

MMWR

MORBIDITY AND MORTALITY WEEKLY REPORT

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National Disability Awareness Month, 1993

October is National Disability Awareness Month. During this month, employers, volunteer organizations, churches, schools, and other groups are encouraged to provide seminars and job fairs that promote understanding of disabilities and emphasize a person's abilities rather than disabilities. This issue of *MMWR* includes reports of assessments of work disability, mobility disability, and self-care disability in the United States. Additional information about National Disability Awareness Month is available from The President's Committee on Employment of People with Disabilities, 131 F Street, N.W., Washington, DC 20004-1107; telephone (202) 376-6200.

Current Trends

Prevalence of Work Disability — United States, 1990

Work disability, defined as the inability to perform work as a result of a physical, mental, or other health condition, costs approximately \$111.6 billion each year in direct and indirect medical costs and lost wages (1). National health objectives for the year 2000 are to increase the span of healthy life for persons in the United States and to reduce the proportion of persons experiencing disability from chronic conditions (as defined by CDC's National Health Interview Survey) to a maximum of 8% (baseline: 9.4% in 1988) (objective 17.2) (2). This report presents national and state-specific prevalence rates of work disability in the United States for 1990 and compares rates with those for 1980 (3).

Data on work disability among U.S. residents have been collected by the Bureau of the Census since 1970. In this analysis, rates of work disability were calculated for persons aged 16–64 years using data from the 1990 census. Work disability was defined on the census questionnaire as the inability to perform work resulting from a physical, mental, or other health condition of 6 months' duration or longer; categories are nonsevere (limitation in the type or amount of work a person can perform) and severe (inability to perform work of any type).

In 1990, an estimated 12.8 million persons aged 16–64 years had a work disability: 6.6 million were severe and 6.2 million, nonsevere. Rates of work disability varied

Work Disability — Continued

widely among the states, ranging from 61.8 (New Jersey) to 126.2 (West Virginia) per 1000 population. Prevalence rates were highest in West Virginia, Kentucky (114.3), Arkansas (111.7), Louisiana (102.9) and Mississippi (109.8) (Table 1).

From 1980 to 1990, the prevalence of work disability declined nationally, from 85.2 to 81.5 per 1000 persons, and rates of severe and nonsevere work disability decreased by 3.9% and 4.7%, respectively. Rates of work disability declined for the District of Columbia and 29 states, primarily in the South, and increased for 21, primarily in the Midwest and West. For states with high rates of severe disability in 1980, rates remained high in 1990. The five states with the highest rates of severe disability also had high rates of nonsevere work disability.

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Editorial Note: Although age-specific, all-cause mortality in the United States has steadily decreased since the late 1940s, self-reported disability increased from 1962 through 1984 (4). In addition, even though the findings in this report indicate national declines from 1980 to 1990 in the estimated rate of work disability, the proportion of U.S. residents affected by work disability and the variability in rates of work disability among states remain high. These findings are consistent with other studies (1,4).

TABLE 1. Rate* of work disability among persons aged 16–64 years and estimated numbers of persons with any work disability, by state — United States, 1990

State	Rate	No. persons with any work disability	State	Rate	No. persons with any work disability
Alabama	96.8	245,000	Montana	97.0	47,000
Alaska	66.3	23,000	Nebraska	71.4	68,000
Arizona	83.1	188,000	Nevada	83.4	66,000
Arkansas	111.7	159,000	New Hampshire	72.7	53,000
California	74.2	1,422,000	New Jersey	61.8	311,000
Colorado	78.4	167,000	New Mexico	88.3	82,000
Connecticut	63.8	136,000	New York	74.3	866,000
Delaware	77.4	33,000	North Carolina	87.3	371,000
District of Columbia	84.0	35,000	North Dakota	69.7	26,000
Florida	86.6	676,000	Ohio	90.1	618,000
Georgia	88.4	368,000	Oklahoma	101.6	195,000
Hawaii	65.9	44,000	Oregon	100.1	178,000
Idaho	90.4	54,000	Pennsylvania	82.6	617,000
Illinois	68.9	500,000	Rhode Island	85.8	55,000
Indiana	79.0	277,000	South Carolina	91.1	199,000
Iowa	75.8	128,000	South Dakota	78.1	32,000
Kansas	72.0	108,000	Tennessee	97.3	304,000
Kentucky	114.3	265,000	Texas	76.0	813,000
Louisiana	102.9	266,000	Utah	72.9	72,000
Maine	101.5	79,000	Vermont	79.0	29,000
Maryland	70.5	221,000	Virginia	75.4	299,000
Massachusetts	72.0	284,000	Washington	90.9	280,000
Michigan	90.4	536,000	West Virginia	126.2	142,000
Minnesota	73.9	204,000	Wisconsin	73.2	224,000
Mississippi	109.8	171,000	Wyoming	72.7	20,000
Missouri	85.4	271,000	Overall	81.5	12,821,000

*Per 1000 persons.

Source: Bureau of the Census, 1990.

Work Disability — Continued

Potential explanations for the declining trend in work disability and for the state-specific variability include changing patterns in self-reporting of health conditions, variations in categorization of functional disability based on job benefits and conditions (e.g., job retraining or reassignment, vocational rehabilitation, early retirement, or workers' compensation) (5), demographic factors (e.g., age, socioeconomic status, educational level, and marital status), and economic factors (e.g., the rate of unemployment in a particular state, opportunities for employment for persons with disabilities, and retirement patterns) (4-9).

In this report, the finding that rates of work disability increased in nearly half the states from 1980 to 1990 may reflect the change in age distribution in the United States. Age is a strong determinant of work disability: as the average age of the population increases there is usually a concomitant increase in the prevalence of work disability (4). In addition, the finding that states with the highest prevalence of severe work disability also had high rates of nonsevere work disability suggests that similar factors may influence rates of severe and nonsevere work disability.

The state-specific estimates of work disability in this report can provide guidance to states in planning and monitoring efforts to reduce the impact of work disabilities. These efforts should include collaboration among national, state, and local public health officials along with business and industry leaders to evaluate policies on job training or reassignment, vocational rehabilitation, and workers' compensation to ensure optimal retraining and rehabilitation of persons with disabilities. This level of collaboration is essential in implementing the guidelines of the Americans with Disabilities Act*.

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*Public Law 101-336.

*Epidemiologic Notes and Reports***Prevalence of Mobility and Self-Care Disability —
United States, 1990**

An estimated 43 million persons in the United States have a disability* (1); the estimated annual economic impact of disabilities—representing loss of wages, medical-care expenditures, and additional household expenditures—is approximately \$176.7 billion (2). The Institute of Medicine recently recommended surveillance and systematic collection of information at the national and state levels to assist in program planning and evaluation for state-based programs for the prevention of disabilities and secondary conditions (i.e., health conditions resulting from a disability) (3). To characterize state-specific disability patterns and better plan for funding of disability services, the National Institute of Disability and Rehabilitation Research (NIDRR) and CDC assessed data from the 1990 census on two forms of disability: difficulty with mobility and self-care activities. This report summarizes the results of the assessment for persons aged ≥ 16 years.

In the 1990 census, more than 41 million persons completed the "long form," which included questions about disability. Census respondents were asked, "Because of a health condition that has lasted 6 or more months, does this person have any difficulty 1) going outside the home alone (e.g., shopping or visiting a doctor's office) or 2) taking care of his or her own personal needs (e.g., bathing, dressing, or getting around inside the home)" (4). Persons who answered yes to the first part were considered to have a mobility disability. Persons who answered yes to the second part were considered to have a self-care disability.

In 1990, 13.2 million persons (70.5 per 1000 population) aged ≥ 16 years had some mobility or self-care disability. Among persons aged ≥ 65 years, an estimated 5.9 million reported having either a mobility or self-care disability (201.1 per 1000); approximately 29% of these persons reported both types of disability. The prevalence of mobility disability for respondents aged ≥ 16 years was 43.2 per 1000; for persons aged 16–64 years and aged ≥ 65 years, the prevalences were 21.9 and 156.0, respectively. The prevalence of self-care disability for respondents aged ≥ 16 years was 47.7; for persons aged 16–64 years and ≥ 65 years, the prevalences were 34.2 and 119.2, respectively (Table 1).

The median state-specific prevalence of mobility disability was 40.4 per 1000 population (range: 19.6–65.2); and self-care disability, 44.2 (range: 21.8–71.9). For persons aged 16–64 years, the median prevalence for mobility disability was 20.1 (range: 12.0–35.6); and self-care disability, 30.6 (range: 15.9–58.8). In comparison, for persons aged ≥ 65 years, the median rate of mobility disability was 145.9 (range: 104.5–221.5); and self-care disability, 113.6 (range: 69.4–169.3).

Prevalence rates of mobility or self-care disability were highest in Mississippi, Alabama, the District of Columbia, West Virginia, and Arkansas. The mobility or self-care disability rate in Mississippi (104.1 per 1000 population) was more than three times that in Alaska (32.7), the lowest ranking state. Among persons aged ≥ 65 years, the rate

*Limitation in actions or activities because of a physical, mental, or other health condition as defined by the Americans with Disabilities Act of 1990 (ADA) (Public Law 101-336) (1).

*Mobility and Self-Care Disability — Continued***TABLE 1. Rate* of mobility disability or self-care disability among persons aged ≥16 years, by age group and state — United States, 1990**

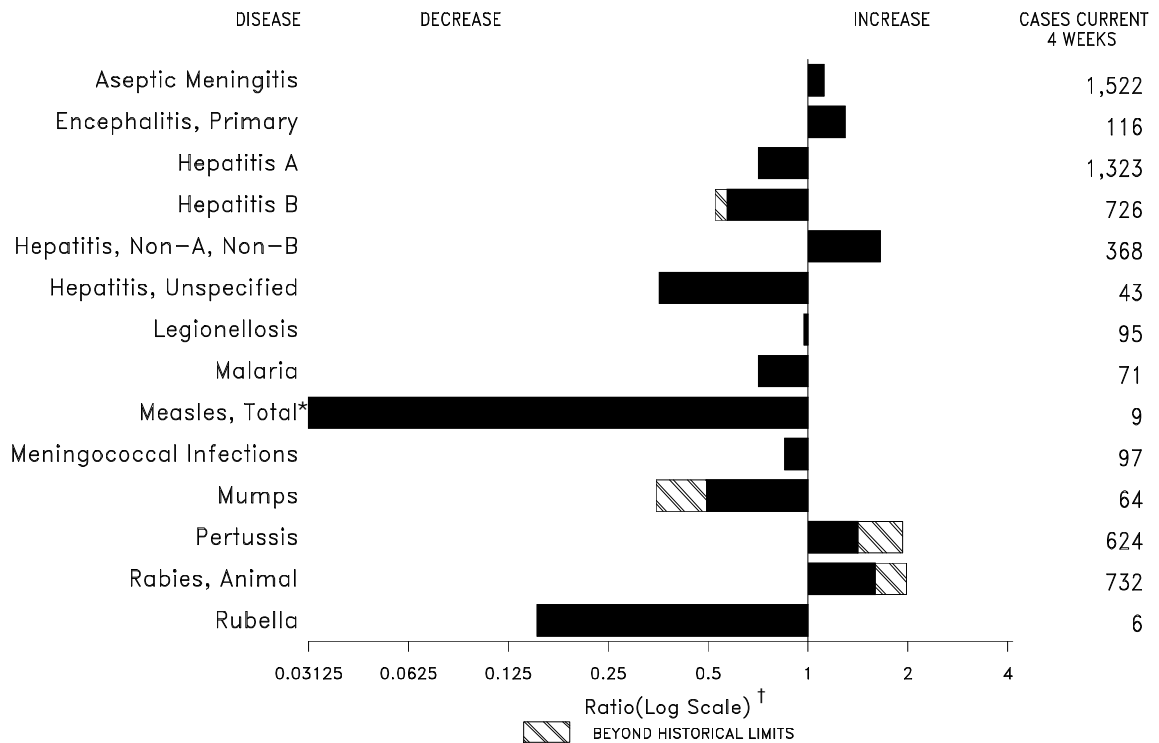
State	16-64 yrs		≥65 yrs		Total	
	Mobility	Self-care	Mobility	Self-care	Mobility	Self-care
Alabama	29.8	46.5	212.1	158.5	59.9	65.0
Alaska	12.8	17.6	129.8	90.5	19.6	21.8
Arizona	20.4	29.7	130.3	93.4	39.1	40.6
Arkansas	29.0	38.9	191.4	143.3	59.5	58.5
California	21.3	38.0	147.2	115.9	38.2	48.5
Colorado	16.2	22.5	135.5	94.2	31.4	31.6
Connecticut	16.4	28.8	136.7	115.1	36.0	42.9
Delaware	19.9	33.1	144.6	106.5	38.8	44.2
District of Columbia	25.9	58.8	170.2	145.9	47.5	71.8
Florida	24.0	37.1	133.2	111.8	48.8	54.1
Georgia	24.5	39.9	198.4	143.5	47.0	53.3
Hawaii	16.4	31.6	126.3	111.4	33.1	43.7
Idaho	15.6	17.8	122.8	78.5	32.9	27.6
Illinois	20.8	34.7	154.8	117.7	41.8	47.7
Indiana	19.9	30.5	152.8	111.9	40.7	43.3
Iowa	15.7	22.8	127.6	102.6	36.7	37.8
Kansas	15.6	25.5	131.8	98.5	36.0	38.3
Kentucky	32.6	36.7	207.0	138.8	60.5	53.0
Louisiana	29.9	47.2	197.5	152.6	54.2	62.5
Maine	19.9	23.7	144.9	98.9	40.6	36.2
Maryland	18.5	36.6	156.5	116.8	37.2	47.4
Massachusetts	19.8	26.9	146.1	112.2	40.3	40.8
Michigan	23.1	33.3	158.5	117.4	43.6	46.0
Minnesota	14.1	20.1	124.5	94.8	31.2	31.6
Mississippi	34.4	52.8	221.5	169.3	65.2	71.9
Missouri	21.9	31.1	160.7	121.6	46.1	46.9
Montana	16.3	19.8	119.3	78.4	33.8	29.7
Nebraska	14.3	21.3	115.5	85.5	32.2	32.7
Nevada	18.5	28.7	125.2	96.7	33.0	38.0
New Hampshire	14.7	18.9	130.8	95.1	30.8	29.5
New Jersey	20.3	37.2	148.2	119.1	41.2	50.6
New Mexico	22.5	34.1	149.2	106.6	40.8	44.6
New York	32.6	36.7	207.0	138.8	60.5	53.0
North Carolina	24.2	38.0	186.3	136.9	48.9	53.0
North Dakota	23.6	15.9	104.5	75.4	37.6	26.7
Ohio	21.9	31.1	160.7	121.6	46.1	46.9
Oklahoma	24.5	31.2	171.9	125.1	49.8	47.3
Oregon	18.1	22.8	133.3	96.3	38.1	35.6
Pennsylvania	21.9	31.6	152.8	118.9	46.5	48.0
Rhode Island	21.1	30.1	143.1	114.8	43.1	45.4
South Carolina	27.0	47.6	184.3	140.8	50.3	61.5
South Dakota	15.5	20.9	105.2	69.4	32.5	30.1
Tennessee	27.5	34.8	197.1	138.3	54.3	51.2
Texas	21.3	34.0	171.3	131.0	41.0	46.7
Utah	13.9	18.9	137.3	92.2	29.6	28.2
Vermont	14.5	16.0	131.0	82.0	31.3	25.5
Virginia	19.5	30.8	168.6	123.3	39.8	43.4
Washington	17.5	21.9	131.2	94.0	34.6	32.8
West Virginia	35.6	38.5	208.5	143.8	67.8	58.1
Wisconsin	16.9	22.1	124.8	96.9	34.7	34.5
Wyoming	12.0	16.0	121.3	82.1	27.0	25.1
Overall	21.9	34.2	156.0	119.2	43.2	47.7

*Per 1000 persons.

Source: Bureau of the Census, 1990.

(Continued on page 767)

FIGURE I. Notifiable disease reports, comparison of 4-week totals ending October 2, 1993, with historical data — United States



*The large apparent decrease in reported cases of measles (total) reflects dramatic fluctuations in the historical baseline. (Ratio (log scale) for week thirty-nine is 0.01907).

† Ratio of current 4-week total to mean of 15 4-week totals (from previous, comparable, and subsequent 4-week periods for the past 5 years). The point where the hatched area begins is based on the mean and two standard deviations of these 4-week totals.

TABLE I. Summary — cases of specified notifiable diseases, United States, cumulative, week ending October 2, 1993 (39th Week)

	Cum. 1993		Cum. 1993
AIDS*	76,755	Measles: imported	51
Anthrax	-	indigenous	200
Botulism: Foodborne	13	Plague	8
Infant	46	Poliomyelitis, Paralytic [§]	-
Other	2	Psittacosis	43
Brucellosis	65	Rabies, human	1
Cholera	16	Syphilis, primary & secondary	19,384
Congenital rubella syndrome	6	Syphilis, congenital, age < 1 year [¶]	1,493
Diphtheria	-	Tetanus	33
Encephalitis, post-infectious	137	Toxic shock syndrome	182
Gonorrhea	283,362	Trichinosis	9
<i>Haemophilus influenzae</i> (invasive disease) [†]	875	Tuberculosis	15,649
Hansen Disease	127	Tularemia	101
Leptospirosis	30	Typhoid fever	247
Lyme Disease	5,133	Typhus fever, tickborne (RMSF)	367

*Updated monthly; last update September 18, 1993.

[†]Of 829 cases of known age, 268 (32%) were reported among children less than 5 years of age.

[§]Two (2) cases of suspected poliomyelitis have been reported in 1993; 4 of the 5 suspected cases with onset in 1992 were confirmed; the confirmed cases were vaccine associated.

[¶]Reports through second quarter of 1993.

TABLE II. Cases of selected notifiable diseases, United States, weeks ending October 2, 1993, and September 26, 1992 (39th Week)

Reporting Area	AIDS*	Aseptic Meningitis	Encephalitis		Gonorrhea		Hepatitis (Viral), by type				Legionellosis	Lyme Disease
			Primary	Post-infectious			A	B	NA,NB	Unspecified		
			Cum. 1993	Cum. 1993	Cum. 1993	Cum. 1993	Cum. 1993	Cum. 1992	Cum. 1993	Cum. 1993		
UNITED STATES	76,755	8,773	609	137	283,362	370,113	15,877	8,963	3,639	469	903	5,133
NEW ENGLAND	3,990	290	15	8	6,245	7,762	370	357	425	13	48	1,425
Maine	113	29	2	-	70	80	14	10	4	-	5	8
N.H.	83	41	-	2	47	87	33	80	344	3	3	49
Vt.	48	32	4	-	19	20	4	7	2	-	1	5
Mass.	2,211	112	7	4	2,262	2,784	176	196	67	10	35	152
R.I.	248	76	2	2	324	532	64	20	8	-	4	213
Conn.	1,287	-	-	-	3,523	4,259	79	44	-	-	-	998
MID. ATLANTIC	17,869	602	44	8	32,715	41,970	791	977	281	5	180	2,609
Upstate N.Y.	2,827	322	31	5	6,663	8,607	281	308	187	1	56	1,398
N.Y. City	9,679	104	1	-	9,014	14,920	177	121	1	-	3	3
N.J.	3,275	-	-	-	3,400	5,823	218	269	63	-	28	594
Pa.	2,088	176	12	3	13,638	12,620	115	279	30	4	93	614
E.N. CENTRAL	6,092	1,480	141	26	54,104	69,591	1,801	1,101	472	12	236	71
Ohio	1,196	534	51	4	16,862	20,790	228	150	32	-	125	32
Ind.	685	161	17	11	5,965	6,651	508	183	10	1	41	14
Ill.	2,135	300	26	3	13,587	22,265	571	201	53	5	12	8
Mich.	1,468	452	37	8	13,334	16,580	161	314	343	6	47	17
Wis.	608	33	10	-	4,356	3,305	333	253	34	-	11	-
W.N. CENTRAL	2,624	555	25	10	15,060	19,735	1,814	491	128	12	72	138
Minn.	531	68	7	-	1,793	2,247	320	51	4	4	1	52
Iowa	149	109	4	2	1,207	1,266	42	27	8	2	10	7
Mo.	1,463	170	2	8	8,584	11,033	1,159	352	95	6	19	38
N. Dak.	2	12	3	-	38	58	63	-	-	-	1	2
S. Dak.	22	19	5	-	193	135	14	-	-	-	-	-
Nebr.	164	16	1	-	476	1,267	152	13	8	-	34	4
Kans.	293	161	3	-	2,769	3,729	64	48	13	-	7	35
S. ATLANTIC	16,266	1,885	153	54	75,129	111,013	914	1,707	502	66	161	707
Del.	294	56	3	-	1,094	1,339	9	128	103	-	10	338
Md.	2,043	189	21	-	12,381	11,837	126	206	17	5	40	122
D.C.	1,012	31	-	-	3,678	4,787	9	35	-	-	13	2
Va.	1,275	232	34	6	8,954	12,786	109	111	29	31	6	58
W. Va.	55	22	70	-	493	661	18	30	23	-	3	41
N.C.	961	192	22	-	19,093	18,557	60	241	57	-	21	73
S.C.	959	24	-	-	8,163	8,284	12	40	3	1	18	8
Ga.	2,175	120	1	-	4,660	32,356	70	168	83	-	28	34
Fla.	7,492	1,019	2	48	16,613	20,406	501	748	187	29	22	31
E.S. CENTRAL	2,027	576	27	7	33,717	36,833	217	952	736	1	37	20
Ky.	248	244	9	6	3,611	3,624	86	63	10	-	14	7
Tenn.	813	134	7	-	10,179	11,600	57	800	712	-	15	10
Ala.	610	135	1	-	11,994	12,846	47	83	4	1	2	3
Miss.	356	63	10	1	7,933	8,763	27	6	10	-	6	-
W.S. CENTRAL	7,691	978	43	2	34,274	40,338	1,600	1,252	224	136	23	49
Ark.	294	53	1	-	6,546	5,802	43	49	4	2	3	2
La.	1,027	72	5	-	9,114	11,177	60	170	98	3	3	1
Okla.	623	1	7	-	3,191	4,132	127	244	77	10	11	20
Tex.	5,747	852	30	2	15,423	19,227	1,370	789	45	121	6	26
MOUNTAIN	3,248	535	23	4	8,417	9,390	3,070	434	253	64	57	21
Mont.	23	-	-	1	60	88	58	4	2	-	5	-
Idaho	56	10	-	-	128	83	162	35	-	2	1	2
Wyo.	33	5	-	-	65	45	12	21	82	-	6	9
Colo.	1,108	174	11	-	2,690	3,439	721	54	41	36	6	-
N. Mex.	250	104	4	2	711	701	286	161	78	2	5	2
Ariz.	1,043	150	6	-	3,089	3,169	1,138	72	13	12	12	-
Utah	217	37	1	-	263	260	591	41	24	11	7	3
Nev.	518	55	1	1	1,411	1,605	102	46	13	1	15	5
PACIFIC	16,948	1,872	138	18	23,701	33,481	5,300	1,692	618	160	89	93
Wash.	1,153	-	1	-	2,914	3,016	626	176	150	9	10	4
Oreg.	620	-	-	-	1,206	1,255	73	26	11	-	-	2
Calif.	14,887	1,755	132	18	18,721	28,311	3,951	1,463	445	148	72	86
Alaska	49	16	4	-	462	502	588	8	9	-	-	-
Hawaii	239	101	1	-	398	397	62	19	3	3	7	1
Guam	-	2	-	-	39	50	2	2	-	1	-	-
P.R.	2,265	43	-	-	390	169	71	313	73	2	-	-
V.I.	35	-	-	-	79	78	-	4	-	-	-	-
Amer. Samoa	-	-	-	-	37	34	16	-	-	-	-	-
C.N.M.I.	-	3	-	-	60	61	-	1	-	1	-	-

N: Not notifiable U: Unavailable C.N.M.I.: Commonwealth of Northern Mariana Islands

*Updated monthly; last update September 18, 1993.

TABLE II. (Cont'd.) Cases of selected notifiable diseases, United States, weeks ending October 2, 1993, and September 26, 1992 (39th Week)

Reporting Area	Measles (Rubeola)						Men- gococcal infections	Mumps		Pertussis			Rubella		
	Malaria	Indigenous		Imported*		Total		1993	Cum. 1993	1993	Cum. 1993	Cum. 1992	1993	Cum. 1993	Cum. 1992
		Cum. 1993	1993	Cum. 1993	1993										
UNITED STATES	845	2	200	1	51	2,166	1,786	15	1,231	120	3,810	2,075	1	161	139
NEW ENGLAND	65	-	57	-	5	63	98	-	8	12	604	181	-	1	6
Maine	2	-	2	-	-	4	5	-	-	-	19	11	-	1	1
N.H.	6	-	2	-	-	13	13	-	-	3	238	43	-	-	-
Vt.	1	-	30	-	1	-	6	-	-	4	68	8	-	-	-
Mass.	32	-	14	-	3	21	54	-	2	-	215	84	-	-	-
R.I.	2	-	-	-	1	21	1	-	2	-	6	1	-	-	4
Conn.	22	-	9	-	-	4	19	-	4	5	58	34	-	-	1
MID. ATLANTIC	124	-	10	-	6	204	213	1	92	15	458	123	-	51	10
Upstate N.Y.	46	-	-	-	2	111	95	-	33	4	202	76	-	10	7
N.Y. City	24	-	5	-	2	55	19	-	2	-	7	9	-	22	-
N.J.	32	-	5	-	2	38	34	-	8	-	35	38	-	13	3
Pa.	22	-	-	-	-	-	65	1	49	11	214	-	-	6	-
E.N. CENTRAL	58	1	16	-	7	60	276	1	189	47	827	399	-	6	9
Ohio	11	-	5	-	3	6	80	-	68	24	284	60	-	1	-
Ind.	3	1	1	-	-	20	46	-	3	7	93	27	-	1	-
Ill.	31	-	5	-	-	17	75	-	44	-	192	36	-	1	8
Mich.	13	-	5	-	1	13	46	1	59	16	73	10	-	2	1
Wis.	-	-	-	-	3	4	29	-	15	-	185	266	-	1	-
W.N. CENTRAL	22	-	1	-	2	11	116	2	40	2	356	171	-	1	8
Minn.	4	-	-	-	-	10	7	-	2	-	191	33	-	-	-
Iowa	3	-	-	-	-	1	23	1	8	1	28	5	-	-	3
Mo.	7	-	1	-	-	-	44	1	23	1	101	82	-	1	1
N. Dak.	2	-	-	-	-	-	3	-	5	-	3	13	-	-	-
S. Dak.	2	-	-	-	-	-	3	-	-	-	8	11	-	-	-
Nebr.	3	-	-	-	-	-	9	-	1	-	9	8	-	-	-
Kans.	1	-	-	-	2	-	27	-	1	-	16	19	-	-	4
S. ATLANTIC	234	-	15	1	12	125	340	1	376	4	356	121	-	9	18
Del.	2	-	1	-	-	1	11	-	5	-	14	7	-	2	-
Md.	33	-	-	-	4	16	42	1	67	1	108	22	-	2	5
D.C.	10	-	-	-	-	-	5	-	1	-	8	1	-	-	-
Va.	23	-	-	1 [†]	3	15	37	-	25	2	52	10	-	-	-
W. Va.	2	-	-	-	-	-	12	-	15	-	9	7	-	-	1
N.C.	94	-	-	-	-	24	58	-	197	-	54	22	-	-	-
S.C.	4	-	-	-	-	29	31	-	15	-	13	10	-	-	7
Ga.	15	-	-	-	-	3	76	-	14	1	25	14	-	-	-
Fla.	51	-	14	-	5	37	68	-	37	-	73	28	-	5	5
E.S. CENTRAL	24	-	1	-	-	460	108	2	46	5	251	24	1	1	1
Ky.	4	-	-	-	-	443	20	-	-	-	29	1	-	-	-
Tenn.	9	-	-	-	-	-	28	2	13	4	158	6	1	1	1
Ala.	6	-	1	-	-	-	34	-	22	1	53	14	-	-	-
Miss.	5	-	-	-	-	17	26	-	11	-	11	3	-	-	-
W.S. CENTRAL	19	-	7	-	3	1,101	171	2	178	4	132	196	-	17	7
Ark.	3	-	-	-	-	-	18	-	4	2	10	14	-	-	-
La.	2	-	1	-	-	-	30	-	16	-	9	7	-	1	-
Okla.	4	-	-	-	-	11	25	-	11	2	71	28	-	1	-
Tex.	10	-	6	-	3	1,090	98	2	147	-	42	147	-	15	7
MOUNTAIN	29	1	4	-	1	34	144	3	51	22	329	299	-	8	7
Mont.	2	-	-	-	-	-	13	-	-	-	7	4	-	-	-
Idaho	1	-	-	-	-	-	10	-	5	-	102	41	-	1	1
Wyo.	-	-	-	-	-	1	2	-	2	-	1	-	-	-	-
Colo.	18	-	2	-	1	28	27	2	16	22	111	39	-	-	1
N. Mex.	5	-	-	-	-	2	4	N	N	-	34	73	-	-	-
Ariz.	-	1	1	-	-	3	70	1	8	-	44	110	-	2	2
Utah	1	-	-	-	-	-	11	-	4	-	27	30	-	4	1
Nev.	2	-	1	-	-	-	7	-	16	-	3	2	-	1	2
PACIFIC	270	-	89	-	15	108	320	3	251	9	497	561	-	67	73
Wash.	27	-	-	-	-	10	60	-	10	-	55	173	-	-	6
Oreg.	4	-	-	-	-	3	22	N	N	2	16	31	-	3	1
Calif.	233	-	78	-	4	54	217	2	213	7	411	327	-	36	44
Alaska	1	-	-	-	2	9	13	-	8	-	5	10	-	1	-
Hawaii	5	-	11	-	9	32	8	1	20	-	10	20	-	27	22
Guam	1	U	2	U	-	10	1	U	6	U	-	-	U	-	3
P.R.	-	-	224	-	-	339	8	-	3	-	6	12	-	-	-
V.I.	-	-	-	-	-	-	-	-	4	-	-	-	-	-	-
Amer. Samoa	-	-	1	-	-	-	-	1	1	-	2	6	-	-	-
C.N.M.I.	-	U	-	U	1	2	-	U	12	U	1	1	U	-	-

*For measles only, imported cases include both out-of-state and international importations.

N: Not notifiable

U: Unavailable

[†] International

[§] Out-of-state

TABLE II. (Cont'd.) Cases of selected notifiable diseases, United States, weeks ending October 2, 1993, and September 26, 1992 (39th Week)

Reporting Area	Syphilis (Primary & Secondary)		Toxic- Shock Syndrome	Tuberculosis		Tula- remia	Typhoid Fever	Typhus Fever (Tick-borne) (RMSF)	Rabies, Animal
	Cum. 1993	Cum. 1992	Cum. 1993	Cum. 1993	Cum. 1992	Cum. 1993	Cum. 1993	Cum. 1993	Cum. 1993
UNITED STATES	19,384	25,476	182	15,649	16,855	101	247	367	6,726
NEW ENGLAND	290	503	13	385	346	-	22	5	1,159
Maine	4	5	3	30	19	-	-	-	-
N.H.	26	35	3	9	14	-	1	-	79
Vt.	1	1	1	5	6	-	-	-	20
Mass.	108	253	5	214	180	-	15	5	479
R.I.	12	24	1	44	23	-	-	-	-
Conn.	139	185	-	83	104	-	6	-	581
MID. ATLANTIC	1,748	3,530	30	3,470	4,038	1	49	25	2,574
Upstate N.Y.	155	284	15	328	546	1	11	5	1,966
N.Y. City	847	1,991	1	2,044	2,320	-	26	-	-
N.J.	223	440	-	591	698	-	9	10	329
Pa.	523	815	14	507	474	-	3	10	279
E.N. CENTRAL	2,779	3,771	36	1,454	1,639	4	30	12	91
Ohio	883	593	12	235	240	-	6	8	5
Ind.	251	211	1	161	134	1	1	1	9
Ill.	844	1,677	6	651	825	2	16	1	16
Mich.	462	704	17	340	375	1	6	2	16
Wis.	339	586	-	67	65	-	1	-	45
W.N. CENTRAL	1,209	1,106	12	359	405	33	2	17	282
Minn.	59	68	2	43	114	-	-	1	37
Iowa	54	38	5	39	34	-	-	6	58
Mo.	982	857	2	196	177	14	2	7	15
N. Dak.	1	1	-	5	8	-	-	-	51
S. Dak.	1	-	-	11	18	15	-	2	38
Nebr.	10	24	-	14	16	1	-	-	7
Kans.	102	118	3	51	38	3	-	1	76
S. ATLANTIC	5,132	6,972	22	3,100	3,164	2	39	172	1,589
Del.	87	162	1	36	39	-	1	1	115
Md.	278	490	1	294	273	-	8	10	479
D.C.	261	305	-	124	89	-	-	-	14
Va.	491	564	6	309	273	-	4	8	298
W. Va.	12	15	-	61	73	-	-	6	71
N.C.	1,449	1,876	3	401	406	1	2	104	80
S.C.	757	927	-	312	313	-	-	10	124
Ga.	860	1,386	2	582	649	-	3	26	362
Fla.	937	1,247	9	981	1,049	1	21	7	46
E.S. CENTRAL	3,023	3,298	9	988	1,077	5	7	48	170
Ky.	254	121	2	283	284	1	2	8	15
Tenn.	841	878	3	145	283	3	2	27	72
Ala.	639	1,184	2	379	315	1	3	4	83
Miss.	1,289	1,115	2	181	195	-	-	9	-
W.S. CENTRAL	4,423	4,604	2	1,697	1,877	39	4	78	450
Ark.	589	675	-	148	152	23	-	4	28
La.	1,942	1,868	-	-	155	-	1	1	5
Okla.	319	272	2	115	117	13	-	69	56
Tex.	1,573	1,789	-	1,434	1,453	3	3	4	361
MOUNTAIN	185	278	11	380	454	11	8	10	148
Mont.	1	7	-	15	-	5	-	1	21
Idaho	-	1	1	9	18	-	-	-	6
Wyo.	7	3	-	3	-	2	-	8	18
Colo.	54	44	2	32	44	-	5	1	25
N. Mex.	24	36	1	46	64	1	1	-	9
Ariz.	82	138	1	171	200	-	2	-	52
Utah	5	8	4	23	62	2	-	-	4
Nev.	12	41	2	81	66	1	-	-	13
PACIFIC	595	1,414	47	3,816	3,855	6	86	-	263
Wash.	49	70	7	199	218	1	6	-	-
Oreg.	55	32	-	79	98	2	-	-	-
Calif.	478	1,300	40	3,301	3,299	3	77	-	246
Alaska	8	4	-	40	49	-	-	-	17
Hawaii	5	8	-	197	191	-	3	-	-
Guam	2	3	-	31	58	-	-	-	-
P.R.	399	266	-	185	200	-	-	-	35
V.I.	34	52	-	2	3	-	-	-	-
Amer. Samoa	-	-	-	2	-	-	1	-	-
C.N.M.I.	3	5	-	25	48	-	-	-	-

U: Unavailable

TABLE III. Deaths in 121 U.S. cities,* week ending
October 2, 1993 (39th Week)

Reporting Area	All Causes, By Age (Years)						P&I [†] Total	Reporting Area	All Causes, By Age (Years)						P&I [†] Total
	All Ages	≥65	45-64	25-44	1-24	<1			All Ages	≥65	45-64	25-44	1-24	<1	
NEW ENGLAND	627	425	115	62	14	11	50	S. ATLANTIC	1,033	606	213	149	33	30	62
Boston, Mass.	165	95	42	19	4	5	15	Atlanta, Ga.	158	93	28	26	4	7	7
Bridgeport, Conn.	50	31	11	4	2	2	4	Baltimore, Md.	162	88	38	31	3	2	21
Cambridge, Mass.	35	24	8	3	-	-	2	Charlotte, N.C.	61	40	14	5	1	1	4
Fall River, Mass.	32	28	4	-	-	-	1	Jacksonville, Fla.	100	71	13	11	2	3	10
Hartford, Conn.	46	27	14	3	2	-	2	Miami, Fla.	120	68	33	16	3	-	-
Lowell, Mass.	29	21	4	3	1	-	-	Norfolk, Va.	51	25	7	10	4	5	1
Lynn, Mass.	U	U	U	U	U	U	U	Richmond, Va.	U	U	U	U	U	U	U
New Bedford, Mass.	24	18	4	2	-	-	2	Savannah, Ga.	42	30	8	3	-	1	2
New Haven, Conn.	45	21	10	9	2	3	2	St. Petersburg, Fla.	49	37	2	4	3	3	-
Providence, R.I.	67	53	4	8	2	-	11	Tampa, Fla.	166	100	40	17	4	4	12
Somerville, Mass.	10	8	2	-	-	-	1	Washington, D.C.	107	41	29	24	9	3	5
Springfield, Mass.	42	37	2	3	-	-	1	Wilmington, Del.	17	13	1	2	-	1	-
Waterbury, Conn.	37	26	4	7	-	-	5	E.S. CENTRAL	731	481	141	68	26	15	47
Worcester, Mass.	45	36	6	1	1	1	4	Birmingham, Ala.	121	71	29	11	4	6	1
MID. ATLANTIC	2,233	1,433	418	280	62	40	81	Chattanooga, Tenn.	65	49	10	4	1	1	4
Albany, N.Y.	52	35	11	3	-	3	2	Knoxville, Tenn.	63	44	12	5	2	-	7
Allentown, Pa.	28	20	2	4	2	-	-	Lexington, Ky.	71	62	7	1	1	-	7
Buffalo, N.Y.	100	71	19	5	3	2	3	Memphis, Tenn.	182	104	40	27	6	5	16
Camden, N.J.	43	21	10	6	4	2	1	Mobile, Ala.	70	56	9	4	-	1	6
Elizabeth, N.J.	15	12	3	-	-	-	3	Montgomery, Ala.	45	26	13	4	2	-	1
Erie, Pa.§	48	32	13	2	-	1	2	Nashville, Tenn.	114	69	21	12	10	2	5
Jersey City, N.J.	48	27	9	10	2	-	2	W.S. CENTRAL	1,364	804	273	159	79	49	44
New York City, N.Y.	1,317	817	252	190	39	19	31	Austin, Tex.	77	56	3	11	4	3	6
Newark, N.J.	53	25	10	13	4	1	4	Baton Rouge, La.	12	8	2	-	2	-	-
Paterson, N.J.	25	18	3	4	-	-	-	Corpus Christi, Tex.	63	43	14	2	2	2	3
Philadelphia, Pa.	102	63	19	13	3	4	11	Dallas, Tex.	183	95	33	31	12	12	1
Pittsburgh, Pa.§	54	40	9	1	1	3	3	El Paso, Tex.	80	54	12	6	5	3	-
Reading, Pa.	U	U	U	U	U	U	U	Et. Worth, Tex.	102	58	27	11	5	1	1
Rochester, N.Y.	125	88	24	12	-	1	9	Houston, Tex.	315	161	91	45	14	4	15
Schenectady, N.Y.	14	12	1	1	-	-	1	Little Rock, Ark.	68	44	12	6	3	3	3
Scranton, Pa.§	34	29	2	2	1	-	1	New Orleans, La.	117	53	10	23	21	10	-
Syracuse, N.Y.	93	69	15	5	3	1	5	San Antonio, Tex.	204	136	37	18	7	6	9
Trenton, N.J.	38	22	9	5	-	2	-	Shreveport, La.	57	40	12	3	1	1	2
Utica, N.Y.	17	14	3	-	-	-	-	Tulsa, Okla.	86	56	20	3	3	4	4
Yonkers, N.Y.	27	18	4	4	-	1	3	MOUNTAIN	835	552	162	76	30	15	56
E.N. CENTRAL	2,114	1,334	392	214	115	57	103	Albuquerque, N.M.	91	69	14	4	4	-	3
Akron, Ohio	56	48	6	1	-	1	-	Colo. Springs, Colo.	38	20	10	5	1	2	2
Canton, Ohio	51	37	8	1	2	3	3	Denver, Colo.	129	79	28	14	4	4	12
Chicago, Ill.	394	152	75	82	72	13	13	Las Vegas, Nev.	150	94	32	16	8	-	5
Cincinnati, Ohio	154	101	30	12	6	5	13	Ogden, Utah	18	13	3	1	1	-	2
Cleveland, Ohio	132	87	27	9	7	2	3	Phoenix, Ariz.	174	95	40	22	9	8	18
Columbus, Ohio	161	108	37	11	1	4	7	Pueblo, Colo.	26	20	4	2	-	-	2
Dayton, Ohio	114	82	25	4	3	-	9	Salt Lake City, Utah	91	72	12	6	1	-	7
Detroit, Mich.	243	140	46	38	8	10	7	Tucson, Ariz.	118	90	19	6	2	1	5
Evansville, Ind.	59	43	10	5	1	-	5	PACIFIC	1,737	1,127	323	178	62	43	105
Fort Wayne, Ind.	67	49	13	2	1	2	2	Berkeley, Calif.	21	16	2	3	-	-	1
Gary, Ind.	16	10	1	4	-	-	2	Fresno, Calif.	93	59	15	13	5	1	8
Grand Rapids, Mich.	43	29	6	5	3	-	5	Glendale, Calif.	14	8	2	1	2	-	-
Indianapolis, Ind.	190	131	32	15	4	8	12	Honolulu, Hawaii	74	53	15	4	1	1	9
Madison, Wis.	36	25	8	1	-	2	3	Long Beach, Calif.	88	54	17	9	4	4	9
Milwaukee, Wis.	111	85	16	9	1	-	6	Los Angeles, Calif.	389	245	74	44	17	6	12
Peoria, Ill.	44	31	5	3	3	2	3	Pasadena, Calif.	30	23	3	1	-	3	3
Rockford, Ill.	45	29	11	4	1	-	5	Portland, Ore.	116	76	19	14	3	4	3
South Bend, Ind.	41	32	5	3	-	1	1	Sacramento, Calif.	156	105	21	20	8	2	13
Toledo, Ohio	106	72	25	4	1	4	4	San Diego, Calif.	169	98	39	18	6	8	14
Youngstown, Ohio	51	43	6	1	1	-	-	San Francisco, Calif.	142	77	31	25	3	6	-
W.N. CENTRAL	795	574	131	48	20	21	39	San Jose, Calif.	160	104	39	11	4	2	17
Des Moines, Iowa	68	55	9	2	1	1	2	Santa Cruz, Calif.	29	26	-	1	2	-	1
Duluth, Minn.	19	15	2	1	1	-	2	Seattle, Wash.	127	87	22	10	6	2	4
Kansas City, Kans.	35	23	5	3	2	2	2	Spokane, Wash.	52	41	9	-	1	1	5
Kansas City, Mo.	110	80	17	5	3	5	4	Tacoma, Wash.	77	55	15	4	-	3	6
Lincoln, Nebr.	35	26	8	1	-	-	-	TOTAL	11,469 [†]	7,336	2,168	1,234	441	281	587
Minneapolis, Minn.	186	131	33	12	5	4	12								
Omaha, Nebr.	87	57	21	5	2	2	1								
St. Louis, Mo.	138	101	18	10	5	4	11								
St. Paul, Minn.	71	57	7	5	-	2	5								
Wichita, Kans.	46	29	11	4	1	1	-								

*Mortality data in this table are voluntarily reported from 121 cities in the United States, most of which have populations of 100,000 or more. A death is reported by the place of its occurrence and by the week that the death certificate was filed. Fetal deaths are not included.

[†]Pneumonia and influenza.

[‡]Because of changes in reporting methods in these 3 Pennsylvania cities, these numbers are partial counts for the current week. Complete counts will be available in 4 to 6 weeks.

[§]Total includes unknown ages.

U: Unavailable.

Mobility and Self-Care Disability — Continued

of mobility or self-care disability in Mississippi (276.9) was twice as high as in South Dakota (133.0), the lowest ranking state.

Reported by: MP LaPlante, PhD, Disability Statistics, Rehabilitation Research, and Training Center, Institute for Health and Aging, Univ of California at San Francisco. National Institute on Disability and Rehabilitation Research, US Dept of Education. Applications Br, Div of Surveillance and Epidemiology, Epidemiology Program Office; and Disabilities Prevention Program, Office of the Director, National Center for Environmental Health, CDC.

Editorial Note: Although several national surveys that provide disability estimates differ in the aspects and focus of disability measures, the definitions used in those surveys are all within the framework of activity limitations (5). The findings in this report are consistent with previous estimates (6) indicating that a substantial proportion of persons in the United States have mobility and self-care disabilities.

Disability traditionally has connoted limitations in ability to perform life activities because of an impairment (1) (i.e., loss of mental, anatomical, or physiological structure or function as a result of active disease, residual losses from formerly active disease, or congenital losses or injury not associated with active disease [7]). The ADA defines disability as either a person with a physical or mental impairment that substantially limits one or more of the major life activities, a person with a medical record of such an impairment, or a person regarded as having such an impairment.

Efforts to clarify definitions and taxonomic schemes for disability have been conducted by the Public Health Service Task Force on Improving Medical Criteria for Disability Determination (Public Health Service, unpublished data, 1992) and by CDC, in collaboration with Statistics Canada, as a World Health Organization (WHO) collaborating center for the revision of WHO's *International Classification of Impairments, Disabilities, and Handicaps* (8). These efforts should assist in improving the systematic collection, analysis, and dissemination of information about impairments, limitations, and disabilities. This information will clarify the roles of prevention and early intervention and guide programs addressing the needs of persons with disabilities; such programs include CDC's Disabilities Prevention Program, National Center for Environmental Health; the U.S. Department of Education's NIDRR; and the National Institutes of Health's National Center for Medical Rehabilitation Research.

The 1990 census estimates included in this report represent one assessment of disability, but additional data are needed, such as the causes of these limitations and the extent to which these limitations are determined by personal impairments, by environmental barriers, or both. Efforts to compile these data should focus on the systematic collection of area-specific information about impairments, limitations, and disabilities. This information can be used for the development of public policy and program evaluation. The state-specific estimates of mobility and self-care limitations described in this report can guide states in prioritizing efforts for programs designed to prevent disabilities and secondary conditions in persons with disabilities.

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*Effectiveness in Disease and Injury Prevention***Comprehensive Delivery of Adult Vaccination —
Minnesota, 1986–1992**

Despite the availability of safe and effective vaccines, many adults still suffer from vaccine-preventable diseases. For example, each year an estimated 40,000–60,000 adults die as a result of pneumococcal infection and influenza (1). In addition, from 1985 through 1992, 433 (92.7%) of 467 cases of tetanus occurred among adults (CDC, unpublished data, 1993). Although up to 90% of influenza-related deaths occur among persons aged ≥ 65 years, the 1991 National Health Interview Survey indicated that, during the preceding year, only 41% and 20% of persons aged ≥ 65 years reported receiving influenza vaccine and pneumococcal vaccine, respectively (CDC, unpublished data, 1991). This report describes the efforts of the Hennepin County (Minneapolis) Community Health Department (HCCHD) (1990 population: 1.1 million) to provide comprehensive vaccination services to persons aged ≥ 62 years.

Since 1979, HCCHD has conducted an annual influenza vaccination program in 14 clinics for persons aged ≥ 62 years and for persons with high-risk conditions. From 1979 through 1992, the number of influenza vaccine doses delivered by the clinics increased from 1010 to 5649; 5% of the approximately 110,000 persons aged ≥ 62 years in the county were vaccinated through these clinics in 1992. Because the prevalence of immunity to tetanus and diphtheria is low among persons aged ≥ 65 years (2), in 1986 HCCHD initiated a plan for comprehensive vaccination services to older persons, including the provision of tetanus-diphtheria (Td) toxoids beginning in 1986 and pneumococcal vaccine beginning in 1991. Td toxoid doses were offered to all persons aged ≥ 62 years who reported not having had received a booster within the preceding 10 years and to persons who were certain that they had not been vaccinated within at least 7 years. Pneumococcal vaccine was offered to all older persons who had never received this vaccine.

In 1986, of 3399 persons who received influenza vaccine, 707 (20.8%) received a Td toxoid. From 1986 through 1992, a total of 2489 older persons in the county received Td boosters. In 1991, of 4911 persons vaccinated against influenza, 993 (20.2%) also received pneumococcal vaccine. In 1992, of 5649 persons vaccinated against influenza, 720 (12.8%) received pneumococcal vaccine. An assessment for duplicate

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administration of pneumococcal vaccine in 1991 and 1992 indicated that of the 1713 doses administered at HCCHD clinics, only three (0.2%) were repeat doses; none of these persons reported adverse reactions to the vaccine.

To ensure efficient delivery of vaccines in the clinics, each type of vaccine (influenza, Td, and pneumococcal) was color-coded on all signs and U.S. Public Health Service Important Information Statements and Vaccine Information pamphlets, and color-coded posters were displayed for each type of vaccine listing the vaccine's indications and contraindications. In addition, nurses adhered to a protocol for informing patients about specific vaccinations.

To prevent repeat administration of pneumococcal vaccine, a three-part record keeping system was established: 1) all persons vaccinated against pneumococcal disease were given a Minnesota vaccination record card and asked to provide their primary health-care provider with this information; 2) a color-coded sticker was placed on the back of the patient's Medicare card as an additional record of vaccination; and 3) the names and dates of birth of all persons vaccinated were entered into a county public health department computer data base and made accessible at subsequent clinics.

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Editorial Note: Previous reports have identified at least three principal barriers to achievement of high vaccination levels among adults: 1) missed opportunities to vaccinate during contacts with health-care providers for unrelated reasons in offices, outpatient clinics, and hospitals (1); 2) lack of comprehensive vaccine-delivery systems in the public and private sectors (1); and 3) patient and provider fears concerning adverse events following vaccination (3). In contrast, receipt of vaccination against influenza has been positively associated with past history of vaccination, physician or nurse recommendations for influenza vaccination, and expressed intention to adhere to physician or nurse recommendations for influenza vaccination (3).

The findings in this report indicate that, from 1986 through 1992, by using a strategy of consistent reminders and providing comprehensive clinic-based vaccination services, HCCHD increased delivery of influenza and pneumococcal vaccines and Td toxoids among persons aged ≥ 65 years. Simultaneous administration of vaccines, accelerated patient flow, and reduced confusion among older persons concerning the availability of the vaccines all appeared to contribute to this increase. The approach of HCCHD is consistent with the Standards for Adult Immunization Practice that encourages providers to administer simultaneously all vaccine doses for which a person is eligible at the time of each visit (4).

The program initiated by HCCHD and efforts by other public health departments to overcome barriers to adult vaccination (5,6) are practical examples of approaches necessary to achieve the national health objectives for the year 2000. These objectives include: 1) reducing epidemic-related pneumonia and influenza-related deaths among persons aged ≥ 65 years (objective 20.2); 2) increasing to at least 60% pneumococcal and influenza vaccination levels among noninstitutionalized, high-risk populations (objective 20.11); and 3) increasing to at least 90% the proportion of public health departments that provide adult vaccinations (objective 20.16) (7). In 1991, of the 63 city and state health departments receiving federal vaccination grant funds to enable adult

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vaccination, 23 (36.5%) provided pneumococcal vaccine, 31 (49.2%) provided influenza vaccine, and 63 (100%) provided Td toxoids (CDC, unpublished data, 1992).

Increased vaccination coverage among adults and achievement of the national health objectives for vaccination will require multifaceted strategies, including publicly supported delivery mechanisms that reduce cost and accessibility constraints, collaboration between the public and private sectors to improve awareness of the national health objectives and vaccine delivery, and ongoing evaluation of current programs. The recent coverage of influenza vaccine by Medicare is an example of an attempt to remove a cost constraint and improve influenza vaccination levels among Medicare beneficiaries (8). National Adult Immunization Week (October 24–30, 1993) emphasizes the importance of appropriately vaccinating all adults and focuses attention on efforts that promote prevention and control of vaccine-preventable diseases. Additional information is available from the National Coalition for Adult Immunization, 4733 Bethesda Avenue, Suite 750, Bethesda, MD 20814; fax (301) 907-0878.

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*Notice to Readers***Progress in the Development of Hantavirus Diagnostic Assays —
United States**

Through September 29, 1993, a total of 39 persons in 11 states, including one recently identified in Montana, with confirmed acute hantavirus respiratory illness have been reported to CDC (1,2); 25 (64%) of these cases have been fatal. The diagnosis of confirmed hantavirus infection has been based on the presence in serum of immunoglobulin M (IgM) antibodies or rising titers of immunoglobulin G (IgG) antibodies that cross-react to four previously identified hantaviruses (Hantaan, Seoul, Puumala, and Prospect Hill), immunohistochemical staining of tissues, or a positive polymerase chain reaction (PCR) test in tissues.

Genetic recombinant-derived proteins have been produced in vitro from viral genomic sequences amplified from tissues obtained from patients who died with con-

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firmed hantavirus illness. These proteins have been adapted to assays for homologous antiviral antibodies in patients with suspected hantavirus infection and in rodent hosts. At the University of New Mexico (UNM), Western blot assays with N and G1 proteins have been developed that successfully detected antibodies in serum from all 16 patients with confirmed disease who were tested; in nine of nine persons tested, antibodies were detected on the first day of hospital admission. The serum specimens did not react with the G1 proteins of Prospect Hill or Puumala viruses, the two hantaviruses that are most cross-reactive with the new hantavirus. No false-positive reactions occurred in 20 control serum specimens.

At CDC, purified recombinant N protein has been used as an antigen for IgG enzyme-linked immunosorbent assays (ELISAs) that demonstrated higher specific optical density values compared to Prospect Hill virus, the viral antigen previously identified as most reactive with serum specimens obtained from patients and rodents in the southwestern United States. Preliminary results with these ELISAs suggest that the use of homologous antigen may moderately increase the estimates of prevalence among infected rodents; no additional cases in humans have been recognized through the use of these assays. Negative tests on 232 serum specimens obtained from patients with adult respiratory distress syndrome not associated with hantavirus infections confirmed the specificity of the recombinant N protein antigen. Initial application of this same purified recombinant protein in IgM assays indicates that the protein is reactive in this format.

Reverse transcription and PCR amplification of genomic sequences from human blood obtained during the early phases of disease also has been attempted in collaborative studies between UNM and CDC. Stored peripheral blood mononuclear cells obtained early in the course of disease from seven patients with confirmed disease were PCR positive; four of the seven corresponding plasma specimens from these patients also were positive. All four stored blood clots available from these patients were positive as well.

Cases of acute hantavirus disease continue to be confirmed in the United States. The diagnostic findings of the prototypic tests described in this report suggest that it may be possible to rapidly diagnose infection in patients with suspected hantavirus disease. Use of recombinant-derived homologous antigens, which has preceded the isolation of the virus in cell culture, should improve the sensitivity and specificity of results obtained with available heterologous antigens. However, these hantavirus assays are for experimental use only and none have been approved by the Food and Drug Administration for use in the United States. These newer assays will require standardization and systematic evaluation with larger numbers of specimens before approval for marketing and broader usage are considered. Until assays are approved, health providers caring for patients with suspected hantavirus illness should forward specimens for testing to CDC through their respective state health departments.

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