandemic in Mexico	Conference abstract.
Deng, L. H.	J Zhejiang Univ Sci B	2012	Clinical characteristics of critical patients with pandemic influenza A (H1N1) virus infection in Chengdu, China	Only severe cases studied.
Di Giambenedetto, S.	Eur J Clin Microbiol Infect Dis	2011	Clinical presentation, microbiological features and correlates of disease severity of 2009	Less than 20 hospitalized cases included in the study.
Diaz, E.	J Infect	2012	Corticosteroid therapy in patients with primary viral pneumonia due to pandemic (H1N1) 2009 influenza	Insufficient information provided in the article to extract a HFR.
Dolan, G. P.	PLoS One	2012	The comparative clinical course of pregnant and non-pregnant women hospitalised with influenza A(H1N1)pdm09 infection	More complete report of the study published elsewhere [112].
Dominguez-Cherit, G.	JAMA	2009	Critically ill patients with 2009 Influenza A(H1N1) in Mexico	Only severe cases studied.
Doshi, S. S.	Am J Epidemiol	2012	The burden and severity of illness due to 2009 pandemic influenza A (H1N1) in a large US city during the late summer and early fall of 2009	Insufficient information provided in the article to extract a HFR.
Echevarria-Zuno, S.	Lancet	2009	Infection and death from influenza A H1N1 virus in Mexico: a retrospective analysis	More complete report of the study published elsewhere [23].
Enstone, J. E.	Emerg Infect Dis	2011	Nosocomial pandemic (H1N1) 2009, United Kingdom, 2009-2010	More complete report of the study published elsewhere [112].
Eriksson, C.	Crit Care Med	2010	Factors associated with respiratory failure and mortality among children hospitalized with seasonal influenza and pandemic 2009 H1N1	Conference abstract.
Estenssoro, E.	Am J Respir Crit Care Med	2010	Pandemic 2009 influenza A in Argentina: a study of 337 patients on mechanical ventilation	Insufficient information provided in the article to extract a HFR.
Fajardo-Dolci, G. E.	Salud Publica Mex	2009	Epidemiological profile of mortality due to human influenza A (H1N1) in Mexico	Insufficient information provided in the article to extract a HFR.
Farias, J. A.	Intensive Care Med	2010	Critically ill infants and children with influenza A (H1N1) in pediatric intensive care units in Argentina	Insufficient information provided in the article to extract a HFR.
Fowler, R. A.	Lancet	2010	Paediatric mortality related to H1N1 infection in England	Comment, not an original study.

Fuhrman, C.	Epidemiol Infect	2011	Adult intensive-care patients with 2009 pandemic influenza A(H1N1) infection	Insufficient information provided in the article to extract a HFR.
Fuhrman, C.	Euro Surveill	2010	Severe hospitalised 2009 pandemic influenza A(H1N1) cases in France, 1 July-15 November 2009	Insufficient information provided in the article to extract a HFR.
Fujikura, Y.	Am J Resp Crit Care	2011	Influenza pneumonia among adult patients in Japan: A large-scale investigation	Conference abstract.
Gauzere, B. A.	Bull Soc Pathol Exot	2011	Severe cases of A(H1N1)v2009 infection in Reunion Island in 2009 and 2010	Insufficient information provided in the article to extract a HFR.
Gauzere, B. A.	Emerg Infect Dis	2011	Intensive care unit admission for pandemic (H1N1) 2009, Reunion Island, 2009	Letter, not an original study.
Gioula, G.	Euro J Gen Med	2010	Epidemiological Surveillance of Pandemic H1N1 2009 infections in Northern Greece [Turkish]	Only severe cases studied.
Godoy, P.	Rev Esp Salud Publica	2011	Surveillance of the pandemic influenza (H1N1) 2009 in Catalonia: results and implications	Only severe cases studied.
Godoy, P.	Rev Esp Salud Publica	2011	Characteristics of cases hospitalized for severe pandemic (H1N1) 2009 in Catalonia	Only severe cases studied.
Gosbell, I. B.	Med J Australia	2010	Comparison of adult patients hospitalised with pandemic (H1N1) 2009 influenza and seasonal influenza during the "PROTECT" phase of the pandemic response: Reply	Letter, not an original study.
Greenwald, B.	Critical Care Medicine	2009	Influenza a H1N1 in critically-ill children in New York City: The first wave, 2009	Conference paper, not an original study.
Grijalva-Otero, I.	Arch Med Res	2009	Critical analysis of deaths due to atypical pneumonia during the onset of influenza A (H1N1) virus epidemic	Insufficient information provided in the article to extract a HFR
Gu, S.	Am J Respr Crit Care	2011	A comparison of the first and second wave of H1N1-related critical illness in Canada	Conference abstract.
Gubbels, S.	Epidemiol Infect	2013	Burden and characteristics of influenza A and B in Danish intensive care units during the 2009/10 and 2010/11 influenza seasons	Insufficient information provided in the article to extract a HFR.
Gubbels, S.	Euro Surveill	2010	National surveillance of pandemic influenza A(H1N1) infection-related admissions to intensive care units during the 2009-10 winter peak in Denmark: two complementary approaches	Insufficient information provided in the article to extract a HFR.
Gurgun, A.	Tuberk Toraks	2010	Comparison of the patients with pandemic (H1N1) influenza A virus pneumonia and community-acquired pneumonia [Turkish]	Insufficient information provided in the article to extract a HFR.
Gutierrez-Cuadra, M.	Clin Microbl Infec	2011	Hospitalised patients with pandemic influenza A/H1N1 virus infection had similar outcomes independently of hospital characteristics	Conference abstract.
Han, C. H.	Tuberc Respir Dis	2010	Clinical features of hospitalized adult patients with pneumonia in novel influenza A(H1N1) infection [Korean]	Only severe cases studied.
Hahne, S.	Euro Surveill	2009	Epidemiology and control of influenza A(H1N1)v in the Netherlands: the first 115 cases	Less than 5 hospitalized cases included in the study.
Hanslik, T.	PLoS Curr	2010	Preliminary estimation of risk factors for admission to intensive care units and for death in patients infected with A(H1N1)2009 influenza virus, France, 2009-2010	Insufficient information provided in the article to extract a HFR.
Hasegawa, M.	Emerg Infect Dis	2011	Pandemic (H1N1) 2009-associated pneumonia in children, Japan	Insufficient information provided in the article to extract a HFR.



He, Z.	Zhong Nan Da Xue Xue Bao Yi Xue Ban	2010	Clinical analysis of critically ill patients with H1N1 influenza	Insufficient information provided in the article to extract a HFR.
Health Protection Agency	Euro Surveill	2009	Epidemiology of new influenza A (H1N1) virus infection, United Kingdom, April-June 2009	Less than 5 hospitalized cases included in the study.
Hong, S. B.	Epidemiol Infect	2013	Epidemiological analysis of critically ill adult patients with pandemic influenza A(H1N1) in South Korea	Insufficient information provided in the article to extract a HFR.
Hiba, V.	Clin Microbiol Infect	2011	The benefit of early treatment with oseltamivir in hospitalised patients with documented 2009 influenza A/H1N1: Retrospective study	Conference abstract.
Imam, H. M. I.	Med J Malaysia	2010	Identification of children infected with 2009 pandemic influenza A (H1N1) in government hospitals	Conference abstract.
Ishigaki, H.	Pediatr Int	2011	Critical findings of severe influenza A (H1N1) pneumonia in children	Insufficient information provided in the article to extract a HFR.
Ishiguro, T.	Nihon Kokyuki Gakkai Zasshi	2011	Comparison between pandemic H1N1 2009 influenza pneumonia and seasonal influenza pneumonia in adults [Japanese]	Insufficient information provided in the article to extract a HFR.
Islam, Q. T.	J Med	2010	Experience of pandemic influenza a (H1N1) 2009 at Dhaka Medical College Hospital	Insufficient information provided in the article to extract a HFR.
Jhung, M. A.	Clin Infect Dis	2011	Epidemiology of 2009 pandemic influenza A (H1N1) in the United States	Insufficient information provided in the article to extract a HFR.
Jhung, M. A.	Influenza Other Respi Viruses	2011	Preliminary results of 2009 pandemic influenza surveillance in the United States using the Aggregate Hospitalization and Death Reporting Activity	Insufficient information provided in the article to extract a HFR.
Joob, B.	N Am J Med Sci	2012	H1N1-infected patient in intensive care unit	Letter, not an original study.
Jouvet, P.	Pediatr Crit Care Med	2010	Critical illness in children with influenza A/pH1N1 2009 infection in Canada	Insufficient information provided in the article to extract a HFR.
Kashyap, R.	Crit Care Med	2010	Are patient characteristics and clinical outcomes of 2009 H1N1 influenza infection different from that of seasonal influenza infection?	Conference abstract.
Kelly, M. E.	Intens Care Med	2012	Clinical, laboratory and radiological differences in critically ill and non-critically ill h1n1 positive patients	Conference abstract.
Kendirli, T.	Pediatr Crit Care Med	2012	Critically ill children with pandemic influenza (H1N1) in pediatric intensive care units in Turkey	Insufficient information provided in the article to extract a HFR.
Khan, G.	Emerg Infect Dis	2011	Pandemic (H1N1) 2009, Abu Dhabi, United Arab Emirates, May 2009-March 2010	Insufficient information provided in the article to extract a HFR.
Khandaker, G.	Emerg Infect Dis	2011	Pandemic (H1N1) 2009 and seasonal influenza A (H3N2) in children's hospital, Australia	Letter, not an original study.
Klimova, E. A.	Ter Arkh	2010	Outcomes of severe pandemic influenza A/H1N1/2009 [Russian]	Insufficient information provided in the article to extract a HFR.
Kojacic, M.	Croat Med J	2012	Characteristics and outcome of mechanically ventilated patients with 2009 H1N1 influenza in Bosnia and Herzegovina and Serbia: impact of newly established multidisciplinary intensive care units	Insufficient information provided in the article to extract a HFR.
Kok, J.	Clin Infect Dis	2011	The infection attack rate and severity of 2009 pandemic H1N1 influenza in Hong Kong: Accuracy amidst ambiguity	Letter, not an original study.

Koluder, N.	Med Arh	2011	Clinical and epidemiological characteristics of novel AH1N1 flu	Insufficient information provided in the article to extract a HFR.
Kool, J. L.	BMC Infect Dis	2013	Influenza surveillance in the Pacific Island countries and territories during the 2009 pandemic: an observational study	Insufficient information provided in the article to extract a HFR.
Kumar, A.	JAMA	2009	Critically ill patients with 2009 influenza A(H1N1) infection in Canada	Insufficient information provided in the article to extract a HFR.
Kumar, T. C.	N Am J Med Sci	2012	H1N1-infected Patients in ICU and Their Clinical Outcome	Insufficient information provided in the article to extract a HFR.
Kusznierz, G.	Influenza Other Respi Viruses	2013	Clinical features of the hospitalized patients with 2009 pandemic influenza A (H1N1) in Santa Fe, Argentina	All deaths in the province but only a sample of survival cases were included in the study.
Kute, V. B.	Saudi J Kidney Dis Transpl	2011	High mortality in critically ill patients infected with 2009 pandemic influenza A (H1N1) with pneumonia and acute kidney injury	Only severe cases studied.
Kute, V. B.	Indian J Crit Care Med	2011	Critically ill patients with 2009 H1N1 infection in an Indian intensive care unit	Letter, not an original study.
Laurent, C.	Pediatr Infect Dis J	2012	Viral epidemiology and severity of respiratory infections in infants in 2009: a prospective study	Insufficient information provided in the article to extract a HFR.
Lee, I. K.	Influenza Other Respi Viruses	2012	Clinical and epidemiological characteristics of Novel AH1N1 flu	Insufficient information provided in the article to extract a HFR.
Lee, J. E.	Yonsei Med J	2013	Clinical and Radiological Characteristics of 2009 H1N1 Influenza Associated Pneumonia in Young Male Adults	Insufficient information provided in the article to extract a HFR.
Lee, N.	Thorax	2010	Outcomes of adults hospitalized with severe influenza	Insufficient information provided in the article to extract a HFR.
Lee, N.	Antivir Ther	2012	Diagnosis, management and outcomes of adults hospitalized with influenza	Review, not an original study.
Leen, T.	Intensive Crit Care Nurs	2010	Early experience with influenza A H1N109 in an Australian intensive care unit	Insufficient information provided in the article to extract a HFR.
Li, G.	J Clin Virol	2009	Outcome of critically ill patients with influenza virus infection	Insufficient information provided in the article to extract a HFR.
Li, H.	Chin Crit Care Med	2010	Clinical analysis of 75 patients with severe influenza A H1N1 in Qinghai Province [Chinese]	Only severe cases studied.
Li, Y.	Respirology	2011	Review analysis of 119 severe cases of A/H1N1 influenza	Conference abstract.
Liu, L.	Chin Med J (Engl)	2011	Sixty-two severe and critical patients with 2009 influenza A (H1N1) in Shanghai, China	Only severe cases studied.
Liu, X. D.	Chin Crit Care Med	2010	Clinical characteristics and analysis of imaging in patients with severe influenza a H1N1 virus infection [Chinese]	Only severe cases studied.
Lopez-Garcia, E.	Rev Esp Salud Publica	2010	Influenza (H1N1) 1009 in Castilla y Leon, Spain: Hospitalized case studies and match with the protocols of action developed. [Spanish]	Insufficient information provided in the article to extract a HFR.
Mady, A.	J Infect Public Health	2012	Clinical experience with severe 2009 H1N1 influenza in the intensive care unit at King Saud Medical City, Saudi Arabia	Insufficient information provided in the article to extract a HFR.
Martin-Loeches, I.	Chest	2011	Community-acquired respiratory coinfection in critically ill patients with pandemic 2009 influenza A(H1N1) virus	Insufficient information provided in the article to extract a HFR.
Mata-Marin, J. A.	Clin Microbiol Infect	2010	Predictive factors for mortality among in-hospital Mexican patients infected with influenza A/H1N1	Conference abstract.

Mayoral, J. M.	BMC Public Health	2013	Social factors related to the clinical severity of influenza cases in Spain during the A (H1N1) 2009 virus pandemic	Insufficient information provided in the article to extract a HFR.
McLean, E.	Epidemiol Infect	2010	Pandemic (H1N1) 2009 influenza in the UK: Clinical and epidemiological findings from the first few hundred (FF100) cases	Less than 20 hospitalized cases included in the study.
Melidou, A.	Hippokratia	2013	Severity of the two post-pandemic influenza seasons 2010-11 and 2011-12 in Northern Greece	Insufficient information provided in the article to extract a HFR.
Meschi, S.	BMC Infect Dis	2011	Duration of viral shedding in hospitalized patients infected with pandemic H1N1	Insufficient information provided in the article to extract a HFR.
Michelim, L.	Clin Microbiol Infect	2010	Clinical characteristics of influenza A H1N1-2009 outbreak at a public university hospital in the north-eastern region of Rio Grande Do Sul, Brazil	Conference abstract.
Miller, A. C.	Am J Respir Crit Care	2011	Pediatric patients with 2009 H1N1 did not differ significantly from a 2005-2008 seasonal cohort in a New York city teaching hospital	Conference abstract.
Miller, A. C.	J Intensive Care Med	2012	Influenza A 2009 (H1N1) virus in admitted and critically ill patients	Insufficient information provided in the article to extract a HFR.
Miller, R. R., 3 <sup>rd</sup>	Chest	2010	Clinical findings and demographic factors associated with ICU admission in Utah due to novel 2009 influenza A(H1N1) infection	Insufficient information provided in the article to extract a HFR.
Mitchell, R.	Am J Infect Control	2013	Understanding the burden of influenza infection among adults in Canadian hospitals: a comparison of the 2009-2010 pandemic season with the prepandemic and postpandemic seasons	Insufficient information provided in the article to extract a HFR.
Mohammad, F.	Clin Microbiol Infect	2011	H1N1 influenza pandemic from June 2010 to November 2010 at a single nodal centre in Hyderabad, India	Conference abstract.
Moradi, A.	Clin Microbiol Infect	2011	Factors associated with death or ICU admission due to pandemic 2009 influenza A/H1N1 infection	Conference abstract.
Morgan, O. W.	PLoS One	2010	Morbid obesity as a risk factor for hospitalization and death due to 2009 pandemic influenza A(H1N1) disease	Insufficient information provided in the article to extract a HFR.
Nawas, M.	Blood	2011	Comparison of H1N1 and seasonal flu related hospitalizations in children with SCD: A pediatric health information system (PHIS) database analysis	Only severe cases studied.
New influenza A(H1N1) investigation teams	Euro Surveill	2009	New influenza A(H1N1) virus infections in France, April - May 2009	Less than 20 hospitalized cases included in the study.
Nguyen-Van-Tam, J. S.	Thorax	2010	Risk factors for hospitalisation and poor outcome with pandemic A/H1N1 influenza: United Kingdom first wave (May-September 2009)	More complete report of the study published elsewhere [112].
Nickel, K. B.	Public Health Rep	2011	Age as an independent risk factor for intensive care unit admission or death due to 2009 pandemic influenza A (H1N1) virus infection	Insufficient information provided in the article to extract a HFR.
Nicolay, N.	Crit Care Resusc	2010	Epidemiology, clinical characteristics and resource implications of pandemic (H1N1) 2009 in intensive care units in Ireland	Insufficient information provided in the article to extract a HFR.
Nin, N.	J Crit Care	2011	Clinical characteristics and outcomes of patients with 2009 influenza A(H1N1) virus infection with respiratory failure requiring mechanical ventilation	Insufficient information provided in the article to extract a HFR.

Oliveira, W. K.	Euro Surveill	2009	Pandemic H1N1 influenza in Brazil: Analysis of the first 34,506 notified cases of influenza-like illness with severe acute respiratory infection (SARI)	Insufficient information provided in the article to extract a HFR.
Onyango, C. O.	J Infect Dis	2012	Influenza surveillance among children with pneumonia admitted to a district hospital in coastal Kenya, 2007-2010	Insufficient information provided in the article to extract a HFR.
Oerested, I.	Clin Microbiol Infect	2012	The first, second and third wave of pandemic influenza A (H1N1) in North Denmark region, 2009-2011: A population-based study of hospitalisations	Conference abstract.
Perez-Padilla, R.	N Engl J Med	2009	Pneumonia and respiratory failure from swine-origin influenza A (H1N1) in Mexico	Insufficient information provided in the article to extract a HFR.
Petrovic, V.	Croat Med J	2011	Overview of the winter wave of 2009 pandemic influenza A(H1N1)v in Vojvodina, Serbia	Insufficient information provided in the article to extract a HFR.
Plessa, E.	Clin Pediatr (Phila)	2010	Clinical features, risk factors, and complications among pediatric patients with pandemic influenza A (H1N1)	Insufficient information provided in the article to extract a HFR.
Poulakou, G.	Clin Microbiol Infect	2012	First influenza season after the 2009 pandemic influenza: characteristics of intensive care unit admissions in adults and children in Vall d'Hebron Hospital	Insufficient information provided in the article to extract a HFR.
Presanis, A. M.	PLoS Curr	2009	The severity of pandemic H1N1 influenza in the United States, April – July 2009	Duplicate publication.
Rahamat-Langendoen, J. C.	Clin Microbiol Infect	2011	Seasonal versus pandemic influenza: Differences in severity, course of illness and treatment	Conference abstract
Rana, H.	J Assoc Physicians India	2012	Epidemiology and clinical outcome of H1N1 in Gujarat from July 2009 to March 2010	Insufficient information provided in the article to extract a HFR.
Randolph, A. G.	Pediatrics	2011	Critically ill children during the 2009-2010 influenza pandemic in the United States	Insufficient information provided in the article to extract a HFR.
Rasul, C. H.	APJTM	2011	Burden and outcome of human influenza in a tertiary care hospital of Bangladesh	Less than 20 hospitalized cases included in the study.
Reyes, L.	Influenza Other Respi Viruses	2010	Population-based surveillance for 2009 pandemic influenza A (H1N1) virus in Guatemala, 2009	Insufficient information provided in the article to extract a HFR.
Reyes, S.	Respir Med	2011	Risk factors of A/H1N1 etiology in pneumonia and its impact on mortality	Insufficient information provided in the article to extract a HFR.
Rhim, J. W.	BMC Infect Dis	2011	Epidemiological and clinical characteristics of childhood pandemic 2009 H1N1 virus infection: an observational cohort study	Insufficient information provided in the article to extract a HFR.
Ribeiro, A.	Int J Infect Dis	2010	Factors associated to death in patients with confirmed diagnosis for influenza A/H1N1. State of Sao Paulo, Brazil, April to October, 2009	Conference abstract.
Rice, T. W.	Crit Care Med	2012	Critical illness from 2009 pandemic influenza A virus and bacterial coinfection in the United States	Insufficient information provided in the article to extract a HFR.
Riquelme, R.	Int J Tuberc Lung Dis	2011	Predicting mortality in hospitalized patients with 2009 H1N1 influenza pneumonia	Insufficient information provided in the article to extract a HFR.
Riquelme, R.	Eur Respir J	2011	Influenza pneumonia: a comparison between seasonal influenza virus and the H1N1 pandemic	Insufficient information provided in the article to extract a HFR.
Riscili, B. P.	PLoS One	2011	An assessment of H1N1 influenza-associated acute respiratory distress syndrome severity after adjustment for treatment characteristics	Insufficient information provided in the article to extract a HFR.

Rodriguez, A.	J Antimicrob Chemother	2011	Impact of early oseltamivir treatment on outcome in critically ill patients with 2009 pandemic influenza A	Insufficient information provided in the article to extract a HFR.
Rodriguez-Valero, M.	J Infect Dev Ctries	2012	Difference between early clinical features of swine origin A H1N1 influenza confirmed and not confirmed infection in Mexico	Insufficient information provided in the article to extract a HFR.
Romero-Marquez, R. S.	Rev Med Inst Mex Seguro Soc	2010	Epidemiologic characteristics of influenza A H1N1 in Queretaro	Insufficient information provided in the article to extract a HFR.
Ryoo, S. M.	Crit Care Med	2011	Comparison of clinical features and outcomes of hospitalized patients with novel influenza A (H1N1) pneumonia and other pneumonia	Conference abstract.
Saeed, A.	Chest	2009	Characteristics of critically ill patients admitted with influenza-like illness (ILI) during the H1N1 pandemic (April to July 2009)	Conference paper, not an original study.
Saleh, P.	ZUMS Journal	2011	Demographic and paraclinical findings of patients with novel H1N1 infection hospitalized in infectious disease ward, Sina hospital, Tabriz, Iran	Duplicate publication.
Saidel-Odes, L.	Int J Infect Dis	2011	Risk factors for community-acquired pneumonia with influenza A/H1N1 in southern Israel	Insufficient information provided in the article to extract a HFR.
Sandoval, C.	Int J Infect Dis	2010	Clinical and epidemiology characterization of children hospitalized with influenza A H1N1 (FLU AH1N1) during the first wave of 2009 outbreak, Santiago, Chile	Conference abstract.
Santa-Olalla Peralta, P.	Rev Esp Salud Publica	2010	Critically ill patients with 2009 pandemic influenza A (H1N1) infection in Spain: factors associated with death, April 2009-January 2010 [Spanish]	Insufficient information provided in the article to extract a HFR.
Sasbon, J. S.	Pediatr Crit Care Med	2011	Influenza A (pH1N1) infection in children admitted to a pediatric intensive care unit: differences with other respiratory viruses	Insufficient information provided in the article to extract a HFR.
Sertogullarindan, B.	Afr Health Sci	2011	Clinical and prognostic features of patients with pandemic 2009 influenza A (H1N1) virus in the intensive care unit	Insufficient information provided in the article to extract a HFR.
Shimada, T.	Euro Surveill	2009	Epidemiology of influenza A(H1N1)v virus infection in Japan, May-June 2009	Hospitalized for isolation, rather than severity of condition.
Shin, S. Y.	Pediatr Pulmonol	2010	Clinical characteristics of Korean pediatric patients critically ill with influenza A (H1N1) virus	Insufficient information provided in the article to extract a HFR.
Shrestha, S. S.	Clin Infect Dis	2011	Estimating the burden of 2009 pandemic influenza A (H1N1) in the United States (April 2009-April 2010)	Insufficient information provided in the article to extract a HFR.
Simmerman, J. M.	PLoS One	2009	Incidence, seasonality and mortality associated with influenza pneumonia in Thailand	Information to extract a HFR not included in the article, the number of H1N1pdm09 hospitalized cases and deaths not reported.
Sofia, A.	Arch Dis Child	2010	Epidemiology of infection among children admitted to the hospital with the novel influenza virus A	Conference abstract.
Sohn, C. H.	Acad Emerg Med	2013	Comparison of clinical features and outcomes of hospitalized adult patients with novel influenza A (H1N1) pneumonia and other pneumonia	Insufficient information provided in the article to extract a HFR.
Sriram, P.	Indian J Pediatr	2010	Clinical profile of swine flu in children at Puducherry	Less than 5 hospitalized cases included in the study.
Takasaki, J.	Respirology	2011	Risk factors and successful treatment approach for hospitalized patients due to pandemic H1N1 2009 in Japan	Conference abstract.

Taylor, G.	BMC Proceedings	2011	Laboratory-confirmed pandemic H1N1 influenza in hospitalized adults-findings from the Canadian Nosocomial Infection Surveillance Program (CNISP)	Conference abstract.
Tamme, K.	Medicina (Kaunas)	2012	Clinical and pathological findings of fatal 2009-2010 pandemic influenza A (H1N1) infection in Estonia	Insufficient information provided in the article to extract a HFR.
Teke, T.	Int J Med Sci	2011	2009 H1N1 influenza and experience in three critical care units	Insufficient information provided in the article to extract a HFR.
Thiansukhon, E.	Clin Microbiol Infect	2010	A comparative study between 2009 H1N1 influenza A virus and seasonal influenza virus infections at a Bangkok hospital, Thailand	Conference abstract.
Thomas, R.	Chest	2010	H1N1 2009 influenza in the Southern hemisphere: A hospitalization study	Conference abstract.
Thormann, M.	Int J Infect Dis	2010	Epidemiologic and clinical findings of A H1N1 2009 pandemic influenza in the Dominican Republic	Conference abstract.
Tobar, E.	Critical Care Medicine	2009	Critical care management of patients with severe respiratory failure due to novel a (H1N1) virus infection. A systematic approach in a tertiary-care center in Chile	Conference paper, not an original study.
Toma, M.	Pediatr Res	2011	Clinical outcome of children hospitalized with lower respiratory tract infection (LRTI) due to influenza (Flu) and respiratory syncytial (RSV) viruses	Conference abstract.
Tresoldi, A. T.	J Trop Pediatr	2011	Clinical features and outcome of children and adolescents hospitalized with influenza A (H1N1) virus infection compared with flu-like symptoms and negative rapid tests for influenza A (H1N1) admitted in the same period of time	Insufficient information provided in the article to extract a HFR.
Vachon, J.	Can J Infect Dis Med	2010	Impact of co-morbidities on outcome severity among pandemic H1N1 2009 (pH1N1) hospitalized cases in Canada	Conference abstract.
Valdes, C. E. S.	Rev Cubana Med Trop	2011	Severe acute respiratory infection in Cuban patients during the influenza A (H1N1) pandemic in Cuba, 2009 [Spanish]	Insufficient information provided in the article to extract a HFR.
Van Kerkhove, M. D.	Influenza Other Respi Viruses	2011	Epidemiologic and virologic assessment of the 2009 influenza A (H1N1) pandemic on selected temperate countries in the Southern Hemisphere: Argentina, Australia, Chile, New Zealand and South Africa	Insufficient information provided in the article to extract a HFR.
Viasus, D.	Clin Microbiol Infect	2012	Changes in epidemiology, clinical features and severity of influenza A (H1N1) 2009 pneumonia in the first post-pandemic influenza season	Insufficient information provided in the article to extract a HFR.
Viasus, D.	Clin Microbiol Infect	2011	Factors associated with severe disease in hospitalized adults with pandemic (H1N1) 2009 in Spain	More complete report of the study published elsewhere [163].
Viasus, D.	Medicine (Baltimore)	2011	Pneumonia complicating pandemic (H1N1) 2009: risk factors, clinical features, and outcomes	More complete report of the study published elsewhere [163].
Viasus, D.	Chest	2011	Timing of oseltamivir administration and outcomes in hospitalized adults with pandemic 2009 influenza A(H1N1) virus infection	More complete report of the study published elsewhere [163].
Viasus, D.	J Infect	2013	Community-acquired pneumonia during the first post-pandemic	Only severe cases studied.

Wane, J.	PLoS One	2010	influenza season: a prospective, multicenter cohort study 2009 pandemic influenza A(H1N1) virus outbreak and response—Rwanda, October, 2009-May, 2010	Information to extract a HFR not included in the article, the number of H1N1pdm09 hospitalized cases and deaths not reported.
Webb, S. A.	Crit Care	2011	Critical care services and the H1N1 (2009) influenza epidemic in Australia and New Zealand in 2010: the impact of the second winter epidemic	Insufficient information provided in the article to extract a HFR.
Wieching, A.	BMC Res Notes	2012	Clinical characteristics of pediatric hospitalizations associated with 2009 pandemic influenza A (H1N1) in Northern Bavaria, Germany	Insufficient information provided in the article to extract a HFR.
Wilking, H.	Euro Surveill	2010	Mortality of 2009 pandemic influenza a (H1N1) in Germany	Insufficient information provided in the article to extract a HFR.
Wilkinson, K.	Can J Infect Dis Med Microbiol	2010	Laboratory-confirmed influenza in hospitalized adults: Findings from the Canadian nosocomial infections surveillance program, June 1 to December 31, 2009	Conference abstract.
Wilkinson, K.	Can J Infect Dis Med Microbiol	2011	Laboratory-confirmed pandemic H1N1 influenza in hospitalized adults – Findings from the Canadian nosocomial infection surveillance program (CNISP), 2009-10	Conference abstract.
Wiramus, S.	Ann Fr Anesth Reanim	2010	Hospitalized patients with 2009 H1N1 influenza in intensive care unit over the world, epidemiological assessment in January 2010	Editorial, not an original study.
WHO	Wkly Epidemiol Rec	2009	Human infection with new influenza A (H1N1) virus: clinical observations from a school-associated outbreak in Kobe, Japan, May 2009	Hospitalized for isolation, rather than severity of condition.
Wulandari, L.	Chest	2010	Clinical features of influenza a (H1N1) patients hospitalized in Dr Soetomo Hospital, Surabaya, Indonesia, during the peak of the 2009 flu pandemic	Conference abstract
Yang, L.	Euro Surveill	2012	Hospitalisation associated with the 2009 H1N1 pandemic and seasonal influenza in Hong Kong, 2005 to 2010	Insufficient information provided in the article to extract a HFR.
Yang, P.	J Infect	2010	Severe, critical and fatal cases of 2009 H1N1 influenza in China	Only severe cases studied.
Yang, S. Q.	Clin Respir J	2013	Influenza pneumonia among adolescents and adults: a concurrent comparison between influenza A (H1N1) pdm09 and A (H3N2) in the post-pandemic period	Only severe cases studied.
Yokota, R. T.	Emerg Infect Dis	2011	Risk factors for death from pandemic (H1N1) 2009, Southern Brazil	Not representative as prevalence of obesity and diabetes in hospitalized cases is higher than that in the general population.
Yung, M.	Pediatrics	2011	Pandemic H1N1 in children requiring intensive care in Australia and New Zealand during winter 2009	Insufficient information provided in the article to extract a HFR.
Zahariadis, G.	CMAJ	2010	Identification and epidemiology of severe respiratory disease due to novel swine-origin influenza A (H1N1) virus infection in Alberta	Less than 5 hospitalized cases included in the study.
Zarychanski, R.	CMAJ	2010	Correlates of severe disease in patients with 2009 pandemic influenza (H1N1) virus infection	Insufficient information provided in the article to extract a HFR.
Zhang, P. J.	Chin Med J (Engl)	2013	Risk factors for adult death due to 2009 pandemic influenza A	Only severe cases studied.

Zhou, B.	Int J Infect Dis	2010	(H1N1) virus infection: a 2151 severe and critical cases analysis Clinical characteristics and treatment of 27 cases of H1N1 influenza	Conference abstract.
Zurynski, Y.	J Paediatr Child H	2011	Influenza complications and deaths reported to the apsu among aboriginal and torres strait islander and non-aboriginal and torres strait islander children in 2008, 2009 and 2010	Conference abstract.

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**Web Table 2: Summary of hospitalization-fatality risk studies of influenza A(H1N1pdm09) included in the systematic review**

Reference	Country	Study period	Hospital type	Cohort design	% of male	Overall HFR (%)	Overall HIR (%)
Campbell 2010a [27]	Canada	Apr 09-Sep 09	Multicenter	No	50	5	16
Gilca 2011 [66]	Canada	May 09-Jul 09	Multicenter	Yes	48	5	15
Helferty 2010 [74]	Canada	Apr 09-Apr 10	Multicenter	No	50	5	18
Launay 2010 [91]	Canada	Apr 09-Dec 09	Referral	Yes	51	0 (Children)	11 (Children)
O’Riordan 2009 [119]	Canada	May 09-Jul 09	Referral	Yes	60	0 (Children)	21 (Children)
Tran 2012 [157]	Canada	May 09-Mar 10	Multicenter	No	57	1 (Children)	15 (Children)
Wilkinson 2012 [165]	Canada	Jun 09-May 10	Multicenter	No	46	6 (Adults & Elderly)	25 (Adults & Elderly)
Bagdure 2010 [14]	USA	May 09-Nov 09	Referral	Yes	61	3 (Children)	26 (Children)
Baird 2012 [15]	USA	May 09-Apr 10	Referral	Yes	53	1 (Children)	26 (Children)
Balter 2010 [18]	USA	Apr 09-Jul 09	Multicenter	No	47	5	NA
CDC 2009 [33]	USA	Apr 09-May 09	Multicenter	No	30	0	20
CDC 2010 [34]	USA	Apr 09-May 09	Multicenter	No	55	4	24
CDC 2011 [35]	USA	Apr 09-May 10	Multicenter	No	NA	4	22
Chan 2011 [36]	USA	Oct 09-Dec 09	Referral	Yes	53	2	16
Chaves 2013 [38]	USA	Oct 10-Apr 11	Multicenter	No	51	3	25
Chowell 2012 [46]	USA	Apr 09-Mar 10	Multicenter	No	44	14	28
Cox 2012 [50]	USA	Apr 09-Apr 10	Multicenter	No	47	3	21
Echenique 2013 [60]	USA	Oct 09-Dec 09	Referral	Yes	54	2	17
Eriksson 2012 [61]	USA	Jun 09-Dec 09	Referral	Yes	57	1 (Children)	19 (Children)
Gastanaduy 2012 [63]	USA	Apr 09-May 09	Referral	Yes	59	1 (Children)	9 (Children)
Jain 2009 [82]	USA	May 09-Jun 09	Multicenter	Yes	51	7	25
Jain 2012 [81]	USA	May 09-Oct 09	Multicenter	Yes	48	8	31
Kumar 2010 [89]	USA	Apr 09-Aug 09	Community	Yes	56	3 (Children)	19 (Children)
LaBeaud 2013 [90]	USA	Apr 09-Feb 10	Referral	Yes	63	1 (Children)	34 (Children)
Levy 2013 [100]	USA	Oct 09-Feb 10	Multicenter	Yes	41	5	NA
Louie 2009 [102]	USA	Apr 09-Aug 09	Multicenter	No	49	11	31
Louie 2010 [103]	USA	Apr 09-Aug 09	Multicenter	No	59	2 (Children)	27 (Children)
Morgan 2012 [110]	USA	Jun 09-Dec 09	Referral	Yes	49	0 (Children)	14 (Children)

Novel Swine-Origin Influenza A (H1N1) Virus Investigation Team 2009 [117]	USA	Apr 09-May 09	Multicenter	No	NA	6 (Children & Adults)	22 (Children & Adults)
Ostovar 2011 [122]	USA	Apr 09-Aug 09	Referral	Yes	47	0 (Children)	30 (Children)
Presanis 2009 [131]	USA	Apr 09-Jul 09	Multicenter	No	NA	4	25
Satterwhite 2010 [139]	USA	Aug 09-Oct 09	Multicenter	No	40	6	21
Skarbinski 2011 [145]	USA	Sep 09-Oct 09	Multicenter	Yes	43	8	34
Sundar 2011 [150]	USA	Jun 09-Dec 09	Referral	Yes	52	7	37
Tamma 2010 [152]	USA	May 09-Nov 09	Referral	Yes	53	0 (Children)	20 (Children)
Thompson 2011 [154]	USA	Sep 09-Jan 10	Multicenter	Yes	49	4	NA
Truelove 2011 [158]	USA	Apr 09-Jan 10	Multicenter	No	NA	4	21
Venkata 2010 [162]	USA	May 09-Dec 09	Referral	Yes	50	8 (Adults & Elderly)	44 (Adults & Elderly)
Snacken 2012 [146]	9 European Countries (Austria, Finland, France, Ireland, Malta, Portugal, Romania, Slovakia, Spain)	Oct 10-May 11	Multicenter	No	55	16	38
Poepl 2011 [130]	Austria	Sep 09-Feb 10	Multicenter	Yes	70	4	14
Cherifi 2011 [42]	Belgium	Jun 09-Nov 09	Referral	Yes	40	3 (Adults & Elderly)	27 (Adults & Elderly)
Celjuska-Tosev 2010 [32]	Croatia	Jul 09-Mar 10	Referral	Yes	57	2	21
Orsted 2013 [120]	Denmark	Jul 09-Feb 11	Multicenter	Yes	53	5	12
Barrau 2012 [20]	France	Jul 09-Mar 10	Multicenter	No	42	3	10
Payet 2013 [127]	France	Sep 09-Jan 10	Referral	Yes	54	7 (Adults & Elderly)	23 (Adults & Elderly)
Ploin 2013 [129]	France	Nov 09-Feb 10	Multicenter	Yes	95	5 (Children & Adults)	33 (Children & Adults)
Adlhoch 2012 [2]	Germany	Nov 09-Mar 10	Multicenter	No	66	27	71
Bauernfeind 2012 [22]	Germany	Sep 09-Apr 10	Referral	Yes	44	22	67
Lehners 2013 [96]	Germany	Aug 09-Apr 10	Community	Yes	52	8	28
Gioula 2011 [67]	Greece	May 09-Mar 10	Multicenter	No	NA	13	1
Cullen 2009 [51]	Ireland	Apr 09-Oct 09	Multicenter	No	48	2	9
Rebolledo 2013 [177]	Ireland	Apr 09-Aug 10	Multicenter	No	61	1 (Children)	5 (Children)
Bassetti 2010 [21]	Italy	Jul 09-Nov 09	Multicenter	Yes	55	3	12

Buccoliero 2010 [25]	Italy	Nov 09-Dec 09	Referral	Yes	44	3	NA
Tramuto 2011 [156]	Italy	Apr 09-Dec 10	Multicenter	No	52	2	4
Mickiene 2011 [108]	Lithuania	Nov 09-Mar 10	Multicenter	Yes	43	5	7 (Adults & Elderly)
Brandsaeter 2011 [24]	Norway	Jul 09-Dec 09	Community	Yes	41	6 (Adults & Elderly)	27 (Adults & Elderly)
Cholewinska 2010 [45]	Poland	Aug 09-Dec 09	Referral	Yes	41	1 (Adults & Elderly)	NA
Zolotusca 2013 [178]	Romania	Oct 09-Dec 11	Referral	No	NA	20	NA
Canak 2013 [29]	Serbia	Oct 09-Feb 10	Referral	Yes	52	1	4
Capelastegui 2012 [30]	Spain	Jul 09-Feb 10	Multicenter	Yes	48	1 (Adults & Elderly)	NA
Cortes 2010 [49]	Spain	Apr 09-May 09	Community	No	NA	3	12
Del Rosal 2011 [55]	Spain	May09-Nov 09	Multicenter	Yes	60	1 (Children)	10 (Children)
Delgado-Rodriguez 2013a [56]	Spain	Jul 09-Feb 11	Multicenter	Yes	50	1	10
Delgado-Rodriguez 2013b [56]	Spain	Jul 09-Feb 11	Multicenter	Yes	57	3	25
Esteban-Vasallo 2011 [62]	Spain	May 09-May 10	Multicenter	Yes	50	4	21
Gonzalez-Velez 2011 [70]	Spain	Jul 09-Dec 09	Referral	Yes	46	2	19
Gonzalez 2011 [69]	Spain	Jul 09-Jan 10	Community	Yes	45	3	14
Giannella 2010 [65]	Spain	Sep 09-Dec 09	Referral	Yes	42	9 (Adults)	42 (Adults)
Gutierrez-Cuadra 2012 [72]	Spain	Jun 09-Dec 09	Multicenter	Yes	61	8 (Adults & Elderly)	16 (Adults & Elderly)
Hernandez-Bou 2013 [76]	Spain	Aug 09-Dec 09	Multicenter	Yes	58	2 (Children)	18 (Children)
Launes 2012 [92]	Spain	Jul 09-Dec 09	Referral	Yes	48	6 (Children)	NA
Lera Carballo 2011 [99]	Spain	Jul 09-Dec 09	Referral	Yes	NA	2 (Children)	4 (Children)
Moral 2011 [109]	Spain	Jun 09- Jul 10	Multicenter	Yes	63	4 (Children)	10 (Children)
Pano-Pardo 2012 [124]	Spain	Jun 09-Nov 09	Referral	Yes	51	2 (Adults & Elderly)	12 (Adults & Elderly)
Rodriguez-Rieiro 2012 [135]	Spain	Jul 09-Dec 09	Multicenter	Yes	50	2	NA
Santa-Olalla Peralta 2010 [138]	Spain	Apr 09-Dec 09	Multicenter	No	55	7	28
Viasus 2012 [163]	Spain	Jun 09-Nov 09	Multicenter	Yes	51	2 (Adults & Elderly)	12 (Adults & Elderly)
Rhedin 2012 [133]	Sweden	Jul 09-Dec 09	Referral	Yes	59	2 (Children)	11 (Children)
Lucker 2011 [106]	Switzerland	Oct 09-Jan 10	Referral	Yes	53	2	16
van 't Klooster 2010 [161]	The Netherlands	Jun 09-Dec 09	Multicenter	No	47	2	10

Akinci 2011 [6]	Turkey	Oct 09-Dec 09	Referral	Yes	35	3 (Adults & Elderly)	5 (Adults & Elderly)
Bal 2012 [17]	Turkey	Nov 09-Dec 09	Referral	Yes	63	2 (Children)	4 (Children)
Ciftci 2011 [48]	Turkey	Jul 09-Feb 10	Referral	Yes	57	4 (Children)	11 (Children)
Hancerli 2010 [73]	Turkey	Oct 09-Nov 09	Community	Yes	60	0 (Children)	NA
Kaya 2012 [83]	Turkey	Oct 09-May 10	Referral	Yes	44	20	NA
Kirakli 2011 [86]	Turkey	Nov 09-Feb 10	Referral	Yes	44	20	39
Kondolot 2010 [88]	Turkey	Oct 09-Jan 10	Referral	Yes	49	11 (Children)	14 (Children)
Nayman Alpat 2012 [114]	Turkey	Nov 09-Feb 10	Community	Yes	43	8	47
Tasar 2012 [153]	Turkey	Oct 09-Dec 09	Community	Yes	64	2 (Children)	NA
Tutuncu 2010 [159]	Turkey	Oct 09-Dec 09	Referral	Yes	46	14 (Adults & Elderly)	22 (Adults & Elderly)
Campbell 2010b [28]	UK	Apr 09-Jan 10	Community	No	48	4	11
Herberg 2011 [75]	UK	May 09-Jan 10	Referral	Yes	NA	10 (Children)	30 (Children)
Myles 2012 [112]	UK	May 09-Jan 10	Multicenter	Yes	47	5	13
Presanis 2011 [132]	UK	Jun 09-Feb 10	Multicenter	No	NA	4	15
Gentile 2011 [64]	Argentina	Apr 09-Aug 09	Multicenter	Yes	57	6 (Children)	NA
Libster 2009 [101]	Argentina	May 09-Jul 09	Multicenter	Yes	52	5 (Children)	19 (Children)
Camargo 2012 [26]	Brazil	Aug 09-Nov 09	Referral	Yes	48	7 (Children & Adults)	17 (Children & Adults)
Lenzi 2012 [97]	Brazil	Mar 10-Dec 10	Multicenter	No	45	14	NA
Lenzi 2013 [98]	Brazil	Jan 09-Dec 09	Community	Yes	51	26 (Elderly)	NA
Marcos 2012 [107]	Brazil	May 09-Dec 10	Referral	Yes	54	5 (Children)	31 (Children)
Schuelter-Trevisol 2012 [140]	Brazil	Jul 09-Sep 09	Multicenter	No	NA	6	NA
Timenetsky 2011 [155]	Brazil	Apr 09-Dec 09	Referral	Yes	55	2	14
Armstrong 2012 [12]	Chile	May 09-Dec 10	Multicenter	Yes	44	16 (Adults & Elderly)	36 (Adults & Elderly)
Baehr 2010 [13]	Chile	May 09-Jul 09	Community	Yes	36	0 (Adults & Elderly)	NA
Castro-Jimenez 2009 [31]	Colombia	May 09-Jul 09	Multicenter	No	NA	27	NA
Borja-Aburto 2012a [23]	Mexico	Apr 09-Mar 12	Multicenter	No	NA	16	NA
Borja-Aburto 2012b [23]	Mexico	Apr 09-Mar 12	Multicenter	No	NA	14	NA
Chen 2012b [40]	China	Nov 09-May 11	Community	Yes	64	2 (Children)	20 (Children)
Influenza CCIG 2010 [80]	China	Sep 09-Feb 10	Multicenter	Yes	63	8 (Children)	30 (Children)

Lu 2010 [105]	China	Nov 09-Jan 10	Referral	Yes	69	3 (Children)	21 (Children)
Xi 2010 [166]	China	Oct 09-Dec 09	Multicenter	Yes	58	17 (Adults & Elderly)	NA
Xiao 2010 [167]	China	Jun 09- Jul 09	Referral	Yes	57	0 (Children & Adults)	0 (Children & Adults)
Xu 2012 [169]	China	Sep 09-Jul 10	Multicenter	Yes	64	4 (Children)	21 (Children)
Xu 2013 [168]	China	Nov 10-May 11	Multicenter	No	59	11	21
Yu 2011 [171]	China	Sep 09-Feb 10	Multicenter	Yes	56	8	38
Zhang 2010 [172]	China	May 09-Aug 09	Multicenter	No	54	0	NA
Chiu 2011 [43]	Hong Kong	Jul 09-Sep 09	Referral	Yes	56	0 (Children)	0 (Children)
Lee 2011 [95]	Hong Kong	Jun 09-May 10	Community	Yes	45	3 (Adults & Elderly)	7 (Adults & Elderly)
Chawla 2013 [174]	India	Oct 09-Dec 10	Referral	Yes	57	13	NA
Chudasama 2013 [47]	India	Sep 09-Nov 10	Referral	Yes	51	25	NA
Kinikar 2011 [85]	India	Aug 09-Jan 10	Referral	Yes	47	16 (Children)	96 (Children)
Mehta 2013 [176]	India	Jun 09-Dec 11	Referral	Yes	50	7	39
Nelliyani 2010 [115]	India	Jun 09-Nov 09	Community	Yes	62	23	28
Parakh 2010 [125]	India	Aug 09-Jan 10	Referral	Yes	40	12 (Children)	28 (Children)
Patel 2013 [126]	India	Aug 09-Feb 10	Referral	Yes	65	22	NA
Saha 2010 [136]	India	Jun 09-Aug 09	Referral	Yes	62	0 (Children)	0 (Children)
Sharma 2010 [141]	India	Sep 09-Jan 10	Referral	Yes	50	13	NA
Siddharth 2012 [144]	India	May 09-Apr 10	Referral	Yes	61	52	NA
Golparvar 2013 [179]	Iran	Mar 09-Mar 10	Multicenter	Yes	51	15	17
Gouya 2011 [71]	Iran	May 09-Dec 09	Multicenter	No	NA	5	NA
Saleh 2010 [137]	Iran	Oct 09-Dec 09	Community	Yes	58	20	53
Tabarsi 2011 [151]	Iran	Jun 09-Dec 09	Referral	Yes	57	15	43
Dubnov-Raz 2011 [59]	Israel	Jul 09-Sep 09	Referral	Yes	NA	0 (Children)	5 (Children)
Goldberg 2011 [68]	Israel	Jul 09-Dec 09	Community	Yes	NA	0 (Children)	2 (Children)
Hiba 2011 [77]	Israel	Jul 09- Jan 10	Multicenter	Yes	48	3	7
Shlomai 2010 [142]	Israel	Jul 09-Aug 09	Referral	Yes	55	5	22
Stein 2010 [148]	Israel	Jul 09-Dec 09	Multicenter	Yes	56	1 (Children)	9 (Children)
Kobayashi 2012 [87]	Japan	Aug 09-Mar 10	Multicenter	Yes	64	0 (Children)	3 (Children)
Okada 2010 [118]	Japan	Jul 09- Jan 10	Community	Yes	74	0 (Children)	NA

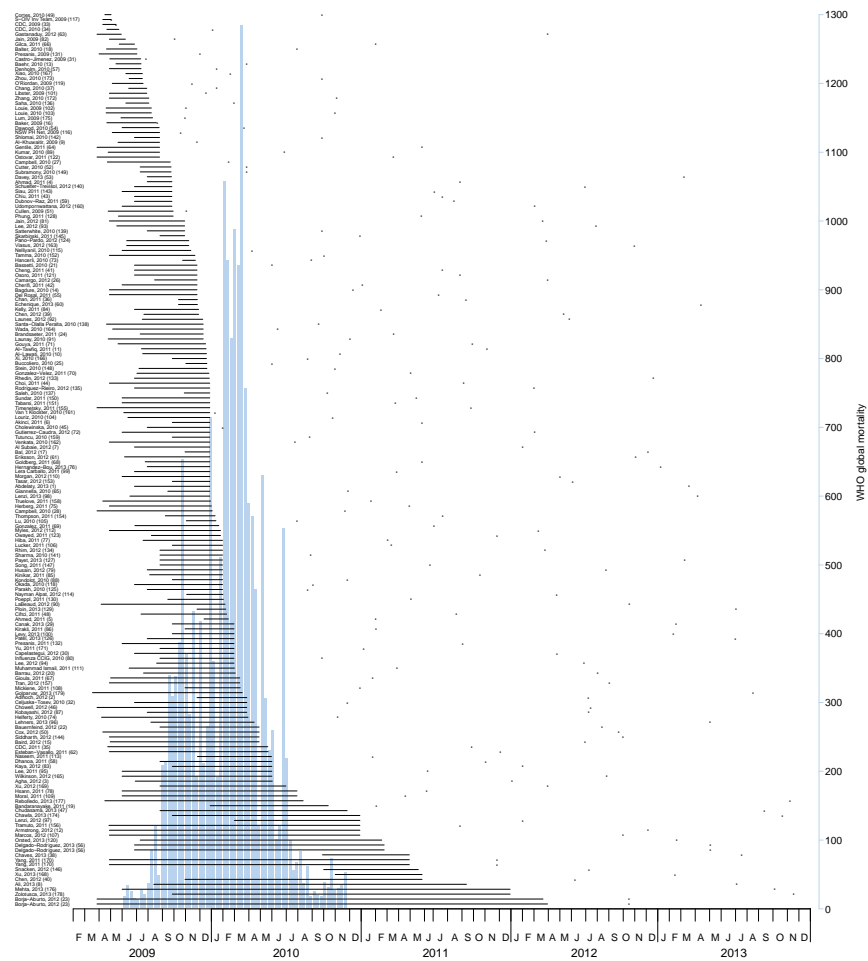
Wada 2010 [164]	Japan	May 09-Dec 09	Multicenter	No	64	1	NA
Husain 2012 [79]	Kuwait	Aug 09-Jan 10	Multicenter	Yes	65	2 (Children)	6 (Children)
Owayed 2011 [123]	Kuwait	Aug 09-Jan 10	Referral	Yes	59	1 (Children)	3 (Children)
Zhou 2010 [173]	Macau	Jun 09- Jul 09	Community	Yes	56	0 (Children & Adults)	0 (Children & Adults)
Dhanoa 2011 [58]	Malaysia	Sep 09-May 10	Referral	Yes	50	4	18
Muhammad Ismail 2011 [111]	Malaysia	Jun 09-Mar 10	Multicenter	Yes	56	4 (Children)	10 (Children)
Ahmad 2011 [4]	Oman	Aug 09-Sep 09	Community	Yes	40	16	NA
Al-Lawati 2010 [10]	Oman	Jul 09-Dec 09	Referral	Yes	37	7	14
Ali 2013 [8]	Pakistan	Aug 09-Sep 11	Referral	Yes	63	15 (Children)	15 (Children)
Naseem 2011 [113]	Pakistan	Dec 09-May 10	Referral	Yes	39	17	28
Abdelaty 2013 [1]	Saudi Arabia	Jul 09-Dec 09	Community	Yes	36	1 (Adults)	4 (Adults)
Agha 2012 [3]	Saudi Arabia	Jul 09- Jun 10	Referral	Yes	49	15	19
Al Subaie 2012 [7]	Saudi Arabia	Jul 09-Dec 09	Community	Yes	60	4 (Children)	10 (Children)
Al-Khuwaitir 2009 [9]	Saudi Arabia	May 09-Aug 09	Community	Yes	75	2 (Children & Adults)	7 (Children & Adults)
Al-Tawfiq 2011 [11]	Saudi Arabia	Jul 09-Dec 09	Referral	Yes	51	2	15
Cutter 2010 [52]	Singapore	Jul 09-Sep 09	Multicenter	No	NA	1	7
Hsann 2011 [78]	Singapore	Jun 09- Jul 10	Referral	Yes	50	5	13
Siau 2011 [143]	Singapore	Jun 09-Sep 09	Community	Yes	47	5	12
Subramony 2010 [149]	Singapore	Jul 09-Sep 09	Multicenter	Yes	49	1	7
Choi 2011 [44]	South Korea	May 09-Dec 09	Referral	No	61	2	12
Lee 2012b [94]	South Korea	Aug 09-Feb 10	Referral	Yes	68	0 (Children)	5 (Children)
Rhim 2012 [134]	South Korea	Sep 09-Jan 10	Community	Yes	53	0	2
Song 2011 [147]	South Korea	Sep 09-Jan 10	Community	Yes	NA	3 (Adults & Elderly)	NA
Chen 2012a [39]	Taiwan	Jul 09-Dec 09	Referral	Yes	67	5 (Children)	23 (Children)
Lee 2012a [93]	Taiwan	May 09-Oct 09	Community	Yes	52	0	0
Yang 2011a [170]	Taiwan	May 09-Apr 11	Multicenter	No	NA	6	NA
Yang 2011b [170]	Taiwan	May 09-Apr 11	Multicenter	No	NA	10	NA
Udompornwattana 2012 [160]	Thailand	Jun 09-Sep 09	Referral	Yes	50	2 (Children)	4 (Children)
Chang 2010 [37]	Australia	Jun 09- Jul 09	Referral	Yes	38	8 (Adults)	21 (Adults)
Dawood 2010 [54]	Australia	Jun 09-Aug 09	Multicenter	No	NA	3	NA

Denholm 2009 [57]	Australia	May 09-Jul 09	Multicenter	Yes	46	3 (Adults & Elderly)	27 (Adults & Elderly)
Kelly 2011 [84]	Australia	Jul 09-Dec 09	Multicenter	No	46	6 (Adults & Elderly)	22 (Adults & Elderly)
Lum 2009 [175]	Australia	May 09-Aug 09	Community	Yes	NA	3	21
New South Wales public health network 2009 [116]	Australia	May 09-Aug 09	Multicenter	No	50	4	19
Phung 2011 [128]	Australia	May 09-Oct 09	Multicenter	No	46	3	15
Baker 2009 [16]	New Zealand	Apr 09-Aug 09	Multicenter	No	NA	2	12
Bandaranayake 2011 [19]	New Zealand	Jan 10-Oct 10	Multicenter	No	NA	2	NA
Cheng 2011 [41]	2 countries (Australia & New Zealand)	Jul 09-Nov 09	Multicenter	No	46	5	22
Ahmed 2011 [5]	Egypt	Dec 09-Feb 10	Community	Yes	45	15 (Adults & Elderly)	NA
Osoro 2011 [121]	Kenya	Jul 09-Nov 09	Multicenter	Yes	49	4	2
Louriz 2010 [104]	Morocco	Jun 09-Dec 09	Multicenter	Yes	57	3 (Children & Adults)	11 (Children & Adults)
Davey 2013 [53]	4 countries (Australia, Denmark, UK, USA)	Aug 09-Sep 09	Multicenter	Yes	52	10 (Adults & Elderly)	25 (Adults & Elderly)

Cohort design: ICU admission and fatality data is collected among a cohort of hospitalized cases.

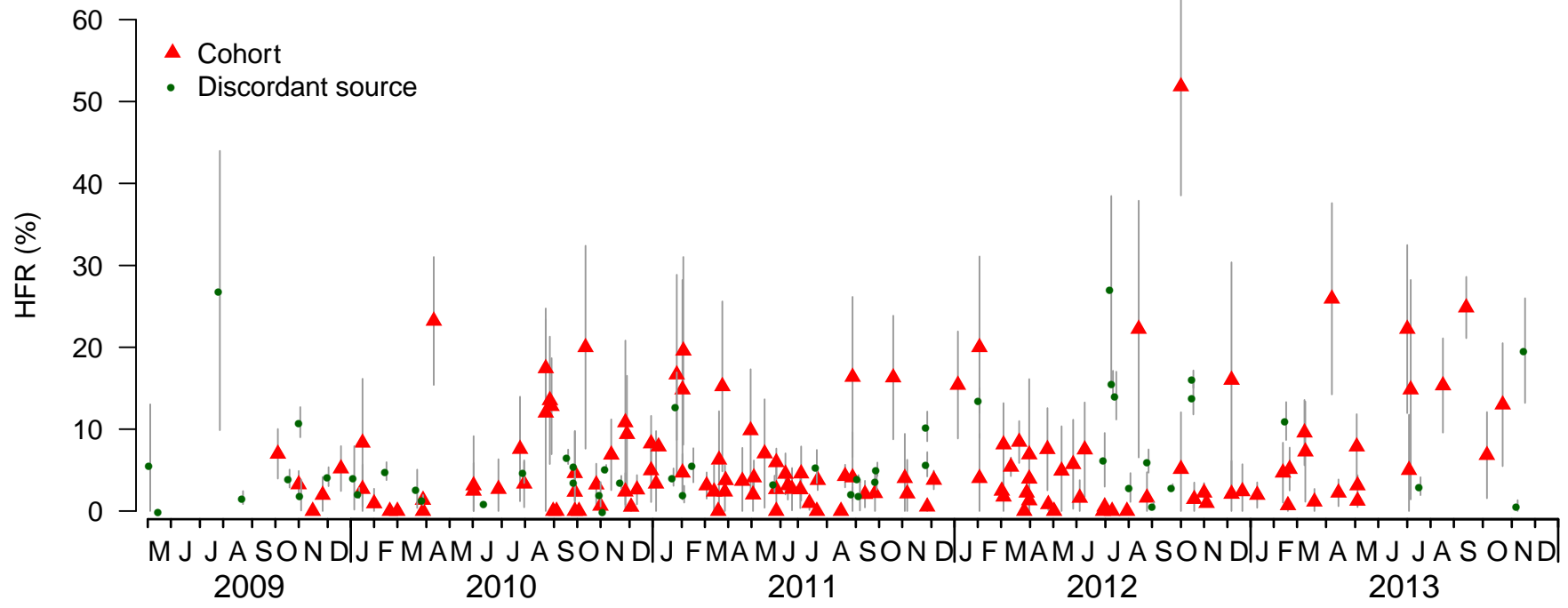
Discordant Source design: ICU admission and fatality data is collected independently of hospitalization data.

NSW PH Net, New H1N1 Inv Team and S-OIV Inv Team stand for New South Wales Public Health Network, New Influenza A(H1N1) Investigation Team and Novel Swine-Origin Influenza A (H1N1) Virus Investigation Team respectively.

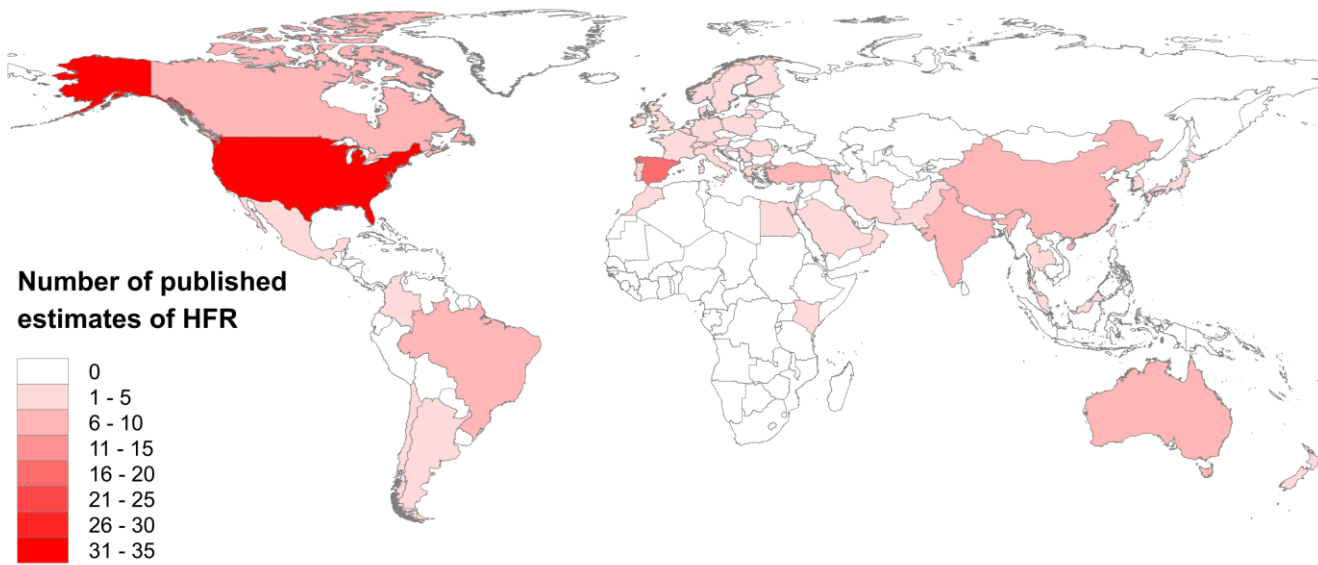


**Web Figure 1. Study dates (solid horizontal lines), eventual publication dates of the HFR estimates included in the review (points) compared with the histogram of confirmed H1N1pdm09 deaths reported to the World Health Organization (underlying histogram). See Web Table 2 for details of each estimate.**

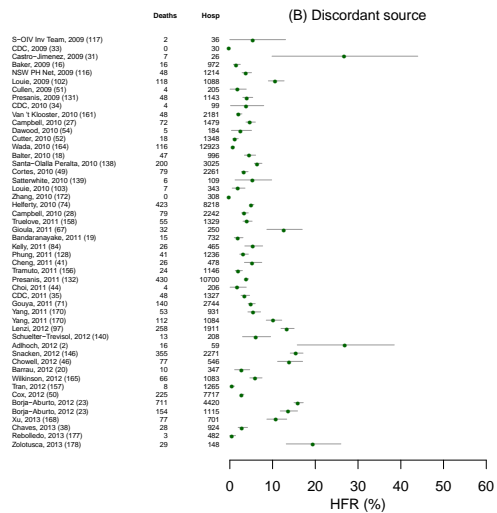
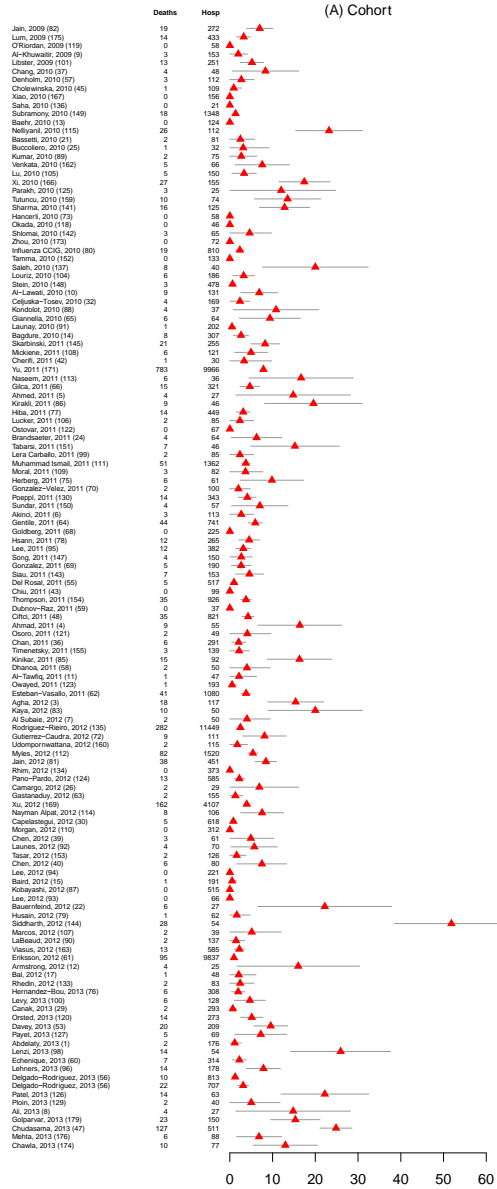




Web Figure 2: Overall estimates of the HFR by eventual publication dates



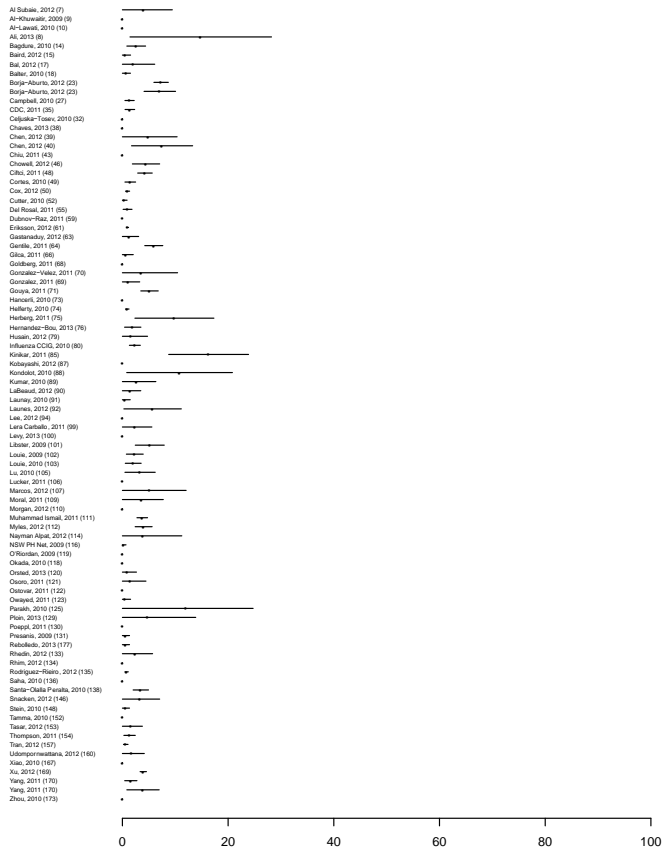
**Web Figure 3: Number of published estimates of the HFR by country**



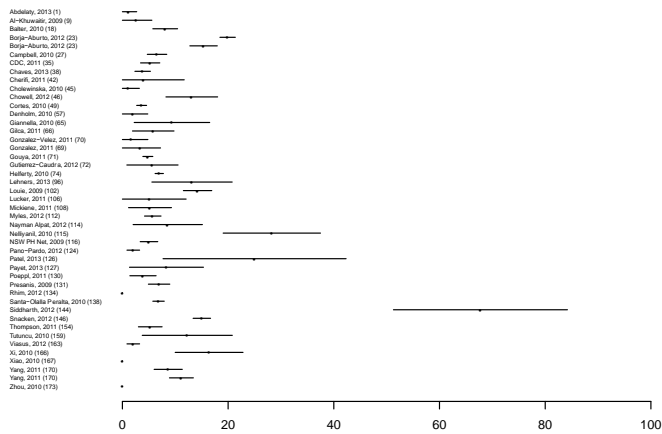
**Web Figure 4: Overall estimates of the HFR, by study design. A) cohort, and B) discordant source. Pooled estimates of the HFR were: A) 4.3% (95% CI: 3.5%, 5.3%) [ $I^2=95.63\%$ ] and B) 5.3% (95% CI: 4.0%, 6.6%) [ $I^2=98.53\%$ ]**



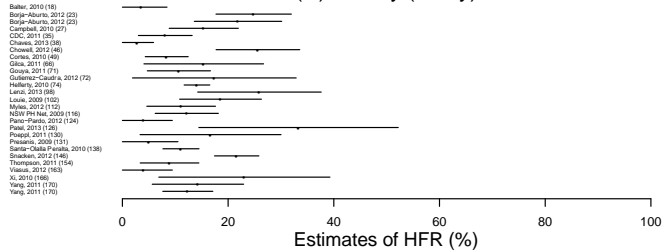
(A) Children (0–19 y)



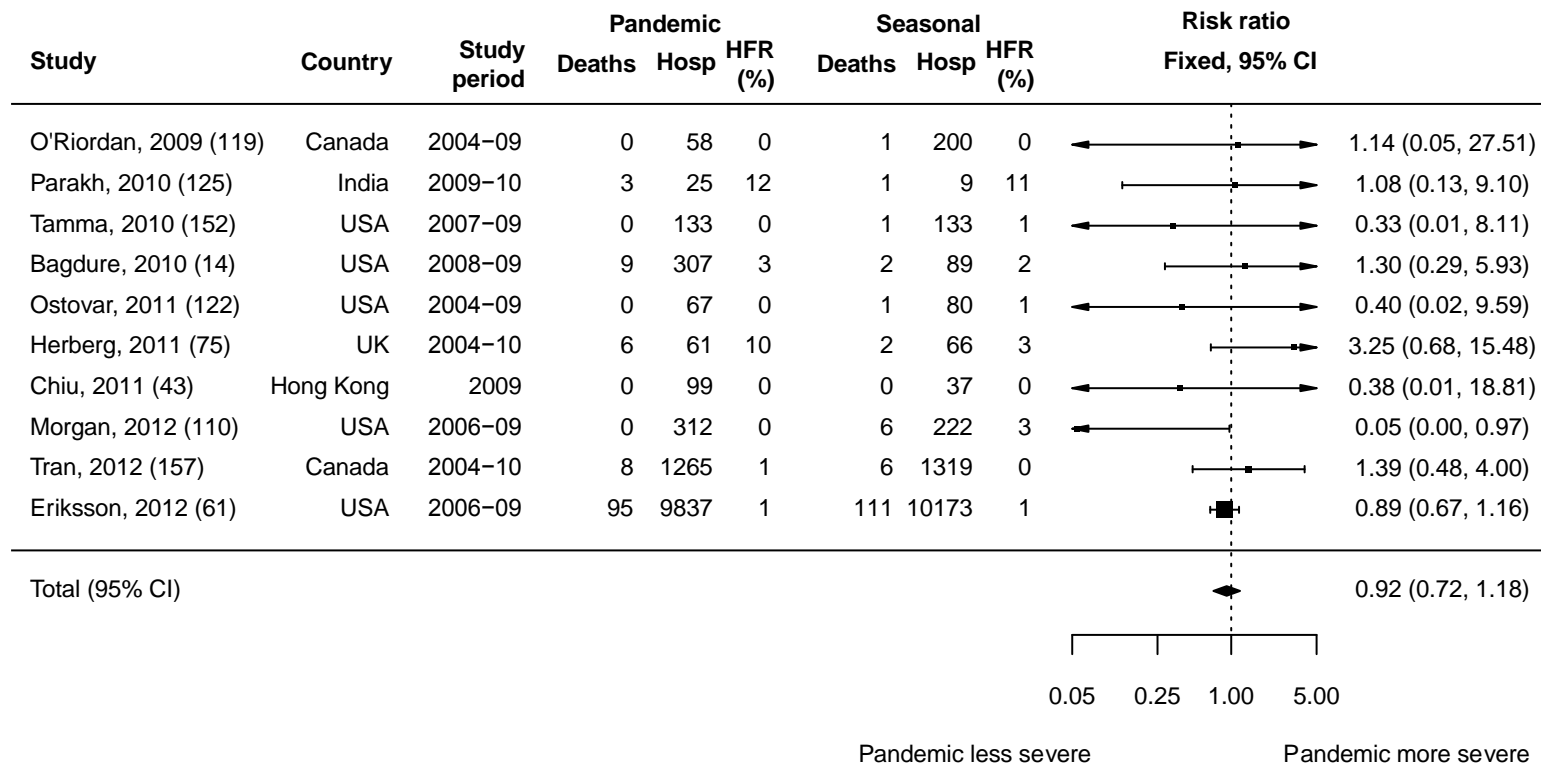
(B) Adults (20–64 y)



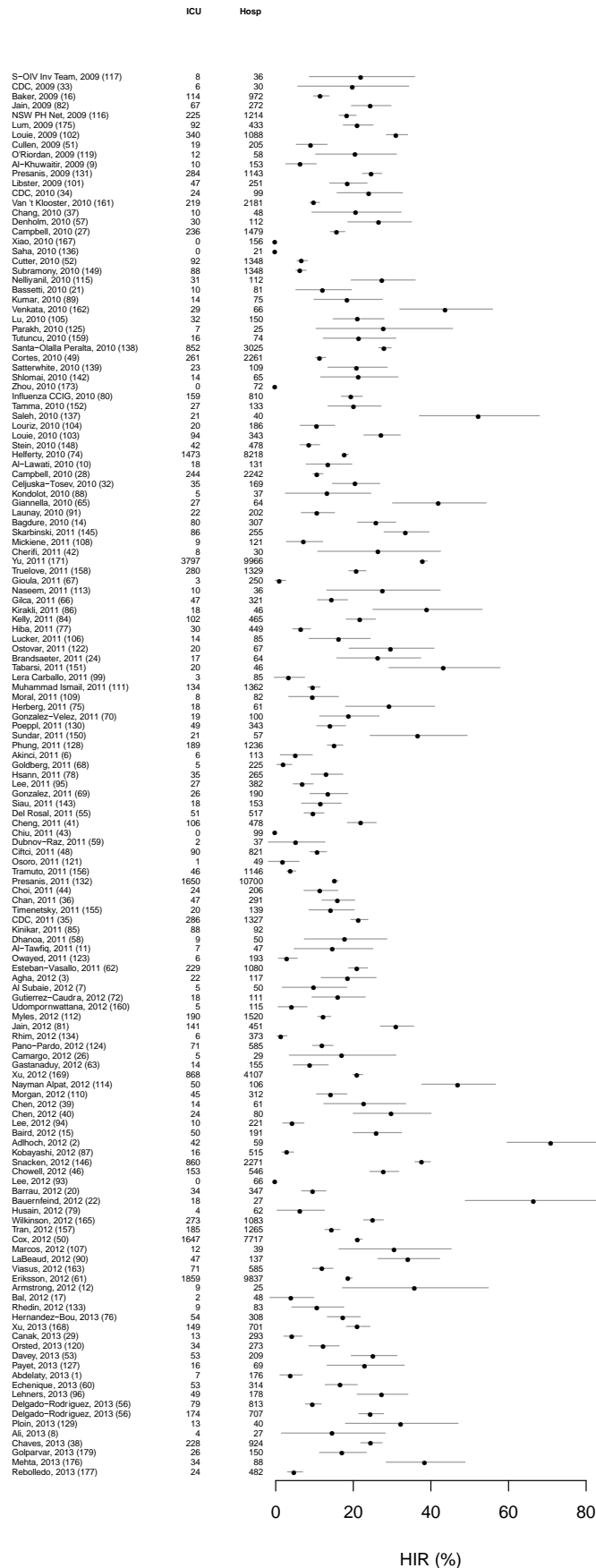
(C) Elderly (65+ y)



Web Figure 6. Age-specific estimates of the risk of death among hospitalized cases of H1N1pdm09.



**Web Figure 7: Comparative estimates of the HFR of H1N1pmd09 vs. seasonal influenza**



Web Figure 8. Overall estimates of the risk of ICU admission among hospitalized cases of H1N1pdm09.

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