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MORBIDITY AND MORTALITY WEEKLY REPORT

Epidemiologic Notes and Reports

Human Anthrax — Colorado

The first known case of human anthrax in Colorado since 1955 occurred in September 1980 in a 30-year-old man who had worked with animal carcasses. *Bacillus anthracis* has been isolated from dead cattle in the area.

The man had assisted in skinning animal carcasses at a local rendering plant from August 26-31, during which time he was scratched on the arm by an animal hoof. On September 4, a small lesion resembling an insect bite developed on his right forearm. The lesion progressed in size and developed secondary swelling. When the man was seen by his physician on September 8, the lesion was approximately 2 X 3 cm in diameter, and a black eschar and satellite vesicles were present. Cultures were taken, and intramuscular penicillin was given. On a follow-up visit the next day, he had more swelling of his arm, a temperature of 104 F (40 C), headache, and myalgias. He was admitted to a local hospital and begun on high-dose intravenous penicillin. He has had a slow but progressive recovery since that time. *B. anthracis* was isolated from the wound culture.

Before this patient's exposure to cattle carcasses, there had been several unexplained deaths among livestock in a neighboring county in Colorado. Fifty-one cattle from 6 ranches in north-central Colorado died in the period August 13-September 13; the most deaths occurred on August 31. The diagnosis of anthrax was established by culture from 2 of the dead animals by the Veterinary Diagnostic Laboratory of Colorado State University on September 3. A quarantine and vaccination program for livestock in the area was initiated by the Colorado Department of Agriculture; the number of cases subsequently decreased.

Before recognition of the outbreak, 7 of the 51 cattle carcasses were processed through the plant in which the patient occasionally worked. In addition, a total of 14 hides from affected cattle herds were transported to a tanning facility in Torrington, Wyoming; these hides, and other hides in contact with them, were buried. A small portion of fresh-frozen ground beef from the same animals was shipped to Rapid City, South Dakota, for consumption by racing dogs. An attempt to recall the beef was made, but it had already been fed to the dogs. However, no illness was subsequently recognized in these animals. The remaining products from the 14 carcasses were identified and sent through the rendering process, which involves cooking at approximately 260 F (126.6 C) for 30-45 minutes.

Surveillance of other workers at the rendering facilities, tanning facility, and affected ranches has yielded no other cases in humans.

Reported by JP Cullen, MD, Weld County Health Dept; JG Donnelly, MD, BE Miller, MPH, Boulder City-County Health Dept; JF Hudelson, DVM, Colorado Dept of Agriculture; L Lauerman, DVM, PhD, W Adney, BS, Colorado State University; JK Emerson, DVM, MPH, RS Hopkins, MD, State

Human Anthrax – Continued

Epidemiologist, Colorado Dept of Health; Field Services Div, Bacterial Zoonoses Br, Bur of Epidemiology, CDC.

Editorial Note: This is the first human case of anthrax in the United States since 1978, when there were 6 cases. The High Plains of the western United States have experienced periodic epizootics of anthrax in cattle over the past 25 years. However, human disease associated with these outbreaks has been unusual. Rainy spring seasons and hot, dry summers appear to precede cattle disease in this area. The mechanism by which these meteorological factors contribute to the occurrence of anthrax outbreaks in grazing range cattle is unknown.

Follow-Up on Toxic-Shock Syndrome

In the September 19 issue of the MMWR, data demonstrating increased risk of toxic-shock syndrome in users of Rely tampons were presented (*1*). On September 22, the manufacturer of this product, Procter and Gamble Company, voluntarily withdrew Rely from the market.

Reported by Bacterial Diseases Div, Bur of Epidemiology, CDC.

Reference

1. MMWR 1980;29:441-5.

Current Trends

Measles Vaccine Efficacy – United States

From July 1978 through October 1979, 24 of 63 Immunization Project Areas* voluntarily supplied CDC with detailed information on their reported measles cases. This included such data as vaccination status (where known), complications of the disease, and means of diagnosis. During this 16-month period, the following 9 project areas submitted such information on more than 80% of the cases that they had reported to the MMWR: Colorado, Kentucky, Louisiana, New Jersey, New Mexico, Massachusetts, North Dakota, Ohio, and Utah. Five other project areas maintained this level of reporting for shorter periods ranging from 3 to 10 months: Arizona, Iowa, Missouri, Virginia, and Washington. During this interval, 18,755 cases of measles were reported from all sources to the MMWR; the more detailed information was obtained on 2,480 (13.2%) cases from the project areas. Of these 2,480 cases, 1,901 (77.0%) originated from the above-named states. The remainder of this report will focus exclusively on these 1,901 cases.

A history of vaccination status was available for 1,669 (88.0%) cases, and 869 of these (52.0%) gave a history of measles vaccination. Documented proof from personal, school, or clinic records of adequate† vaccination was obtained from 434 (26.0%) of the 1,669 patients. An undocumented history of adequate vaccination was elicited from an

*State or local health jurisdictions which have been awarded federal funding for immunization programs.

†Histories of vaccination were considered adequate if the vaccination occurred after 12 months of age and was with live, further-attenuated vaccine alone, with Edmonston B vaccine with gamma globulin, or with any measles vaccine after 1968.

Measles — Continued

additional 163 (10.0%) cases. Another 197 (12.0%) were judged to be inadequately vaccinated and 75 (4.0%) were not classifiable. Of the 1,669 cases, 800 (48.0%) indicated no prior receipt of measles vaccine.

Reported by Surveillance and Assessment Br, Immunization Div, Bur of State Services, and Field Services Div, Bur of Epidemiology, CDC.

Editorial Note: Because a substantial percentage of measles cases have adequate vaccination histories, concern has been raised about vaccine efficacy—both initial and long-term. Vaccine efficacy cannot be evaluated by simply determining the percentage of reported cases with vaccine histories; underlying vaccination levels must be considered. Vaccine efficacy is calculated in the following manner:

$$\text{Vaccine Efficacy (VE)} = \frac{(\text{Attack Rate in Unvaccinated} - \text{Attack Rate in Vaccinated})}{\text{Attack Rate in Unvaccinated}} \times 100\%$$

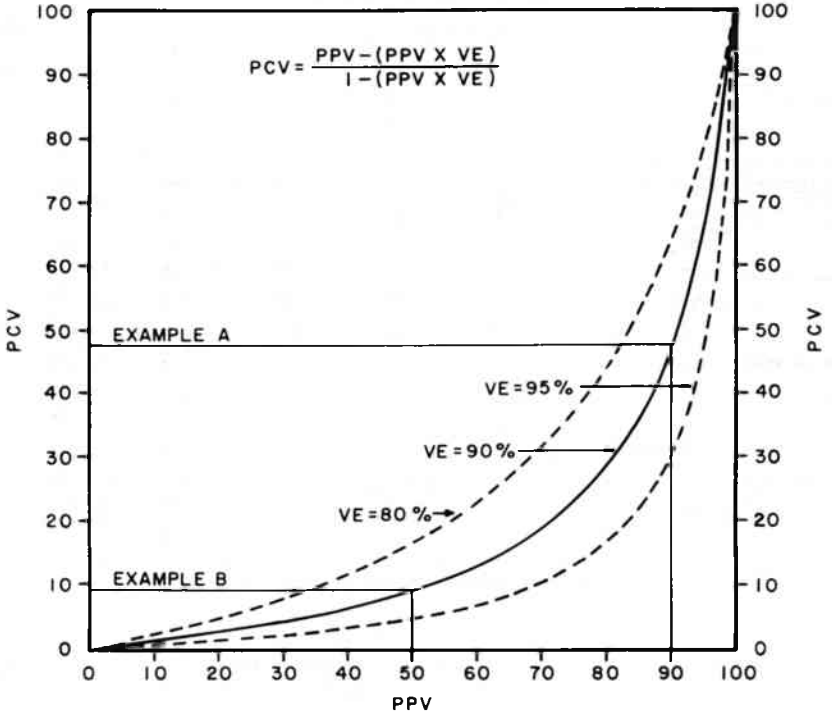
This equation can be rewritten to express the percentage of cases vaccinated (PCV) in terms of the percentage of the population vaccinated (PPV) and vaccine efficacy (VE); thus,

$$\text{PCV} = \frac{\text{PPV} - (\text{PPV} \times \text{VE})}{1 - (\text{PPV} \times \text{VE})}$$

By knowing 2 of these variables, the third can be calculated.

Figure 1 shows 3 of a family of curves which can be generated from the above equation, each for a different assumed vaccine efficacy. These curves predict the theoretical

FIGURE 1. Percentage of cases vaccinated (PCV) per percentage of population vaccinated (PPV), for 3 values of vaccine efficacy (VE)



Measles — Continued

proportion of cases that will have a vaccine history in the event of an outbreak. These curves do not predict the occurrence of an outbreak in any given set of circumstances, but rather the expected proportional distribution of cases should an outbreak occur. For example, if a measles epidemic is observed in a population with homogeneous measles exposure where 90% of the individuals are vaccinated (PPV = 90%) with a 90%-effective vaccine (VE = 90%), the expected percentage of vaccinated cases would be 47% (PCV = 47%; Example A, Figure 1). If only 50% were vaccinated, then 9% of the cases would be expected to have a history of vaccination (Example B). For a given vaccine efficacy, the percentage of cases vaccinated should increase as the percentage of the population that is vaccinated increases.

Most recent clinical trials have shown a measles vaccine efficacy of 90% or better (*1,2*). In the above article, the 12% of cases with histories of vaccination which, under inspection, proved to be inadequate underlines the need to evaluate vaccination histories thoroughly.

References

1. Marks JS, Halpin TJ, Orenstein WA. Measles vaccine efficacy in children previously vaccinated at 12 months of age. Pediatrics 1978;62:955-60.
2. McCormick JB, Halsey N, Rosenberg R. Measles vaccine efficacy determined from secondary attack rates during a severe epidemic. J Pediatr 1977;90:13-6.

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

[Cumulative totals include revised and delayed reports through previous weeks.]

DISEASE	39th WEEK ENDING		MEDIAN 1975-1979	CUMULATIVE, FIRST 39 WEEKS		
	September 27, 1980	September 29, 1979*		September 27, 1980	September 29, 1979*	MEDIAN 1975-1979
Aseptic meningitis	274	380	192	4,864	5,652	3,385
Brucellosis	4	6	5	140	130	180
Chickenpox	376	369	369	157,219	172,301	151,191
Diphtheria	–	–	–	3	57	72
Encephalitis: Primary (arthropod-borne & unspec.)	49	36	48	716	773	896
Post-infectious	1	2	3	164	183	183
Hepatitis, Viral: Type B	380	313	313	13,089	10,857	11,250
Type A	631	682	682	20,769	22,182	23,085
Type unspecified	259	259	176	8,843	7,635	6,230
Malaria	49	12	12	1,463	536	416
Measles (rubeola)	23	86	98	12,881	12,207	24,117
Meningococcal infections: Total	37	34	26	1,997	2,044	1,359
Civilian	37	34	26	1,987	2,026	1,350
Military	–	–	–	10	18	18
Mumps	45	82	169	7,250	11,349	16,388
Pertussis	47	24	25	1,245	1,047	1,152
Rubella (German measles)	27	49	60	3,347	10,783	14,962
Tetanus	1	–	1	55	50	55
Tuberculosis	563	585	613	20,510	20,738	22,581
Tularemia	3	2	2	159	156	106
Typhoid fever	14	18	11	350	374	316
Typhus fever, tick-borne (Rky. Mt. spotted)	44	21	23	1,012	924	924
Venereal diseases:						
Gonorrhea: Civilian	21,269	22,304	21,819	742,935	745,038	745,038
Military	400	504	508	20,395	20,661	20,661
Syphilis, primary & secondary: Civilian	603	653	524	19,994	18,343	18,144
Military	10	3	6	261	234	234
Rabies in animals	95	117	66	4,905	3,843	2,339

TABLE II. Notifiable diseases of low frequency, United States

	CUM. 1980		CUM. 1980
Anthrax	1	Poliomyelitis: Total	6
Botulism	47	Paralytic	4
Cholera	8	Psittacosis (Ups. NY 1)	84
Congenital rubella syndrome	46	Rabies in man	–
Leprosy (La. 2, Tex. 1, Wash. 1, Calif. 3, Hawaii 3)	152	Trichinosis (Mass. 1, N.J. 1)	91
Leptospirosis (Mass. 1, Tex. 1)	56	Typhus fever, flea-borne (endemic, murine) (Va. 1, Tex. 5)	54
Plague	15		

*Delayed reports received for calendar year 1979 are used to update last year's weekly and cumulative totals.

TABLE III. Cases of specified notifiable diseases, United States, weeks ending September 27, 1980, and September 29, 1979 (39th week)

REPORTING AREA	ASEPTIC MENINGITIS	BRUCELLOSIS	CHICKEN-POX	DIPHTHERIA		ENCEPHALITIS			HEPATITIS (VIRAL), BY TYPE			MALARIA	
						Primary		Post-infectious	B	A	Unspecified		
	1980	1980	1980	1980	CUM. 1980	1980	1979*	1980	1980	1980	1980	1980	CUM. 1980
UNITED STATES	274	4	376	–	3	49	36	1	380	631	259	49	1,463
NEW ENGLAND	16	1	30	–	–	1	1	–	11	10	7	–	86
Maine	3	–	4	–	–	–	–	–	–	–	1	–	14
N.H.	–	–	6	–	–	1	–	–	–	2	1	–	7
Vt.	1	–	–	–	–	–	–	–	–	1	–	–	1
Mass.	12	1	9	–	–	–	–	–	6	4	5	–	42
R.I.	–	–	3	–	–	–	–	–	2	2	–	–	9
Conn.	–	–	8	–	–	–	1	–	3	1	–	–	13
MID. ATLANTIC	69	1	27	–	1	2	9	–	70	60	18	5	190
Upstate N.Y.	12	1	12	–	–	–	4	–	15	7	1	–	29
N.Y. City	11	–	15	–	1	–	–	–	22	11	4	3	51
N.J.	20	–	NN	–	–	1	3	–	19	22	10	2	51
Pa.	26	–	–	–	–	1	2	–	14	20	3	–	59
E.N. CENTRAL	22	–	129	–	1	14	5	–	41	93	27	6	82
Ohio	–	–	3	–	–	7	–	–	3	12	11	2	14
Ind.	–	–	22	–	–	1	2	–	11	16	7	–	9
Ill.	–	–	13	–	–	–	–	–	9	35	3	2	30
Mich.	14	–	25	–	1	3	3	–	13	25	6	2	21
Wis.	8	–	66	–	–	3	–	–	5	5	–	–	8
W.N. CENTRAL	9	1	41	–	1	6	–	–	12	23	8	1	61
Minn.	–	1	2	–	–	–	–	–	3	6	–	–	19
Iowa	4	–	18	–	–	3	–	–	3	4	4	–	7
Mo.	2	–	–	–	1	1	–	–	3	6	2	1	13
N. Dak.	–	–	1	–	–	–	–	–	–	3	–	–	–
S. Dak.	–	–	3	–	–	–	–	–	–	–	–	–	3
Nebr.	2	–	–	–	–	2	–	–	1	2	2	–	7
Kans.	1	–	17	–	–	–	–	–	2	2	–	–	12
S. ATLANTIC	48	–	56	–	–	8	6	–	81	87	35	5	153
Del.	1	–	–	–	–	–	–	–	2	–	–	–	–
Md.	6	–	3	–	–	1	–	–	8	4	10	–	24
D.C.	1	–	–	–	–	–	–	–	2	–	–	–	2
Va.	6	–	–	–	–	4	–	–	9	10	4	2	56
W. Va.	4	–	24	–	–	–	3	–	–	1	–	–	4
N.C.	9	–	NN	–	–	3	1	–	11	7	6	1	12
S.C.	4	–	–	–	–	–	–	–	9	6	2	–	9
Ga.	2	–	–	–	–	–	1	–	24	14	–	1	15
Fla.	15	–	29	–	–	–	1	–	16	45	13	1	31
E.S. CENTRAL	52	–	13	–	–	3	4	1	16	28	6	–	10
Ky.	25	–	12	–	–	–	–	–	–	–	–	–	2
Tenn.	4	–	NN	–	–	1	–	–	8	13	4	–	–
Ala.	23	–	–	–	–	1	1	1	4	2	2	–	6
Miss.	–	–	1	–	–	1	3	–	4	13	–	–	2
W.S. CENTRAL	24	1	18	–	–	10	2	–	39	101	48	6	138
Ark.	–	–	2	–	–	–	–	–	–	6	4	–	8
La.	4	–	NN	–	–	–	–	–	13	26	6	–	42
Okla.	1	–	–	–	–	–	–	–	5	10	3	–	12
Tex.	19	1	16	–	–	10	2	–	21	59	35	6	76
MOUNTAIN	6	–	15	–	–	–	3	–	16	46	38	1	78
Mont.	–	–	4	–	–	–	–	–	–	1	–	–	1
Idaho	–	–	1	–	–	–	–	–	1	1	–	–	1
Wyo.	–	–	–	–	–	–	–	–	–	1	–	–	2
Colo.	4	–	10	–	–	–	–	–	5	16	5	1	32
N. Mex.	–	–	–	–	–	–	–	–	–	5	–	–	3
Ariz.	–	–	NN	–	–	–	–	–	7	17	27	–	16
Utah	1	–	–	–	–	–	3	–	1	2	1	–	15
Nev.	1	–	–	–	–	–	–	–	2	3	5	–	8
PACIFIC	28	–	47	–	–	5	6	–	94	183	72	25	665
Wash.	5	–	18	–	–	1	1	–	4	13	6	1	48
Oreg.	3	–	1	–	–	1	–	–	6	22	–	–	36
Calif.	19	–	–	–	–	3	4	–	80	145	66	24	560
Alaska	1	–	24	–	–	–	1	–	1	–	–	–	6
Hawaii	–	–	4	–	–	–	–	–	3	3	–	–	15
Guam	NA	NA	NA	NA	–	NA	–	–	NA	NA	NA	NA	3
P.R.	2	–	9	–	–	–	–	–	2	10	7	–	3
V.I.	NA	NA	NA	NA	–	NA	–	–	NA	NA	NA	NA	–
Pac. Trust Terr.	NA	NA	NA	NA	–	NA	–	–	NA	NA	NA	NA	–

NN: Not notifiable. NA: Not available.
*Delayed reports received for 1979 are not shown below but are used to update last year's weekly and cumulative totals.

TABLE III (Cont.'d). Cases of specified notifiable diseases, United States, weeks ending September 27, 1980, and September 29, 1979 (39th week)

REPORTING AREA	MEASLES (RUBEOLA)			MENINGOCOCCAL INFECTIONS TOTAL			MUMPS		PERTUSSIS	RUBELLA		TETANUS
	1980	CUM. 1980	CUM. 1979*	1980	CUM. 1980	CUM. 1979*	1980	CUM. 1980	1980	1980	CUM. 1980	CUM. 1980
UNITED STATES	23	12,881	12,207	37	1,997	2,044	45	7,250	47	27	3,347	55
NEW ENGLAND	–	670	288	–	105	113	3	564	1	1	217	2
Maine	–	33	17	–	5	6	1	287	–	–	68	1
N.H.	–	327	33	–	8	10	–	21	–	1	36	–
Vt.	–	226	119	–	13	6	–	12	–	–	3	–
Mass.	–	58	13	–	35	43	1	124	–	–	82	–
R.I.	–	2	102	–	7	7	1	24	–	–	9	1
Conn.	–	24	4	–	37	41	–	96	1	–	19	–
MID. ATLANTIC	5	3,781	1,493	10	365	308	3	809	7	1	554	7
Upstate N.Y.	–	693	625	–	113	108	3	117	1	1	210	2
N.Y. City	3	1,186	766	5	96	76	–	92	1	–	97	2
N.J.	–	827	57	3	76	73	–	102	2	–	101	–
Pa.	2	1,075	45	2	80	51	–	498	3	–	146	3
E.N. CENTRAL	3	2,423	3,178	6	229	222	17	2,726	10	11	810	3
Ohio	1	378	266	2	75	92	1	1,124	1	–	8	1
Ind.	–	91	204	–	37	42	3	125	1	7	345	–
Ill.	1	338	1,423	4	47	14	2	359	4	–	161	–
Mich.	–	235	825	–	57	56	5	806	3	–	126	1
Wis.	1	1,381	460	–	13	18	6	312	1	4	170	1
W.N. CENTRAL	–	1,315	1,732	–	78	66	2	279	3	1	193	3
Minn.	–	1,101	1,217	–	20	12	–	15	2	–	27	1
Iowa	–	–	16	–	9	10	–	43	–	1	9	–
Mo.	–	64	409	–	35	33	–	99	–	–	40	1
N. Dak.	–	–	21	–	1	1	–	4	–	–	5	–
S. Dak.	–	–	2	–	5	4	–	2	–	–	2	–
Nebr.	–	83	–	–	–	–	–	9	–	–	1	–
Kans.	–	67	67	–	8	6	2	107	1	–	109	1
S. ATLANTIC	6	1,894	1,890	8	484	495	8	989	13	6	341	10
Del.	–	3	1	–	2	5	–	39	–	–	1	–
Md.	–	82	16	–	46	41	2	331	–	–	71	1
D.C.	–	–	–	1	2	–	–	4	–	–	1	–
Va.	4	305	273	–	48	71	–	64	–	–	51	3
W. Va.	–	15	54	–	17	8	4	97	4	–	24	1
N.C.	–	129	112	1	92	76	–	92	3	–	46	1
S.C.	–	159	168	3	57	59	–	205	1	2	53	3
Ga.	–	811	466	–	83	70	–	3	3	–	–	–
Fla.	2	390	800	3	137	165	2	154	2	4	94	1
E.S. CENTRAL	–	332	205	2	179	150	3	859	2	–	82	4
Ky.	–	55	37	2	55	29	1	752	–	–	38	1
Tenn.	–	171	60	–	47	44	1	26	1	–	39	2
Ala.	–	22	84	–	50	36	–	21	1	–	3	1
Miss.	–	84	24	–	27	41	1	60	–	–	2	–
W.S. CENTRAL	1	918	906	4	206	311	3	259	4	1	120	18
Ark.	–	13	7	–	18	24	1	21	–	–	4	2
La.	–	11	250	–	75	117	1	68	1	–	10	5
Okla.	–	745	22	–	17	30	–	–	–	1	5	1
Tex.	1	149	627	4	96	140	1	170	3	–	101	10
MOUNTAIN	–	484	318	3	73	81	1	195	–	–	143	–
Mont.	–	2	53	–	3	9	–	55	–	–	43	–
Idaho	–	–	18	–	4	8	1	16	–	–	20	–
Wyo.	–	–	36	–	3	1	–	–	–	–	1	–
Colo.	–	24	68	1	19	5	–	53	–	–	12	–
N. Mex.	–	13	38	1	9	4	–	–	–	–	5	–
Ariz.	–	390	76	–	13	35	–	35	–	–	31	–
Utah	–	47	18	–	5	8	–	27	–	–	25	–
Nev.	–	8	11	1	17	11	–	9	–	–	6	–
PACIFIC	8	1,064	2,197	4	278	298	5	570	7	6	887	8
Wash.	–	177	1,126	1	51	50	–	129	1	–	81	–
Oreg.	–	–	61	1	47	25	1	69	–	–	50	–
Calif.	8	875	928	2	172	207	3	343	6	6	739	8
Alaska	–	6	17	–	8	6	–	12	–	–	12	–
Hawaii	–	6	65	–	–	10	1	17	–	–	5	–
Guam	NA	5	12	–	1	1	NA	9	NA	NA	–	–
P.R.	4	141	345	–	9	5	2	136	–	–	18	10
V.I.	NA	6	5	–	1	3	NA	2	NA	NA	–	–
Pac. Trust Terr.	NA	6	8	–	–	1	NA	20	NA	NA	1	–

NA: Not available.
*Delayed reports received for 1979 are not shown below but are used to update last year's weekly and cumulative totals.

TABLE III (Cont.'d). Cases of specified notifiable diseases, United States, weeks ending September 27, 1980, and September 29, 1979 (39th week)

REPORTING AREA	TUBERCULOSIS		TULAREMIA	TYPHOID FEVER		TYPHUS FEVER (Tick-borne) (RMSF)		VENEREAL DISEASES (Civilian)						RABIES (in Animals)
								GONORRHEA			SYPHILIS (Pri. & Sec.)			
	1980	CUM. 1980	CUM. 1980	1980	CUM. 1980	1980	CUM. 1980	1980	CUM. 1980	CUM. 1979*	1980	CUM. 1980	CUM. 1979*	CUM. 1980
UNITED STATES	563	20,510	159	14	350	44	1,012	21,269	742,935	745,038	603	19,994	18,343	4,905
NEW ENGLAND	7	580	6	–	8	1	12	660	18,822	18,444	15	445	359	50
Maine	–	42	–	–	1	–	–	42	1,078	1,279	–	5	10	21
N.H.	–	14	–	–	–	–	–	19	682	685	–	1	16	7
Vt.	–	19	–	–	–	–	–	13	441	438	–	5	1	–
Mass.	4	320	4	–	5	–	5	271	7,859	7,320	10	286	202	13
R.I.	–	56	1	–	1	–	2	44	1,214	1,502	2	26	12	1
Conn.	3	129	1	–	1	1	5	271	7,548	7,220	3	122	118	8
MID. ATLANTIC	72	3,311	3	2	71	5	46	2,241	80,815	80,726	81	2,798	2,749	61
Upstate N.Y.	17	655	1	–	12	1	14	315	14,935	13,744	13	249	204	32
N.Y. City	32	1,197	1	2	31	–	3	1,200	31,417	31,964	51	1,810	1,850	–
N.J.	5	686	1	–	15	1	17	172	14,507	14,008	10	335	365	12
Pa.	18	773	–	–	13	3	12	554	19,956	21,010	7	404	330	17
E.N. CENTRAL	89	2,953	1	2	31	–	27	3,251	115,143	116,742	82	1,874	2,379	736
Ohio	18	531	–	–	7	–	14	1,374	30,685	31,939	–	277	457	44
Ind.	7	308	–	–	–	–	2	223	11,556	10,117	3	146	174	63
Ill.	34	1,047	–	1	13	–	6	564	35,893	36,843	74	1,086	1,337	397
Mich.	25	890	1	1	7	–	3	813	26,202	27,239	2	294	343	14
Wis.	5	177	–	–	4	–	2	277	10,807	10,604	3	71	68	218
W.N. CENTRAL	12	746	27	2	25	–	52	1,222	35,689	36,478	4	254	241	1,581
Minn.	–	140	1	–	3	–	–	144	5,797	6,100	–	86	64	177
Iowa	5	69	1	–	2	–	3	136	3,830	4,345	–	14	28	339
Mo.	6	343	22	1	17	–	33	692	15,996	15,589	3	126	112	316
N. Dak.	1	40	–	–	–	–	–	25	512	604	–	3	2	187
S. Dak.	–	38	–	–	1	–	2	38	1,071	1,237	–	4	2	351
Nebr.	–	29	1	1	1	–	4	138	2,753	2,578	1	7	4	85
Kans.	–	87	2	–	1	–	10	49	5,730	6,025	–	14	29	126
S. ATLANTIC	143	4,537	9	1	38	27	645	6,418	186,444	180,586	188	4,793	4,352	379
Del.	4	64	–	–	1	–	2	57	2,644	2,989	–	10	21	1
Md.	9	555	2	–	2	6	70	558	19,679	22,303	12	343	286	24
D.C.	NA	266	–	–	4	–	–	327	13,134	11,870	9	359	337	–
Va.	35	497	–	1	7	2	89	675	16,955	17,304	13	425	364	13
W. Va.	–	159	–	–	3	–	4	68	2,477	2,449	–	15	43	21
N.C.	32	814	3	–	3	14	285	966	26,941	25,870	11	327	349	20
S.C.	8	411	–	–	3	2	136	480	17,544	16,944	12	277	224	51
Ga.	11	606	4	–	–	3	54	1,300	36,532	34,143	41	1,375	1,205	187
Fla.	44	1,165	–	–	15	–	5	1,987	50,538	46,714	90	1,662	1,523	62
E.S. CENTRAL	57	1,865	10	–	10	8	99	1,533	60,747	63,557	64	1,645	1,200	267
Ky.	9	416	–	–	3	1	16	373	8,990	8,379	3	108	131	117
Tenn.	13	613	7	–	1	1	54	519	21,842	22,809	30	690	515	108
Ala.	23	493	1	–	2	3	16	266	17,959	19,078	17	354	215	42
Miss.	12	343	2	–	4	3	13	375	11,956	13,291	14	493	339	–
W.S. CENTRAL	80	2,313	62	5	55	3	112	2,280	94,533	95,865	139	3,993	3,376	1,158
Ark.	14	254	40	–	5	2	25	92	7,354	7,466	–	138	108	153
La.	5	430	–	1	1	–	2	494	17,206	17,077	63	983	865	12
Okla.	12	239	16	–	4	–	58	307	9,555	9,422	9	80	70	194
Tex.	49	1,390	6	4	45	1	27	1,387	60,418	61,900	67	2,792	2,333	799
MOUNTAIN	25	547	34	–	21	–	15	552	28,627	29,941	11	470	375	209
Mont.	4	24	15	–	1	–	3	NA	1,020	1,474	NA	2	8	48
Idaho	1	23	1	–	1	–	1	61	1,274	1,355	–	24	21	2
Wyo.	–	16	4	–	–	–	2	20	838	866	1	10	8	15
Colo.	2	82	6	–	7	–	4	195	7,769	7,918	1	121	74	52
N. Mex.	1	102	–	–	2	–	4	104	3,444	3,663	4	82	68	39
Ariz.	16	236	1	–	7	–	–	NA	7,682	8,408	NA	154	114	49
Utah	1	38	5	–	3	–	1	37	1,448	1,526	–	13	3	3
Nev.	–	26	2	–	–	–	–	135	5,152	4,731	5	64	79	1
PACIFIC	78	3,658	7	2	91	–	4	3,112	122,115	122,699	19	3,722	3,312	464
Wash.	3	318	–	–	3	–	–	NA	9,633	10,599	NA	203	166	–
Oreg.	6	136	3	–	9	–	1	232	8,431	7,788	3	84	138	4
Calif.	68	3,081	3	2	79	–	3	2,754	98,617	98,196	13	3,303	2,916	416
Alaska	–	49	1	–	–	–	–	88	2,992	3,802	–	7	21	44
Hawaii	1	74	–	–	–	–	–	38	2,442	2,314	3	125	71	–
Guam	NA	30	–	NA	–	NA	–	NA	72	90	NA	4	–	–
P.R.	–	127	–	–	8	–	–	31	2,032	1,630	16	458	421	42
V.I.	NA	–	–	NA	–	NA	–	NA	108	125	NA	10	7	–
Pac. Trust Terr.	NA	33	–	NA	–	NA	–	NA	334	345	NA	–	1	–

NA: Not available.
*Delayed reports received for 1979 are not shown below but are used to update last year's weekly and cumulative totals.

TABLE IV. Deaths in 121 U.S. cities,* week ending September 27, 1980 (39th week)

REPORTING AREA	ALL CAUSES, BY AGE (YEARS)					P&I** TOTAL
	ALL AGES	>65	45-64	25-44	<1	
NEW ENGLAND	683	442	151	40	21	44
Boston, Mass.	173	101	41	13	8	14
Bridgeport, Conn.	46	35	8	2	–	4
Cambridge, Mass.	20	17	3	–	–	3
Fall River, Mass.	35	26	6	1	1	–
Hartford, Conn.	62	38	17	2	2	1
Lowell, Mass.	21	15	5	–	–	1
Lynn, Mass.	24	20	3	1	–	1
New Bedford, Mass.	25	18	7	–	–	2
New Haven, Conn.	50	29	11	5	1	4
Providence, R.I.	62	38	14	5	2	1
Somerville, Mass.	15	10	4	–	–	2
Springfield, Mass.	57	35	12	1	5	4
Waterbury, Conn.	37	23	6	8	–	4
Worcester, Mass.	56	37	14	2	2	3
MID. ATLANTIC	2,408	1,530	593	169	61	97
Albany, N.Y.	42	26	7	3	4	2
Allentown, Pa.	20	16	4	–	–	–
Buffalo, N.Y.	131	80	41	6	3	5
Camden, N.J.	32	18	6	5	2	1
Elizabeth, N.J.	20	15	5	–	–	3
Erie, Pa.†	33	20	9	1	2	–
Jersey City, N.J.	42	21	19	1	1	1
Newark, N.J.	51	27	15	6	1	3
N.Y. City, N.Y.	1,290	838	296	99	30	37
Paterson, N.J.	28	20	3	2	3	–
Philadelphia, Pa.†	272	151	87	16	7	22
Pittsburgh, Pa.†	65	41	14	6	3	2
Reading, Pa.	30	24	5	1	–	1
Rochester, N.Y.	137	89	31	8	5	16
Schenectady, N.Y.	20	13	6	–	–	–
Scranton, Pa.†	27	22	5	–	–	–
Syracuse, N.Y.	84	49	24	10	–	3
Trenton, N.J.	32	20	7	3	–	–
Utica, N.Y.	24	19	4	–	–	–
Yonkers, N.Y.	28	21	5	2	–	1
E.N. CENTRAL	2,223	1,306	608	141	84	62
Akron, Ohio	51	30	14	2	5	–
Canton, Ohio	50	27	16	3	2	1
Chicago, Ill.	509	289	140	38	19	11
Cincinnati, Ohio	164	92	46	10	8	6
Cleveland, Ohio	187	103	56	14	7	6
Columbus, Ohio	90	47	26	7	3	4
Dayton, Ohio	114	63	31	12	3	4
Detroit, Mich.	273	157	76	19	10	5
Evansville, Ind.	38	26	10	–	2	1
Fort Wayne, Ind.	52	31	15	2	1	3
Gary, Ind.	20	9	7	4	–	1
Grand Rapids, Mich.	70	48	13	4	1	7
Indianapolis, Ind.	169	110	40	12	3	–
Madison, Wis.	28	14	9	–	2	2
Milwaukee, Wis.	128	74	44	5	4	7
Peoria, Ill.	36	22	7	2	4	1
Rockford, Ill.	40	27	7	2	2	–
South Bend, Ind.	46	33	11	–	1	2
Toledo, Ohio	98	63	27	2	5	1
Youngstown, Ohio	60	41	13	3	2	–
W.N. CENTRAL	674	433	146	38	27	18
Des Moines, Iowa	47	35	8	1	1	1
Duluth, Minn.	27	16	8	2	–	3
Kansas City, Kans.	34	20	8	4	1	2
Kansas City, Mo.	105	73	15	7	5	4
Lincoln, Nebr.	32	21	8	3	–	–
Minneapolis, Minn.	84	55	16	3	6	1
Omaha, Nebr.	85	53	20	5	3	1
St. Louis, Mo.	156	91	46	6	7	4
St. Paul, Minn.	59	44	7	5	2	1
Wichita, Kans.	45	25	10	2	2	1

REPORTING AREA	ALL CAUSES, BY AGE (YEARS)					P&I** TOTAL
	ALL AGES	>65	45-64	25-44	<1	
S. ATLANTIC	1,341	748	371	115	53	36
Atlanta, Ga.	149	72	48	19	3	6
Baltimore, Md.	384	212	120	30	9	7
Charlotte, N.C.	47	26	12	4	3	3
Jacksonville, Fla.	106	65	26	8	4	2
Miami, Fla.	99	48	26	11	9	1
Norfolk, Va.	33	15	10	2	3	1
Richmond, Va.	74	35	26	2	9	2
Savannah, Ga.	36	22	9	2	2	3
St. Petersburg, Fla.	73	64	6	–	3	1
Tampa, Fla.	66	36	20	4	3	3
Washington, D.C.	236	138	56	27	5	5
Wilmington, Del.	38	15	12	6	–	2
E.S. CENTRAL	669	405	151	60	25	31
Birmingham, Ala.	106	71	19	11	2	1
Chattanooga, Tenn.	57	39	8	3	6	3
Knoxville, Tenn.	39	26	8	1	–	1
Louisville, Ky.	112	67	34	6	4	8
Memphis, Tenn.	150	89	35	21	–	9
Mobile, Ala.	53	26	12	8	4	1
Montgomery, Ala.	38	25	7	2	2	2
Nashville, Tenn.	114	62	28	8	7	6
W.S. CENTRAL	1,228	649	327	101	79	49
Austin, Tex.	39	17	12	2	4	2
Baton Rouge, La.	47	22	14	5	3	2
Corpus Christi, Tex.	33	20	6	3	3	1
Dallas, Tex.	168	88	53	11	4	–
El Paso, Tex.	50	25	8	5	8	5
Fort Worth, Tex.	80	49	12	11	5	5
Houston, Tex.	253	118	71	30	11	11
Little Rock, Ark.	93	49	20	8	9	6
New Orleans, La.	163	88	39	10	22	–
San Antonio, Tex.	162	102	36	9	9	13
Shreveport, La.	59	28	26	3	–	2
Tulsa, Okla.	81	43	30	4	1	2
MOUNTAIN	631	376	141	49	32	23
Albuquerque, N.Mex.	97	58	22	7	5	10
Colo. Springs, Colo.	37	26	6	1	2	2
Denver, Colo.	140	79	38	12	2	6
Las Vegas, Nev.	61	30	15	8	5	1
Ogden, Utah	18	14	1	1	2	1
Phoenix, Ariz.	127	77	29	11	7	1
Pueblo, Colo.	15	11	2	1	–	1
Salt Lake City, Utah	65	34	13	4	9	1
Tucson, Ariz.	71	47	15	4	–	–
PACIFIC	1,875	1,197	432	120	45	56
Berkeley, Calif.	30	22	6	2	–	1
Fresno, Calif.	73	45	11	4	4	2
Glendale, Calif.	34	20	12	1	–	1
Honolulu, Hawaii	56	28	20	3	1	3
Long Beach, Calif.	112	74	25	5	3	2
Los Angeles, Calif.	623	390	144	53	10	16
Oakland, Calif.	81	50	26	3	–	5
Pasadena, Calif.	29	25	4	–	–	3
Portland, Oreg.	107	70	24	4	6	–
Sacramento, Calif.	88	58	17	6	2	5
San Diego, Calif. ††	141	87	35	9	4	1
San Francisco, Calif.	138	92	33	8	2	3
San Jose, Calif.	154	87	38	13	7	6
Seattle, Wash.	137	103	20	5	4	2
Spokane, Wash.	38	23	12	1	–	5
Tacoma, Wash.	34	23	5	3	2	1
TOTAL	11,732	7,086	2,920	833	427	416

*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.

††Data not available this week. Figures are estimates based on average percent of regional totals.

Nutritional Status of Southeast Asian Refugee Children

Since mid-1975, nearly 300,000 Indochinese refugees have been relocated in the United States. This large influx may have a substantial impact on the future planning and implementation of the various health and social services provided by state and local jurisdictions. While some information about the health of these refugees is being accumulated, little is known about their nutritional status. Inquiries from several federal agencies prompted the Nutrition Division, CDC, to design a special survey to obtain selected nutrition-related data on Southeast Asian refugee children.

Four clinics in Washington and California were chosen* for a record search. Data from the charts of 850 Southeast Asian refugee children were selected because young children are usually most vulnerable to protein-energy malnutrition (PEM). Only children seen after July 1, 1979, were included in the study, on the assumption that recently arrived refugees would be most likely to have significant nutrition-related problems. Because of the possible impact of intervention activities (such as special feeding programs) on nutrition-related indicators, only data from the first health screening visit were collected.

A control group for this study was selected from the National Nutrition Surveillance (NNS) System data base.† This comparison group contained 1,100 children of Asian descent less than 5 years of age who were screened in CDC-coordinated NNS clinics throughout the country before the influx of Southeast Asian refugees in 1979. The control group included an unknown number of refugee children, but the consensus of health professionals was that refugees who arrived in the period 1975-1979 were better nourished than those who have arrived since.

In addition to hemoglobin and hematocrit determinations, 3 anthropometric indices—height for age, weight for age, and weight for height— were used to describe the nature and extent of PEM among these pre-school-age children.

Data for all anthropometric indices are presented as standard deviation values based on the National Center for Health Statistics (NCHS)/CDC reference population distribution. Children with a height-for-age ratio of more than 2.0 standard deviations below the reference mean‡ are considered chronically malnourished ("stunted"). Children with a weight-for-height ratio more than 2.0 standard deviations below the reference mean are considered acutely malnourished ("wasted"). Children with both height-for-age and weight-for-height ratios of more than 2.0 standard deviations below the reference mean are classified as being both stunted and wasted. This group is considered to be at the greatest nutritional risk.

Data for 824 children were analyzed; the records of 605 children screened contained both height and weight measurements. Table 1 presents the prevalence of selected indices of nutritional status by age and sex for the survey and control groups. Anemia was more prevalent among the survey group (39% with low hemoglobin) than the control group (13% with low hemoglobin). Substantially more members of the survey group than of

*On the basis of numbers of refugee patients, availability of appropriate data, and willingness to participate (i.e., a "convenience sample").

†CDC is working with selected state and local health departments to develop a nutrition surveillance system based on information routinely collected in service delivery programs. The data are rapidly analyzed and returned to the source for use in patient evaluation and program planning.

‡Approximately 2.3% of the NCHS/CDC reference population falls below this cutoff on all anthropometric indices.

Nutritional Status of Refugees -- Continued

the control group were stunted (38% compared with 9%). Children over 24 months of age were more severely stunted than those less than 2 years in both study and control groups. The overall prevalence of wasting was 3% for the survey group and 1% for the control group, but children less than 2 years of age in the study group had a higher prevalence (6%-7%) than children in the control group (2%). Only 3 of 605 children in the survey group were identified as being both stunted and wasted.

TABLE 1. Percentage of Southeast Asian refugee children with low nutrition indices, by sex and age, Washington and California, July 1979-June 1980

Refugee children	Hemoglobin*		Hematocrit†		Height for Age‡		Weight for Age‡		Weight for Height‡	
	No. Exam.	% Low	No. Exam.	% Low	No. Exam.	% Low	No. Exam.	% Low	No. Exam.	% Low
Survey group										
Male										
0-23 months	44	36%	63	43%	106	31%	106	18%	106	6%
24-59 months	139	40%	174	48%	237	39%	237	16%	237	1%
Female										
0-23 months	29	45%	40	43%	72	33%	72	14%	72	7%
24-59 months	118	38%	149	41%	190	43%	190	24%	190	2%
TOTAL	330	39%	426	44%	605	38%	605	19%	605	3%
Control group										
Male										
0-23 months	51	4%	245	11%	329	7%	329	3%	329	2%
24-59 months	44	28%	183	12%	236	15%	236	6%	236	1%
Female										
0-23 months	60	8%	242	7%	321	5%	321	4%	321	1%
24-59 months	49	16%	167	13%	214	11%	214	7%	214	1%
TOTAL	204	13%	837	10%	1100	9%	1100	5%	1100	1%

*Children 6-23 months with hemoglobin of <10 gm or children 24-59 months with hemoglobin of <11 gm were considered low.

†Children 6-23 months with hematocrit of <31% or children 24-59 months with hematocrit of <34% were considered low.

‡Values of more than 2.0 standard deviations below the mean were considered low for all anthropometric indices. (Expected prevalence of "low" for all anthropometric indices is 2.3% based on the NCHS/CDC reference population.)

Table 2 shows the prevalence of anemia by the length of stay in the United States before screening. The prevalence was higher for refugees screened 2-6 weeks after entry (42%) than for those tested within the first 2 weeks (30%). For those in the United States over 6 weeks before being screened, the prevalence dropped to 16%.

Reported by International District Community Health Center, Seattle, Washington; Indochinese Refugee Screening Clinic, Seattle-King County Dept of Public Health, Seattle, Washington; U.S. Public Health Service Hospital, San Francisco, California; Queen of Angels Clinic, Los Angeles, California; Nutrition Div, Bur of Smallpox Eradication, CDC.

Editorial Note: Both anemia and stunting appear to be major nutrition-related problems for Southeast Asian refugee children who have entered the United States since July 1, 1979. Wasting was relatively uncommon for members of both groups, except for recent arrivals who were less than 24 months of age at the time of the initial clinic visit.

These data suggest that clinic personnel caring for Southeast Asian refugee children

Nutritional Status of Refugees – Continued

need to be aware of the need for identification and follow-up of anemia in all age groups and possible acute undernutrition affecting children less than 24 months old. Particular care should be used in following patients during the initial 6 weeks in the United States when they are most likely to have anemia. The high initial prevalence of this condition may reflect the impact of a difficult adjustment period for children on American diets for the first time.

TABLE 2. Percentage of Southeast Asian refugee children with low hemoglobin/hematocrit, by length of stay in the United States, Washington and California, July 1979-June 1980

	Southeast Asian refugee children	
Length of stay in the United States	Number examined*	Number with low hemoglobin/hematocrit (%)
Less than 2 weeks	217	64 (30%)
2-6 weeks	268	112 (42%)
6 weeks and longer	57	9 (16%)
TOTAL	542	185 (34%)

*Does not include children with unknown hemoglobin/hematocrit, date of entry, or date of screening.

Erratum, Vol. 29, No. 33

p401 In the article, "Formaldehyde Exposure at a Mortuary Science Embalming Laboratory – Ohio," reference 5 was incorrect. The correct citation is:

5. Bureau of National Affairs. Formaldehyde: industry testing indicates chemical causes cancer in rats, safety unit says. Chemical Regulation Reporter 1979;3:1160-1.

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