The World

Note: GIDEON does not follow routine country reports on human Influenza, because 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.  
- 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.  
- Case-fatality rates during the “Russian pandemic” of 1889 were comparable to those of the pandemics of 1957 and 1968.
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. 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."
- Of the 15 H-subtypes, H-5 and H-7 are the most virulent to man.
- Strains constantly evolve through a mechanism of reassortment, resulting in "antigenic drift" and "antigenic shift."

Swine Influenza: There is evidence for the occurrence of a swine influenza outbreak in England in 1892. 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. 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.
- Thirty 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 during 2011 to 2012. The true number was estimated at 2,055 cases; 306 cases (1 fatal) in 2012.

- Four cases of infection by H3N2 swine influenza virus which carries the pandemic gene of 2009 H1N1 virus were acquired at a pig fair in the United States in 2012.
- Fifteen additional cases were reported at agricultural fairs in the United States in 2013.

2009 to 2010 H1N1 influenza ("swine flu") - An outbreak of H1N1 pdm09 influenza was reported. Context: A pandemic of H1N1 Influenza virus A (H1N1) pdm09 infection occurred. Infection occurred.

- Over 600,000 cases were reported with the true number for first 12 months estimated at 293,500.
- 18,449 fatal cases were reported with the true number for first 12 months estimated at 293,500.
- Reporting of case-number summaries was suspended by WHO as of July 26; and on August 10, the pandemic was declared to have ended.

Human-to-swine transmission was confirmed in Argentina, Brazil, Cambodia, Sri Lanka, Vietnam, Italy and Canada during the outbreak; and infected swine were identified in Argentina, Australia, Brazil, Cameroon, Cuba, Denmark, Finland, Germany, Greece, Hungary, Iceland, India, Indonesia, Ireland, Italy, Japan, England, Mexico, Norway, Northern Ireland, Republic of Korea, Russia, Scotland, Taiwan, Thailand, the United Kingdom and the United States.

Infected turkeys were subsequently identified in Canada, Chile, Japan, Mexico, and Taiwan.
<table>
<thead>
<tr>
<th>Country</th>
<th>Fatalities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Afghanistan (17 fatal)</td>
<td>17</td>
</tr>
<tr>
<td>Albania (6 fatal)</td>
<td>6</td>
</tr>
<tr>
<td>Algeria (57 fatal cases)</td>
<td>57</td>
</tr>
<tr>
<td>American Samoa (94 - 0 fatal)</td>
<td>94</td>
</tr>
<tr>
<td>Andorra (1)</td>
<td>1</td>
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<tr>
<td>Angola (37)</td>
<td>37</td>
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<tr>
<td>Anguilla (14)</td>
<td>14</td>
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<tr>
<td>Antigua and Barbuda (0 fatal)</td>
<td>0</td>
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<tr>
<td>Argentina (626 fatal)</td>
<td>626</td>
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<tr>
<td>Armenia (3 fatal)</td>
<td>3</td>
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<tr>
<td>Aruba (13)</td>
<td>13</td>
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<tr>
<td>Austria (24 fatal)</td>
<td>24</td>
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<tr>
<td>Azerbaijan (2), Bahamas (4 fatal)</td>
<td>6</td>
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<tr>
<td>Bahrain (7 fatal)</td>
<td>7</td>
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<tr>
<td>Bangladesh (7 fatal)</td>
<td>7</td>
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<tr>
<td>Barbados (157 - 3 fatal)</td>
<td>154</td>
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<tr>
<td>Belarus (20 fatal)</td>
<td>20</td>
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<tr>
<td>Belgium (17 fatal)</td>
<td>17</td>
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<tr>
<td>Belize (20 fatal)</td>
<td>20</td>
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<tr>
<td>Bermuda (1 fatal)</td>
<td>1</td>
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<tr>
<td>Bhutan (487)</td>
<td>487</td>
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<tr>
<td>Bolivia (59 fatal)</td>
<td>59</td>
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<tr>
<td>Bosnia and Herzegovina (10 fatal)</td>
<td>10</td>
</tr>
<tr>
<td>Botswana (23)</td>
<td>23</td>
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<tr>
<td>Brazil (53,797 cases, 2,173 fatal)</td>
<td>2,173</td>
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<tr>
<td>British Virgin Islands (25)</td>
<td>25</td>
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<tr>
<td>Bulgaria (40 fatal)</td>
<td>40</td>
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<tr>
<td>Burundi (7)</td>
<td>7</td>
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<tr>
<td>Cambodia (6 fatal)</td>
<td>6</td>
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<tr>
<td>Cape Verde (118)</td>
<td>118</td>
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<tr>
<td>Cayman Islands (10 - 1 fatal)</td>
<td>10</td>
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<tr>
<td>Chad (1)</td>
<td>1</td>
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<tr>
<td>Chile (156 fatal)</td>
<td>156</td>
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<tr>
<td>China (724 fatal - including 56 in Hong Kong)</td>
<td>724</td>
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<tr>
<td>Dominica (51)</td>
<td>51</td>
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<tr>
<td>Dominican Republic (464 - 24 fatal)</td>
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<tr>
<td>Ecuador (130 fatal)</td>
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<tr>
<td>Egypt (281 fatal)</td>
<td>281</td>
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<tr>
<td>El Salvador (34 fatal)</td>
<td>34</td>
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<tr>
<td>Estonia (19 fatal)</td>
<td>19</td>
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<tr>
<td>Falkland Islands (7)</td>
<td>7</td>
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<tr>
<td>Fiji (268 - 0 fatal)</td>
<td>268</td>
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<tr>
<td>Finland (43 fatal)</td>
<td>43</td>
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<tr>
<td>French Guiana (29 - 1 fatal)</td>
<td>28</td>
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<tr>
<td>French Polynesia (185 - 7 fatal)</td>
<td>185</td>
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<tr>
<td>Gabon (72)</td>
<td>72</td>
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<tr>
<td>Georgia (20 fatal, Germany (253 fatal)</td>
<td>20</td>
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<tr>
<td>Ghana (1 fatal)</td>
<td>1</td>
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<tr>
<td>Gibraltar (16)</td>
<td>16</td>
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<tr>
<td>Greece (141 fatal)</td>
<td>141</td>
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<tr>
<td>Grenada (28), Guadeloupe (5 fatal)</td>
<td>28</td>
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<tr>
<td>Guam (341 - 2 fatal)</td>
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<tr>
<td>Guatemala (26 fatal)</td>
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<tr>
<td>Guinea (73), Guyana (30)</td>
<td>30</td>
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<tr>
<td>Haiti (95)</td>
<td>95</td>
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<tr>
<td>Honduras (18 fatal)</td>
<td>18</td>
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<tr>
<td>Hong Kong (232 fatal)</td>
<td>232</td>
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<tr>
<td>Iceland (2 fatal)</td>
<td>2</td>
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<tr>
<td>India (44,958 - 2,703 fatal)</td>
<td>44,985</td>
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<tr>
<td>Indonesia (691 - 10 fatal)</td>
<td>691</td>
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<tr>
<td>Iran (147 fatal)</td>
<td>147</td>
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<tr>
<td>Iraq (42 fatal)</td>
<td>42</td>
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<tr>
<td>Ireland (24 fatal)</td>
<td>24</td>
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<tr>
<td>Israel (113 fatal, including 28 in Gaza and the West Bank)</td>
<td>113</td>
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<tr>
<td>Italy (256 fatal)</td>
<td>256</td>
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<tr>
<td>Ivory Coast (5)</td>
<td>5</td>
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<tr>
<td>Jamaica (7 fatal)</td>
<td>7</td>
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<tr>
<td>Japan (13,581 hospitalized;198 fatal)</td>
<td>13,581</td>
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<tr>
<td>Jordan (19 fatal)</td>
<td>19</td>
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<tr>
<td>Kazakhstan (17)</td>
<td>17</td>
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<tr>
<td>Kenya (417)</td>
<td>417</td>
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<tr>
<td>Kuwait (30 fatal)</td>
<td>30</td>
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<tr>
<td>Latvia (34 fatal)</td>
<td>34</td>
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<tr>
<td>Lebanon (5 fatal)</td>
<td>5</td>
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<tr>
<td>Lesotho (65)</td>
<td>65</td>
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<tr>
<td>Libya (1 fatal)</td>
<td>1</td>
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<tr>
<td>Lithuania (23)</td>
<td>23</td>
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<tr>
<td>Luxembourg (3 fatal)</td>
<td>3</td>
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<tr>
<td>Macao (2 fatal)</td>
<td>2</td>
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<tr>
<td>Macedonia (23 fatal)</td>
<td>23</td>
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<tr>
<td>Madagascar (3 fatal)</td>
<td>3</td>
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<tr>
<td>Malaysia (1,780 - 77 fatal)</td>
<td>1,780</td>
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<tr>
<td>Marshall Islands (115 - 1 fatal)</td>
<td>115</td>
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<tr>
<td>Martinique (44 - 1 fatal)</td>
<td>44</td>
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<tr>
<td>Mauritius (8 fatal)</td>
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<tr>
<td>Mexico (1,969 fatal)</td>
<td>1,969</td>
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<tr>
<td>Mexico (1,969 fatal)</td>
<td>1,969</td>
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<tr>
<td>Microchips</td>
<td>80</td>
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<tr>
<td>Moldova (35 fatal)</td>
<td>35</td>
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<td>Monaco (1)</td>
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<tr>
<td>Mongolia (29 fatal)</td>
<td>29</td>
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<tr>
<td>Montenegro (7 fatal)</td>
<td>7</td>
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<tr>
<td>Morocco (64 fatal)</td>
<td>64</td>
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<tr>
<td>Myanmar (137)</td>
<td>137</td>
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<tr>
<td>Namibia (1 fatal)</td>
<td>1</td>
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<tr>
<td>Nepal (8 - 0 fatal)</td>
<td>8</td>
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<tr>
<td>Nepal (172 - 3 fatal)</td>
<td>172</td>
</tr>
<tr>
<td>Netherlands (62 fatal)</td>
<td>62</td>
</tr>
<tr>
<td>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)</td>
<td>128</td>
</tr>
<tr>
<td>Nicaragua (2,175 cases - 11 fatal)</td>
<td>2,175</td>
</tr>
<tr>
<td>Nigeria (642)</td>
<td>642</td>
</tr>
<tr>
<td>Niue (0), Northern Marianas (6 - 0 fatal)</td>
<td>6</td>
</tr>
<tr>
<td>Norway (12,513 cases, 29 fatal)</td>
<td>12,513</td>
</tr>
<tr>
<td>Pakistan (14 - 0 fatal)</td>
<td>14</td>
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<tr>
<td>Palau (47 - 0 fatal)</td>
<td>47</td>
</tr>
</tbody>
</table>
AVIAN INFLUENZA IN HUMANS:
Graph: Worldwide. Influenza - Avian H5N1, cases - GIDEON

Notes:
1. A total of 853 cases were reported to December 31, 2015. 1547 1548 1549 1550 1551 1552
   Individual years: 1553
   2010 - See reference 1553

Graph: Worldwide. Influenza - Avian H5N1, deaths - GIDEON

Notes:
1. A total of 456 fatal cases were reported through December 31, 2015. 1554

Summary:
During November 26, 2003 to December 31, 2015, human infection by avian influenza virus type H5N1 was reported in 16 countries: 1555 1556 1557 1558 1559, Azerbaijan (8 cases, 5 fatal), 1560 1561, Bangladesh (8 cases, 1 fatal), 1562 1563, Cambodia (56 cases, 37 fatal), 1564 1565 1566 1567 1568 1569 1570, Canada (1 fatal case, imported), 1571 1572 1573, China (53 cases, 31 fatal), 1574 1575 1576 1577 1578 1579, Djibouti (1 case, nonfatal), 1580, Egypt (350 cases, 118 fatal), 1581 1582 1583 1584 1585 1586 1587 1588 1589 1590 1591 1592 1593 1594 1595 1596 1597 1598 1599, Indonesia (199 cases, 167 fatal), 1600 1601 1602 1603 1604 1605, Iraq (3 cases, 2 fatal), 1606, Laos (2 cases, 2 fatal), 1607, Myanmar (1 case, 0 fatal), 1608 1609, Pakistan (3 cases, 1 fatal), 1610 1611 1612, Thailand (25 cases, 17 fatal), 1613 1614 1615 1616 1617 1618 1619 1620 1621 1622 1623 1624, Turkey (12 cases, 4 fatal), and Viet Nam (127 cases, 63 fatal).

Notes on Avian influenza in humans: 1625 1626 1627 1628 1629

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. 1630 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. 1631

- There is evidence that sub-clinical infection may occur. 1632

- 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. 1633

H5N6

Six cases (2 fatal) of H5N6 infection were reported in China during 2014 to December 2015 1634 1635 1636 1637 1638 1639 1640 1641; 10 (2 fatal) in January, 2016. 1642 1643 1644

- A fatal case of H5N6 infection was reported in Hong Kong in 2015. 1645

H6N1

2013 - A non-fatal case of human infection by Avian influenza virus H6N1 was reported in Taiwan. The patient did not have a history of poultry contact. 1646 1647 1648

- H6 infection had not been reported in humans in China as of 2015; however seropositivity toward this strain is widespread. 1649 1650

H11N9 and H7

Seropositivity toward H5 and H9 types was demonstrated among poultry workers in China during 2007 to 2008. 1651

- Seropositivity toward avian influenza virus type H11N9 was demonstrated among hunters in the United States in 2009.

- Seropositivity toward H7 was demonstrated in Italian poultry workers during 2008 to 2010. 1652

H7N9

721 cases (283 fatal to February 2016) of human infection by Avian influenza virus A(H7N9) were reported in China; with an additional 20 cases in Hong Kong (13), Taiwan (4), Canada (2) and Malaysia (1). There was some evidence for human-to-human transmission. 1653 1654 1655 1656 1657 1658 1659 1660 1661 1662 1663 1664 1665 1666 1667 1668 1669 1670 1671 1672 1673 1674 1675 1676 1677 1678 1679 1680 1681 1682 1683 1684 1685 1686 1687 1688 1689 1690 1691 1692 1693 1694 1695 1696 1697 1698 1699 1700 1701 1702 1703 1704 1705 1706 1707 1708 1709 1710 1711 1712 1713 1714 1715 1716 1717 1718 1719 1720 1721 1722 1723 1724 1725 1726 1727 1728 1729 1730 1731 1732 1733 1734 1735 1736 1737 1738 1739 1740 1741 1742 1743 1744 1745 1746 1747 1748 1749 1750 1751 1752 1753 1754 1755 1756 1757 1758 1759 1760 1761 1762 1763 1764 1765 1766 1767 1768 1769 1770 1771 1772 1773 1774 1775 1776 1777 1778 1779 1780 1781 1782 1783 1784 1785 1786 1787 1788

Asymptomatic infection was common among poultry workers. 1789 1790 1791 1792 1793

- Nosocomial spread has been documented in some cases. 1794

- Fatal Avian influenza virus A(H7N9) infection was confirmed in a Taiwanese worker who returned to Taiwan from China 1796 1797, and in a Chinese tourist in Taiwan. 1798 1799 1800

An Indonesian worker and a Chinese traveler were found to be infected with A(H7N9) infection after arriving to Hong Kong from China. 1801 1802 1803 1804 1805 1806 1807 1808 1809 1810 1811 1812 1813 1814 1815

A total of three imported cases (from the mainland) were reported in Hong Kong to January 2015. 1816

2014 - 306 cases (124 fatal) of H7N9 influenza were reported in China. 1817 1818 1819 1820 1821 1822 1823 1824 1825 1826 1827 1828 1829 1830 1831 1832 1833 1834 1835 1836 1837 1838 1839 1840 1841 1842 1843 1844 1845 1846 1847 1848 1849 1850 1851 1852 1853 1854 1855 1856 1857 1858 1859 1860 1861 1862 1863 1864 1865 1866 1867

Eight cases (1 fatal)
of A(H7N9) infection in Hong Kong followed travel in China, a traveler from Hong Kong was hospitalized for the infection in China; a Chinese tourist developed H7N9 infection after arriving to Malaysia from China; two Taiwanese travelers were hospitalized for H7N9 infection following return from China; and a traveler from Hong Kong was hospitalized for the infection in China.

Seroprevalence rates of 6.3% were demonstrated among asymptomatic poultry workers in China. There is some evidence that H7N9 virus could be transmitted in human feces. Two travelers from Hong Kong acquired H7N9 infection in China; and two travelers from Canada acquired H7N9 infection in China.

- 2015 - 245 cases (97 fatal) of H7N9 influenza were reported.
- 2016 - 28 cases (8 fatal) of H7N9 influenza were reported in China in January.

H9N2
Cases of human H9N2 infection were reported in Hong Kong in 1999 (2 cases), 2003 (1), 2007 (1) and 2013 (1); in Bangladesh in 2011; in China during 1998 to 1999; and in Egypt in 2015. H9N2 infection has been identified in farmed minks in China.

H10N8
Asymptomatic infection (seropositivity) was subsequently demonstrated in animal workers.

Chronology - humans:
(Note that official figures reported by W.H.O. and reporting countries vary.)

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

1997 to 1998 - An outbreak (18 cases, 6 fatal) of human infection by the avian (chicken) strain H5N1 was reported in Hong Kong. The virus was also found in ducks and geese. 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. 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.

2002 to 2003 - Seven cases of human H7N3 infection (conjunctivitis and respiratory) were reported in Italy.

2003 - A single case of human H7N2 infection (respiratory) was reported in the United States.

2004 - 17 cases of human H5N1 infection (12 fatal) were reported in Thailand, and 29 (20 fatal) in Vietnam. 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.

- Two cases of human H7N3 infection (conjunctivitis) were reported in Canada.

- One case is Thailand appeared to have occurred through person-to-person transmission; and 5 asymptomatic individuals in Japan were found to be seropositive.

2006 - Eight cases (5 fatal) of human H5N1 infection were reported in Azerbaijan, 2014, 2015, 2016, 2017, 2018, 2 (fatal) in Cambodia, 2019, 2020, 2021, 13 (8 fatal) in China, 2022, 2023, 2024, 2025, 2026, 2027, 18 (10 fatal) in Egypt, 2028, 2029, 2030, 2031, 2032, 2033, 2034, 2035, 2036, 2037, 55 (45 fatal) in Indonesia, 2038, 2039, 2040, 2041, 2042, 2043, 2044, 2045, 2046, 2047, 2048, 2049, 2050, 2051, 2052, 2053, 2054, 2055, 2056, 2057, 2058, 2059, 2060, 2061, 2062, 2063, 2064, 2065, 3 (total) in Thailand, 2066, 2067, and 12 (4 fatal) in Turkey.

- An outbreak of influenza (H5N2) among chickens was reported in Japan, 2008, 2009, 2010, 2011, 2012, 2013, Approximately 77 cases of human infection were reported.


- A case of human infection (conjunctivitis) due to H7N3 virus was reported in Hong Kong, 2166.

- Twelve cases (4 confirmed) of probable human infection by H7N2 virus (conjunctivitis and flu-like symptoms) were reported in the United Kingdom, 2167, 2168, 2169, 2170, 2171, 2172, 2173, 2174, 2175.

2009 - One case (nonfatal) of human H5N1 infection was reported in Cambodia, 2180, 2181, 2182, 4 (all fatal) in China, 2183, 2184, 2185, 2186, 2187, 8 (4 fatal) in Egypt, 2188, 2189, 2190, 2191, 2192, 2193, 2194, 2195, 2196, 2197, 24 (20 fatal) in Indonesia, 2198, 2199, 2200, 2201, 2202, 2203, 2204, 2205, 2206, 2207, 2208, 2209, 2210, 2211, 2212, 2213, 2214, 2215, 2216, 2217, 2218, 2219, 2220, 2221, 2222, 2223, 2224, and 6 (5 fatal) in Vietnam.

- A case of human infection by swine influenza virus (H1N1) was reported in Spain, 2225, 2226, 2227.

- A case (nonfatal) of human H9N2 infection was reported in Hong Kong - a child from Guangdong, China, 2228.

2010 - Three cases (fatal) of human H5N1 infection were reported in Cambodia, 2311, 2312, 2313, 2 (1 fatal) in China, 2314, 2315, 2316, 2317, 2318, 29 cases (13 fatal) in Egypt, 2319, 2320, 2321, 2322, 2323, 2324, 2325, 2326, 2327, 2328, 2329, 2330, 2331, 2332, 2333, 2334, 2335, 2336, 2337, 9 (7 fatal) in Indonesia, 2338, 2339, 2340, 2341, 2342, 2343, 2344, 2345, 2346, 2347, 2348, 2349, 2350, 2351, 2352, 2353, 2354, 2355, 2356, 7 (2 fatal) in Vietnam.

- An outbreak of low pathogenicity avian influenza A (H10N7) was reported in a poultry abattoir. Seven workers developed infection characterized by minor upper respiratory tract symptoms and conjunctivitis, 2367.

2011 - Two cases (nonfatal) of human H5N1 infection were reported in Bangladesh, 2368, 2369, 8 (8 fatal) in Cambodia, 2370, 2371, 2372, 2373, 2374, 2375, 2376, 2377, 2378, 2379, 1 (fatal) in China, 2380, 2381, 2382, 40 (15 fatal) in Egypt, 2383, 2384, 2385, 2386, 2387, 2388, 2389, 2390, 2391, 2392, 2393, 2394, 2395, 2396, 2397, 2398, 2399, 2400, 2401, 2402, 2403, 2404, 2405, 2406, 2407, 10 (10 fatal) in Indonesia, 2408, 2409, 2410, 2411, 2412, 2413, 2414, 2415, 2416, 2417, 2418, 2419, 2420, 2421, 2422, 2423, 2424, 2425, 2426, 2427.

- A case of subclinical infection by H9N2 virus was reported in Bangladesh in 2011, 2428, 2429, 2430, three (fatal) in

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Outbreaks of H5N1 infection in poultry were reported in 62 countries from 2003 to February 2009. There were 14 outbreaks of H5 or H7 reported in poultry, of which three also involved human infection. Of these, only five outbreaks were widespread, and only one involved more than one country.

- During the course of an outbreak of Avian influenza H5N2 among birds in Taiwan, seropositive poultry workers were identified. Two poultry workers developed conjunctivitis due to Avian influenza H7N3 during an outbreak among poultry in Mexico.

In 2013: One case (fatal) of human H5N1 infection was reported in Bangladesh; 24 (12 fatal) in Cambodia; one (fatal) in Canada (imported from China); 2496, 2497, 2498, 2499, 2500, 2501; 2 (2 fatal) in China. 2502, 2503, 2504, 2505, 2506; 3 (3 fatal) in Egypt 2507, 2508, 2509, 2510, 2511, 2512, 2513; 3 (fatal) in Indonesia 2514, 2515, 2516, 2517; and 2 (1 fatal) in Vietnam. 2518

- 144 cases (46 fatal) of human infection by Avian influenza virus A(H7N9) were reported in China. 2519, 2520, 2521, 2522

- Four cases (2 fatal) of H5N6 infection were reported in China; 2846, 2847, 2848, 2849, 2850

In 2014: Nine cases (4 fatal) of human H5N1 infection were reported in Cambodia; 31 (18 fatal) in Egypt; 2681, 2682, 2683, 2684, 2685, 2686; 2 (0 fatal) in China; 2687, 2688, 2689, 2690, 2691, 2692, 2693, 2694, 2695, 2696, 2697, 2698, 2699, 2700, 2701, 2702

- 241 cases (97 fatal to December) of human infection by Avian influenza virus A(H7N9) were reported in China. 2796, 2797, 2798, 2799, 2800, 2801, 2802, 2803, 2804, 2805, 2806, 2807

In 2015: Five cases (1 fatal) of human H5N1 infection were reported in China; 145 (40 fatal) in Egypt. 2772, 2773, 2774, 2775, 2776, 2777, 2778, 2779, 2780, 2781, 2782, 2783, 2784, 2785, 2786, 2787, 2788, 2789, 2790, 2791, 2792, 2793, 2794

AVIAN INFLUENZA IN BIRDS: 2830, 2831, 2832, 2833, 2834, 2835, 2836, 2837, 2838, 2839, 2840, 2841, 2842, 2843, 2844, 2845

- 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.

- 2004 - Beginning in late June 2004, new lethal outbreaks of H5N1 among poultry and other birds were reported by several

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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.
- 2003 to 2010 - Outbreaks had been reported in a total of 63 countries.

Chronology - birds:
Detailed time-line available at 2856 2857 2858 2864 2865
59 countries reported outbreaks of H5N1 avian influenza among birds during 2003 to May 2007; 63 countries as of June 2010. 2865

As of 2011, repeated H5N1 avian influenza outbreaks had been reported primarily in six countries: Bangladesh, China, Egypt, India, Indonesia and Vietnam.

1959 - An outbreak of H5N1 infection among chickens in Scotland 2868
1963 - An outbreak of H7N3 infection among turkeys in England 2874
1966 - An outbreak of H5N9 infection among turkeys in Canada 2874
1976 - An outbreak of H7N7 infection among chickens in Australia 2878
1979 - An outbreak of H7N7 infection among chickens in Germany 2879
1979 - An outbreak of H7N7 infection among turkeys in England 2870
1983 to 1985 - An outbreak of H5N2 infection among chickens in the United States 2872 2873
1985 - An outbreak of H7N7 infection among chickens in Australia 2874
1991 - An outbreak of H5N1 infection among turkeys in England 2874
1992 - An outbreak of H7N3 infection among chickens in Australia 2874
1993 to 1995 - An outbreak of H5N2 infection among chickens in Mexico 2875 2876 2877
1994 - An outbreak of H7N3 infection among chickens in Australia 2878
1994 - An outbreak of H7N3 infection among chickens in Pakistan 2879
1996 - H5N1 virus is isolated from a farmed goose in Guangdong Province, China. 2879
1997 - An outbreak of H7N4 infection among chickens in Australia 2870
1997 to 1998 - An outbreak of H5N1 infection was reported among chickens, ducks and geese in Hong Kong. 2880 2881
1997 - An outbreak of H5N2 infection among chickens in Italy. 2882 2883 2884 2885
1997 to 1998 - An outbreak of H7N2 infection was reported among chickens in the United States. 2886 2887
1998 - Avian H9N2 influenza virus was identified in poultry in Iran. 2888 2889 2890 2891
1998 to 1999 - An outbreak of avian influenza (H7N1) was reported among turkeys and farmed ostriches in Italy. 2892
1999 (publication year) - H9N2 virus was reported among poultry in Pakistan. 2893
1999 to 2000 - An outbreak of H7N1 infection among turkeys and farmed ostriches in Italy. 2894 2895
2000 - H5N1 infection was reported among chickens in Chile 2901 2902 and Hong Kong. 2903 2904
2003 - An outbreak of H5N1 infection began among poultry in Korea and spread to several Asian countries. 2905 2906
2003 - H7N7 virus was reported among chickens in Belgium and the Netherlands 2907 2908 2909 2910 2911 2912; H7N3 virus in Italy and the Netherlands 2913 with low levels of seroconversion in human contacts. 2914
2004 - Avian and human infection by Influenza virus A (H10N7) was reported in Egypt. 2915 2916
2004 - Two cases of human infection by H7N3 from an avian source were reported in Canada. 2917 2918
2004 - Outbreaks of H5N2 among ducks 2919 and H9N8 among chickens in Republic of Korea. 2919; H5N2 among ducks in China 2919 and ostriches in South Africa. 2920
2004 - Outbreaks of H5N2 and H7N2 infection among poultry in the United States. 2921 2922 2923 2924
2004 to 2005 - Outbreaks of H5N1 infection among chickens and ducks in Cambodia, China 2925 2926 2927, Indonesia 2928, Japan 2929, Laos, Malaysia, Mongolia 2930, Pakistan, Thailand 2931 2932 2933 2934, and Viet Nam; outbreaks of H3N8 infection were reported among ducks in China. 2935
2005 - Outbreaks of H7 infection among chickens in North Korea. 2936 2937 2938
2005 - Outbreaks of H5N2 infection were reported among chickens in Japan 2939, chickens in Mexico. 2940 and ostriches in Zimbabwe. 2941
2005 - H5N1 infection was reported among poultry and water fowl in China 2942 2943 2944, swans in Croatia 2945, a duck in Italy. 2946, geese in Kazakhstan. 2947, a flamingo in Kuwait. 2948, ducks in Romania 2949 2950 2951, fowl in Russia 2952 2953 2954, a wild falcon in Saudi Arabia. 2955 2956, turkeys in Turkey 2957 2958 2959 2960, birds in Ukraine 2961 and ducks in the United States. 2962
2005 - An outbreak of H9N2 infection among chickens in Colombia. 2963
2005 - H7N3 virus was identified in the droppings of migratory birds in Taiwan. 2964
2005 - Avian influenza H5N9, H5N2 and H5N3 in wild birds in Canada. 2965 2966 2967 2968
2005 to 2006 - Outbreaks of avian influenza (H5N2) were reported among ostriches in South Africa and birds in Japan.

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

2006 - H5N1 virus confirmed in poultry in Africa. This was the first confirmation of this strain in Africa.

2006 - H5N1 virus was confirmed in wild birds and / or poultry in 48 additional countries: Afghanistan, Albania, Austria, Azerbaijan, Bosnia & Herzegovina, Burkina Faso, Cambodia, Cameroon, China, Croatia, Cyprus, Czech Republic, Denmark, Djibouti, Egypt, France, Germany, Greece, Hong Kong, Hungary, India, Iraq, Israel, Italy, Ivory Coast, Jordan, Kazakhstan, Laos, Malaysia, Mongolia, Myanmar, Nigeria, Pakistan, Poland, Portugal, Republic of Korea, Romania, Russian Federation, Scotland, Sweden, Switzerland, Thailand, Turkey, Ukraine and Vietnam.

2006 - H5 virus was reported among birds in Denmark, Georgia, Italy and the Philippines. H7N3 virus was reported in domestic fowl in England; H3N3 among farmed birds in Denmark; and H7N7 among poultry in the Netherlands.

2007 - H5N1 virus was reported in wild birds and / or poultry in 29 countries: Afghanistan, Bangladesh, Benin, Cambodia, China, Czech Republic, Djibouti, France, Germany, Ghana, Hong Kong, Hungary, India, Indonesia, Japan, Kuwait, Malaysia, Nigeria, Pakistan, Poland, Russia, Saudi Arabia, Singapore, South Korea, Sweden, Switzerland, Thailand, Turkey, Ukraine and Vietnam.

2007 - Avian influenza caused by a "Low pathogenic strain" was reported in birds in Bulgaria.

2007 - Avian influenza (H5N1) was confirmed in wild birds and / or poultry in 25 countries: Afghanistan, Bangladesh, Benin, Cambodia, China, Egypt, Germany, Hong Kong, India, Indonesia, Israel, Japan, and Malaysia.

2008 - Avian influenza (H7) was reported among ducks in Bulgaria and chickens in Denmark; and in England.

2008 - Avian influenza (H5N1) was confirmed in wild birds and / or poultry in 25 countries: Bangladesh, Benin, China, Egypt, Germany, Hong Kong, India, Indonesia, Israel, and Malaysia.

2009 - Avian influenza (H5N1) was confirmed in wild birds and / or poultry in 14 countries: Bangladesh, Cambodia, China, Egypt, France, Germany, Hong Kong, India, Indonesia, Laos, Mongolia, Nepal, Russian Federation, and Turkey.

2009 - Avian influenza (H3N3) was reported among fowl in France and Germany; H5N2 among poultry in Canada; LPNAI H7N6 among quail in Japan; LPNAI H5 among fowl in Republic of Korea; and LPAI H7N9 among fowl in the United States.
among fowl in Spain; H5 among birds in Mongolia; H5N3 among ducks in the Czech Republic; H7N3 among poultry in Italy (seropositive poultry workers identified); and H6N1 among turkeys in the United Kingdom.

2010 - Avian influenza (H5N1) was confirmed in birds and/or poultry in 18 countries: Bangladesh

2011 - Avian influenza (H5N1) was confirmed in birds and/or poultry in 13 countries: Bangladesh, Cambodia, China, Indonesia, Iran, Israel (West Bank), the Netherlands, Nigeria, the Philippines, South Africa, Thailand, Turkey, Vietnam, and Vietnam.

2012 - Avian influenza (H5) was identified among birds in Hong Kong (associated with seropositive poultry workers), the Netherlands, Ireland, Italy, Russian Federation, South Africa, and Sri Lanka; H7N3 among poultry in Mexico; H5N3 among poultry in Germany; H7 among birds in Australia; and H7N7 among birds in the Netherlands.

2013 - Avian influenza (H5N1) was confirmed in birds and/or poultry in eight countries: Cambodia, China, Hong Kong, Indonesia, Nepal, North Korea, and Vietnam.

2014 - Avian influenza (H5N1) was confirmed in birds among 11 countries: Cambodia, Thailand, China, Democratic Republic of Korea, India, Laos, Libya, Nepal, the Netherlands, Russian Federation, United Arab Emirates, and Vietnam.

2014 - Avian influenza H5 was reported among birds in Taiwan; H5N2 in Canada; the Netherlands; Germany; South Africa; Taiwan; the United States; and H5N3 among poultry in China; H6N1 among poultry in China; Italy; the Netherlands; Japan; Russia; The United Kingdom; and Vietnam.
VACCINE RECOMMENDATIONS: The vaccine selection process is reviewed in reference \[4323\]

Vaccine recommendations for 1990 to 1991: \[4324\]
A/Guizhou/54/89 (H3N2)-like;
A/Singapore/6/86 (H1N1)-like;
B/Yamagata/16/88-like
Vaccine recommendations for 1991 to 1992:  
A/Beijing/353/89 (H3N2)-like;  
A/Singapore/6/86 (H1N1)-like;  
B/Yamagata/16/88-like OR B/Panama/45/90-like

Vaccine recommendations for 1992 to 1993:  
A/Beijing/353/89 (H3N2)-like;  
A/Singapore/6/86 (H1N1)-like;  
B/Yamagata/16/88-like OR B/Panama/45/90-like

The American Food and Drug Administration (FDA) recommended a trivalent influenza vaccine which included:  
A/Texas/36/91-like (H1N1)  
A/Beijing/353/89-like (H3N2)  
B/Panama/45/90-like

Vaccine recommendations for 1993 to 1994:  
A/Beijing/32/92 (H3N2)-like;  
A/Singapore/6/86 (H1N1)-like;  
B/Panama/45/90-like

Vaccine recommendations for 1994 to 1995:  
A/Shandong/9/93 (H3N2)-like;  
A/Singapore/6/86 (H1N1)-like;  
B/Panama/45/90-like

Vaccine recommendations for 1995 to 1996:  
A/Johannesburg/33/94 (H3N2)-like;  
A/Singapore/6/86 (H1N1)-like;  
B/Beijing/184/93-like

Vaccine recommendations for 1996 to 1997:  
A/Wuhan/359/95 (H3N2)-like;  
A/Singapore/6/86 (H1N1)-like;  
B/Beijing/184/93-like

Vaccine recommendations for 1997 to 1998:  
A/Wuhan/359/95 (H3N2)-like;  
i.e., A/Nanching/933/95 (H3N2)-like  
A/Bayern/07/95 (H1N1)-like;  
i.e., A/Johannesburg/82/96 (H1N1)-like  
B/Beijing/184/93-like  
i.e., 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:  
A/Sydney/5/97(H3N2)-like;  
i.e., A/Nanching/933/95 (H3N2)-like  
A/Beijing/262/95 (H1N1)-like;  
i.e., A/Johannesburg/82/96 (H1N1)-like  
B/Beijing/184/93-like  
i.e., B/Harbin/07/94.

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

Vaccine recommendations for 2000:  
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:  

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: 4339 4340
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: 4341
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: 4342 4343
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: 4344
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: 4345 4346
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): 4347
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: 4348
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: 4349 4350 4351
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): 4352 4353 4354
A/Brisbane/59/2007 (H1N1)-like virus
A/Brisbane/10/2007 (H3N2)-like virus
B/Brisbane/60/2008-like virus

Vaccine recommendations for 2010 (southern hemisphere): 4355
A/California/7/2009 (H1N1)-like virus
A/Perth/16/2009 (H3N2)-like virus
B/Brisbane/60/2008-like virus

Vaccine recommendations for 2010 to 2011 (northern hemisphere): 4356
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): 4357
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): 4358
### A/California/7/2009 (H1N1)-like virus

- A/California/7/2009 (H1N1)pdm09-like virus
- A/Hong Kong/4801/2014 (H3N2)-like virus
- A/Perth/16/2009 (H3N2)-like virus
- A/Switzerland/9715293/2013 (H3N2)-like virus
- B/Phuket/2073/2013-like virus
- B/Massachusetts/2/2012-like virus
- B/Perth/16/2009-like virus
- B/Brisbane/60/2008-like virus

### A/Perth/16/2009 (H3N2)-like virus

- A/California/7/2009 (H1N1)pdm09-like virus
- A/Hong Kong/4801/2014 (H3N2)-like virus
- A/Perth/16/2009 (H3N2)-like virus
- A/Switzerland/9715293/2013 (H3N2)-like virus
- B/Phuket/2073/2013-like virus
- B/Massachusetts/2/2012-like virus

### B/Brisbane/60/2008-like virus

- A/California/7/2009 (H1N1)pdm09-like virus
- A/Hong Kong/4801/2014 (H3N2)-like virus
- A/Perth/16/2009 (H3N2)-like virus
- A/Switzerland/9715293/2013 (H3N2)-like virus
- B/Phuket/2073/2013-like virus

### Vaccine recommendations for 2012 (southern hemisphere)

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### Vaccine recommendations for 2012 to 2013 (northern hemisphere)

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<td>4362</td>
<td>A/Victoria/361/2011 (H3N2)-like virus</td>
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<td>B/Wisconsin/1/2010-like virus</td>
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### Vaccine recommendations for 2013 (southern hemisphere)

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<td>B/Wisconsin/1/2010-like virus</td>
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### Vaccine recommendations for 2014 (southern hemisphere)

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<td>A/Texas/50/2012 (H3N2)-like virus</td>
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### Vaccine recommendations for 2014 to 2015 (northern hemisphere)

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### Vaccine recommendations for 2015 (southern hemisphere)

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<td>4369</td>
<td>A/Switzerland/9715293/2013 (H3N2)-like virus</td>
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### Vaccine recommendations for 2015 to 2016 (northern hemisphere)

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### Vaccine recommendations for 2016 (southern hemisphere)

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<td>A/Hong Kong/4801/2014 (H3N2)-like virus</td>
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<td>4374</td>
<td>B/Brisbane/60/2008-like virus</td>
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Avian influenza (H5) was confirmed in poultry in 2006 \(^1\) and 2007. \(^2\) \(^3\) \(^4\) \(^5\) \(^6\)

**Notable outbreaks:**

2009 to 2010 - An outbreak (17 fatal cases) of H1N1 pdm09 influenza was reported. \(^7\) \(^8\)

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H5N1 influenza was reported in birds in 2006. \(^1\) \(^2\) \(^3\)

**Notable outbreaks:**

1969 to 1970 - An outbreak (845,270 cases) of A (H3N2) Hong Kong influenza was reported.

2009 to 2010 - An outbreak (6 fatal cases) of H1N1 pdm09 influenza was reported.

### References

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American Samoa

**Notable outbreaks:**

2009 to 2010 - An outbreak (94 cases, 0 fatal) of H1N1 pdm09 influenza was reported.

### References


Andorra

**Notable outbreaks:**

2009 to 2010 - An outbreak (1 case) of H1N1 pdm09 influenza was reported.

### Angola

**Notable outbreaks:**

2009 to 2010 - An outbreak (37 cases) of H1N1 pdm09 influenza was reported. \(^1\)

### References


### Anguilla

**Notable outbreaks:**

2009 to 2010 - An outbreak (14 cases) of H1N1 pdm09 influenza was reported.

### Antigua and Barbuda

**Notable outbreaks:**

2009 to 2010 - An outbreak (0 fatal cases) of H1N1 pdm09 influenza was reported.