CENTERS FOR DISEASE CONTROL

November 22, 1985 / Vol. 34 / No. 46

MMWR

MORBIDITY AND MORTALITY WEEKLY REPORT

Improving Eye Care for Persons with Diabetes Mellitus — Michigan

Since 1984, the Michigan Department of Public Health Diabetes Control Program (MDCP) has conducted a statewide project to prevent vision loss by improving detection and treatment of diabetic retinopathy. Guidelines stressing the importance of routine annual examinations by ophthalmologists have been developed and widely distributed among physicians, patient educators, and persons with diabetes mellitus (*1*). Patient and provider surveys to determine eye care and referral practices have also been conducted to provide a baseline for assessing the impact of the project.

A mail survey of practicing ophthalmologists was conducted between August and October 1984 to describe ophthalmologist utilization patterns for diabetic and nondiabetic persons. The survey obtained information from ophthalmologists and their patients over a 5-day period. Ophthalmologists were identified from the membership roster of the Michigan Ophthalmological Society (MOS) and were selected from urban and rural regions of the state.

Questionnaires were sent to 51 general ophthalmologists and 21 retinal specialists; the response rates were 49% and 29%, respectively. Completed questionnaires were obtained from 12% of practicing general ophthalmologists and 27% of the practicing retinal specialists who were members of the MOS.

Of the 3,923 patients who visited the responding ophthalmologists during the 5-day survey periods, the MDCP obtained data on 3,325 (85%). Approximately 10% and 17% of the patients examined by the general ophthalmologists and retinal specialists, respectively, had diabetes.

In the general ophthalmologists' practices, 14% of diabetic patients were visiting for the first time, and in the retinal specialists' practices, 19%. Similarly, 20% and 25% of nondiabetic persons were having initial eye examinations by the general ophthalmologists or retinal specialists.

Individuals receiving their initial ophthalmologic examinations were asked to identify the person who recommended the visit. Diabetic individuals reported that the most important stimulus was their physician (Table 1); the second most important professional person was their optometrist. The most important source of nonprofessional encouragement for the diabetic individuals was self-referral, which accounted for 18% of initial visits to general ophthalmologists and 8% of initial visits to retinal specialists. Collectively, relatives and friends stimulated 30% of referrals to general ophthalmologists and approximately 20% of referrals to retinal specialists.

To allow evaluation of the impact of the 1984 Diabetic Retinopathy Guidelines, a survey was conducted during May 1985 to document baseline referral patterns for eye care for persons with diabetes. The survey was sent to members of the Michigan Organization of Diabetes Educators (MODE), the principal professional organization for diabetes educators in

Diabetes Mellitus — Continued

Michigan. Each MODE member actively involved in patient education was asked to complete a questionnaire and have up to seven patients also complete a questionnaire before beginning instruction.

Seventy (31%) of the 228 MODE members and 202 diabetes patients completed the survey. The patient educators who responded included 52 registered nurses, 15 registered dietitians, and four other health professionals. MODE's members include 142 registered nurses, 42 registered dietitians, and 38 other health professionals (six unknown).

Responses from the diabetes educators determined that 80% always or almost always recommended that their diabetic patients have routine eye examinations. Sixty-one percent of these educators recommended an eye examination by an ophthalmologist at least every 12 months. Among the 29% of educators who had already read Michigan's guidelines, 80% indicated their practices were in accord with the guidelines, compared to 54% for those who had not read the guidelines.

Seventy-five percent of the registered nurses made patient-referral recommendations consistent with the state's recommendations, compared to 17% of the other health professionals. For example, three of the 11 registered dietitians who indicated they advised their patients regarding eye care provided recommendations equivalent to those in the guidelines.

According to the guidelines, 177 (88%) of the 202 diabetic respondents should have received an eye examination through dilated pupils by an ophthalmologist during the previous 12 months. Only 76 (43%) received such care.

When asked about professional advice provided by physicians, nurses, or health educators, 81 (46%) of the 177 diabetic individuals reported they were told to have their eyes examined at least annually, and 71 (40%) were told to go to an ophthalmologist. Only 46 (26%) of 177 were told the complete recommendations in Michigan's guidelines. Diabetic individuals who received advice consistent with the guidelines were twice as likely to have visited an ophthalmologist during the past year as those who had not received such advice (67%, compared with 34%).

Self-reported "eye problems" seemed to influence the decision of a diabetic person to have an ophthalmologic exam, but these conditions did not appear to influence whether a diabetic person followed the guidelines. Among patients who were not advised about the guidelines, 44% of those with self-reported eye problems visited ophthalmologists within the past

TABLE 1. Sources of recommendation for initial ophthalmologic examination of diabetic and nondiabetic persons — Michigan, 1984

Source of recommendation*	General ophthalmologists				Retinal specialists			
	Diabetic		Nondiabetic		Diabetic		Nondiabetic	
	No.	(%)	No.	(%)	No.	(%)	No.	(%)
Physician	15	(45)	95	(22)	12	(50)	26	(38)
Optometrist	2	(6)	46	(10)	2	(8)	11	(16)
Other health-care professionals	0	(0)	20	(5)	2	(8)	4	(6)
Self	6	(18)	93	(21)	2	(8)	4	(6)
Relative	5	(15)	81	(18)	3	(13)	14	(20)
Friend	5	(15)	81	(18)	2	(8)	10	(14)
Other nonhealth-care personnel	0	(0)	14	(3)	1	(4)	1	(1)
Not stated	1	(3)	13	(3)	0	(0)	1	(1)
Total	**33**	**(100)**	**439**	**(100)**	**24**	**(100)**	**69**	**(100)**

*The categories may sum to more than the total because several respondents named more than one source.

Diabetes Mellitus — Continued

12 months, compared to 25% of those without problems. Among individuals who were advised, 70% of those with eye problems and 63% of those without eye problems reported visiting an ophthalmologist within the past 12 months.

Reported by W Herman, MD, University of Michigan, Ann Arbor, M Halpern, PhD, BE Pack, MPH, J Beasley, MA, C Callaghan, MPH, Diabetes Control Program, Center for Health Promotion, Michigan Dept of Public Health; Div of Diabetes Control, Center for Prevention Svcs, CDC.

Editorial Note: Diabetic retinopathy accounts for at least 10% of new cases of legal blindness in the United States each year and is the leading cause of new cases of legal blindness in adults aged 20-74 years (*2*). Proliferative diabetic retinopathy, the most severe form, is generally asymptomatic in its most treatable stages. In a university setting, 52% of internists and 33% of diabetologists missed the diagnosis of proliferative retinopathy, while fewer than 10% of ophthalmologists missed this diagnosis (*3*). A recent study, however, found that 37% of persons with earlier onset and 50% of persons with later onset of diabetes had not received an ophthalmological exam within the past 2 years (*4*).

In Michigan, public health officials are working to improve the level of diabetic care. They have developed referral guidelines for the detection of diabetic retinopathy, and they are disseminating these guidelines to physicians, diabetes educators, and other primary health-care providers. In addition, they are using media coverage to inform diabetic persons of the need for annual ophthalmologic examinations.

Surveys conducted in Michigan have attempted to document the current referral practices of providers and the care-seeking behavior of diabetic individuals and suggest that considerable improvements should be made in ophthalmologic utilization, patient and professional education, and patient-referral recommendations. Because these surveys had low response rates, caution must be used when making inferences from these findings. Additional information was not available to address the issue of selection bias. Subsequent surveys will be designed to improve response rates and collect information on nonrespondents.

Survey information from Michigan, thus far, is encouraging. For example, appropriate changes in patient behavior are occurring. Patients who did not report eye problems but who received recommendations consistent with Michigan's guidelines were much more likely to visit ophthalmologists than patients with eye problems who did not receive the guidelines. Further evaluation will be necessary to determine the impact of Michigan's Diabetic Retinopathy Guidelines. It will be necessary to document changes in retinopathy referral patterns and care-seeking behavior of the diabetic individual.

In an effort to prevent blindness associated with diabetic eye disease, CDC continues to support retinopathy projects in Georgia, Michigan, and Mississippi and is initiating eye-care projects for diabetic persons in the following states: Colorado, Florida, Kansas, Kentucky, Maryland, Massachusetts, Minnesota, New York, Ohio, and West Virginia. The program provides for examination of diabetic persons at high risk for retinopathy. These include persons who have noninsulin-dependent diabetes mellitus or postpubertal individuals with insulin-dependent diabetes mellitus of 5 or more years duration. Participants will also be examined for glaucoma, cataracts, and impaired visual acuity and for hypertension that can be associated with the development of retinopathy. Patients identified with treatable conditions will be assured access to care, and all participants will be referred for annual eye examinations. Those requesting further information should contact the state health departments in the states listed above or the Division of Diabetes Control, Center for Prevention Services, CDC.

References

1. Michigan Department of Public Health. Diabetic retinopathy guidelines, 1984.
2. Kahn HA, Moorhead HB. Statistics on blindness in the model reporting area, 1969-70. National Eye Institute, 1973.
3. Sussman EJ, Tsiaras WG, Soper KA. Diagnosis of diabetic eye disease. JAMA 1982;247:3231-4.
4. Witkin SR, Klein R. Ophthalmologic care for persons with diabetes. JAMA 1984;251:2534-7.

Human Rabies Diagnosed 2 Months Postmortem — Texas

The first case of human rabies reported in the United States in 1985 was diagnosed July 16, 1985, by an Abilene, Texas, pathologist who noted encephalitis suggestive of rabies on reviewing sections of the brain of a patient who had died May 20. The patient, a 19-year-old Mexican national, had lived in Texas after arriving in the United States approximately 1½ months before the onset of his illness. He had no known history of exposure to rabies.

The patient was in good health until May 2 or 3, when he developed nausea, vomiting, and shortness of breath. On the morning of May 5, he was seen at the emergency room of an Abilene hospital. Temperature, pulse, and blood pressure were normal. Physical examination and a chest roentgenogram did not reveal abnormalities, and the patient was discharged from the emergency room.

Shortly after midnight on May 6, he returned to the emergency room because of intensification of breathing difficulties, persistent nausea and vomiting, and fever of 40.6 C (105 F). His blood pressure fluctuated between 215/140 and 80/0. He was coherent enough to answer questions in Spanish; however, because he spoke no English, no detailed history of his activities for the past several months was obtained. Tetanus and rabies were considered,

(Continued on page 705)

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

Disease	46th Week Ending			Cumulative, 46th Week Ending		
	Nov. 16, 1985	Nov. 17, 1984	Median 1980-1984	Nov. 16, 1985	Nov. 17, 1984	Median 1980-1984
Acquired Immunodeficiency Syndrome (AIDS)	121	89	N	7,016	3,732	N
Aseptic meningitis	224	195	195	9,153	7,273	8,550
Encephalitis: Primary (arthropod-borne & unspec.)	27	18	37	1,135	1,061	1,377
Post-infectious	-	-	-	107	103	81
Gonorrhea: Civilian	14,639	16,982	17,601	745,765	745,193	849,153
Military	301	328	331	16,222	18,958	23,482
Hepatitis: Type A	415	439	540	20,097	18,984	20,274
Type B	525	493	480	23,111	22,900	19,225
Non A, Non B	61	65	N	3,600	3,352	N
Unspecified	75	104	195	5,078	4,526	7,660
Legionellosis	15	8	N	579	610	N
Leprosy	14	5	3	321	200	200
Malaria	28	19	20	903	894	951
Measles: Total*	1	4	25	2,601	2,443	2,443
Indigenous	1	3	N	2,167	2,153	N
Imported	-	1	N	434	290	N
Meningococcal infections: Total	28	55	55	2,080	2,377	2,410
Civilian	28	55	55	2,076	2,373	2,395
Military	-	-	-	4	4	14
Mumps	25	48	75	2,574	2,613	3,981
Pertussis	59	28	29	2,889	2,097	1,556
Rubella (German measles)	4	13	17	585	683	1,919
Syphilis (Primary & Secondary): Civilian	370	499	594	22,601	24,698	27,393
Military	1	2	4	127	263	338
Toxic Shock syndrome	5	7	N	313	422	N
Tuberculosis	342	327	459	18,778	18,726	22,502
Tularemia	6	2	3	151	268	250
Typhoid fever	14	14	6	330	336	409
Typhus fever, tick-borne (RMSF)	7	7	5	669	808	1,078
Rabies, animal	86	94	94	4,726	4,847	5,618

TABLE II. Notifiable diseases of low frequency, United States

	Cum 1985		Cum 1985
Anthrax	-	Leptospirosis (Mich 2)	33
Botulism: Foodborne	43	Plague (Colo. 1)	16
Infant	58	Poliomyelitis: Total	5
Other	1	Paralytic	5
Brucellosis (Mo. 1, Ga. 1)	121	Psittacosis (Mich. 4)	98
Cholera	3	Rabies, human	1
Congenital rubella syndrome	-	Tetanus (Va. 1, Calif. 1)	64
Congenital syphilis, ages < 1 year	149	Trichinosis	54
Diphtheria	1	Typhus fever, flea-borne (endemic, murine) (Calif. 1)	22

*There were no cases of internationally imported measles reported for this week.

TABLE III. Cases of specified notifiable diseases, United States, weeks ending November 16, 1985 and November 17, 1984 (46th Week)

Reporting Area	AIDS	Aseptic Meningitis	Encephalitis		Gonorrhea (Civilian)		Hepatitis (Viral), by type				Legionellosis	Leprosy
			Primary	Post-infectious			A	B	NA,NB	Unspecified		
	Cum. 1985	1985	Cum. 1985	Cum. 1985	Cum. 1985	Cum. 1984	1985	1985	1985	1985	1985	Cum. 1985
UNITED STATES	7,016	224	1,135	107	745,765	745,193	415	525	61	75	15	321
NEW ENGLAND	235	26	31	-	20,147	20,210	13	42	8	11	1	7
Maine	11	-	-	-	1,028	884	-	2	-	-	-	-
N.H.	3	-	7	-	506	657	-	-	-	-	-	-
Vt.	2	-	-	-	295	337	1	-	-	-	-	-
Mass.	138	9	18	-	8,362	8,606	-	17	8	8	1	7
R.I.	12	2	-	-	1,625	1,449	2	7	-	-	-	-
Conn.	69	15	6	-	8,331	8,277	10	16	-	3	-	-
MID ATLANTIC	2,744	61	142	11	113,108	99,894	22	55	8	3	-	35
Upstate N.Y.	298	26	45	4	15,932	16,077	6	20	4	1	-	1
N.Y. City	1,890	2	16	-	54,766	38,632	1	-	-	-	-	30
N.J.	396	21	28	-	17,200	17,846	6	16	2	1	-	-
Pa.	160	12	53	7	25,210	27,339	9	19	2	1	-	4
E.N. CENTRAL	301	25	335	20	104,069	104,553	18	32	3	3	4	21
Ohio	51	7	139	4	28,642	27,942	7	14	-	-	4	3
Ind.	24	1	65	2	11,240	11,332	-	2	-	-	-	-
Ill.	150	9	53	8	24,346	22,832	1	3	-	-	-	16
Mich.	54	8	58	-	29,894	30,729	10	13	3	3	-	2
Wis.	22	-	20	6	9,947	11,718	-	-	-	-	-	-
W.N. CENTRAL	98	9	71	4	36,961	36,944	11	17	-	1	4	2
Minn.	34	1	34	1	5,462	5,513	2	-	-	-	1	1
Iowa	10	5	26	-	3,966	4,028	-	3	-	-	1	-
Mo.	40	3	-	-	17,869	17,719	1	11	-	1	1	1
N. Dak.	1	-	-	1	249	344	-	-	-	-	-	-
S. Dak.	1	-	-	-	707	868	7	1	-	-	-	-
Nebr.	3	-	5	-	3,168	2,752	-	-	-	-	1	-
Kans.	9	-	6	2	5,540	5,720	1	2	-	-	-	-
S. ATLANTIC	1,075	58	133	42	165,035	188,701	40	139	11	8	5	8
Del.	10	4	8	-	3,919	3,548	1	-	-	1	-	-
Md.	120	5	28	1	25,749	21,393	-	29	-	-	1	1
D.C.	156	-	-	-	14,073	13,394	-	3	-	-	-	-
Va.	90	10	27	6	17,127	17,871	10	8	3	1	2	-
W. Va.	6	3	37	-	2,329	2,397	-	2	-	-	2	-
N.C.	57	4	27	1	32,669	30,435	5	12	-	1	-	2
S.C.	25	6	6	-	19,523	19,281	1	15	-	-	-	-
Ga.	164	2	-	-	-	34,995	3	25	2	-	-	1
Fla.	447	24	-	34	49,646	45,387	20	45	6	5	-	4
E.S. CENTRAL	63	7	37	4	67,875	67,291	3	22	2	3	1	-
Ky.	15	7	17	-	7,803	8,010	1	3	-	1	-	-
Tenn.	16	-	6	-	26,024	27,282	1	3	-	1	-	-
Ala.	25	-	11	4	20,371	20,528	1	10	1	-	1	-
Miss.	7	-	3	-	13,677	11,471	-	6	1	1	-	-
W.S. CENTRAL	511	12	136	2	99,423	100,823	52	32	8	18	-	26
Ark.	7	-	6	1	9,426	9,307	-	-	-	-	-	1
La.	80	3	9	-	18,947	22,041	3	1	2	-	-	7
Okla.	15	-	24	1	11,080	11,119	5	4	-	-	-	-
Tex.	409	9	97	-	59,970	58,356	44	27	6	18	-	18
MOUNTAIN	131	10	40	6	24,643	24,480	59	38	7	5	-	9
Mont.	1	-	-	-	716	937	3	3	-	-	-	-
Idaho	1	1	-	-	837	1,169	5	3	-	-	-	-
Wyo.	-	-	1	-	577	658	-	-	-	-	-	-
Colo.	45	1	6	2	7,156	7,008	7	3	-	3	-	2
N. Mex.	12	5	3	-	2,787	2,964	1	2	-	-	-	-
Ariz.	50	2	17	-	7,371	6,769	35	19	6	2	-	1
Utah	13	-	10	4	1,199	1,168	1	3	1	-	-	4
Nev.	9	1	3	-	4,000	3,807	7	5	-	-	-	2
PACIFIC	1,858	16	210	18	114,504	102,297	197	148	14	23	-	213
Wash.	107	-	13	1	8,786	7,928	-	-	-	-	-	34
Oreg.	29	-	1	-	5,739	5,915	60	21	3	1	-	4
Calif.	1,701	15	158	17	95,681	84,216	120	127	10	22	-	154
Alaska	3	-	38	-	2,771	2,511	-	-	1	-	-	-
Hawaii	18	1	-	-	1,527	1,727	17	-	-	-	-	21
Guam	1	U	-	-	156	213	U	U	U	U	U	3
P.R.	86	U	6	2	2,732	2,980	U	U	U	U	U	2
V.I.	2	-	-	-	369	472	-	-	-	-	-	-
Pac. Trust Terr.	-	U	-	-	146	-	U	U	U	U	U	20

N: Not notifiable U: Unavailable

TABLE III. (Cont'd.) Cases of specified notifiable diseases, United States, weeks ending November 16, 1985 and November 17, 1984 (46th Week)

Reporting Area	Malaria	Measles (Rubeola)					Menin-gococcal Infections	Mumps		Pertussis			Rubella		
		Indigenous		Imported *		Total									
	Cum. 1985	1985	Cum. 1985	1985	Cum. 1985	Cum. 1984	Cum. 1985	1985	Cum. 1985	1985	Cum. 1985	Cum. 1984	1985	Cum. 1985	Cum. 1984
UNITED STATES	903	1	2,167	-	434	2,443	2,080	25	2,574	59	2,889	2,097	4	585	683
NEW ENGLAND	52	-	38	-	88	106	98	-	58	2	199	70	-	12	18
Maine	4	-	-	-	1	-	4	-	6	-	10	4	-	-	1
N.H.	4	-	-	-	-	36	14	-	10	-	107	17	-	2	1
Vt.	1	-	-	-	-	7	10	-	3	-	3	23	-	-	-
Mass.	25	-	34	-	84	49	17	-	17	-	46	18	-	6	16
R.I.	6	-	-	-	-	-	17	-	15	-	22	4	-	-	-
Conn.	12	-	4	-	3	14	36	-	7	2	11	4	-	4	-
MID ATLANTIC	141	-	193	-	38	162	366	2	300	6	230	181	-	226	223
Upstate N.Y.	49	-	72	-	13	41	143	2	161	1	107	102	-	18	99
N.Y. City	53	-	67	-	12	109	62	-	30	-	27	8	-	185	103
N.J.	15	-	17	-	10	7	59	-	46	-	11	13	-	9	20
Pa.	24	-	37	-	3	5	102	-	63	5	85	58	-	14	1
E.N. CENTRAL	59	-	436	-	90	697	363	8	904	11	645	483	-	33	100
Ohio	11	-	-	-	54	9	115	8	273	8	109	75	-	-	2
Ind.	4	-	55	-	2	3	47	-	37	-	188	229	-	1	5
Ill.	21	-	286	-	10	181	83	-	200	1	47	27	-	16	63
Mich.	17	-	37	-	23	464	90	-	310	1	47	30	-	15	22
Wis.	6	-	58	-	1	40	28	-	84	1	254	122	-	1	8
W.N. CENTRAL	31	-	2	-	10	56	105	-	78	9	221	124	1	20	39
Minn.	14	-	-	-	6	47	26	-	1	5	113	16	-	2	4
Iowa	2	-	-	-	-	-	10	-	16	2	30	13	-	1	1
Mo.	5	-	1	-	2	4	41	-	14	2	30	20	1	8	-
N. Dak.	2	-	-	-	2	-	5	-	4	-	9	-	-	2	3
S. Dak.	1	-	-	-	-	-	3	-	-	-	3	9	-	-	-
Nebr.	1	-	-	-	-	-	9	-	3	-	8	12	-	-	-
Kans.	6	-	1	-	-	5	11	-	40	-	28	54	-	7	31
S. ATLANTIC	103	-	279	-	30	66	397	2	255	5	376	210	-	55	27
Del.	-	-	-	-	-	-	11	-	1	-	2	2	-	1	2
Md.	25	-	104	-	9	22	55	-	33	1	156	61	-	6	1
D.C.	8	-	9	-	1	8	7	-	-	-	1	-	-	-	-
Va.	20	-	21	-	7	5	48	-	46	-	19	19	-	2	-
W. Va.	2	-	31	-	2	-	8	2	70	-	4	11	-	9	-
N.C.	9	-	9	-	-	1	54	-	19	1	32	34	-	1	-
S.C.	-	-	-	-	3	1	34	-	11	-	2	2	-	3	-
Ga.	9	-	8	-	-	2	69	-	28	-	93	17	-	4	2
Fla.	30	-	97	-	8	27	111	-	47	3	67	64	-	29	22
E.S. CENTRAL	11	-	-	-	7	6	91	1	30	5	63	14	-	3	12
Ky.	4	-	-	-	5	1	9	-	8	-	8	2	-	3	6
Tenn.	-	-	-	-	1	2	35	1	18	-	25	7	-	-	-
Ala.	6	-	-	-	-	3	26	-	1	2	23	1	-	-	3
Miss.	1	-	-	-	1	-	21	-	3	3	7	4	-	-	3
W.S. CENTRAL	82	-	421	-	15	565	177	7	289	12	517	324	2	39	54
Ark.	3	-	-	-	-	8	18	1	7	-	14	22	-	1	3
La.	1	-	42	-	-	8	25	-	2	1	17	8	-	-	-
Okla.	5	-	-	-	1	8	32	N	N	1	159	243	-	1	-
Tex.	73	-	379	-	14	541	102	6	280	10	327	51	2	37	51
MOUNTAIN	50	-	497	-	51	145	92	-	230	5	207	121	-	5	21
Mont.	-	-	122	-	17	-	11	-	11	-	9	19	-	-	-
Idaho	3	-	126	-	18	23	5	-	9	-	7	7	-	1	1
Wyo.	1	-	5	-	-	-	6	-	2	-	-	6	-	-	2
Colo.	15	-	6	-	7	6	23	-	24	2	85	45	-	-	2
N. Mex.	14	-	1	-	5	88	10	N	N	-	13	11	-	2	1
Ariz.	11	-	237	-	4	1	22	-	113	2	40	24	-	1	4
Utah	2	-	-	-	-	27	9	-	6	1	53	7	-	-	7
Nev.	4	-	-	-	-	-	6	-	65	-	-	2	-	1	4
PACIFIC	374	1	301	-	105	640	391	5	430	4	431	570	1	192	189
Wash.	23	-	90	-	39	154	65	-	35	-	75	316	-	14	1
Oreg.	13	-	4	-	1	-	35	N	N	4	49	30	1	2	2
Calif.	319	1	189	-	60	323	270	5	367	-	260	148	-	133	180
Alaska	2	-	-	-	-	-	9	-	9	-	30	1	-	1	1
Hawaii	17	-	18	-	5	163	12	-	19	-	17	75	-	42	5
Guam	1	U	10	U	1	90	-	U	5	U	-	-	U	2	4
P.R.	-	U	67	U	-	137	13	U	146	U	12	1	U	27	19
V.I.	-	-	4	-	6	-	-	-	3	-	-	-	-	-	-
Pac. Trust Terr.	-	U	-	U	-	-	-	U	3	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 November 16, 1985 and November 17, 1984 (46th Week)

Reporting Area	Syphilis (Civilian) (Primary & Secondary)		Toxic-shock Syndrome	Tuberculosis		Tula-remia	Typhoid Fever	Typhus Fever (Tick-borne) (RMSF)	Rabies, Animal
	Cum. 1985	Cum. 1984	1985	Cum. 1985	Cum. 1984	Cum. 1985	Cum. 1985	Cum. 1985	Cum. 1985
UNITED STATES	22,601	24,698	5	18,778	18,726	151	330	669 +9	4,726
NEW ENGLAND	525	467	2	649	565	4	13	8	20
Maine	13	9	-	41	28	-	-	-	-
N.H.	36	14	-	20	26	-	-	1	1
Vt.	5	1	-	8	7	-	-	-	1
Mass.	261	266	-	384	314	4	10	6	11
R.I.	15	19	1	50	45	-	-	1	-
Conn.	195	158	1	146	145	-	3	-	7
MID ATLANTIC	3,193	3,290	-	3,358	3,396	2	49	34	555
Upstate N.Y.	238	292	-	586	528	-	13	9	130
N.Y. City	1,929	1,984	-	1,637	1,385	1	25	5	-
N.J.	620	581	-	453	756	1	10	4	39
Pa.	406	433	-	682	727	-	1	16	386
E.N. CENTRAL	886	1,169	1	2,298	2,431	3	40	43 +4	169
Ohio	134	212	1	397	438	-	11	27	28
Ind.	74	125	-	291	292	-	3	5	23
Ill.	400	429	-	990	1,007	2	16	9 3	38
Mich.	219	334	-	491	548	-	8	2	25
Wis.	59	69	-	129	146	1	2	-	55
W.N. CENTRAL	211	327	-	522	575	46	13	42	847
Minn.	42	84	-	112	100	1	6	-	163
Iowa	18	11	-	53	58	-	3	1	140
Mo.	114	166	-	250	287	30	3	7	46
N. Dak.	3	9	-	9	13	-	-	1	126
S. Dak.	6	1	-	27	22	8	-	2	294
Nebr.	6	15	-	12	29	2	1	4	34
Kans.	22	41	-	59	66	5	-	27	44
S. ATLANTIC	5,585	7,257	-	3,849	3,880	6	35	318 +5	1,202
Del.	36	19	-	41	50	1	-	3	1
Md.	397	441	-	356	363	-	11	26	603
D.C.	297	292	-	138	156	-	-	-	-
Va.	267	376	-	368	376	1	3	25	165
W. Va.	23	18	-	99	122	-	1	2 1	28
N.C.	609	765	-	497	591	4	4	131	11
S.C.	712	688	-	467	468	-	1	71	61
Ga.	-	1,254	-	645	587	-	3	48	190
Fla.	3,244	3,404	-	1,238	1,167	-	12	12 3	143
E.S. CENTRAL	1,934	1,797	-	1,635	1,758	9	5	74	224
Ky.	63	88	-	402	411	-	1	13	33
Tenn.	568	462	-	485	508	7	2	32	66
Ala.	595	602	-	482	519	1	2	15	118
Miss.	708	645	-	266	320	1	-	14	7
W.S. CENTRAL	5,490	6,014	-	2,384	2,238	58	29	133	774
Ark.	292	198	-	281	255	35	-	16	129
La.	959	1,071	-	335	322	-	1	4	19
Okla.	170	188	-	229	212	17	2	90	97
Tex.	4,069	4,557	-	1,539	1,449	6	26	23	529
MOUNTAIN	667	570	1	504	510	15	12	14	414
Mont.	6	3	-	46	17	4	-	6	210
Idaho	5	22	-	23	27	-	-	-	10
Wyo.	10	7	-	5	4	-	-	4	27
Colo.	191	153	-	72	64	2	4	2	25
N. Mex.	112	77	-	82	95	2	4	-	12
Ariz.	281	210	1	229	233	4	3	-	115
Utah	8	18	-	17	35	3	1	-	4
Nev.	54	80	-	30	35	-	-	2	11
PACIFIC	4,110	3,807	1	3,579	3,373	8	134	3	521
Wash.	97	136	-	210	174	-	1	-	4
Oreg.	92	102	-	119	137	1	5	-	4
Calif.	3,855	3,492	1	2,992	2,803	4	122	3	510
Alaska	4	6	-	89	64	3	2	-	3
Hawaii	62	71	-	169	195	-	4	-	-
Guam	2	-	U	35	48	-	3	-	-
P.R.	758	690	U	307	343	-	3	-	34
V.I.	3	10	-	1	4	-	52	-	-
Pac. Trust Terr.	13	-	U	16	-	-	-	-	-

U Unavailable

TABLE IV. Deaths in 121 U.S. cities,* week ending November 16, 1985 (46th Week)

Reporting Area	All Causes, By Age (Years)						P&I** Total
	All Ages	≥65	45-64	25-44	1-24	<1	
NEW ENGLAND	703	512	119	44	11	17	56
Boston, Mass.	206	130	42	19	4	11	20
Bridgeport, Conn.	30	18	8	4	-	-	-
Cambridge, Mass.	26	21	5	-	-	-	-
Fall River, Mass.	30	24	6	-	-	-	2
Hartford, Conn.	78	56	16	4	-	2	6
Lowell, Mass.	25	20	4	-	1	-	-
Lynn, Mass.	22	18	1	1	-	2	-
New Bedford, Mass.	27	24	3	-	-	-	1
New Haven, Conn.	45	29	10	5	1	-	3
Providence, R.I.	69	53	9	3	2	2	3
Somerville, Mass.	4	4	-	-	-	-	-
Springfield, Mass.	41	31	8	1	1	-	2
Waterbury, Conn.	48	38	6	3	1	-	8
Worcester, Mass.	52	46	1	4	1	-	11
MID ATLANTIC	2,580	2,100	259	88	53	80	117
Albany, N.Y.	51	38	8	-	1	4	2
Allentown, Pa.	21	15	3	3	-	-	-
Buffalo, N.Y.	59	38	13	4	2	2	2
Camden, N.J.	36	21	11	1	-	3	3
Elizabeth, N.J.	27	19	8	-	-	-	1
Erie, Pa.†	29	22	6	1	-	-	-
Jersey City, N.J.	50	34	9	5	2	-	-
N.Y. City, N.Y. §	1,449	1,356	9	23	29	32	55
Newark, N.J.	74	25	22	14	6	7	6
Paterson, N.J.	32	23	4	4	-	1	1
Philadelphia, Pa.	300	192	65	18	4	21	20
Pittsburgh, Pa.†	78	48	23	4	1	2	5
Reading, Pa.	35	27	5	1	2	-	5
Rochester, N.Y.	109	73	27	5	1	3	6
Schenectady, N.Y.	31	26	1	1	2	1	3
Scranton, Pa.†	26	17	8	-	-	1	3
Syracuse, N.Y.	85	62	16	1	3	3	1
Trenton, N.J.	31	22	8	1	-	-	-
Utica, N.Y.	30	23	7	-	-	-	1
Yonkers, N.Y.	27	19	6	2	-	-	3
E.N. CENTRAL	2,329	1,634	412	129	59	94	83
Akron, Ohio	83	52	27	-	-	4	2
Canton, Ohio	26	23	2	-	1	-	3
Chicago, Ill.§	553	462	11	26	16	37	16
Cincinnati, Ohio	106	71	20	10	3	2	7
Cleveland, Ohio	157	94	45	7	4	7	1
Columbus, Ohio	174	121	32	11	4	6	-
Dayton, Ohio	107	67	34	4	1	1	2
Detroit, Mich.	263	154	63	24	11	11	6
Evansville, Ind.	49	36	9	3	-	1	2
Fort Wayne, Ind.	51	31	13	3	-	4	3
Gary, Ind.	31	15	6	7	3	-	-
Grand Rapids, Mich	69	53	10	3	1	2	8
Indianapolis, Ind.	147	98	35	6	3	5	1
Madison, Wis.	41	26	7	4	3	1	2
Milwaukee, Wis.	138	93	34	3	2	6	12
Peoria, Ill.	48	34	11	2	-	1	8
Rockford, Ill.	38	24	11	2	1	-	1
South Bend, Ind.	66	46	13	4	1	2	3
Toledo, Ohio	109	77	16	7	5	4	4
Youngstown, Ohio	73	57	13	3	-	-	2
W.N. CENTRAL	682	486	140	22	15	18	22
Des Moines, Iowa	59	42	11	2	3	1	3
Duluth, Minn.	29	21	5	1	-	2	-
Kansas City, Kans.	39	27	5	5	1	1	-
Kansas City, Mo.	108	69	31	1	1	6	6
Lincoln, Nebr.	33	22	8	1	-	1	3
Minneapolis, Minn.	67	41	16	3	5	2	-
Omaha, Nebr.	87	64	16	3	1	3	4
St. Louis, Mo.	133	99	27	3	3	1	3
St. Paul, Minn.	63	53	7	2	1	-	-
Wichita, Kans.	64	48	14	1	-	1	3
S. ATLANTIC	1,124	756	218	80	31	39	64
Atlanta, Ga.	132	79	36	11	1	5	2
Baltimore, Md.	262	161	65	24	7	5	13
Charlotte, N.C.	64	43	17	2	-	2	10
Jacksonville, Fla.	107	66	19	12	7	3	2
Miami, Fla. §	112	103	2	1	3	3	2
Norfolk, Va.	46	28	5	3	5	5	3
Richmond, Va.	80	47	18	10	2	3	10
Savannah, Ga.	37	27	6	2	1	1	6
St. Petersburg, Fla.	91	79	8	2	-	2	10
Tampa, Fla.	67	38	20	3	2	4	1
Washington, D.C.	87	51	18	9	3	6	4
Wilmington, Del.	39	34	4	1	-	-	1
E.S. CENTRAL	668	397	156	46	22	47	26
Birmingham, Ala.	126	72	29	11	7	7	-
Chattanooga, Tenn.	66	49	10	4	1	2	8
Knoxville, Tenn.	55	33	13	4	2	3	4
Louisville, Ky.	101	58	29	10	-	4	4
Memphis, Tenn.	152	78	36	10	7	21	6
Mobile, Ala.	55	40	12	2	-	1	1
Montgomery, Ala.	27	17	3	1	4	2	2
Nashville, Tenn.	86	50	24	4	1	7	1
W.S. CENTRAL	1,226	839	192	97	52	46	55
Austin, Tex.	53	30	7	10	5	1	8
Baton Rouge, La.	39	22	9	6	1	1	1
Corpus Christi, Tex.	38	17	15	4	1	1	3
Dallas, Tex.	171	100	38	19	6	8	4
El Paso, Tex.	49	33	7	3	3	3	2
Fort Worth, Tex.	77	47	14	5	4	7	2
Houston, Tex. §	346	311	2	7	17	9	6
Little Rock, Ark.	56	26	17	6	2	5	7
New Orleans, La.	122	71	25	14	6	6	-
San Antonio, Tex.	147	88	38	13	4	4	13
Shreveport, La.	38	29	5	2	2	-	1
Tulsa, Okla.	90	65	15	8	1	1	8
MOUNTAIN	597	361	140	49	22	25	31
Albuquerque, N.Mex.	73	43	14	11	4	1	1
Colo. Springs, Colo.	36	25	8	1	1	1	4
Denver, Colo.	107	57	29	9	6	6	10
Las Vegas, Nev.	100	55	30	12	2	1	4
Ogden, Utah	22	17	2	2	-	1	2
Phoenix, Ariz.	120	70	29	7	3	11	4
Pueblo, Colo.	23	15	5	1	2	-	2
Salt Lake City, Utah	36	21	8	3	2	2	1
Tucson, Ariz.	80	58	15	3	2	2	3
PACIFIC	1,733	1,157	332	140	52	46	114
Berkeley, Calif.	18	10	5	2	-	1	-
Fresno, Calif.	63	39	13	6	2	3	1
Glendale, Calif.	15	10	3	2	-	-	-
Honolulu, Hawaii	68	43	12	6	2	5	5
Long Beach, Calif.	92	62	21	4	3	2	13
Los Angeles, Calif.	452	286	96	48	10	6	16
Oakland, Calif.	61	38	12	6	3	2	4
Pasadena, Calif.	23	19	3	1	-	-	5
Portland, Oreg.	109	78	16	9	4	2	5
Sacramento, Calif.	141	103	27	7	3	1	16
San Diego, Calif.	148	95	31	12	9	1	16
San Francisco, Calif.	145	98	26	12	5	4	3
San Jose, Calif.	137	83	24	15	4	11	8
Seattle, Wash.	157	113	25	9	5	5	8
Spokane, Wash.	57	46	8	-	1	2	10
Tacoma, Wash.	47	34	10	1	1	1	4
TOTAL	11,642††	8,242	1,968	695	317	412	568

* 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.
§ 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 1983*†	Estimated mortality June 1985		Estimated number of physician contacts June 1985*¶
		Number*§	Annual Rate/100,000*§	
ALL CAUSES (TOTAL)	9,170,000	163,390	834.9	107,100,000
Accidents and adverse effects (E800-E949)	2,219,000	8,140	41.6	6,500,000
Malignant neoplasms (140-208)	1,808,000	37,180	190.0	1,500,000
Diseases of heart (390-398, 402, 404-429)	1,559,000	58,960	301.3	5,200,000
Suicides, homicides (E950-E978)	1,218,000	4,030	20.6	—
Chronic liver disease and cirrhosis (571)	248,000	2,040	10.4	100,000
Cerebrovascular diseases (430-438)	226,000	11,900	60.8	700,000
Congenital anomalies (740-759)	134,000	1,330	6.8	500,000
Chronic obstructive pulmonary diseases and allied conditions (490-496)	123,000	5,990	30.6	800,000
Diabetes mellitus (250)	115,000	2,880	14.7	3,100,000
Pneumonia and influenza (480-487)	106,000	4,520	23.1	600,000
Prenatal care*				3,700,000
Infant mortality*††		3,100	9.6 /1,000 live births	

*For details of calculation, see footnotes for Table V, *MMWR* 1985;34:2.

†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. 32, No. 13, September 21, 1984.

§National Center for Health Statistics, *Monthly Vital Statistics Report* (MVSR), Vol. 34, No. 7, October 21, 1985, pp. 8-9.

¶IMS America *National Disease and Therapeutic Index* (NDTI), Monthly Report, June 1985, Section III.

††MVSR Vol. 34, No. 6, September 18, 1985, p. 1.

Human Rabies — Continued

but both were ruled out because of a negative history of an injury or animal bite. Admission white blood cell count (WBC) was 25,800/mm^3 and hematocrit, 49%. An arterial blood gas sample revealed a metabolic acidosis. Serum potassium was 2.9 meq/l; glucose, 389 mg/dl; lactate, 12.2 meq/l; and serum acetone, negative. Urinalysis showed a trace of protein, mild ketonuria, and 3+ glucose. He was admitted to the hospital's coronary-care unit in acute respiratory distress with a provisional diagnosis of sepsis and rupture of the esophagus, but a cine-esophagram did not confirm the latter diagnosis. A repeat chest roentgenogram examination showed air in the neck and mediastinum and right-lung infiltrates. Aspiration pneumonia was suspected. The patient was intubated for respiratory distress approximately 4 hours

Human Rabies — Continued

after admission and was treated with broad-spectrum antibiotics. Blood and stool cultures for bacteria and a blood smear for malaria parasites were negative. A drug screen of serum showed only a positive reaction for acetaminophen.

The patient improved enough by May 8 to have the endotracheal tube removed. However, over the next day, his neurologic condition deteriorated, and he became disoriented and combative. Tremors were noted in his neck. A neurology consultant felt the patient's disorientation was metabolic in origin, but suggested cerebrospinal fluid examination. The initial lumbar puncture, performed May 12, showed 3 red blood cells/mm^3 and 14 WBCs/mm^3 (86% lymphocytes and 14% neutrophils) and 159 mg/dl of protein. On May 13, the patient suffered respiratory arrest and required reintubation. Over the next 7 days, his course was marked by progressively deepening coma without focal signs. His electroencephalogram showed a slow-wave pattern. The patient died May 20, 2 weeks after admission.

Since rabies was not seriously suspected during the patient's illness or at autopsy, microscope examinations of the brain and other tissue specimens were given routine rather than expeditious scheduling. Consequently, microscope examination of the brain was not undertaken until early July, when the pathologist reviewed the sections from the brain. The histologic diagnosis was further supported on July 16 by a Houston neuropathologist. On July 18, formalin-fixed brain tissue preserved from the autopsy was forwarded to CDC for examination. Direct fluorescent-antibody examination gave strongly positive results, and rabies was confirmed.

On July 19, local, regional, and state public health physicians met the members of the medical staff, hospital administrators, and approximately 140 hospital employees who had had contact with the patient. Rabies postexposure prophylaxis was made available to the employees and staff members by the hospital; 85 workers elected to take the treatment. Postexposure treatment was also offered to relatives and friends who could be located; they denied exposure to the patient's saliva or vomitus and chose to receive no treatment. Cost of rabies immune globulin and human diploid cell rabies vaccine was approximately $29,000.

Reported by BB Geeslin, MD, BB Trotter, MD, Abilene, D Armstrong, MD, Houston, C Ferris, MD, Abilene-Taylor County Heath District, MJ Woltjen, MD, Texas Public Health Region 4, TL Gustafson, MD, CE Alexander, MD, State Epidemiologist, Texas Dept of Health; Div of Viral Diseases, Center for Infectious Diseases, CDC.

Editorial Note: Of the 47 rabies cases diagnosed in the United States (or in American citizens outside the United States) and reported to CDC since 1960, no history of exposure could be ascertained for 13 (28%). A median incubation period of 35 days (range 12-701) was determined for the other 34 cases. In the present case, the absence of a history of a bite or other contact with a possibly rabid animal may have been attributable to memory loss resulting from encephalitis or to miscommunication because of the language barrier. Although the source of exposure is unknown, the patient's 1½-month residency in the United States is compatible with exposure in Texas or Mexico. In the semiarid plains of Texas, skunks are the principal reservoir for rabies, although rabid bats and foxes play an occasional role in the transmission of the infection in that region. In Mexico, dogs account for most reported cases of rabies.

Five (56%) of the nine rabies cases reported to CDC since 1980 occurred among individuals who had recently lived in rabies-endemic areas outside the United States. The last two cases were foreign nationals who developed rabies shortly after arrival in the United States from rabies-endemic areas (*1*). In both, rabies was diagnosed postmortem. When encephalitis occurs in a person who has lived in an area where rabies is enzootic, the diagnosis should be considered seriously, even in the absence of a history of exposure. Suggestive of rabies in the present case, in addition to encephalitis, were agitation, progressive unexplained dysphagia, and later in the course of illness, fasciculations of the neck.

Human Rabies – Continued

Although the prognosis for recovery after onset of clinical illness is bleak, early suspicion of rabies will allow for rapid institution of isolation measures to reduce the number of persons exposed to the patient and eliminate most exposures that might occur in situations such as airway care, provision of oral and dental hygiene, and physical examination of the head and neck (*2*).

The low risk of rabies transmission to hospital personnel caring for a rabid patient (*3*) is supported by the absence of rabies cases in hospital contacts of the patient despite a 60- to 78-day delay in instituting postexposure prophylaxis. Postexposure prophylaxis is recommended after contact with a rabid human only if a bite or nonbite exposure (contamination of a mucous membrane or open wound with saliva or other potentially infectious material) occurred (*2,4*). When only persons known to be exposed are treated, unnecessary postexposure treatments can be discouraged, and substantial savings can result. Consultation with state or federal health officials experienced in evaluating human rabies is recommended.

References

1. CDC. Human rabies acquired outside the United States. MMWR 1985;34:235-6.
2. Remington PL, Shope T, Andrews J. A recommended approach to the evaluation of human rabies exposure in an acute care hospital. JAMA 1985;254:67-9.
3. Anderson LJ, Vernon AA, Helmick CG, Roberts MR. Prophylaxis for persons in contact with patients who have rabies. N Engl J Med 1980;302:967-8.
4. ACIP. Rabies prevention—United States, 1984. MMWR 1984;33:393-402, 407-8.

Turkey-Associated Salmonellosis at an Elementary School — Georgia

Between May 10, and May 16, 1985, an estimated 351 children and staff at a Georgia elementary school developed febrile gastroenteritis. *Salmonella enteritidis*, sensitive to all antimicrobials tested, was isolated from more than 100 children; 23 were hospitalized; none died. The risk of illness was strongly associated with eating turkey salad with the school lunch on May 10, which was reported by 64 (91%) of 70 ill children and none of 13 well children in a case-control study ($p < 10^{-8}$). Culture of leftover refrigerated turkey salad yielded *S. enteritidis;* quantitative culture yielded 8.8×10^5 *Salmonella* per gram of salad. Each child received an estimated 56 grams of salad (5.0×10^7 *Salmonella*).

The turkey salad had been prepared by four asymptomatic foodhandlers. Inspection of the kitchen did not reveal foodhandling practices or equipment malfunctions that might have contributed to the outbreak, except that after being cooked and deboned May 9, the turkey was refrigerated overnight in an 8-inch deep pan.

Reported by M Smith, W Fancher, R Blumberg, MD, G Bohan, MD, DeKalb County Health Dept, D Smith, T McKinley, MPH, Office of Epidemiology, RK Sikes, DVM, State Epidemiologist, Georgia Dept of Human Resources; Enteric Diseases Br, Div of Bacterial Diseases, Center for Infectious Diseases, CDC.

Editorial Note: In studies of nontyphoidal *Salmonella* with human volunteers, the lowest dose of organisms to cause illness varied from 1.0×10^5 to 4.5×10^7, but the amount of *Salmonella* ingested in foodborne outbreaks is often lower (*1*). The observation of a 100% attack rate among children consuming an estimated 5.0×10^7 organisms suggests that the minimum dose required to cause illness is much lower.

Although turkey was reported as the vehicle in only 27 (7%) of 405 foodborne outbreaks of salmonellosis reported through the CDC foodborne surveillance system during 1972-1981, it was the vehicle in seven (23%) of 30 of the *Salmonella* outbreaks occurring in schools during that time (*2*). Turkey was the most common vehicle for all bacterial foodborne outbreaks in Georgia schools in 1971, usually after contamination during deboning followed by inadequate refrigeration (*3*). When a pan more than 4 inches deep is used to refrigerate a large hot mass, the center of the mass can remain above 50 degrees for over 24 hours, allow-

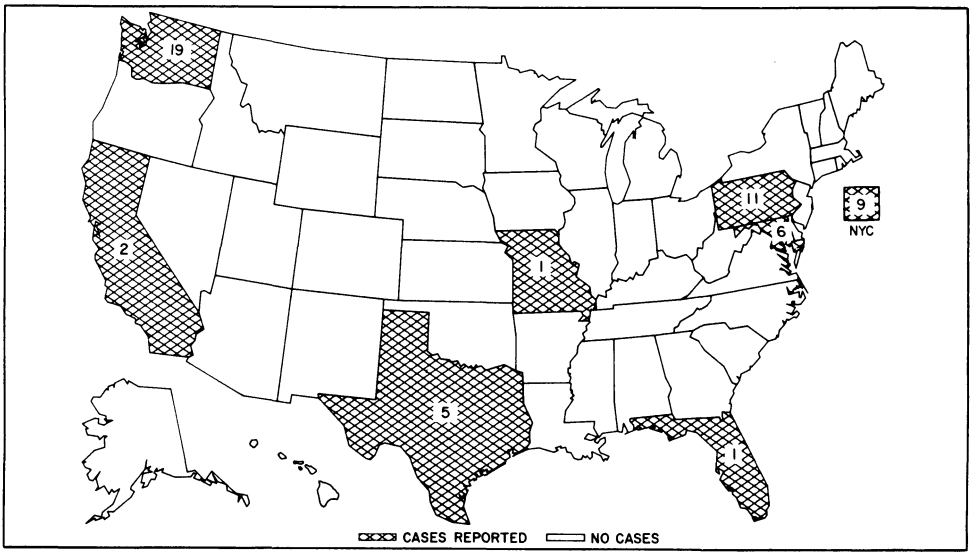
Salmonellosis — Continued

ing ample growth of contaminating bacteria. Particular attention to adequate cooking and refrigeration during the upcoming holiday season can prevent turkey-associated outbreaks.

References

1. Blaser MJ, Newman LS. A review of human salmonellosis: I. Infective dose. Rev Infect Dis 1982;4: 1096-106.
2. CDC. Foodborne surveillance reports 1972-1981.
3. Bryan FL, McKinley TW. Turkey: the bad guy of the school lunch room. School Foodservice Journal 1971;10:83-92.

FIGURE I. Reported measles cases — United States, weeks 42-45, 1985



☆U.S. Government Printing Office: 1986-746-149/21030 Region IV

HHS Publication No. (CDC) 86-8017