



**Trends in Pneumonia and Influenza
Morbidity and Mortality**

**American Lung Association
Research and Program Services
Epidemiology and Statistics Unit
April 2010**

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INTRODUCTION¹

Pneumonia and influenza are significant causes of morbidity and mortality. Together these conditions are ranked as the eighth leading cause of death in the United States.¹ Along with other respiratory conditions, such as the common cold and acute bronchitis, these disorders are substantial contributors to days lost from work and school. The following tables delineate information available from national surveys and statistics on trends in morbidity and mortality attributed to pneumonia and influenza. In addition, vaccine recommendations to prevent pneumonia and influenza are included.

MORTALITY

Effective with 1999 mortality data, the population standard used for calculating age-adjusted death rates was changed from the 1940 population to the 2000 population. This change has had three important outcomes: (i) provided age-adjusted rates that are less divergent from crude rates (ii) ensured that all government agencies use the same standard and (iii) corrected the public perception that age-adjustment to the 1940 population provides out-of-date statistics. Use of the 2000 population standard places greater weight on death rates at older ages and less weight on death rates at younger ages. Because most lung disease rates increase with age, death rates using the new standard are higher than those using the previous (1940) standard.

The tenth revision of International Classification of Diseases (ICD-10) replaced ICD-9 in coding and classifying mortality data from death certificates. The ICD is periodically revised to reflect changes in the medical field. This change has had several consequences: (i) new cause-of-death titles and corresponding cause-of-death codes, i.e. ICD-10 has alphanumeric categories rather than numeric categories, (ii) breaks in comparability of cause-of-death statistics, and (iii) restructuring of the leading causes of death.

A direct sequel rule applies to the tenth revision ICD code which states: If a person dies of pneumonia but had an underlying condition of which pneumonia was a result, then that underlying disease is considered the cause of death on the death certificate, not pneumonia. Therefore, deaths classified as pneumonia in ICD-9 are classified in ICD-10 to other causes. As a result of the new ICD-10 code, fewer deaths are attributable directly to pneumonia. Influenza was largely unaffected by the ICD-10 revision.

Please note the discrepancy in years of data reported for each measure of disease magnitude is due to limited availability of national data. Complete mortality data is available for 2006. This trend report contains the latest statistics and research findings available at the time of publication.

Sex and Race Specific Mortality Rates

Figures 1 and 2 compare the pneumonia and influenza age-adjusted death rates between 1979 and 2006 based on the 1940 and 2000 standard populations, respectively. Age-adjusted death rates are approximately 2.5 times greater for pneumonia and 2.2 times greater for influenza using

¹ Unless otherwise noted, terms such as higher or less are not intended to indicate statistical significance.

the 2000 standard population than the 1940 standard population.²

Table 1 shows the number of pneumonia and influenza deaths between 1979 and 2006 by race and sex. The overall number of deaths attributed to pneumonia and influenza in 2006 was 56,326; a 10.6% decrease from the previous year. For the second year in a row, pneumonia and influenza together remained the eighth leading cause of death in the U.S. in 2006.³ The 30% decrease seen in the number of overall deaths between 1998 and later years is predominantly due to the revision of the ICD codes.

Pneumonia consistently accounts for the overwhelming majority of these deaths. In 2006, 55,477 people died from pneumonia and 849 people died from influenza.⁴

Table 2 displays age-adjusted death rates for pneumonia and influenza between 1979 and 2006 by sex and race. In 2006, the age-adjusted death rate for pneumonia and influenza was 17.8 per 100,000 persons. Separately, the age-adjusted death rate was 17.5 per 100,000 for pneumonia and 0.3 per 100,000 for influenza. Due to the change in age-adjusted standard populations from the year 1940 to the year 2000, age-adjusted death rates for 1999 to 2006 are approximately 2.7 times greater than those seen in 1979 to 1998.⁵

The number of deaths due to pneumonia and influenza has been higher among females since the mid-1980s. However, females have age-adjusted death rates close to 30% lower than that in men because the female population in the U.S. is larger than the male population. In 2006, the age-adjusted death rates for females and males were 15.5 and 21.2 per 100,000, respectively.⁶

Figure 3 displays this trend.

In 2006, black men were approximately 16% more likely to die from pneumonia and influenza than white men (24.4 per 100,000 vs. 20.9 per 100,000) where as black and white women were almost equally likely to die from pneumonia and influenza (16.7 per 100,000 and 15.5 per 100,000). **Figure 4** display these trends.⁷

Table 3 describes the number of deaths and the age-adjusted death rate per 100,000 population due to pneumonia and influenza among people of Hispanic origin. In 2006, 2,966 Hispanics died from pneumonia and influenza; 2,927 of these deaths were from pneumonia. Age-adjusted death rates for pneumonia and influenza in Hispanics (15.0 per 100,000) were 15.7% lower than non-Hispanic whites (17.8 per 100,000) and 24.6% lower than non-Hispanic blacks (19.9 per 100,000).⁸

Age-Specific Mortality

For the 65 and over population, pneumonia and influenza are the seventh leading cause of death.⁹ Close to 90% of deaths due to these diseases occur in this age group.¹⁰ **Tables 4 and 5** delineate the number of deaths and age-specific death rates for pneumonia and influenza between 1979 and 2006.

Very few deaths are attributed to influenza in the population under age 55. As seen in the 2006 mortality statistics, the highest death rate for influenza is in those over age 85 (7.0 per

100,000).¹¹

INFLUENZA INCIDENCE

From 1982 to 1996, annual data on the incidence of pneumonia, influenza and other acute respiratory infections was collected by the National Health Interview Survey (NHIS), a multi-purpose health survey on the health of the civilian, non-institutionalized, household population of the U.S. However, when the National Center for Health Statistics revised the NHIS questionnaire in 1997, questions on pneumonia, influenza and acute respiratory conditions were eliminated due to data inconsistencies. The 2007 NHIS questionnaire contained a question on influenza and pneumonia morbidity for the first time in a decade. Since this question differed significantly from those on previous surveys, data from earlier years are not displayed as the data are not comparable. **Table 6** shows influenza and pneumonia prevalence cases and rates per thousand population for youth and adults in 2007. The data is also broken down by race, sex and age. In 2007, influenza and pneumonia rates were generally higher among youths compared to adults and higher among whites compared to blacks.¹²

INFLUENZA SURVEILLANCE

Although estimates on influenza incidence are not collected regularly, the Centers for Disease Control and Prevention (CDC) monitors seasonal and geographic influenza patterns through isolation of viral strains and through reports from selected, strategically located physicians. The most recent influenza season, 2009–2010, was atypical due to the emergence of 2009 novel H1N1. Whereas influenza activity usually does not start to increase until around October, the previous season saw a huge surge in early May that continued at extraordinary levels through the summer and fall months. After peaking in mid June, influenza activity decreased to a low during mid August, before increasing again as the normal flu season commenced. This second increase still occurred much earlier in the influenza season than is typical, with peak activity occurring in mid to late October.¹³ Since the end of December to late March, influenza activity has remained low, although higher than normal for the period between flu seasons.¹⁴

Between August 30th, 2009 and January 9th, 2010, the World Health Organization (WHO) and National Respiratory and Enteric Virus Surveillance System (NREVSS) laboratories in the U.S. reported testing more than 310,000 specimens for influenza viruses. About a quarter of these tests were positive for influenza (26.2%, 81,179), with the majority being influenza A viruses (99.7%). Of the influenza A specimens that were tested for subtype, 99.4% were 2009 H1N1 viruses.¹⁵

HOSPITAL DISCHARGES

Throughout the year, persons with weak immune systems and/or underlying health problems are at increased risk for complications from influenza infection and are more likely to be hospitalized. One major complication is pneumonia. The National Hospital Discharge Survey provides hospitalization data for pneumonia and influenza annually. Complete hospitalization data is available through 2006.

Table 7 delineates the most recent data on hospital discharges by diagnosis, sex, age and region of the United States for 2006. The majority of hospitalizations attributed to pneumonia were due to unspecified organisms (85.5%). Approximately 2.1 percent of discharges were attributed to pneumococcal pneumonia while other bacterial pneumonia was responsible for 8.6 percent of hospital discharges. Viral pneumonia was responsible for 2.3 percent of pneumonia discharges. When examined on a regional basis, the number of pneumonia discharges was highest in the South (438,000) and lowest in the West (210,000).¹⁶

Overall, an estimated 37,000 hospital discharges were attributed to influenza in 2006. When examined regionally, the greatest number of influenza discharges occurred in the South (14,000).¹⁷

Sex-Specific Hospital Discharges

Table 8 displays the number and rate of hospital discharges attributed to pneumonia and influenza by sex from 1988 to 2006. An estimated 589,000 discharges (40.2 per 10,000) in males and 643,000 discharges (42.4 per 10,000) in females were attributable to pneumonia in 2006. During 2006, an estimated 12,000 discharges in males (0.9 per 10,000) and 25,000 discharges (1.6 per 10,000) in females were attributed to influenza, respectively.¹⁸

Age-Specific Hospital Discharges

Table 9 delineates the age-specific trend in hospital discharges attributed to pneumonia and influenza from 1988 to 2006. In 2006, those 65 and older accounted for approximately 57% of the total number of pneumonia discharges. This trend is evident in **Figure 6**. The hospital discharge rate for pneumonia was lowest for those 15–44 years of age (8.5 per 10,000) followed by those under 15 (28.3 per 10,000) and those 45–64 years (33.4 per 10,000). Those over 65 had the highest hospital discharge rate at 189.0 per 10,000.¹⁹

The hospital discharge rate for influenza could not be calculated reliably for those 15–44 and 45–64 years of age due to the relatively small number of influenza discharges within these age groups. Those over 65 had the highest number of discharges (18,000) and the highest discharge rate of 4.9 per 10,000 persons.²⁰

Race-Specific Hospital Discharges

Table 10 displays the trend in hospital discharges attributed to pneumonia by race from 1988 to 2006. The 2006 discharge rate was highest in whites (32.9 per 10,000) and lowest in all other races (19.2 per 10,000). The rate in blacks was 30.5 per 10,000. These rates, however, should be interpreted with caution due to the large percentage of discharges for which race was not reported. **Figure 7** also displays this race-specific trend.²¹

Hospital discharges due to influenza by race are unreliable and are therefore not shown in this report.

VACCINATION RATES^{II}

Influenza is largely preventable by annual vaccination, and the major form of pneumonia is controllable by vaccination as well. Raw data from the Behavioral Risk Factor Surveillance System is analyzed by the American Lung Association to produce estimates of annual vaccination rates at the state level. **Figure 8** displays the state-specific percentage of persons aged 65 and older that reported ever having received a pneumococcal vaccination in 2008. Percentages ranged from a low of 55.1% in the District of Columbia to a high of 73.0% in New Hampshire. The United States average was 67.1%. Table 12 displays the same data for 1997-2008 and the change in rates over this period.²²

Vaccination with the flu shot has been associated with reductions in influenza-related respiratory illness and physician visits among all age groups, hospitalization and death among the elderly, young children and people at high risk, otitis media among children and work absenteeism among adults.

Although vaccination with the flu shot has increased substantially during the 1990's, further improvements in vaccine coverage levels are needed, chiefly among persons aged 65 years and older, whom are at higher risk of serious illness and death compared with all other age groups.

A national objective for the year 2010 is to increase influenza and pneumococcal vaccination levels above 90% among persons aged 65 years and older.²³ To monitor the states' progress towards achieving this objective, data from the 2008 Behavioral Risk Factor Surveillance System (BRFSS) is analyzed. Nationwide, the percentage of influenza vaccinations among persons aged 65 years and older was 70.9%. However, there was wide variation among the states; Nevada reported the lowest percentage (57.1%), while Colorado reported the highest percentage (77.9%). **Table 11** shows the state-specific percentages for those aged 65 and older who reported receiving a flu shot in the last year for 1997 to 2008 and the change in rates over this period.²⁴

Vaccination against influenza is a Medicare (Part B) reimbursable service. **Table 13** shows the percentage of fee-for-service Medicare beneficiaries aged 65 and older who received flu shots paid for by Medicare from 2000 to 2004. Percentages ranged from a low of 60.4% in DC to a high of 80.8% in Iowa in 2004. The United States average was 74.9%.²⁵ **Figure 9** also displays this data.

With clear and striking evidence of the effectiveness of the flu vaccine in reducing hospitalizations and deaths and in producing direct cost savings, providers and patients alike should take steps to ensure that people at high risk receive the flu shot each year. This recommendation also encompasses people with asthma. It had long been postulated that many asthma exacerbations were precipitated by influenza infection; yet vaccination rates among people with asthma were low due to the speculation by both medical professionals and the public that receiving the flu shot may worsen or exacerbate asthma. However, a study conducted by the

^{II} The CDC's Advisory Committee on Immunization Practices (ACIP) issues recommendations which include who should be vaccinated, when, how often and contraindications among other important information. Influenza vaccination is recommended annually; pneumonia vaccination is only required once for most people, although certain groups may need a second booster shot.

American Lung Association Asthma Clinical Research Centers network found that the opposite was true — receiving the flu shot was safe for people with asthma and did not cause higher rates of side effects compared with those who received a placebo.²⁶

Despite the results of this study, the percentage of people with asthma receiving the flu shot remains low. Currently, there is no surveillance system in place which provides state specific data on flu vaccination among children with asthma. Studies indicate that only about 10% of children with asthma receive the flu shot. The percent of adults with asthma who receive the flu shot was higher at approximately 45.6% in 2008. **Table 14** displays the percent of adults with asthma who have received the flu shot between 2003 and 2008. The percent of adults with asthma receiving the flu shot ranged from a low of 27.8% in Nevada to a high of 55.1% in Utah in 2008.²⁷ **Figure 10** displays this data.

Additional analysis by the American Lung Association found that if 100% of people with asthma received a flu shot, then close to 156,000 hospitalizations could be prevented each year.^{28,29,30,31}

VACCINATION RECOMMENDATIONS

Medicare (Part B) will pay 100 percent for pneumococcal vaccination and its administration, if ordered by a physician. The emergence of serious drug-resistant pneumococci accentuates the urgent need for pneumococcal immunization. Most adults need to receive the pneumococcal vaccination only once. Those patients at high risk should consult their physicians to find out if they need a second vaccination.

The greatest risk of pneumococcal pneumonia is usually among people who:³²

- Have chronic illnesses such as lung disease, heart disease, kidney disorders, sickle cell anemia, or diabetes.
- Are recovering from severe illness
- Reside in nursing homes or other chronic care facilities
- Are age 65 or older

There are two vaccine options available in the United States for influenza. One option is the nasal spray, FluMist, which is approved to prevent influenza illness in healthy people ages 2–49. The safety and effectiveness of FluMist in children under 2 years of age, persons 50 years of age and over, and people with asthma or other reactive airway diseases has not been established. FluMist should not be given for any reason to people with immune suppression or to people with chronic underlying medical conditions that may predispose them to severe flu infections. For all of the aforementioned people, the flu shot is indicated.³³

The Advisory Committee on Immunization Practices (ACIP) recommends annual influenza vaccination for everyone over 6 months of age. This recommendation differs from last year's in that everyone is now recommended to receive a flu shot, instead of only particular groups. Previously, only children and those with conditions that place them at increased risk for complications from influenza were included in the recommendations. The new recommendation is meant to remove barriers to receiving a flu shot and impart the importance of preventing influenza across the entire population.³⁴

ANTIVIRAL DRUGS

Vaccination is the primary means of preventing morbidity and mortality associated with influenza. Antiviral drugs are also important for the prevention and control of influenza. Two classes are available: adamantanes and neuraminidase inhibitors. Adamantanes are only active against influenza A viruses, but recently their effectiveness has decreased. Preliminary data from the 2009–2010 influenza season indicates that 81.8% of influenza A (H3N2) and 99.6% of influenza A (2009 H1N1) strains were resistant to adamantanes during this period. The CDC recommends the use of neuraminidase inhibitors for treatment and chemoprophylaxis of influenza A instead of the adamantane antiviral drugs until susceptibility to adamantanes drugs is reestablished among circulating influenza A viruses.³⁵

ECONOMIC COSTS^{III}

Together, pneumonia and influenza represented a cost to the U.S. economy in 2005 of \$40.2 billion, \$6.0 billion due to indirect costs and \$34.2 billion in direct costs.³⁶ In 2010, the economic costs of all lung diseases are projected to be approximately \$173.4 billion — \$108.9 billion in direct health expenditures and \$64.5 billions in indirect cost.³⁷

Glossary

Mortality is the term used to refer to deaths. Mortality rates are per 100,000 population and are usually age-adjusted to the 2000 U.S. standard population.

Age-Adjusted Mortality Rate: is a figure that is statistically adjusted to remove the distorting effect of age when comparing populations with different age structures. Most rates are age-adjusted to the 2000 U.S. standard population.

Morbidity is defined as illness and is the term used to refer to measures of illness, such as hospitalizations or emergency room visits.

Prevalence: is the number of existing cases of a particular condition, disease or other occurrence (e.g. persons smoking) at a given time. Prevalence rates are the number of existing cases in a particular population quantity at a given time (e.g. 10 cases per 100,000). Chronic disease prevalence is reported per 1,000 population.

Incidence: is the number of new cases occurring in a population during a particular period of time (e.g. 100 cases of tuberculosis from 1998 to 2002). Incidence rates are reported per 100 or 100,000 population.

^{III} Economic costs are divided into direct and indirect costs. Direct costs are expenditures for hospital care, physician and other professional care, nursing home care and drugs. Indirect costs represent lost earnings due to illness and lost future earnings by those who died from given illness.

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Table 1: Pneumonia and Influenza - Number of Deaths, by Race and Sex, 1979-1998, 1999-2006

Cause of Death	All Other Races ⁽¹⁾											
	All Race			White			Total			Black		
	Both	Male	Female	Both	Male	Female	Both	Male	Female	Both	Male	Female
Pneumonia & Influenza												
1979 ⁽²⁾	45,030	23,725	21,305	39,803	20,544	19,259	5,227	3,181	2,046	4,740	2,884	1,856
1981	53,731	27,059	26,672	47,919	23,531	24,388	5,812	3,528	2,284	5,276	3,201	2,075
1983	55,854	28,007	27,847	49,996	24,463	25,533	5,858	3,544	2,314	5,234	3,190	2,044
1985	67,615	33,159	34,456	60,508	29,028	31,480	7,107	4,131	2,976	6,338	3,664	2,674
1987	69,225	33,562	35,663	61,811	29,284	32,527	7,414	4,278	3,136	6,565	3,795	2,770
1989	76,550	35,701	40,849	67,853	30,892	36,961	8,697	4,809	3,888	7,585	4,168	3,417
1991	77,860	36,214	41,646	69,276	31,589	37,687	8,584	4,625	3,959	7,372	3,938	3,434
1993	82,820	37,996	44,824	73,720	33,151	40,569	9,100	4,845	4,255	7,724	4,051	3,673
1995	82,923	37,787	45,136	73,641	32,948	40,693	9,282	4,839	4,443	7,803	4,019	3,784
1996	83,727	37,991	45,736	74,194	32,924	41,270	9,533	5,067	4,466	7,963	4,170	3,793
1997	86,449	39,284	47,165	76,875	34,386	42,489	9,574	4,898	4,676	7,920	3,978	3,848
1998	91,871	40,979	50,892	81,659	35,795	45,864	10,212	5,184	5,028	8,326	4,178	4,148
1999 ⁽³⁾	63,730	27,718	36,012	56,694	24,281	32,413	7,036	3,437	3,599	5,876	2,825	3,051
2000	65,313	28,658	36,655	57,914	25,002	32,912	7,399	3,656	3,743	5,990	2,915	3,075
2001	62,034	27,342	34,692	54,774	23,744	31,030	7,260	3,598	3,662	5,771	2,813	2,958
2002	65,681	28,918	36,763	58,346	25,381	32,965	7,335	3,537	3,798	5,871	2,768	3,103
2003	65,163	28,778	36,385	57,645	25,009	32,636	7,518	3,769	3,749	5,872	2,906	2,966
2004	59,664	26,861	32,803	52,430	23,348	29,082	7,234	3,513	3,721	5,700	2,775	2,925
2005	63,001	28,052	34,949	55,540	24,425	31,115	7,461	3,627	3,834	5,780	2,729	3,051
2006	56,326	25,650	30,676	49,401	22,310	27,091	6,925	3,340	3,585	5,311	2,486	2,825
Pneumonia												
1979 ⁽²⁾	44,426	23,493	20,933	39,253	20,340	18,913	5,173	3,153	2,020	4,697	2,862	1,835
1981	50,725	25,954	24,771	45,079	22,498	22,581	5,646	3,456	2,190	5,130	3,137	1,993
1983	54,423	27,464	26,959	48,616	23,943	24,673	5,807	3,521	2,286	5,194	3,171	2,023
1985	65,561	32,422	33,139	58,561	28,347	30,214	7,000	4,075	2,925	6,247	3,616	2,631
1987	68,593	33,310	35,283	61,216	29,048	32,168	7,414	4,278	3,136	6,565	3,795	2,770
1989	74,957	35,151	39,806	66,344	30,379	35,965	8,613	4,772	3,841	7,521	4,141	3,380
1991	76,723	35,781	40,942	68,207	31,187	37,020	8,516	4,594	3,922	7,320	3,915	3,405
1993	81,776	37,607	44,169	72,728	32,785	39,943	9,048	4,822	4,226	7,677	4,028	3,649
1995	82,317	37,565	44,752	73,075	32,742	40,333	9,242	4,823	4,419	7,772	4,008	3,764
1996	82,982	37,722	45,260	73,499	32,678	40,821	9,483	5,044	4,439	7,929	4,156	3,773
1997	85,729	39,013	46,716	76,194	34,135	42,059	9,535	4,878	4,657	7,894	3,965	3,929
1998	90,147	40,395	49,752	79,992	35,235	44,757	10,155	5,160	4,995	8,293	4,165	4,128
1999 ⁽³⁾	62,065	27,116	34,949	55,120	23,712	31,408	6,945	3,404	3,541	5,810	2,801	3,009
2000	63,548	27,994	35,554	56,252	24,385	31,867	7,296	3,609	3,687	5,909	2,880	3,029
2001	61,777	27,241	34,536	54,545	23,656	30,889	7,232	3,585	3,647	5,771	2,813	2,958
2002	64,954	28,629	36,325	57,660	25,111	32,549	7,294	3,518	3,776	5,841	2,753	3,088
2003	63,371	28,079	35,292	55,992	24,369	31,623	7,379	3,710	3,669	5,775	2,869	2,906
2004	58,564	26,440	32,124	51,397	22,960	28,437	7,167	3,480	3,687	5,650	2,750	2,900
2005	61,189	27,395	33,794	53,830	23,816	30,014	7,359	3,579	3,780	5,711	2,697	3,014
2006	55,477	25,288	30,189	48,613	21,978	26,635	6,864	3,310	3,554	5,270	2,465	2,805

(Continued on Next Page)

Table 1 cont: Pneumonia and Influenza - Number of Deaths, by Race and Sex, 1979-1998, 1999-2006

Cause of Death	All Race			White			All Other Races ⁽¹⁾					
							Total			Black		
	Both	Male	Female	Both	Male	Female	Both	Male	Female	Both	Male	Female
Influenza												
1979 ⁽²⁾	604	232	372	550	204	346	54	28	26	43	22	21
1981	3,006	1,105	1,901	2,840	1,033	1,807	166	72	94	146	64	82
1983	1,431	543	888	1,380	520	860	51	23	28	40	19	21
1985	2,054	737	1,317	1,947	681	1,266	107	56	51	91	48	43
1987	632	252	380	595	236	359	37	16	21	22	10	12
1989	1,593	550	1,043	1,509	513	996	84	37	47	64	27	37
1991	1,137	433	704	1,069	402	667	68	31	37	52	23	29
1993	1,044	389	655	992	366	626	52	23	29	47	23	24
1995	606	222	384	566	206	360	40	16	24	31	11	20
1996	745	269	476	695	246	449	50	23	27	34	14	20
1997	720	271	449	681	251	430	39	20	19	26	13	13
1998	1,724	584	1,140	1,667	560	1,107	57	24	33	33	13	20
1999 ⁽³⁾	1,665	602	1,063	1,574	569	1,005	91	33	58	66	24	42
2000	1,765	664	1,101	1,662	617	1,045	103	47	56	81	35	46
2001	257	101	156	229	88	141	28	13	15	20	10	10
2002	727	289	438	686	270	416	41	19	22	30	15	15
2003	1,792	699	1,093	1,653	640	1,013	139	59	80	97	37	60
2004	1,100	421	679	1,033	388	645	67	33	34	50	25	25
2005	1,812	657	1,155	1,710	609	1,101	102	48	54	69	32	37
2006	849	362	487	788	332	456	61	30	31	41	21	20

Source: Centers for Disease Control and Prevention. National Center for Health Statistics. National Vital Statistics Report. Deaths: Final Data for 2006. April 17, 2009. Vol 57 No 11.

Notes:

(1) All races other than white.

(2) International Classification of Diseases, 9th Revision (ICD-9) Code 480-487.

(3) International Classification of Diseases, 10th Revision (ICD-10) Code J10-J18.

Table 2: Pneumonia & Influenza - Age-Adjusted Death Rates per 100,000 population, by Sex and Race, 1979-1998, 1999-2006 ^(1,2)

Cause of Death	All Other Races ⁽³⁾											
	All Race			White			Total			Black		
	Both	Male	Female	Both	Male	Female	Both	Male	Female	Both	Male	Female
Pneumonia & Influenza												
1979 ⁽⁴⁾	11.4	15.6	8.4	10.7	14.6	8.0	16.1	22.8	10.8	17.2	24.6	11.4
1981	12.3	16.6	9.2	11.6	15.6	9.0	16.3	24.0	10.5	17.7	26.4	11.3
1983	11.8	16.2	8.8	11.3	15.3	8.6	14.9	22.1	9.6	16.2	24.3	10.2
1985	13.4	18.2	10.1	12.8	17.4	9.8	16.8	24.2	11.4	18.5	26.8	12.4
1987	13.1	17.7	10.0	12.5	16.8	9.7	16.4	23.5	11.1	18.2	26.4	12.2
1989	13.7	17.9	10.7	13.0	16.9	10.3	17.8	24.9	12.5	19.8	27.9	13.8
1991	13.4	17.5	10.6	12.8	16.6	10.2	16.8	23.2	12.2	18.7	26.2	13.5
1993	13.5	17.5	10.7	12.9	16.6	10.4	16.8	23.3	12.3	18.6	25.9	13.5
1995	12.9	16.5	10.4	12.4	15.7	10.1	16.1	22.0	12.0	17.8	24.5	13.2
1996	12.8	16.2	10.4	12.2	15.2	10.1	15.9	22.0	11.6	17.8	24.8	12.9
1997	12.9	16.2	10.5	12.4	15.5	10.2	15.4	20.6	11.8	17.2	23.0	13.1
1998	13.2	16.3	11.0	12.7	15.5	10.7	15.6	20.9	11.9	17.4	23.5	13.2
1999 ⁽⁵⁾	23.6	28.0	20.8	23.4	27.7	20.8	23.3	29.2	19.5	25.6	32.4	21.3
2000	23.7	28.1	20.9	23.5	27.7	20.9	24.0	30.2	19.9	25.8	32.7	21.4
2001	22.0	26.6	19.2	21.7	26.0	19.1	22.8	30.1	18.4	24.1	32.3	19.4
2002	22.6	27.0	19.9	22.6	26.7	19.9	22.2	28.4	18.5	24.0	30.8	20.0
2003	22.0	26.1	19.4	21.9	25.7	19.5	21.8	28.5	17.6	23.3	30.9	18.7
2004	19.8	23.7	17.3	19.6	23.3	17.2	20.4	25.9	17.0	22.3	29.1	18.1
2005	20.3	23.9	17.9	20.2	23.6	18.0	20.0	25.1	16.8	21.7	26.9	18.4
2006	17.8	21.2	15.5	17.7	20.9	15.5	18.0	22.7	15.1	19.6	24.4	16.7
Pneumonia												
1979 ⁽⁴⁾	11.2	15.4	8.2	10.5	14.5	7.8	16.0	22.6	10.7	17.1	24.4	11.3
1981	11.6	16.0	8.6	11.0	14.9	8.4	15.9	23.5	10.1	17.3	25.9	10.9
1983	11.5	15.9	8.6	11.0	15.0	8.3	14.8	22.0	9.5	16.1	24.2	10.1
1985	13.0	17.8	9.8	12.5	17.0	9.5	16.6	23.9	11.2	18.3	26.5	12.2
1987	13.0	17.6	9.9	12.4	16.7	9.6	16.3	23.4	11.0	18.1	26.4	12.1
1989	13.4	17.7	10.4	12.7	16.6	10.0	17.6	24.7	12.4	19.7	27.7	13.7
1991	13.2	17.3	10.4	12.5	16.4	10.0	16.7	23.1	12.1	18.5	26.0	13.4
1993	13.3	17.3	10.6	12.7	16.3	10.2	16.7	23.2	12.2	18.4	25.8	13.4
1995	12.8	16.4	10.3	12.3	15.6	10.0	16.0	21.9	11.9	17.8	24.5	13.2
1996	12.7	16.0	10.3	12.1	15.1	10.0	15.8	21.9	11.5	17.7	24.7	12.8
1997	12.8	16.1	10.4	12.3	15.4	10.1	15.3	20.5	11.8	17.1	22.9	13.1
1998	13.0	16.1	10.7	12.4	15.3	10.4	15.6	20.8	11.9	17.4	23.5	13.1
1999 ⁽⁵⁾	22.9	27.4	20.2	22.8	27	20.2	23	29	19.2	25.3	32.1	21.1
2000	23.0	27.5	20.2	22.8	27.0	20.2	23.7	29.9	19.6	25.5	32.3	21.0
2001	21.9	26.5	19.1	21.6	25.9	19.0	22.7	30.0	18.4	24.1	32.2	19.4
2002	22.4	26.7	19.6	22.3	26.4	19.7	22.1	28.2	18.4	23.9	30.7	19.9
2003	21.4	25.5	18.8	21.3	25.0	18.9	21.4	28.2	17.2	23.0	30.6	18.4
2004	19.4	23.3	16.9	19.2	22.9	16.8	20.2	25.7	16.8	22.1	28.9	18.0
2005	19.7	23.3	17.3	19.6	23.0	17.4	19.7	24.8	16.5	21.5	26.6	18.2
2006	17.5	20.9	15.3	17.4	20.6	15.2	17.9	22.5	15.0	19.5	24.2	16.6

(Continued on Next Page)

Table 2 cont: Pneumonia & Influenza - Age-Adjusted Death Rates per 100,000 population, by Sex and Race, 1979-1998, 1999-2006 ^(1,2)

Cause of Death	All Race			White			All Other Races ⁽³⁾						
	Both	Male	Female	Both	Male	Female	Total			Black			
							Both	Male	Female	Both	Male	Female	
Influenza													
1979 ⁽⁴⁾	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.2	0.1	
1981	0.6	0.6	0.6	0.6	0.7	0.6	0.4	0.4	0.4	0.5	0.5	0.4	
1983	0.3	0.3	0.2	0.3	0.3	0.3	0.1	0.1	0.1	0.1	0.1	0.1	
1985	0.3	0.4	0.3	0.3	0.4	0.3	0.2	0.3	0.2	0.3	0.3	0.2	
1987	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	
1989	0.3	0.3	0.3	0.3	0.3	0.3	0.1	0.2	0.1	0.1	0.2	0.1	
1991	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.1	0.1	0.1	0.1	
1993	0.2	0.2	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	
1995	0.1	0.1	0.1	0.1	0.1	0.1	0.0	*	0.1	0.1	*	0.1	
1996	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	*	0.1	
1997	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	*	0.1	*	*	
1998	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.0	*	0.0	
1999 ⁽⁵⁾	0.6	0.6	0.6	0.6	0.6	0.6	0.3	0.2	0.3	0.3	0.2	0.3	
2000	0.6	0.6	0.6	0.6	0.7	0.7	0.3	0.4	0.3	0.3	0.4	0.3	
2001	0.1	0.1	0.1	0.1	0.1	0.1	0.1	*	*	0.1	*	*	
2002	0.2	0.3	0.2	0.2	0.3	0.2*	0.1	*	0.1	0.1	*	*	
2003	0.6	0.6	0.6	0.6	0.6	0.8	0.3	0.2	0.3	0.3	0.2	0.3	
2004	0.4	0.4	0.4	0.4	0.4	0.4	0.2	0.2	0.2	0.2	0.2	0.2	
2005	0.6	0.6	0.6	0.6	0.6	0.6	0.3	0.3	0.2	0.2	0.3	0.2	
2006	0.3	0.3	0.2	0.3	0.3	0.3	0.1	0.2	0.1	0.1	0.2	0.1	

Source: Centers for Disease Control and Prevention. National Center for Health Statistics. National Vital Statistics Report. Deaths: Final Data for 2006. April 17, 2009. Vol 57 No 11.

Notes:

- (1) Rates for the years 1979-1998 are age-adjusted to the 1940 U.S. Standard Population.
 - (2) Rates for the years 1999-2005 are age-adjusted to the 2000 U.S. Standard Population.
 - (3) All races other than white.
 - (4) International Classification of Diseases, 9th Revision (ICD-9) Code 480-487.
 - (5) International Classification of Diseases, 10th Revision (ICD-10) Code J10-J18.
- * Figure does not meet standard of reliability or precision.

Table 3: Pneumonia and Influenza - Number of Deaths and Age-Adjusted Death Rates per 100,000 population by Race and Hispanic Origin, 1999-2006^(1,2)

Cause of Death	Hispanic		Non-Hispanic		Non-Hispanic White		Non-Hispanic Black	
	Number	Rate	Number	Rate	Number	Rate	Number	Rate
Pneumonia & Influenza								
1999	2,246	15.6	61,218	23.9	54,280	23.7	5,794	26.1
2000	2,625	17.0	62,440	23.9	55,135	23.7	5,920	26.4
2001	2,722	20.5	59,103	22.0	51,952	21.7	5,686	24.3
2002	2,824	19.2	62,657	22.7	55,419	22.6	5,803	24.3
2003	2,948	18.4	62,042	22.2	54,617	22.0	5,798	23.6
2004	2,912	19.6	56,581	22.5	49,456	17.1	5,620	19.9
2005	3,085	16.8	59,804	20.5	52,431	20.4	5,716	22.1
2006	2,966	15.0	53,249	17.9	46,419	17.8	5,242	19.9
Pneumonia								
1999	2,201	15.3	59,606	23.2	52,758	23.0	5,729	25.8
2000	2,578	16.7	60,724	23.3	53,522	23.0	5,839	26.0
2001	2,709	20.4	58,859	21.9	51,736	21.6	5,666	24.3
2002	2,805	19.2	61,953	22.5	54,756	22.4	5,773	24.2
2003	2,873	18.1	60,328	21.6	53,039	21.4	5,703	23.2
2004	2,886	19.2	55,510	22.3	48,452	17.0	5,570	19.5
2005	3,030	16.6	58,052	19.9	50,777	19.7	5,649	21.8
2006	2,927	14.9	52,441	17.7	45,670	17.5	5,202	19.7
Influenza								
1999	45	0.3	1,612	0.6	1,522	0.6	65	0.3
2000	47	0.3	1,716	0.6	1,613	0.7	81	0.4
2001	13	*	244	0.1	216	0.1	20	0.1
2002	19	*	704	0.2	663	0.3	30	0.1
2003	75	0.3	1,714	0.6	1,578	0.7	95	0.3
2004	26	0.4	1,071	0.2	1,004	0.1	50	0.5
2005	55	0.2	1,752	0.6	1,654	0.6	67	0.2
2006	39	0.1	808	0.3	749	0.3	40	0.1

Source: Centers for Disease Control and Prevention. National Center for Health Statistics. National Vital Statistics Report. Deaths: Final Data for 2006. April 17, 2009. Vol 57 No 14.

Notes:

(1) International Classification of Diseases, 9th Revision (ICD-9) Code 480-487.

(2) International Classification of Diseases, 10th Revision (ICD-10) Code J10-J18.

Table 4: Pneumonia and Influenza - Number of Deaths by 10-Year Age Groups, 1979-1998, 1999-2006

Death	Total	< 1	1 - 4	5-14	15-24	25 - 34	35 - 44	45 - 54	55 - 64	65 - 74	75 - 84	85+
Pneumonia & Influenza												
1979 ⁽¹⁾	45,030	1,129	258	212	341	524	813	1,634	3,511	7,337	13,995	15,266
1981	53,731	809	240	161	327	571	864	1,677	4,033	8,349	16,751	19,935
1983	55,854	769	232	130	270	577	816	1,498	3,743	8,438	17,293	22,073
1985	67,615	705	219	130	251	630	1,047	1,623	4,130	9,828	21,296	27,705
1987	69,225	674	199	94	268	759	1,177	1,626	3,879	10,026	21,777	28,739
1989	76,550	636	228	122	271	881	1,415	1,707	3,880	10,418	24,022	32,955
1991	77,860	607	207	135	256	759	1,444	1,738	3,738	10,223	24,595	34,144
1993	82,820	530	182	135	251	724	1,551	1,879	3,704	10,823	25,859	37,171
1995	82,923	492	156	128	207	622	1,480	2,079	3,458	10,737	25,985	37,575
1996	83,727	496	168	136	203	568	1,461	2,093	3,613	10,597	26,355	38,027
1997	86,449	421	180	141	220	534	1,394	2,233	3,759	10,535	27,358	39,668
1998	91,871	441	146	121	215	531	1,400	2,167	3,856	11,005	28,857	43,127
1999 ⁽²⁾	63,730	320	130	93	179	339	1,063	1,697	2,625	6,861	19,192	31,229
2000	65,313	289	103	87	189	364	1,068	1,774	2,879	7,189	19,821	31,547
2001	62,034	299	112	92	181	339	983	1,801	2,704	6,650	18,677	30,191
2002	65,681	263	110	91	167	345	971	1,918	2,987	6,847	19,984	31,995
2003	65,163	322	163	147	224	373	992	2,140	3,130	6,831	19,442	31,397
2004	59,664	273	119	82	185	303	891	1,897	3,154	6,382	18,066	28,312
2005	63,001	265	110	106	172	354	934	2,183	3,422	6,623	18,563	30,267
2006	56,326	263	125	68	184	335	841	2,007	3,154	6,061	16,668	26,617
Pneumonia												
1979 ⁽¹⁾	44,426	1,120	250	204	332	516	807	1,624	3,483	7,253	13,826	15,001
1981	50,725	796	232	149	309	540	845	1,629	3,886	7,950	15,812	18,563
1983	54,423	763	224	127	263	568	802	1,479	3,676	8,255	16,893	21,358
1985	65,561	698	213	123	244	622	1,032	1,592	4,040	9,614	20,698	26,637
1987	68,593	666	193	93	262	751	1,161	1,609	3,842	9,962	21,622	28,425
1989	74,957	624	220	108	255	866	1,384	1,676	3,808	10,246	23,591	32,164
1991	76,723	591	192	124	246	744	1,423	1,712	3,684	10,086	24,304	33,603
1993	81,776	520	168	122	243	716	1,532	1,857	3,658	10,709	25,601	36,639
1995	82,317	485	149	121	201	621	1,466	2,061	3,427	10,657	25,850	37,275
1996	82,982	481	165	128	195	560	1,447	2,072	3,575	10,513	26,172	37,664
1997	85,729	409	170	128	216	527	1,376	2,215	3,728	10,457	37,196	39,301
1998	90,147	435	143	107	205	530	1,383	2,146	3,795	10,853	28,344	42,201
1999 ⁽²⁾	62,065	307	118	82	168	330	1,047	1,671	2,554	6,697	18,741	30,348
2000	63,548	280	93	76	176	351	1,046	1,726	2,786	6,990	19,329	30,692
2001	61,777	292	106	80	174	329	977	1,786	2,683	6,629	18,621	30,095
2002	64,954	256	105	79	160	341	963	1,901	2,957	6,791	19,807	31,591
2003	63,317	291	104	101	194	360	968	2,079	3,045	6,648	18,985	30,594
2004	58,564	255	101	69	178	299	875	1,872	3,099	6,283	17,775	27,758
2005	61,189	246	91	86	160	343	915	2,138	3,356	6,486	18,081	29,285
2006	55,477	245	106	43	171	329	831	1,981	3,111	5,980	16,432	26,245

(Continued on Next Page)

Table 4 cntd: Pneumonia & Influenza - Number of Deaths by 10-Year Age Groups, 1979-1998, 1999-2006

Death	Total	< 1	1 - 4	5-14	15-24	25 - 34	35 - 44	45 - 54	55 - 64	65 - 74	75 - 84	85+
Influenza												
1979 ⁽¹⁾	604	9	8	8	9	8	6	10	28	84	169	265
1981	3,006	13	8	12	18	31	19	48	147	399	939	1,372
1983	1,431	6	8	3	7	9	14	19	67	183	400	715
1985	2,054	7	6	7	7	8	15	31	90	214	598	1,068
1987	632	8	6	1	6	8	16	17	37	64	155	314
1989	1,593	12	8	14	16	15	31	31	72	172	431	791
1991	1,137	16	15	11	10	15	21	26	54	137	291	541
1993	1,044	10	14	13	8	8	19	22	46	114	258	532
1995	606	7	7	7	6	1	14	18	31	80	135	300
1996	745	15	3	8	8	8	14	21	38	84	183	363
1997	720	12	10	13	4	7	18	18	31	78	162	367
1998	1,724	6	3	14	10	1	17	21	61	152	513	926
1999 ⁽²⁾	1,665	13	12	11	11	9	16	26	71	164	451	881
2000	1,765	9	10	11	13	13	22	48	93	199	492	855
2001	257	7	6	12	7	10	6	15	21	21	56	96
2002	727	7	5	12	7	4	8	17	30	56	177	404
2003	1,792	31	59	46	30	13	24	61	85	183	457	803
2004	1,100	18	18	13	7	4	16	25	55	99	291	554
2005	1,812	19	19	20	12	11	19	45	66	137	482	982
2006	849	18	19	25	13	6	10	26	43	81	236	372

Source: Centers for Disease Control and Prevention. National Center for Health Statistics. National Vital Statistics Report. Deaths: Final Data for 2006. April 17, 2009. Vol 57 No 14.

Notes:

(1) International Classification of Diseases, 9th Revision (ICD-9) Code 480-487.

(2) International Classification of Diseases, 10th Revision (ICD-10) Code J10-J18.

Table 5: Pneumonia & Influenza - Age-Adjusted & Age-Specific Death Rates per 100,000 population, 1979-1998,1999-2006

Cause of Death	Total ⁽¹⁾	< 1	1 - 4	5 - 14	15 - 24	25 - 34	35 - 44	45 - 54	55 - 64	65 - 74	75 - 84	85+
Pneumonia & Influenza												
1979 ⁽²⁾	20.0	32.3	2.0	0.6	0.8	1.5	3.2	7.1	16.4	47.8	184.2	649.9
1981	23.4	22.3	1.8	0.5	0.8	1.5	3.3	7.4	18.4	52.5	209.9	848.6
1983	23.9	21.1	1.7	0.4	0.7	1.4	2.8	6.7	16.9	51.4	205.2	876.5
1985	28.4	18.7	1.5	0.4	0.6	1.5	3.3	7.2	18.7	58.3	239.5	1,038.7
1987	28.6	17.7	1.4	0.3	0.7	1.8	3.4	7.0	17.8	57.5	232.3	1,018.0
1989	31.0	15.7	1.6	0.4	0.7	2.0	3.9	6.9	18.3	58.3	243.9	1,110.4
1991	30.9	14.8	1.4	0.4	0.7	1.8	3.7	6.8	17.8	55.9	238.5	1,080.5
1993	32.1	13.2	1.2	0.4	0.7	1.7	3.8	6.6	17.7	58.1	241.2	1,089.0
1995	31.6	12.6	1.0	0.3	0.6	1.5	3.5	6.7	16.4	57.2	233.2	1,035.7
1996	31.5	12.7	1.1	0.4	0.6	1.4	3.4	6.5	16.9	56.8	230.6	1,010.9
1997	32.3	10.8	1.2	0.4	0.6	1.3	3.2	6.6	17.2	57.0	233.7	1,024.7
1998	34.0	11.2	1.0	0.3	0.6	1.4	3.1	6.3	17.0	59.8	241.4	1,063.9
1999 ⁽³⁾	23.4	8.4	0.9	0.2	0.5	0.9	2.4	4.7	11.2	37.7	158.0	748.0
2000	23.7	7.5	0.7	0.2	0.5	1.0	2.4	4.8	12.0	39.6	161.0	734.4
2001	21.8	7.4	0.7	0.2	0.5	0.9	2.2	4.6	10.7	36.3	148.5	685.6
2002	22.8	65.5	0.7	0.2	0.4	0.9	2.2	4.8	11.2	37.5	156.9	696.6
2003	22.4	8.0	1.0	0.4	0.5	0.9	2.2	5.2	11.2	37.3	151.1	666.1
2004	19.8	6.7	0.7	0.2	0.4	0.8	2.0	4.6	10.9	34.6	139.3	582.6
2005	20.3	6.5	0.7	0.3	0.4	0.9	2.1	5.1	11.3	35.5	142.2	593.9
2006	17.8	6.4	0.8	0.2	0.4	0.8	1.9	4.6	10.0	32.0	127.8	502.5
Pneumonia												
1979 ⁽²⁾	19.8	32.1	2.0	0.6	0.8	1.4	3.2	7.1	16.2	47.3	181.9	682.7
1981	22.1	21.9	1.7	0.4	0.7	1.4	3.2	7.2	17.7	50.0	198.0	790.2
1983	23.3	21.0	1.6	0.4	0.6	1.4	2.7	6.6	16.6	50.3	200.4	848.2
1985	27.6	18.6	1.5	0.4	0.6	1.5	3.3	7.1	18.3	57.0	232.8	998.7
1987	28.3	17.5	1.3	0.3	0.7	1.8	3.4	7.0	17.7	57.2	230.6	1,006.0
1989	30.4	15.4	1.5	0.3	0.7	2.0	3.8	6.8	17.9	57.4	239.5	1,083.0
1991	30.8	14.4	1.3	0.3	0.7	1.7	3.6	6.7	17.5	55.2	235.6	1,063.0
1993	31.1	13.0	1.1	0.3	0.7	1.7	3.8	6.5	17.5	57.5	238.8	1,073.0
1995	31.3	12.4	0.9	0.3	0.6	1.5	3.5	6.6	16.2	56.8	231.9	1,027.0
1996	31.3	12.8	1.1	0.3	0.5	1.4	3.3	6.4	16.7	56.3	229.0	1,001.3
1997	32.0	10.7	1.1	0.3	0.6	1.3	3.1	6.6	17.0	56.5	232.3	1,015.2
1998	33.4	11.5	0.9	0.3	0.6	1.4	3.1	6.2	16.7	59.0	237.1	1,041.1
1999 ⁽³⁾	22.8	8.0	0.8	0.2	0.4	0.9	2.3	4.7	10.9	36.8	154.3	726.9
2000	23.1	7.3	0.6	0.2	0.5	0.9	2.3	4.6	11.6	38.5	157.0	714.5
2001	21.7	7.2	0.7	0.2	0.4	0.8	2.2	4.6	10.6	36.2	148.1	683.4
2002	22.5	6.3	0.7	0.2	0.4	0.9	2.1	4.7	11.1	37.2	155.5	687.8
2003	21.8	7.3	0.7	0.2	0.5	0.9	2.2	5.1	10.9	36.3	147.5	649.1
2004	19.4	6.3	0.6	0.2	0.4	0.8	2.0	4.5	10.7	34.0	137.0	571.2
2005	19.7	6.0	0.6	0.2	0.4	0.9	2.1	5.0	11.1	34.8	138.5	574.7
2006	17.5	5.9	0.7	0.1	0.4	0.8	1.9	4.6	9.8	31.6	125.9	495.5

(Continued on Next Page)

Table 5 cntd: Pneumonia & Influenza - Age-Adjusted & Age-Specific Death Rates per 100,000 population, 1979-1998,1999-2006

Cause of Death	Total ⁽¹⁾	< 1	1 - 4	5-14	15 - 24	25 - 34	35 - 44	45 - 54	55 - 64	65 - 74	75 - 84	85+
Influenza												
1979 ⁽²⁾	0.3	*	*	*	*	*	*	*	0.1	0.5	2.2	12.1
1981	1.3	*	*	*	*	0.1	*	0.2	0.7	2.5	11.8	58.4
1983	0.6	*	*	*	*	*	*	*	0.3	1.1	4.7	28.4
1985	0.9	*	*	*	*	*	*	0.1	0.4	1.3	6.7	40.0
1987	0.3	*	*	*	*	*	*	*	0.2	0.4	1.7	11.1
1989	0.6	*	*	*	*	*	0.1	0.1	0.3	1.0	4.4	26.7
1991	0.5	*	*	*	*	*	0.1	0.1	0.3	0.7	2.8	17.1
1993	0.4	*	*	*	*	*	*	0.1	0.2	0.6	2.4	15.6
1995	0.2	*	*	*	*	*	*	*	0.1	0.4	1.2	8.3
1996	0.3	*	*	*	*	*	*	0.6	0.2	0.5	1.6	9.7
1997	0.3	*	*	*	*	*	*	*	0.1	0.4	1.4	9.5
1998	0.6	*	*	*	*	*	*	0.1	0.3	0.8	4.3	22.8
1999 ⁽³⁾	0.6	*	*	*	*	*	*	0.1	0.3	0.9	3.7	21.1
2000	0.6	*	*	*	*	*	0.0	0.1	0.4	1.1	4.0	19.9
2001	0.1	*	*	*	*	*	*	*	0.1	0.1	0.4	2.2
2002	0.3	*	*	*	*	*	*	*	0.1	0.3	1.4	8.8
2003	0.6	0.8	0.4	0.1	0.1	*	0.1	0.1	0.3	1.0	3.6	17.0
2004	0.4	*	*	*	*	*	*	0.1	0.2	0.5	2.2	11.4
2005	0.6	*	*	0.0	*	*	*	0.1	0.2	0.7	3.7	19.3
2006	0.3	*	*	0.1	*	*	*	0.1	0.1	0.4	1.8	7.0

Source: Centers for Disease Control and Prevention. National Center for Health Statistics. National Vital Statistics Report. Deaths: Final Data for 2006. April 17, 2009. Vol 57 No 14.

Notes:

* Figure does not meet standard of reliability or precision - estimate is based on fewer than 20 deaths.

(1) Total rates are age-adjusted.

(2) International Classification of Diseases, 9th Revision (ICD-9) Code 480-487.

(3) International Classification of Diseases, 10th Revision (ICD-10) Code J10-J18.

Table 6: Influenza & Pneumonia - Number of Cases and Rate per 1,000 population Among Youth and Adults by Race, Sex and Age, 2007⁽¹⁾

Race/Age	Total		Male		Female	
	Number	Rate	Number	Rate	Number	Rate
Total						
Under 18 Total	4,447,893	64.6	2,170,938	61.7	2,276,955	67.6
<5	1,153,817	60.5	545,564	56.0	608,253	65.1
5-17	3,294,076	66.2	1,625,374	63.8	1,668,702	68.6
Over 18 Total	11,021,357	63.1	4,845,737	56.2	6,175,620	69.8
18-44	4,986,690	48.4	2,254,218	43.9	2,732,472	52.9
45-65	4,458,288	62.2	1,939,938	55.6	2,518,350	68.3
65+	1,576,379	45.4	651,581	44.0	924,798	46.5
White						
Under 18 Total	4,107,538	72.6	2,057,665	70.8	2,049,873	74.4
<5	1,081,009	69.3	504,687	63.0	576,322	75.8
5-17	3,026,529	73.9	1,552,978	73.8	1,473,551	73.9
Over 18 Total	10,259,485	56.2	4,563,343	51.3	5,696,142	60.9
18-44	4,605,240	52.5	2,132,574	48.1	2,472,666	56.9
45-65	4,147,225	65.7	1,793,406	57.8	2,353,819	73.3
65+	1,507,020	47.7	637,363	46.9	869,657	48.4
Black						
Under 18 Total	340,355	27.7	113,273	18.4	227,082	37.0
<5	72,808	20.9	40,877	23.7	31,931	18.2
5-17	267,547	30.4	72,396	16.3	195,151	44.5
Over 18 Total	761,872	28.3	282,394	23.4	479,478	32.2
18-44	381,450	25.1	121,644	17.4	259,806	31.6
45-65	311,063	36.2	146,532	38.1	164,531	34.7
65+	69,359	22.2	14,218	11.7	55,141	28.8

Source: Centers for Disease Control and Prevention. National Center for Health Statistics. National Health Interview Survey 2007. Analysis by the American Lung Association, Research and Program Services Division using SPSS and SUDAAN software.

Notes:

(1) Adults were asked "During the past twelve months have you had influenza or pneumonia?"; data on children was obtained by asking parents or guardians "During the past twelve months, has a doctor or other health professional told you that [child] had influenza or pneumonia?" Youth and adult data should not be compared due to these two different questions.

Table 7: Pneumonia & Influenza - Number of First-Listed Hospital Discharges by Diagnosis, Sex, Age, & Geographic Region, 2006

Diagnosis	Total ⁽¹⁾	Sex		Age				Geographic Region			
		Male	Female	<15	15-44	45-64	65+	North-East	Mid-West	South	West
<i>(Number in Thousands)</i>											
Pneumonia (480-486), Total Discharges ⁽³⁾	1,232	589	643	172	107	250	704	233	351	438	210
Viral Pneumonia (480) ⁽³⁾	28	14	14	19	--	--	5 ⁽²⁾	--	10	10	5 ⁽²⁾
Due To Respiratory Syncytial Virus (480.1)	13	7 ⁽²⁾	6 ⁽²⁾	11	--	--	--	--	--	5 ⁽²⁾	--
Unspecified (480.9)	13	6 ⁽²⁾	7 ⁽²⁾	7 ⁽²⁾	--	--	5 ⁽²⁾	--	5 ⁽²⁾	--	--
Pneumococcal Pneumonia (481)	26	11	15	--	--	8 ⁽²⁾	14	--	7 ⁽²⁾	12	--
Other Bacterial Pneumonia (482) ⁽³⁾	106	57	49	9 ⁽²⁾	9 ⁽²⁾	22	66	18	28	32	28
Due to Pseudomonas (482.1)	17	8 ⁽²⁾	9 ⁽²⁾	--	--	5 ⁽²⁾	9 ⁽²⁾	--	--	7 ⁽²⁾	6 ⁽²⁾
Due to Hemophilus Influenzae (482.2)	8	--	--	--	--	--	6 ⁽²⁾	--	--	--	--
Due to Streptococcus (482.3)	6	--	--	--	--	--	--	--	--	--	--
Due to Staphylococcus (482.4)	39	21	18	--	--	6 ⁽²⁾	28	6 ⁽²⁾	12	11	11
Due to Other Specified Bacteria (482.8)	14	9 ⁽²⁾	5 ⁽²⁾	--	--	--	10	--	5 ⁽²⁾	6 ⁽²⁾	--
Unspecified (482.9)	17	8 ⁽²⁾	9 ⁽²⁾	5 ⁽²⁾	--	--	8 ⁽²⁾	--	--	--	6 ⁽²⁾
Pneumonia Due to Other Specified Organism (483)	7 ⁽²⁾	--	--	--	--	--	--	--	--	--	--
Bronchopneumonia, Organism Unspecified (485)	13	7 ⁽²⁾	5 ⁽²⁾	6 ⁽²⁾	--	--	--	--	--	6 ⁽²⁾	--
Pneumonia, Organism Unspecified (486)	1,053	496	557	132	91	216	615	205	302	376	170
Influenza (487), Total Discharges ⁽³⁾	37	12	25	10	--	--	18	--	--	14	--
With Pneumonia (487.0)	12	--	7 ⁽²⁾	--	--	--	6 ⁽²⁾	--	--	--	--
With Other Respiratory Manifestations (487.1)	23	7 ⁽²⁾	16	5 ⁽²⁾	--	--	12	--	--	8 ⁽²⁾	--

Source: Centers for Disease Control and Prevention. National Center For Health Statistics. National Hospital Discharge Survey, 2006. Unpublished Data provided by NCHS upon special request.

Notes:

(1) Due to rounding, total pneumonia discharges (ICD Codes 480-486) shown in this table may differ from those shown in tables 9 and 10.

(2) Estimates of 5,000-10,000 to be used with caution.

(3) Total may differ due to estimates of less than 5,000 not being shown.

-- Estimates of less than 5,000 are not shown.

Table 8: Pneumonia & Influenza - Number & Rate per 10,000 population of First-Listed Hospital Discharges, by Type & Sex, 1988-2006

Year	Pneumonia ⁽¹⁾						Influenza ⁽²⁾					
	Total ⁽³⁾		Males		Females		Total ⁽³⁾		Males		Females	
	Number	Rate	Number	Rate	Number	Rate	Number	Rate	Number	Rate	Number	Rate
1988	924,000	37.9	472,000	40.0	452,000	35.9	45,000	1.8	16,000	1.4	29,000	2.3
1989	1,033,000	41.9	544,000	45.6	489,000	38.5	45,000	1.8	17,000	1.4	28,000	2.2
1990	1,052,000	42.2	530,000	43.8	522,000	40.6	44,000	1.8	15,000	1.2	29,000	2.3
1991	1,089,000	43.5	545,000	44.3	544,000	42.2	26,000	1.0	12,000	1.0	15,000	1.2
1992	1,059,000	41.8	535,000	43.5	524,000	40.1	13,000	0.5	5,000 ⁽⁴⁾	0.4 ⁽⁴⁾	8,000 ⁽⁴⁾	0.6 ⁽⁴⁾
1993	1,184,000	46.2	598,000	48.0	586,000	44.5	25,000	1.0	12,000	1.0	14,000	1.1
1994	1,191,000	46.0	599,000	47.6	591,000	44.4	31,000	1.2	14,000	1.1	17,000	1.3
1995	1,246,000	47.6	610,000	48.0	636,000	47.4	19,000	0.7	7,000 ⁽⁴⁾	0.6 ⁽⁴⁾	12,000	0.9
1996	1,202,000	45.5	574,000	44.6	628,000	46.4	21,000	0.8	9,000 ⁽⁴⁾	0.7 ⁽⁴⁾	12,000	0.9
1997	1,304,000	48.2	634,000	47.9	665,000	48.2	19,000	0.7	11,000	0.8	7,000 ⁽⁴⁾	0.5 ⁽⁴⁾
1998	1,328,000	48.6	638,000	47.8	690,000	49.4	34,000	1.2	16,000	1.2	18,000	1.3
1999	1,379,000	50	668,000	49.6	707,000	50.2	37,000	1.3	14,000	1.0	23,000	1.6
2000	1,282,000	46.1	583,000	42.9	699,000	49.2	39,000	1.4	16,000	1.2	23,000	1.6
2001	1,300,000	45.8	641,000	46.2	659,000	45.5	15,000	0.5	9,000 ⁽⁴⁾	0.6 ⁽⁴⁾	6,000 ⁽⁴⁾	0.4 ⁽⁴⁾
2002	1,312,000	45.7	618,000	44	694,000	47.3	28,000	1.0	12,000	0.9	15,000	1.0
2003	1,393,000	48.1	678,000	47.7	715,000	48.5	70,000	2.4	34,000	2.4	36,000	2.5
2004	1,329,000	45.5	637,000	44.4	692,000	46.5	20,000	0.7	9000 ⁽⁴⁾	0.7 ⁽⁴⁾	11,000	0.7
2005	1,368,000	46.3	651,000	44.9	717,000	47.7	62,000	2.1	29,000	2.0	33,000	2.2
2006	1,232,000	41.3	589,000	40.2	643,000	42.4	37,000	1.2	12,000	0.9	25,000	1.6

Source: Centers for Disease Control and Prevention. National Center For Health Statistics. National Hospital Discharge Survey, 1988-2006. Unpublished Data provided by NCHS upon special request.

Notes:

(1) ICD-9-CM Codes 480-486.

(2) ICD-9-CM Code 487.

(3) Total number of discharges may not equal the sum of male and female discharges due to rounding and the exclusion of estimates that do not meet the standards of reliability or precision.

(4) Estimates of 5,000-10,000, and corresponding rates, should be used with caution.

Table 9: Pneumonia & Influenza - Number & Rate per 10,000 population of First-Listed Hospital Discharges by Type & Age, 1988-2006

Year	Pneumonia ⁽¹⁾								Influenza ⁽¹⁾							
	<15		15-44		45-64		65+		<15		15-44		45-64		65+	
	Number	Rate	Number	Rate	Number	Rate	Number	Rate	Number	Rate	Number	Rate	Number	Rate	Number	Rate
1988	184,000	34.7	111,000	9.7	139,000	30.3	490,000	161.3	*	*	8,000 ⁽³⁾	0.7 ⁽³⁾	10,000	2.2	22,000	7.2
1989	220,000	40.9	136,000	11.8	145,000	31.2	532,000	171.8	*	*	14,000	1.2	7,000 ⁽³⁾	1.5 ⁽³⁾	19,000	6.1
1990	211,000	38.5	141,000	12.1	153,000	32.7	546,000	172.9	*	*	10,000	0.9	6,000 ⁽³⁾	1.3 ⁽³⁾	23,000	7.3
1991	207,000	37.5	126,000	10.8	141,000	30.2	582,000	183.3	6,000 ⁽³⁾	1.1 ⁽³⁾	8,000 ⁽³⁾	0.7 ⁽³⁾	6,000 ⁽³⁾	1.3 ⁽³⁾	7,000 ⁽³⁾	2.2 ⁽³⁾
1992	208,000	37.2	135,000	11.5	161,000	33.2	556,000	172.1	*	*	*	*	*	*	6,000 ⁽³⁾	1.9 ⁽³⁾
1993	209,000	36.9	142,000	12.1	191,000	38.5	642,000	195.9	*	*	8,000 ⁽³⁾	0.7	*	*	11,000	3.4
1994	199,000	34.7	147,000	12.5	191,000	37.6	627,000	189.1	*	*	*	*	7,000 ⁽³⁾	1.4 ⁽³⁾	15,000	4.5
1995	243,000	42.1	154,000	13.0	161,000	30.9	687,000	205.0	*	*	*	*	*	*	7,000 ⁽³⁾	2.1 ⁽³⁾
1996	190,000	33.0	140,000	11.8	173,000	32.3	699,000	206.3	*	*	6,000 ⁽³⁾	1.0 ⁽³⁾	*	*	9,000 ⁽³⁾	2.7 ⁽³⁾
1997	194,000	32.5	124,000	10.2	179,000	32.4	780,000	230.9	*	*	*	*	*	*	10,000	3.0
1998	211,000	35.2	131,000	10.7	226,000	39.6	760,000	223.0	9,000 ⁽³⁾	1.5 ⁽³⁾	7,000 ⁽³⁾	0.6 ⁽³⁾	9,000 ⁽³⁾	1.6 ⁽³⁾	13,000	3.8
1999	208,000	34.5	123,000	10.1	218,000	36.9	810,000	236.6	6,000 ⁽³⁾	1.0 ⁽³⁾	6,000 ⁽³⁾	0.5 ⁽³⁾	6,000 ⁽³⁾	1.0 ⁽³⁾	18,000	5.3
2000	173,000	28.6	128,000	10.5	218,000	35.8	763,000	221.2	6000 ⁽³⁾	1.0 ⁽³⁾	*	*	6,000 ⁰	1.0 ⁽³⁾	23,000	6.7
2001	192,000	31.8	118,000	9.6	212,000	32.9	756,000	214.2	7,000 ⁽³⁾	1.2 ⁽³⁾	*	*	*	*	*	*
2002	203,000	33.5	117,000	9.4	216,000	32.4	776,000	218.0	12,000	2.0	*	*	6,000 ⁽³⁾	0.9 ⁽³⁾	7,000 ⁽³⁾	2.0 ⁽³⁾
2003	198,000	32.6	124,000	10.0	265,000	38.6	806,000	224.4	35,000	5.8	7,000 ⁽³⁾	0.6 ⁽³⁾	9,000 ⁽³⁾	1.5 ⁽³⁾	19,000	5.4
2004	182,000	29.8	104,000	8.3	244,000	34.5	800,000	220.4	6,000 ⁽³⁾	1.0	*	0.03 ⁽³⁾	*	0.4 ⁽³⁾	11,000	3.2
2005	193,000	31.9	110,000	8.8	251,000	34.5	814,000	221.3	14,000	2.4	*	0.27	8,000 ⁽³⁾	1.2	36,000	9.8
2006	172,000	28.3	107,000	8.5	250,000	33.4	704,000	189.0	10,000	1.6	*	*	*	*	18,000	4.9

Source: Centers for Disease Control and Prevention. National Center For Health Statistics. National Hospital Discharge Survey, 1988-2006. Unpublished Data provided by NCHS upon special request.

Notes:

(1) ICD-9-CM Codes 480-486.

(2) ICD-9-CM Code 487.

(3) Estimates of 5,000-10,000, and corresponding rates, should be used with caution.

* Estimates less than 5,000 are not shown.

Table 10: Pneumonia - Number & Rate per 10,000 population of First-Listed Hospital Discharges by Race, 1988-2006 ⁽¹⁾

Year	Number of Discharges			Rate per 100,000		
	White ⁽²⁾	Black	Other ⁽³⁾	White ⁽²⁾	Black	Other ⁽³⁾
1988	713,000	111,000	32,000	34.6	36.7	37.7
1989	760,000	144,000	28,000	36.6	47.6	44.3
1990	748,000	124,000	26,000	35.7	40.3	29.0
1991	749,000	129,000	34,000	35.7	41.6	34.1
1992	687,000	132,000	34,000	32.4	42.2	32.5
1993	756,000	143,000	38,000	35.4	44.9	35.1
1994	771,000	146,000	45,000	35.8	45.1	40.3
1995	829,000	171,000	33,000	38.2	52.0	29.2
1996	786,000	149,000	49,000	35.8	44.5	40.7
1997	868,000	153,000	50,000	39.0	43.4	39.8
1998	890,000	154,000	53,000	39.7	43.3	40.1
1999	891,000	153,000	61,000	39.4	42.4	45.1
2000	839,000	137,000	31,000	36.9	38.4	17.7
2001	853,000	138,000	40,000	37.2	38.3	22.2
2002	842,000	151,000	40,000	36.3	41.4	21.2
2003	894,000	138,000	51,000	38.3	37.5	26.5
2004	855,000	123,000	45,000	36.4	33.0	22.7
2005	888,000	138,000	36,000	37.5	36.6	17.7
2006	787,000	116,000	41,000	32.9	30.5	19.2

Source: Centers for Disease Control and Prevention. National Center For Health Statistics. National Hospital Discharge Survey, 1988-2006. Unpublished Data provided by NCHS upon special request.

Notes:

(1) ICD-9-CM Codes 480-486

(2) Between 1988 and 2004, the number of discharges not reporting race increased dramatically. It appears that hospital discharges in whites might be disproportionately underestimated. For this reason, comparisons between races should be made with caution.

(3) All races other than whites and blacks.

Table 11: Percentage of Adults 65 Years & Older Who Reported Receiving a Flu Shot Within the Past Year by State, 1997-2008

State	Influenza Shot										% Difference 1997-2008
	1997%	1999%	2001%	2002%	2003%	2004%	2005%	2006%	2007%	2008%	
Alabama	62.6	64.6	65.9	64.8	70.2	66.1	60.8	62.0	69.0	68.7	9.8
Alaska	58.3	59.8	62.8	69.5	66.5	64.1	61.1	62.5	64.4	68.5	17.5
Arizona	72.9	71.3	61.8	69.7	68.9	66.1	62.5	65.4	69.0	71.4	-2.1
Arkansas	61.1	67.3	63.2	69.0	71.0	68.7	65.2	68.6	70.5	70.5	15.5
California	65.5	72.2	68.9	71.5	72.5	70.9	65.9	66.9	69.3	70.0	6.8
Colorado	74.4	74.8	77.4	73.3	74.2	78.8	74.2	75.9	76.4	77.9	4.7
Connecticut	67.2	64.8	69.1	71.4	74.3	73.0	71.1	71.1	74.7	74.6	10.9
Delaware	68.6	67.7	67.6	71.5	70.0	69.2	65.7	70.3	73.8	69.6	1.4
DC	54.3	55.8	55.5	58.7	63.0	54.8	54.7	61.2	60.2	61.3	12.9
Florida	62.3	63.3	54.9	57.0	65.9	65.1	55.6	61.5	64.7	63.5	2.0
Georgia	58.5	57.0	62.2	59.3	67.0	64.4	60.8	64.8	67.6	65.2	11.5
Hawaii	71.1	74.1	79.0	73.9	67.0	n/a	72.1	75.7	78.5	77.1	8.4
Idaho	66.4	69.0	65.1	65.1	70.3	66.1	63.9	65.2	69.1	68.4	3.1
Illinois	67.8	67.5	62.2	61.1	76.4	65.3	55.9	66.4	68.1	63.2	-6.7
Indiana	62.5	66.2	65.7	66.3	66.1	64.2	64.0	65.3	71.9	68.6	9.8
Iowa	69.7	69.6	72.8	73.5	77.5	74.0	71.7	73.6	74.6	76.5	9.7
Kansas	61.5	67.0	68.5	68.6	70.8	68.1	65.9	72.5	73.5	72.0	17.0
Kentucky	61.2	68.4	60.9	65.7	69.1	64.2	62.4	66.0	73.2	73.6	20.3
Louisiana	58.4	60.3	56.1	57.3	68.3	68.6	62.4	64.4	68.4	68.0	16.5
Maine	72.1	73.7	71.5	73.8	74.8	72.1	67.7	72.0	77.2	74.6	3.4
Maryland	63.4	62.6	67.3	65.9	68.4	64.6	59.3	66.1	71.3	69.8	10.0
Massachusetts	66.0	69.4	70.6	72.6	74.9	70.5	69.8	73.1	77.9	72.0	9.1
Michigan	63.6	70.0	60.4	67.7	67.5	66.9	67.1	71.3	70.9	70.0	10.1
Minnesota	69.0	64.0	70.1	76.6	80.3	78.2	78.1	73.8	79.6	76.4	10.8
Mississippi	61.1	62.8	61.8	63.0	69.0	66.8	61.5	65.4	69.6	67.5	10.5
Missouri	70.3	68.4	67.5	68.7	69.9	69.1	61.7	72.2	69.5	71.3	1.4
Montana	68.4	72.9	73.1	67.6	72.8	72.1	69.5	72.6	72.8	69.3	1.4
Nebraska	65.8	69.2	70.1	68.2	73.6	75.8	72.6	73.3	76.8	75.7	15.0
Nevada	56.5	62.2	63.3	60.3	60.0	59.0	53.0	57.7	61.9	57.1	1.1
New Hampshire	64.6	65.1	69.4	72.3	73.9	70.7	70.2	71.9	77.6	78.1	20.9
New Jersey	60.7	65.3	64.5	69.1	67.2	67.5	63.4	66.3	70.6	65.9	8.6
New Mexico	72.8	68.8	70.0	66.6	72.4	72.3	68.0	67.6	70.0	69.7	-4.2
New York	64.5	63.8	62.5	64.7	68.0	65.9	61.8	64.7	70.5	70.9	9.9
North Carolina	64.6	64.2	66.1	68.1	68.8	66.9	65.5	69.6	71.3	73.0	13.0
North Dakota	64.8	67.2	70.0	73.9	73.0	74.2	70.1	71.4	72.4	73.2	12.9
Ohio	65.4	68.8	63.4	66.6	68.0	67.5	64.7	68.2	72.5	70.3	7.4
Oklahoma	69.3	71.8	72.7	72.7	75.8	74.9	73.2	70.6	76.1	73.2	5.6
Oregon	69.8	65.2	71.7	68.0	70.5	71.0	68.9	71.3	73.1	70.1	0.5
Pennsylvania	65.8	63.1	63.8	70.5	69.1	63.8	59.3	68.3	72.6	71.7	8.9
Rhode Island	67.7	75.8	72.6	73.7	76.2	73.0	67.2	74.7	80.0	74.0	9.2
South Carolina	74.3	69.9	66.2	69.4	69.3	66.0	60.9	62.9	70.2	68.0	-8.4
South Dakota	65.6	73.6	74.1	74.2	77.9	76.8	76.3	74.1	77.4	76.3	16.2
Tennessee	69.1	65.5	65.6	71.6	69.1	66.3	61.6	70.4	70.1	70.8	2.5
Texas	68.0	69.8	61.8	61.0	67.7	67.0	61.6	66.4	66.7	71.1	4.5
Utah	66.1	75.1	68.7	71.1	74.8	75.4	69.6	72.1	76.2	73.3	10.9
Vermont	69.5	73.4	71.5	73.6	74.1	66.6	66.3	72.8	74.7	73.4	5.6
Virginia	67.7	65.7	65.3	65.3	69.6	68.6	66.8	69.1	75.3	73.1	7.9
Washington	70.3	68.9	72.5	65.1	73.4	67.9	67.8	70.6	72.0	71.4	1.5
West Virginia	58.2	62.9	61.7	65.8	69.1	67.8	63.6	66.4	70.7	71.1	22.1
Wisconsin	66.1	64.9	70.4	74.0	72.1	74.2	71.8	72.0	74.1	73.0	10.4
Wyoming	72.4	73.8	69.6	70.6	72.6	73.8	72.9	70.8	76.3	70.7	-2.3
Range	41.5-74.4	55.8-75.8	54.9-79.0	57.0-76.6	60.0-80.3	54.8-78.8	54.7-78.1	57.7-75.9	60.2-80.0	57.1-78.1	-8.4-22.1
Median	65.9	67.4	67.3	68.7	69.9	67.8	65.7	69.6	72.0	71.1	9.1

Source: Centers for Disease Control and Prevention. Behavioral Risk Factor Surveillance System. Prevalence Data, 1997-2008

Table 12: Percentage of Adults 65 Years & Older Who Reported Ever Receiving a Pneumococcal Vaccination by State, 1997-2008

State	Pneumococcal Vaccination										% Difference 1997-2008
	1997%	1999%	2001%	2002%	2003%	2004%	2005%	2006%	2007%	2008%	
Alabama	47.5	53.9	60.3	58.5	61.4	60.1	61.9	59.7	65.3	66.8	40.6
Alaska	39.2	43.8	65.3	59.8	59.6	57.2	61.1	59.9	66.0	66.0	68.4
Arizona	59.4	53.4	65.6	68.0	65.5	68.5	65.4	66.5	67.2	70.9	19.4
Arkansas	39.1	50.2	59.0	58.7	61.8	62.0	57.4	64.4	63.9	64.2	64.2
California	49.8	57.0	59.6	66.7	65.2	63.5	61.3	60.0	60.4	62.7	25.9
Colorado	53.3	62.7	68.6	68.1	69.1	70.1	70.2	72.9	72.5	72.5	36.0
Connecticut	43.0	49.0	63.3	64.5	64.5	67.7	69.3	68.1	64.9	66.8	55.3
Delaware	52.6	66.5	68.9	64.3	67.4	66.2	65.9	65.6	72.2	71.9	36.7
DC	32.3	35.3	49.0	48.0	50.1	51.3	51.6	52.0	55.9	55.1	70.6
Florida	45.5	53.5	58.1	57.2	64.4	64.3	62.4	62.9	63.0	61.5	35.2
Georgia	48.5	49.7	57.9	57.3	60.5	59.4	62.5	63.1	63.6	65.2	34.4
Hawaii	51.7	55.8	63.7	59.5	69.4	n/a	65.9	68.8	69.4	65.6	26.9
Idaho	50.2	55.2	60.3	57.5	67.2	60.1	61.6	62.8	66.1	65.1	29.7
Illinois	44.7	47.4	56.7	56.7	57.0	58.2	57.0	60.0	61.4	57.4	28.4
Indiana	38.0	51.6	60.2	61.2	61.5	62.0	65.3	63.8	68.4	68.5	80.3
Iowa	51.5	61.2	65.9	66.2	71.4	68.1	69.1	71.1	69.3	70.0	35.9
Kansas	43.7	55.1	62.9	62.1	60.3	62.5	66.8	69.5	68.7	67.3	54.0
Kentucky	38.6	52.0	55.1	56.6	59.6	57.7	62.9	64.6	66.0	65.0	68.4
Louisiana	32.2	40.4	49.5	56.3	64.2	67.3	71.4	66.4	66.6	65.8	104.3
Maine	50.0	57.3	65.0	66.8	64.8	65.6	64.4	67.9	71.1	72.3	44.6
Maryland	41.0	54.1	62.3	63.4	62.0	64.0	62.0	66.0	65.6	66.7	62.7
Massachusetts	52.7	56.8	63.5	63.4	69.4	65.2	64.8	70.8	71.2	66.9	26.9
Michigan	45.6	57.7	56.6	63.0	62.7	59.9	66.2	67.6	63.5	66.3	45.4
Minnesota	48.3	51.9	62.9	70.4	73.0	67.9	71.1	71.1	70.9	70.5	46.0
Mississippi	45.9	50.4	55.7	58.9	61.7	64.5	65.7	68.7	65.3	66.5	44.9
Missouri	44.3	52.8	56.0	60.8	61.1	67.0	64.8	67.8	66.4	67.7	52.8
Montana	50.8	61.2	67.9	67.3	69.1	71.6	69.9	71.5	72.6	69.4	36.6
Nebraska	49.8	54.8	61.2	61.3	64.8	65.7	67.9	68.3	71.8	70.6	41.8
Nevada	53.5	61.0	66.3	65.0	63.2	66.7	69.8	69.1	66.7	62.6	17.0
New Hampshire	49.6	60.4	62.7	63.8	69.3	66.7	69.8	68.4	71.9	73.0	47.2
New Jersey	33.9	55.1	58.9	63.1	62.4	64.2	64.0	66.4	63.4	60.5	78.5
New Mexico	50.1	53.2	62.7	62.7	63.9	64.6	64.7	64.5	63.2	66.1	31.9
New York	38.9	50.0	55.9	62.4	61.7	62.9	62.0	61.0	63.4	65.3	67.9
North Carolina	50.6	58.5	65.8	63.0	66.6	64.2	66.2	68.5	69.2	68.7	35.8
North Dakota	40.8	55.0	64.2	72.5	71.2	70.3	71.7	69.4	70.5	68.4	67.6
Ohio	38.5	55.0	59.3	63.7	64.7	61.0	61.5	68.5	69.9	66.9	73.8
Oklahoma	40.4	53.7	66.1	65.5	68.6	69.9	71.1	70.2	71.7	71.4	76.7
Oregon	55.9	56.2	70.9	65.0	71.7	69.3	71.4	74.7	74.0	71.1	27.2
Pennsylvania	47.1	52.2	59.5	63.5	66.1	63.9	67.2	68.8	69.7	70.7	50.1
Rhode Island	43.0	56.9	67.0	67.6	69.3	70.0	71.5	72.5	72.4	70.5	64.0
South Carolina	41.6	56.1	57.9	64.9	63.0	63.9	65.6	61.5	64.2	66.2	59.1
South Dakota	40.6	50.4	59.2	56.7	63.7	66.1	66.3	65.0	63.7	65.4	61.1
Tennessee	45.0	54.3	55.4	61.4	60.8	63.5	63.8	66.5	65.3	64.3	42.9
Texas	44.4	55.9	58.0	56.9	62.0	61.3	62.2	63.7	63.4	63.9	43.9
Utah	48.5	61.3	67.3	65.0	66.2	65.7	66.4	65.9	68.8	69.2	42.7
Vermont	51.6	56.5	67.3	66.3	66.1	65.6	66.7	66.9	69.8	70.2	36.0
Virginia	53.6	55.2	60.1	60.8	65.2	61.6	66.5	66.8	69.7	67.7	26.3
Washington	51.6	55.8	66.8	63.0	68.6	65.7	66.9	69.6	70.7	69.8	35.3
West Virginia	41.3	54.3	61.3	61.2	63.8	64.7	68.2	65.4	67.3	68.2	65.1
Wisconsin	42.6	53.7	65.6	70.6	66.7	70.3	65.7	71.9	69.4	70.3	65.0
Wyoming	50.9	61.5	68.4	68.2	70.4	70.6	71.2	69.7	72.2	68.9	35.4
Range	32.2-59.4	35.3-52.6	49.0-70.9	48.0-72.5	50.1-73.0	51.3-71.6	51.6-71.7	52.0-74.7	55.9-74.0	55.1-73.0	17.0-104.3
Median	45.8	54.9	62.3	63.0	64.4	64.5	65.9	66.9	67.3	66.9	44.6

Source: Centers for Disease Control and Prevention. Behavioral Risk Factor Surveillance System. Prevalence Data, 1997-2008

Table 13: Influenza Vaccination of Fee-For-Service Medicare Beneficiaries Aged 65+ Paid by Medicare by State, 2000-2004

State	2000 %	2001 %	2002 %	2003 %	2004 %	% Change 2000-2004
Alabama	70.7	67.2	69.2	71.5	72.3	2.3
Alaska	74.3	67.4	71.6	69.2	71.8	-3.3
Arizona	77.7	67.1	70.1	69.9	73.5	-5.5
Arkansas	73.6	72.6	70.8	72.8	74.4	1.1
California	72.5	69.0	69.4	71.1	71.9	-0.8
Colorado	80.2	76.6	75.6	78.4	79.5	-0.9
Connecticut	73.6	73.3	72.5	74.3	76.9	4.4
Delaware	72.4	73.4	73.7	72.6	79.8	10.2
District of Columbia	58.6	61.8	64.1	65.1	60.4	3.1
Florida	70.4	64.5	67.8	68.3	70.6	0.3
Georgia	70.1	65.4	67.4	68.7	70.9	1.0
Hawaii	74.2	77.8	74.9	79.2	80.3	8.2
Idaho	75.6	68.2	71.8	73.8	73.1	-3.4
Illinois	71.0	64.6	68.4	70.0	70.9	-0.2
Indiana	73.1	69.2	71.5	69.9	72.2	-1.2
Iowa	79.1	77.2	78.1	79.7	80.8	2.1
Kansas	80.2	74.6	75.7	73.6	77.3	-3.6
Kentucky	69.1	68.9	67.5	71.6	70.3	1.6
Louisiana	65.8	67.6	70.4	74.9	75.7	15.0
Maine	76.6	78.9	77.4	78.2	79.1	3.2
Maryland	73.8	70.2	73.0	71.5	73.9	0.1
Massachusetts	75.7	69.1	75.5	72.4	73.5	-3.0
Michigan	73.2	67.7	70.1	70.5	73.5	0.4
Minnesota	77.6	76.0	78.2	78.1	78.9	1.7
Mississippi	70.5	70.7	71.3	71.3	71.4	1.2
Missouri	74.6	69.8	74.0	75.0	76.2	2.1
Montana	79.5	72.8	77.2	75.0	74.9	-5.8
Nebraska	78.0	77.9	76.2	76.6	78.0	0.0
Nevada	65.6	58.9	62.8	62.9	66.8	1.9
New Hampshire	76.0	74.8	73.8	75.5	79.7	4.8
New Jersey	68.3	64.6	69.6	71.3	72.9	6.8
New Mexico	73.6	71.0	69.9	71.7	75.9	3.2
New York	70.4	69.2	71.7	71.7	73.2	4.0
North Carolina	71.8	70.6	72.2	73.4	74.9	4.3
North Dakota	79.4	72.5	72.8	75.9	79.2	-0.3
Ohio	74.4	69.4	70.6	72.5	73.3	-1.5
Oklahoma	77.7	75.8	78.6	78.9	78.6	1.1
Oregon	74.7	73.3	74.0	73.6	77.4	3.7
Pennsylvania	73.2	70.0	73.0	72.4	74.2	1.4
Rhode Island	76.5	74.1	76.9	78.6	77.0	0.7
South Carolina	71.6	71.0	72.1	71.8	73.1	2.1
South Dakota	75.0	74.5	78.3	77.0	79.2	5.6
Tennessee	73.2	70.0	72.3	74.7	76.0	3.8
Texas	72.4	68.5	69.7	71.5	74.6	3.0
Utah	76.4	75.3	74.7	79.2	78.8	3.1
Vermont	77.1	74.0	80.9	78.7	75.7	-1.9
Virginia	74.9	69.9	74.2	74.5	74.5	-0.4
Washington	77.6	72.2	73.9	72.4	77.4	-0.3
West Virginia	72.4	70.3	72.9	72.9	72.2	-0.3
Wisconsin	74.9	72.0	75.1	75.2	78.2	4.4
Wyoming	76.3	74.0	74.2	76.3	75.6	-0.9
National Average	73.8	70.9	72.7	73.4	74.9	1.5

Source: Centers for Medicare and Medicaid Services. Consumer Assessment of Health Providers and Systems (CAHPS), 2000-2004.

Table 14: Percent & 95 Percent Confidence Intervals of Adults with Asthma who Received the Flu Shot, 2003-2008 ⁽¹⁾

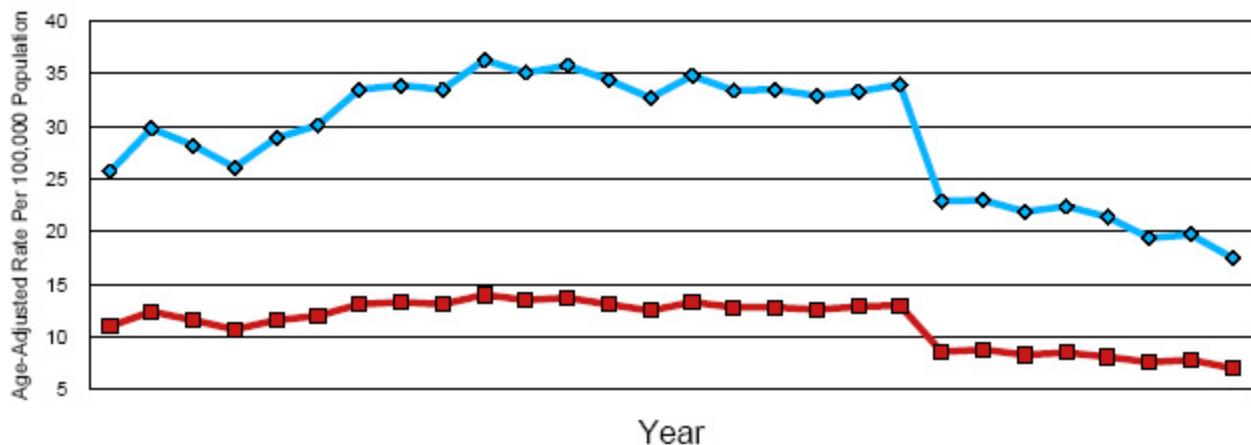
State	2003		2004		2005		2006		2007		2008		% Change 2003-2008
	%	CI of %	%	CI of %	%	CI of %	%	CI of %	%	CI of %	%	CI of %	
Alabama	41.3	(34.3-48.3)	42.5	(38.0-47.0)	35.1	(30.8-39.5)	35.9	(29.9-42.0)	46.5	(41.4-51.7)	45.5	(41.2-49.9)	10.2
Alaska	45.8	(40.5-51.0)	45.7	(40.9-50.5)	42.7	(36.5-48.9)	37.9	(32.3-43.6)	46.7	(38.6-54.8)	50.5	(41.3-59.7)	10.3
Arizona	42.5	(37.0-48.0)	45.0	(38.3-51.7)	33.9	(30.2-37.6)	45.7	(37.2-54.2)	45.8	(37.9-53.8)	45.9	(40.3-51.4)	8.0
Arkansas	46.8	(41.5-52.0)	44.3	(40.1-48.5)	42.2	(39.2-45.1)	40.3	(36.3-44.4)	51.7	(46.0-57.5)	45.2	(39.1-51.3)	-3.4
California	37.0	(33.0-40.9)	44.5	(39.4-49.6)	35.8	(31.3-40.3)	37.3	(32.7-42.0)	39.0	(34.2-43.7)	44.6	(41.7-47.6)	20.5
Colorado	43.8	(39.0-48.6)	51.5	(47.4-55.5)	41.7	(37.8-45.6)	46.1	(41.8-50.4)	53.0	(49.6-56.5)	49.3	(45.9-52.6)	12.6
Connecticut	45.7	(42.1-49.2)	43.8	(40.7-47.2)	37.0	(33.0-41.1)	44.4	(41.6-47.2)	49.6	(45.6-53.7)	47.3	(42.9-51.7)	3.5
D.C.	31.8	(24.6-38.9)	37.1	(30.7-43.6)	36.0	(30.7-41.3)	39.9	(35.8-43.9)	42.2	(37.9-46.4)	49.8	(43.8-55.8)	56.6
Delaware	39.6	(34.2-44.8)	41.5	(36.8-46.2)	40.3	(35.8-44.8)	43.0	(38.5-47.6)	51.2	(45.5-56.8)	48.1	(43.2-53.1)	21.5
Florida	41.6	(35.1-47.9)	34.2	(30.0-38.3)	36.5	(33.0-40.0)	36.5	(33.4-39.6)	39.3	(36.8-41.9)	43.0	(38.6-47.5)	3.4
Georgia	36.1	(39.0-48.6)	38.2	(32.0-44.0)	34.2	(30.2-38.3)	33.9	(29.4-38.4)	41.5	(38.1-44.9)	34.1	(30.0-38.2)	-5.5
Hawaii	44.2	(31.4-40.6)	N/A	N/A	42.5	(37.6-47.5)	45.3	(39.5-51.0)	48.3	(43.3-53.3)	51.6	(47.3-55.8)	16.7
Idaho	37.5	(33.6-41.3)	44.6	(39.9-49.3)	30.6	(27.1-34.1)	35.5	(32.3-38.6)	45.7	(42.2-49.2)	37.4	(34.7-40.2)	-0.3
Illinois	36.5	(32.6-40.4)	40.2	(36.1-44.3)	35.4	(32.6-38.3)	40.7	(36.7-44.6)	44.8	(40.6-48.9)	42.3	(37.4-47.2)	15.9
Indiana	40.1	(37.1-43.1)	41.1	(56.3-65.7)	39.5	(35.6-43.5)	39.7	(36.9-42.6)	45.9	(41.9-49.9)	43.8	(38.4-49.2)	9.2
Iowa	40.5	(34.9-46.0)	50.4	(45.6-55.2)	37.8	(33.5-42.1)	47.5	(44.0-51.1)	50.8	(45.7-55.8)	46.2	(41.1-51.3)	14.1
Kansas	37.5	(32.5-42.4)	41.0	(37.8-44.3)	35.2	(32.4-38.1)	41.6	(39.0-44.2)	47.5	(44.2-50.7)	43.2	(39.5-46.8)	15.2
Kentucky	37.7	(34.9-40.4)	37.8	(32.6-42.9)	32.4	(29.1-35.8)	39.0	(35.8-42.1)	46.8	(41.1-52.5)	46.4	(42.6-50.1)	23.1
Louisiana	43.1	(37.7-48.3)	44.0	(39.4-48.6)	32.4	(25.1-39.8)	48.6	(43.4-53.8)	43.6	(37.9-49.3)	41.4	(37.0-45.8)	-3.9
Maine	46.6	(42.5-50.5)	45.7	(41.6-49.8)	38.3	(34.9-41.8)	48.5	(44.8-52.3)	52.6	(48.8-56.4)	48.3	(44.8-51.9)	3.6
Maryland	43.7	(38.1-49.2)	45.5	(39.5-51.5)	34.9	(31.9-37.8)	37.5	(33.5-41.5)	50.4	(46.9-53.9)	41.5	(38.3-44.7)	-5.0
Massachusetts	43.4	(39.8-46.9)	45.4	(41.7-49.0)	39.2	(36.7-41.7)	49.1	(46.6-51.5)	51.1	(48.6-53.6)	53.3	(50.4-56.1)	22.8
Michigan	39.5	(36.1-42.8)	40.5	(36.1-44.9)	32.9	(30.7-35.2)	42.8	(39.0-46.6)	44.4	(41.1-47.8)	46.6	(43.7-49.5)	18.0
Minnesota	45.8	(40.3-51.1)	49.6	(44.8-54.3)	47.0	(42.6-51.5)	49.3	(45.8-52.9)	55.5	(51.0-60.0)	54.5	(47.9-61.1)	19.0
Mississippi	35.7	(31.3-39.9)	39.3	(35.0-43.6)	39.4	(35.5-43.3)	42.7	(38.6-46.7)	47.4	(41.5-53.4)	41.1	(36.7-45.5)	15.1
Missouri	38.9	(34.2-43.6)	51.0	(46.7-55.4)	37.4	(33.7-41.2)	38.2	(34.2-42.2)	44.3	(39.7-48.9)	45.3	(40.3-50.2)	16.5
Montana	53.4	(48.1-58.5)	48.0	(43.6-52.4)	42.2	(38.0-46.5)	45.2	(41.4-48.9)	53.5	(49.6-57.5)	48.4	(44.9-52.0)	-9.4
Nebraska	51.6	(47.1-55.9)	45.8	(42.2-49.5)	41.1	(37.0-45.3)	46.8	(43.0-50.5)	48.8	(44.6-53.0)	52.7	(48.3-57.1)	2.1
Nevada	32.7	(25.8-39.5)	40.9	(34.2-47.6)	22.3	(16.4-28.2)	31.3	(25.4-37.1)	35.6	(29.1-42.2)	27.8	(23.6-32.0)	-15.0
New Hampshire	43.5	(39.9-47.0)	38.6	(35.5-41.8)	41.5	(38.7-44.3)	49.1	(45.0-53.1)	53.3	(49.4-57.2)	52.1	(48.8-55.5)	19.8
New Jersey	37.9	(35.3-40.5)	44.7	(42.1-47.2)	32.7	(30.2-35.3)	38.8	(35.6-41.9)	48.6	(44.9-52.3)	40.6	(36.9-44.3)	7.1
New Mexico	46.6	(42.4-50.7)	41.7	(38.0-45.4)	38.4	(34.7-42.2)	43.6	(39.3-47.8)	52.0	(48.1-55.9)	52.0	(47.3-56.7)	11.6
New York	44.3	(40.4-48.1)	41.0	(37.9-44.1)	37.0	(34.4-39.7)	41.4	(37.6-45.1)	44.9	(40.6-49.1)	49.5	(45.6-53.5)	11.7
North Carolina	41.4	(37.2-45.5)	41.8	(38.7-44.9)	35.4	(33.2-37.6)	44.7	(41.9-47.5)	47.2	(44.3-50.1)	50.0	(46.7-53.2)	20.8
North Dakota	49.6	(45.1-54.1)	47.3	(41.8-52.8)	41.2	(37.3-45.2)	47.4	(41.5-53.4)	50.0	(45.6-54.3)	51.8	(47.8-55.8)	4.4
Ohio	36.9	(32.6-41.2)	41.7	(37.2-46.2)	33.5	(30.3-36.7)	39.5	(35.6-43.3)	43.1	(40.1-46.2)	43.4	(41.1-45.7)	17.6
Oklahoma	44.8	(41.1-48.5)	48.8	(45.0-52.6)	44.3	(41.7-46.9)	47.9	(44.4-51.4)	54.1	(49.6-58.6)	47.2	(43.9-50.6)	5.4
Oregon	40.5	(36.6-44.4)	45.4	(41.2-49.5)	35.9	(34.0-37.7)	43.4	(39.7-47.1)	51.4	(47.5-55.3)	44.7	(40.4-49.1)	10.4
Pennsylvania	40.4	(36.5-44.1)	40.5	(37.2-43.8)	33.2	(30.3-36.1)	44.3	(40.7-47.9)	51.7	(48.4-55.0)	46.6	(43.4-49.8)	15.3
Rhode Island	46.1	(41.3-50.8)	52.6	(47.6-57.6)	38.4	(34.7-42.0)	47.0	(43.3-50.7)	57.0	(51.8-62.2)	48.2	(44.7-51.6)	4.6
South Carolina	48.7	(43.8-53.5)	46.3	(42.6-49.9)	35.4	(31.2-39.6)	40.6	(37.5-43.6)	44.6	(41.0-48.1)	44.3	(39.7-49.0)	-9.0
South Dakota	56.0	(51.2-60.6)	61.9	(56.9-66.9)	43.5	(39.3-47.6)	49.7	(45.8-53.6)	53.6	(48.5-58.7)	54.2	(47.9-60.5)	-3.2
Tennessee	37.1	(32.9-41.2)	42.9	(38.0-47.8)	35.8	(30.1-41.1)	45.0	(41.1-48.8)	55.9	(51.1-60.7)	47.5	(43.1-52.0)	28.0
Texas	38.4	(34.4-42.2)	44.6	(40.2-49.0)	36.2	(32.6-39.9)	50.0	(39.9-60.1)	43.0	(40.0-45.9)	49.4	(45.5-53.3)	28.6
Utah	35.7	(31.3-40.1)	44.9	(40.0-49.8)	41.8	(37.7-46.0)	38.0	(33.6-42.5)	55.6	(47.2-64.0)	55.1	(50.3-59.9)	54.3
Vermont	36.9	(33.1-40.7)	41.4	(37.1-45.7)	36.0	(33.0-39.0)	43.4	(40.5-46.2)	54.0	(50.1-57.8)	49.8	(46.1-53.5)	35.0
Virginia	39.4	(34.0-44.7)	47.5	(42.3-52.8)	37.5	(33.0-42.0)	37.2	(32.8-41.6)	50.5	(45.6-55.5)	46.4	(40.8-52.0)	17.8
Washington	41.9	(39.7-44.0)	40.2	(38.1-42.4)	32.1	(30.5-33.8)	41.8	(39.8-43.8)	45.2	(43.1-47.2)	46.7	(44.3-49.0)	11.5
West Virginia	45.9	(41.4-50.3)	40.5	(36.1-44.8)	34.3	(30.3-38.3)	47.3	(43.4-51.1)	46.3	(42.9-49.6)	45.3	(41.1-49.5)	-1.3
Wisconsin	43.5	(38.4-48.4)	46.0	(42.8-49.2)	42.3	(38.1-46.5)	44.8	(41.4-48.2)	52.3	(48.0-56.6)	49.2	(43.9-54.4)	13.1
Wyoming	55.4	(51.1-59.6)	46.7	(41.7-51.7)	40.2	(35.9-44.5)	45.5	(40.7-50.4)	45.7	(40.3-51.1)	49.3	(45.5-53.2)	-11.0
United States	40.4	(39.5-41.2)	43.0	(42.1-43.9)	36.3	(35.6-37.1)	41.7	(40.7-42.8)	46.1	(45.2-47.0)	45.6	(44.7-46.2)	12.9

Source: Centers for Disease Control and Prevention. Behavioral Risk Factor Surveillance Survey raw data, 2003-2008. Analysis by the Research and Program Services Division of the American Lung Association.

Note:

(1) Data for earlier years is available by request.

Figure 1: Pneumonia - Age-Adjusted Death Rates Based on the 1940 & 2000 Standard Populations, 1979-2006 ⁽¹⁾



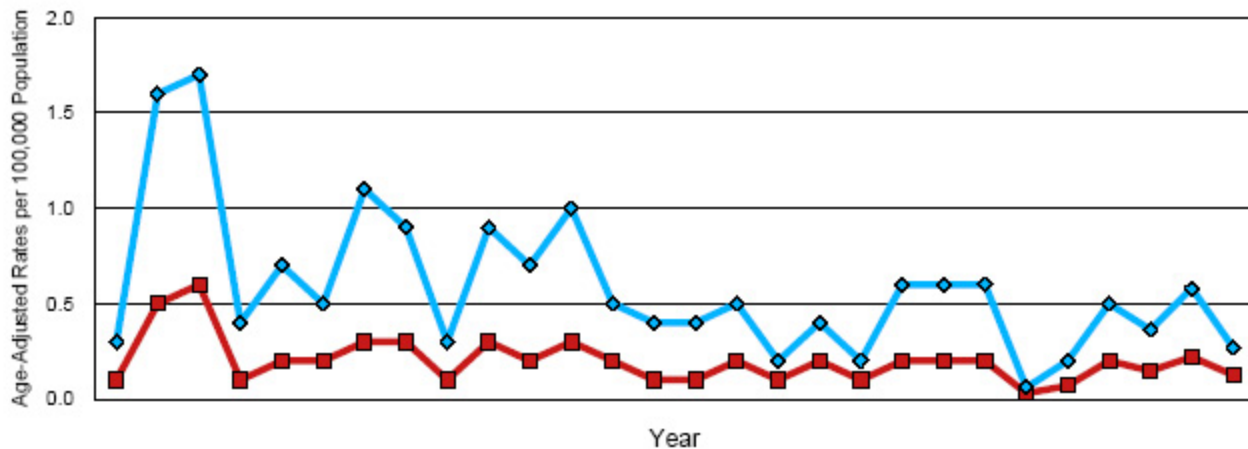
	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
■ 1940	11.0	12.4	11.6	10.7	11.6	12.0	13.1	13.3	13.1	14.0	13.5	13.7	13.1	12.5	13.3	12.8	12.8	12.6	12.9	13.0	8.6	8.8	8.3	8.5	8.1	7.6	7.8	7.0
◆ 2000	25.7	29.8	28.2	26.1	28.9	30.1	33.5	33.9	33.5	36.3	35.1	35.8	34.4	32.7	34.8	33.4	33.5	32.9	33.3	34.0	22.9	23.0	21.9	22.4	21.4	19.4	19.7	17.5

Source: Centers for Disease Control and Prevention. National Center for Health Statistics. CDC WONDER On-line Database, compiled from Compressed Mortality File 1999-2006 Series 20 No. 2L, 2009. Accessed on March 25, 2010.

Note:

(1) 1979-1998 rates reflect the International Classification of Diseases, 9th Revision (ICD-9) Codes 480-486. 1999-2006 rates reflect the International Classification of Diseases, 10th Revision (ICD-10) Codes J12-J18.

Figure 2: Influenza - Age-Adjusted Death Rates Based on the 1940 & 2000 Standard Population, 1979-2006 ⁽¹⁾



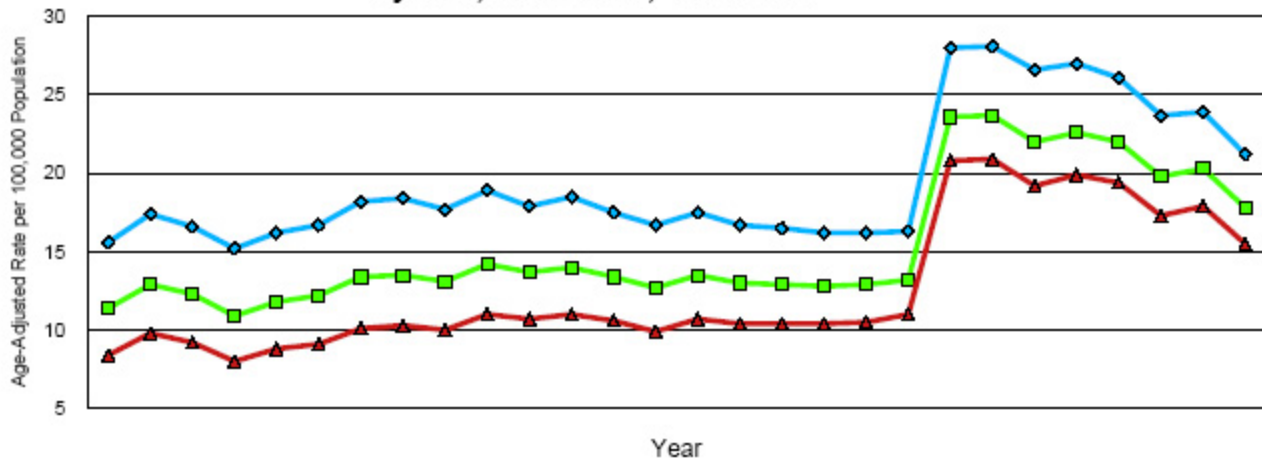
	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
■ 1940	0.1	0.5	0.6	0.1	0.2	0.2	0.3	0.3	0.1	0.3	0.2	0.3	0.2	0.1	0.1	0.2	0.1	0.2	0.1	0.2	0.2	0.2	0.0	0.1	0.2	0.1	0.2	0.1
◆ 2000	0.3	1.6	1.7	0.4	0.7	0.5	1.1	0.9	0.3	0.9	0.7	1.0	0.5	0.4	0.4	0.5	0.2	0.4	0.2	0.6	0.6	0.6	0.1	0.2	0.5	0.4	0.6	0.3

Source: Centers for Disease Control and Prevention. National Center for Health Statistics. CDC WONDER On-line Database, compiled from Compressed Mortality File 1999-2006 Series 20 No. 2L, 2009. Accessed on March 25, 2010.

Note:

(1) 1979-1998 rates reflect the International Classification of Diseases, 9th Revision (ICD-9) Code 487. 1999-2006 rates reflect the International Classification of Diseases, 10th Revision (ICD-10) Codes J10-J11.

Figure 3: Pneumonia & Influenza - Age-Adjusted Death Rate by Sex, 1979-1998, 1999-2006 ^(1,2)



	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Total	11.4	12.9	12.3	10.9	11.8	12.2	13.4	13.5	13.1	14.2	13.7	14.0	13.4	12.7	13.5	13.0	12.9	12.8	12.9	13.2	23.6	23.7	22.0	22.6	22.0	19.8	20.3	17.8
Male	15.6	17.4	16.6	15.2	16.2	16.7	18.2	18.4	17.7	18.9	17.9	18.5	17.5	16.7	17.5	16.7	16.5	16.2	16.2	16.3	28.0	28.1	26.6	27.0	26.1	23.7	23.9	21.2
Female	8.4	9.8	9.2	8.0	8.8	9.1	10.1	10.3	10.0	11.0	10.7	11.0	10.6	9.9	10.7	10.4	10.4	10.4	10.5	11.0	20.8	20.9	19.2	19.9	19.4	17.3	17.9	15.5

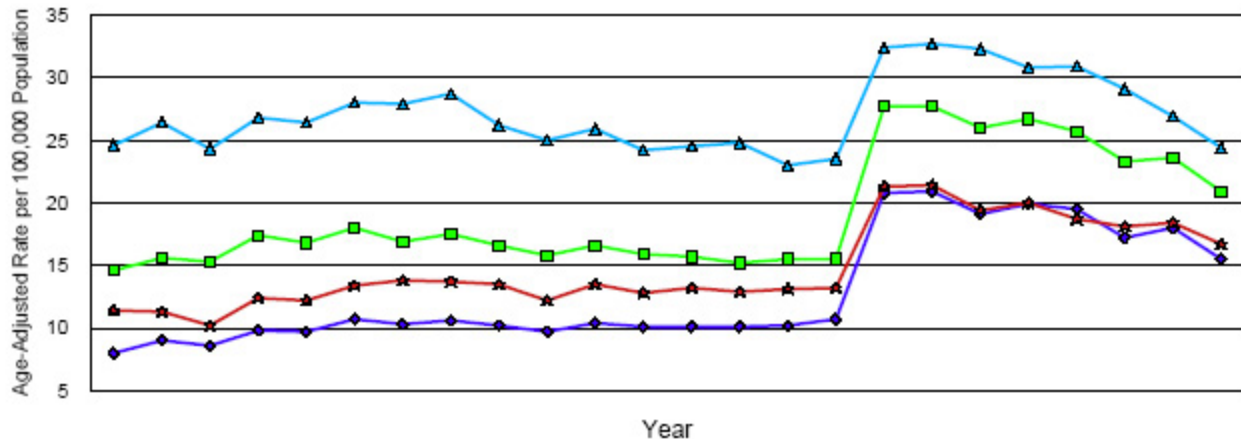
Source: Centers for Disease Control and Prevention. National Center for Health Statistics. National Vital Statistics Report. Deaths: Final Data for 2006. April 17, 2009. Vol 57 No 11.

Notes:

(1) The increase seen between 1998 and 1999 was a result of the change in the age-adjusted standard U.S. population from 1940 to 2000, not an actual increase in the number of deaths for pneumonia and influenza.

(2) 1979-1998 rates reflect the International Classification of Diseases, 9th Revision (ICD-9) Codes 480-487. 1999-2005 rates reflect the International Classification of Diseases, 10th Revision (ICD-10) Codes J10-J18.

Figure 4: Pneumonia & Influenza - Age-Adjusted Death Rate by Sex & Race, 1979-1998, 1999-2006 ^(1,2)

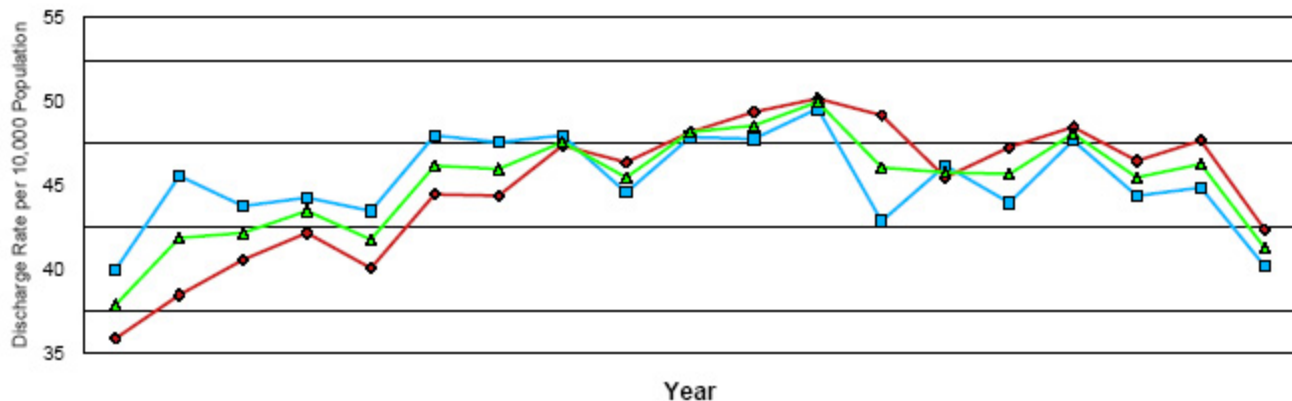


	1979	1981	1983	1985	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
White Males	14.6	15.6	15.3	17.4	16.8	18.0	16.9	17.5	16.6	15.8	16.6	15.9	15.7	15.2	15.5	15.5	27.7	27.7	26.0	26.7	25.7	23.3	23.6	20.9
White Females	8.0	9.0	8.6	9.8	9.7	10.7	10.3	10.6	10.2	9.7	10.4	10.1	10.1	10.1	10.2	10.7	20.8	20.9	19.1	19.9	19.5	17.2	18.0	15.5
Black Males	24.6	26.4	24.3	26.8	26.4	28.0	27.9	28.7	26.2	25.0	25.9	24.2	24.5	24.8	23.0	23.5	32.4	32.7	32.3	30.8	30.9	29.1	26.9	24.4
Black Females	11.4	11.3	10.2	12.4	12.2	13.4	13.8	13.7	13.5	12.2	13.5	12.8	13.2	12.9	13.1	13.2	21.3	21.4	19.4	20.0	18.7	18.1	18.4	16.7

Source: Centers for Disease Control and Prevention. National Center for Health Statistics. National Vital Statistics Report. Deaths: Final Data for 2006. April 17, 2009. Vol 57 No 11.

- Notes:
- (1) The increase seen between 1998 and 1999 was a result of the change in the age-adjusted standard U.S. population from 1940 to 2000, not an actual increase in the number of deaths for pneumonia and influenza.
 - (2) 1979-1998 rates reflect the International Classification of Diseases, 9th Revision (ICD-9) Codes 480-487. 1999-2005 rates reflect the International Classification of Diseases, 10th Revision (ICD-10) Codes J10-J18.

**Figure 5: Pneumonia - First-Listed Hospital Discharge Rate
by Sex, 1988-2006 ^(1,2)**



	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Male	40.0	45.6	43.8	44.3	43.5	48.0	47.6	48.0	44.6	47.9	47.8	49.6	42.9	46.2	44.0	47.7	44.4	44.9	40.2
Female	35.9	38.5	40.6	42.2	40.1	44.5	44.4	47.4	46.4	48.2	49.4	50.2	49.2	45.5	47.3	48.5	46.5	47.7	42.4
Total	37.9	41.9	42.2	43.5	41.8	46.2	46.0	47.6	45.5	48.2	48.6	50.0	46.1	45.8	45.7	48.1	45.5	46.3	41.3

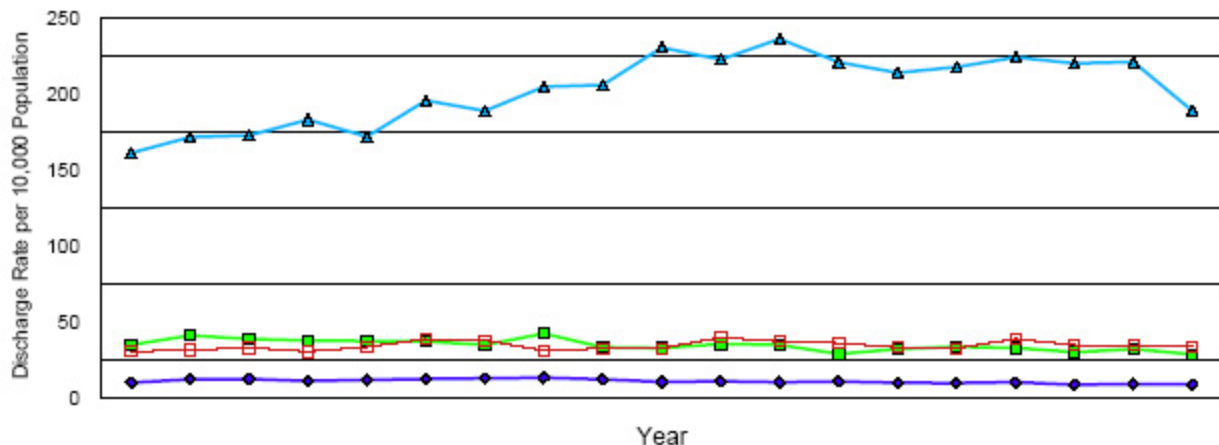
Source: Centers for Disease Control and Prevention. National Center For Health Statistics. National Hospital Discharge Survey, 1988-2006. Unpublished Data provided by NCHS upon special request.

Notes:

(1) Data from 1988-2006 may not be comparable to earlier years, due to the redesign of the survey.

(2) Because these estimates are based on a sample, they may differ from figures that would be obtained from a census of the population. Each data point reported is an estimate of the true population value and subject to sampling variability.

Figure 6: Pneumonia - First-Listed Hospital Discharge Rate by Age, 1988-2006 ^(1,2)



	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
■ <15	34.7	40.9	38.5	37.5	37.2	36.9	34.7	42.1	33.0	32.5	35.2	34.5	28.8	31.8	33.5	32.6	29.8	31.9	28.3
◆ 15-44	9.7	11.8	12.1	10.8	11.5	12.1	12.5	13.0	11.8	10.2	10.7	10.1	10.5	9.6	9.4	10.0	8.3	8.8	8.5
▣ 45-64	30.3	31.2	32.7	30.2	33.2	38.5	37.6	30.9	32.3	32.4	39.6	36.9	35.8	32.9	32.4	38.8	34.5	34.5	33.4
▲ 65+	161.3	171.8	172.9	183.3	172.1	195.9	189.1	205.0	206.3	230.9	223.0	236.6	221.2	214.2	218.0	224.4	220.4	221.3	189.0

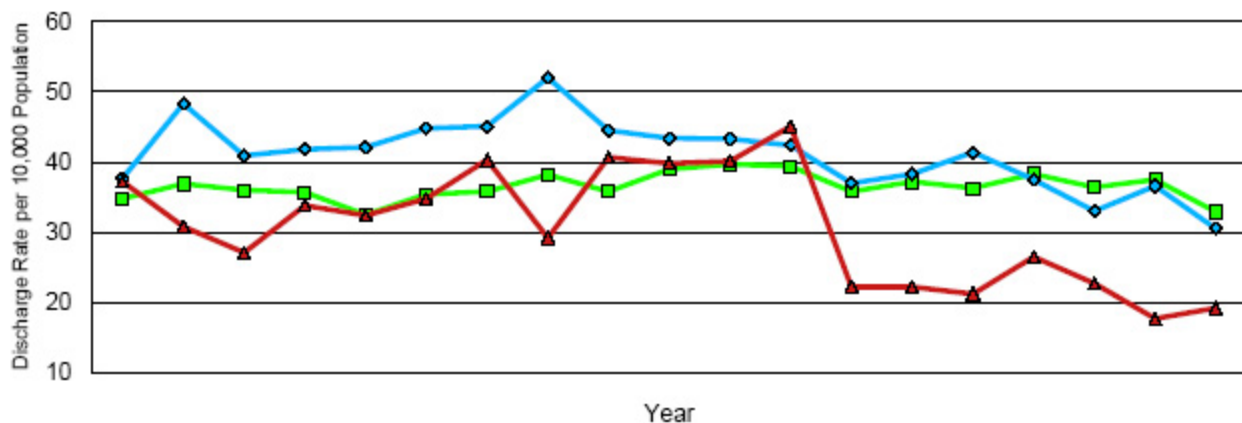
Source: Centers for Disease Control and Prevention. National Center For Health Statistics. National Hospital Discharge Survey, 1988-2006. Unpublished Data provided by NCHS upon special request.

Notes:

(1) Data from 1988-2006 may not be comparable to earlier years, due to the redesign of the survey.

(2) Because these estimates are based on a sample, they may differ from figures that would be obtained from a census of the population. Each data point reported is an estimate of the true population value and subject to sampling variability.

Figure 7: Pneumonia - First-Listed Hospital Discharge Rates by Race, 1988-2006 ^(1,2,3)

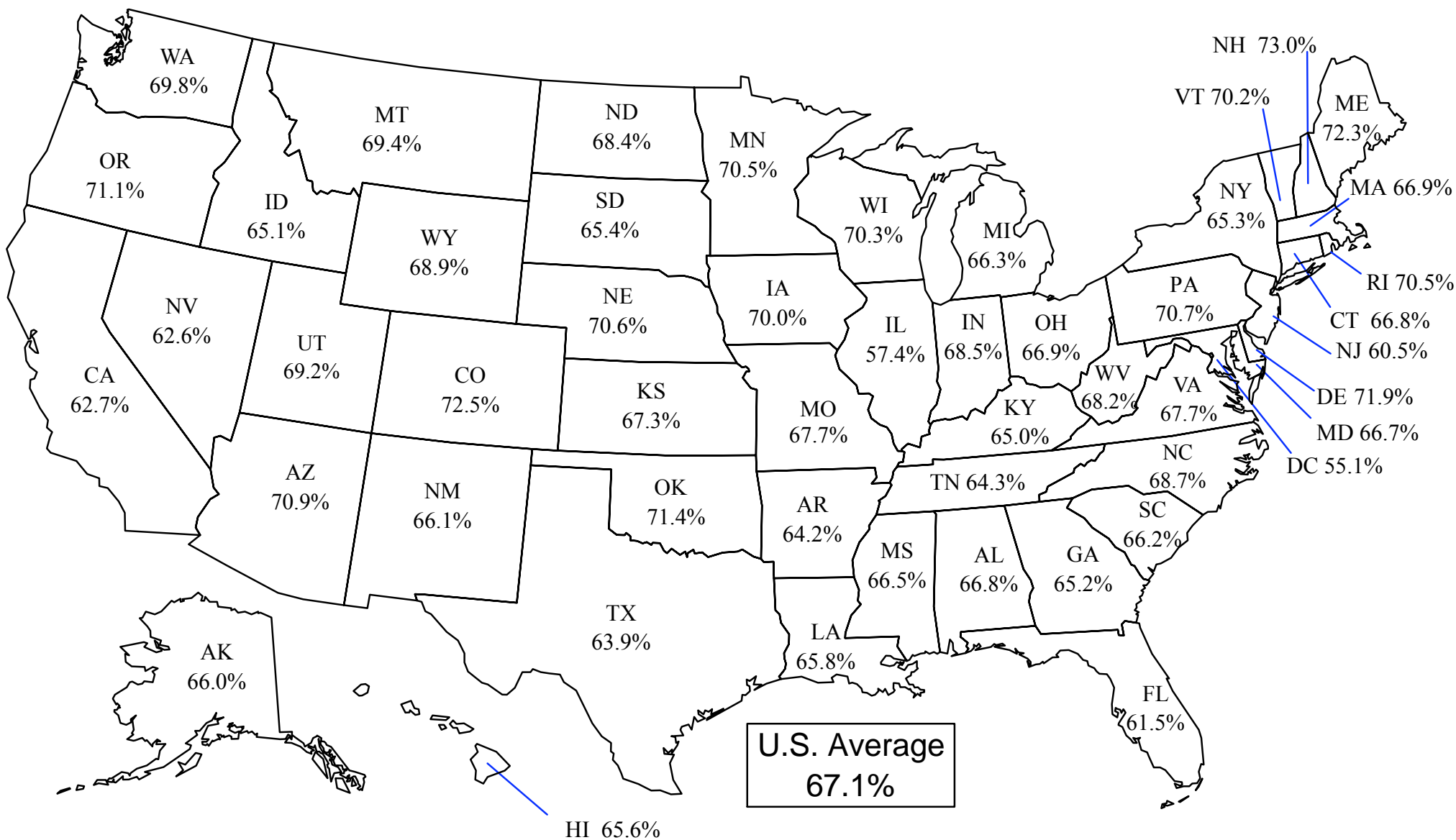


	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
■ White	34.8	36.9	36.0	35.7	32.5	35.4	35.8	38.2	35.8	39.0	39.7	39.4	35.8	37.2	36.3	38.3	36.4	37.5	32.9
◆ Black	37.7	48.3	40.9	41.8	42.1	44.8	45.1	52.0	44.5	43.4	43.3	42.4	37.0	38.3	41.4	37.5	33.0	36.6	30.5
▲ Other	37.2	30.8	27.1	33.8	32.4	34.8	40.3	29.2	40.7	39.8	40.1	45.1	22.2	22.2	21.2	26.5	22.7	17.7	19.2

Source: Centers for Disease Control and Prevention. National Center For Health Statistics. National Hospital Discharge Survey, 1988-2006. Unpublished Data provided by NCHS upon special request.

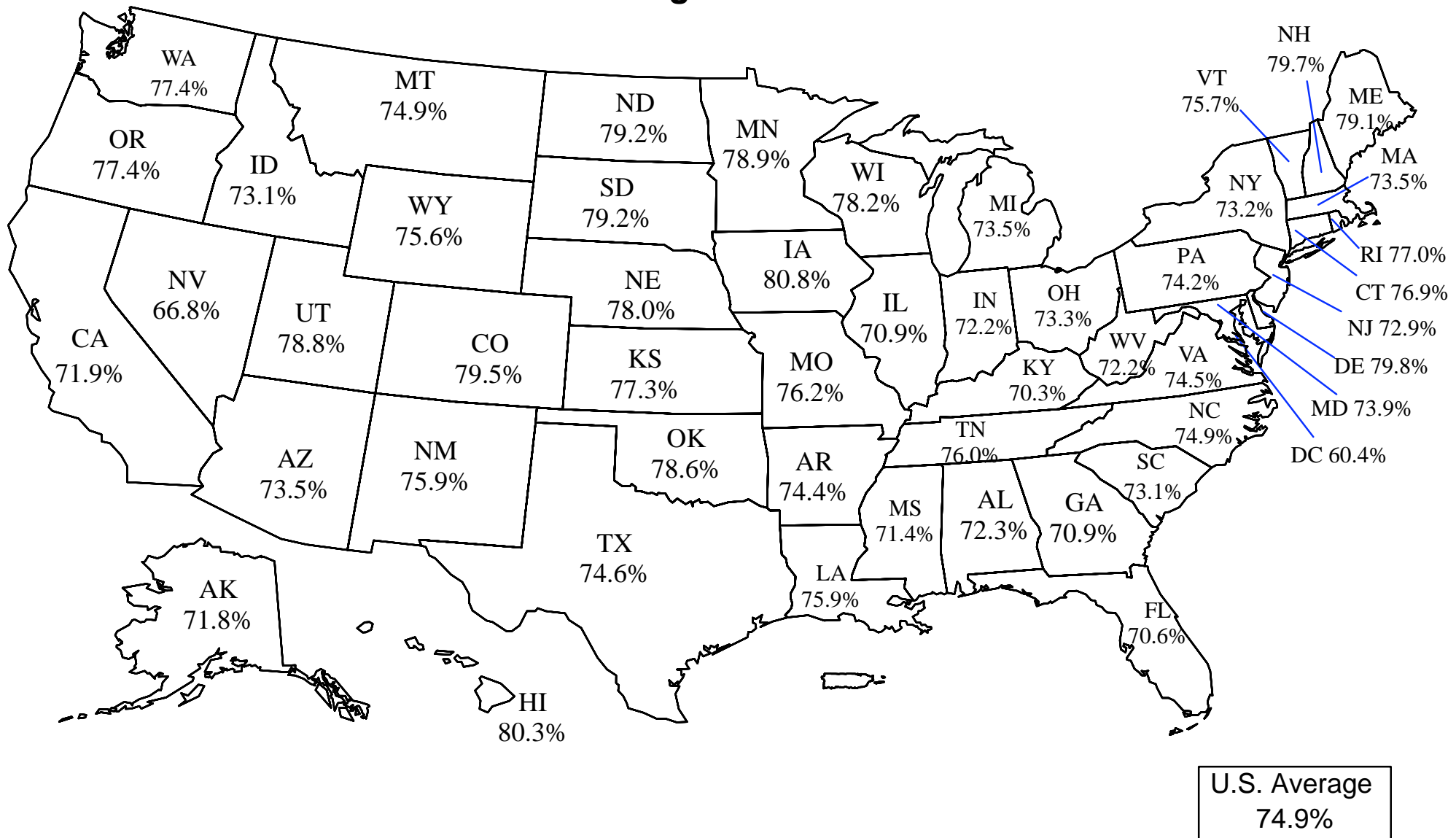
- Notes:
- (1) Between 1988 and 2006, the number of discharges not reporting race increased dramatically. It appears that hospital discharges in whites might be disproportionately underestimated, particularly in later years. For this reason, comparisons between races should be made with caution.
 - (2) Data from 1988-2006 may not be comparable to earlier years, due to the redesign of the survey.
 - (3) Because these estimates are based on a sample, they may differ from figures that would be obtained from a census of the population. Each data point reported is an estimate of the true population value and subject to sampling variability.

Figure 8: Persons Age 65 or Older Ever Receiving Pneumococcal Vaccination, 2008



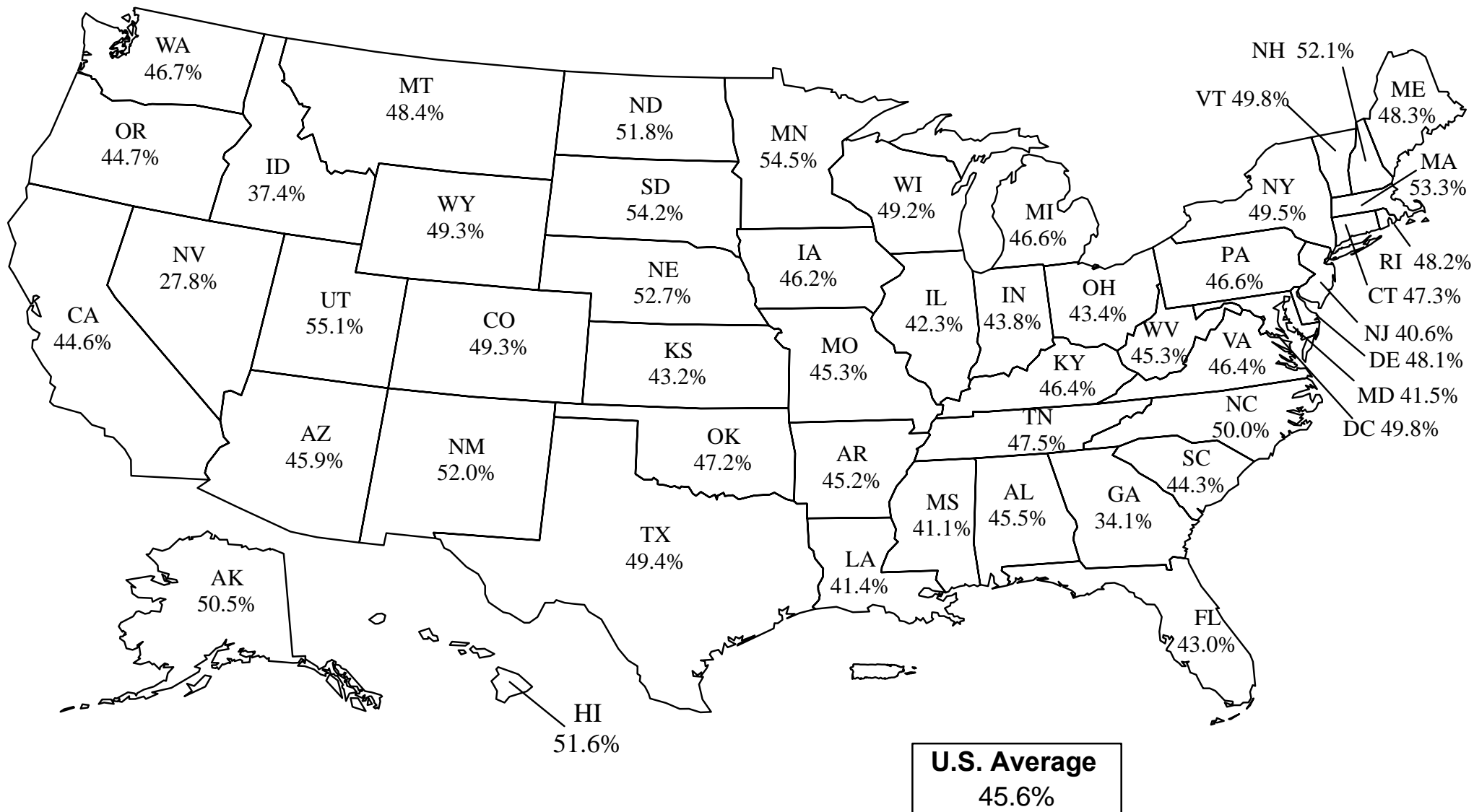
Source: Centers for Disease Control and Prevention. Behavioral Risk Factor Surveillance System. Prevalence Data, 2008. Analysis by the Research and Program Services Division of the American Lung Association.

Figure 9: 2004 Fee-For-Service Medicare Beneficiaries, Age 65 or Older, Receiving a Flu Shot



Source: Centers for Medicare and Medicaid Services. Consumer Assessment of Health Providers and Systems (CAHPS).

Figure 10: Percentage of Adults with Asthma who Received the Flu Shot, 2008



Source: Centers for Disease Control and Prevention. Behavioral Risk Factor Surveillance Survey raw data, 2008. Analysis by the Research and Program Services Division of the American Lung Association.