Influenza and Pneumonia are a leading cause of death in the U.S. The sad part of these diseases is that they can easily be prevented by a vaccination, yet continue to cause disease and death for thousands each year. As highlighted by the emergence of novel H1N1 and the severity of the last flu season, continued vigilance and resources are necessary to lessen the burden caused by these diseases.

**Influenza**

Influenza is a highly contagious viral infection that is one of the most severe illnesses of the winter season. Depending on the severity of the virus, 15 to 61 million Americans contract influenza each year. Many confuse the flu with the common cold, but in actuality, the flu is much more serious. In the United States, the flu is responsible for 226,000 hospitalizations and an average of 36,000 deaths annually.

**Novel H1N1**

A new influenza subtype is novel H1N1, or “swine flu,” first identified in April 2009. Similarities between this influenza A virus and influenza viruses previously identified in swine were initially identified, although it is actually a mix of four different strains, including swine, avian, and human influenza. Novel H1N1 has been widespread during the 2009–2010 flu season and continues to infect people. While the risks from influenza viruses can be similar, there are often important differences between them too. Most of the information in this section is about normal seasonal influenza as scientists are still learning about novel H1N1.

**How Flu Spreads and Who Is At Risk**

Influenza is spread easily from person to person. An infected person needs only to cough, sneeze, or even talk in order to expel the virus into the air. Anyone can get influenza, especially when it is widespread in a community. People who are not healthy or well to begin with are particularly susceptible to the complications that can follow. This includes those with chronic lung disease, such as asthma, COPD (which includes emphysema and chronic bronchitis), bronchiectasis, or cystic fibrosis. Pregnant women, while also at risk from seasonal influenza, appear to be even more at risk from novel H1N1, along with younger adults. For anyone at high-risk, influenza is a very serious illness.

**Flu Symptoms**

Symptoms of influenza include fever, chills, body aches, headache, sore throat, cough, and a runny or stuffy nose. The influenza sufferer may also experience nausea, vomiting, or diarrhea, although these symptoms are more common among children.
Prevention With Vaccines

Seasonal influenza can be prevented with a high degree of success when a person receives the seasonal influenza vaccine. Health officials recommend influenza immunization for approximately 250 million Americans, including all children 6 months through 18 years of age.

Two vaccine options are available in the United States. The first is the flu shot. The viruses in the flu shot are inactivated so that someone receiving the vaccination cannot get influenza from it. Instead, protection develops in the form of substances called antibodies. The amount of antibodies in the body is greatest 1 or 2 months after vaccination and then gradually declines. The influenza shot is covered by Medicare and many other health plans. All persons 50 years of age and older or in other high-risk groups, such as those with asthma, should receive the flu shot annually. An American Lung Association study proved that the flu shot is safe for people with asthma.5

The second option for vaccination against the flu is FluMist, the only nasal spray approved for influenza vaccination. The nasal spray is made from a live but weakened virus. FluMist is only approved by the FDA for healthy people ages 2 to 49. It has not been proven safe for high-risk populations, such as those with asthma, who should receive the inactivated flu shot.6

The strains of influenza virus usually change each year, so people should be vaccinated each fall with the new vaccine. October 15th through November 15th is the best time to get vaccinated. However, it is never “too late” to get a flu shot since it only takes about 2 weeks until it starts offering protection and because the flu season can last through March. The 2009–2010 flu season has included two separate flu shots or sprays; one for seasonal flu and one for novel H1N1. Both are being distributed at record levels, although increased interest in vaccination has made it difficult at times during the season for everyone to find available shots when desired.

Prevention With Antivirals

Another tool in the fight against influenza are antiviral drugs. Two drugs are currently available for use in preventing or reducing the severity of symptoms associated with influenza infection: oseltamivir (Tamiflu) and zanamivir (Relenza). Oseltamivir comes in pill or liquid form, and zanamivir as a powder. When started shortly after symptoms first appear, antivirals can help decrease the severity of symptoms, shorten the duration of disease by one or two days, as well as prevent serious complications related to the flu.7

Vaccination Goals

Healthy People 2010 targets for influenza vaccination are 60 percent for persons with high-risk conditions aged 18-64 and 90 percent for those aged 65 years or older. No racial/ethnic group, at any age group, has met these standards. Methods for increasing vaccination levels include standing vaccination orders (compared to needing a specific order from
a healthcare provider for each patient) and reminder and recall systems in place to pursue vaccination of recommended groups.\(^8\)

One study estimated that 1,880 minority deaths could be prevented each year if these immunization gaps were eliminated. If the Healthy People 2010 goal of 90 percent vaccination coverage were achieved, 3,750 minority and 11,840 Caucasian deaths could be prevented annually. A total of 33,000 years of minority life could be gained if influenza vaccination rates were equal from age 65 on.\(^9\)

**Pneumonia**

Pneumonia is a serious infection of the lungs. The air sacs in the lungs become inflamed and fill with pus and other liquid, making it difficult for oxygen to reach the blood through them. If there is too little oxygen in the blood, then the body’s cells cannot work properly. Pneumonia can cause oxygen deprivation and the spread of infection through the body, which may lead to death.\(^10\)

**Who Has It**

No ongoing surveillance of pneumonia cases exists, so hospital discharges are the best indicator available for estimating the burden of this disease. In 2006, there were an estimated 589,000 hospital discharges in males (40.2 per 10,000) and 643,000 discharges in females (42.4 per 10,000) attributable to pneumonia. The highest pneumonia discharge rate that year was seen in those Americans 65 years of age and older, at 189.0 per 10,000.\(^11\)

**Cause**

Pneumonia does not have one single cause. Over 30 different agents can cause pneumonia, but the common ones are bacteria, viruses, mycoplasmas, other infectious agents such as fungi including pneumocystis, and various chemicals. Approximately half of pneumonia cases are believed to be caused by viruses and tend to result in less severe illness than bacteria-caused pneumonia. Most pneumonia in young children results from viral infection, including respiratory syncytial virus (RSV). The symptoms of viral pneumonia are similar to influenza symptoms and include fever, dry cough, headache, muscle pain, weakness, and increasing breathlessness.

**High Risk Groups**

People considered at high risk for pneumonia include the elderly (over 65 years of age), young children whose immune systems are not yet fully developed, and those with underlying health problems, such as chronic obstructive pulmonary disease (COPD), diabetes, and cardiovascular disease. Patients with diseases that impair the immune system, such as AIDS, those undergoing cancer therapy or organ transplantation, or patients with other chronic illnesses are particularly vulnerable.\(^12\)

**Prevention and Treatment**

One of the best ways to prevent pneumonia is to vaccinate against it. In addition, an annual flu shot can provide protection due to the close
The pneumococcal polysaccharide vaccine (PPV) is recommended for anyone over 65 years of age, those with serious long-term health problems, anyone with lowered infection resistance, all Alaskan Natives and certain Native American populations.

The pneumococcal conjugate vaccine (PCV) is also recommended for children less than 2 years of age and children between 2 and 5 years of age who have serious long-term health problems, lowered infection resistance, are Alaskan Native, Native American, African American, or attend a group day care center.13

Treatment for pneumonia caused by bacteria, and sometimes mycoplasma, usually involves antibiotics. All types of pneumonia usually require supportive treatment, including a proper diet, and may include oxygen to increase oxygen in the blood when needed.14 For some patients, medication to ease chest pain and to provide relief from violent coughing may also be necessary.

**Influenza and Pneumonia**

Influenza is often complicated by pneumonia, especially in the elderly. Because the two are linked so strongly, they are often grouped together for data reporting.

**Deaths**

Until 1936, pneumonia was the number one cause of death in the U.S. Since then, the use of antibiotics and vaccines has reduced its impact significantly. In 2006, pneumonia and influenza combined ranked as the nation’s eighth leading cause of death with 56,326. Pneumonia consistently accounts for the overwhelming majority of deaths between the two, as 55,477 people died of pneumonia in 2006.15

During the 2007–2008 influenza season, deaths associated with influenza and pneumonia peaked at 9.1 percent of all deaths per week. The proportion of deaths associated with influenza and pneumonia were above the epidemic threshold for 13 consecutive weeks beginning in January 2008.16

**Costs**

Influenza and pneumonia pose a great cost to the American economy. In 2005 influenza and pneumonia represented a cost of $40.2 billion to the U.S. economy, $6.0 billion in indirect costs and $34.2 billion in direct costs.17

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**Racial/Ethnic Differences**

**African Americans**

It is hard to know how many people of each race or national origin have pneumonia because no national reporting or monitoring system exists to capture diagnoses of the disease. The best available method for tracking differences
between races or ethnicities for influenza and pneumonia is through the number of deaths due to these diseases. African Americans have a much higher rate of death from influenza and pneumonia than do Caucasians. In 2006, the age-adjusted death rate due to influenza and pneumonia was 19.9 per 100,000 among African Americans, 12 percent higher than the rate of 17.8 per 100,000 among Caucasians (Figure 1).\(^8\)

In addition, African Americans are less likely to get vaccinated for influenza and pneumonia. In 2008, 25.8 percent of African Americans reported receiving a flu shot, a rate significantly lower than the nationwide average of 30.5 percent or the rate of 33.1 percent among Caucasians (Figure 2). A similarly significant gap occurred for pneumonia vaccinations, with only 42.8 percent of African Americans over 65 years of age receiving one, compared to 58 percent among all those over 65, and 62 percent among Caucasians over 65.\(^9\) This despite the pneumonia shot being covered by Medicare and available to all seniors.\(^20\)

Results from focus groups of African American patients who did not want to be immunized revealed they shared some misunderstandings about the flu common among the broader population, but the beliefs were more widespread. They believed that the vaccine could give people the flu. They also felt that it could be prevented by taking traditional anti-cold and “stay healthy” precautions, such as hand washing, taking vitamins, eating right, and getting enough sleep. Others expressed a strong distrust of the government, physicians and drug companies, and demonstrated a firm belief that they could control their own health status and outcomes.\(^21\)

One study compared opinions of older African Americans and health care providers about the influenza vaccine. Researchers found that providers were aware of older African Americans’ fear of the vaccine giving them the flu and distrust of the vaccine and healthcare system. However, the providers were not aware of concerns about allergic reactions and interactions with other medications. Addressing these beliefs and lack of trust and offering further information to African American patients may help to decrease the gap in vaccination rates between African Americans and the rest of the U.S.\(^22\)
Hispanics

Lack of surveillance and reporting limits the available knowledge about the incidence of pneumonia and influenza among Hispanic populations, as with other ethnic and racial groups. Here as well, the best information comes from mortality rates, where Hispanics fared much better compared to other groups. Hispanics had one of the lowest age-adjusted mortality rates due to influenza and pneumonia among all racial/ethnic groups in 2006 at 15.0 per 100,000 population (Figure 1, above). Hispanics were almost 16 percent less likely to die from influenza or pneumonia than Caucasians. However, in 2006, influenza/pneumonia ranked as the ninth leading cause of death in Hispanics overall and the seventh leading cause of death in the over 65 Hispanic population.

In 2008, 22.8 percent of Hispanics reported receiving a flu shot, a rate significantly lower than the nationwide average of 30.5 percent or the rate of 33.1 percent among Caucasians (Figure 2, above). A similarly significant gap occurred for pneumonia vaccinations, with only 35.3 percent of Hispanics over 65 years of age receiving one, compared to 58 percent among all those over 65, and 62 percent among Caucasians over 65. This is despite the pneumonia shot being covered by Medicare and available to all seniors.

Asian Americans and Native Hawaiians/Pacific Islanders

Lack of surveillance and reporting limits the available knowledge about the incidence of pneumonia and influenza among all ethnic and racial groups, but lack of data particularly limits knowledge about Asian Americans and Native Hawaiians/Pacific Islanders.

However, the little information available shows that Asian Americans and Native Hawaiians/Pacific Islanders bear a smaller burden from these diseases compared to other racial and ethnic groups. In 2006, there were 1,327 deaths due to influenza and pneumonia among Asians and Pacific Islanders, the lowest age-adjusted death rate of any racial or ethnic group at 12.8 per 100,000. Despite that, influenza and pneumonia ranked as the sixth leading cause of death overall and the fourth leading cause of death in those over the age of 65 among Asian Americans and Native Hawaiian/Pacific Islanders (Figure 1, above). These rankings are higher than what is seen among other groups.

Limited data are available on influenza and pneumonia vaccination rates for Asian Americans and Native Hawaiians/Pacific Islanders. Major national health surveys have begun to collect data on this group, but because of small sample sizes, estimates are not considered statistically accurate and are not published or released. Often analysts group Asian Americans and Native Hawaiians/Pacific Islanders with American Indians into the category of “Other Races.”

One survey with estimates for Asians found that influenza vaccinations for the 2006-07 season among those at high-risk and recommended for
vaccination were close to the national average for those 18-49 and 50-64 years of age. The rate for Asians 65 years of age and older was above the national average and significantly higher than during the 2005-06 season.28

A recent study compared vaccination rates of Caucasians, and Vietnamese Americans, and other Asian Americans (Figure 3). Vietnamese Americans had a higher rate of influenza vaccination (61%) than other Asian Americans (45%) and Caucasians (52%). Vietnamese Americans however, had a lower rate of pneumococcal vaccination (41%) than other Asian Americans (56%) and Caucasians (67%). This study indicates that health behaviors and outcomes can differ widely among Asian subgroups. Analyses of preventive care measures in Asian Americans should focus on subgroups to ensure accuracy and quality of assessments.29

A recent report on healthcare disparities found that one of the three largest disparities facing Asian Americans (compared to Caucasians) was in rates of adults 65 and over who had never received a pneumococcal vaccination. In addition, this disparity grew worse since the previous report.30

**American Indians/Alaska Natives**

Data is the most limited among American Indians and Alaska Natives due to the small populations from which national surveys have to sample. However, some data are available concerning mortality among these populations. In 2006, there were 261 deaths among American Indians and Alaska Natives due to, influenza and pneumonia. The age-adjusted death rate for these diseases (16.2 per 100,000) among these groups were lower than the rate among Caucasians (17.8 per 100,000) (Figure 1, above). Pneumonia and influenza ranked as the tenth leading cause of death overall and the seventh leading cause of death in those over the age of 65 in 2006 among American Indians and Alaska Natives.31

A recent study of the impact of novel H1N1 on American Indians and Alaska Natives found that these populations had a death rate from this disease that was four times greater than the rate among all others. This markedly higher burden may be due to greater levels of poverty, delays in accessing care, or chronic disease levels among these populations. Among those who died from novel H1N1, American Indians and Alaska Natives were much more likely to have had asthma or diabetes compared to other groups.32
During the 2006-07 influenza season, influenza vaccination among American Indians/Alaska Natives with high-risk conditions was above the national average for those 18-49 and 50-64 years, at 43.9 percent and 43.6 percent respectively. However, it was lower than the national average for those over 65 years at 63.1 percent.\textsuperscript{33}

A 2008 study found no disparities in influenza vaccination coverage, although pneumococcal vaccination coverage was lower among American Indian/Alaska Natives than Caucasians. This difference was attributed to sociodemographic risk factors. Regional variation indicated a need to monitor coverage and target interventions to reduce disparities within geographically and culturally diverse subpopulations of American Indians/Alaska Natives.\textsuperscript{34}

Resources

2. Ibid.
4. Ibid.
17. Unpublished data from the National Heart, Lung, and Blood Institute. 2007 provided upon special request.


