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Epidemiologic Notes and Reports

Measles Outbreak — Washington, 1989: Failure of Delayed Postexposure Prophylaxis with Vaccine

From March 1 through May 31, 1989, 19 confirmed measles cases* occurred in a health district in Washington (district attack rate: 26 cases per 100,000 population). No measles cases had been reported in the district since 1983. The index patient was an unvaccinated 3-year-old girl; five generations of cases followed.

Nine patients were <5 years of age, including five who were <16 months of age; eight were 5–19 years of age; and two were >19 years of age. Eleven cases were in Hispanics (384 per 100,000 population[†]), and eight were in non-Hispanic whites (11 per 100,000[†]).

Three cases occurred in children vaccinated before the outbreak at ≥15 months of age. Twelve patients had never been vaccinated; of these, five were <15 months of age, four had not received vaccine as recommended[§], two had religious exemptions, and one was born before 1957.

Four cases were in children vaccinated during the outbreak. One child received vaccine 2 days after being exposed to measles on a school bus. The other three children were exposed to measles by their siblings. Assuming an incubation period of 14 days to onset of rash, these three children received vaccine 4, 5, and 7 days after they were infected.

Control measures included exclusion of students and teachers from school if they could not provide proof of immunity. Persons who were vaccinated within 72 hours after exposure or who had not been exposed to measles were immediately readmitted following vaccination. If vaccine was received >72 hours after a well-defined community exposure, exclusion was continued for 14 days. Exclusion also was continued for 14 days for persons exposed at home and vaccinated >72 hours after the start of the home contact's infectious period (defined as 4 days before rash onset).

*Illness with generalized rash lasting ≥3 days, temperature ≥38.3 C (≥101 F), cough or coryza or conjunctivitis, and serologic confirmation or epidemiologic linkage to a serologically confirmed case.

[†]Based on 1988 population estimates.

[§]Vaccine is routinely indicated for persons born in or after 1957 who are ≥15 months of age, lack evidence of immunity, have no medical contraindication to vaccination, and have no religious or philosophic exemption.

Measles — Continued

Eight cases (42%) were epidemiologically linked to two of the three children vaccinated >72 hours after infection. The child vaccinated 5 days after infection exposed six case-patients. Despite the exclusion policy, this child was in school when he developed prodromal symptoms 7 days after receiving vaccine. The child vaccinated 7 days after infection exposed two case-patients. This child attended church the day he developed prodromal symptoms, 4 days after vaccination.

Reported by: P Malone, Chelan-Douglas Health District; B Baker, Immunization Program Office, JM Kobayashi, MD, State Epidemiologist, Washington Dept of Health. Div of Field Svcs, Epidemiology Program Office, CDC.

Editorial Note: Measles vaccine may be protective when administered to susceptible persons after exposure, particularly if given within 72 hours (*1–5*). The Immunization Practices Advisory Committee (ACIP) recommends vaccination as the preferred prophylaxis in susceptible persons for up to 72 hours after measles exposure. Immune globulin is recommended by ACIP for selected persons (e.g., pregnant women and immunocompromised persons) and may modify or even prevent measles if administered between 72 hours and 6 days after exposure (*6*).

Although protection by vaccine is not absolute, the ACIP supports readmission to school of all previously unimmunized children immediately following vaccination. No distinction is made between children who are vaccinated within 72 hours of exposure and those whose vaccination is delayed. The more restrictive Washington policy that extends exclusion if children are not vaccinated within 72 hours of exposure is based on the diminished efficacy of delayed postexposure vaccination.

In the Washington outbreak, persons who received vaccine >72 hours after exposure infected 42% of the case-patients, prolonging the outbreak substantially. The role that delayed postexposure vaccination may play in other measles outbreaks in the United States is unknown. During a more recent outbreak in this state, only one of 218 reported cases was in a child known to have been vaccinated >72 hours after exposure (*7*).

Findings from this outbreak investigation illustrate the potential for measles transmission when postexposure vaccination is delayed and indicate a need to define the role of delayed postexposure vaccination in measles outbreaks in the United States. The disruption in education that would result from more restrictive national exclusion guidelines may offset the number of measles cases that might be prevented. New outbreak-control recommendations (*6*) calling for revaccination of all persons in at-risk schools who have not previously had two doses of vaccine should lessen the chances of spread from persons incubating measles at the time of vaccination.

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Measles — Continued

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Progress in Chronic Disease Prevention

Summary of a Workshop on Screening for Hepatocellular Carcinoma

When patients present with hepatocelluar carcinoma (HCC) at the symptomatic stage, the disease is rapidly fatal, with a mean survival time of <4 months (*1*). Because prolonged survival has been reported following resection or other therapies when HCC has been detected at an early stage, screening for early detection of HCC may be useful. On September 11 and 12, 1989, a workshop to review available data on the use of screening for early detection of HCC was held in Anchorage, Alaska. The conference was sponsored by the Alaska Area Native Health Service of the Indian Health Service, the Fox Chase Cancer Center, and CDC's Arctic Investigations Program, Center for Infectious Diseases. Participants included investigators from China, Hong Kong, Japan, South Africa, and the United States who had studied the early detection of HCC.

Workshop participants addressed several questions regarding HCC, including whether HCC can be detected at an early stage using serologic markers or radiologic tests, whether treatment of HCC detected at an early stage can lead to prolonged survival, and whether high-risk groups for HCC in which routine screening should be considered can be identified. Although workshop participants considered a range of available data, their conclusions were not based on formal quantitative measures of cost and effectiveness of screening.

Based on clinical and laboratory data on serologic markers associated with HCC and on radiologic tests for HCC, the workshop participants concluded that serum alpha-fetoprotein (AFP) and ultrasound are the most sensitive markers available at this time for the early detection of HCC. Serum AFP levels have been reported to be elevated in 55%–95% of patients with HCC (*2–6*). Screening programs in Shanghai and Alaska demonstrated that AFP screening of hepatitis B virus (HBV) carriers, a known high-risk group for HCC, enabled early detection of small encapsulated tumors; resection of these tumors resulted in long tumor-free survival in some patients (*5,6*). In Japan, similar results were obtained when ultrasound was used as a primary screening tool among persons with cirrhosis (*7*). High-risk groups for HCC in which screening could be considered include HBV carriers (*6,8*), patients with cirrhosis of any etiology or hemochromatosis (*9,10*), and possibly patients with hepatitis C virus infection and other non-A, non-B hepatitis infections (*11,12*).

Although participants agreed that more studies are needed before firm screening recommendations can be made, the group concluded that periodic AFP testing every 6–12 months of HBV carriers may be useful to detect HCC at an early stage. Subsets of HBV carriers with a family history of HCC or with the presence of cirrhosis may be at higher risk and may benefit from more frequent screening. The participants concluded that other issues requiring further study include 1) the frequency of screening, 2) the effectiveness of using AFP as a primary screening marker for HCC, with ultrasound as an adjunct in patients with elevated AFP values, 3) the use of

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ultrasound as a primary screening marker for HCC, and 4) the development of more specific screening markers for HCC. Participants encouraged prospective cohort studies of persons with chronic liver diseases in which the use of various screening modalities and regimens could be assessed and suggested that cost-effectiveness studies of AFP screening could be useful in decision-making.

Reported by: WT London, Fox Chase Cancer Center, Philadelphia, Pennsylvania. BJ McMahon, Alaska Area Native Health Svc, Indian Health Svc, Anchorage, Alaska. Arctic Investigations Laboratory and Hepatitis Br, Div of Viral and Rickettsial Diseases, Center for Infectious Diseases, CDC.

Editorial Note: HCC causes an estimated 250,000 deaths worldwide each year and in many parts of the world is the leading cause of cancer mortality. In the United States, HCC is relatively uncommon; in 1986, based on data from the National Cancer Institute's Surveillance, Epidemiology, and End Results Program, the incidence for HCC was 2.4 per 100,000 population, compared with 55.8 per 100,000 for lung cancer and 50.5 per 100,000 for cancer of the colon and rectum (*13*). Nonetheless, certain groups in the United States (e.g., male Alaskan Native HBV carriers) have annual HCC rates >60 per 100,000 (*14*).

In the United States, 15%–36% of HCC cases are associated with chronic HBV infection (*15,16*). Because of the high risk for developing HCC after prolonged HBV infection, HBV carriers represent a likely target group for screening programs for early detection. The workshop participants concluded that more studies are needed to identify other high-risk groups in which screening might be useful.

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Use of Mammography — United States, 1990

In 1989, promotion of mammography increased through expanded media coverage, national and local information efforts, and screening programs. To determine whether mammography use increased as a result of the increased promotion, in February 1990, the Mammography Attitudes and Usage Study (MAUS) was conducted for the Jacobs Institute of Women's Health* with technical assistance from the National Cancer Institute (NCI). This report summarizes findings from this survey, which indicate that in February 1990 almost two thirds of women aged ≥40 years had had at least one mammogram—a substantial increase over percentages reported in earlier national surveys (*1*)—but less than one third of women aged ≥ 40 years were following mammography screening guidelines†.

The MAUS used a multistage cluster sample of households with telephones, based on the Waksberg method of random-digit–dialing (*2*). Nine hundred eighty women aged ≥40 years (which included 863 white and 83 black women) were interviewed. The data were weighted to reflect the age-, education-, and race-specific distribution of U.S. women in 1989 and to reflect the respondents' probability of selection. The response rate was 64%; characteristics of the remaining 36% are unknown.

In 1990, use of mammography was higher among white women than among black women and higher among women with a higher income and more education (Table 1, page 627). Use was most prevalent among women 50–59 years of age, then decreased inversely with age (Table 1). Other characteristics of women most likely to have had a mammogram included having a household income of ≥$50,000 (77%), having a college degree or higher education level (74%), and being married (70%).

Twenty-three percent of the women surveyed reported having had their first mammogram within the past 2 years. Thirty-nine percent had had their first mammogram >2 years before this survey.

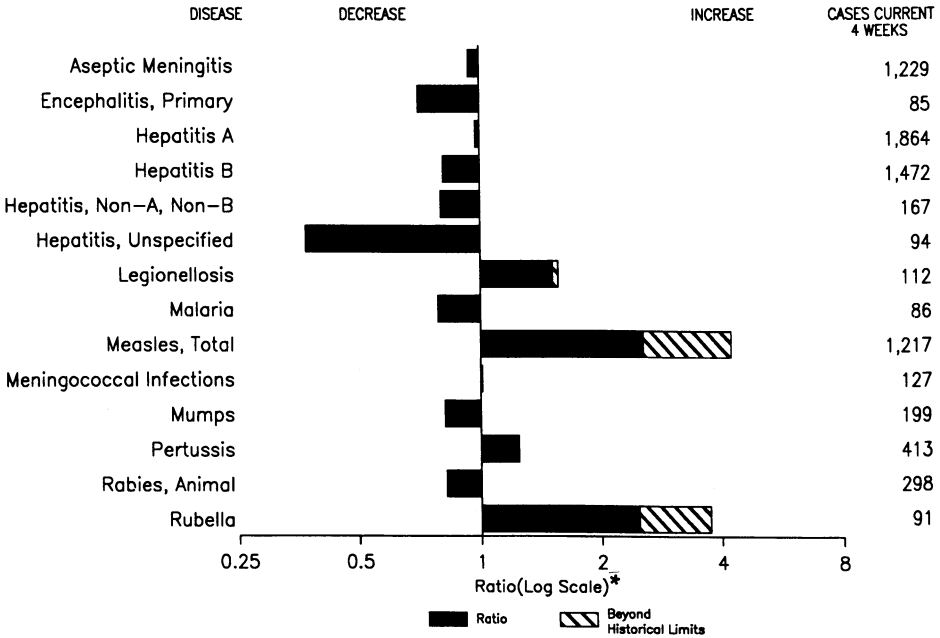
Thirty-five percent of the study population had had more than one mammogram, and 31% were following mammography guidelines established by NCI, the American Cancer Society (ACS), and 11 other medical organizations. The guidelines state

(Continued on page 627)

*An independent, nonprofit organization founded by the American College of Obstetricians and Gynecologists.

†Women were counted as following the guidelines if they were 1) aged 40–49 years and reported that they have a mammogram at least every 2 years, 2) aged ≥50 years and reported that they have a mammogram at least yearly, or 3) aged 40–42 years and had had their first and only mammogram within the past 2 years. In addition, women who had had a mammogram whenever their physician recommended it were assumed to be following the guidelines.

FIGURE I. Notifiable disease reports, comparison of 4-week totals ending September 8, 1990, with historical data — United States



*Ratio of current 4-week total to mean of 15 4-week totals (from comparable, previous, and subsequent 4-week periods for past 5 years).

TABLE I. Summary — cases of specified notifiable diseases, United States, cumulative, week ending September 8, 1990 (36th Week)

	Cum. 1990		Cum. 1990
AIDS	28,308	Plague	1
Anthrax	-	Poliomyelitis, Paralytic*	-
Botulism: Foodborne	9	Psittacosis	81
Infant	41	Rabies, human	1
Other	6	Syphilis: civilian	32,876
Brucellosis	54	military	170
Cholera	3	Syphilis, congenital, age < 1 year	685
Congenital rubella syndrome	3	Tetanus	38
Diphtheria	2	Toxic shock syndrome	225
Encephalitis, post-infectious	70	Trichinosis	21
Gonorrhea: civilian	456,882	Tuberculosis	15,933
military	6,119	Tularemia	86
Leprosy	146	Typhoid fever	293
Leptospirosis	34	Typhus fever, tickborne (RMSF)	433
Measles: imported	991		
indigenous	19,117		

*Three cases of suspected poliomyelitis have been reported in 1990; five of 13 suspected cases in 1989 were confirmed and all were vaccine-associated.

TABLE II. Cases of specified notifiable diseases, United States, weeks ending September 8, 1990, and September 9, 1989 (36th Week)

Reporting Area	AIDS	Aseptic Meningitis	Encephalitis		Gonorrhea (Civilian)		Hepatitis (Viral), by type				Legionellosis	Leprosy
			Primary	Post-infectious			A	B	NA,NB	Unspecified		
	Cum. 1990	Cum. 1990	Cum. 1990	Cum. 1990	Cum. 1990	Cum. 1989	Cum. 1990	Cum. 1990	Cum. 1990	Cum. 1990	Cum. 1990	Cum. 1990
UNITED STATES	28,308	5,413	538	70	456,882	477,502	19,700	13,947	1,511	1,137	829	146
NEW ENGLAND	1,008	210	17	-	12,819	13,708	418	742	50	48	38	10
Maine	40	8	3	-	138	182	7	24	4	1	4	-
N.H.	48	20	-	-	119	116	6	33	4	3	4	-
Vt.	13	20	2	-	40	44	4	37	4	-	5	-
Mass.	563	68	6	-	5,380	5,308	289	465	27	42	18	9
R.I.	56	66	1	-	814	998	43	31	1	2	7	1
Conn.	288	28	5	-	6,328	7,060	69	152	10	-	-	-
MID. ATLANTIC	8,610	523	35	4	60,733	70,498	2,740	1,900	162	81	264	17
Upstate N.Y.	1,067	281	29	1	9,373	10,647	786	509	49	20	101	1
N.Y. City	4,972	105	3	1	25,160	28,656	373	509	23	43	63	12
N.J.	1,728	-	1	-	10,261	10,614	252	428	33	-	42	3
Pa.	843	137	2	2	15,939	20,581	1,329	454	57	18	58	1
E.N. CENTRAL	2,022	1,044	135	12	87,217	86,526	1,540	1,631	128	72	192	2
Ohio	484	230	40	4	25,506	22,525	145	287	51	11	66	-
Ind.	176	147	2	6	7,828	6,254	111	292	9	15	32	-
Ill.	843	180	45	2	27,964	28,172	763	326	32	15	14	1
Mich.	368	443	43	-	20,613	22,251	269	467	25	31	59	1
Wis.	151	44	5	-	5,306	7,324	252	259	11	-	21	-
W.N. CENTRAL	666	265	46	2	23,536	21,402	1,161	639	98	27	42	1
Minn.	120	25	17	1	2,944	2,389	167	82	21	-	1	-
Iowa	25	38	5	-	1,735	1,813	227	47	8	3	4	-
Mo.	396	136	7	1	14,096	13,181	344	393	45	20	26	-
N. Dak.	2	11	-	-	76	104	12	5	2	1	-	-
S. Dak.	2	5	2	-	158	177	167	6	3	-	-	-
Nebr.	32	22	7	-	1,246	922	71	26	4	-	6	1
Kans.	89	28	8	-	3,281	2,816	173	80	15	3	5	-
S. ATLANTIC	5,957	1,113	122	20	130,905	129,269	2,357	2,654	225	173	129	5
Del.	65	29	3	-	2,121	2,132	93	71	6	2	6	-
Md.	642	137	16	1	15,138	14,979	808	374	34	9	52	3
D.C.	512	2	-	-	9,097	8,287	12	28	4	-	-	-
Va.	542	186	36	2	12,275	10,924	195	170	31	126	10	-
W. Va.	51	37	26	-	811	995	15	61	4	4	3	-
N.C.	406	120	27	-	19,854	19,620	523	742	86	-	20	1
S.C.	250	15	1	-	10,439	11,853	31	428	13	8	15	-
Ga.	769	203	4	1	28,740	24,718	279	306	8	7	14	-
Fla.	2,720	384	9	16	32,430	35,761	401	474	39	17	9	1
E.S. CENTRAL	731	453	44	2	39,615	37,603	266	1,074	120	4	47	-
Ky.	135	108	18	-	4,169	3,663	67	369	37	3	19	-
Tenn.	237	76	19	2	11,639	12,617	124	579	67	-	16	-
Ala.	144	188	7	-	13,988	11,899	74	122	14	-	12	-
Miss.	215	81	-	-	9,819	9,424	1	4	2	1	-	-
W.S. CENTRAL	3,102	513	30	7	48,781	49,556	2,045	1,457	62	181	39	30
Ark.	137	8	1	-	6,043	5,806	355	55	6	13	7	-
La.	476	68	6	-	8,639	10,482	135	225	3	7	12	-
Okla.	148	47	3	6	4,279	4,267	393	107	19	17	13	-
Tex.	2,341	390	20	1	29,820	29,001	1,162	1,070	34	144	7	30
MOUNTAIN	769	260	19	2	8,755	9,837	3,199	1,058	151	87	31	-
Mont.	9	4	-	-	124	135	92	50	5	4	3	-
Idaho	19	7	-	-	96	135	74	62	8	-	3	-
Wyo.	2	1	1	-	109	70	48	13	5	1	-	-
Colo.	250	58	4	-	1,698	2,090	208	118	34	31	5	-
N. Mex.	68	11	-	-	880	953	636	143	9	6	2	-
Ariz.	232	132	7	-	3,726	3,953	1,539	374	59	31	10	-
Utah	75	24	3	-	290	318	364	77	21	5	3	-
Nev.	114	23	4	2	1,832	2,183	238	221	10	9	5	-
PACIFIC	5,443	1,032	90	21	44,521	59,103	5,974	2,792	515	464	47	81
Wash.	436	-	6	1	3,681	4,643	996	408	86	25	11	4
Oreg.	219	-	-	-	1,756	2,187	622	292	40	7	-	-
Calif.	4,673	873	78	19	38,009	51,250	4,150	1,999	375	426	35	64
Alaska	22	91	5	-	728	645	143	43	5	1	-	-
Hawaii	93	68	1	1	347	378	63	50	9	5	1	13
Guam	1	2	-	-	159	117	11	2	-	10	-	-
P.R.	998	45	6	-	460	761	113	192	2	19	-	-
V.I.	10	-	-	-	292	491	1	9	-	-	-	-
Amer. Samoa	-	1	-	-	49	34	26	-	-	-	-	10
C.N.M.I.	-	-	-	-	148	72	10	9	-	15	-	4

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

TABLE II. (Cont'd.) Cases of specified notifiable diseases, United States, weeks ending September 8, 1990, and September 9, 1989 (36th Week)

Reporting Area	Malaria	Measles (Rubeola)					Menin-gococcal Infections	Mumps		Pertussis			Rubella		
		Indigenous		Imported*		Total									
	Cum. 1990	1990	Cum. 1990	1990	Cum. 1990	Cum. 1989	Cum. 1990	1990	Cum. 1990	1990	Cum. 1990	Cum. 1989	1990	Cum. 1990	Cum. 1989
UNITED STATES	791	300	19,117	3	991	11,837	1,784	60	3,934	120	2,436	2,397	3	795	295
NEW ENGLAND	65	1	255	-	25	321	134	-	36	4	277	269	-	8	6
Maine	1	-	27	-	2	1	11	-	-	-	10	9	-	1	-
N.H.	4	-	-	-	8	15	10	-	8	-	40	5	-	1	4
Vt.	6	-	-	-	1	3	10	-	1	-	6	6	-	-	1
Mass.	34	1	18	-	7	49	61	-	11	4	204	223	-	2	1
R.I.	5	-	27	-	3	41	12	-	5	-	2	11	-	1	-
Conn.	15	-	183	-	4	212	30	-	11	-	15	15	-	3	-
MID. ATLANTIC	164	4	980	-	150	922	262	4	251	13	409	131	-	11	29
Upstate N.Y.	33	-	200	-	110	140	99	-	105	6	283	45	-	10	12
N.Y. City	55	-	226	-	21	95	38	-	-	-	-	4	-	-	15
N.J.	54	-	188	-	10	426	58	-	62	-	21	26	-	-	2
Pa.	22	4	366	-	9	261	67	4	84	7	105	56	-	1	-
E.N. CENTRAL	47	-	3,208	-	143	3,955	237	1	419	11	486	338	-	31	24
Ohio	7	-	549	-	3	937	74	-	89	-	154	45	-	1	3
Ind.	2	-	319	-	1	78	23	-	16	7	90	19	-	-	-
Ill.	19	-	1,249	-	10	2,402	64	-	146	-	98	109	-	18	19
Mich.	15	-	348	-	125	317	55	1	128	4	64	33	-	9	1
Wis.	4	-	743	-	4	221	21	-	40	-	80	132	-	3	1
W.N. CENTRAL	14	-	805	-	13	647	58	2	124	3	133	171	-	22	6
Minn.	3	-	350	-	3	17	11	-	14	-	31	44	-	17	-
Iowa	2	-	25	-	1	9	1	-	17	-	17	13	-	4	1
Mo.	8	-	96	-	-	368	23	1	52	2	67	103	-	-	4
N. Dak.	-	-	-	-	-	-	1	-	-	-	2	2	-	1	-
S. Dak.	-	-	15	-	8	-	2	-	-	-	1	1	-	-	-
Nebr.	-	-	97	-	1	113	5	1	4	1	6	5	-	-	-
Kans.	1	-	222	-	-	140	15	-	37	-	9	3	-	-	1
S. ATLANTIC	163	2	867	-	315	558	318	39	1,625	26	217	216	-	18	9
Del.	3	-	8	-	3	39	3	-	4	-	5	1	-	-	-
Md.	45	-	193	-	18	80	37	2	922	5	53	37	-	2	2
D.C.	10	-	15	-	7	39	11	-	32	-	14	-	-	1	-
Va.	40	-	73	-	2	22	40	-	90	-	15	25	-	1	-
W. Va.	2	-	6	-	-	51	13	-	40	2	16	22	-	-	-
N.C.	13	-	9	-	15	168	47	35	255	19	58	40	-	-	1
S.C.	-	-	4	-	-	3	21	2	47	-	5	-	-	-	-
Ga.	15	-	81	-	201	2	56	-	82	-	24	28	-	-	-
Fla.	35	2	478	-	69	154	90	-	153	-	27	63	-	14	6
E.S. CENTRAL	18	12	161	1	3	221	109	2	86	7	120	164	1	5	2
Ky.	2	1	34	1§	1	38	33	-	-	-	-	1	1	1	-
Tenn.	9	11	81	-	-	137	45	1	48	3	52	98	-	4	2
Ala.	7	-	20	-	2	46	29	1	14	3	61	56	-	-	-
Miss.	-	-	26	-	-	-	2	-	24	1	7	9	-	-	-
W.S. CENTRAL	45	-	4,003	-	88	3,127	123	4	603	8	98	240	-	66	36
Ark.	2	-	12	-	28	8	16	-	133	-	8	20	-	3	-
La.	3	-	10	-	-	11	29	-	102	3	22	14	-	-	5
Okla.	9	-	174	-	-	106	15	-	105	5	37	43	-	1	1
Tex.	31	-	3,807	-	60	3,002	63	4	263	-	31	163	-	62	30
MOUNTAIN	19	6	807	-	99	386	56	2	308	18	221	519	1	108	35
Mont.	1	-	-	-	1	13	10	-	1	-	26	31	-	13	1
Idaho	3	-	16	-	10	2	5	1	143	-	36	65	-	49	32
Wyo.	-	-	-	-	15	-	-	-	2	-	-	-	-	-	1
Colo.	2	-	90	-	46	82	17	-	23	-	63	45	-	4	-
N. Mex.	3	-	81	-	12	31	7	N	N	1	17	23	-	-	-
Ariz.	9	2	280	-	12	141	5	-	115	1	49	341	-	32	-
Utah	-	-	126	-	-	114	6	1	9	16	26	13	1	2	-
Nev.	1	4	214	-	3	3	6	-	15	-	4	1	-	8	1
PACIFIC	256	275	8,031	2	155	1,700	487	6	482	30	475	349	1	526	148
Wash.	18	-	202	-	69	54	60	-	42	11	122	141	-	-	-
Oreg.	12	-	168	-	44	28	53	N	N	5	57	9	-	10	4
Calif.	221	275	7,575	2	36	1,590	361	6	418	14	254	183	1	503	123
Alaska	2	-	78	-	2	1	8	-	4	-	4	1	-	-	-
Hawaii	3	-	8	-	4	30	5	-	18	-	38	15	-	13	21
Guam	3	U	-	U	1	4	-	U	3	U	-	1	U	-	-
P.R.	2	U	1,634	U	-	513	9	U	7	U	6	4	U	-	8
V.I.	-	U	21	U	3	4	-	U	8	U	-	-	U	-	-
Amer. Samoa	35	U	190	U	-	-	-	U	19	U	-	-	U	-	-
C.N.M.I.	-	U	-	U	-	-	-	U	8	U	4	-	U	-	-

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

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

TABLE II. (Cont'd.) Cases of specified notifiable diseases, United States, weeks ending September 8, 1990, and September 9, 1989 (36th Week)

Reporting Area	Syphilis (Civilian) (Primary & Secondary)		Toxic-shock Syndrome	Tuberculosis		Tula-remia	Typhoid Fever	Typhus Fever (Tick-borne) (RMSF)	Rabies, Animal
	Cum. 1990	Cum. 1989	Cum. 1990	Cum. 1990	Cum. 1989	Cum. 1990	Cum. 1990	Cum. 1990	Cum. 1990
UNITED STATES	32,876	29,487	225	15,933	14,428	86	293	433	2,937
NEW ENGLAND	1,205	1,168	17	380	397	3	23	14	5
Maine	7	8	6	-	12	-	-	-	-
N.H.	40	10	1	3	19	-	-	-	2
Vt.	1	-	-	7	7	-	-	-	-
Mass.	474	360	8	211	202	3	21	13	-
R.I.	14	21	1	49	47	-	-	-	-
Conn.	669	769	1	110	110	-	2	1	3
MID. ATLANTIC	6,575	6,053	22	3,862	2,773	1	67	19	672
Upstate N.Y.	598	616	8	286	233	-	13	10	91
N.Y. City	2,997	2,658	5	2,446	1,519	-	37	-	-
N.J.	1,111	970	-	620	558	1	14	6	216
Pa.	1,869	1,809	9	510	463	-	3	3	365
E.N. CENTRAL	2,382	1,237	51	1,529	1,481	2	22	40	128
Ohio	385	102	19	260	259	1	5	31	5
Ind.	60	46	1	134	136	1	1	1	9
Ill.	974	544	7	776	679	-	11	1	23
Mich.	736	439	24	296	321	-	4	7	40
Wis.	227	106	-	63	86	-	1	-	51
W.N. CENTRAL	345	230	25	410	362	31	4	44	477
Minn.	70	35	2	69	71	-	-	-	172
Iowa	45	27	6	43	28	-	1	1	17
Mo.	177	119	8	214	170	23	3	28	19
N. Dak.	1	3	-	15	12	-	-	-	68
S. Dak.	1	1	-	9	18	3	-	2	160
Nebr.	9	17	3	14	18	3	-	1	4
Kans.	42	28	6	46	45	2	-	12	37
S. ATLANTIC	10,816	10,683	20	2,931	3,076	3	34	180	811
Del.	129	121	1	26	30	-	-	1	20
Md.	805	537	1	226	251	-	10	14	298
D.C.	734	608	1	104	138	-	-	-	-
Va.	600	373	2	257	248	1	2	16	139
W. Va.	57	13	-	52	54	-	1	-	30
N.C.	1,208	725	10	364	383	1	2	103	7
S.C.	706	588	2	323	347	1	1	35	100
Ga.	2,786	2,688	1	489	465	-	1	9	154
Fla.	3,791	5,030	2	1,090	1,160	-	17	2	63
E.S. CENTRAL	2,985	1,914	11	1,122	1,135	7	2	61	126
Ky.	62	41	2	275	283	1	1	9	36
Tenn.	1,209	821	7	277	315	6	-	44	27
Ala.	918	596	2	355	331	-	1	8	63
Miss.	796	456	-	215	206	-	-	-	-
W.S. CENTRAL	5,059	4,003	11	1,875	1,698	25	8	57	346
Ark.	362	258	-	249	177	17	-	13	38
La.	1,171	954	1	170	233	-	-	2	18
Okla.	169	67	7	138	148	8	2	38	99
Tex.	3,357	2,724	3	1,318	1,140	-	6	4	191
MOUNTAIN	618	435	24	368	317	11	18	10	147
Mont.	-	1	-	22	11	-	-	4	35
Idaho	6	1	2	11	20	-	-	-	2
Wyo.	-	5	2	3	-	3	-	-	43
Colo.	27	55	7	21	28	3	-	1	10
N. Mex.	32	21	3	81	61	3	-	1	7
Ariz.	454	186	7	159	138	-	16	1	27
Utah	8	13	3	22	26	2	-	3	9
Nev.	91	153	-	49	33	-	2	-	14
PACIFIC	2,891	3,764	44	3,456	3,189	3	115	8	225
Wash.	229	314	4	193	158	1	19	-	-
Oreg.	101	175	2	88	98	-	4	1	1
Calif.	2,542	3,263	37	3,015	2,765	-	88	2	202
Alaska	11	3	-	29	46	2	-	-	22
Hawaii	8	9	1	131	122	-	4	5	-
Guam	2	4	-	30	54	-	-	-	-
P.R.	204	385	-	66	210	-	-	-	33
V.I.	8	8	-	4	4	-	-	-	-
Amer. Samoa	-	-	-	11	6	-	1	-	-
C.N.M.I.	3	8	-	40	18	-	4	-	-

U: Unavailable

TABLE III. Deaths in 121 U.S. cities,* week ending September 8, 1990 (36th Week)

Reporting Area	All Causes, By Age (Years)						P&I**
	All Ages	≥65	45-64	25-44	1-24	<1	Total
NEW ENGLAND	533	362	98	43	11	19	31
Boston, Mass.	155	89	33	19	2	12	5
Bridgeport, Conn.	24	18	2	3	1	-	-
Cambridge, Mass.	19	15	4	-	-	-	2
Fall River, Mass.	24	18	3	3	-	-	-
Hartford, Conn.§	49	30	10	6	3	-	6
Lowell, Mass.	21	16	3	2	-	-	1
Lynn, Mass.	17	14	3	-	-	-	1
New Bedford, Mass.	29	25	3	-	-	1	-
New Haven, Conn.	37	24	5	2	1	5	2
Providence, R.I.	32	20	8	2	2	-	-
Somerville, Mass.	9	9	-	-	-	-	1
Springfield, Mass.	30	22	7	1	-	-	1
Waterbury, Conn.	31	25	5	1	-	-	5
Worcester, Mass.	56	37	12	4	2	1	7
MID. ATLANTIC	2,308	1,446	473	260	57	71	128
Albany, N.Y.	47	31	13	1	-	2	2
Allentown, Pa.	19	15	3	1	-	-	-
Buffalo, N.Y.	98	67	20	7	2	2	• 3
Camden, N.J.	49	28	14	2	1	4	-
Elizabeth, N.J.	19	16	3	-	-	-	1
Erie, Pa.†	39	30	8	1	-	-	2
Jersey City, N.J.	32	21	6	5	-	-	1
N.Y. City, N.Y.	1,225	739	250	169	34	33	51
Newark, N.J.	69	28	13	21	5	2	12
Paterson, N.J.	12	5	3	2	-	2	-
Philadelphia, Pa.	298	176	72	27	8	15	16
Pittsburgh, Pa.†	61	42	9	7	-	2	8
Reading, Pa.	27	24	3	-	-	-	5
Rochester, N.Y.	120	84	21	6	3	6	12
Schenectady, N.Y.	30	20	7	3	-	-	2
Scranton, Pa.†	26	21	4	1	-	-	2
Syracuse, N.Y.	65	45	11	3	3	3	2
Trenton, N.J.	25	16	6	3	-	-	3
Utica, N.Y.	23	21	2	-	-	-	3
Yonkers, N.Y.	24	17	5	1	1	-	3
E.N. CENTRAL	1,987	1,292	389	174	58	74	90
Akron, Ohio	61	46	10	3	1	1	-
Canton, Ohio	36	27	9	-	-	-	2
Chicago, Ill.§	564	362	125	45	10	22	16
Cincinnati, Ohio	91	57	20	6	3	5	11
Cleveland, Ohio	137	93	24	12	4	4	4
Columbus, Ohio	134	85	28	12	4	5	2
Dayton, Ohio	98	60	25	10	1	2	4
Detroit, Mich.	200	100	46	33	10	11	5
Evansville, Ind.	28	23	2	2	-	1	-
Fort Wayne, Ind.	55	36	16	1	1	1	7
Gary, Ind.	14	4	2	5	2	1	1
Grand Rapids, Mich.	38	24	7	3	3	1	3
Indianapolis, Ind.	132	81	26	11	6	8	-
Madison, Wis.	28	16	3	6	2	1	3
Milwaukee, Wis.	109	81	12	10	4	2	7
Peoria, Ill.	42	31	5	2	1	3	2
Rockford, Ill.	40	29	5	2	3	1	5
South Bend, Ind.	36	26	5	4	1	-	6
Toledo, Ohio	96	76	11	4	2	3	10
Youngstown, Ohio	48	35	8	3	-	2	2
W.N. CENTRAL	693	502	111	33	27	20	30
Des Moines, Iowa	73	54	13	-	5	1	4
Duluth, Minn.	21	19	2	-	-	-	1
Kansas City, Kans.	32	19	8	3	1	1	1
Kansas City, Mo.	151	106	24	12	6	3	10
Lincoln, Nebr.	17	14	2	-	1	-	2
Minneapolis, Minn.	128	86	29	3	2	8	7
Omaha, Nebr.	78	62	6	2	6	2	3
St. Louis, Mo.	103	71	17	9	2	4	-
St. Paul, Minn.	41	33	4	2	1	1	1
Wichita, Kans.	49	38	6	2	3	-	1

Reporting Area	All Causes, By Age (Years)						P&I**
	All Ages	≥65	45-64	25-44	1-24	<1	Total
S. ATLANTIC	1,136	626	254	146	58	51	45
Atlanta, Ga.	135	73	44	13	3	2	4
Baltimore, Md.	126	77	28	13	3	5	8
Charlotte, N.C.	46	31	6	4	1	4	2
Jacksonville, Fla.	102	71	12	12	3	4	5
Miami, Fla.	103	55	24	17	3	4	2
Norfolk, Va.	40	27	5	4	2	2	2
Richmond, Va.	72	44	17	5	4	2	7
Savannah, Ga.	44	24	9	5	5	1	-
St. Petersburg, Fla.	55	40	11	2	1	1	6
Tampa, Fla.	45	27	7	7	3	1	1
Washington, D.C.	362	152	91	63	30	25	8
Wilmington, Del.	6	5	-	1	-	-	-
E.S. CENTRAL	770	501	151	63	32	23	51
Birmingham, Ala.	80	47	20	4	6	3	2
Chattanooga, Tenn.	64	46	10	4	3	1	5
Knoxville, Tenn.	91	69	16	3	-	3	5
Louisville, Ky.	124	82	23	11	2	6	7
Memphis, Tenn.	188	115	43	18	10	2	20
Mobile, Ala.§	89	58	15	9	5	2	3
Montgomery, Ala.§	41	31	6	2	1	1	2
Nashville, Tenn.	93	53	18	12	5	5	7
W.S. CENTRAL	1,587	951	354	186	50	46	57
Austin, Tex.	52	34	10	8	-	-	8
Baton Rouge, La.	19	11	4	3	-	1	1
Corpus Christi, Tex.	28	25	1	1	1	-	2
Dallas, Tex.	161	85	46	21	4	5	4
El Paso, Tex.	46	27	8	5	4	2	6
Fort Worth, Tex	79	51	19	6	2	1	-
Houston, Tex.§	734	436	169	89	24	16	18
Little Rock, Ark.	40	20	10	7	1	2	3
New Orleans, La.	117	68	26	12	3	8	-
San Antonio, Tex.	175	104	33	26	7	5	6
Shreveport, La.	66	43	13	3	3	4	6
Tulsa, Okla.	70	47	15	5	1	2	3
MOUNTAIN	594	373	122	52	28	19	17
Albuquerque, N. Mex.	59	37	6	7	8	1	1
Colo. Springs, Colo.	38	25	7	2	1	3	3
Denver, Colo.	102	70	21	7	3	1	3
Las Vegas, Nev.	95	47	32	8	7	1	2
Ogden, Utah	20	17	3	-	-	-	-
Phoenix, Ariz.	107	60	28	11	3	5	-
Pueblo, Colo.	28	22	5	1	-	-	2
Salt Lake City, Utah	46	28	9	5	-	4	2
Tucson, Ariz.	99	67	11	11	6	4	4
PACIFIC	1,549	986	294	167	52	45	94
Berkeley, Calif.	11	7	2	2	-	-	1
Fresno, Calif.	104	61	24	13	3	3	8
Glendale, Calif.	16	12	2	2	-	-	1
Honolulu, Hawaii	61	45	12	3	-	1	13
Long Beach, Calif.	78	47	14	11	3	3	9
Los Angeles Calif.	319	184	61	46	16	10	9
Oakland, Calif.	49	29	8	7	4	1	2
Pasadena, Calif.	21	12	5	2	2	-	-
Portland, Oreg.	73	55	10	6	1	1	3
Sacramento, Calif.	122	78	23	12	5	4	6
San Diego, Calif.	173	116	28	11	10	7	18
San Francisco, Calif.	149	82	29	30	3	4	2
San Jose, Calif.	143	89	31	13	4	5	14
Seattle, Wash.	144	104	32	4	-	4	5
Spokane, Wash.	51	36	8	4	1	2	2
Tacoma, Wash.	35	29	5	1	-	-	1
TOTAL	11,157††	7,039	2,246	1,124	373	368	543

*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 available 4 weeks.

Mammography – Continued

that women aged 40–49 years should have a mammogram every 1–2 years, then once every year thereafter. Compliance with the guidelines decreased with increasing age (Figure 1).

Nearly three fourths of women ≥40 years of age who had had a mammogram reported they did so because their doctor recommended it, a finding that was consistent across age, race, income, and education categories. Forty-five percent of women who had never had a mammogram reported that their physician did not tell them to have a mammogram. This same group was also more likely to be uncomfortable in asking their physician for a mammogram if the physician did not mention it first.

Approximately 50% of the women reported they would not pay $150 per year for a mammogram; nearly 40% reported they thought "mammograms cost too much."

Many women who had never had a mammogram did not believe they were at risk for breast cancer. For about 40%, the reason for not having a mammogram was "No one in my family has had breast cancer"; for 26%, the reason was "I am not at risk for breast cancer." The latter group was most likely to believe that a mammogram is important only for women who feel a lump or have other symptoms of breast cancer.

TABLE 1. Percentage of women aged ≥40 years who reported ever having had a mammogram, by race, age, income, and education – United States

	MAUS* (n=980)		NKAB† (n=836)		NHIS§ (n=6858)	
Category	**%**	**95% CI¶**	**%**	**95% CI**	**%**	**95% CI**
Race						
White	65	62–68	69	65–73	39	38–40
Black	58	47–69	59	52–66	30	28–32
Age (yrs)						
40–49	64	59–69	68	62–74	41	39–43
50–59	71	55–77	70	64–76	44	42–46
60–69	65	59–71	71	65–77	38	36–40
≥70	56	49–63	59	51–67	28	27–29
Annual income						
<$25,000	60	55–65	64	59–69	32	31–33
≥$25,000	71	67–75	74	69–79	47	45–49
Education						
Less than high school	58	50–66	58	50–66	25	24–26
High school	65	60–70	67	62–72	41	40–42
Some college	72	66–78	72	66–78	49	47–51
College degree or more	74	68–80	79	72–86	49	47–51
Total	**64**	**61–67**	**67**	**64–71**	**37**	**36–38**

*Mammography Attitudes and Usage Study, February 1990; weighted to reflect the age-, education-, and race-specific distribution of U.S. women in 1989.

†National Knowledge, Attitudes, and Behavior Survey, April 1989–February 1990; weighted to reflect the age-, education-, and race-specific distribution of U.S. women in 1988.

§National Health Interview Survey, 1987.

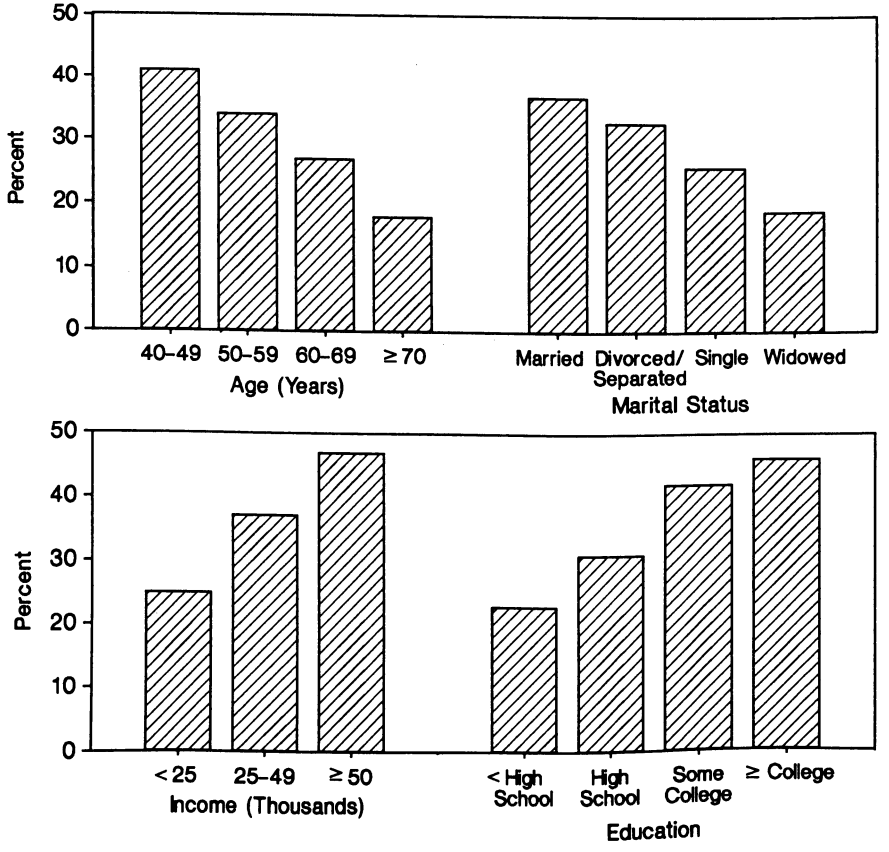
¶Confidence interval.

Mammography — Continued

Of the women who had had only one mammogram and were not following the guidelines, 35% indicated that the following statement applied to them: "My first mammogram showed no problems, so I don't need to have any more." Twenty-nine percent of these women agreed that "Mammograms cost too much," and 27% believed that because no one in their families had had breast cancer, they did not need to have additional mammograms. Ninety-five percent did not agree with the statement "I had a bad experience with my first one."

Cost of mammograms and fear of radiation were cited as concerns by women who had had a mammogram but were not in compliance with mammography guidelines and women who had never had a mammogram. Most (91%) women agreed that breast cancer found in its earliest stage is highly curable, and most (88%) agreed that a mammogram can find breast cancer even in women with no symptoms. Similarly, most (93%) women correctly disagreed with the statement "After menopause, women do not have to worry about breast cancer." Rates were consistent for all age categories for these statements.

FIGURE 1. Percentage of women ≥40 years of age who follow mammography guidelines,* by age, marital status, income, and education — United States



*From Mammography Attitudes and Usage Study, February 1990.

Mammography — Continued

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Editorial Note: The MAUS findings show that the proportion of women aged ≥40 years who had had at least one mammogram has nearly doubled since the 1987 National Health Interview Survey (NHIS) and indicate that mammography use increased during the period of increased publicity encouraging women to have mammograms. Although the interview methodology was different, the percentage of women interviewed in the MAUS telephone survey who had had a mammogram by 1987 was comparable to the percentage found in the NHIS in-person interviews. MAUS findings by age, race, income, and education were similar to findings of the National Knowledge, Attitudes, and Behavior Survey (NKAB) conducted by NCI from April 1989 to February 1990 (Table 1). NKAB used random-digit–dialed telephone interviews of 836 women aged ≥40 years (which included 584 white and 189 black women); data were weighted for the distribution of U.S. women in 1988 by age, education, and race.

Further evidence of an increase in mammography use includes the Behavioral Risk Factor Surveillance System, which demonstrated an increase in mammography use from January to December 1987 (*3*), as well as surveys conducted by NCI's Breast Cancer Screening Consortium for 1988 and 1989, which indicated that 51%–74% of women ≥50 years of age had had a mammogram (*4*).

Breast cancer death rates could be decreased by an estimated 30% if women received mammograms at recommended intervals (*5,6*). However, if death rates are to be decreased, mammography use rates must continue to increase, and women must return for repeat mammograms at recommended intervals. Special efforts are needed to ensure that older women and women with low levels of income and education receive mammograms. Physicians are key motivators of women to use mammography. Physicians' referral rates are increasing (*7*), and ACS, NCI, and CDC are working with the Jacobs Institute of Women's Health and other medical organizations to facilitate these increases. In addition, efforts to attain higher mammography use should include informing women that the radiation from a mammogram is negligible and should not deter them from receiving regular mammograms. The expense of mammograms is being addressed by local efforts to reduce costs and by legislation in an increasing number of states (*8*). As of July 1990, 29 states required insurance companies to provide some level of coverage for mammography (*9*).

References

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Mammography — Continued

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Notice to Readers

Revised Dosing Regimen for Malaria Prophylaxis with Mefloquine

A U.S. interagency group on malaria prevention has recently reviewed documented experience on the effectiveness and tolerance of mefloquine (Lariam®) for malaria prophylaxis. Based on this review, the group has proposed a change in the dosing regimen for malaria prophylaxis with mefloquine. Consequently, CDC has revised the dosing recommendations for mefloquine use. The new regimen consists of a single dose of mefloquine to be taken *weekly*, starting 1 week before travel. Prophylaxis should be continued *weekly during travel in malarious areas and for 4 weeks after* a person leaves such areas.

This notice updates the information in the following publications:

1. CDC. Recommendations for the prevention of malaria among travelers. MMWR 1990;39(no. RR-3):4.
2. CDC. Health information for international travel, 1990. Atlanta: US Department of Health and Human Services, Public Health Service, 1990:98; DHHS publication no. (CDC)90-8280.

Detailed recommendations for the prevention of malaria may be obtained 24 hours a day by calling the CDC Malaria Hotline at (404) 332-4555.

Information about the availability of mefloquine can be obtained from the manufacturer at (800) 526-6367.

Reported by: Malaria Br, Div of Parasitic Diseases, Center for Infectious Diseases, CDC.

The *Morbidity and Mortality Weekly Report* is prepared by the Centers for Disease Control, Atlanta, Georgia, and is available on a paid subscription basis from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402, (202) 783-3238.

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. Accounts of interesting cases, outbreaks, environmental hazards, or other public health problems of current interest to health officials, as well as matters pertaining to editorial or other textual considerations should be addressed to: Editor, *Morbidity and Mortality Weekly Report*, Mailstop C-08, Centers for Disease Control, Atlanta, Georgia 30333; telephone (404) 332-4555.

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