



# South Carolina Prepares: Influenza Today

## Public Health Emergency Preparedness Report, 2012

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## Public Health Emergency Preparedness Program Overview

**Mission.** The mission of the South Carolina Department of Health and Environmental Control (DHEC) is to promote and protect the health of the public and the environment. As the state's public health and environmental protection agency, DHEC provides a wide range of services for the public and the regulated community. All areas of the Department play a part in emergency preparedness and response. The public health **emergency** preparedness program relies on effective partnerships within DHEC, with other government agencies and with private organizations.

**Strategy and Objectives.** The core strategy for public health preparedness is to build and sustain public health capabilities that are used every day, so these capabilities will be ready when disaster strikes. The state must be prepared to respond to all types of hazard, including epidemic diseases such as influenza. The major objectives of the public health preparedness program are to maintain up-to-date emergency plans; to sustain state and regional disease control and laboratory capabilities; and to coordinate emergency preparedness efforts with hospitals, health care providers, state agencies and other organizations. The preparedness program's priority objective for the next five years is to sustain epidemiology, laboratory and public health emergency management capabilities at the state and regional levels. Other capabilities will be addressed as resources permit.

**Roles.** No one can predict when disaster will strike or the form that disaster will take. The public health employees who work to promote and protect health every day are the same ones who will be called upon to respond to a disaster in South Carolina. DHEC is involved in many disaster response tasks. Under the State Emergency Operations Plan, DHEC has leadership responsibility for health and medical services and hazardous material response. DHEC also supports other emergency functions. DHEC staff at emergency operations centers track the changing situation during a disaster and coordinate response activities. Emergency managers monitor evacuation of medical facilities, coordinate emergency medical services and other resources, and send public health teams from one region to another. DHEC staff conduct disease investigations, check the safety of food and water supplies, provide public information, staff special medical needs shelters, respond to hazardous materials threats, and provide public health services.

**Pandemic Preparedness.** Since the beginning of the Public Health Emergency Preparedness Program and the Hospital Preparedness Program in 2002, much attention has been devoted to preparing for an influenza pandemic. These preparations were very important during the response to the actual influenza pandemic in 2009-10. Public health staff were prepared to respond quickly and effectively to the initial outbreak, to monitor the course of the pandemic, to inform the public, and to coordinate with other organizations. Previous reports in this series have documented the plans and activities that were undertaken to prepare for a pandemic and to respond to the A(H1N1) pandemic in 2009. Some of the key activities included:

- The State Pandemic Influenza plan was prepared and updated each year.
- A Mass Fatality Plan was developed in cooperation with the Coroner's Association and other partners.
- Each year, DHEC has a seasonal influenza vaccination campaign to encourage people in high risk groups to get flu shots.

- Each year, DHEC conducts disease surveillance for influenza and influenza-like illnesses. <http://www.scdhec.gov/health/disease/acute/flu.htm>
- DHEC maintains a Health Alert Network to quickly provide alerts and detailed information to health care providers about disease outbreaks or important health problems, including influenza. <http://www.scdhec.gov/health/disease/han/notifications.htm>
- A State Public Health Emergency Pharmaceutical Stockpile with antiviral medicines to treat influenza is maintained.
- Guidance has been developed on public health and medical care ethical issues.
- State and regional exercises were held to test Pandemic Influenza response plans with community planning partners.
- Public health regions conducted mass seasonal influenza vaccination clinics.
- The public information campaign, “What Do You Do to Prevent the Flu?” began airing on television and radio in October 2007. The purpose is to increase public awareness and knowledge of ways they can prevent the spread of influenza. The messages promote vaccination, hand washing, cough etiquette, and staying home when sick.
- The Department published informational materials for the public and health care providers.
- A hand-washing video for school children was released in 2008 and has been widely distributed through schools, Parent-Teacher Associations, and health care providers.
- South Carolina has coordinated pandemic planning with southeastern states and regional federal officials.

## **Introduction: Pandemics and Seasonal Influenza**

Historically, about three times a century, an outbreak of influenza occurs with a virus that is new to the human immune system, resulting in a pandemic: the rapid worldwide spread of a disease. In about one-third of these outbreaks, a virus emerges which is particularly virulent, contagious and lethal, such as the “Spanish Flu” of 1918 that killed approximately 550,000 Americans and 100 million people worldwide in less than eight months. In March 2009, an influenza pandemic began in Mexico and the southwest United States. For the first time in forty years a new strain of influenza, H1N1 (2009), spread worldwide. While the H1N1 (2009) pandemic did not have the devastating results of the “Spanish Flu” of 1918, it did sicken roughly 60.8 million persons in the United States, causing 274,000 hospitalizations and 12,500 deaths. In South Carolina, from September 1, 2009 through June 26, 2010, there were 1,091 hospitalizations and 49 laboratory confirmed deaths due to the pandemic influenza, as reported to DHEC. This pandemic disproportionately affected younger, otherwise healthy persons, as well as pregnant women. Eighty-seven percent of the total deaths from this pandemic occurred in people under the age of 65, a significant departure from the pattern usually seen with seasonal influenza and many pandemics.

Seasonal influenza remains a serious public health concern. Seasonal influenza is caused by influenza viruses, which infect the respiratory tract (i.e., the nose, throat, lungs). Unlike many other viral respiratory infections, such as the common cold, the flu can cause severe illness and life-threatening complications in many people. According to the CDC, in the United States, on

average 5% to 20% of the population gets the flu and more than 200,000 people are hospitalized from seasonal flu-related complications. Flu seasons are unpredictable and can be severe. Over a period of 30 years, between 1976 and 2006, estimates of flu-associated deaths in the United States range from a low of about 3,000 to a high of about 49,000 people. Some people, such as older people, young children, pregnant women, and people with certain health conditions, such as asthma, heart disease or a weakened immune system, are at high risk for serious flu complications.

The effects of the flu are unpredictable and can vary from season to season, depending on the strain of the virus, when the flu vaccine is available, how many people get vaccinated and how well the vaccine is matched to the flu viruses that are causing illness. Regardless of the degree of illness, infection by an influenza virus causes loss of work and school time, the possibility of affecting less healthy family members and the risk of complications. No matter what strain is circulating or what its severity is, the public health message is the same nationally and here in South Carolina: the best way to prevent the flu is to get vaccinated.

The Department's efforts to prepare for seasonal influenza are directly tied to our efforts related to preparedness and response to a pandemic influenza. Each year the seasonal influenza response provides opportunities to strengthen our prevention messages about the disease, improve surveillance, epidemiology, and refine our system of vaccination.

## **Influenza Strains Today**

There are three types of influenza viruses, classified as A, B, or C, based on their antigenic composition. Type A viruses are subdivided into groups based on two surface proteins: hemagglutinin (HA) and neuroaminidase (NA) which are indicated as H1 through H6 and N1 through N9, respectively. Type A viruses are the ones of most concern to public health because they can be found in humans and animals. Surveillance of Influenza A viruses in animals is critical to detecting the emergence of novel viruses with the pandemic potential in humans.

Human influenza A and B viruses cause seasonal influenza every year. Influenza C infections are relatively uncommon, can cause mild respiratory illness, and have never been reported to cause epidemics. Because the changes in seasonal influenza viruses are generally incremental and viruses circulating during the Southern Hemisphere winter are similar to those that circulate in the coming winter in the Northern Hemisphere, scientists can predict with moderate accuracy which viruses will circulate during the influenza season. For example, the H1N1 (2009) virus appeared in spring of 2009, causing a pandemic, but continued into 2010 and now is one of the strains that is part of today's seasonal influenza cases. Seasonal influenza vaccines are well-matched to the currently circulating strains of influenza.

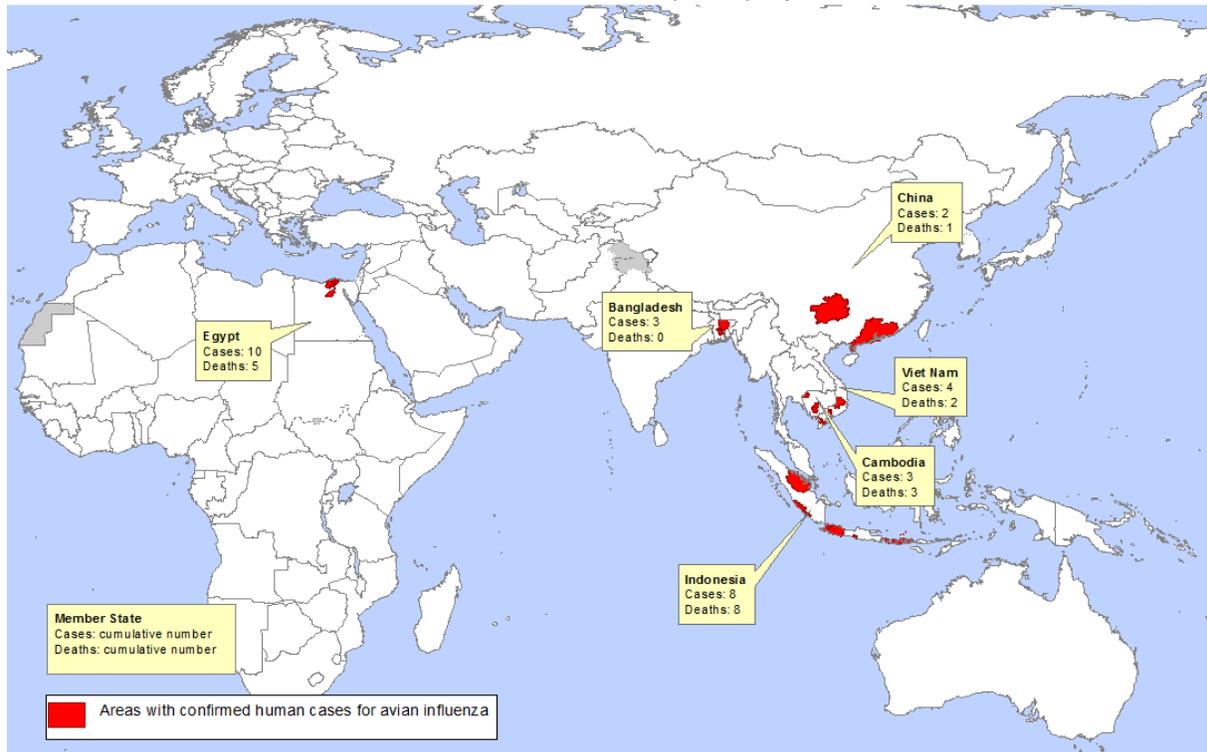
Pandemic influenza typically is caused by the emergence of a virulent new strain of influenza A to which most people have no immunity and for which there is no vaccine. This allows it to cause a global outbreak of serious illness. Currently, there are a number of strains of avian and swine influenza virus that are being monitored as potential pandemic strains.

## **Avian Influenza**

Influenza A(H5N1) disease is an avian (bird) flu virus that is endemic in wild birds throughout Asia, Africa and the Middle East. It has caused sporadic outbreaks in domestic poultry in many countries. Because A(H5N1) is so deadly to poultry, it is considered “highly pathogenic,” or highly disease causing. Human infection with A(H5N1) is rare. Most infections occurred after direct or close contact with poultry infected with A(H5N1). There is no evidence that this virus can spread easily between people. However, because of its highly pathogenic nature, and because viruses can mutate and become infectious between humans, the World Health Organization and the CDC closely monitor outbreaks of this influenza virus. Multiple strains of A(H5N1) have developed over the years so that multiple vaccine viruses must be considered for production of pandemic vaccines.

Since 2003, over 600 human infections with highly pathogenic A(H5N1) viruses have been reported to the World Health Organization (WHO) by 15 countries in Asia, Africa, Europe, and the Near East. There were 359 deaths as of August 2012 and 59% of the persons infected died from their illness. From January through August 2012, 30 human A(H5N1) cases and 19 deaths were reported from six countries— Bangladesh, Cambodia, China, Egypt, Indonesia and Viet Nam.

Areas with confirmed human cases for avian influenza A(H5N1) reported to WHO, 2012- to-date\*,



\*All dates refer to onset of illness  
Data as of 10 August 2012  
Source: WHO/HIP

The designations employed and the presentation of the material in this publication do not imply the expression of any opinion whatsoever on the part of the World Health Organization concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. Dotted and dashed lines on maps represent approximate border lines for which there may not yet be full agreement.  
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Two human cases of avian influenza A(H7N3) were reported from Mexico in 2012. Influenza A(H7) strains cause sporadic outbreaks in domestic poultry worldwide. Human cases

have been documented among persons with close contact to poultry. The cases in Mexico were mild conjunctivitis, contracted by workers directly exposed to poultry. There was no person-to-person transmission. A number of candidate A(H7) vaccine viruses are maintained by the Centers for Disease Control and the World Health Organization.

## Swine Influenza

Influenza viruses can spread from pigs to people and from people to pigs. A virus that normally circulates in swine but spreads to humans is called “variant.” Seasonal influenza vaccination does not protect against variant strains.

In 2011, twelve people contracted a swine influenza virus, A(H3N2)v in the U.S., most from direct exposure to pigs. This virus strain has circulated widely across the country among pigs since 2010. Beginning in July 2012, a number of outbreaks occurred among humans exposed to pigs, many at agricultural fairs. Between July and September 2012, a total of 305 people in 10 states contracted A(H3N2)v. Most cases were relatively mild, but there have been 16 hospitalizations and one death due to the disease. The virus strain has characteristics that make it easy to spread from pigs to people. Other swine flu strains have infected humans as well: there have been three human cases reported of swine flu A(H1N2)v and one case of swine flu A(H1N1)v. So far, no swine flu cases have been reported in South Carolina in 2012.

## Surveillance and Epidemiology

Each year, DHEC and U.S. public health experts monitor the spread and characteristics of influenza and other diseases. This activity is called disease surveillance. Influenza surveillance allows DHEC and the CDC to see what impact flu is having on the health of residents. Surveillance helps to:

- Determine whether the influenza virus is *what* is causing flu-like symptoms (Sometimes other diseases have influenza-like symptoms but are not influenza.)
- Understand which *new* flu viruses are circulating in South Carolina. (The types of influenza virus that infect people often change from one flu season to the next.)
- Tell us *when* the influenza virus first appears in the state, and also when it decreases,
- Determine *where* in the state the influenza virus is circulating
- Understand what types of vaccines are most likely to succeed the following year.

Surveillance can describe the trend of influenza in South Carolina, but it cannot tell exactly how many cases of influenza there are in the state. This is because not everyone who gets the influenza goes to the doctor to get tested, and there is no way of monitoring these unreported cases of flu.

In South Carolina, influenza surveillance consists of several components. Each component provides different types of information about influenza; together, they create a solid overview of influenza activity in the state. Surveillance methods include reporting of lab confirmed influenza hospitalizations, deaths, positive laboratory confirmatory tests, and positive rapid flu tests by healthcare providers and laboratories. Additionally, sentinel providers report influenza-like-illness to Disease Control.

Influenza seasons have been variable throughout the last four years in South Carolina. The 2008-09 season appeared to be an average season until the pandemic virus A(H1N1)2009 emerged in the spring. This led to a 2009-10 season in which the majority of influenza cases were seen early in the season (October) and influenza levels were extremely low during the traditional peak month of February. The 2010-11 season was considered a more typical season. However, the 2011-12 flu season was extremely unusual. In fact, CDC has characterized the season as “one that began late and was mild.”

From October, 2011 to July 7, 2012, 136 positive laboratory tests for influenza were reported in South Carolina. More than four times this number were reported during the 2010-11 season. There were 114 influenza associated hospitalizations and one influenza associated death reported. Influenza A (H1N1), A(H3N2), and B co-circulated throughout the season; however, the majority of positive specimens were influenza A(H1N1) and A(H3N2). Nationally, A(H3N2) was the predominant circulating strain.

Surveillance of animal health is also a key activity in South Carolina. Clemson University Livestock Poultry Health works closely with DHEC to provide surveillance information on animal and bird diseases that pose health threats to the human population. Beginning in 2006, Clemson University Livestock Poultry Health (CULPH), Clemson University Cooperative Extension Services, Clemson University Regulatory and Public Service Programs, and the South Carolina Department of Agriculture implemented biosecurity measures in the form of a grassroots program called SC Ag-Watch: Protecting South Carolina’s Agriculture through Awareness and Response Training. This program works with poultry producers and processors to prepare for terrorist incidents and to monitor for animal diseases, such as avian or swine influenza.

## **Influenza Vaccination in South Carolina**

The Advisory Committee on Immunization Practices recommends influenza vaccination for all persons age 6 months and older. Estimates of South Carolina’s influenza vaccination rates made by the Centers for Disease Control and Prevention for the 2010-11 and 2011-12 influenza seasons are presented in Table 1. Seasonal influenza vaccination during the 2010-11 flu season reached 46.6% of the population age 6 months and older. In 2011-12, coverage dropped by 4.5% to 42.1% of the population age 6 months and older. Persons age 65 and older are considered at high risk for complications from seasonal flu, and a seasonal vaccination rate of 72.6% was achieved in 2010-11. This declined to 65.7% in the 2011-12 flu season. There was an increase of 5.1% in the percentage of children age 6 months to 17 years who were vaccinated, to 50.6% in 2011-12. Influenza vaccination is now widely available in many communities through pharmacies and other health care providers. Public health information campaigns and outreach efforts may have contributed to higher vaccination rates among children.

**Table 1. Influenza Vaccination Coverage in South Carolina for 2010-11 and 2011-12**

<b>Population Group</b>	<b>CDC Interim Estimate of Seasonal Flu Vaccination Coverage 2010-2011</b>	<b>CDC Final Estimate of Seasonal Flu Vaccination Coverage 2011-2012</b>	<b>Difference</b>
Children age 6 months to 17 years	45.5%	50.6%	+5.1%
Persons 18 years or older	47.0%	39.6%	-7.4%
Persons ages 18 to 49 years at high risk	58.2%	34.4%	-23.8%
Persons ages 18 to 49 years not at high risk	37.9%	27.5%	-10.4%
Persons ages 50-64	47.7%	45.8%	-1.9%
Persons ages 65 years and older	72.6%	65.7%	-6.9%
Persons ages 6 months and older	46.6%	42.1%	-4.5%
Non-Hispanic white persons ages 6 months and older	46.8%	42.6%	-4.2%
Non-Hispanic black persons ages 6 months and older	40.1%	39.6%	-0.5%
Hispanic persons ages 6 months and older	61.6%	52.2%	-9.7%
Non-Hispanic other race/ethnicity ages 6 months and older	63.5%	39.5%	-24.0%

**Note:**

The final estimates of seasonal influenza vaccination coverage for South Carolina for August 2011-May 2012 are reported at <http://www.cdc.gov/flu/professionals/vaccination/reporti1112/reportii/index.htm> State-specific seasonal influenza vaccination coverage estimates were reported for August 2010-February 2011 in the June 10, 2011 issue of CDC's Morbidity and Mortality Weekly Report.

DHEC's influenza prevention messages to South Carolinians remains the same:

- Get an influenza vaccination every year. This is even more important for those in the high risk categories.
- Wash hands and cover your coughs and sneezes to prevent the spread of illness.
- If you are ill, stay home to prevent the spread of the disease to others.

## Key Pandemic Preparedness Issues

- **Federal funding reductions jeopardize public health preparedness efforts.** Federal funding for preparedness has been significantly reduced. The federal CDC Public Health Emergency Preparedness base grant that has supported emergency preparedness capacity throughout DHEC has been severely reduced, from \$14,497,322 in FY 2002-03, to \$8,593,244 in FY 2012-13, a reduction of 41% in the base annual funding over the ten years of the program. The ongoing reduction in base funding for public health preparedness has caused cut-backs in program personnel and jeopardizes preparedness efforts. Federal programs require a 10% state match each year: reductions in state funding for DHEC means that it is very difficult to identify sufficient state in-kind match for the grants. Federal match requirements for PHEP and HPP are projected to be approximately \$1,500,000 (10% of federal funds) for FY 2013-14.
- **Disease surveillance and response activities were provided via Federal funds.** The ability to identify, classify and determine populations at-risk to a newly emerging pathogen depends upon a robust public health infrastructure capable of providing timely disease surveillance and response information to decision-makers. A vast majority of staff engaged in all surveillance and response activities, including response to pandemic influenza, are supported by federal funds. Without this continued source of funding or additional state resources, the ability to respond to a large-scale infectious disease event would be severely limited.
- **Seasonal influenza vaccination for school children and low income families should be a priority in order to protect our citizens against influenza.** Most seasonal flu vaccinations are accomplished through the private sector with funding from Medicaid, Medicare, private insurance or out-of-pocket payments by consumers. Although vaccination rates have improved in recent years, fewer than half of all South Carolinians received a seasonal flu vaccination last year. It is important that a stable publicly-funded program be established to promote influenza vaccination and see that vaccinations are made available at low cost or no charge to people who cannot otherwise afford vaccination. The public health seasonal influenza program has no state funding and limited federal funding. DHEC provides only a small percentage of seasonal flu vaccinations and many low-income citizens do not get vaccinated. The response to H1N1 demonstrated the value and effectiveness of school-located vaccination clinics: an investment in protecting children against flu pays off for the entire population by reducing absenteeism from school and work.

## Online Resources

South Carolina Department of Health and Environmental Control Flu in South Carolina Website:  
<http://www.scdhec.gov/flu/index.htm>

South Carolina Department of Health and Environmental Control Flu Vaccination Clinic Finder:  
<http://www.scdhec.net/flu/clinics.asp>

Pandemic Influenza Ethics Task Force:  
<http://www.scdhec.gov/administration/ophp/pandemic-ethics.htm>

U.S. Department of Health and Human Services Pandemic Influenza website:  
<http://www.flu.gov/>

### **South Carolina Legislature Online Reports:**

South Carolina Prepares for Pandemic Influenza: Public Health Preparedness Progress Report, 2011

<http://www.scstatehouse.gov/reports/dhec/PandemicInfluenzaProgressReportNovember12011.pdf>

South Carolina Prepares for Pandemic Influenza: Public Health Preparedness Report, 2010

<http://www.scstatehouse.gov/archives/dhec/PandemicInfluenzaProgressReportFinal11032010.pdf>

South Carolina Responds to Pandemic Influenza: Public Health Preparedness Report, 2009

<http://www.scstatehouse.gov/archives/dhec/PandemicInfluenzaProgressReport110609Final.pdf>

South Carolina Prepares: Pandemic Influenza Preparedness Progress Report, 2008

<http://www.scstatehouse.gov/archives/dhec/PandemicInfluenzaProgressReportDecember2008.pdf>

South Carolina Prepares: Pandemic Influenza Progress Report, 2007

[http://www.scstatehouse.gov/archives/dhec/pandemicinfluenzaprogressreport2007\\_1.pdf](http://www.scstatehouse.gov/archives/dhec/pandemicinfluenzaprogressreport2007_1.pdf)

South Carolina Prepares: Pandemic Influenza Report, 2006

<http://www.scstatehouse.gov/archives/dhec/pandemicinfluenza.pdf>