Note: ***GIDEON*** does not follow routine country reports on human Influenza, since the scope and nature of these data are often diffuse, sporadic or inconsistent. Atypical infections and unusually severe outbreaks are summarized below and in the relevant country notes.

Historical background:
The first known influenza epidemic was recorded in Europe during 1173 to 1174. [1]
- A subsequent outbreak was recorded in 1580.
- Four pandemics were recorded during 1830 to 1848: 1830 to 1831, 1833, 1836 to 1837 and 1847 to 1848. [2] [3]
- Case-fatality rates during the "Russian pandemic" of 1889 were comparable to those of the pandemics of 1957 and 1968. [4]
- 21 million deaths were estimated for an H1N1 pandemic ('The Spanish Flu') during 1918 to 1919. Some estimate the number as high as 40 million deaths. [5] [6] [7] [8] [9] [10]
- The "Asian flu" (H2N2, 1957) and "Hong Kong flu" (H3N2, 1968) pandemics each resulted in 1 to 4 million deaths. [11] [12] [13] [14] [15] [16]
- 21 million deaths were estimated for an H1N1 pandemic ('The Spanish Flu') during 1918 to 1919. Some estimate the number as high as 40 million deaths. [17] [18] [19]
- The "Asian flu" (H2N2, 1957) and "Hong Kong flu" (H3N2, 1968) pandemics each resulted in 1 to 4 million deaths. [20] [21] [22] [23] [24] [25]
- An additional pandemic ("Russian Flu") was reported during 1989 to 1994. [26]
- An additional 27 pandemics had been documented as of 2003. [27]
- Excess deaths attributable to influenza in the United States numbered 603,600 during the epidemics of 1918 to 1919, 1957 to 1958 and 1968 to 1969.
- An additional 600,000 were estimated to have died in non-pandemic years during 1957 to 1990.
- A pandemic of H1N1 influenza during 2009 to 2010 involved over 200 countries (see below).

Influenza is transmitted through inhalation; however, direct contact with infected secretions has also been implicated.
- Acquisition of infection has been documented during international air travel. [28]
- Patients remain infectious for 5 to 7 days, with the greatest degree of infectivity occurring during the first 24 hours of illness.

Influenza strains differ from one another according to the nature of two surface proteins: hemagglutinin (H) and neuraminidase (NA).
- Strains constantly evolve through a mechanism of reassortment, resulting in "antigenic drift" and "antigenic shift." [29] [30] [31]
- Of the 15 H-subtypes, H-5 and H-7 are the most virulent to man.

Swine Influenza: [32] [33] [34] [35] [36]
- 50 cases of swine influenza virus infection (most H1N1) were reported in humans during 1958 to 2005. [37]
- A total of 46 cases of human infection by swine influenza viruses had been reported worldwide to 2008: 31 in the United States, 6 Czechoslovakia, 4 Netherlands, 3 Russia, 1 Canada and 1 Hong Kong. [38] These figures include an outbreak (12 cases, 1 fatal) at a military facility in New Jersey, United States in 1976
- Two cases (non-fatal) of swine (H3N2) influenza virus infection were reported in the United States in 2009. [39] [40]

- Twelve infections with a swine-origin H3N2 reassortant strain that includes the M gene from the 2009 pandemic H1N1 (pH1N1) virus were reported in the United States in 2011. [41] [42] [43] [44] [45] [46] [47] [48] [49] [50]

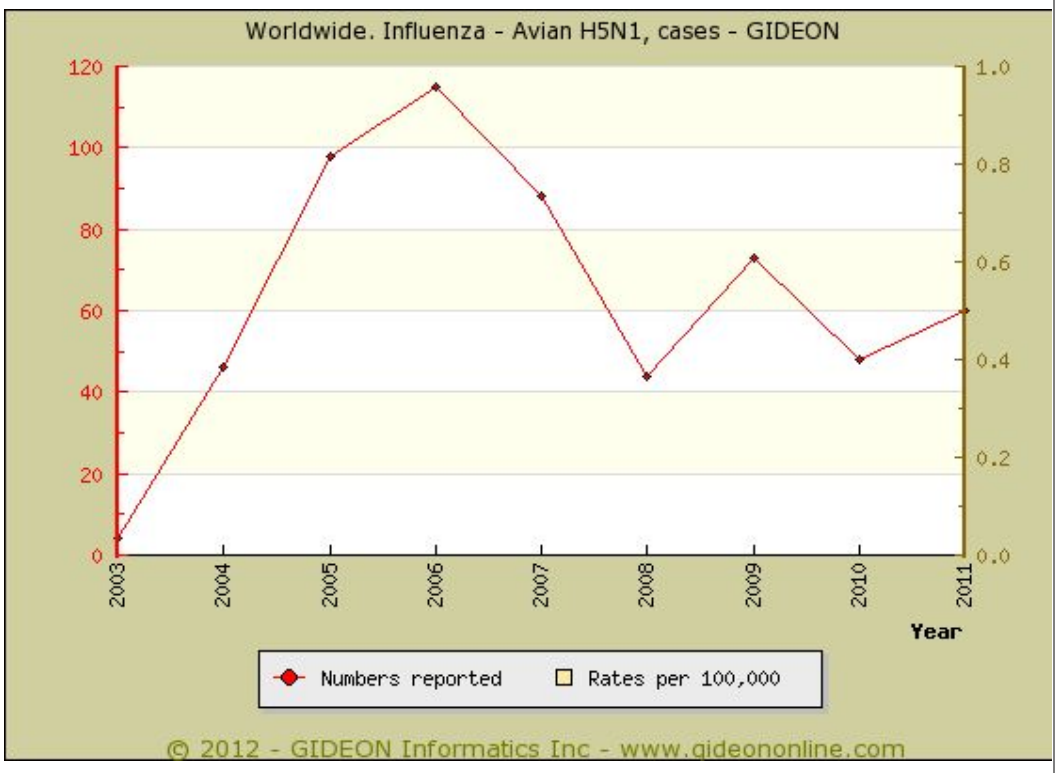
2009 to 2010 H1N1 influenza ("swine flu" [51] [52]) - An outbreak was reported. ***Context :*** A pandemic of H1N1 Influenza virus [A (H1N1) pdm09 [53]] infection occurred. [54] [55] [56] [57] [58] [59] [60] [61] [62] [63] [64] [65] [66] [67] [68] [69] [70] [71] [72] [73] [74] [75] [76] [77] [78] [79] [80] [81] [82] [83] [84] [85] [86] [87] [88] [89] [90] [91] [92] [93] [94] [95] [96] [97] [98] [99] [100] [101] [102] [103] [104] [105] [106] [107] [108] [109] [110] [111] [112] [113] [114] [115] [116] [117] [118] [119] [120] [121] [122] [123] [124] [125] [126] [127] [128] [129] [130] [131] [132] [133] [134] Over 600,000 cases had been officially-reported worldwide as of March, 2010. [135] [136] [137] 18,449 fatal cases were reported to August 1, 2010. [138] [139] [140] [141] [142] [143] [144] [145] [146] [147] [148] [149] [150] [151] [152] [153] [154] [155] [156] [157] [158] [159] [160] [161] Indigenous populations from Australia, Canada, the United States and New Zealand were found to have at least a 3-fold greater death rate than others in their countries. [162] [163] [164] [165] [166] [167] [168] [169] [170] [171] [172] [173] [174] [175] [176] [177] Reporting of case-number summaries was suspended by WHO as of July 6 [178] ; and on August 10, the pandemic was declared to have ended. [179] [180] The pandemic began in Mexico, spreading rapidly to the United States and Canada. Swine were not implicated in the transmission of disease. [181] [182] Human-to-swine transmission was confirmed in Argentina [183] , Vietnam [184] [185] and Canada during the outbreak [186] [187] [188] [189] [190] [191] [192] [193] [194] [195] ; and infected swine were identified in Argentina [196] [197] [198] , Australia [199] [200] [201] , Cameroon [202] [203] , China [204] [205] [206] [207] , Denmark [208] , Finland [209] , Germany [210] [211] , Iceland [212] , India [213] , Indonesia [214] , Ireland [215] , Italy [216] [217] , Japan [218] , England [219] , Mexico [220] , Northern Ireland [221] , Norway [222] [223] , Republic of Korea [224] [225] , Russian Federation [226] , Scotland [227] , Taiwan [228] , Thailand [229] [230] , the United Kingdom [231] and the United States. [232] [233] [234] [235] [236] [237] [238] [239] Infected turkeys were subsequently identified in Canada [240] [241] [242] , Chile [243] [244] [245] [246] , France [247] the United Kingdom [248] and the United States. [249] [250] Infection was reported in cats [251] [252] [253] [254] [255] [256] [257] [258] [259] [260] [261] , ferrets [262] [263] [264] [265] , a dog [266] , a badger (*Taxidea taxus*) , a captive Bornean binturong (*Arctictis binturong penicillata*) [267] [268] and a cheetah [269] [270] in the United States [271] [272] [273] [274] [275] [276] [277] ; skunks in Canada [278] ; dogs in Italy [279] and China [280] , and in dogs and swine in Hong Kong. [281]

- Reporting dates vary by country. The following updates include incidence data as of December 31, 2010. [282] [283] : Afghanistan (17 fatal) [284] [285] , Albania (6 fatal), Algeria (57 fatal cases), American Samoa (94 - 0 fatal), Andorra (1), Angola (37), Anguilla (14), Antigua and Barbuda (0 fatal), Argentina (626 fatal) [286] [287] [288] [289] [290] [291] [292] [293] [294] [295] [296] [297] [298] [299] [300] [301] [302] [303] [304] , Armenia (3 fatal), Aruba (13), Australia (51,170 - 195 fatal) [305] [306] [307] [308] [309] [310] [311] [312] [313] [314] [315] [316] [317] [318] [319] [320] [321] [322] [323] [324] [325] [326] [327] [328] [329] [330] [331] [332] [333] [334] [335] [336] [337] [338] [339] [340] [341] [342] [343] [344] [345] [346] [347] [348] [349] , Austria (24 fatal) [350] , Azerbaijan (2), Bahamas (4 fatal), Bahrain (7 fatal), Bangladesh (7 fatal) [351] , Barbados (157 - 3 fatal) [352] , Belarus (20 fatal) [353] , Belgium (17 fatal) [354] [355] [356] [357] , Belize (60), Bermuda (1 fatal), Bhutan (6), Bolivia (59 fatal) [358] , Bosnia and Herzegovina (10 fatal), Botswana (23), Brazil (2,125 fatal) [359] [360] [361] [362] [363] [364] , British Virgin Islands (25), Brunei (850 - 1 fatal), Bulgaria (40 fatal) , Burundi (7), Cambodia (6 fatal) [365] [366] , Cameroon (4) [367] , Canada (429 fatal) [368] [369] [370] [371] [372] [373] [374] [375] [376] [377] [378] [379] [380] [381] [382] [383] [384] [385] [386] [387] [388] [389] [390] [391] [392] [393] , Cape Verde (118), Cayman Islands (130 - 1 fatal), Chad (1), Chile (156 fatal) [394] [395] [396] [397] [398] [399] [400] [401] [402] [403] [404] [405] [406] [407] [408] , China (724 fatal - including 56 in Hong Kong [409] [410] [411] [412] [413] [414] [415] [416] [417] [418] [419] [420] [421] [422] [423] [424] [425] [426] [427] [428] and 2 in Macao) [429] [430] [431] [432] [433] [434] [435] [436] [437] [438] [439] [440] [441] [442] [443] [444] [445] [446] [447] [448] [449] [450] [451] [452] [453] [454] [455] [456] [457] [458] [459] [460] [461] [462] [463] [464] [465] [466] [467] [468] [469] [470] [471] [472] [473] [474] [475] [476] [477] , Colombia (254 fatal) [478] , Comoros (2

fatal in Mayotte) [479] , Congo (21) [480] , Cook Islands (106 - 1 fatal), Costa Rica (65 fatal), Croatia (25 fatal), Cuba (1,805 - 83 fatal) [481] , Cyprus (6 fatal) [482] , Czech Republic (98 fatal), Democratic Republic of Congo (222), Democratic Republic of Korea (9) [483] , Denmark (32 fatal) [484] [485] [486] [487] , Dominica (51), Dominican Republic (464 - 24 fatal), Ecuador (130 fatal) [488] , Egypt (281 fatal) [489] [490] [491] [492] , El Salvador (34 fatal) [493] , Estonia (19 fatal), Ethiopia (12), Falkland Islands (7), Fiji (268 - 0 fatal), Finland (43 fatal) [494] [495] [496] , France (349 fatal) [497] [498] [499] [500] [501] [502] [503] [504] [505] [506] [507] [508] [509] [510] [511] [512] [513] [514] [515] [516] [517] [518] [519] [520] [521] [522] [523] [524] , French Guiana (29 - 1 fatal) [525] , French Polynesia (185 - 7 fatal) [526] [527] , Gabon (4), Georgia (20 fatal), Germany (253 fatal) [528] [529] [530] [531] [532] [533] [534] [535] [536] [537] [538] [539] [540] [541] [542] [543] [544] [545] , Ghana (1 fatal), Gibraltar (16), Greece (141 fatal) [546] [547] [548] [549] [550] [551] [552] [553] [554] [555] , Grenada (28), Guadeloupe (5 fatal) [556] , Guam (341 - 2 fatal) [557] , Guatemala (26 fatal) [558] [559] , Guyana (30), Haiti (92) [560] , Honduras (18 fatal), Hong Kong (56 fatal) [561] [562] [563] [564] [565] [566] [567] [568] [569] [570] [571] [572] [573] [574] [575] [576] [577] [578] [579] [580] , Hungary (133 fatal) [581] , Iceland (2 fatal) [582] [583] , India (1,385 fatal) [584] [585] [586] [587] [588] [589] [590] [591] [592] [593] [594] [595] [596] [597] [598] [599] [600] , Indonesia (691 - 10 fatal) [601] [602] , Iran (147 fatal) [603] [604] [605] [606] [607] [608] , Iraq (42 fatal) [609] , Ireland (24 fatal) [610] [611] [612] , Israel (113 fatal, including 28 in Gaza and the West Bank) [613] [614] [615] [616] [617] [618] [619] [620] [621] [622] [623] [624] [625] , Italy (256 fatal) [626] [627] [628] [629] [630] [631] [632] [633] [634] [635] [636] [637] [638] , Ivory Coast (5), Jamaica (7 fatal), Japan (198 fatal) [639] [640] [641] [642] [643] [644] [645] [646] [647] [648] [649] [650] [651] [652] [653] [654] [655] [656] [657] [658] [659] [660] [661] [662] [663] [664] , Jordan (19 fatal) [665] , Kazakhstan (17) [666] , Kenya (417) [667] [668] [669] , Kiribati (4 - 0 fatal), Kuwait (30 fatal), Laos (156 - 1 fatal) [670] [671] , Latvia (34 fatal), Lebanon (5 fatal) [672] , Lesotho (65), Libya (1 fatal), Liechtenstein (5), Lithuania (23 fatal) [673] , Luxembourg (3 fatal) [674] , Macao (2 fatal) [675] , Macedonia (23 fatal), Madagascar (3 fatal) [676] , Malaysia (1,780 - 77 fatal) [677] [678] [679] [680] [681] [682] [683] [684] , Malawi (4), Maldives (1 fatal), Mali (12) [685] , Malta (5 fatal), Marshall Islands (115 - 1 fatal), Martinique (44 - 1 fatal) [686] , Mauritania (15), Mauritius (8 fatal), Mexico (1,316 fatal) [687] [688] [689] [690] [691] [692] [693] [694] [695] [696] [697] [698] [699] [700] [701] [702] [703] [704] [705] [706] [707] [708] [709] [710] [711] [712] [713] [714] [715] [716] [717] [718] [719] [720] [721] [722] [723] [724] , Micronesia (82 - 0 fatal), Moldova (35 fatal) [725] , Monaco (1), Mongolia (29 fatal) [726] [727] , Montenegro (7 fatal), Montserrat (21), Morocco (53 fatal) [728] , Mozambique (2 fatal), Myanmar (137) [729] [730] [731] , Namibia (1 fatal), Nauru (8 - 0 fatal), Nepal (172 - 3 fatal) [732] [733] [734] [735] , The Netherlands (62 fatal) [736] [737] [738] [739] [740] [741] [742] [743] [744] [745] [746] [747] , Netherlands Antilles (128 cases - 59 in Curacao, including 3 on a cruise ship; 29 in St. Maarten and 38 on Bonaire), New Caledonia (508 - 7 fatal), New Zealand (4,974 - 51 fatal) [748] [749] [750] [751] [752] [753] [754] [755] [756] [757] [758] [759] [760] [761] [762] [763] [764] [765] [766] [767] [768] [769] [770] , Nicaragua (2,152 cases - 11 fatal) [771] , Niger (12), Nigeria (2 fatal) [772] , Niue (0), Northern Marianas (6 - 0 fatal), Norway (29 fatal) [773] [774] [775] , Oman (31 fatal), Pakistan (14 fatal) [776] [777] [778] , Palau (47 - 0 fatal), Panama (12 fatal) [779] [780] , Papua New Guinea (29 - 0 fatal), Paraguay (47 fatal), Peru (238 fatal) [781] [782] [783] [784] [785] , Philippines (3,207 - 30 fatal), Pitcairn Island (0), Poland (148 fatal) [786] , Portugal (83 fatal) [787] [788] [789] , Puerto Rico (20), Qatar (8 fatal) [790] , Republic of Korea (171 fatal) [791] [792] [793] [794] [795] [796] [797] [798] [799] [800] [801] , Reunion (12 fatal) [802] [803] [804] [805] [806] [807] [808] [809] [810] [811] [812] [813] [814] , Romania (122 fatal) [815] , Russian Federation (19 fatal) [816] [817] [818] [819] [820] [821] [822] [823] [824] [825] , Rwanda (433) [826] , Saint Kitts and Nevis (2 fatal), Saint Lucia (1 fatal), Saint Vincent and the Grenadines (19), Samoa (173 - 2 fatal), Sao Tome and Principe (2 fatal), Saudi Arabia (124 fatal) [827] [828] [829] [830] [831] [832] [833] [834] [835] [836] [837] [838] [839] [840] [841] , Scotland (38 fatal) [842] [843] [844] [845] [846] [847] [848] [849] [850] [851] [852] [853] , Senegal (184), Serbia (71 fatal) [854] , Seychelles (33), Singapore (19 fatal) [855] [856] [857] [858] [859] [860] [861] [862] [863] [864] [865] [866] [867] [868] [869] [870] [871] [872] [873] , Slovakia (53 fatal), Slovenia (19 fatal) [874] , Solomon Islands (4 - 0 fatal), South Africa (93 fatal) [875] [876] , Spain (271 fatal) [877] [878] [879] [880] [881] [882] [883] [884] [885]

[886] [887] [888] [889] [890] [891] [892] [893] [894] [895] [896] [897] [898] [899] [900] [901] [902] [903] [904] [905] [906] [907] [908] , Sri Lanka (48 fatal), Sudan (5 fatal), Suriname (144 - 2 fatal), Swaziland (2), Sweden (25 fatal) [909] [910] [911] , Switzerland (18 fatal) [912] [913] [914] , Syria (127 fatal), Taiwan (49 fatal) [915] [916] [917] [918] [919] [920] [921] [922] [923] [924] [925] [926] , Tanzania (1 fatal), Thailand (212 fatal) [927] [928] [929] [930] [931] [932] [933] [934] [935] [936] [937] [938] [939] [940] , Tokelau (0), Tonga (20 - 1 fatal), Trinidad and Tobago (5 fatal), Tunisia (21 fatal), Turkey (627 fatal) [941] [942] [943] [944] [945] [946] [947] [948] [949] , Turks and Caicos Islands (45), Tuvalu (23 - 0), Uganda (263), Ukraine (282 fatal) [950] [951] [952] [953] [954] [955] [956] [957] [958] [959] , United Arab Emirates (6 fatal) [960] [961] [962] [963] , United Kingdom (474 fatal: at least 142 in England, 38 in Scotland - including the first fatal case in Europe [964] [965] [966] , 21 in Wales and 13 in Northern Ireland) [967] [968] [969] [970] [971] [972] [973] [974] [975] [976] [977] [978] [979] [980] [981] [982] [983] [984] [985] [986] [987] [988] [989] [990] [991] [992] [993] [994] [995] [996] [997] [998] [999] [1000] [1001] [1002] [1003] [1004] [1005] [1006] [1007] [1008] [1009] [1010] [1011] [1012] , United States (2,718 fatal) [1013] [1014] [1015] [1016] [1017] [1018] [1019] [1020] [1021] [1022] [1023] [1024] [1025] [1026] [1027] [1028] [1029] [1030] [1031] [1032] [1033] [1034] [1035] [1036] [1037] [1038] [1039] [1040] [1041] [1042] [1043] [1044] [1045] [1046] [1047] [1048] [1049] [1050] [1051] [1052] [1053] [1054] [1055] [1056] [1057] [1058] [1059] [1060] [1061] [1062] [1063] [1064] [1065] [1066] [1067] [1068] [1069] [1070] [1071] [1072] [1073] [1074] [1075] [1076] [1077] [1078] , Uruguay (20 fatal), Vanuatu (3 - 0 fatal), Venezuela (137 fatal) [1079] [1080] , Vietnam (53 fatal) [1081] [1082] [1083] [1084] [1085] [1086] [1087] , Uruguay (20 fatal), Vanuatu (3 - 0 fatal), Venezuela (137 fatal) [1088] [1089] , Vietnam (53 fatal) [1090] [1091] [1092] [1093] [1094] [1095] [1096] , Virgin Islands, U.S. (49), Wallis and Futuna (55 - 0 fatal) [1097] , Yemen (28 fatal) , Zambia (90) and Zimbabwe (41). [1098] [1099] [1100] [1101] [1102] [1103] [1104] [1105] [1106] [1107] [1108] [1109] [1110] [1111] [1112] [1113] [1114] [1115] [1116] [1117] [1118] [1119] [1120] [1121] [1122] [1123] [1124] [1125] [1126] [1127] [1128] [1129] [1130] [1131] [1132] [1133] [1134] [1135] [1136] [1137] [1138] [1139] [1140] [1141] [1142] [1143] [1144] [1145] [1146] [1147] [1148] [1149] [1150] [1151] [1152] [1153] [1154] [1155]

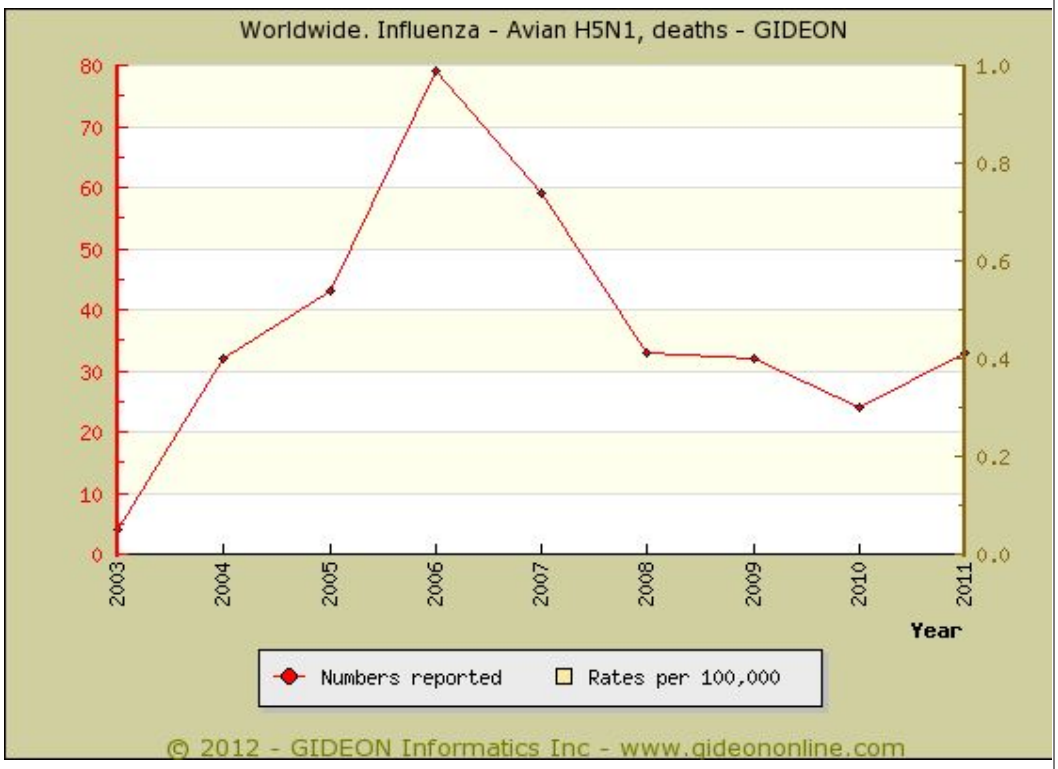
AVIAN INFLUENZA IN HUMANS:



Worldwide. Influenza - Avian H5N1, cases

2003	2004	2005	2006	2007	2008
4	46	98	115	88	44
2009	**2010**	**2011**			
73	48	60			

Notes:
1. A total of 590 cases were reported through March 1, 2012. [1156]
   Individual years:
   2010 - See reference [1157]



Worldwide. Influenza - Avian H5N1, deaths

2003	2004	2005	2006	2007	2008
4	32	43	79	59	33
2009	**2010**	**2011**			
32	24	33			

Notes:
1. A total of 349 fatal cases were reported through March 1, 2012.

Summary:

During November 26, 2003 to March 1, 2012, human infection by avian influenza A virus (H5N1) was reported in 15 countries: [1158] [1159] Azerbaijan (8 cases, 5 fatal) [1160] [1161] , Bangladesh (3 cases, nonfatal) [1162] , Cambodia (19 cases, 17 fatal) [1163] [1164] [1165] [1166] , China (41 cases, 27 fatal) [1167] [1168] , Djibouti (1 case, nonfatal) [1169] , Egypt (163 cases, 57 fatal) [1170] [1171] [1172] [1173] [1174] [1175] [1176] [1177] , Indonesia (186 cases, 154 fatal) [1178] [1179] [1180] [1181] , Iraq (3 cases, 2 fatal) [1182] , Laos (2 cases, 2 fatal) [1183] , Myanmar (1 case, 0 fatal) , Nigeria (1 case, 1 fatal) , Pakistan (3 cases, 1 fatal) , Thailand (25 cases, 17 fatal) [1184] [1185] [1186] , Turkey (12 cases, 4 fatal), and Viet Nam (121 cases, 61 fatal) [1187] [1188] [1189] [1190] [1191] [1192]

Notes on Avian influenza in humans: [1193]

- H5N1 mutates rapidly and has a propensity to acquire genes from other animal species. Birds may excrete the virus from mouth and cloaca for up to ten days.
- H5N1 virus was found to survive in bird feces for at least 35 days at low temperature (4 degrees C) and for 6 days at 39 degrees C. [1194] At a much higher temperature (37 degrees C or 98.6 degrees F), H5N1 viruses have been shown to survive, in fecal samples, for 6 days.
- The clinical spectrum of H5N1 virus infection ranges from asymptomatic infection to fatal pneumonitis and multiple organ failure.
- Reactive hemophagocytic syndrome is the most characteristic pathological finding and may contribute to the lymphopenia, liver dysfunction, and abnormal clotting profiles observed among patients with severe infection.
- Approximately 90% of patients with H5N1 infection have been below age 40. [1195]
- There is evidence that sub-clinical infection may occur. [1196]
- 106 cases of human infection by avian influenza virus H7 were reported during 1996 to 2007.
- Seropositivity toward avian Influenza virus types H5, H6 and H7 was demonstrated among American veterinarians during 2002 to 2004. [1197]
- Seropositivity toward H5 and H9 types was demonstrated among poultry workers in China during 2007 to 2008. [1198]
- Seropositivity toward avian influenza virus type H11N9 was demonstrated among hunters in the United States in 2009.

Chronology - humans:

(Note that official figures reported by W.H.O. and reporting countries vary). [1199]

1996 - A single case of human H7N7 infection (conjunctivitis) was reported in England. [1200]

1997 to 1998 - An outbreak (18 cases, 6 fatal) of human infection by the avian (chicken) strain H5N1 was reported in Hong Kong. [1201] [1202] [1203] [1204] [1205] [1206] [1207] [1208] [1209] [1210] [1211] [1212] [1213] [1214] [1215] [1216] [1217] [1218] [1219] [1220] [1221] The virus was also found in ducks and geese. [1222] [1223] Transmission was predominantly bird-to-man, with sporadic cases acquired from patients. The clinical spectrum of H5N1 virus infection ranged from asymptomatic infection to fatal pneumonitis and multiple organ failure. Reactive hemophagocytic syndrome was the most characteristic pathological finding and might have contributed to the lymphopenia, liver dysfunction, and abnormal clotting profiles that were observed among patients with severe infection. Antibody was demonstrated in 17.2% of poultry workers during the outbreak. Approximately 1.5 million chickens and other birds were slaughtered in attempts to control the outbreak.

1999 - An outbreak (2 children hospitalized) of H9N2 infection was reported in Hong Kong. [1224] [1225] [1226] 4% of chickens tested during 1997 had been infected with this strain; and 49% of poultry workers were seropositive at the time. There was no evidence for human-to-human transmission. H5N1 virus was isolated from a goose.

2002 - A single case of human H7N2 infection (respiratory) was reported in the United States. [1227]

2002 to 2003 - Seven cases of human H7N3 infection (conjunctivitis and respiratory) were reported in Italy. [1228] [1229] [1230] [1231] [1232]

2003 - A single case of human H7N2 infection (respiratory) was reported in the United States. [1233]
- An outbreak of avian infection (HPAI = H7N7) was reported in Germany, Belgium and the Netherlands; including cases of human infection (conjunctivitis and or respiratory disease) in Belgium and the Netherlands. [1234]
- 453 cases of human infection (1 fatal) were reported in the Netherlands at the time. [1235] [1236] [1237] [1238] [1239] [1240] [1241] [1242]
- Seroconversion was documented in 33 household members of patients, with documentation of H7N7 conjunctivitis in four. [1243]
- One case of human H5N1 (fatal) was reported in China (confirmation released only in 2006) [1244] [1245] and 3 (fatal) in Vietnam.

2004 - 17 cases of human H5N1 infection (12 fatal) were reported in Thailand [1246] [1247] [1248], and 29 (20 fatal) in Vietnam. [1249] [1250]
- By late February, the number of new human H5 cases being reported in Thailand and Viet Nam slowed and then stopped. Within a month, countries in Asia were reporting that the avian influenza outbreak among poultry had been contained.
- Asymptomatic human infection by H5N1 virus was associated with avian infections in the Republic of Korea during 2003 to 2004. [1251] [1252]
- Two cases of human H7N3 infection (conjunctivitis) were reported in Canada. [1253] [1254] [1255] [1256] [1257] [1258]

2005 - 4 cases (4 fatal) of human H5N1 infection were reported in Cambodia [1259] [1260], 8 (5 fatal) in China [1261], 20 (13 fatal) in Indonesia [1262], 5 (2 fatal) in Thailand, and 61 (19 fatal) in Vietnam. [1263] [1264] [1265]
- One case is Thailand appeared to have been acquired through person-to-person transmission; and 5 asymptomatic persons in Japan were found to be seropositive.

2006 - Eight cases (5 fatal) of human H5N1 infection were reported in Azerbaijan [1266] [1267] [1268] [1269] [1270], 2 (fatal) in Cambodia [1271] [1272] [1273], 13 (8 fatal) in China [1274] [1275] [1276] [1277] [1278], 1 (nonfatal) in Djibouti [1279], 18 (10 fatal) in Egypt [1280] [1281] [1282] [1283] [1284] [1285] [1286] [1287] [1288] [1289], 55 (45 fatal) in Indonesia [1290] [1291] [1292] [1293] [1294] [1295] [1296] [1297] [1298] [1299] [1300] [1301] [1302] [1303] [1304] [1305] [1306] [1307] [1308] [1309] [1310] [1311] [1312] [1313], 3 (2 fatal) in Iraq [1314] [1315] [1316] [1317], 3 (total) in Thailand [1318] [1319] and 12 (4 fatal) in Turkey. [1320] [1321] [1322] [1323] [1324] [1325] [1326] [1327] [1328] [1329]
- An outbreak of influenza (H5N2) among chickens was reported in Japan [1330] [1331] Approximately 77 cases of human infection were reported. [1332]
- Eight members of a single family in Indonesia were infected, with some evidence for

limited person to person spread. [1333] [1334] [1335] [1336]
- A case of human infection (conjunctivitis) due to H7N3 virus was reported in England. [1337] [1338]

2007 - One case (fatal) of human H5N1 infection was reported in Cambodia [1339] [1340], 5 (3 fatal) in China [1341] [1342] [1343] [1344] [1345] [1346] [1347] [1348], 25 (9 fatal) in Egypt [1349] [1350] [1351] [1352] [1353] [1354] [1355] [1356] [1357] [1358] [1359] [1360] [1361] [1362] [1363] [1364] [1365] [1366] [1367], 42 (37 fatal) in Indonesia [1368] [1369] [1370] [1371] [1372] [1373] [1374] [1375] [1376] [1377] [1378] [1379] [1380] [1381] [1382] [1383] [1384] [1385] [1386] [1387] [1388] [1389] [1390] [1391] [1392] [1393] [1394], 2 (fatal) in Laos [1395] [1396] [1397] [1398] [1399] [1400] [1401], 1 (nonfatal) in Myanmar [1402], 1 (fatal) in Nigeria [1403], 3 (1 fatal) in Pakistan [1404] [1405] [1406], and 8 (5 fatal) in Vietnam. [1407] [1408] [1409] [1410]
- In one case, a patient in Pakistan was infected through contact with another human who had been involved in culling poultry. [1411] [1412] [1413] A case of human to human transmission was also documented in China. [1414]
- A case of human infection due to H9N2 virus was reported in Hong Kong. [1415]
- Twelve cases (4 confirmed) of probable human infection by H7N2 virus (conjunctivitis and flu-like symptoms) were reported in the United Kingdom. [1416] [1417] [1418] [1419] [1420] [1421] [1422] [1423]

2008 - One case (nonfatal) of human H5N1 infection was reported in Bangladesh [1424] [1425] [1426] [1427], 1 (nonfatal) in Cambodia [1428] [1429] [1430], 4 (all fatal) in China [1431] [1432] [1433] [1434] [1435], 8 (4 fatal) in Egypt [1436] [1437] [1438] [1439] [1440] [1441] [1442] [1443] [1444] [1445], 24 (20 fatal) in Indonesia [1446] [1447] [1448] [1449] [1450] [1451] [1452] [1453] [1454] [1455] [1456] [1457] [1458] [1459] [1460] [1461] [1462] [1463] [1464], and 6 (5 fatal) in Vietnam. [1465] [1466] [1467] [1468] [1469] [1470] [1471] [1472]
- A case of human infection by swine influenza virus (H1H1) was reported in Spain. [1473] [1474] [1475]

- A case (nonfatal) of human H9N2 infection was reported in Hong Kong - a child from Guangdong, China. [1476]

2009 [1477] [1478] - One case (nonfatal) of human H5N1 infection was reported in Cambodia [1479], 7 (4 fatal) in China [1480] [1481] [1482] [1483] [1484] [1485] [1486] [1487] [1488]; 39 (4 fatal) in Egypt [1489] [1490] [1491] [1492] [1493] [1494] [1495] [1496] [1497] [1498] [1499] [1500] [1501] [1502] [1503] [1504] [1505] [1506] [1507] [1508] [1509] [1510] [1511] [1512] [1513] [1514] [1515] [1516] [1517] [1518] [1519] [1520] [1521] [1522] [1523] [1524] [1525] [1526] [1527] [1528] [1529] [1530] [1531] [1532] [1533] [1534]; 20 (19 fatal) in Indonesia [1535]; and 5 (fatal) in Vietnam. [1536] [1537] [1538] [1539] [1540] [1541] [1542] [1543] [1544] [1545] [1546] [1547] [1548] [1549] [1550] [1551] [1552] [1553] [1554] [1555]

- A case of human H9 influenza virus infection was imported into Hong Kong from Guangdong [1556]; and a local child acquired H9N2 virus infection (non-fatal). [1557]

2010 - Three cases (fatal) of human H5N1 infection were reported in Cambodia [1558] [1559] [1560]; 2 (1 fatal) in China [1561] [1562] [1563] [1564] [1565], 29 cases (13 fatal) in Egypt [1566] [1567] [1568] [1569] [1570] [1571] [1572] [1573] [1574] [1575] [1576] [1577] [1578] [1579] [1580] [1581] [1582] [1583] [1584]; 9 (7 fatal) in Indonesia. [1585] [1586] [1587] [1588] [1589] [1590] [1591] [1592] [1593] [1594] [1595] [1596] [1597] [1598] [1599] [1600] [1601] [1602] [1603]; 7 (2 fatal) in Vietnam. [1604] [1605] [1606] [1607] [1608] [1609] [1610] [1611] [1612] [1613]

2011 - Two cases (nonfatal) of human H5N1 infection were reported in Bangladesh [1614] [1615]; 8 (8 fatal) in Cambodia [1616] [1617] [1618] [1619] [1620] [1621] [1622] [1623] [1624]; 1 (fatal) in China [1625] [1626] [1627]; 38 (14 fatal) in Egypt [1628] [1629] [1630] [1631] [1632] [1633] [1634] [1635] [1636] [1637] [1638] [1639] [1640] [1641] [1642] [1643] [1644] [1645] [1646] [1647] [1648] [1649] [1650] [1651]; 11 (9 fatal) in Indonesia. [1652] [1653] [1654] [1655] [1656] [1657] [1658] [1659] [1660] [1661] [1662] [1663] [1664] [1665] [1666] [1667] [1668]

- A case of human infection by H9N2 virus was reported in Bangladesh in 2011. [1669]

2012 - One case (fatal) of human H5N1 infection was reported in Cambodia [1670] [1671] [1672] ; 5 (2 fatal) in Egypt [1673] [1674] [1675] [1676] ; three (fatal) in Indonesia [1677] [1678] [1679] [1680] [1681] ; two (fatal) in Vietnam. [1682] [1683] [1684]

AVIAN INFLUENZA IN BIRDS: [1685] [1686] [1687] [1688] [1689]
- 1959 to 2003 - 21 outbreaks of HPAI were reported worldwide - the majority in Europe. Of these, only five outbreaks were widespread, and only one involved more than one country.
- 1997 to 2003 - 14 outbreaks of H5 or H7 were reported in poultry, of which three also involved human infection.
- 2003 to February 2009 - Outbreaks of H5N1 infection in poultry were reported in 62 countries. [1690]
- 2004 - Beginning in late June 2004, new lethal outbreaks of H5N1 among poultry and other birds were reported by several countries in Asia: Cambodia, China, India, Indonesia, Malaysia, Russian Republic, Thailand and Viet Nam.
- 2003 to 2005 - Outbreaks of highly pathogenic avian influenza A (H5N1) occurred among poultry in 8 countries in Asia (Cambodia, China, Indonesia, Japan, Laos, South Korea, Thailand and Viet Nam) during late 2003 and early 2004.
- 2003 to 2008 - Highly pathogenic avian influenza A (H5N1) was reported in wild birds and / or poultry in 61 countries. [1691] H5N1 infection was reported in 11 African countries during 2005 to early 2008. [1692]
- 2003 to 2010 - Outbreaks had been reported in a total of 63 countries. [1693] [1694]

Chronology - birds:
Detailed time-line available at [1695] [1696] [1697]
59 countries reported outbreaks of H5N1 avian influenza among birds during 2003 to May 2007 [1698] [1699] [1700] [1701] [1702] ; 63 countries as of June 2010. [1703]
As of 2011, continual H5N1 avian influenza outbreaks were reported primarily in six countries: Bangladesh, China, Egypt, India, Indonesia and Vietnam. [1704]

1959 - An outbreak of H5N1 infection among chickens in Scotland [1705]
1963 - An outbreak of H7N3 infection among turkeys in England
1966 - An outbreak of H5N9 infection among turkeys in Canada
1976 - An outbreak of H7N7 infection among chickens in Australia
1979 - An outbreak of H7N7 infection among chickens in Germany
1979 - An outbreak of H7N7 infection among turkeys in England [1706]
1983 to 1985 - An outbreak of H5N2 infection among chickens in the United States
1983 - An outbreak of H5N8 infection among turkeys in Ireland [1707]
1985 - An outbreak of H7N7 infection among chickens in Australia [1708]
1991 - An outbreak of H5N1 infection among turkeys in England [1709] [1710]
1992 - An outbreak of H7N3 infection among chickens in Australia [1711]
1993 to 1995 - An outbreak of H5N2 infection among chickens in Mexico [1712] [1713] [1714]
1994 - An outbreak of H7N3 infection among chickens in Australia [1715]
1994 - An outbreak of H7N3 infection among chickens in Pakistan
1996 - H5N1 virus is isolated from a farmed goose in Guangdong Province, China.
1997 - An outbreak of H7N4 infection among chickens in Australia [1716]
1997 to 1998 - An outbreak of H5N1 infection was reported among chickens,

ducks and geese in Hong Kong. [1717] [1718] [1719] [1720] [1721]

1997 - An outbreak of H5N2 infection among chickens in Italy. [1722] [1723]

1997 to 1998 - An outbreak of H7N2 infection was reported among chickens in the United States. [1724] [1725] [1726] [1727]

1998 - Avian influenza H9N2 influenza was identified in poultry in Iran. [1728]

1998 to 1999 - An outbreak of avian influenza (H7N1) was reported among turkeys and farmed ostriches in Italy. [1729] [1730] [1731] No human cases were reported. [1732]

1999 (publication year) - H9N2 virus was reported among poultry in Pakistan. [1733]

1999 to 2000 - An outbreak of H7N1 infection among turkeys and farmed ostriches in Italy. [1734] [1735]

2002 - H5N1 infection was reported among chickens in Chile [1736] [1737] and Hong Kong. [1738] [1739]

2003 - An outbreak of H5N1 infection began among poultry in Korea and spread to several Asian countries. [1740] [1741]

2003 - H7N7 virus was reported among chickens in Belgium and the Netherlands [1742] [1743] [1744] [1745] [1746] [1747] ; H7N3 virus in Italy and the Netherlands [1748] , with low levels of seroconversion in human contacts. [1749]

2004 - Avian and human infection by Influenza virus A (H10N7) was reported in Egypt.

2004 - Two cases of human infection by H7N3 from an avian source were reported in Canada. [1750] [1751]

2004 - Outbreaks of H5N2 among ducks [1752] and H9N8 among chickens in Republic of Korea. [1753] ; H5N2 among ostriches in South Africa. [1754]

2004 - Outbreaks of H5N2 and H7N2 infection among poultry in the United States. [1755] [1756] [1757] [1758]

2004 to 2005 - Outbreaks of H5N1 infection among chickens and ducks in Cambodia, China [1759] [1760] [1761] , Indonesia [1762] , Japan [1763] Laos, Malaysia, Mongolia [1764] , Pakistan, Thailand [1765] [1766] [1767] , and Viet Nam; outbreaks of H3N8 infection were reported among ducks in China. [1768]

2005 - Outbreaks of H7 infection among chickens in North Korea. [1769] [1770] [1771]

2005 - Outbreaks of H5N2 infection were reported among chickens in Japan [1772] , chickens in Mexico. [1773] and ostriches in Zimbabwe. [1774]

2005 - H5N1 infection was reported among poultry and water fowl in China [1775] [1776] [1777] , swans in Croatia [1778] , a duck in Italy. [1779] , geese in Kazakhstan. [1780] , a flamingo in Kuwait. [1781] , ducks in Romania [1782] [1783] [1784] , fowl in Russia [1785] [1786] [1787] , a wild falcon in Saudi Arabia. [1788] [1789] , turkeys in Turkey [1790] [1791] [1792] [1793] , birds in Ukraine [1794] and ducks in the United States. [1795]

2005 - An outbreak of H9N2 infection among chickens in Colombia. [1796]

2005 - H7N3 virus was identified in the droppings of migratory birds in Taiwan. [1797]

2005 - Avian influenza H5N9, H5N2 and H5N3 in wild birds in Canada. [1798] [1799] [1800] [1801]

2005 to 2006 - Outbreaks of avian influenza (H5N2) were reported among ostriches in South Africa [1802] [1803] [1804] [1805] [1806] and birds in Japan. [1807]

2006 to 2009 - Sporadic cases of H3N2 infection were reported among ducks in China. [1808]

2006 - H5N1 virus confirmed in poultry in Nigeria. [1809] [1810] [1811] This was the first confirmation of this strain in Africa. [1812] [1813] [1814] [1815] [1816]

2006 - H5N1 virus was confirmed in wild birds and / or poultry in 48 additional countries [1817] [1818] : Afghanistan, Albania [1819] , Austria [1820] [1821] , Azerbaijan [1822] [1823] ,

Bosnia & Herzegovina [1824] [1825], Burkina Faso [1826] [1827], Cambodia [1828] [1829] [1830], Cameroon [1831], China [1832] [1833] [1834] [1835] [1836] [1837], Croatia [1838], Cyprus, Czech Republic [1839] [1840], Denmark [1841] [1842] [1843], Djibouti [1844], Egypt [1845] [1846], France [1847] [1848], Germany [1849], Greece, Hong Kong [1850], Hungary [1851], India [1852], Iran [1853], Iraq [1854], Israel [1855] [1856], Italy [1857], Ivory Coast [1858] [1859], Jordan [1860], Kazakhstan [1861], Laos [1862] [1863] [1864], Malaysia [1865], Mongolia, Myanmar, Niger [1866], Pakistan [1867], the Palestinian Authority [1868], Poland [1869], Republic of Korea [1870] [1871] [1872] [1873], Romania [1874] [1875], Russian Federation [1876] [1877], Scotland [1878] [1879], Serbia [1880], Slovakia, Slovenia, Spain [1881], Sudan [1882] [1883] [1884] [1885], Sweden [1886] [1887] [1888] [1889] [1890], Switzerland [1891], Thailand [1892] [1893], Turkey [1894] [1895] [1896], Ukraine and Vietnam. [1897] [1898] [1899] [1900] [1901] [1902] [1903] [1904] [1905] [1906] [1907]

2006 - H5 virus was reported among in birds in Denmark [1908], Georgia, Italy [1909] and the Philippines. [1910]

2006 - H7N3 virus was reported in domestic fowl in England [1911] [1912] [1913]; H3N3 among farmed birds in Denmark [1914]; H7N7 among poultry in the Netherlands. [1915] [1916]

2006 - Avian influenza caused by a 'low pathogenic strain' was reported in birds in Bulgaria. [1917] [1918] [1919]

2007 - Avian influenza (H5N1) was confirmed in wild birds and / or poultry in 29 countries [1920] [1921]: Afghanistan [1922] [1923] [1924], Bangladesh [1925] [1926] [1927] [1928] [1929] [1930] [1931] [1932] [1933] [1934] [1935], Benin [1936] [1937], Cambodia [1938], China [1939], Czech Republic [1940], Djibouti [1941], France [1942], Germany [1943] [1944] [1945] [1946] [1947] [1948] [1949] [1950] [1951] [1952] [1953] [1954] [1955] [1956], Ghana [1957] [1958] [1959] [1960], Hong Kong [1961] [1962] [1963], Hungary [1964] [1965] [1966] [1967], India [1968] [1969], Indonesia [1970], Japan [1971] [1972] [1973] [1974], Kuwait [1975] [1976] [1977] [1978] [1979] [1980], Malaysia [1981], Laos [1982], Myanmar [1983] [1984] [1985] [1986] [1987], Nigeria [1988] [1989] [1990] [1991] [1992] [1993] [1994] [1995], Pakistan [1996] [1997] [1998] [1999], Poland [2000] [2001] [2002] [2003] [2004], Romania [2005] [2006], the Russian Federation [2007] [2008] [2009] [2010] [2011], Saudi Arabia [2012] [2013] [2014] [2015] [2016] [2017] [2018] [2019] [2020] [2021], Thailand [2022] [2023] [2024], Togo [2025] [2026] [2027] [2028], Turkey [2029] [2030], the United Kingdom [2031] [2032] [2033] [2034] [2035] [2036] [2037] [2038] [2039] and Vietnam [2040] [2041] [2042] [2043] [2044] [2045] [2046] [2047] [2048] [2049] [2050] [2051] [2052] [2053]

2007 - H5N2 virus was reported in birds in the United States [2054] [2055], Italy [2056], Dominican Republic [2057], and Portugal. [2058] [2059] H7N2 virus was reported among fowl in Italy [2060] [2061]; and in England [2062] [2063] [2064] and Wales [2065] - with 12 cases (4 confirmed) of human disease (conjunctivitis and flu-like illness). [2066] [2067] [2068] [2069] [2070] [2071] H7N3 virus infection was reported among poultry in Canada [2072] [2073] [2074] [2075] [2076] [2077], Italy [2078] [2079] and Vietnam [2080]. H7N8 virus infection was reported among fowl in Republic of Korea. [2081] [2082]

2008 - Avian influenza (H5N1) was confirmed in wild birds and / or poultry in 25 countries [2083]: Bangladesh [2084] [2085] [2086] [2087] [2088] [2089] [2090] [2091], Cambodia [2092] [2093] [2094], China [2095] [2096] [2097] [2098] [2099] [2100] [2101] [2102] [2103], Egypt [2104] [2105], Germany [2106] [2107] [2108], Hong Kong [2109] [2110] [2111] [2112] [2113] [2114] [2115] [2116] [2117] [2118] [2119] [2120], India [2121] [2122] [2123] [2124] [2125] [2126] [2127] [2128] [2129] [2130] [2131] [2132] [2133] [2134] [2135] [2136] [2137] [2138] [2139], Indonesia [2140] [2141] [2142], Iran [2143], Israel [2144], Japan [2145] [2146] [2147] [2148], Laos [2149] [2150] [2151] [2152], New Zealand (low-pathogenic strain) [2153], Nigeria [2154] [2155] [2156] [2157] [2158], Pakistan [2159] [2160] [2161] [2162] [2163], Republic of Korea [2164] [2165] [2166] [2167] [2168] [2169] [2170] [2171] [2172] [2173] [2174] [2175], Russian Federation [2176], Saudi Arabia [2177], Switzerland [2178] [2179], Thailand [2180] [2181] [2182], Togo [2183] [2184], Turkey [2185] [2186] [2187] [2188], Ukraine [2189] [2190], United Kingdom [2191] [2192] [2193] [2194] [2195] [2196] [2197] and Vietnam. [2198] [2199] [2200] [2201] [2202] [2203] [2204] [2205] [2206] [2207] [2208]

2008 - Avian influenza (H7) was reported among ducks in Bulgaria [2209] [2210] and chickens in Denmark [2211] [2212]; H7N7 among chickens in the United Kingdom. [2213] [2214]

[2215] [2216] [2217] ; H5N2 among poultry in Haiti [2218] , Taiwan [2219] [2220] [2221] and Republic of Korea [2222] [2223] ; H7N3 among chickens and swans in the United States. [2224] [2225] ; H5 infection among poultry in Belgium [2226] and Benin [2227] ; H5N8 in a pheasant in the United States. [2228] ; H9 among chickens in Iraq. [2229] ; H5N3 among fowl in Germany. [2230] [2231] [2232] [2233] [2234] ; H9N2 among chickens in the Rupublic of Korea. [2235]

2009 - Avian influenza (H5N1) was confirmed in wild birds and / or poultry in 14 countries: Bangladesh [2236] [2237] , Cambodia [2238] , China [2239] [2240] [2241] [2242] , Egypt [2243] , France [2244] [2245] , Germany [2246] , Hong Kong [2247] [2248] , India [2249] [2250] [2251] [2252] , Indonesia [2253] [2254] [2255] [2256] , Laos [2257] , Mongolia [2258] [2259] [2260] , Nepal [2261] [2262] [2263] , Russian Federation [2264] [2265] [2266] , and Vietnam. [2267] [2268] [2269] [2270]

2009 - Avian influenza (H3N3) was reported among fowl in France [2271] and Germany [2272] ; H5N2 among poultry in Canada. [2273] [2274] ; LPNAI H7N6 among quail in Japan [2275] [2276] [2277] [2278] ; LPNAI H5 among fowl in Republic of Korea [2279] ; LPAI H7N9 among fowl in the United States [2280] [2281] [2282] ; H7 among fowl in Germany [2283] ; H7N7 among fowl in Spain [2284] [2285] ; H5 among birds in Mongolia [2286] ; H5N3 among ducks in the Czech Republic [2287] ; H7N3 among poultry in Italy [2288] ; and H6N1 among turkeys in the United Kingdom. [2289] [2290] [2291]

2010 - Avian influenza (H5N1) was confirmed in birds and / or poultry in 18 countries: Bangladesh [2292] [2293] [2294] , Bhutan [2295] [2296] , Bulgaria [2297] [2298] [2299] , Cambodia [2300] , China [2301] [2302] [2303] [2304] [2305] , Egypt [2306] [2307] , Hong Kong [2308] [2309] , Indonesia [2310] [2311] [2312] [2313] , Israel [2314] [2315] [2316] [2317] [2318] and the West Bank [2319] [2320] , Japan [2321] [2322] [2323] [2324] , Laos [2325] , Mongolia [2326] , Myanmar [2327] , Nepal [2328] [2329] [2330] , Republic of Korea [2331] [2332] [2333] [2334] [2335] , Romania [2336] [2337] [2338] , Russian Federation [2339] and Vietnam. [2340] [2341] [2342] [2343] [2344]

2010 - Avian influenza H5 was reported among poultry in Bangladesh, Egypt, India [2345] and Indonesia [2346] , wild ducks in Mongolia [2347] and zoo birds in Japan [2348] ; H5N2 among fowl in Canada [2349] and Germany [2350] ; H7 among poultry in Denmark [2351] and the Netherlands [2352] ; H7N6 [2353] [2354] , H7N2 [2355] and H7N7 among poultry in Republic of Korea [2356] ; and H5N2 among poultry in Taiwan. [2357]

2011 - Avian influenza (H5N1) was confirmed in birds and / or poultry in 13 countries: Bangladesh [2358] [2359] [2360] [2361] [2362] [2363] [2364] , Cambodia [2365] , China [2366] [2367] , Egypt [2368] , Hong Kong [2369] [2370] [2371] [2372] [2373] , India [2374] [2375] [2376] [2377] [2378] [2379] [2380] , Indonesia [2381] [2382] [2383] [2384] [2385] [2386] [2387] [2388] [2389] [2390] , Iran [2391] , Israel (West Bank) [2392] [2393] [2394] [2395] [2396] [2397] [2398] [2399] , Iran [2400] , Japan [2401] [2402] [2403] [2404] [2405] [2406] [2407] [2408] [2409] , Republic of Korea [2410] [2411] [2412] [2413] [2414] [2415] and Vietnam. [2416] [2417]

2011 - Avian influenza (H5) was confirmed among poultry and wild birds in Myanmar [2418] ; H5N2 among birds in Taiwan [2419] and ostriches in South Africa [2420] [2421] [2422] [2423] ; H7N7 among poultry in Germany [2424] [2425] [2426] [2427] ; H7 among poultry in the Netherlands [2428] [2429] [2430] ; H7N9 [2431] and H7N3 among poultry in the United States [2432] [2433]

2012 - Avian influenza (H5N1) was confirmed in birds and / or poultry in four countries: Bhutan [2434] , Hong Kong [2435] [2436] , India. [2437] [2438] and Myanmar. [2439]

2012 - Avian influenza (H5N2) was confirmed in poultry. [2440]

Influenza in other animals:

As of 2009, animal species with confirmed infection included cow (*Bos taurus*), domestic cat/feral cat (*Felis domestica*) [2441] , Cynomolgus macaques (*Macaca fascicularis*), dog (*Canis lupus familiaris*), ferret (*Mustela putoris furo*) [2442] , leopard (*Panthera pardus*), mink [2443] [2444] , New Zealand white rabbit (*Oryctolagus cuniculus*), palm civet (*Chrotogale owstoni* Owston) [2445] [2446] , pig (*Sus domesticus*),

raccoon (*Procyon lotor*) [2447] [2448] , rat (*Rattus norvegicus*), red fox (*Vulpes vulpes*) , stone marten. [2449] and tiger (*Panthera tigris*). [2450]
- Evidence for infection by avian influenza viruses (H5N1 and N9N2) was confirmed in pigs in 2004.
- H5N1 virus was also found in tigers, leopards, dogs, civet cats and domestic cats during 2004 to 2008. [2451] [2452] [2453] [2454] [2455] [2456]
- Influenza virus H5N1 was confirmed in pigs in Indonesia in 2005 [2457] and 2006 [2458] ; cats in Germany [2459] and Indonesia [2460] in 2006 ; and donkeys in Egypt (2010 publication) [2461] [2462].
- Infected blow flies (*Calliphora nigribarbis*) were identified in the vicinity of poultry infected with H5N1 influenza virus in Japan. [2463]
- Influenza virus H3N2 has been identified in dogs in Republic of Korea [2464] ; pika in China [2465] ; bats (*Nyctalus noctula*) in Kazakhstan [2466] [2467] ; and mink in Denmark. [2468]
- H1N1 infection was identified in captive giant anteaters (*Myrmecophaga tridactyla*) in the United States in 2007. [2469]
- During the H1N1 pandemic of 2009, infection was confirmed in swine [2470] [2471] [2472] [2473] , Iceland [2474] [2475] [2476] [2477] [2478] [2479] [2480] [2481] [2482] [2483] [2484] [2485] , turkeys [2486] [2487] [2488] [2489] [2490] [2491] , cats [2492] and ferrets. [2493] [2494] [2495] [2496] [2497] [2498] [2499]

VACCINE RECOMMENDATIONS: The vaccine selection process is reviewed in reference [2500]

During 1992 to 1993, the American Food and Drug Administration (FDA) recommended a trivalent influenza vaccine which included: [2501]
A/Texas/36/91-like (H1N1)
A/Beijing/353/89-like (H3N2)
B/Panama/45/90-like viruses.

During 1995 to 1996 disease activity was due to A (H3N2) similar to A/Beijing/32/92, A/Shandong/9/93 or A/Guangdong/25/93; H1N1 similar to A/Singapore/6/86, A/Victoria/36/88, A/Texas/36/91; and B similar to B/Panama/45/90, B/Quingdau/102/87 and B/Victoria/2/87.
Vaccine recommendations [2502] for this period consisted of a trivalent vaccine which included
A/Texas/36/91-like (H1N1) (or A/Singapore/6/86),
A/Johannesburg/33/94-like (H3N2) (or A/Nanching/933/95) and
B/Beijing/184/93-like (or B/Harbin/07/94).

During 1996 to 1997, epidemics of A(H2N2) predominated in Africa, Europe, the Americas and Japan; while influenza B predominated in the rest of Asia.
Vaccine recommendations for this period consisted of a trivalent vaccine which included
A/Wuhan/359/95 (H3N2)-like,
A/Singapore/6/86 (H1N1)-like and
B/Beijing/184/93-like

Vaccine recommendations for 1997 to 1998: [2503] [2504]
A/Wuhan/359/95 (H3N2)-like;
ie, A/Nanching/933/95 (H3N2)-like
A/Bayern/07/95 (H1N1)-like;

ie, A/Johannesburg/82/96 (H1N1)-like
B/Beijing/184/93-like
ie, B/Harbin/07/94

Vaccine recommendations for the 1998 Australian winter (also adopted by South Africa and New Zealand):
A/Bayern/07/95(H1N1)-like
A/Sydney/05/97(H3N2)-like
B/Beijing/184/93-like

Vaccine recommendations for 1998 to 1999: [2505]
A/Sydney/5/97(H3N2)-like;
ie, A/Nanching/933/95 (H3N2)-like
A/Beijing/262/95 (H1N1)-like;
ie, A/Johannesburg/82/96 (H1N1)-like
B/Beijing/184/93-like
ie, B/Harbin/07/94.

Vaccine recommendations for 1999 to 2000: [2506]
A/Sydney/5/97 (H3N2)-like;
A/Beijing/262/95 (H1N1)-like
B/Yamanashi/166/98-like.

Vaccine recommendations for 2000: [2507]
A/Moscow/10/99 (H3N2)-like
A/New Caledonia/20/99 (H1N1)-like
B/Beijing/7/97-like or B/Shandong/7/97-like.

Vaccine recommendations for 2000 to 2001 and 2001 to 2002: [2508]
A/Moscow/10/99 (H3N2)-like virus (eg, A/Panama/2007/99)
A/New Caledonia/20/99 (H1N1)-like virus
B/Sichuan/379/99-like virus; such as B/Johannesburg/5/99 or B/Victoria/504/2000

Vaccine recommendations for 2002 to 2003: [2509] [2510]
A/New Caledonia/20/99 (H1N1)-like virus
A/Moscow/10/99 (H3N2)-like virus; such as A/Panama/2007/99 (H3N2)-like
B/Hong Kong/330/2001-like virus; such as B/Shandong/7/97-like virus - or B/Hong Kong/1434/2002

Vaccine recommendations for 2003 to 2004: [2511]
A/New Caledonia/20/99 (H1N1)-like virus
A/Fujian/411/2002 (H3N2)-like virus
B/Hong Kong/330/2001-like virus; such as B/Shandong/7/97-like virus - or B/Hong Kong/1434/2002

Vaccine recommendations for 2004 to 2005: [2512] [2513]
A/New Caledonia/20/99 (H1N1)-like virus
A/Wellington/1/2004 (H3N2)-like virus
B/Shanghai/361/2002-like virus; such as B/Shanghai/361/2002 - or B/Jilin/20/2003

Vaccine recommendations for 2005 to 2006: [2514]
A/New Caledonia/20/99 (H1N1)-like virus
A/California/7/2004 (H3N2)-like virus
B/Shanghai/361/2002-like virus; such as B/Shanghai/361/2002 - or B/Jilin/20/2003 (B/Malaysia/2506/2004-like virus recommended for Southern Hemisphere)

Vaccine recommendations for 2006 to 2007: [2515] [2516]
A/New Caledonia/20/99 (H1N1)-like virus
A/Wisconsin/67/2005 (H3N2)-like virus
B/Malaysia/2506/2004-like virus

Vaccine recommendations for 2007 to 2008 (northern hemisphere): [2517]
A/Solomon Islands/3/2006 (H1N1)-like virus
A/Wisconsin/67/2005 (H3N2)-like virus
B/Malaysia/2506/2004-like virus

Vaccine recommendations for 2008: [2518]
A/Solomon Islands/3/2006 (H1N1)-like virus
A/Brisbane/10/2007 (H3N2)-like virus
B/Florida/4/2006-like virus

Vaccine recommendations for 2008 to 2009: [2519] [2520] [2521]
A/Brisbane/59/2007 (H1N1)-like virus
A/Brisbane/10/2007 (H3N2)-like virus
B/Florida/4/2006-like virus

Vaccine recommendations for 2009 to 2010 (northern hemisphere): [2522] [2523] [2524]
A/Brisbane/59/2007 (H1N1)-like virus
A/Brisbane/10/2007 (H3N2)-like virus
B/Brisbane/60/2008-like virus
A/Mexico/2009 (H1N1)-like virus

Vaccine recommendations for 2010 (southern hemisphere): [2525] [2526] [2527]
A/California/7/2009 (H1N1)-like virus
A/Perth/16/2009 (H3N2)-like virus
B/Brisbane/60/2008-like virus
A/Mexico/2009 (H1N1)-like virus

Vaccine recommendations for 2010 to 2011 (northern hemisphere): [2528] [2529]
A/California/7/2009 (H1N1)-like virus
A/Perth/16/2009 (H3N2)-like virus
B/Brisbane/60/2008-like virus

Vaccine recommendations for 2011 (southern hemisphere) [2530]
A/California/7/2009 (H1N1)-like virus
A/Perth/16/2009 (H3N2)-like virus
B/Brisbane/60/2008-like virus

Vaccine recommendations for 2011 to 2012 (northern hemisphere): [2531] [2532] [2533] [2534]
A/California/7/2009 (H1N1)-like virus
A/Perth/16/2009 (H3N2)-like virus
B/Brisbane/60/2008-like virus

Vaccine recommendations for 2012 (southern hemisphere): [2535] [2536]
A/California/7/2009(H1N1)
A/Perth/16/2009 (H3N2)-like virus
B/Brisbane/60/2008-like virus

Vaccine recommendations for 2012 to 2013 (northern hemisphere) [2537]
A/California/7/2009 (H1N1)pdm09-like virus
A/Victoria/361/2011 (H3N2)-like virus
B/Wisconsin/1/2010-like virus

List of all references

Clinical:
Description of Influenza

Influenza is characterized by acute onset of fever, headache, myalgia, nonproductive cough, sore throat, and rhinitis. [1]
- The illness usually resolves in 2 to 7 days; however, symptoms often persist for up to two weeks.
- Severe illness or death may complicate the acute infection, notably in pregnant women [2] , the elderly and patients with underlying medical conditions. [3]
- Complications include primary viral pneumonia or bacterial pneumonia (most commonly pneumococcal); myocarditis, myositis, Guillain-Barre syndrome [4] , encephalitis [5] , Gianotti-Crosti syndrome [6] and transverse myelitis. [7] [8] [9]

WHO Case definition for surveillance - Influenza:
Clinical case definition
A person with sudden onset of fever of >38°C and cough or sore throat in the absence of other diagnoses.
Laboratory criteria for diagnosis
- Virus isolation: Swab or aspirate from the suspected individual, or
- Direct detection of influenza viral antigen.
- Serology: Fourfold rise in antibody titer between early and late serum.
Case classification
- Suspected: A case that meets the clinical case definition.
- Confirmed: A case that meets the clinical case definition and is laboratory-confirmed (used mainly in epidemiological investigation rather than surveillance).

WHO definition for surveillance - Swine influenza (H1H1):
confirmed case - person with swine influenza A (H1N1) virus infection laboratory confirmed by
- real-time RT-PCR and/or
- viral culture and/or

- 4-fold rise in swine influenza A(H1N1) virus specific neutralizing antibodies
probable case - either
- person with influenza test positive for influenza A, but unsubtypable by reagents used to detect seasonal influenza virus infection , or
- person with clinically compatible illness or who died of unexplained acute respiratory illness who is considered to be epidemiologically linked to probable or confirmed case

CDC definition for surveillance - Swine influenza (H1H1):
confirmed case - person with acute respiratory illness with swine influenza A (H1N1) virus infection laboratory confirmed at CDC by
- real-time reverse transcriptase polymerase chain reaction (RT-PCR) and/or
- viral culture
probable case - person with acute febrile respiratory illness who is
- positive for influenza A, but negative for H1 and H3 by influenza RT-PCR
- positive for influenza A by influenza rapid test or influenza immunofluorescence assay (IFA) plus meets criteria for suspected case
suspected case - person with acute respiratory illness (defined as recent onset of >= 2 of rhinorrhea or nasal congestion, sore throat, or cough) plus
- close contact to confirmed case of swine influenza A (H1N1) virus infection during case's infectious period, or
- close contact defined as within about 6 feet of ill person
- infectious period defined as 1 day prior to illness onset to 7 days after onset
- travel to or residence in area with confirmed cases of swine influenza A (H1N1) virus infection

Avian influenza H5N1 infection:
Avian influenza H5N1 infection is characterized by fever greater than 38 C, shortness of breath and cough. [10] [11]
- The incubation period is 2 to 4 days.
- All patients reported to date have presented with significant lymphopenia and marked chest radiograph abnormalities consisting of diffuse, multifocal or patchy infiltrates.
- Some cases showed segmental or lobular consolidation with air bronchograms.
- Crackles were frequently heard on auscultation.
- Some of the patients reported sore throat, conjunctivitis, myalgia, rash or rhinorrhea.
- Watery diarrhea or loose stools was noted in approximately 50% of the cases.
- Myocardial dysfunction and hepatic dysfunction are also reported.
- Reactive hemophagocytic syndrome is the most characteristic pathological finding and may contribute to the lymphopenia, liver dysfunction, and abnormal clotting profiles observed among patients with severe infection.
- Approximately 90% of patients with H5N1 infection have been below age 40. [12]
- Approximately 60% of patients have died, on an average of 10 days after onset of symptoms.

Influenza virus H1N1 infection
- During the "Spanish flu" H1N1 pandemic of 1918 to 1919, illness was characterized by unusual severity, tendency to affect young healthy adults, rapid progression and overwhelming pneumonia.
- During the outbreak of H1N1 2009 virus infection [13] , children [14] [15] and young adults

accounted for a large proportion of cases. [16] [17] Severe cases were not necessarily associated with underlying disease. Obesity [18] [19] [20] [21] [22] [23] [24] [25] [26] , immune-compromise [27] (but not necessarily AIDS [28]) , pregnancy [29] [30] [31] [32] [33] [34] [35] [36] [37] [38] [39] [40] [41] [42] [43] [44] [45] [46] [47] [48] , infection while hospitalized [49] , preexisting neurological disorders [50] , sickle cell disease [51] and asthma were identified as risk factors for complications. [52] [53] [54] [55] [56] [57] [58] Children below age 5 years, particularly those with neuro-developmental disorders, were also found to be at risk. [59] [60] [61]

- Most deaths were caused by primary viral pneumonia [62] [63] [64] [65] [66] [67] [68] [69] [70] [71] [72] , and bacterial co-infection was identified in as many as 29% of fatal cases. [73] [74] [75] [76] [77] [78]

- Vomiting and diarrhea were reported in up to 25% of patients [79] , and as many as 6% were afebrile. [80] Case-fatality rates were not necessarily higher than those reported for other strains of Influenza virus. [81] [82]

- Additional complications included rhabdomyolysis [83] [84] [85] [86] [87] , encephalitis or encephalopathy [88] [89] [90] [91] [92] [93] [94] [95] [96] [97] [98] [99] [100] [101] [102] [103] [104] [105] [106] [107] , aseptic meningitis [108] , acute disseminated or hemorrhagic leukoencephalitis [109] [110] [111] [112] [113] [114] [115] [116] [117] , cerebellitis [118] , acute myelopathy [119] , Guillain-Barre syndrome [120] [121] [122] , parkinsonism [123] , narcolepsy [124] [125] , quadriplegia [126] , glomerulonephritis [127] [128] or renal failure [129] [130] [131] [132] [133] [134] [135] [136] [137] , hemolytic-uremic syndrome [138] [139] [140] [141] [142] , reactive thrombocytosis [143] , hemophagocytic lymphohistiocytosis [144] [145] [146] [147] [148] [149] , myopathy [150] , cold agglutinin syndrome [151] , autoimmune [152] and thrombotic thrombocytopenic purpura [153] , myocarditis [154] [155] [156] [157] [158] [159] [160] [161] [162] [163] [164] [165] [166] [167] [168] [169] [170] [171] [172] [173] or reversible myocardial dysfunction [174] [175] [176] , pericarditis [177] [178] , subacute thyroiditis [179] , rash [180] , pancreatitis [181] , vascular thrombosis [182] , plastic bronchitis [183] and Acute Respiratory Distress Syndrome (ARDS). [184] [185] [186] [187] [188] [189] [190] [191] [192] [193] [194] [195] [196]

- In some cases, the clinical features of leptospirosis suggested a diagnosis of H1N1 influenza. [197]

List of all references

Pathogens related to Influenza

Influenza virus

Typical signs and symptoms of Influenza

+ Outbreak or case cluster
+ Epidemic or large outbreak
+ The patient is an adult
+ Fever
+ Pulmonary, thoracic, chest wall or cardiac
+ Cough
+ Neurological - headache, meningitis, etc
+ Headache
+ Musculoskeletal - muscle, bone and joint
+ Myalgia; or muscular mass or swelling
+ Presumed respiratory or pharyngeal acquisition

Personal Notes:

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