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Epidemiologic Notes and Reports

Occupational Exposure to Synthetic Estrogens — Puerto Rico

Following complaints of breast enlargement in male employees and menstrual disorders in the female employees of an oral contraceptive plant in Puerto Rico, an investigation was initiated in May 1976. It revealed that during the previous 12 months, 5 of the company's 25 male employees (20%) and 12 of its 30 females (40%) had experienced symptoms or signs compatible with increased absorption of estrogens.

All 55 employees were questioned; 53 agreed to be examined. Plasma samples were drawn for ethinyl estradiol determination and environmental air samples obtained for measurement of estrogen and progestogen concentrations. Hyperestrogenism in males was defined as clinical gynecomastia or a history of gynecomastia with or without decreased libido and increased areolar pigmentation in an employee since he had begun work at the factory; a female case was defined as intermenstrual bleeding (at least 1 episode of vaginal bleeding other than menstruation) in a woman since she had started work at the factory. Five cases of hyperestrogenism were found in the 5 males who came into contact with the powdered hormones used to make the contraceptive tablets. Three had clinical gynecomastia at the time of the examination. Cases were also diagnosed in 2 (40%) of the women who came in contact with the powdered product; 55% of the production line operators gave similar menstrual histories. No cases were identified in the clerical staff.

In view of the subjective nature of the data obtained from the 30 women employees, 60 matched nonfactory controls were selected for menstrual histories for the same time period. The factory workers (non-clerical) had an estimated 4-fold increased risk of menstrual disorders compared with matched controls.

Environmental measurement of air showed a wide variation in the concentrations of estrogen and progestogen. No definitive statement can be made concerning the values, however, as the method of measurement is a new one, and no occupational air standards exist for these hormones. The plasma ethinyl estradiol levels were elevated* in 60% of the persons handling the powdered product; the prevalence of elevated levels among all factory workers was 32%. Nevertheless, the short *in vivo* half life of synthetic estrogen (1 to 2 hours) and the absence of accurate information on the time of the venipuncture relative to occupational exposure or oral contraceptive ingestion precludes further analysis.

Measures to control dust in the plant were considered good. The highest risk groups were provided with air-supplied vinyl suits. The company had taken considerable efforts to minimize dust evolution, and the workers appeared to be adhering to regulations.

Reported by J Rivera-Dueño, MD, Puerto Rico Dept of Health; Hazards Evaluation Br, National Institute for Occupational Safety and Health; Environmental Hazards Activity, Cancer and Birth Defects Div, Bur of Epidemiology, CDC.

Editorial Note: This appears to be the first published report of occupational hyperestrogenism caused by oral contraceptives, although isolated reports exist of gynecomastia associated with diethylstilbestrol production (*2,3*).

The company involved in this study was exemplary in its efforts to control dust in its plant. The fact that clinical illness nevertheless occurred suggests that new techniques may be needed to contain these chemicals, such as total enclosure of the product throughout its formulation. There is also a need to establish occupational health standards for estrogens in air.

References

1. Kundu N: Radioimmunoassay of contraceptive steroids. II. Synthesis of 6,7. ^{3}H-mestranol and ethinyl estradiol of high specific activity. Steroids 23:151-161, 1975
2. Pacynski A, Budzynska A, Przyleck S, Rosaczynski J: Hyperestrogenism in a pharmaceutical factory. Endrokrinol Pol (Warsawa) 22:149-154, 1971
3. National Institute for Occupational Safety and Health: Health Hazards Evaluation Report (71-9). Cincinnati, NIOSH, 1973

* Plasma ethinyl estradiol is considered elevated if it exceeds 30 pg/ml for all men and for women not currently using oral contraceptives, or 150 pg/ml for women currently using low dose estrogen oral contraceptives (*1*).

Follow-up on Meningococcal Disease — Alaska, Oregon, Washington

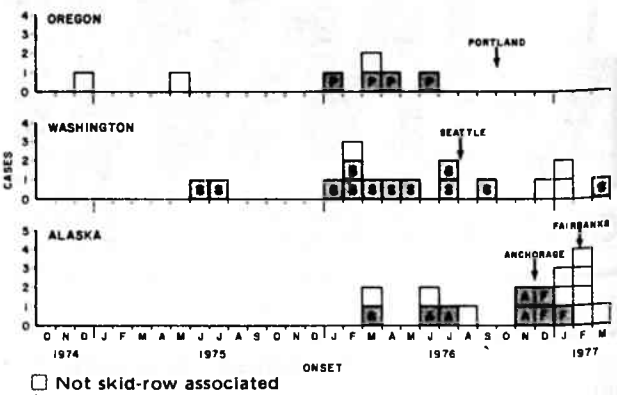
Alaska: Two confirmed and 1 suspect case of serogroup A meningococcal disease occurred in December 1976 and January 1977 in frequenters of a skid-row-like area of Fairbanks; all 3 were heavy users of alcohol. The area is inhabited by approximately 150 people but is frequented by many more. The Fairbanks Health Center and the Alaska Department of Health and Social Services began inoculating residents of this area with serogroup A meningococcal vaccine on February 14, 1977. To date, 90 persons have been inoculated.

Since March 1976, 17 cases of serogroup A disease have been reported in Alaska (Figure 1), whereas none was reported in the preceding 20 years. A small outbreak involving 5 persons occurred in a skid-row-like area in Anchorage in 1976, and serogroup A vaccine was used to control it (MMWR 25[43],1976; MMWR 26[4],1977). All serogroup A isolates tested for sulfadiazine sensitivity have been sensitive.

Oregon and Washington: Small outbreaks of serogroup A meningococcal disease occurred in 1975 and 1976 in skid-row areas of Portland and Seattle (MMWR 25[15,35], 1976; MMWR 26[4],1977) (Figure 1). Serogroup A vaccine was administered to residents of those areas. Only 2 skid-row inhabitants have become ill since the vaccine campaigns began. One was a 46-year-old Seattle resident who became ill 12 days after receiving serogroup A vaccine. The other was a 46-year-old alcoholic seaman who lives in Seattle but fell ill aboard ship 2 days after leaving home. He was hospitalized in Anchorage. He had not been vaccinated. Three cases have occurred in other residents in Washington this winter (Figure 1). All serogroup A isolates tested for sulfadiazine sensitivity have been sensitive.

Reported by P Rogers, RN, Fairbanks Health Center; GW Counts, MD, Harborview Medical Center, Seattle; AHB Pedersen, MD, MPH, Seattle-King County Dept of Public Health; RI Fraser, MD, JP Middaugh, MD, Acting State Epidemiologist, F Pauls, PhD, Alaska Dept of Health and Social Services; JA Googins, MD, State Epidemiologist, E Press, MD, Oregon Health Division; J Allard, PhD, State Epidemiologist, JA Beare, MD, Washington Dept of Social and Health Services; and Special Pathogens Br, Bacterial Diseases Div, Bur of Epidemiology, CDC.

FIGURE 1. Serogroup A meningococcal cases and vaccination campaigns, Oregon, Washington, Alaska, October 1974-March 9, 1977*



☐ Not skid-row associated
☐ Skid-row associated — P-Portland, S-Seattle, A-Anchorage, F-Fairbanks
↓ Date skid-row vaccination campaign started

*Includes 2 suspect cases, 1 in Anchorage and 1 in Fairbanks

Editorial Note: Selective group A meningococcal vaccination appears to have had some impact on outbreaks of group A meningococcal disease in skid-row populations of Portland, Seattle, Anchorage, and Fairbanks. The appearance of group A cases in Alaska and Washington outside these identifiable groups necessitates continued close surveillance. Meningococcal vaccines seem to offer some protection as early as 1 week after vaccination, but protection is not maximal until 2 weeks or more after vaccination.

Table I. Summary—Cases of Specified Notifiable Diseases: United States

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

DISEASE	12th WEEK ENDING		MEDIAN 1972–1976	CUMULATIVE, FIRST 12 WEEKS		
	March 26, 1977	March 27, 1976		March 26, 1977	March 27, 1976	MEDIAN 1972–1976
Aseptic meningitis	30	25	28	424	430	417
Brucellosis	3	3	2	39	58	23
Chickenpox	5,875	6,574	---	69,879	65,847	---
Diphtheria	4	5	5	14	84	57
Encephalitis: Primary	13	13	14	140	180	180
Encephalitis: Post-Infectious	1	4	4	24	54	48
Hepatitis, Viral: Type B	318	289	192	3,596	3,231	2,255
Hepatitis, Viral: Type A	636	753	879	7,719	8,334	10,293
Hepatitis, Viral: Type unspecified	192	133		2,200	2,028	
Malaria	6	10	5	71	75	65
Measles (rubeola)	2,007	1,577	952	16,348	10,075	7,962
Meningococcal infections, total	49	56	35	545	461	424
Civilian	49	55	33	542	457	411
Military	–	1	1	3	4	12
Mumps	555	1,261	1,846	6,908	15,150	20,322
Pertussis	23	13	---	157	257	---
Rubella (German measles)	730	634	634	6,113	4,079	4,079
Tetanus	1	–	2	7	7	13
Tuberculosis	618	603	---	6,617	7,085	---
Tularemia	–	2	2	15	26	24
Typhoid fever	8	6	6	77	77	77
Typhus, tick-borne (Rky. Mt. spotted fever)	–	–	–	19	5	11
Venereal Diseases:						
Gonorrhea: Civilian	16,832	19,103	---	214,557	223,625	---
Gonorrhea: Military	286	573	---	5,984	6,884	---
Syphilis, primary and secondary: Civilian	479	549	---	5,191	6,094	---
Syphilis, primary and secondary: Military	3	5	---	69	82	---
Rabies in animals	49	40	51	520	466	611

Table II. Notifiable Diseases of Low Frequency: United States

	CUM.		CUM.
Anthrax:	–	Poliomyelitis, total:	2
Botulism:	9	Paralytic:	2
Congenital rubella syndrome:	2	Psittacosis:	10
Leprosy:	26	Rabies in man:	–
Leptospirosis:*	10	Trichinosis:*	24
Plague:	1	Typhus, murine:*	9

*Delayed reports: Leptospirosis: Tex 1 (1976); Trichinosis: Tex. 1 (1976); Typhus, murine: Tex. 2 (1976)

Table III
Cases of Specified Notifiable Diseases: United States
Weeks Ending March 26, 1977 and March 27, 1976 — 12th Week

AREA REPORTING	ASEPTIC MENINGITIS	BRUCELLOSIS	CHICKENPOX	DIPHTHERIA		ENCEPHALITIS			HEPATITIS, VIRAL			MALARIA	
						Primary: Arthropod-borne and Unspecified		Post Infectious	Type B	Type A	Type Unspecified		
	1977	1977	1977	1977	CUM. 1977	1977	1976	1977	1977	1977	1977	1977	CUM. 1977
UNITED STATES	30	3	5,875	4	14	13	13	1	318	636	192	6	71
NEW ENGLAND	–	–	579	–	–	–	–	–	11	12	14	1	4
Maine	–	–	3	–	–	–	–	–	–	–	–	–	–
New Hampshire	–	–	8	–	–	–	–	–	–	–	1	–	–
Vermont*	–	–	4	–	–	–	–	–	–	2	–	–	–
Massachusetts	–	–	280	–	–	–	–	–	2	5	7	–	2
Rhode Island	–	–	96	–	–	–	–	–	4	1	–	–	1
Connecticut	–	–	188	–	–	–	–	–	5	4	6	1	1
MIDDLE ATLANTIC	4	1	508	4	5	4	1	–	63	73	20	1	16
Upstate New York	1	1	355	–	–	–	–	–	9	9	2	–	5
New York City	–	–	72	4	5	–	–	–	11	12	3	1	9
New Jersey*	3	–	NN	–	–	2	–	–	21	22	14	–	1
Pennsylvania	–	–	81	–	–	2	1	–	22	30	1	–	1
EAST NORTH CENTRAL	1	–	2,620	–	–	–	5	1	45	94	7	–	5
Ohio	–	–	167	–	–	–	2	–	9	26	–	–	3
Indiana	–	–	125	–	–	–	–	1	1	4	5	–	–
Illinois	–	–	567	–	–	–	–	–	6	18	1	–	1
Michigan	1	–	1,206	–	–	–	3	–	27	42	1	–	1
Wisconsin	–	–	555	–	–	–	–	–	2	4	–	–	–
WEST NORTH CENTRAL	–	1	714	–	–	1	1	–	7	13	9	1	6
Minnesota	–	–	–	–	–	–	–	–	1	2	–	–	2
Iowa	–	–	289	–	–	–	–	–	2	1	1	–	–
Missouri*	–	1	12	–	–	–	–	–	2	7	7	1	3
North Dakota	–	–	54	–	–	–	–	–	1	–	–	–	–
South Dakota	–	–	31	–	–	–	–	–	1	–	–	–	–
Nebraska	–	–	112	–	–	1	1	–	–	–	–	–	–
Kansas	–	–	216	–	–	–	–	–	–	3	1	–	1
SOUTH ATLANTIC	11	1	625	–	–	2	–	–	33	61	28	1	13
Delaware*	1	–	6	–	–	–	–	–	1	1	1	–	–
Maryland	–	–	9	–	–	–	–	–	7	3	7	–	5
District of Columbia	–	–	5	–	–	–	–	–	–	–	–	–	1
Virginia	–	–	3	–	–	1	–	–	2	2	–	–	3
West Virginia	3	–	227	–	–	–	–	–	2	9	–	–	–
North Carolina	2	–	NN	–	–	–	–	–	7	4	1	1	1
South Carolina	–	–	16	–	–	–	–	–	2	2	6	–	–
Georgia	1	–	–	–	–	–	–	–	1	9	–	–	1
Florida	4	1	359	–	–	1	–	–	11	31	13	–	2
EAST SOUTH CENTRAL	1	–	104	–	–	3	1	–	32	86	5	–	3
Kentucky	–	–	18	–	–	–	–	–	12	26	5	–	3
Tennessee	1	–	NN	–	–	3	–	–	19	35	–	–	–
Alabama	–	–	72	–	–	–	–	–	1	6	–	–	–
Mississippi	–	–	14	–	–	–	1	–	–	19	–	–	–
WEST SOUTH CENTRAL	1	–	73	–	1	1	2	–	30	94	47	–	4
Arkansas*	–	–	24	–	–	–	–	–	3	14	3	–	–
Louisiana	–	–	NN	–	–	–	–	–	1	8	2	–	–
Oklahoma	–	–	49	–	–	–	1	–	5	10	6	–	–
Texas*	1	–	–	–	1	1	1	–	21	62	36	–	4
MOUNTAIN	–	–	244	–	–	–	–	–	22	59	14	1	5
Montana*	–	–	19	–	–	–	–	–	1	–	1	–	–
Idaho*	–	–	25	–	–	–	–	–	–	1	–	–	–
Wyoming	–	–	–	–	–	–	–	–	–	2	–	–	–
Colorado	–	–	133	–	–	–	–	–	5	10	3	1	4
New Mexico	–	–	4	–	–	–	–	–	1	11	1	–	–
Arizona	–	–	NN	–	–	–	–	–	12	29	7	–	1
Utah	–	–	63	–	–	–	–	–	3	6	2	–	–
Nevada	–	–	–	–	–	–	–	–	–	–	–	–	–
PACIFIC	12	–	408	–	8	2	3	–	75	144	48	1	15
Washington	1	–	371	–	7	–	1	–	–	12	–	–	–
Oregon	1	–	–	–	–	–	–	–	23	37	2	–	1
California*	8	–	–	–	–	2	2	–	51	88	46	1	10
Alaska	2	–	1	–	1	–	–	–	–	7	–	–	–
Hawaii	–	–	36	–	–	–	–	–	1	–	–	–	4
Guam	NA	NA	NA	NA	–	NA	–	–	–	NA	NA	NA	–
Puerto Rico	–	–	13	–	–	–	–	–	4	13	–	–	–
Virgin Islands	–	–	1	–	–	–	–	–	–	–	–	–	–

NA: Not available
NN: Not notifiable
*Delayed reports: Asep. meng.: N.J. add 1 (1976); Brucellosis: Tex. add 4 (1976); Chickenpox: Calif. add 56 (1977); Enceph.: N. J. add 1 (1976); Hep. B: Mo. add 1, Ark. add 6, Idaho add 1 (1977), Hep. A: Vt. delete 1, Ark. add 3, Mont. add 1 (1977); Hep. unsp.: Del. add 2 (1976), Tex. add 1, Mont. delete 2, Idaho add 1 (1977)

Table III-Continued
Cases of Specified Notifiable Diseases: United States
Weeks Ending March 26, 1977 and March 27, 1976 — 12th Week

REPORTING AREA	MEASLES (Rubeola)			MENINGOCOCCAL INFECTIONS TOTAL			MUMPS		PERTUSSIS	RUBELLA		TETANUS
	1977	CUMULATIVE		1977	CUMULATIVE		1977	CUM. 1977	1977	1977	CUM. 1977	CUM. 1977
		1977	1976		1977	1976						
UNITED STATES	2,007	16,348	10,075	49	545	461	555	6,908	23	730	6,113	7
NEW ENGLAND	81	686	110	2	32	24	51	354	–	11	222	–
Maine	–	3	3	–	2	–	1	21	–	1	12	–
New Hampshire*	1	167	2	–	5	2	31	63	–	–	28	–
Vermont	7	167	–	–	2	1	–	5	–	–	27	–
Massachusetts*	32	154	2	2	7	6	4	56	–	6	90	–
Rhode Island	–	5	14	–	–	4	3	26	–	–	13	–
Connecticut	41	190	89	–	16	11	12	183	–	4	52	–
MIDDLE ATLANTIC	264	1,881	2,076	10	79	53	58	469	2	99	1,498	–
Upstate New York	47	459	745	2	24	19	4	66	–	86	753	–
New York City	12	92	74	3	15	15	17	191	1	8	93	–
New Jersey	23	54	163	3	20	9	29	127	–	–	581	–
Pennsylvania	182	1,276	1,094	2	20	10	8	85	1	5	71	–
EAST NORTH CENTRAL	412	4,097	3,783	1	48	51	173	2,436	4	244	1,668	–
Ohio	18	180	6	–	24	16	19	406	–	84	451	–
Indiana	159	2,048	768	–	2	4	16	139	–	36	519	–
Illinois	104	437	378	–	6	5	35	252	3	9	115	–
Michigan	58	417	1,222	1	13	21	68	804	1	89	412	–
Wisconsin*	73	1,015	1,409	–	3	5	35	835	–	26	171	–
WEST NORTH CENTRAL	492	3,361	205	3	35	37	59	1,572	1	12	171	1
Minnesota*	84	475	46	1	15	5	–	3	–	–	5	–
Iowa	227	1,992	8	–	2	7	41	911	–	4	83	–
Missouri*	62	231	5	1	12	10	9	284	1	–	14	1
North Dakota	–	2	1	–	1	–	1	5	–	–	–	–
South Dakota	1	10	1	1	4	2	2	15	–	–	–	–
Nebraska	18	85	36	–	–	2	–	14	–	–	1	–
Kansas*	100	566	108	–	1	11	6	340	–	8	68	–
SOUTH ATLANTIC	62	745	712	11	115	95	32	276	9	119	545	1
Delaware	1	18	84	–	1	–	6	49	–	–	7	–
Maryland	–	30	363	–	8	7	1	18	–	–	–	–
District of Columbia	–	1	1	–	–	2	–	2	–	–	–	–
Virginia	33	448	12	–	6	11	–	38	–	2	100	1
West Virginia	4	40	83	–	6	3	8	73	7	10	41	–
North Carolina	1	17	–	4	31	18	–	11	2	46	220	–
South Carolina	3	74	–	–	10	12	2	7	–	59	148	–
Georgia	20	111	–	1	20	7	–	6	–	2	16	–
Florida	–	6	169	6	33	35	15	72	–	–	13	–
EAST SOUTH CENTRAL	85	296	281	7	58	33	39	387	1	81	819	1
Kentucky	7	90	271	–	17	5	13	41	–	3	21	1
Tennessee	78	197	5	4	15	13	19	227	1	78	794	–
Alabama	–	–	–	2	19	10	7	111	–	–	3	–
Mississippi	–	9	5	1	7	5	–	8	–	–	1	–
WEST SOUTH CENTRAL	67	818	309	10	99	75	37	614	1	17	315	3
Arkansas	–	1	–	1	5	2	–	5	–	–	–	–
Louisiana	4	53	5	1	38	8	–	26	–	–	7	1
Oklahoma	4	39	200	–	2	15	21	233	1	2	16	–
Texas	59	725	104	8	54	50	16	350	–	15	292	2
MOUNTAIN	115	1,084	2,068	–	13	19	30	272	1	68	220	–
Montana*	30	625	65	–	–	2	–	2	–	1	6	–
Idaho	2	27	782	–	1	1	4	62	–	–	–	–
Wyoming	–	1	–	–	–	–	–	–	–	–	1	–
Colorado	62	308	36	–	1	8	20	100	–	66	172	–
New Mexico	–	5	3	–	5	1	–	62	1	–	1	–
Arizona	11	84	176	–	5	3	–	–	–	–	–	–
Utah	1	3	992	–	–	4	6	45	–	1	37	–
Nevada	9	31	14	–	1	–	–	1	–	–	3	–
PACIFIC	429	3,380	531	5	66	74	76	528	4	79	655	1
Washington	1	191	63	3	11	14	6	107	1	14	193	–
Oregon	6	74	8	–	5	5	30	121	1	11	45	–
California	421	3,066	458	2	40	49	40	276	2	54	412	1
Alaska	–	48	–	–	9	4	–	17	–	–	–	–
Hawaii	1	1	2	–	1	2	–	7	–	–	5	–
Guam	NA	3	4	–	–	1	NA	–	NA	NA	2	–
Puerto Rico	37	206	53	–	–	1	11	170	–	–	4	2
Virgin Islands	–	6	1	–	–	–	24	116	–	–	–	–

NA: Not available

*Delayed reports: Measles: N. Hamp. add 1, Mass delete 3, Mo. delete 1, Kansas delete 61, Mont. delete 1 (1977); Men. Inf.: Wisc. add 1, Mo. add 2 (1977); Mumps: Minn. delete 300 (1976)
Pertussis: Mo. add 1 (1977)

Table III-Continued
Cases of Specified Notifiable Diseases: United States
Weeks Ending March 26, 1977 and March 27, 1976 — 12th Week

REPORTING AREA	TUBERCULOSIS		TULAREMIA	TYPHOID FEVER		TYPHUS-FEVER TICK-BORNE (RMSF)		VENEREAL DISEASES (Civilian Cases Only)						RABIES IN ANIMALS
								GONORRHEA			SYPHILIS (Pri. & Sec.)			
									CUMULATIVE			CUMULATIVE		
	1977	CUM. 1977	CUM. 1977	1977	CUM. 1977	1977	CUM. 1977	1977	1977	1976	1977	1977	1976	CUM. 1977
UNITED STATES	618	6,617	15	8	77	–	19	16,832	214,557	223,624	479	5,191	6,094	520
NEW ENGLAND	28	235	1	–	2	–	–	480	5,553	6,181	17	183	180	8
Maine	2	18	–	–	–	–	–	39	472	539	–	7	7	8
New Hampshire	–	6	–	–	–	–	–	13	205	141	–	–	3	–
Vermont	2	10	–	–	–	–	–	14	139	127	–	3	2	–
Massachusetts	17	125	1	–	1	–	–	230	2,409	2,961	14	132	124	–
Rhode Island	3	15	–	–	–	–	–	40	408	420	–	2	9	–
Connecticut	4	61	–	–	1	–	–	144	1,920	1,993	3	39	35	–
MIDDLE ATLANTIC	128	1,003	–	2	15	–	1	1,820	24,148	23,221	58	738	1,046	5
Upstate New York	14	150	–	–	1	–	1	327	3,250	3,604	5	57	57	5
New York City	45	320	–	–	7	–	–	344	10,976	9,765	33	469	693	–
New Jersey	41	271	–	2	5	–	–	549	3,651	3,729	10	101	147	–
Pennsylvania	28	262	–	–	2	–	–	600	6,271	6,123	10	111	149	–
EAST NORTH CENTRAL	116	1,131	2	1	9	–	–	2,019	31,402	36,643	59	585	575	17
Ohio*	33	195	1	–	2	–	–	702	8,074	9,296	12	157	136	–
Indiana	23	124	–	–	–	–	–	137	2,599	3,416	2	37	31	1
Illinois	33	411	–	–	1	–	–	333	10,654	13,161	39	312	305	2
Michigan	23	347	–	1	6	–	–	596	7,131	7,366	5	56	77	1
Wisconsin	4	54	1	–	–	–	–	251	2,944	3,404	1	23	26	13
WEST NORTH CENTRAL	20	205	3	–	5	–	3	1,063	11,221	11,214	10	112	116	117
Minnesota	–	38	–	–	1	–	–	197	1,966	2,122	2	36	28	46
Iowa	3	23	–	–	–	–	–	64	1,364	1,501	1	9	16	15
Missouri	9	85	2	–	2	–	3	336	4,684	4,372	7	37	49	11
North Dakota	–	5	–	–	–	–	–	10	171	170	–	–	–	14
South Dakota*	4	11	1	–	–	–	–	26	301	338	–	1	2	21
Nebraska	3	9	–	–	–	–	–	131	902	913	–	14	7	–
Kansas*	1	34	–	–	2	–	–	299	1,833	1,798	–	15	14	10
SOUTH ATLANTIC	121	1,546	5	–	13	–	9	3,995	51,129	53,325	116	1,474	1,767	61
Delaware	–	15	–	–	–	–	–	47	662	754	–	11	15	–
Maryland	15	223	–	–	–	–	–	550	6,358	7,446	3	97	149	–
District of Columbia	10	72	–	–	–	–	–	298	2,811	3,427	9	150	159	–
Virginia	7	165	–	–	5	–	1	335	5,299	5,819	12	140	152	2
West Virginia	5	66	–	–	2	–	–	71	681	659	–	1	11	3
North Carolina*	26	281	–	–	1	–	6	434	8,042	8,032	16	207	347	1
South Carolina	14	147	2	–	–	–	–	333	4,748	5,055	10	72	96	–
Georgia	16	177	3	–	–	–	2	756	10,069	9,854	19	267	209	47
Florida	28	400	–	–	5	–	–	1,171	12,459	12,279	47	529	629	8
EAST SOUTH CENTRAL	47	552	–	–	1	–	4	1,567	18,357	20,104	9	174	262	15
Kentucky	23	126	–	–	–	–	1	271	2,619	2,631	–	19	44	8
Tennessee	11	190	–	–	–	–	2	585	7,440	7,821	2	45	105	4
Alabama	13	151	–	–	1	–	1	528	4,956	5,622	2	33	47	3
Mississippi	–	85	–	–	–	–	–	183	3,342	4,030	5	77	66	–
WEST SOUTH CENTRAL	79	740	1	–	–	–	2	2,235	28,172	31,211	123	725	709	205
Arkansas	6	67	–	–	–	–	–	234	2,201	2,871	2	16	24	17
Louisiana	6	155	–	–	–	–	–	268	3,879	4,366	9	141	148	1
Oklahoma	9	74	–	–	–	–	1	206	2,487	2,899	1	18	35	85
Texas*	58	444	1	–	–	–	1	1,527	19,605	21,075	111	550	502	102
MOUNTAIN	9	180	3	2	8	–	–	743	8,731	8,963	12	116	175	10
Montana	–	5	1	–	–	–	–	31	462	456	–	–	3	10
Idaho*	–	11	–	–	–	–	–	62	425	453	–	2	5	–
Wyoming	–	4	–	–	–	–	–	18	237	186	–	7	5	–
Colorado	4	33	2	2	6	–	–	199	2,228	2,282	2	31	45	–
New Mexico	1	28	–	–	–	–	–	134	1,313	1,854	7	22	54	–
Arizona	4	84	–	–	1	–	–	233	2,474	2,538	3	47	50	–
Utah	–	6	–	–	1	–	–	39	493	515	–	5	1	–
Nevada	–	9	–	–	–	–	–	27	1,099	679	–	2	12	–
PACIFIC	70	1,025	–	3	24	–	–	2,910	35,844	32,762	75	1,084	1,264	82
Washington	–	32	–	–	–	–	–	117	2,539	2,729	–	21	27	–
Oregon	5	45	–	–	2	–	–	274	2,648	2,465	4	42	40	–
California	57	790	–	2	21	–	–	2,431	28,865	25,948	71	1,006	1,177	73
Alaska	–	8	–	–	–	–	–	37	1,066	954	–	4	1	9
Hawaii	8	150	–	1	1	–	–	51	726	666	–	11	19	–
Guam	NA	11	–	NA	–	NA	–	NA	62	105	NA	1	1	–
Puerto Rico	1	74	–	1	2	–	–	43	653	603	7	126	130	10
Virgin Islands	–	1	–	–	–	–	–	–	29	58	–	1	25	–

NA: Not available
*Delayed reports: TB: Ohio delete 2, Kansas delete 1, N. Car. delete 1, Idaho add 1 (1977); RMSF: Tex. add 1 (1976); GC: S. Dak. delete 1 (1977)

Table IV
Deaths in 121 United States Cities*
Week Ending March 26, 1977 — 12th Week

REPORTING AREA	ALL CAUSES					Pneumonia and Influenza
	ALL AGES	65 Years and Over	45-64 Years	25-44 Years	Under 1 Year	ALL AGES
NEW ENGLAND	749	465	185	39	42	31
Boston, Mass.	239	139	63	20	12	9
Bridgeport, Conn.	45	28	14	1	-	3
Cambridge, Mass.	26	25	1	-	-	3
Fall River, Mass.	30	22	6	-	-	-
Hartford, Conn.	40	25	10	2	2	-
Lowell, Mass.	26	20	5	-	-	2
Lynn, Mass.	26	17	9	-	-	-
New Bedford, Mass.	29	21	6	1	-	4
New Haven, Conn.	67	25	15	8	18	-
Providence, R.I.	63	37	18	4	1	3
Somerville, Mass.	12	10	2	-	-	1
Springfield, Mass.	47	32	12	1	2	4
Waterbury, Conn.	37	27	8	2	-	1
Worcester, Mass.	62	37	16	-	7	1
MIDDLE ATLANTIC	3,012	1,919	716	174	109	140
Albany, N. Y.	47	31	7	4	5	-
Allentown, Pa.	24	17	5	1	1	4
Buffalo, N. Y.	104	56	30	10	3	11
Camden, N. J.	38	22	12	1	1	-
Elizabeth, N. J.	40	25	11	3	1	-
Erie, Pa.	41	29	7	1	3	5
Jersey City, N. J.	53	31	15	3	2	2
Newark, N. J.	106	49	32	11	9	5
New York City, N. Y.	1,440	959	327	79	41	66
Paterson, N. J.	36	23	3	4	4	-
Philadelphia, Pa.	496	287	123	35	26	10
Pittsburgh, Pa.	175	113	42	9	5	8
Reading, Pa.	33	22	10	1	-	-
Rochester, N. Y.	136	89	38	3	-	14
Schenectady, N. Y.	32	19	10	2	1	-
Scranton, Pa.	39	28	8	1	1	2
Syracuse, N. Y.	66	38	18	3	4	3
Trenton, N. J.	43	33	6	1	2	2
Utica, N. Y.	28	24	3	-	-	6
Yonkers, N. Y.	35	24	9	2	-	2
EAST NORTH CENTRAL	2,235	1,317	573	148	96	72
Akron, Ohio	49	30	14	2	2	-
Canton, Ohio	38	24	10	1	-	1
Chicago, Ill.	567	305	161	45	34	11
Cincinnati, Ohio	153	92	44	6	4	2
Cleveland, Ohio	176	105	49	12	4	7
Columbus, Ohio	89	53	23	3	5	8
Dayton, Ohio	109	66	23	8	6	2
Detroit, Mich.	275	158	68	27	5	8
Evansville, Ind.	38	24	11	3	-	1
Fort Wayne, Ind.	45	27	11	2	4	6
Gary, Ind.	35	12	12	7	1	2
Grand Rapids, Mich.	67	43	13	2	5	11
Indianapolis, Ind.	133	84	28	8	6	4
Madison, Wis.	60	35	14	5	1	6
Milwaukee, Wis.	132	86	33	3	7	-
Peoria, Ill.	35	22	5	3	4	-
Rockford, Ill.	31	18	10	1	1	1
South Bend, Ind.	31	16	10	1	2	-
Toledo, Ohio	105	74	23	3	2	2
Youngstown, Ohio	67	43	11	6	3	-
WEST NORTH CENTRAL	760	506	164	34	30	26
Des Moines, Iowa	34	25	7	-	-	-
Duluth, Minn.	13	7	4	1	1	2
Kansas City, Kans.	38	24	9	2	1	-
Kansas City, Mo.	124	80	30	6	6	6
Lincoln, Nebr.	38	24	10	3	-	3
Minneapolis, Minn.	94	63	19	3	6	3
Omaha, Nebr.	99	66	18	5	3	2
St. Louis, Mo.	205	132	52	8	6	6
St. Paul, Minn.	64	50	7	4	3	1
Wichita, Kans.	51	35	8	2	4	3

REPORTING AREA	ALL CAUSES					Pneumonia and Influenza
	ALL AGES	65 Years and Over	45-64 Years	25-44 Years	Under 1 Year	ALL AGES
SOUTH ATLANTIC	1,118	635	322	66	42	57
Atlanta, Ga.	123	72	34	8	2	3
Baltimore, Md.	209	120	68	8	5	3
Charlotte, N. C.	79	42	22	5	6	6
Jacksonville, Fla.	75	31	27	6	-	7
Miami, Fla.	109	57	39	7	4	7
Norfolk, Va.	54	27	15	2	6	3
Richmond, Va.	87	60	19	3	2	6
Savannah, Ga.	36	23	4	4	2	5
St. Petersburg, Fla.	92	70	16	5	-	4
Tampa, Fla.	52	34	13	2	2	6
Washington, D. C.	167	78	57	12	12	5
Wilmington, Del.	35	21	8	4	1	2
EAST SOUTH CENTRAL	735	453	179	46	27	50
Birmingham, Ala.	129	74	36	12	2	7
Chattanooga, Tenn.	56	42	12	2	-	11
Knoxville, Tenn.	60	47	9	4	-	3
Louisville, Ky.	125	71	35	5	6	9
Memphis, Tenn.	157	94	37	14	5	5
Mobile, Ala.	82	50	20	3	5	4
Montgomery, Ala.	42	29	8	2	1	7
Nashville, Tenn.	84	46	22	4	8	4
WEST SOUTH CENTRAL	1,275	728	362	90	42	23
Austin, Tex.	40	26	8	4	-	-
Baton Rouge, La.	57	39	14	3	1	1
Corpus Christi, Tex.	48	29	10	5	1	1
Dallas, Tex.	192	97	56	23	7	4
El Paso, Tex.	64	30	22	3	1	1
Fort Worth, Tex.	89	45	27	4	7	-
Houston, Tex.	287	157	94	20	7	4
Little Rock, Ark.	73	43	16	5	5	4
New Orleans, La.	149	92	47	3	4	-
San Antonio, Tex.	144	88	36	10	6	3
Shreveport, La.	68	39	18	8	1	1
Tulsa, Okla.	64	43	14	2	2	4
MOUNTAIN	566	356	134	21	23	16
Albuquerque, N. Mex.	52	31	13	4	2	3
Colorado Springs, Colo.	41	29	6	-	1	5
Denver, Colo.	134	84	29	4	5	2
Las Vegas, Nev.	17	8	7	-	-	1
Ogden, Utah	13	7	6	-	-	-
Phoenix, Ariz.	145	94	33	4	6	3
Pueblo, Colo.	19	14	5	-	-	1
Salt Lake City, Utah	62	38	14	4	5	-
Tucson, Ariz.	83	51	21	5	4	1
PACIFIC	1,800	1,074	436	96	129	46
Berkeley, Calif.	26	18	5	2	-	1
Fresno, Calif.	58	34	11	6	5	1
Glendale, Calif.	30	23	7	-	-	3
Honolulu, Hawaii	45	17	19	2	1	1
Long Beach, Calif.	92	2	2	-	83	2
Los Angeles, Calif.	591	371	160	32	10	19
Oakland, Calif.	53	35	15	3	-	-
Pasadena, Calif.	39	32	4	2	1	1
Portland, Oreg.	162	101	37	7	11	1
Sacramento, Calif.	77	50	17	4	3	2
San Diego, Calif.	136	82	37	10	1	3
San Francisco, Calif.	165	97	45	13	5	2
San Jose, Calif.	60	38	17	2	1	1
Seattle, Wash.	160	108	32	8	5	2
Spokane, Wash.	62	40	14	3	3	5
Tacoma, Wash.	44	26	14	2	-	2
TOTAL	12,250	7,453	3,071	714	540	461
Expected Number	12,259	7,552	3,158	754	386	528

*By place of occurrence and week of filing certificate. Excludes fetal deaths.

The Morbidity and Mortality Weekly Report, circulation 62,700, is published by the Center for Disease Control, Atlanta, Georgia. The data in this report are provisional, based on weekly telegraphs to CDC by state health departments. The reporting week concludes at close of business on Friday; compiled data on a national basis are officially released to the public on the succeeding Friday.

The editor welcomes accounts of interesting cases, outbreaks, environmental hazards, or other public health problems of current interest to health officials. Send reports to: Center for Disease Control, Attn.: Editor, Morbidity and Mortality Weekly Report, Atlanta, Georgia 30333.

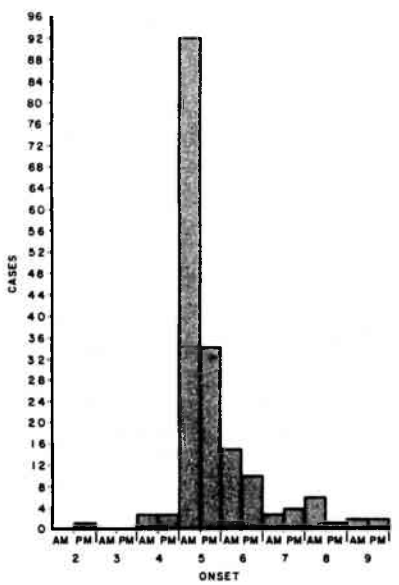
Send mailing list additions, deletions, and address changes to: Center for Disease Control, Attn.: Distribution Services, GSO, 1-SB-36, Atlanta, Georgia 30333. When requesting changes be sure to give your former address, including zip code and mailing list code number, or send an old address label.

Outbreak of Shigellosis — Fort Bliss, Texas

An outbreak of foodborne shigellosis occurred on November 5, 1976, in a tactical unit conducting field training exercises at Fort Bliss, Texas. Of 850 soldiers at risk, 176 became ill with diarrheal disease; 53 were hospitalized.

The onset of the majority of the cases (92) was between 1 AM and noon on November 5; an additional 34 cases occurred during the second half of the day. Excluding the suspected index case, the range of onset was from November 4 to 9 (Figure 2).

FIGURE 2. Gastrointestinal disease by time of onset, Fort Bliss, Texas, November 1976.



The disease was characterized by rapid onset with fever up to 105 F, abdominal cramps, profuse diarrhea (bloody in several cases), and frequent vomiting. Many of the more serious cases with high fevers complained of severe myalgia with backache. The mean duration of the disease was 4 days, with a range from 1 to 8 days. The longest period of hospitalization was 5 days; however, most of the hospitalized cases were discharged within 48 hours. All of the cases recovered without sequelae. Stool cultures were positive for *Shigella boydii*, serotype 2, in 29 individuals.

The distribution of times of onset and the nature of the illness typified a foodborne infection originating from a common source. Although the unit was operating under field conditions, there was a common mess hall where the majority of the personnel ate their meals. A limited number of meals were prepared separately and delivered to troops at various outlying areas; most of these meals were distributed at noon.

Interviews with a large sampling of soldiers concerning food ingestion on November 3 and 4 revealed a statistically significant association between eating spaghetti at the evening meal on November 3 and subsequent diarrheal disease (Table 1).

The mean incubation period calculated from the time of ingestion of the spaghetti at the evening meal of November 3 was 50.5 hours. The spaghetti was not available for culturing. However, water, milk, and several other foods that were available failed to demonstrate any contamination with enteric pathogens.

Of the 26 foodhandlers working in the mess hall at the time of the outbreak, 12 were symptomatic with diarrheal disease. Nine of the symptomatic and 1 of the asymptomatic foodhandlers had positive stool cultures for *S. boydii*, serotype 2. One of the foodhandlers responsible for preparing the spaghetti reported having had diarrheal disease at the time he prepared the spaghetti. This foodhandler had spent the preceding weekend (October 30-31) in Juarez, Mexico; 2 days later he had onset of illness.

TABLE 1. Attack rate by history of consumption of spaghetti, Fort Bliss, November 1976

	Ill	Not Ill	Total
Ate spaghetti	84	64	148
Did not eat spaghetti	1	12	13
Total	**85**	**76**	**161**

P=.001

The meat sauce had been prepared the morning of the outbreak, while the spaghetti was prepared in the afternoon several hours before being served. The spaghetti and sauce were reportedly reheated before serving. However, field mess facilities, including those for handwashing, were limited, and there is some question whether the reheating was performed as prescribed.

The following control measures were taken:

1. All foodhandlers associated with the outbreak were removed from the mess line and rectal swabs taken. The foodhandlers were not allowed to work at that job until they had consecutive negative cultures taken at least 24 hours apart. Cultures were not taken until at least 48 hours after discontinuance of antimicrobials. (Symptomatic foodhandlers were placed on 2 gms ampicillin daily for 7 days.)

2. Meticulous attention to food preparation procedures, especially handwashing for mess personnel, which included brushing of fingers and nails, was instituted. All food service personnel were continuously monitored for signs or symptoms of disease, and proper foodhandling techniques were emphasized.

3. All persons who were ill or had a positive culture were instructed in proper sanitary practices by a community health nurse. Special attention was given to soldiers with families to insure that secondary cases did not occur in family units. All family contacts were instructed to report any occurrence of diarrheal disease.

Reported by RL Coultrip, MD, MPH, Colonel, MC, William Beaumont Army Medical Center, El Paso, Texas; MD Siletchnik, MD, Captain, MC, Fort Bliss; and Enteric Diseases Br, Bacterial Diseases Div, Bur of Epidemiology, CDC.

Editorial Note: This outbreak was unusual in 2 respects: Shigellae are an uncommon cause of foodborne illness, and *Shigella boydii* is an unusual cause of *Shigella* dysentary in the United States. In 1975, only 2% of all *Shigella* isolates reported to the *Shigella* Surveillance System at CDC were *S. boydii*. Most of these infections probably were acquired during foreign travel. Although it is difficult to incriminate conclusively the individual who apparently contaminated the spaghetti sauce, it is possible that he acquired *S. boydii* infection during his trip to Mexico.

Current Trends

Influenza — Texas, Alaska

Among recent influenza A isolates received from the NIAID-sponsored influenza surveillance program at Baylor University, Houston, Texas, 2 more viruses have been identified which may be similar to the A/Texas/1/77 virus (MMWR 26[12]:100, 1977). These were obtained from pediatric patients who were ill in early March. Two isolates of influenza B were made from ill patients in San Antonio, Texas, cultured last week during the continuing investigation of A/Texas influenza.

The World Health Organization (WHO) Collaborating Center for Influenza, CDC, Atlanta, has performed preliminary laboratory characterization of influenza A isolates from patients in Alaska. Two isolates were made from patients in Fairbanks and Anchorage who were ill in early March. Six isolates were made from passengers who had been aboard an airline flight on March 14 from Anchorage to Kodiak. The plane developed mechanical problems during a stop in Homer, and many of the passengers remained aboard the plane during the 6 hours required for repair. One passenger developed an acute febrile respiratory illness during the flight; subsequently, 35 of 48 other passengers and crew became ill. One isolate was made from a contact of an ill passenger. These viruses appear related to A/Texas/1/77 but may not be identical to it. Currently, there is evidence of influenza activity throughout the state. Investigations to determine the antigenic properties of these Alaska isolates, to determine the extent of activity of disease, to obtain additional specimens for isolation, and to estimate the efficacy of the current A/Victoria vaccine against the more recent isolates are under way.

Reported by R Bell, MD, C Rothe, MD, San Antonio; P Glezen, MD, Houston; C Webb, MD, State Epidemiologist, Austin; J Starr, MD, State Epidemiologist, Juneau, Alaska; Field Services Div and Alaska Activity, Bur of Epidemiology; the Virology Div, Bur of Laboratories; and the National Influenza Immunization Program, CDC.

International Notes

Quarantine Measures

The following changes should be made in the *Supplement — Health Information for International Travel,* MMWR, Vol. 25, October 1976:

SAUDI ARABIA

Cholera — Delete note. Insert: During the period 26 September 1977 to 1 January 1978 (season of periodic mass congregation), a Certificate showing a single dose of vaccine administered not less than 1 week and not more than 6 months before arriving in Saudi Arabia is required from ALL travelers. In addition, travelers arriving from countries any part of which is infected are required to possess: (i) a certificate showing that, before arriving in Saudi Arabia, they have spent 5 days in a cholera-free area in their countries which should be designated by health authorities and notified in advance to Saudi Arabia Health Authorities (time spent on board a safe vessel is considered as a period spent in a cholera-free area provided no case appears on board; (ii) a Certificate from local health authorities showing that arrivals have taken adequate doses of tetracycline or any substitute antibiotic for 4 subsequent days immediately before leaving the local infected area or during their stay in the cholera-free area.

During the period from 2 January 1977 to 25 September 1977, a Certificate is required ONLY from travelers arriving from countries any part of which is infected.

TANZANIA, UNITED REPUBLIC OF

Yellow fever — Insert: A Certificate is ALSO required from travelers arriving from countries in the endemic zones.

Smallpox — Change code to II. Insert: A Certificate is ALSO required from travelers who within the preceding 14 days have been in a country any part of which is infected.

THAILAND

Smallpox — Change code to II. Insert: A Certificate is ALSO required from travelers who within the preceding 14 days have been in a country any part of which is infected.

TONGA

Smallpox — Oceania: Delete all information. Insert: American Samoa, Australia, British Solomon Islands, Cook Islands, Fiji, French Polynesia, Gilbert Island, Nauru, New Caledonia, New Hebrides, New Zealand, Niue, Norfolk and Tokelau Islands, Tuvalu, Western Samoa.

TURKEY

Smallpox — Delete all information. Insert code II.

UNION OF SOVIET SOCIALIST REPUBLICS

Smallpox — Delete all information. Insert code II. Insert: A Certificate is ALSO required from travelers arriving from all countries any part of which is infected. A Certificate is ALSO required from travelers arriving from:

Africa: Ethiopia.

U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
PUBLIC HEALTH SERVICE / CENTER FOR DISEASE CONTROL
ATLANTA, GEORGIA 30333

Director, Center for Disease Control, David J. Sencer, M.D.
Director, Bureau of Epidemiology, Philip S. Brachman, M.D.
Editor, Michael B. Gregg, M.D.
Managing Editor, Anne D. Mather, M.A.

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