

MMWR

MORBIDITY AND MORTALITY WEEKLY REPORT

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*Recommendation of the Immunization
Practices Advisory Committee (ACIP)*

Prevention and Control of Influenza

These recommendations extensively revise previous influenza vaccine recommendations of the Immunization Practices Advisory Committee (ACIP) (superseding MMWR 1983;32:333-7) and provide information on the vaccine and antiviral agent available for control of influenza in the 1984-1985 influenza season and on target groups for which special influenza control programs are recommended.

INTRODUCTION

Influenza viruses have continually demonstrated an ability to cause major epidemics of respiratory disease. Typical influenza illness is characterized by abrupt onset of fever, sore throat, and nonproductive cough and, unlike many other common respiratory infections, can cause extreme malaise lasting several days. More severe disease can result from invasion of the lungs by influenza virus (primary viral pneumonia) or by secondary bacterial pneumonia. High attack rates of acute illness and the frequent occurrence of lower respiratory tract complications usually result in dramatic rises in numbers of visits to physicians' offices and to hospital emergency rooms. Furthermore, influenza frequently infects individuals, who, because of their ages or underlying health problems, are poorly able to cope with the disease and often require medical attention, including hospitalization. Such persons are considered to be medically at "high risk" in epidemics. In one recent study, for example, hospitalization rates for adults with "high-risk" medical conditions increased during major epidemics by about twofold to fivefold in different age groups, reaching a maximum rate of about 800 excess hospitalizations per 100,000 high-risk persons.

A further indication of the impact of influenza epidemics is the significant elevation of mortality that often occurs. Such excess mortality is attributed not only to the direct cause of influenza pneumonia but also to an increase in deaths from cardiopulmonary disease. Epidemics have been associated with excess deaths of 10,000 persons or more 15 times from 1957 to 1982; excess mortality again exceeded the epidemic threshold during the 1982-1983 influenza season.

The greatest impact of influenza is normally seen when new strains appear against which most of the population lacks immunity. In these circumstances (e.g., 1957 and 1968), pandemics occur, and a quarter or more of the U.S. population has been affected over a period of 2-3 months.

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Because of the increasing proportion of elderly persons in the U.S. population and because age and its associated chronic diseases are risk factors for severe influenza illness, the future toll from influenza may increase, unless control measures are used more vigorously than in the past. Other populations at high risk for influenza-related complications are also increasing, due, for example, to the success of intensive-care units for neonates, better management of diseases, such as cystic fibrosis, and better survival rates for organ-transplant recipients. This statement discusses the presently available medical-control measures, immunoprophylaxis with vaccines, and prophylaxis or therapy with the antiviral drug, amantadine.

OPTIONS FOR THE CONTROL OF INFLUENZA

For about 20 years, efforts to reduce the impact of influenza in the United States have been aimed primarily at immunoprophylaxis of persons at greatest risk of serious illness or death. Observations during influenza epidemics indicate that most influenza-related deaths occur among: (1) persons older than 65 years of age and (2) persons with chronic, underlying disorders of the cardiovascular, pulmonary, and/or renal systems, as well as those with metabolic diseases (including diabetes mellitus), severe anemia, and/or compromised immune function. Recommendations listed below apply mainly to these high-risk groups. In addition, measures are described that apply to other individuals or groups under special circumstances. Influenza-control options should also be made available to individuals who wish to reduce their chances of acquiring influenza infection or to reduce the severity of disease.

Prophylaxis is likely to be achieved with greatest cost-effectiveness by vaccinating individuals for whom infection may have the most severe consequences and for whom there is a higher-than-average potential for infection. In addition, vaccination can best be organized when such high-risk individuals routinely have contact with the health-care delivery system for causes other than acute respiratory infection before the influenza season, thereby permitting vaccine administration without special visits to doctors' offices or clinics. Other indications for prophylaxis (whether with vaccine or antiviral drugs) include the strong desire of any person to avoid a preventable illness.

The presently available specific therapy for influenza A—amantadine hydrochloride (Symmetrel®)—is most likely to be beneficial for individuals who seek medical attention promptly due to the abrupt onset of an acute respiratory infection with troublesome symptoms during an influenza A epidemic. For high-risk individuals for whom influenza vaccine has not been used or has not prevented infection, amantadine therapy should be effective in reducing the severity of disease.

INACTIVATED INFLUENZA VACCINE

Use of inactivated influenza vaccine is the single most important measure in preventing and/or attenuating influenza infection. Potency of present vaccines is such that nearly all vaccinated young adults develop hemagglutination-inhibition antibody titers that are likely to protect them against infection by strains like those in the vaccine and, often, by related variants that emerge. The elderly, the very young, and patients with certain chronic diseases may develop lower post-vaccination antibody titers than young adults. Under these circumstances, however, influenza vaccine may be more effective in preventing lower respiratory tract involvement or other complications of influenza than in preventing infection and involvement of the upper respiratory tract. Influenza vaccine will not, of course, prevent primary illnesses caused by other respiratory pathogens.

Annual vaccination against influenza has been recommended since 1963 for individuals at high risk of lower respiratory tract complications and death following influenza infection, i.e.,

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the elderly and persons with chronic disorders of the cardiovascular, pulmonary, and/or renal systems, metabolic diseases, severe anemia, and/or compromised immune function. These groups have been identified primarily by reviews of death certificate data, supported by hospital-based or population-based studies. Each group encompasses patients along a continuum of underlying general health. In other words, within each broadly defined high-risk category, some persons may be more likely than others to suffer severe complications from influenza infection.

Investigations of influenza outbreaks in nursing homes, for example, have demonstrated attack rates as high as 60%, with case-fatality ratios as high as 30% or more. Chronic diseases and other debilitating conditions are common among nursing-home residents, and spread of infection can often be explosive in such relatively crowded and closed environments. Recent retrospective studies of noninstitutionalized patients also suggest that chronic, underlying diseases, particularly those that affect the cardiovascular and pulmonary systems, may contribute more to the severity of illness than age alone. Since influenza infections are also known to invoke abnormalities in gas exchange and peripheral airways dysfunction in adults, children with compromised pulmonary function, including those with cystic fibrosis, chronic asthma, and bronchopulmonary dysplasia, and neonates in intensive-care units may also be at higher risk of severe illness, although firm evidence is lacking. Children with congenital heart disease may also be considered at high risk, since respiratory viruses in general often produce severe infections in this population.

Target Groups for Vaccination

1. Based on the above observations, the previous broadly defined high-risk group has been further classified on the basis of priority, so special efforts can be directed at providing vaccine to those who may derive the greatest benefit. Groups for which active, targeted vaccination efforts are most necessary are:
 - a. Adults and children with chronic disorders of the cardiovascular or pulmonary systems that are severe enough to have required regular medical follow-ups or hospitalization during the preceding year.
 - b. Residents of nursing homes and other chronic-care facilities (e.g., institutions housing patients of any age with chronic medical conditions).
2. Although not proven, it is reasonable to believe that medical personnel can transmit influenza infections to their high-risk patients while they are themselves incubating infection, undergoing subclinical infection, or working despite the existence of mild symptoms. In many winters, nosocomial outbreaks of influenza are reported. The potential for introducing influenza to high-risk groups, such as patients with severely compromised cardiopulmonary or immune systems or infants in neonatal intensive-care units, should be reduced by vaccination programs targeted at medical personnel. Therefore, physicians, nurses and other personnel who have extensive contact with high-risk patients (e.g., primary-care and certain speciality clinicians and staff of intensive-care units) should receive influenza vaccination annually.
3. After considering the needs of the above two target groups, high priority should also be given to organizing special programs making vaccine readily available to persons at moderately increased risk of serious illness compared with the general population:
 - a. Otherwise healthy individuals over 65 years of age.
 - b. Adults and children with chronic metabolic diseases (including diabetes mellitus), renal dysfunction, anemia, immunosuppression, or asthma that are severe enough to have required regular medical follow-ups or hospitalization during the preceding year.

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Vaccine Recommendations

Vaccine composition and doses are given in Table 1. Guidelines for use of vaccine are given below for different segments of the population:

High-Priority Target Groups: Annual vaccination with inactivated influenza vaccine is considered the single most important measure in preventing or attenuating influenza infection and is strongly recommended for the above groups. In most past years, only 20% of the groups defined as high risk on the basis of medical condition or age received influenza vaccine in any given year. Increased effort must be made to immunize persons in high-risk groups, particularly those in the highest-priority target groups (1 above).

As an initial step, the ACIP recommends that infection control programs in institutions for the aged or chronically ill have as their goal the achievement of no less than 80% vaccination rates for the residents. Hospitals and physicians should have a similar objective for vaccinating patients with severe cardiopulmonary disorders and for vaccinating medical personnel who have the greatest potential to introduce influenza virus into high-risk hospital settings (2 above). Wherever possible, efforts should also be made to vaccinate persons at moderately increased risk (3 above). This latter objective often requires that active promotion of influenza vaccine be made by individual physicians who practice outside organizations that can set administrative guidelines and procedures for their professional staff. Establishment of physicians' office and clinic systems for influenza vaccination activities are essential to assist the physician in providing vaccine.

General Population: Physicians should administer vaccine to any persons in their practices who wish to reduce their chances of acquiring influenza infection. Persons who provide essential community services, such as employees of fire and police departments, and health-care personnel are not considered to be at increased occupational risk of serious influenza illness but may be considered for vaccination programs designed to minimize the possible disruption of essential activities that can occur during severe epidemics.

Pregnant Women: Pregnancy has not been demonstrated to be a risk factor for severe influenza infection, except in the largest pandemics of 1918-1919 and 1957-1958. Influenza

TABLE 1. Influenza vaccine* dosage, by age of patient — 1984-1985 season

Age group	Product [†]	Dosage [§]	Number of doses
6-35 months	Split virus only	0.25 ml	2 [¶]
3-12 years	Split virus only	0.5 ml	2 [¶]
over 12 years	Whole or split virus	0.5 ml	1

*Contains 15 µg each of A/Chile/83(H1N1), A/Philippines/82(H3N2), and B/USSR/100/83 hemagglutinin antigens in each 0.5 ml. Manufacturers include Connaught Laboratories, Inc. (FLUZONE®: whole and split), Parke-Davis (FLUOGEN® split), and Wyeth Laboratories (Influenza Virus Vaccine, Trivalent®: split).

[†]Because of the lower potential for causing febrile reactions, only split (subvirion) vaccine should be used in children. Immunogenicity and reactogenicity of split and whole virus vaccines are similar in adults when used according to the recommended dosage.

[§]Pneumococcal vaccine and influenza vaccine can be given at the same time at different sites without increasing side effects, but it should be emphasized that, whereas influenza vaccine is given annually, pneumococcal vaccine should be given only once to adults. Detailed immunization records should be provided to each patient to help ensure that additional doses of pneumococcal vaccine are not given.

[¶]Four weeks or more between doses; both doses are recommended for maximum protection. However, if the individual received at least one dose of any influenza vaccine recommended from 1978-1979 to 1983-1984, one dose is sufficient.

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vaccine is considered generally safe for pregnant women. Nonetheless, when vaccine is given during pregnancy, waiting until the second or third trimester is a reasonable precaution to minimize any concern over the theoretical possibility of teratogenicity.

Persons Who Should Not Be Vaccinated: Inactivated influenza vaccine should not be given to persons who have anaphylactic sensitivities to eggs (see Side Effects and Adverse Reactions). Persons with acute febrile illnesses normally should not be vaccinated until their temporary symptoms have abated.

Strategies for Implementing Influenza Vaccine Recommendations

Influenza vaccine should normally be obtained to use during the fall. More effective programs for giving influenza vaccine are needed in nursing homes and other chronic-care facilities, in physicians' offices, and in hospital settings. Adults and children in high-priority target groups who do not reside in nursing homes or other chronic-care facilities should be given influenza vaccine at the time of regular medical follow-ups in the fall. Those not scheduled for regular medical appointments in the fall should be notified by their medical offices or clinics to come in specifically to receive influenza vaccine. Physicians responsible for care of hospitalized patients should, during the fall, consider administering influenza vaccine to patients with high-risk conditions before the patients are discharged.

These and other programs to annually vaccinate target groups require planning well in advance and should, whenever possible, be completed before the beginning of the influenza season. However, vaccine can be given right up to the time influenza virus activity is documented and even thereafter, although temporary chemoprophylaxis may be indicated in these situations (see amantadine recommendations below).

Vaccine Composition

Influenza A viruses are classified into subtypes on the basis of two antigens: hemagglutinin (H) and neuraminidase (N). Three subtypes of hemagglutinin (H1, H2, H3) and two subtypes of neuraminidase (N1, N2) are recognized among influenza A viruses that have caused widespread human disease. Immunity to these antigens, especially hemagglutinin, reduces the likelihood of infection and the severity of disease if infection does occur. However, there may be sufficient antigenic variation (antigenic drift) within the same subtype over time, so that infection or vaccination with one strain may not induce immunity to distantly related strains of the same subtype. Although influenza B viruses have shown much more antigenic stability than influenza A viruses, antigenic variation does occur. As a consequence, the antigenic characteristics of current strains provide the basis for selecting virus strains included in the vaccine.

Based on the most recent epidemiologic and laboratory data (reported periodically in *MMWR* during the 1983-1984 influenza season), it is anticipated that strains prevalent in 1984-1985 will be closely related to A/Philippines/2/82 (H3N2), A/Chile/1/83 (H1N1), and B/USSR/100/83. Therefore, these strains will be included in the vaccine for use during the 1984-1985 season (Table 1). The type A(H1N1) and type B components represent changes from the 1983-1984 vaccine, which should be discarded.

Side Effects and Adverse Reactions

Vaccines used in recent years have generally been associated with only a few reactions; fewer than one-third of vaccinees have been reported to develop local redness or induration for 1 or 2 days at the site of injection.

Systemic reactions have been of two types:

1. Fever, malaise, myalgia, and other systemic symptoms of toxicity, although infrequent, most often affect children and others who have had no exposure to the influenza virus

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antigens contained in the vaccine. These reactions, which begin 6-12 hours after vaccination and persist for 1-2 days, are usually attributed to the influenza antigens (even though the virus is inactivated) and constitute most of the systemic side effects of influenza vaccination.

2. Immediate, presumably allergic, responses, such as flare and wheal or various respiratory tract symptoms of hypersensitivity, occur extremely rarely after influenza vaccination. These symptoms probably result from sensitivity to some vaccine component—most likely residual egg protein. Although current influenza vaccines contain only a small quantity of egg protein, on rare occasions, vaccine can induce hypersensitivity reactions. Individuals with anaphylactic hypersensitivity to eggs should *not* be given influenza vaccine. Such persons include those who, on eating eggs, develop swelling of the lips or tongue or experience acute respiratory distress or collapse. Unlike the 1976 swine influenza vaccine, subsequent vaccines have not been associated with an increased frequency of Guillain-Barré syndrome.

Simultaneous Pneumococcal Vaccination

There is considerable overlap in the target groups for influenza vaccination and those for pneumococcal vaccine. Pneumococcal vaccine and influenza vaccine can be given at the same time at different sites without increased side effects, but it should be emphasized that, whereas influenza vaccine is given annually, pneumococcal vaccine should be given only once to adults. Detailed immunization records, which should be provided to each patient, will help ensure that additional doses of pneumococcal vaccine are not given.

ANTIVIRAL AGENT: AMANTADINE

The only drug currently available for the specific prophylaxis and therapy of influenza virus infections is amantadine hydrochloride (Symmetrel®), which appears to interfere with the uncoating step in the virus replication cycle. The drug also reduces virus shedding. Amantadine is 70%-90% effective in preventing illnesses caused by circulating strains of type A influenza viruses (*it is not effective against type B influenza*). When administered within 24-48 hours after onset of illness, amantadine has been shown to reduce the duration of fever and other systemic symptoms with a more rapid return to routine daily activities and improvement in peripheral airway function. Since it may not prevent actual infection, persons who take the drug may still develop immune responses that will protect them when exposed to antigenically related viruses.

While considerable evidence shows that amantadine chemoprophylaxis is effective against influenza A, *under most circumstances it should not be used in lieu of vaccination*, because it confers no protection against influenza B, and patient compliance could be a problem for continuous administration throughout epidemic periods, which generally last 6-12 weeks.

Amantadine Recommendations

Prophylaxis: Specific circumstances for which amantadine prophylaxis is recommended include the following:

1. As short-term prophylaxis during the course of a *presumed* influenza A outbreak (e.g., in institutions for persons at high risk), particularly when the vaccine may be relatively ineffective (e.g., due to major antigenic changes in the virus). The drug should be given early in the outbreak in an effort to reduce the spread of the infection.
2. As an adjunct to late immunization of high-risk individuals, it is not too late to immunize even when influenza A is known to be in the community. However, since the development of a protective response following vaccination takes about 2 weeks, amantadine should be used in the interim. The drug is not known to interfere with antibody response to the vaccine.

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3. To supplement protection afforded by vaccination, chemoprophylaxis may be considered also for high-risk patients who may be expected to have a poor antibody response to influenza vaccine, e.g., those with severe immunodeficiency.
4. As chemoprophylaxis throughout the influenza season for those few high-risk individuals for whom influenza vaccine is contraindicated because of anaphylactic hypersensitivity to egg protein or prior severe reactions associated with influenza vaccination.

Amantadine can also be used prophylactically in other situations (e.g., unimmunized people who wish to avoid influenza A illness). This decision should be made on an individual basis.

Therapy: Since vaccine efficacy is less than 100%, amantadine should be considered for therapeutic use, particularly for persons in the high-risk groups if they develop an illness compatible with influenza during a period of known or suspected influenza A activity in the community. The drug should be given within 24-48 hours of onset of illness and should be continued until 48 hours after resolution of signs and symptoms.

Persons who should not be given amantadine: Particular caution should be exercised for persons under 1 year of age or persons of any age with impaired renal function (see below).

Dosage

The usual dosage of amantadine is 200 mg/day. Splitting the dose into 100 mg twice daily may reduce the frequency of side effects. Dosages for children and for persons with reduced renal function are given in Table 2.

Side Effects and Adverse Reactions

Five percent to 10% of otherwise healthy adults taking amantadine have reported side effects, such as insomnia, lightheadedness, irritability, and difficulty concentrating. These and

TABLE 2. Amantadine hydrochloride dosage, by age of patient and level of renal function

Age group	Dosage*
Normal renal function	
1-9 years [†]	4.4-8.8 mg/kg/day once daily or divided twice daily. Total dosage should not exceed 150 mg per day
≥ 10 years [§]	200 mg once daily or divided twice daily
Impaired renal function	
CREATININE CLEARANCE: (ml/min 1.73m ²)	
≥ 80	100 mg twice daily
60-80	200 mg/100 mg on alternate days
40-60	100 mg once daily
30-40	200 mg twice weekly
20-30	100 mg thrice weekly
10-20	200 mg/100 mg alternating every 7 days

*For prophylaxis, amantadine must be taken each day for the duration of influenza A activity in the community (generally 6-12 weeks). For therapy, amantadine should be started as soon as possible after onset of symptoms and should be continued for 24-48 hours after the disappearance of symptoms (generally 5-7 days).

[†]Use in children under 1 year of age has not been evaluated adequately. In one study, a dose of 6.6 mg/kg/day was reportedly well-tolerated by children over 2 years of age.

[§]A reduction in dosage for persons over 65 years of age should be considered (100 mg once daily), since renal function may be impaired in as many as 50% of these individuals.

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other side effects (see package insert) may be more pronounced among patients with underlying diseases, particularly those common among the elderly; *provisions for careful monitoring are needed for these individuals* so that adverse effects may be recognized promptly and the drug reduced in dosage or discontinued, if necessary. Since amantadine is not metabolized, toxic levels will occur when renal function is sufficiently impaired.

OTHER MEASURES

Under special circumstances, supplementary control measures may be useful in further limiting the spread of influenza. Influenza is known to cause nosocomial infection, and a number of measures, including isolation, cohorting of patients and personnel, limiting visitors, and avoiding elective admissions and surgery during an influenza outbreak, have all been suggested to limit further transmission. However, the effectiveness of most of these measures has not been conclusively demonstrated. Schools or classrooms have been closed occasionally when explosive outbreaks have occurred. The effect of this measure on virus transmission has not been established.

(Continued on page 265)

TABLE I. Summary—cases specified notifiable diseases, United States

Disease	19th Week Ending			Cumulative, 19th Week Ending		
	May 12, 1984 1984	May 14, 1983 1983	Median 1979-1983	May 12, 1984 1984	May 14, 1983 1983	Median 1979-1983
Acquired Immunodeficiency Syndrome (AIDS)	57	N	N	1,348	N	N
Aseptic meningitis	76	83	83	1,396	1,506	1,278
Encephalitis: Primary (arthropod-borne & unsp.)	21	19	15	302	334	280
Post-infectious	-	3	4	22	36	36
Gonorrhea: Civilian	12,351	17,434	18,424	286,495	324,859	344,307
Military	543	526	623	7,327	8,821	10,028
Hepatitis: Type A	411	415	473	7,906	8,521	9,220
Type B	513	439	408	8,486	8,126	7,052
Non A, Non B	74	73	N	1,264	1,224	N
Unspecified	138	142	171	2,170	2,659	3,654
Legionellosis	11	14	N	184	242	N
Leprosy	5	4	3	77	100	74
Malaria	18	11	15	235	246	295
Measles: Total*	103	21	161	1,180	727	1,369
Indigenous	94	7	N	1,044	600	N
Imported	9	14	N	136	127	N
Meningococcal infections: Total	57	75	74	1,249	1,274	1,278
Civilian	56	75	74	1,246	1,262	1,268
Military	1	-	-	3	12	10
Mumps	66	93	141	1,374	1,611	2,895
Pertussis	29	56	20	646	650	390
Rubella (German measles)	25	30	88	287	446	1,157
Syphilis (Primary & Secondary): Civilian	428	484	500	10,118	11,907	10,919
Military	10	6	6	127	176	132
Toxic Shock syndrome	4	2	N	140	156	N
Tuberculosis	462	368	494	7,540	7,958	9,350
Tularemia	3	2	3	30	61	46
Typhoid fever	5	4	5	113	128	138
Typhus fever, tick-borne (RMSF)	6	10	21	35	63	64
Rabies, animal	86	124	138	1,720	2,433	2,293

TABLE II. Notifiable diseases of low frequency, United States

	Cum 1984		Cum. 1984
Anthrax	-	Plague (Utah 1, Calif. 1)	5
Botulism: Foodborne	6	Poliomyelitis: Total	1
Infant (Hawaii 1)	41	Paralytic	1
Other	2	Psittacosis	27
Brucellosis (Kans. 1, Va. 1, Calif. 2)	39	Rabies, human	-
Cholera	-	Tetanus	10
Congenital rubella syndrome	3	Trichinosis	16
Diphtheria	-	Typhus fever, flea-borne (endemic, murine)	6
Leptospirosis	8		

*Five of the 103 reported cases for this week were imported from a foreign country or can be directly traceable to a known internationally imported case within two generations.

**TABLE III. Cases of specified notifiable diseases, United States, weeks ending
May 12, 1984 and May 14, 1983 (19th Week)**

Reporting Area	AIDS Cum. 1984	Aseptic Mening- itis 1984	Encephalitis		Gonorrhea (Civilian)		Hepatitis (Viral), by type				Legionel- losis 1984	Leprosy Cum. 1984
			Primary Cum. 1984	Post-in- fectious Cum. 1984	Cum. 1984	Cum. 1983	A 1984	B 1984	NA,NB 1984	Unspeci- fied 1984		
UNITED STATES	1,348	76	302	22	286,495	324,859	411	513	74	138	11	77
NEW ENGLAND	49	-	22	-	8,645	8,081	8	31	-	7	2	4
Maine	-	-	-	-	318	435	-	1	-	-	-	-
N.H.	1	-	4	-	222	218	-	6	-	-	-	-
Vt.	-	-	2	-	141	144	-	-	-	-	-	-
Mass	30	-	12	-	3,400	3,579	5	10	-	7	-	4
R.I.	3	-	-	-	560	454	2	8	-	-	-	-
Conn	15	-	4	-	4,004	3,251	1	6	-	-	2	-
MID ATLANTIC	629	14	37	1	39,821	41,443	53	75	4	6	-	7
Upstate N.Y.	50	8	12	1	6,231	6,282	9	19	1	1	-	2
N.Y. City	456	-	-	-	16,809	17,284	33	15	-	3	-	5
N.J.	96	4	14	-	6,428	7,853	11	41	3	2	-	-
Pa	27	2	11	-	10,353	10,024	-	-	-	-	-	-
E.N. CENTRAL	63	6	64	6	36,057	46,615	16	51	7	13	6	5
Ohio	8	2	24	2	9,853	12,562	6	6	1	1	4	2
Ind	8	1	12	-	4,561	5,091	3	14	1	4	-	-
Ill	35	2	10	3	5,714	12,706	2	6	-	2	-	1
Mich	10	1	16	-	11,473	12,312	5	25	5	6	2	2
Wis	2	-	2	1	4,456	3,944	-	-	-	-	-	-
W.N. CENTRAL	10	3	8	-	13,831	15,429	9	13	1	-	-	-
Minn	3	1	2	-	2,021	2,225	1	1	-	-	-	-
Iowa	-	-	4	-	1,617	1,672	1	2	-	-	-	-
Mo	5	2	1	-	6,461	7,537	1	6	1	-	-	-
N Dak	-	-	-	-	144	148	-	-	-	-	-	-
S Dak	-	-	-	-	366	433	-	1	-	-	-	-
Nebr	1	-	-	-	1,033	888	5	-	-	-	-	-
Kans	1	-	1	-	2,189	2,526	1	3	-	-	-	-
S ATLANTIC	165	21	64	8	72,704	82,326	26	86	9	11	3	5
Del	3	-	1	-	1,261	1,509	-	1	-	-	-	-
Md	16	1	14	-	8,536	10,469	5	8	1	3	1	-
D.C.	21	-	-	-	5,270	5,619	1	4	-	-	-	1
Va	13	3	15	4	6,949	6,823	1	6	2	-	1	3
W Va	3	-	4	-	905	869	1	3	-	-	-	-
N.C.	3	1	13	3	11,730	11,915	1	12	2	1	1	-
S.C.	3	-	2	-	7,057	7,993	1	7	2	1	-	-
Ga	20	4	2	-	13,255	17,971	-	23	-	1	-	-
Fla	83	12	13	1	17,741	19,158	16	23	1	6	-	1
E.S. CENTRAL	11	6	14	-	24,865	27,783	7	27	4	4	-	-
Ky	6	1	2	-	3,030	3,278	6	2	2	1	-	-
Tenn	2	3	2	-	10,136	11,043	1	17	1	2	-	-
Ala	2	2	9	-	7,920	8,911	-	7	1	1	-	-
Miss	1	-	1	-	3,779	4,551	-	1	-	-	-	-
W.S. CENTRAL	59	11	20	2	40,491	45,264	68	57	6	67	-	3
Ark	-	-	-	1	3,520	3,405	-	-	-	-	-	-
La	8	1	2	-	9,010	7,525	9	14	-	-	-	-
Okla	4	1	5	1	4,311	5,457	5	5	2	2	-	-
Tex	47	9	13	-	23,650	28,877	54	38	4	65	-	3
MOUNTAIN	16	6	8	1	9,075	10,073	48	40	9	7	-	7
Mont	-	-	-	-	405	453	-	-	-	-	-	-
Idaho	-	-	-	-	425	455	-	-	-	-	-	-
Wyo	1	-	-	-	295	261	-	-	-	-	-	-
Wyo	7	5	5	-	2,508	2,923	16	15	1	-	-	-
Colo	-	-	-	-	1,063	1,264	4	-	-	-	-	-
N Mex	6	-	1	-	2,416	2,673	14	13	8	4	-	5
Ariz	1	1	2	1	485	475	8	4	-	1	-	1
Utah	1	-	-	-	1,478	1,569	6	8	-	2	-	1
PACIFIC	346	9	65	4	41,006	47,845	176	133	34	23	-	46
Wash	15	-	2	-	2,835	3,527	2	5	1	-	-	2
Oreg	1	-	-	-	2,563	2,433	21	13	4	-	-	-
Calif	327	8	61	4	33,866	39,817	151	105	28	21	-	33
Alaska	-	-	-	-	1,039	1,125	1	1	-	1	-	-
Hawaii	3	1	2	-	703	943	1	9	1	1	-	10
Guam	-	U	-	-	59	74	U	U	U	U	U	-
P.R.	19	-	-	1	1,255	1,165	-	11	-	2	-	-
V.I.	-	U	-	-	145	102	U	U	U	U	U	-
Pac. Trust Terr.	-	U	-	-	-	-	U	U	U	U	U	-

N Not notifiable

U. Unavailable

TABLE III. (Cont.'d). Cases of specified notifiable diseases, United States, weeks ending
May 12, 1984 and May 14, 1983 (19th Week)

Reporting Area	Measles (Rubeola)		Menin- gococcal infections				Mumps		Pertussis			Rubella			
	Measles (Rubeola)		Imported *		Total	Mumps		Pertussis			Rubella				
	Indigenous	Imported *	Total	1984	Cum. 1984	Cum. 1983	1984	Cum. 1984	1984	Cum. 1984	Cum. 1983	1984	Cum. 1984	Cum. 1983	
Cum. 1984	1984	Cum. 1984	1984	Cum. 1984	Cum. 1983	Cum. 1984	1984	Cum. 1984	1984	Cum. 1984	Cum. 1983	1984	Cum. 1984	Cum. 1983	
UNITED STATES	235	94	1,044	9	136	727	1,249	66	1,374	29	646	650	25	287	446
NEW ENGLAND	17	22	77	3	6	4	79	-	46	2	11	22	1	24	6
Maine	-	-	-	-	-	-	1	-	13	-	-	-	-	1	-
N.H.	-	1	13	1†	3	-	4	-	5	-	2	4	-	-	2
Vt.	1	-	1	1§	2	-	20	-	3	2	7	3	-	-	2
Mass.	9	21	61	1§	1	2	26	-	14	-	1	12	1	23	2
R.I.	2	-	-	-	-	-	8	-	4	-	1	3	-	-	-
Conn.	5	-	2	-	-	2	20	-	7	-	-	-	-	-	-
MID ATLANTIC	35	7	38	1†	10	22	203	11	187	8	54	199	6	70	26
Upstate N.Y.	11	7	10	1†	3	2	70	-	36	7	35	56	6	60	16
N.Y. City	7	-	26	-	-	16	24	-	7	1	2	24	-	8	2
N.J.	12	-	2	-	3	1	45	11	118	-	3	11	-	2	3
Pa.	5	-	-	-	4	3	64	-	26	-	14	108	-	-	5
E.N. CENTRAL	21	24	336	3	61	408	191	14	503	3	220	165	4	41	79
Ohio	5	-	1	-	1	18	73	7	187	2	37	45	-	2	1
Ind.	-	-	2	-	1	271	25	-	27	1	151	13	-	1	13
Ill.	6	18	114	1†	1	114	34	6	122	-	11	85	4	20	33
Mich.	4	5	218	-	53	5	35	1	127	-	11	9	-	11	12
Wis.	6	1	1	2§	5	-	24	-	40	-	10	13	-	7	20
W.N. CENTRAL	6	-	-	-	1	1	73	1	68	2	67	43	2	18	29
Minn.	-	-	-	-	1	1	14	1	2	1	5	17	-	1	5
Iowa	1	-	-	-	-	-	15	-	14	-	3	4	-	-	-
Mo.	4	-	-	-	-	-	21	-	6	1	11	5	-	-	-
N. Dak.	-	-	-	-	-	-	1	-	1	-	-	1	-	3	-
S. Dak.	-	-	-	-	-	-	3	-	-	-	1	2	-	-	-
Nebr.	-	-	-	-	-	-	7	-	1	-	2	-	-	-	-
Kans.	1	-	-	-	-	-	12	-	44	-	45	14	2	14	24
S. ATLANTIC	43	3	8	1	12	145	287	7	105	1	52	78	1	17	54
Del.	2	-	-	-	-	-	3	-	2	-	-	-	-	-	-
Md.	11	-	3	1†	5	2	22	-	19	-	3	14	-	1	-
D.C.	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-
Va.	7	-	1	-	1	12	31	-	8	-	7	25	-	-	1
W. Va.	-	-	-	-	-	-	4	2	21	-	6	2	-	-	-
N.C.	4	-	-	-	-	-	34	2	12	-	17	5	-	-	6
S.C.	1	-	-	-	-	3	25	-	1	-	1	5	-	-	-
Ga.	3	-	-	-	-	6	65	-	16	-	2	20	-	2	8
Fla.	15	3	4	-	6	122	101	3	26	1	16	7	1	14	39
E.S. CENTRAL	1	-	1	-	2	1	48	6	30	1	4	5	-	5	6
Ky.	-	-	1	-	-	1	4	-	6	-	1	2	-	1	5
Tenn.	-	-	-	-	2	-	18	2	10	-	2	2	-	-	-
Ala.	1	-	-	-	-	-	19	-	4	-	-	-	-	1	1
Miss.	-	-	-	-	-	-	7	4	10	1	1	1	-	3	-
W.S. CENTRAL	10	26	235	-	14	56	140	5	75	-	56	50	-	12	65
Ark.	-	-	-	-	-	10	20	-	4	-	10	4	-	2	-
La.	4	-	-	-	-	12	29	-	-	-	3	2	-	-	9
Okla.	3	-	5	-	-	-	20	N	N	-	34	27	-	-	-
Tex.	3	26	230	-	14	34	71	5	71	-	9	17	-	10	56
MOUNTAIN	11	-	74	-	10	2	48	10	151	2	60	68	2	9	16
Mont.	-	-	-	-	-	-	1	-	3	-	19	1	-	-	3
Idaho	2	-	-	-	-	-	5	-	7	-	1	2	-	1	5
Wyo.	-	-	-	-	-	-	2	-	1	-	3	4	-	1	1
Colo.	1	-	-	-	-	2	18	2	11	2	20	41	2	2	-
N. Mex.	-	-	51	-	8	-	7	N	N	-	5	6	-	-	-
Ariz.	6	-	-	-	-	-	11	8	124	-	8	9	-	-	4
Utah	2	-	23	-	2	-	4	-	4	-	2	5	-	5	2
Nev.	-	-	-	-	-	-	-	-	1	-	2	-	-	-	1
PACIFIC	91	12	275	1	20	88	180	12	209	10	122	20	9	91	165
Wash.	3	-	80	-	-	3	22	1	20	-	14	1	-	1	6
Oreg.	1	-	-	-	-	5	27	N	N	-	9	5	-	-	9
Calif.	84	12	195	1†	18	79	125	9	176	5	38	14	9	88	150
Alaska	-	-	-	-	-	-	5	-	4	-	-	-	-	-	-
Hawaii	3	-	-	-	2	1	1	2	9	5	61	-	-	2	-
Guam	-	U	49	U	1	2	1	U	3	U	-	-	U	1	-
P.R.	2	-	-	-	-	70	4	3	67	-	-	5	-	3	2
V.I.	-	U	-	U	-	5	-	U	3	U	-	-	U	-	1
Pac. Trust Terr.	-	U	-	U	-	-	-	U	-	U	-	-	U	-	-

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

N Not notifiable U Unavailable †International §Out-of-state

TABLE III. (Cont.'d). Cases of specified notifiable diseases, United States, weeks ending

May 12, 1984 and May 14, 1983 (19th Week)

Reporting Area	Syphilis (Civilian) (Primary & Secondary)		Toxic: shock Syndrome	Tuberculosis		Tula- remia	Typhoid Fever	Typhus Fever (Tick-borne) (RMSF)	Rabies, Animal
	Cum. 1984	Cum. 1983	1984	Cum. 1984	Cum. 1983	Cum. 1984	Cum. 1984	Cum. 1984	Cum. 1984
UNITED STATES	10,118	11,907	4	7,540	7,958	30	113	35 ¹⁶	1,720
NEW ENGLAND	222	278	1	213	208	1	3	-	8
Maine	1	7	-	11	13	-	-	-	6
N.H.	3	10	-	13	16	-	-	-	-
Vt.	1	1	-	2	1	-	-	-	-
Mass.	133	178	-	113	111	1	2	-	2
R.I.	8	6	1	17	16	-	-	-	-
Conn.	76	76	-	57	51	-	1	-	-
MID ATLANTIC	1,404	1,531	-	1,409	1,482	-	17	1	107
Upstate N.Y.	98	129	-	226	250	-	7	1	4
N.Y. City	862	881	-	568	598	-	3	-	-
N.J.	258	302	-	301	316	-	3	-	1
Pa.	186	219	-	314	318	-	4	-	102
E.N. CENTRAL	404	666	-	1,036	1,008	-	17	2	66
Ohio	88	170	-	204	160	-	3	2	4
Ind.	60	62	-	103	90	-	2	-	6
Ill.	60	310	-	431	439	-	7	-	37
Mich.	163	94	-	234	268	-	2	-	3
Wis.	33	30	-	64	51	-	3	-	16
W.N. CENTRAL	171	141	-	207	275	8	5	2	270
Minn.	47	57	-	31	48	-	2	-	28
Iowa	10	4	-	30	31	-	-	-	58
Mo.	86	55	-	98	147	8	2	2	26
N. Dak.	1	1	-	5	4	-	-	-	45
S. Dak.	2	3	-	4	19	-	-	-	68
Nebr.	9	7	-	12	8	-	-	-	17
Kans.	16	14	-	27	22	-	1	-	28
S. ATLANTIC	3,089	3,053	-	1,592	1,527	3	13	11	522
Del.	9	15	-	19	10	-	-	-	-
Md.	198	193	-	192	102	-	-	-	288
D.C.	118	129	-	46	65	-	5	-	-
Va.	163	218	-	148	146	-	4	2	106
W. Va.	8	13	-	57	60	-	-	1	14
N.C.	314	278	-	252	179	1	1	2	3
S.C.	303	197	-	176	144	-	1	5	18
Ga.	486	561	-	215	305	2	-	1	55
Fla.	1,490	1,449	-	487	516	-	2	-	38
E.S. CENTRAL	636	807	-	674	772	-	3	4	94
Ky.	35	44	-	147	203	-	1	-	23
Tenn.	173	224	-	222	230	-	2	2	45
Ala.	215	338	-	221	194	-	-	2	26
Miss.	213	201	-	84	145	-	-	-	-
W.S. CENTRAL	2,409	3,095	1	778	914	9	5	13	382
Ark.	78	85	-	84	90	6	-	4	46
La.	456	656	-	101	162	2	1	1	13
Okla.	67	97	1	83	111	1	1	6	48
Tex.	1,808	2,257	-	510	551	-	3	2	275
MOUNTAIN	236	276	1	185	224	6	5	1	59
Mont.	-	4	-	10	22	-	1	1	38
Idaho	10	3	-	9	14	2	-	-	-
Wyo.	2	5	-	-	4	-	-	-	-
Colo.	51	61	-	18	16	1	1	-	-
N. Mex.	30	91	-	41	42	-	2	-	7
Ariz.	99	66	-	79	96	1	-	-	14
Utah	8	9	-	15	18	2	-	-	-
Nev.	36	37	1	13	12	-	1	-	-
PACIFIC	1,547	2,060	1	1,446	1,548	3	45	1	212
Wash.	48	66	-	75	82	-	1	-	1
Oreg.	46	34	-	61	70	1	1	1	-
Calif.	1,422	1,925	1	1,216	1,278	2	39	-	205
Alaska	3	7	-	22	15	-	1	-	6
Hawaii	28	28	-	72	103	-	3	-	-
Guam	-	-	U	4	3	-	-	-	-
P.R.	327	351	-	131	192	-	3	-	16
V.I.	6	8	U	2	1	-	-	-	-
Pac. Trust Terr.	-	-	U	-	-	-	-	-	-

U Unavailable

TABLE IV. Deaths in 121 U.S. cities,* week ending
May 12, 1984 (19th Week Ending)

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	716	496	143	40	15	22	69	S. ATLANTIC	1,243	797	297	70	36	43	47
Boston, Mass.	197	115	45	18	8	11	34	Atlanta, Ga.	135	79	36	12	4	4	1
Bridgeport, Conn.	47	34	8	4	-	-	9	Baltimore, Md.	342	205	98	17	8	14	5
Cambridge, Mass.	26	16	8	1	-	-	3	Charlotte, N.C.	65	44	15	1	2	3	6
Fall River, Mass.	29	20	7	2	-	-	-	Jacksonville, Fla.	98	68	23	4	1	2	4
Hartford, Conn.	51	37	12	2	-	-	-	Miami, Fla.	67	41	14	5	2	5	1
Lowell, Mass.	23	17	5	-	1	-	-	Norfolk, Va.	53	32	11	4	3	3	2
Lynn, Mass.	18	11	6	1	-	-	1	Richmond, Va.	70	37	26	1	3	3	4
New Bedford, Mass.	30	24	5	1	-	-	-	Savannah, Ga.	52	36	10	2	2	2	5
New Haven, Conn.	45	33	9	1	-	2	2	St. Petersburg, Fla.	105	85	11	3	3	3	7
Providence, R.I.	83	63	15	-	2	3	7	Tampa, Fla.	65	49	8	3	3	2	3
Somerville, Mass.	9	8	1	-	-	-	2	Washington, D.C.	149	91	37	16	3	2	6
Springfield, Mass.	50	36	6	6	1	1	8	Wilmington, Del.	42	30	8	2	2	-	3
Waterbury, Conn.	43	31	9	-	1	2	2								
Worcester, Mass.	65	51	7	4	1	2	1								
MID. ATLANTIC	2,693	1,832	557	176	56	72	117	E.S. CENTRAL	819	524	188	51	28	28	36
Albany, N.Y.	60	40	10	4	2	4	5	Birmingham, Ala.	94	61	20	6	4	3	2
Allentown, Pa.	22	18	3	1	-	-	-	Chattanooga, Tenn.	72	45	16	2	5	4	4
Buffalo, N.Y.	117	81	30	4	-	2	10	Knoxville, Tenn.	53	32	15	3	2	1	2
Camden, N.J.	36	23	6	4	-	3	-	Louisville, Ky.	89	54	22	7	5	1	6
Elizabeth, N.J.	33	21	9	3	-	-	3	Memphis, Tenn.	193	125	45	9	8	6	7
Erie, Pa.†	36	25	9	1	1	-	1	Mobile, Ala.	121	88	21	8	2	2	1
Jersey City, N.J.	52	40	8	3	-	1	1	Montgomery, Ala.	73	34	20	10	-	9	3
N.Y. City, N.Y.	1,357	896	277	112	33	39	46	Nashville, Tenn.	124	85	29	6	2	2	11
Newark, N.J.	73	42	18	5	3	5	7	W.S. CENTRAL	1,252	734	302	100	58	58	46
Paterson, N.J.	31	21	6	1	1	2	5	Austin, Tex.	43	29	7	2	2	3	2
Philadelphia, Pa.†	397	272	83	24	9	9	22	Baton Rouge, La.	40	25	8	4	2	1	3
Pittsburgh, Pa.†	66	42	20	4	-	-	1	Corpus Christi, Tex.	38	23	6	1	2	1	2
Reading, Pa.	31	23	6	1	-	1	1	Dallas, Tex.	168	105	43	9	7	4	8
Rochester, N.Y.	112	85	18	2	3	4	6	El Paso, Tex.	52	31	13	2	3	3	4
Schenectady, N.Y.	27	20	7	-	-	-	2	Fort Worth, Tex.	96	59	22	7	3	5	6
Scranton, Pa.†	38	29	8	-	1	-	-	Houston, Tex.	263	140	68	31	16	8	3
Syracuse, N.Y.	113	79	25	5	2	2	1	Little Rock, Ark.	69	34	17	5	3	10	1
Trenton, N.J.	38	28	8	1	1	-	-	New Orleans, La.	124	64	44	8	5	3	-
Utica, N.Y.	21	19	2	-	-	-	3	San Antonio, Tex.	179	109	38	15	8	9	11
Yonkers, N.Y.	33	28	4	1	-	-	3	Shreveport, La.	69	42	14	6	4	3	-
								Tulsa, Okla.	111	73	22	5	4	7	7
E.N. CENTRAL	2,353	1,571	515	128	64	74	95	MOUNTAIN	665	416	148	42	23	36	26
Akron, Ohio	83	64	12	3	2	2	-	Albuquerque, N.Mex.	67	45	14	5	2	1	6
Canton, Ohio	39	26	8	4	-	1	2	Colo. Springs, Colo.	31	17	5	4	1	4	1
Chicago, Ill.	609	390	136	39	20	24	11	Denver, Colo.	120	75	32	5	2	6	4
Cincinnati, Ohio	148	92	36	10	3	7	16	Las Vegas, Nev.	92	49	26	9	6	2	5
Cleveland, Ohio	173	101	50	10	5	7	4	Ogden, Utah	35	31	2	1	1	-	2
Columbus, Ohio	135	96	31	4	2	2	5	Phoenix, Ariz.	160	94	37	11	5	13	2
Dayton, Ohio	96	67	20	5	1	3	3	Pueblo, Colo.	17	10	4	1	2	-	-
Detroit, Mich.	260	137	73	26	14	10	14	Salt Lake City, Utah	47	23	10	5	-	9	1
Evansville, Ind.	39	29	7	1	1	1	4	Tucson, Ariz.	96	72	18	1	4	1	5
Fort Wayne, Ind.	47	33	10	3	-	1	5								
Gary, Ind.	14	4	6	2	2	-	-	PACIFIC	1,945	1,448	287	98	45	52	99
Grand Rapids, Mich.	70	54	11	2	2	1	6	Berkeley, Calif.	22	17	5	-	-	-	-
Indianapolis, Ind.	148	96	33	8	6	5	3	Fresno, Calif.	87	56	17	8	1	5	16
Madison, Wis.	27	20	5	2	-	-	3	Glendale, Calif. §	28	28	-	-	-	-	-
Milwaukee, Wis.	144	109	26	3	1	5	3	Honolulu, Hawaii	51	34	12	4	1	-	3
Peoria, Ill. §	47	45	-	-	-	-	3	Long Beach, Calif.	90	60	19	4	1	6	1
Rockford, Ill.	52	44	7	-	1	2	1	Los Angeles, Calif. §	590	530	3	11	18	14	-
South Bend, Ind.	51	41	8	-	-	2	3	Oakland, Calif.	57	35	15	4	1	2	3
Toledo, Ohio	112	80	23	3	4	2	7	Pasadena, Calif.	31	22	7	-	1	1	1
Youngstown, Ohio	59	43	13	3	-	-	1	Portland, Ore.	112	72	29	4	2	5	7
W.N. CENTRAL	729	481	159	36	20	33	50	Sacramento, Calif.	133	93	32	8	-	-	16
Des Moines, Iowa	58	37	17	-	2	2	2	San Diego, Calif.	155	98	29	14	8	6	18
Duluth, Minn.	16	13	2	1	-	-	3	San Francisco, Calif.	167	114	34	12	2	4	7
Kansas City, Kans.	22	16	5	-	-	-	1	San Jose, Calif.	171	122	29	11	6	3	12
Kansas City, Mo.	124	94	20	5	2	3	15	Seattle, Wash.	148	96	33	16	1	2	6
Lincoln, Neb.	37	31	3	-	1	2	4	Spokane, Wash.	58	41	13	-	3	1	8
Minneapolis, Minn.	91	57	17	3	5	9	5	Tacoma, Wash.	45	30	10	2	-	3	1
Omaha, Neb.	100	60	23	8	4	5	6								
St. Louis, Mo.	128	79	32	10	4	3	7	TOTAL	12,415	8,299	2,596	741	345	418	585
St. Paul, Minn.	88	54	22	6	1	5	2								
Wichita, Kans.	65	40	18	3	1	3	6								

* 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 4 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.

§ Data not available. Figures are estimates based on average of past 4 weeks.

TABLE V. Years of potential life lost, deaths, and death rates, by cause of death, and estimated number of physician contacts, by principal diagnosis, United States

Cause of morbidity or mortality (Ninth Revision ICD, 1975)	Years of potential life lost before age 65 by persons dying in 1982*†	Estimated mortality December 1983		Estimated number of physician contacts December 1983*‡
		Number§	Annual Rate/100,000§	
ALL CAUSES (TOTAL)	9,429,000	175,430	880.1	107,200,000
Accidents and adverse effects (E800-E949)	2,367,000	7,380	37.0	5,300,000
Malignant neoplasms (140-208)	1,809,000	37,850	189.9	2,200,000
Diseases of heart (390-398, 402, 404-429)	1,566,000	67,060	336.4	6,400,000
Suicides, homicides (E950-E978)	1,314,000	3,990	20.0	—
Cerebrovascular diseases (430-438)	256,000	13,590	68.2	800,000
Chronic liver disease and cirrhosis (571)	252,000	2,590	13.0	200,000
Pneumonia and influenza (480-487)	118,000	4,540	22.8	1,300,000
Chronic obstructive pulmonary diseases and allied conditions (490-496)	114,000	5,740	28.8	2,200,000
Diabetes mellitus (250)	106,000	3,070	15.4	2,800,000
Prenatal care*				3,600,000
Infant mortality*††		3,200	10.7 / 1,000 live births	

*For details of calculation, see footnotes for Table V, *MMWR* 1984;33:2.

†Years of potential life lost for persons between 1 year and 65 years old at the time of death are derived from the number of deaths in each age category as reported by the National Center for Health Statistics, *Monthly Vital Statistics Report (MVSR)*, Vol. 31, No. 13, October 5, 1983.

§National Center for Health Statistics, *Monthly Vital Statistics Report (MVSR)*, Vol. 33, No. 1, April 26, 1984, pp. 8-9.

‡IMS America *National Disease and Therapeutic Index (NDTI)*, Monthly Report, December 1983, Section III.

††MVSR Vol. 32, No. 12, March 26, 1984, p. 1.

ACIP: Influenza — Continued

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Current Trends

Lung Cancer and Breast Cancer Trends Among Women — Texas

In 1982, lung cancer equaled breast cancer as the leading cause of cancer death among Texas women (Figure 1).^{*} For 1970-1982, the age-adjusted[†] lung cancer mortality rate per 100,000 women almost doubled from 11.9 to 22.6, and the proportion of deaths from malignant neoplasms attributed to lung cancer increased from 9.7% to 17.4%. During the same period, breast cancer mortality rates and the proportion of total malignant neoplasm deaths attributed to breast cancer remained stable (Table 3).

The highest age-adjusted[§] lung cancer rates and those with the steepest increases occurred among Texas women 65 years of age and older; the rate rose from 52.0/100,000 in 1970 to 110.1/100,000 in 1982. Because 85% of all lung cancer deaths in the United States are attributable to cigarette smoking, the increasing rate for older Texas women can be related to the increasing number of women in this age cohort who began smoking cigarettes in the 1930s and 1940s (1).

^{*}Rates determined from death certification International Classification of Diseases (ICD) categories 162 (lung cancer) and 174 (breast cancer).

[†]Age-adjusted by 5-year age groups using the total 1970 U.S. population as a standard.

[§]Age-adjusted by 5-year age groups using the 1970 U.S. population 65 years and older as a standard.

Cancer — Continued

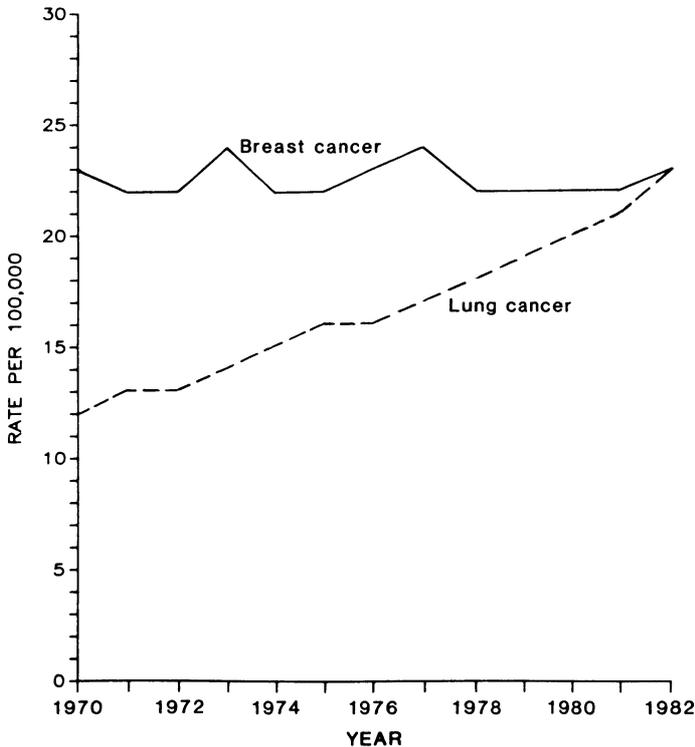
Reported by V Guinee, MD, G Giocco, MS, MD Anderson Hospital and Tumor Institute, University of Texas System Cancer Center, Houston, L Suarez, MS, WD Carroll, MPH, WE Barrington, MPH, A Menchetti, CE Alexander, MD, State Epidemiologist, Texas Dept of Health; Div of Surveillance, Hazard Evaluations and Field Studies, National Institute for Occupational Safety and Health, Div of Field Svcs, Epidemiology Program Office, CDC.

Editorial Note: Based on the historic increase in the exposure of U.S. women to tobacco, an epidemic of lung cancer has been predicted (1,2). Although breast cancer remains the leading cause of cancer death among U.S. and Canadian women, a steady rise in the long-term secular trend of lung cancer mortality rates has been observed in both countries (1,3). In at least two states, the recent predominance of lung cancer over breast cancer has been documented through reviews of age-adjusted mortality rates (4,5).

In 1982, 27% of Texas women surveyed reported currently smoking cigarettes, and 42% reported having smoked at least 100 cigarettes at some time (6). These data point to the continuing need for public health intervention to reduce smoking and the burden of cancer related to it.

While cigarette smoking is the single most important cause of lung cancer, the increase over the past 50 years in the number of U.S. women in the industrial workforce increases the likelihood of exposure to occupational carcinogens. Occupational agents associated with lung

FIGURE 1. Age-adjusted* lung cancer and breast cancer mortality rates among women — Texas, 1970-1982



*Age-adjusted to the 1970 U.S. population.

Cancer — Continued

cancer include arsenic, asbestos, chloroethers, chromates, ionizing radiation, nickel, and polynuclear aromatic hydrocarbon compounds. The risk of lung cancer may be sharply increased as cigarette smoking interacts synergistically with some of these agents (e.g., asbestos) (7).

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TABLE 3. Temporal trends in cancer mortality among women — Texas, 1970-1982

Year	No. of all malignant neoplasms	Lung cancer			Breast cancer		
		Number	Malignant neoplasms (%)	Age-adjusted rate*	Number	Malignant neoplasms (%)	Age-adjusted rate*
1970	6,913	699	9.7	11.9	1,279	18.5	22.8
1975	9,733	1,009	10.4	15.7	1,396	14.3	21.5
1980	9,381	1,482	15.8	20.2	1,640	17.5	22.4
1982	10,008	1,744	17.4	22.6	1,738	17.4	22.6

*Per 100,000 population.

Update: Lyme Disease — United States

Lyme disease (LD) is a systemic, tick-borne illness that usually occurs during the summer. It was first recognized in 1975 in Connecticut (1). With the tick season approaching, public health officials and practitioners should be aware of recent advances in the microbiology, epidemiology, and treatment of this disease.

LD is characterized by a distinctive skin lesion, erythema chronicum migrans (ECM), often accompanied by nonspecific constitutional symptoms, such as fever, headache, myalgias, and arthralgias. ECM begins as a red macule or papule that expands to become an annular lesion, reaching up to 70 cm in diameter (2). Multiple skin lesions may occur. Some patients subsequently develop arthritic, neurologic, or cardiac complications weeks to months after the initial lesion. The arthritis is intermittent and usually involves large joints. Neurologic manifestations include Bell's palsy, meningoencephalitis, and peripheral neuritis; cardiac manifestations include myocarditis and atrioventricular conduction defects. Patients with the B-cell alloantigen, DR2, often have more severe and frequent late manifestations.

Early epidemiologic work suggested that LD's etiologic agent was transmitted by *Ixodes* ticks; subsequent studies confirmed that the distribution of known U.S. vectors—*I. dammini* ticks in the Northeast and Midwest and *I. pacificus* ticks in the West—parallels the distribution

Lyme Disease – Continued

of U.S. cases. In 1982, a spirochete was isolated from an *I. dammini* tick (3). Subsequently, spirochetes were isolated from ECM skin lesions, blood, and spinal fluid of patients with LD (4,5). The spirochete has recently been classified taxonomically as a *Borrelia* (6,7).

LD diagnosis is primarily based on clinical criteria, and in endemic areas, the diagnosis can usually be made based on the characteristic ECM lesion and associated symptoms. However, atypical cases, cases presenting with only late manifestations, or cases occurring outside previously recognized endemic areas may be difficult to diagnose. Several laboratories have developed serologic tests for LD that can aid in the diagnosis. Laboratories at CDC and elsewhere currently use an indirect immunofluorescence assay (IFA) to measure antibodies against the spirochete. A titer of 256 or higher is considered positive, and the IFA appears to be highly specific, although patients with treponemal infections (syphilis, yaws, and pinta) may have false-positive titers. These latter patients have positive treponemal reagin tests, while patients with LD do not. The sensitivity of the LD test varies with the stage of the disease. When only ECM is present, as few as 50% of patients may have positive tests, while with complicated disease (when neurologic, arthritic, or cardiac symptoms are present), almost all patients will have positive tests (8).

Early treatment with tetracycline, penicillin, or erythromycin was previously shown to shorten the duration of ECM and to prevent or ameliorate late complicated disease. Recently, oral tetracycline 250 mg four times a day for 10 days has been suggested as the preferred therapy for patients with ECM (9). Longer or higher dose therapy or parenteral penicillin may be necessary for patients with more severe disease. The role of antibiotic therapy for the late arthritic phase of the disease is still being studied.

With the cooperation of state health departments, LD cases for 1980, 1982, and 1983 were reported to CDC. In 1980 and 1982, 226 and 487 cases, respectively, were reported (10,11). A review of the still incomplete 1983 surveillance data indicates that over 500 cases occurred last year. Whether the increase in number of reported cases is due to increased recognition and interest in the disease or to a real increase in the incidence is unclear.

LD has been reported primarily from states in the three recognized endemic areas: the coastal areas of the Northeast (Connecticut, Delaware, Maryland, Massachusetts, New Jersey, New York, Pennsylvania, Rhode Island); in the Midwest (Minnesota, Wisconsin); and in the West (California, Nevada, Oregon, Utah). These states are within the known range of recognized tick vectors. Additional isolated cases, clinically compatible with LD, have been reported from states outside the range of *I. dammini* or *I. pacificus*: Arkansas, Florida, Georgia, Indiana, Kentucky, Montana, North Carolina, Tennessee, Texas, and Virginia. For the moment, it may be prudent not to consider these states as endemic until additional cases are identified in these areas. The confirmation of cases in these areas, however, will suggest either previously unrecognized vectors or spread of *Ixodes* ticks to new areas. The recent isolation of the spirochete from *Amblyomma americanum* collected in New Jersey, indicates that ticks other than *Ixodes* may be vectors for LD (12).

To better define the geographic distribution and the incidence of LD, state and territorial epidemiologists and CDC are collecting information on suspected cases of LD occurring in the United States each year. Health-care providers are encouraged to report suspected cases to appropriate local and state health departments. Serologic testing of sera from suspected cases of LD is available at some state health departments or CDC. All sera should be submitted to the appropriate state health department with patients' clinical histories.

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Lyme Disease — Continued

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*Notice to Readers***U.S.-Manufactured Pentamidine Isethionate
Cleared for Investigational Use**

A U.S.-manufactured preparation of pentamidine isethionate has undergone satisfactory completion of chemical and biologic tests, and CDC is now able to include this preparation in its claimed investigational exemption for a new drug for treatment of *Pneumocystis carinii* pneumonia. The Investigational New Drug status for the U.S.-manufactured preparation makes it unnecessary for CDC to distribute the foreign-produced product (pentamidine methanesulfonate) described in the May 4, 1984, issue of the *MMWR* (33:225-6). The U.S. preparation is being synthesized by Aldrich Chemical Company, Milwaukee, Wisconsin, and packaged for pharmaceutical use by LyphoMed, Inc., Melrose Park, Illinois.

There are two minor differences between the LyphoMed-manufactured product and the previously used May & Baker preparation of pentamidine isethionate. First, the LyphoMed product contains more pentamidine per vial than the May & Baker product (300 mg, compared with 200 mg). Second, the two preparations differ in their physical appearance. May & Baker uses a "dry fill" manufacturing process that leaves a fluffy white powder in the vial, whereas LyphoMed uses a "wet fill" process, followed by lyophilization, leaving a dry "plug" of white powder at the bottom of the vial.

The dosage of the LyphoMed product is the same as for the May & Baker product (4 mg [salt]/kg body weight).

Reported by Div of Parasitic Diseases, Div of Host Factors, Center for Infectious Diseases, CDC.

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The data in this report are provisional, based on weekly reports to CDC by state health departments. The reporting week concludes at close of business on Friday; compiled data on a national basis are officially released to the public on the succeeding Friday.

The editor welcomes accounts of interesting cases, outbreaks, environmental hazards, or other public health problems of current interest to health officials. Such reports and any other matters pertaining to editorial or other textual considerations should be addressed to: ATTN: Editor, *Morbidity and Mortality Weekly Report*, Centers for Disease Control, Atlanta, Georgia 30333.

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