



**TRENDS IN PNEUMONIA AND INFLUENZA  
MORBIDITY AND MORTALITY**

**AMERICAN LUNG ASSOCIATION  
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## INTRODUCTION<sup>1</sup>

Pneumonia and influenza are significant causes of morbidity and mortality. Together these conditions are ranked as the seventh leading cause of death in the United States. 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.

## 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use the same standard and (iii) corrected the public perception that age adjustment to the 1940 population provides out-of-date statistics.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 more 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 old standard.

Figures 1 and 2 compare the pneumonia and influenza age-adjusted death rates between 1979 and 2001 based on the 1940 and 2000 standard populations, respectively. Age-adjusted death rates are approximately 2.5 times greater for pneumonia and 2 to 3 times greater for influenza using the 2000 standard population than the 1940 standard population.

In addition, 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 major break in comparability occurred between revisions for pneumonia. Pneumonia has a comparability ratio of 0.6957. A comparability ratio measures the net effect of the new ICD revision on death statistics. It is calculated by dividing the number of deaths for a selected cause of death classified by the new revision by the number of deaths classified to the most nearly comparable cause of death by the previous revision. A comparability ratio of 1 denotes no change between revisions; a ratio of less than 1 signifies a decrease and a ratio of greater than 1 symbolizes an increase in deaths. A comparability ratio of 0.6957 indicates a 30% decrease in assignments of deaths due to pneumonia when coded under ICD-10. This decrease is due to a change in the direct sequel rule. The direct sequel rule follows as such: 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. This rule is applied more broadly in ICD-10 than in ICD-9 and specifies many more causes for which pneumonia is considered a direct consequence. Therefore, deaths classified as pneumonia in ICD-9 are classified in ICD-10 to many other causes. Influenza was largely unaffected by the ICD revision (comparability ratio of 1.0088). When the two diseases are combined, the comparability ratio is 0.6982.

### *Sex and Race Specific Mortality Rates*

Table 1 shows the number of pneumonia and influenza deaths between 1979 and 2001 by race and sex. The overall number of deaths attributed to pneumonia and influenza in 2001 was 62,034; a 5% decline from the previous year. However, pneumonia and influenza remained the seventh leading cause of death in the U.S. in 2001. Once again, the 30% decrease seen in the number of overall deaths between 1998 and later years is entirely due to the revision of the ICD codes.

Pneumonia consistently accounts for the overwhelming majority of deaths. This was especially pertinent in 2001 since the number of influenza deaths declined 85% between 2000 and 2001 (1,765 vs. 257, respectively).

Table 2 displays age-adjusted mortality rates for pneumonia and influenza between 1979 and 2001 by race and sex. In 2001, the age-adjusted death rate for pneumonia and influenza was 22.0 per 100,000. Individually, the age-adjusted death rate was 21.9 per 100,000 for pneumonia and 0.1 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 2001 are between 2 to 3 times greater than those seen in 1979 to 1998.

The number of deaths due to pneumonia and influenza has been higher among females since the mid 1980s. However, females have age-adjusted mortality rates close to 30% lower than that in men. In 2001, the age-adjusted death rates for females and males were 19.2 and 26.6 per 100,000, respectively. Figure 3 displays this trend.

In 2001, blacks were 26% more likely to die from pneumonia and influenza than whites (24.1 per 100,000 vs. 19.1 per 100,000). Figure 4 displays these trends.

Table 3 describes the number of deaths and the age-adjusted death rate per 100,000 population due to pneumonia and influenza by Hispanic origin. In 2001, 2,722 Hispanics died from pneumonia and influenza, of these 2,718 died from pneumonia. Age-adjusted death rates in Hispanics were 5% lower than non-Hispanic whites and 16% lower than non-Hispanic blacks.

### *Age-Specific Mortality*

For the 65 and over population pneumonia and influenza are the fifth leading cause of death. Close to 90% of deaths due to these diseases occur in this age group. Tables 4 and 5 delineate the number of deaths and age-specific mortality rates for pneumonia and influenza between 1979 and 2001.

Very few deaths are attributed to influenza in the population under age 55. As observed in the 2001 mortality statistics, the highest death rate for influenza is in those over age 85 (2.2 per 100,000). Influenza mortality estimates were much lower in 2001 than in past years.

## **INCIDENCE**

Annual data on the incidence of pneumonia, influenza and other acute respiratory infections had been collected by the National Health Interview Survey (NHIS), a multi-purpose health survey on the health of the civilian, noninstitutionalized, household population of the U.S from 1982 to 1996. However, when the National Center for Health Statistics revised the questionnaire in 1997, questions on pneumonia, influenza and acute respiratory conditions were eliminated due to data inconsistencies. Therefore, the latest data available on acute lung diseases is for 1996.

Table 10 delineates the trend in the number and the rate of respiratory conditions from 1988 to 1996. In 1996, an estimated 208 million respiratory conditions were reported. The largest contributors to this total were influenza (95 million episodes) and the common cold (62 million episodes). Among reported acute conditions in 1996, respiratory conditions ranked first in the number of conditions per year (78.9 per 100 persons), as a cause of days lost from school (152.2 per 100 youths) and as a cause of lost days from work (99.3 per 100 currently employed persons).

### *Age-Specific Incidence Trends*

Incidence rates for acute respiratory conditions were highest in individuals under age 5 (129.4 per 100 persons). In 1996, influenza, followed by the common cold, showed the highest reported conditions in children under age 5, with approximately 10,780,000 and 9,756,000 episodes, respectively. Overall, the incidence rates for these acute conditions decline with increasing age. For example, the influenza incidence rate among those under age 5 was 53.7 per 100 persons compared to 18.6 per 100 persons in those over age 65.

### *Race-Specific Incidence Trends*

Table 7 shows the trend in the number and incidence rates for pneumonia and influenza by race and age. In 1996 the pneumonia incidence rate in whites was 2.0 per 100 persons. Due to small sample size and large relative standard error, incidence rates presented for pneumonia in whites and blacks are unreliable and should be used with caution.

The overall influenza incidence rate in whites was 37.3 per 100 persons compared to 28.1 per 100 persons among blacks. This difference was not significant.

## INFLUENZA SURVEILLANCE

Although estimates on influenza incidence are no longer available, 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.

In the United States, the 2003-2004 influenza season began and peaked earlier than usual and was more severe than the previous three seasons. Influenza activity peaked in mid-December, when 45 states reported widespread and 4 states regional influenza activity. This was higher than the peak number of states reporting widespread or regional activity over the last four seasons.

Over 99% of laboratory-tested positive respiratory specimens for influenza were A viruses, 1% were B viruses. Unfortunately, the virus variant most frequently isolated - influenza A/Fujian/411/2002 (H3N2) - was not an optimal match to the influenza A variant found in the 2003-2004 vaccine.

Additionally, every week from October to April, the vital statistics offices of 122 cities report the total number and percentage of death certificates filed in which pneumonia is identified as an underlying cause of death or for which there is any mention of influenza. These data are compared to a seasonal baseline or expected number; an epidemic threshold is defined as a certain number of deaths above this expected number. These are defined as "excess deaths".

According to the 122 Cities Mortality Reporting System the percentage of total deaths due to pneumonia and influenza (P&I) exceeded the epidemic threshold for 9 consecutive weeks (weeks ending December 20 to February 14).<sup>2</sup>

## HOSPITAL DISCHARGES

During epidemics, 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.

Table 8 delineates the most recent data on hospital discharges by type and region of the United States for 2002. The majority of hospitalizations attributed to pneumonia were due to unspecified organisms (81.7%). Close to three percent of discharges were attributed to pneumococcal pneumonia while other bacterial pneumonia was responsible for over ten percent of hospital discharges. Viral pneumonia was responsible for three percent of pneumonia discharges. When examined on a regional basis, the number of pneumonia discharges was highest in the South (518,000) and lowest in the West (228,000).

Overall, an estimated 28,000 hospital discharges were attributed to influenza in 2002. When examined regionally, most of the 28,000 discharges occurred in the Midwest.

Between 1988 and 2002 the discharge rate for pneumonia has increased by almost 42% while the rate for influenza has decreased 38%. This may be due to higher rates of influenza vaccination compared to pneumococcal vaccination rates in the general population.

### *Sex-Specific Hospital Discharges*

Table 9 displays the number and rate of hospital discharges attributed to pneumonia and influenza by sex from 1988 to 2002. An estimated 618,000 discharges (44.0 per 10,000) in males and 694,000 discharges (47.3 per 10,000) in females were attributable to pneumonia in 2002. During the same year an estimated 12,000 discharges (0.9 per 10,000) and 15,000 discharges (1.0 per 10,000) were attributed to influenza in males and females, respectively.

### *Age-Specific Hospital Discharges*

Table 10 delineates the age-specific trend in hospital discharges attributed to pneumonia and influenza from 1988 to 2002. In 2002 those 65 and older accounted for 60% of the total number of pneumonia discharges. This trend is evident in Figure 5. The hospital discharge rate for pneumonia was lowest for those 15-44 years of age (9.4 per 10,000) followed by those 45 to 64 years of age (32.4 per 10,000) and those under 15 (33.5 per 10,000). Those over 65 had the highest hospital discharge rate at 218.8 per 10,000. The hospital discharge rates for those 15-44 years and for those over 65 were significantly different from each other and the other age groups.

Due to a small sample, the only reliable age-specific hospital discharge rate for influenza occurred in the under 15 population (2.0 per 10,000).

### *Race-Specific Hospital Discharges*

Table 11 displays the trend in hospital discharges attributed to pneumonia by race from 1988 to 2002. The 2002 discharge rate was highest in blacks (41.4 per 10,000) and lowest in all other races (21.2 per 10,000). The rate in whites was 36.3 per 10,000. These rates, however, should be interpreted with caution due to the large percentage of discharges (21.2% in 2002) for which race was not reported. Figure 6 also displays this race-specific trend.

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

## **VACCINATION RATES**

Influenza is largely preventable with vaccines, and the major form of pneumonia is controllable by vaccine, as well. 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 will need a second vaccination. Figure 7 displays the percentage of beneficiaries aged 65 and older that received a pneumococcal vaccination since 1991. Percentages ranged from a low of 24.2% in Alaska to a high of 49% in North Dakota and Nebraska. The United States average was 39.2%.

There are two vaccine options available in the United States for influenza. The first is the newly approved nasal spray, Flu Mist, which is approved to prevent influenza illness in healthy people ages 5-49. The safety and effectiveness of Flu Mist in children under 5 years old, persons aged 50 years and over, and people with asthma or other reactive airway diseases has not been established. Flu Mist 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 above mentioned, the flu shot is indicated.

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 1990s, further improvements in vaccine coverage levels are needed, chiefly among persons aged 65 years and older are at higher risk of serious illness and death than all other age groups.

A national objective for the year 2010 is to increase influenza and pneumococcal vaccination levels > 90% among persons aged 65 years and older. To monitor the states' progress towards achieving this objective, data from the 2002 Behavioral Risk Factor Surveillance System (BRFSS) were analyzed. The median percentage of influenza vaccination among persons aged 65 years and older was 68.7%. However, there was wide variation among the states; Florida reported the lowest rate with 57%, while Hawaii reported the highest percentage at 76.6%. The median percentage of pneumococcal vaccination among persons aged 65 and older was 63%. Again, there was a wide range among the states; District of Columbia reported the lowest percentage (48%) and North Dakota reported the highest (72.5%). Table 12 shows the state-specific percentages for those aged 65 and older who have ever received a pneumococcal vaccination and/or those who received the flu shot from 1997 to 2002.

Vaccination against influenza was recently added to Medicare (Part B) reimbursable services. Table 13 shows the percentage of beneficiaries aged 65 and older that received influenza vaccinations paid for by Medicare from 1994 to 2002. Percentages ranged from a low of 25.8% in Alaska to a high of 56.8% in Minnesota in 2002. The United States average was 45.5%.

With clear and striking evidence of the effectiveness of the flu shot in reducing hospitalizations, deaths and in producing direct cost savings, providers and patients alike should take steps to ensure that people at high risk receive the flu vaccine each year. This recommendation also encompasses people with asthma. It has 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 vaccine may also worsen or exacerbate asthma. However, a study conducted by the American Lung Association Asthma Clinical Research Center network found that the opposite was true - receiving the flu vaccine was safe for people with asthma and did not cause higher rates of side effects compared with those who received a placebo.

Even with the results of this new study, the percentage of people receiving the flu shot remains low. 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 is slightly higher at approximately 40%. Table 14 displays the percent of adults with asthma who have received the flu vaccine in 2001 and 2002. The percent of adults with asthma receiving the flu shot ranged from a low of 27.1% in Nevada to a high of 51.2% in South Dakota in 2002.

Additional analysis by the American Lung Association found that if 100% of people with asthma received a flu shot, then close to 136,000 hospitalizations could be prevented each year resulting in a cost savings of \$757 million.

### **ECONOMIC COSTS <sup>3</sup>**

Together, pneumonia and influenza will represented a cost to the U.S. economy in 2004 of \$37.5 billion, \$5.6 billion due to indirect mortality costs and \$31.9 billion in direct costs.

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## FOOTNOTES

- 1 Unless otherwise noted, terms such as higher or less are not intended to indicate statistical significance.
- 2 The epidemic threshold is 1.654 standard deviations above the seasonal baseline. The seasonal baseline is projected using a robust regression procedure in which a periodic regression model is applied to observed percentages of deaths from pneumonia and influenza over the previous 5 years.
- 3 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.



TABLE 1: PNEUMONIA AND INFLUENZA - NUMBER OF DEATHS, BY RACE AND SEX, 1979-1998, 1999-2001

CAUSE OF DEATH	ALL RACES			WHITE			ALL OTHER RACES <sup>(1)</sup>					
							TOTAL			BLACK		
	BOTH	MALE	FEMALE	BOTH	MALE	FEMALE	BOTH	MALE	FEMALE	BOTH	MALE	FEMALE
<b>PNEUMONIA &amp; INFLUENZA</b>												
1979 <sup>(2)</sup>	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 <sup>(3)</sup>	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
<b>PNEUMONIA</b>												
1979 <sup>(2)</sup>	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 <sup>(3)</sup>	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
<b>INFLUENZA</b>												
1979 <sup>(2)</sup>	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 <sup>(3)</sup>	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

SOURCE: NATIONAL CENTER FOR HEALTH STATISTICS, REPORT OF FINAL MORTALITY STATISTICS, 1979-2001

## 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 MORTALITY RATES PER 100,000, BY SEX AND RACE, 1979-1998, 1999-2001 <sup>(1,2)</sup>

CAUSE OF DEATH	ALL RACES			WHITE			ALL OTHER RACES <sup>(3)</sup>					
							TOTAL			BLACK		
	BOTH SEXES	MALE	FEMALE	BOTH SEXES	MALE	FEMALE	BOTH SEXES	MALE	FEMALE	BOTH SEXES	MALE	FEMALE
<b>PNEUMONIA &amp; INFLUENZA</b>												
1979 <sup>(4)</sup>	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 <sup>(5)</sup>	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
<b>PNEUMONIA</b>												
1979 <sup>(4)</sup>	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 <sup>(5)</sup>	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
<b>INFLUENZA</b>												
1979 <sup>(4)</sup>	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 <sup>(5)</sup>	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	*	*

SOURCE: NATIONAL CENTER FOR HEALTH STATISTICS, REPORT OF FINAL MORTALITY STATISTICS, 1979-2001

NOTES:

(1) RATES FOR THE YEARS 1979-1998 ARE AGE-ADJUSTED TO THE 1940 U.S. STANDARD POPULATION

(2) RATES FOR THE YEARS 1999-2001 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 ORIGIN, 1999-2001 (1,2)**

YEAR	HISPANIC		NON-HISPANIC		NON-HISPANIC WHITE		NON-HISPANIC BLACK	
	NUMBER	RATE	NUMBER	RATE	NUMBER	RATE	NUMBER	RATE
<b>PNEUMONIA &amp; INFLUENZA</b>								
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
<b>PNEUMONIA</b>								
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
<b>INFLUENZA</b>								
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

**SOURCE: NATIONAL CENTER FOR HEALTH STATISTICS, REPORT OF FINAL MORTALITY STATISTICS, 1999-2001**

**NOTES:**

(1) INTERNATIONAL CLASSIFICATION OF DISEASES, 10TH REVISION (ICD-10) CODE J10-J18

(2) RATES ARE AGE ADJUSTED TO THE 2000 U.S. STANDARD POPULATION

**TABLE 4: PNEUMONIA AND INFLUENZA - NUMBER OF DEATHS BY 10-YEAR AGE GROUPS, 1979-1998, 1999-2001**

CAUSE OF DEATH	TOTAL	< 1	1 - 4	5-14	15-24	25 - 34	35 - 44	45 - 54	55 - 64	65 - 74	75 - 84	85+
<b>PNEUMONIA &amp; INFLUENZA</b>												
1979 <sup>(1)</sup>	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 <sup>(2)</sup>	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
<b>PNEUMONIA</b>												
1979 <sup>(1)</sup>	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 <sup>(2)</sup>	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
<b>INFLUENZA</b>												
1979 <sup>(1)</sup>	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 <sup>(2)</sup>	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

**SOURCE: NATIONAL CENTER FOR HEALTH STATISTICS, REPORT OF FINAL MORTALITY STATISTICS, 1979-2001**

**NOTES:**

(1) ESTIMATES FOR 1979-1998 USE THE INTERNATIONAL CLASSIFICATION OF DISEASES, 9TH REVISION (ICD-9) CODE 480-487

(2) ESTIMATES FOR 1999-2000 USE THE INTERNATIONAL CLASSIFICATION OF DISEASES, 10TH REVISION (ICD-10) CODE J10-J18

**TABLE 5: PNEUMONIA & INFLUENZA - AGE-SPECIFIC MORTALITY RATE PER 100,000 POPULATION, 1979-1998,1999-2001**

CAUSE OF DEATH	TOTAL	< 1	1 - 4	5-14	15-24	25 - 34	35 - 44	45 - 54	55 - 64	65 - 74	75 - 84	85+
<b>PNEUMONIA &amp; INFLUENZA</b>												
1979 <sup>(1)</sup>	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	1038.7
1987	28.6	17.7	1.4	0.3	0.7	1.8	3.4	7.0	17.8	57.5	232.3	1018.0
1989	31.0	15.7	1.6	0.4	0.7	2.0	3.9	6.9	18.3	58.3	243.9	1110.4
1991	30.9	14.8	1.4	0.4	0.7	1.8	3.7	6.8	17.8	55.9	238.5	1080.5
1993	32.1	13.2	1.2	0.4	0.7	1.7	3.8	6.6	17.7	58.1	241.2	1089.0
1995	31.6	12.6	1.0	0.3	0.6	1.5	3.5	6.7	16.4	57.2	233.2	1035.7
1996	31.5	12.7	1.1	0.4	0.6	1.4	3.4	6.5	16.9	56.8	230.6	1010.9
1997	32.3	10.8	1.2	0.4	0.6	1.3	3.2	6.6	17.2	57.0	233.7	1024.7
1998	34.0	11.2	1.0	0.3	0.6	1.4	3.1	6.3	17.0	59.8	241.4	1063.9
1999 <sup>(2)</sup>	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
<b>PNEUMONIA</b>												
1979 <sup>(1)</sup>	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	1006.0
1989	30.4	15.4	1.5	0.3	0.7	2.0	3.8	6.8	17.9	57.4	239.5	1083.0
1991	30.8	14.4	1.3	0.3	0.7	1.7	3.6	6.7	17.5	55.2	235.6	1063.0
1993	31.1	13.0	1.1	0.3	0.7	1.7	3.8	6.5	17.5	57.5	238.8	1073.0
1995	31.3	12.4	0.9	0.3	0.6	1.5	3.5	6.6	16.2	56.8	231.9	1027.0
1996	31.3	12.8	1.1	0.3	0.5	1.4	3.3	6.4	16.7	56.3	229.0	1001.3
1997	32.0	10.7	1.1	0.3	0.6	1.3	3.1	6.6	17.0	56.5	232.3	1015.2
1998	33.4	11.5	0.9	0.3	0.6	1.4	3.1	6.2	16.7	59.0	237.1	1041.1
1999 <sup>(2)</sup>	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
<b>INFLUENZA</b>												
1979 <sup>(1)</sup>	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 <sup>(2)</sup>	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

SOURCE: NATIONAL CENTER FOR HEALTH STATISTICS, REPORT OF FINAL MORTALITY STATISTICS, 1979-2001

NOTES:

\* FIGURE DOES NOT MEET STANDARD OF RELIABILITY OF PRECISION- ESTIMATE IS BASED ON FEWER THAN 20 DEATHS

(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 6: NUMBER OF ACUTE RESPIRATORY CONDITIONS AND INCIDENCE RATES PER 100 PERSONS, SELECTED YEARS, 1982-1996 <sup>(1)</sup>**

YEAR	RESPIRATORY CONDITIONS		COMMON COLD		OTHER ACUTE UPPER RESPIRATORY INFECTIONS		INFLUENZA		ACUTE BRONCHITIS		PNEUMONIA		OTHER RESPIRATORY CONDITIONS	
	NUMBER	RATE	NUMBER	RATE	NUMBER	RATE	NUMBER	RATE	NUMBER	RATE	NUMBER	RATE	NUMBER	RATE
<i>(NUMBER OF ACUTE CONDITIONS IN THOUSANDS)</i>														
1982	181,087	79.7	71,362	31.4	21,787	9.6	74,925	33.0	4,779	2.1	3,124	1.4	5,111	2.3
1983	194,841	85.0	70,443	30.7	22,572	9.8	87,299	38.1	7,136	3.1	3,121	1.4	4,270	1.9
1984	205,387	88.7	66,322	28.6	21,690	9.4	103,440	44.7	6,695	2.9	2,736	1.2	4,504	1.9
1985	203,491	87.1	71,235	30.5	23,822	10.2	94,409	40.4	6,559	2.8	2,891	1.2	4,576	2.0
1986	228,842	96.8	63,428	26.8	21,792	9.2	130,551	55.2	6,275	2.7	2,642	1.1	4,153	1.8
1987	191,049	80.1	61,860	25.9	22,814	9.6	91,028	38.2	7,349	3.1	3,627	1.5	4,370	1.8
1988	209,342	86.9	68,692	28.5	21,993	9.1	103,167	42.8	8,137	3.4	3,007	1.2	4,347	1.8
1989	231,854	95.2	70,809	29.1	21,725	8.9	122,657	50.4	8,789	3.6	3,567	1.5	4,307	1.8
1990	209,825	85.3	61,450	25.0	22,413	9.1	106,807	43.4	10,372	4.2	3,862	1.6	4,920	2.0
1991	250,214	100.6	71,235	28.6	29,221	11.7	129,583	52.1	11,161	4.5	4,146	1.7	4,869	2.0
1992	215,358	85.6	64,604	25.7	24,812	9.9	107,309	42.7	10,257	4.1	3,910	1.6	4,465	1.8
1993	251,551	98.9	68,226	26.8	28,637	11.3	132,633	52.2	12,014	4.7	4,990	2.0	5,052	2.0
1994	208,930	80.5	65,968	25.4	30,866	11.9	90,447	34.8	12,149	4.7	4,220	1.6	5,280	2.0
1995	223,037	85.2	60,564	23.1	31,687	12.1	108,009	41.2	13,250	5.1	5,113	2.0	4,413	1.7
1996	208,623	78.9	62,251	23.6	29,866	11.3	95,049	36.0	12,116	4.6	4,791	1.8	4,550	1.7

**SOURCE: NATIONAL CENTER FOR HEALTH STATISTICS, NATIONAL HEALTH INTERVIEW SURVEY, 1970-1996**

NOTES:

(1) CONDITIONS INVOLVING NEITHER MEDICAL ATTENTION NOR ACTIVITY RESTRICTION ARE EXCLUDED.

**TABLE 7: PNEUMONIA AND INFLUENZA - NUMBER OF CONDITIONS AND INCIDENCE RATE  
PER 100 PERSONS BY RACE AND AGE, 1986-1996<sup>(1)</sup>**

YEAR	PNEUMONIA				INFLUENZA			
	WHITE		BLACK		WHITE		BLACK	
	NUMBER	RATE	NUMBER	RATE	NUMBER	RATE	NUMBER	RATE
1986	2,306,000	1.2	248,000	0.9*	118,558,000	59.2	8,940,000	31.3
1987	3,005,000	1.5	492,000	1.7*	81,715,000	40.5	5,729,000	19.8
1988	2,583,000	1.3	409,000	1.4*	92,534,000	45.5	7,770,000	26.4
1989	3,080,000	1.5	390,000	1.3*	108,509,000	52.9	9,940,000	33.3
1990	3,397,000	1.6	361,000	1.2*	95,837,000	46.3	7,334,000	24.1
1991	3,462,000	1.7	508,000	1.6*	114,918,000	55.2	11,039,000	35.7
1992	3,603,000	1.7	307,000	1.0*	95,472,000	45.6	8,079,000	25.7
1993	4,120,000	1.9	593,000	1.9*	117,915,000	55.8	9,567,000	29.9
1994	3,535,000	1.6	575,000	1.7*	78,327,000	36.5	7,668,000	23.2
1995	4,502,000	2.1	344,000	1.1*	95,540,000	44.0	8,676,000	26.5
1996	4,376,000	2.0	249,000	0.8*	82,048,000	37.3	9,313,000	28.1

**SOURCE: NATIONAL CENTER FOR HEALTH STATISTICS, NATIONAL HEALTH INTERVIEW SURVEY, 1986-1996**

NOTES:

(1) CONDITIONS INVOLVING NEITHER MEDICAL ATTENTION NOR ACTIVITY RESTRICTION ARE EXCLUDED.

-- NO CASES IN SAMPLE.

\*ESTIMATES FOR WHICH THE NUMERATOR HAS A RELATIVE STANDARD ERROR OF MORE THAN 30 PERCENT.

TABLE 8: PNEUMONIA &amp; INFLUENZA - NUMBER OF FIRST-LISTED HOSPITAL DISCHARGES BY TYPE, SEX, AGE, &amp; DEMOGRAPHIC REGION, 2002

DIAGNOSIS	TOTAL <sup>(1)</sup>	SEX		AGE				DEMOGRAPHIC REGION			
		MALE	FEMALE	<15	15-44	45-64	65+	NORTH- EAST	MID- WEST	SOUTH	WEST
(NUMBER IN THOUSANDS)											
PNEUMONIA (480-486), TOTAL DISCHARGES:	1,312	618	694	203	117	216	776	260	305	518	228
VIRAL PNEUMONIA (480)	39	23	16	33	–	–	–	–	10	14	12
DUE TO RESPIRATORY SYNCYTIAL VIRUS (480.1)	21	14	7 <sup>(2)</sup>	19	–	–	–	–	6 <sup>(2)</sup>	8 <sup>(2)</sup>	5 <sup>(2)</sup>
UNSPECIFIED (480.9)	17	9 <sup>(2)</sup>	9 <sup>(2)</sup>	13	–	–	–	–	–	5 <sup>(2)</sup>	7 <sup>(2)</sup>
PNEUMOCOCCAL PNEUMONIA (481)	39	20	19	–	6 <sup>(2)</sup>	7 <sup>(2)</sup>	23	8 <sup>(2)</sup>	12	11	8 <sup>(2)</sup>
OTHER BACTERIAL PNEUMONIA (482)	137	67	70	7 <sup>(2)</sup>	11	22	95				
DUE TO PSEUDOMONAS (482.1)	27	15	12	–	–	–	19	7 <sup>(2)</sup>	–	13	–
DUE TO HEMOPHILUS INFLUENZAE (482.2)	15	9 <sup>(2)</sup>	7 <sup>(2)</sup>	–	–	–	11	–	–	7 <sup>(2)</sup>	–
DUE TO STREPTOCOCCUS (482.3)	8 <sup>(2)</sup>	–	5 <sup>(2)</sup>	–	–	–	–	–	–	–	–
DUE TO STAPHYLOCOCCUS (482.4)	39	17	22	–	–	7 <sup>(2)</sup>	27	7 <sup>(2)</sup>	6 <sup>(2)</sup>	18	8 <sup>(2)</sup>
DUE TO OTHER SPECIFIED BACTERIA (482.8)	25	13	12	–	–	–	20	–	11	17	–
UNSPECIFIED (482.9)	17	7 <sup>(2)</sup>	10	–	–	–	11	5 <sup>(2)</sup>	5 <sup>(2)</sup>	–	–
PNEUMONIA DUE TO OTHER SPECIFIED ORGANISM (483)	–	–	–	–	–	–	–	–	–	–	–
BRONCHOPNEUMONIA, ORGANISM UNSPECIFIED (485)	21	11	9 <sup>(2)</sup>	6 <sup>(2)</sup>	–	–	11	5 <sup>(2)</sup>	–	10	–
PNEUMONIA, ORGANISM UNSPECIFIED (486)	1,072	495	577	150	97	182	644	217	247	426	183
INFLUENZA (487), TOTAL DISCHARGES	28	12	15	12	–	6 <sup>(2)</sup>	7 <sup>(2)</sup>	5 <sup>(2)</sup>	10	7 <sup>(2)</sup>	5 <sup>(2)</sup>
WITH PNEUMONIA (487.0)	7 <sup>(2)</sup>	–	–	–	–	–	–	–	–	–	–
WITH OTHER RESPIRATORY MANIFESTATIONS (487.1)	19	9 <sup>(2)</sup>	9 <sup>(2)</sup>	8 <sup>(2)</sup>	–	–	–	5 <sup>(2)</sup>	6 <sup>(2)</sup>	5 <sup>(2)</sup>	–

SOURCE: NATIONAL CENTER FOR HEALTH STATISTICS, NATIONAL HOSPITAL DISCHARGE SURVEY, 2002

## NOTES:

(1) DUE TO ROUNDING, TOTAL PNEUMONIA DISCHARGES (ICD CODES 480-486) SHOWN IN THIS TABLE MAY DIFFER FROM THOSE SHOWN IN TABLE 9 AND 10

(2) ESTIMATES OF 5,000-10,000 TO BE USED WITH CAUTION

– ESTIMATES OF LESS THAN 5,000 ARE NOT SHOWN



**TABLE 9: PNEUMONIA & INFLUENZA - NUMBER OF FIRST-LISTED HOSPITAL DISCHARGES AND RATE PER 10,000 POPULATION (ICD-9-CM CODES 480-486, 487), BY SEX, 1988-2002**

YEAR	PNEUMONIA						INFLUENZA					
	TOTAL <sup>(1)</sup>		MALES		FEMALES		TOTAL <sup>(1)</sup>		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 <sup>(2)</sup>	0.4 <sup>(2)</sup>	8,000 <sup>(2)</sup>	0.6 <sup>(2)</sup>
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 <sup>(2)</sup>	0.6 <sup>(2)</sup>	12,000	0.9
1996	1,202,000	45.5	574,000	44.6	628,000	46.4	21,000	0.8	9,000 <sup>(2)</sup>	0.7 <sup>(2)</sup>	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 <sup>(2)</sup>	0.5 <sup>(2)</sup>
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 <sup>(2)</sup>	0.6 <sup>(2)</sup>	6,000 <sup>(2)</sup>	0.4 <sup>(2)</sup>
2002	1,312,000	45.7	618,000	44.0	694,000	47.3	28,000	1.0	12,000	0.9	15,000	1.0

**SOURCE: NATIONAL CENTER FOR HEALTH STATISTICS: NATIONAL HOSPITAL DISCHARGE SURVEY, 1988-2002**

**NOTES:**

(1) 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 STANDARD OF RELIABILITY OR PRECISION

(2) ESTIMATES OF 5,000-10,000, AND CORRESPONDING RATES, SHOULD BE USED WITH CAUTION

**TABLE 10: PNEUMONIA & INFLUENZA - NUMBER AND RATE PER 10,000 OF FIRST-LISTED HOSPITAL DISCHARGES BY AGE, 1988-2002**

YEAR	PNEUMONIA								INFLUENZA							
	<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 <sup>(2)</sup>	0.7 <sup>(2)</sup>	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 <sup>(2)</sup>	1.5 <sup>(2)</sup>	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 <sup>(2)</sup>	1.3 <sup>(2)</sup>	23,000	7.3
1991	207,000	37.5	126,000	10.8	141,000	30.2	582,000	183.3	6,000 <sup>(2)</sup>	1.1 <sup>(2)</sup>	8,000 <sup>(2)</sup>	0.7 <sup>(2)</sup>	6,000 <sup>(2)</sup>	1.3 <sup>(2)</sup>	7,000 <sup>(2)</sup>	2.2 <sup>(2)</sup>
1992	208,000	37.2	135,000	11.5	161,000	33.2	556,000	172.1	*	*	*	*	*	*	6,000 <sup>(2)</sup>	1.9 <sup>(2)</sup>
1993	209,000	36.9	142,000	12.1	191,000	38.5	642,000	195.9	*	*	8,000 <sup>(2)</sup>	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 <sup>(2)</sup>	1.4 <sup>(2)</sup>	15,000	4.5
1995	243,000	42.1	154,000	13.0	161,000	30.9	687,000	205.0	*	*	*	*	*	*	7,000 <sup>(2)</sup>	2.1 <sup>(2)</sup>
1996	190,000	33.0	140,000	11.8	173,000	32.3	699,000	206.3	*	*	6,000 <sup>(2)</sup>	1.0 <sup>(2)</sup>	*	*	9,000 <sup>(2)</sup>	2.7 <sup>(2)</sup>
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 <sup>(2)</sup>	1.5 <sup>(2)</sup>	7,000 <sup>(2)</sup>	0.6 <sup>(2)</sup>	9,000 <sup>(2)</sup>	1.6 <sup>(2)</sup>	13,000	3.8
1999	208,000	34.5	123,000	10.1	218,000	36.9	810,000	236.6	6,000 <sup>(2)</sup>	1.0 <sup>(2)</sup>	6,000 <sup>(2)</sup>	0.5 <sup>(2)</sup>	6,000 <sup>(2)</sup>	1.0 <sup>(2)</sup>	18,000	5.3
2000	173,000	28.6	128,000	10.5	218,000	35.8	763,000	221.2	6000 <sup>(2)</sup>	1.0 <sup>(2)</sup>	*	*	6,000 <sup>(2)</sup>	1.0 <sup>(2)</sup>	23,000	6.7
2001	192,000	31.8	118,000	9.6	212,000	32.9	756,000	214.2	7,000 <sup>(2)</sup>	1.2 <sup>(2)</sup>	*	*	*	*	*	*
2002	203,000	33.5	117,000	9.4	216,000	32.4	776,000	218.0	12,000	2.0	*	*	6,000 <sup>(2)</sup>	0.9 <sup>(2)</sup>	7,000 <sup>(2)</sup>	2.0 <sup>(2)</sup>

**SOURCE: NATIONAL CENTER FOR HEALTH STATISTICS, NATIONAL HOSPITAL DISCHARGE SURVEY, 1988-2002**

**NOTES:**

(1) 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 STANDARD OF RELIABILITY OR PRECISION

(2) ESTIMATES OF 5,000-10,000, AND CORRESPONDING RATES, SHOULD BE USED WITH CAUTION

\* ESTIMATES LESS THAN 5,000 ARE NOT SHOWN

**TABLE 11: PNEUMONIA - NUMBER AND RATE PER 10,000 POPULATION OF FIRST- LISTED HOSPITAL DISCHARGES (ICD-9-CM-CODES 480-486) BY RACE, 1979-2002**

YEAR	NUMBER OF DISCHARGES			RATE PER 10,000		
	WHITE	BLACK	OTHER <sup>(1)</sup>	WHITE	BLACK	OTHER <sup>(1)</sup>
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

**SOURCE: NATIONAL CENTER FOR HEALTH STATISTICS, NATIONAL HOSPITAL DISCHARGE SURVEY, 1988-2002**

**NOTES:**

(1) ALL OTHER RACES THAN WHITES AND BLACKS

(2) BETWEEN 1988 AND 2002, 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.

**TABLE 12: PERCENTAGE OF ADULTS 65 YEARS AND OLDER WHO REPORTED EVER HAVING A PNEUMOCOCCAL VACCINATION OR HAVING AN INFLUENZA VACCINATION, 1997-2002**

STATE	Influenza					Pneumococcal				
	1997%	1999%	2001%	2002%	% Difference	1997%	1999%	2001%	2002%	% Difference
					1997-2002					1997-2002
Alabama	62.6	64.6	65.9	64.8	3.4	47.5	53.9	60.3	58.5	23.2
Alaska	58.3	59.8	62.8	69.5	16.1	39.2	43.8	65.3	59.8	52.6
Arizona	72.9	71.3	61.8	69.7	-4.6	59.4	53.4	65.6	68.0	14.5
Arkansas	61.1	67.3	63.2	69.0	11.4	39.1	50.2	59.0	58.7	50.1
California	65.5	72.2	68.9	71.5	8.4	49.8	57.0	59.6	66.7	33.9
Colorado	74.4	74.8	77.4	73.3	-1.5	53.3	62.7	68.6	68.1	27.8
Connecticut	67.2	64.8	69.1	71.4	5.9	43.0	49.0	63.3	64.5	50.0
Delaware	68.6	67.7	67.6	71.5	4.1	52.6	66.5	68.9	64.3	22.2
District of Columbia	54.3	55.8	55.5	58.7	7.5	32.3	35.3	49.0	48.0	48.6
Florida	62.3	63.3	54.9	57.0	-9.3	45.5	53.5	58.1	57.2	25.7
Georgia	58.5	57.0	62.2	59.3	1.3	48.5	49.7	57.9	57.3	18.1
Hawaii	71.1	74.1	79.0	73.9	3.8	51.7	55.8	63.7	59.5	15.1
Idaho	66.4	69.0	65.1	65.1	-2.0	50.2	55.2	60.3	57.5	14.5
Illinois	67.8	67.5	62.2	61.1	-11.0	44.7	47.4	56.7	56.7	26.8
Indiana	62.5	66.2	65.7	66.3	5.7	38.0	51.6	60.2	61.2	61.1
Iowa	69.7	69.6	72.8	73.5	5.2	51.5	61.2	65.9	66.2	28.5
Kansas	61.5	67.0	68.5	68.6	10.3	43.7	55.1	62.9	62.1	42.1
Kentucky	61.2	68.4	60.9	65.7	6.8	38.6	52.0	55.1	56.6	46.6
Louisiana	58.4	60.3	56.1	57.3	-1.9	32.2	40.4	49.5	56.3	74.8
Maine	72.1	73.7	71.5	73.8	2.3	50.0	57.3	65.0	66.8	33.6
Maryland	63.4	62.6	67.3	65.9	3.8	41.0	54.1	62.3	63.4	54.6
Massachusetts	66.0	69.4	70.6	72.6	9.1	52.7	56.8	63.5	63.4	20.3
Michigan	63.6	70.0	60.4	67.7	6.1	45.6	57.7	56.6	63.0	38.2
Minnesota	69.0	64.0	70.1	76.6	9.9	48.3	51.9	62.9	70.4	45.8
Mississippi	61.1	62.8	61.8	63.0	3.0	45.9	50.4	55.7	58.9	28.3
Missouri	70.3	68.4	67.5	68.7	-2.3	44.3	52.8	56.0	60.8	37.2
Montana	68.4	72.9	73.1	67.6	-1.2	50.8	61.2	67.9	67.3	32.5
Nebraska	65.8	69.2	70.1	68.2	3.5	49.8	54.8	61.2	61.3	23.1
Nevada	56.5	62.2	63.3	60.3	6.3	53.5	61.0	66.3	65.0	21.5
New Hampshire	64.6	65.1	69.4	72.3	10.7	49.6	60.4	62.7	63.8	28.6
New Jersey	60.7	65.3	64.5	69.1	12.2	33.9	55.1	58.9	63.1	86.1
New Mexico	72.8	68.8	70.0	66.6	-9.3	50.1	53.2	62.7	62.7	25.1
New York	64.5	63.8	62.5	64.7	0.3	38.9	50.0	55.9	62.4	60.4
North Carolina	64.6	64.2	66.1	68.1	5.1	50.6	58.5	65.8	63.0	24.5
North Dakota	64.8	67.2	70.0	73.9	12.3	40.8	55.0	64.2	72.5	77.7
Ohio	65.4	68.8	63.4	66.6	1.8	38.5	55.0	59.3	63.7	65.5
Oklahoma	69.3	71.8	72.7	72.7	4.7	40.4	53.7	66.1	65.5	62.1
Oregon	69.8	65.2	71.7	68.0	-2.6	55.9	56.2	70.9	65.0	16.3
Pennsylvania	65.8	63.1	63.8	70.5	6.7	47.1	52.2	59.5	63.5	34.8
Rhode Island	67.7	75.8	72.6	73.7	8.1	43.0	56.9	67.0	67.6	57.2
South Carolina	74.3	69.9	66.2	69.4	-7.1	41.6	56.1	57.9	64.9	56.0
South Dakota	65.6	73.6	74.1	74.2	11.6	40.6	50.4	59.2	56.7	39.7
Tennessee	69.1	65.5	65.6	71.6	3.5	45.0	54.3	55.4	61.4	36.4
Texas	68.0	69.8	61.8	61.0	-11.5	44.4	55.9	58.0	56.9	28.2
Utah	66.1	75.1	68.7	71.1	7.0	48.5	61.3	67.3	65.0	34.0
Vermont	69.5	73.4	71.5	73.6	5.6	51.6	56.5	67.3	66.3	28.5
Virginia	67.7	65.7	65.3	65.3	-3.7	53.6	55.2	60.1	60.8	13.4
Washington	70.3	68.9	72.5	65.1	-8.0	51.6	55.8	66.8	63.0	22.1
West Virginia	58.2	62.9	61.7	65.8	11.6	41.3	54.3	61.3	61.2	48.2
Wisconsin	66.1	64.9	70.4	74.0	10.7	42.6	53.7	65.6	70.6	65.7
Wyoming	72.4	73.8	69.6	70.6	-2.5	50.9	61.5	68.4	68.2	34.0
<b>Range</b>	<b>41.5-74.4</b>	<b>55.8-75.8</b>	<b>54.9-79.0</b>	<b>57.0-76.6</b>		<b>32.2-59.4</b>	<b>35.3-52.6</b>	<b>49.0-70.9</b>	<b>48.0-72.5</b>	
<b>Median</b>	<b>65.9</b>	<b>67.4</b>	<b>67.3</b>	<b>68.7</b>		<b>45.8</b>	<b>54.9</b>	<b>62.3</b>	<b>63.0</b>	

Source: Behavioral Risk Factor Surveillance System, 1997-2002

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**TABLE 13: INFLUENZA VACCINATION OF NON-HMO MEDICARE BENEFICIARIES 65+ PAID BY MEDICARE, 1994-2002**

STATE	1994 %	1995 %	1996 %	1997 %	1998 %	1999 %	2000 %	2001 %	2002 %	% Change 1994-2002
Alabama	40.7	40.0	40.9	41.1	40.8	42.6	34.1	38.4	43.1	5.9
Alaska	29.0	26.0	27.1	30.7	29.0	28.1	22.9	26.8	25.8	-11.0
Arizona	46.4	46.4	48.7	46.0	48.8	49.4	30.7	43.1	47.8	3.0
Arkansas	45.8	44.9	45.9	49.9	49.9	52.5	32.6	40.6	47.0	2.6
California	31.4	32.3	34.3	34.2	34.5	34.5	26.4	30.7	35.8	14.0
Colorado	48.4	47.3	51.4	51.7	51.1	52.2	43.1	47.8	47.8	-1.2
Connecticut	42.0	42.7	45.5	45.8	44.3	47.6	40.6	46.9	49.7	18.3
Delaware	38.3	44.7	47.1	40.5	39.1	49.9	34.0	50.3	45.8	19.6
District of Columbia	23.8	25.5	29.6	29.7	28.7	30.0	25.2	27.4	29.3	23.1
Florida	43.3	42.1	44.5	45.4	45.2	40.7	34.1	39.2	43.1	-0.5
Georgia	34.7	37.9	40.2	40.7	41.5	42.6	36.8	41.5	43.8	26.2
Hawaii	36.1	42.0	44.6	45.6	46.0	47.0	43.1	48.3	52.0	44.0
Idaho	48.6	48.6	47.6	47.5	43.8	46.5	39.5	45.8	46.8	-3.7
Illinois	35.1	38.4	40.0	41.3	40.6	41.5	36.8	42.6	44.8	27.6
Indiana	45.0	45.3	46.9	47.0	47.3	49.9	41.9	48.0	49.1	9.1
Iowa	49.2	52.1	55.6	55.9	55.9	56.7	47.9	54.4	55.6	13.0
Kansas	47.7	45.9	47.3	48.7	48.8	49.7	43.5	46.3	48.3	1.3
Kentucky	37.5	45.6	44.4	45.6	45.5	47.3	40.7	44.7	47.5	26.7
Louisiana	30.6	30.9	38.7	37.5	39.5	37.5	30.6	36.4	44.4	45.1
Maine	46.6	45.2	47.2	47.2	47.8	47.3	39.4	42.3	44.6	-4.3
Maryland	36.8	37.5	42.4	42.7	42.2	44.5	40.2	40.6	44.3	20.4
Massachusetts	24.4	25.8	28.3	28.9	28.8	30.5	25.1	32.1	36.2	48.4
Michigan	42.5	43.9	45.5	44.7	45.8	48.2	36.9	43.3	49.2	15.8
Minnesota	46.9	50.7	52.7	55.1	53.4	55.4	50.4	55.3	56.8	21.1
Mississippi	40.2	38.9	38.7	41.8	29.2	42.1	35.3	38.7	41.7	3.7
Missouri	40.5	42.9	45.2	45.8	46.1	46.5	37.2	43.4	46.4	14.6
Montana	49.4	54.5	55.1	54.0	55.7	57.5	49.6	50.8	54.3	9.9
Nebraska	52.7	50.6	50.3	54.0	55.1	54.8	49.2	50.5	52.6	-0.2
Nevada	34.5	36.4	37.6	36.5	33.8	36.0	21.0	30.3	31.0	-10.1
New Hampshire	38.1	42.9	41.7	43.9	44.5	45.3	42.1	45.1	46.4	21.8
New Jersey	35.2	36.9	39.3	40.0	38.8	40.1	33.6	39.8	45.2	28.4
New Mexico	30.0	30.2	32.8	30.5	32.6	30.5	25.5	29.0	32.5	8.3
New York	35.3	36.7	39.6	42.1	41.6	43.0	37.8	42.9	44.8	26.9
North Carolina	39.4	40.9	44.0	43.8	43.4	45.8	43.5	46.7	49.5	25.6
North Dakota	47.1	49.7	52.0	54.8	55.1	56.4	52.2	52.8	54.6	15.9
Ohio	43.9	45.0	47.6	48.6	48.0	50.0	40.3	45.7	49.6	13.0
Oklahoma	39.6	41.1	40.2	40.7	45.9	51.7	43.2	41.4	48.1	21.5
Oregon	47.7	48.2	48.2	46.2	47.7	47.4	35.8	43.4	44.2	-7.3
Pennsylvania	42.9	43.8	45.7	46.4	45.9	47.8	40.2	46.8	50.6	17.9
Rhode Island	42.9	44.9	47.7	49.8	48.6	50.0	41.1	49.6	49.2	14.7
South Carolina	37.9	38.1	39.6	40.8	39.6	43.1	35.6	39.6	43.5	14.8
South Dakota	43.2	43.4	44.4	45.0	46.2	47.3	41.9	46.9	46.9	8.6
Tennessee	43.4	44.4	46.1	46.6	47.0	49.7	42.0	48.1	50.4	16.1
Texas	37.5	38.8	39.9	40.6	40.2	40.3	31.4	35.7	40.4	7.7
Utah	46.3	49.7	45.9	48.0	47.0	49.3	47.0	47.8	51.4	11.0
Vermont	35.9	41.8	44.5	46.1	46.2	47.3	39.6	45.0	47.3	31.8
Virginia	43.8	43.6	46.5	47.2	47.3	49.0	42.4	44.9	47.3	8.0
Washington	45.3	47.4	46.6	45.4	43.8	44.7	37.7	40.8	42.9	-5.3
West Virginia	35.7	37.1	37.0	39.1	39.4	42.5	36.5	38.9	41.8	17.1
Wisconsin	47.7	49.6	52.1	53.2	53.1	52.1	47.8	54.1	55.8	17.0
Wyoming	39.7	46.6	48.2	48.1	48.9	52.3	35.8	47.2	45.4	14.4
TOTAL	39.7	41.0	43.0	43.7	43.5	44.7	37.2	42.2	45.5	14.6

**SOURCE: CENTERS FOR MEDICARE AND MEDICAID SERVICES. INFLUENZA/PNEUMOCOCCAL CAMPAIGN, 1994-2002**

Note: Data reflects claims paid for by Medicare for non-HMO beneficiaries only. Total immunization rates may be higher in those areas with free or publicly-supported programs.

TABLE 14: PERCENT OF ADULTS WITH ASTHMA WHO RECEIVED THE INFLUENZA SHOT, 2001- 2002

State	2001		2002		% Change 2001-2002
	%	CI of %	%	CI of %	
Alabama	33.6	(28.4-38.9)	40.5	(36.1-44.9)	20.5
Alaska	26.3	(19.5-33.0)	33.5	(26.8-40.3)	27.4
Arizona	40.5	(36.1-44.8)	40.6	(35.9-45.3)	0.2
Arkansas	43.2	(37.2-49.1)	35.9	(31.4-40.4)	-16.9
California	39.8	(35.3-44.3)	40.0	(34.4-45.0)	0.5
Colorado	39.6	(33.0-46.3)	40.7	(37.2-44.2)	2.8
Connecticut	41.2	(38.0-44.4)	43.1	(39.6-46.7)	4.6
Delaware	32.2	(26.9-37.6)	42.8	(37.0-48.5)	32.9
D.C.	31.6	(25.1-38.1)	39.6	(35.3-43.8)	25.3
Florida	37.8	(33.4-42.1)	30.8	(26.9-34.7)	-18.5
Georgia	34.8	(30.5-39.0)	30.0	(26.7-33.3)	-13.8
Hawaii	42.2	(36.2-48.1)	46.1	(40.6-51.6)	9.2
Idaho	39.5	(36.3-42.8)	38.1	(34.1-42.1)	-3.5
Illinois	39.3	(32.8-45.7)	40.4	(36.7-44.1)	2.8
Indiana	38.0	(33.9-42.2)	34.3	(31.5-37.2)	-9.7
Iowa	38.3	(33.6-43.0)	49.6	(45.6-53.5)	29.5
Kansas	39.1	(35.1-43.0)	37.1	(33.4-40.8)	-5.1
Kentucky	39.2	(36.1-42.3)	37.6	(34.9-40.4)	-4.1
Louisiana	34.2	(30.0-38.4)	30.0	(25.9-34.0)	-12.3
Maine	45.8	(41.6-50.0)	47.4	(43.7-51.1)	3.5
Maryland	27.0	(23.0-31.1)	44.5	(40.0-49.0)	64.8
Massachusetts	39.1	(36.9-41.4)	42.8	(39.7-45.9)	9.5
Michigan	34.1	(30.3-37.8)	37.1	(34.3-39.9)	8.8
Minnesota	44.5	(40.5-48.6)	43.9	(40.0-47.8)	-1.3
Mississippi	39.3	(32.3-46.2)	44.9	(40.2-49.7)	14.2
Missouri	44.1	(39.3-49.0)	37.2	(33.7-40.8)	-15.6
Montana	47.7	(42.0-53.4)	44.3	(39.3-49.2)	-7.1
Nebraska	52.6	(48.1-57.1)	48.9	(44.1-53.7)	-7.0
Nevada	28.9	(23.0-34.8)	27.1	(21.8-32.5)	-6.2
New Hampshire	40.3	(36.5-44.0)	36.4	(32.4-40.5)	-9.7
New Jersey	35.0	(31.2-38.9)	36.8	(29.4-44.2)	5.1
New Mexico	43.7	(38.5-48.8)	41.2	(37.6-44.9)	-5.7
New York	35.9	(30.8-44.1)	43.8	(39.4-48.2)	22.0
North Carolina	40.4	(36.0-44.7)	42.8	(37.7-47.9)	5.9
North Dakota	47.0	(42.1-51.9)	45.3	(41.2-49.5)	-3.6
Ohio	39.6	(36.5-42.6)	37.5	(34.0-41.1)	-5.3
Oklahoma	50.3	(46.2-54.5)	46.4	(42.9-50.1)	-7.8
Oregon	50.2	(44.7-55.6)	45.8	(42.0-49.6)	-8.8
Pennsylvania	40.4	(36.1-44.8)	45.8	(43.2-48.3)	13.4
Rhode Island	39.6	(36.4-42.7)	47.6	(43.2-52.0)	20.2
South Carolina	45.0	(39.2-50.7)	31.7	(26.8-36.6)	-29.6
South Dakota	50.5	(46.4-54.5)	51.2	(46.1-56.2)	1.4
Tennessee	47.5	(42.6-52.4)	39.9	(35.9-43.8)	-16.0
Texas	40.4	(36.9-43.9)	38.6	(34.6-42.6)	-4.5
Utah	34.2	(29.2-39.2)	39.0	(33.6-44.4)	14.0
Vermont	42.4	(39.6-45.2)	41.1	(37.8-44.4)	-3.1
Virginia	40.9	(35.1-46.8)	40.3	(35.9-44.6)	-1.5
Washington	41.8	(37.3-46.3)	43.9	(40.6-47.1)	5.0
West Virginia	38.3	(34.9-41.7)	36.9	(33.7-40.1)	-3.7
Wisconsin	40.5	(35.0-46.0)	45.5	(41.5-49.6)	12.3
Wyoming	31.1	(27.4-34.8)	42.9	(38.9-46.9)	37.9
<b>United States</b>	<b>39.2</b>	<b>(38.3-40.2)</b>	<b>39.8</b>	<b>(38.9-40.6)</b>	<b>1.5</b>

Source: CDC, Behavioral Risk Factor Surveillance Survey, 2001-2002