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Epidemiologic Notes and Reports

Cytogenetic Patterns in Persons Living near Love Canal — New York

Residents and former residents of the area surrounding Love Canal, a former dump site for chemical wastes of Niagara Falls, New York, were recently studied for cytogenetic changes. Frequencies of chromosomal aberrations and/or sister chromatid exchange (SCE) were measured in peripheral blood specimens obtained between December 1981 and February 1982 from 46 persons. Blind analyses were performed with 44 matched control specimens from persons living in another part of Niagara Falls. Two sets of Love Canal participants were included. The first group consisted of 29 persons who, in 1978, lived in seven of 12 homes, directly adjoining the canal, in which air, water, and soil testing showed elevated levels of chemicals spreading from the canal. The second group included 17 persons in whom cytogenetic analyses had been performed in 1980 as part of a pilot investigation supported by the U.S. Environmental Protection Agency (*1*).

In neither group did frequencies of SCE or chromosomal aberrations (such as gaps, breaks, fragments, or supernumerary acentrics) differ significantly from control levels (Table 1). Karyotypes were normal in all specimens. In assessing chromosome damage, several factors of interest—sex, cigarette smoking, history of playing on the canal site, and history of attending an elementary school that adjoined the site—were examined as possible causes of cytogenetic variation. History of current cigarette smoking was significantly associated with increased SCE frequency, a result observed independently in studies elsewhere (*2*). Other factors, alone or in combination, were not associated with any significant increase in chromosome damage.

TABLE 1. Selected cytogenetic findings in current and former residents of the Love Canal area — Niagara Falls, New York, 1981-1982

	Love Canal		Control		p value
Cytogenetic findings*	**No.**	**Mean ± 1 SD†**	**No.**	**Mean ± 1 SD**	
Achromatic lesions	45	7.84 ± 3.22	44	7.77 ± 3.69	0.67
Chromatid deletions	45	0.98 ± 0.61	44	1.28 ± 0.72	0.06
Isochromatid deletions	45	0.92 ± 0.74	44	0.97 ± 1.00	0.86
Chromatid exchanges	45	0.08 ± 0.18	44	0.07 ± 0.17	1.00
Rings	45	0.04 ± 0.13	44	0.03 ± 0.16	0.48
Dicentrics	45	0.39 ± 0.59	44	0.28 ± 0.43	0.32
Supernumerary acentrics	45	0.15 ± 0.36	44	0.27 ± 0.50	0.18
Sister chromatid exchanges (SCE)§	46	8.48 ± 1.24	42	8.75 ± 1.02	0.23

*Number of aberrations per 100 cells (except SCE).

†Standard deviation.

§Number of SCEs per cell.

Cytogenetic Patterns —Continued

Reported by M Bender, Brookhaven National Laboratory, R Preston, Oak Ridge National Laboratory; Center for Environmental Health, Office of the Director, CDC.

Editorial Note: In May 1980, results of an earlier cytogenetic study led to concern that chromosome damage might be increased among residents of the Love Canal area. Results of the present study do not support this conclusion and indicate instead that chromosome alteration frequencies are the same in Love Canal residents as in residents elsewhere in Niagara Falls. Interpretation of these findings are limited by 1) considerable passage of time since 1978 when homes adjoining the canal were evacuated and corrective drainage work began at the site, and 2) lack of objective measurements for canal-related chemical exposures in individual residents. Although cytogenetic changes in peripheral blood lymphocytes are known to persist for years after exposure to ionizing radiation, similar persistence after chemical exposures may not necessarily occur (*3*).

Cytogenetic studies may prove useful in the future in assessing subclinical toxic damage in situations where tests can be done at the time of exposure or soon after, and where individual exposure can be reliably measured. Present experience, however, suggests that, while cytogenetic measurements of this sort may provide good correlations with doses of radiation or toxin, their predictive value for future individual health is quite uncertain (*3*).

References

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Tularemic Pneumonia — Tennessee

In October and December 1982, three cases of primary tularemic pneumonia were reported to the Tennessee State Department of Public Health. None of the patients manifested ulceroglandular disease; all three recovered.

Case 1: On October 26, a 48-year-old insulin-controlled diabetic male resident of Mississippi was admitted to a Memphis hospital with sepsis and acute rhabdomyolysis. He had a temperature of 40.6 C (105 F), a markedly elevated white blood cell (WBC) count with many young cells, a right lower-lobe pneumonia, and myoglobinuria with a creatine phosphokinase (CPK) of 1049. He was begun on cefamandole; when his condition deteriorated on the second day, tobramycin was added. Tularemia was suspected on the third day, and his wife indicated he had skinned rabbits 2 days before admission. Although admission blood cultures were eventually found positive for *Francisella tularensis* by the state laboratory, initial confirmation of the diagnosis was provided by a convalescent-phase *F. tularensis* titer of 5400 at 2 weeks. The patient has since fully recovered.

Case 2: On December 24, a 37-year-old male resident of Mississippi was admitted to a Memphis hospital with pneumonia and sepsis. Therapy was begun with penicillin; tobramycin and erythromycin were added, and nafcillin was given briefly. On December 27, the patient suffered a respiratory arrest and has since required mechanical ventilation. Significant complications included prolonged hypotension treated with vasopressors, anuric renal failure requiring dialysis, and coma.

Although subsequent information indicated the patient hunted daily, a correct diagnosis was not established until January 17, when the state laboratory identified *F. tularensis* in blood taken on December 25; no growth was detected in the broth until January 3. By the end of January, the patient remained intubated, stuporous without spontaneous muscle

Tularemia – Continued

movement below the neck, and anuric, and suffered *Escherichia coli* sepsis, suspected *Candida* sepsis, and gangrene of the feet. However, he slowly recovered and was discharged in his fourth hospital month.

Case 3: On December 31, a 50-year-old previously healthy male was admitted to a Nashville hospital with a 2-week history of fever, chills, and productive cough. On admission, he had bilateral pneumonia with a WBC count of 28,400, and therapy was begun with ampicillin. His condition worsened; he experienced respiratory failure requiring mechanical ventilation and acute renal failure requiring dialysis. Tularemia was considered in the differential diagnosis; the patient's wife indicated he had skinned a rabbit 1 week before onset of symptoms. Gentamicin was begun on January 2. Although admission blood cultures and the lung biopsy were subsequently reported positive for *F. tularensis* by the state laboratory, the diagnosis was initially confirmed by a 4-fold rise in *F. tularensis* slide test agglutination titers from 80 to 320 between the third and eleventh hospital days. The agglutination titer subsequently rose to 16,000 on January 18. The patient eventually recovered normal renal and respiratory function and was discharged.

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Editorial Note: Pneumonia due to hematogenous dissemination occurs in 10%-15% of ulceroglandular tularemia cases and 30%-80% of typhoid cases, but primary tularemic pneumonia is believed rare (*1*). A history of tick exposure or hunting may be a useful diagnostic clue but is frequently absent (*1,2*). Chest x-ray findings are variable and nonspecific (*3*).

In general, tularemia cases tend to be more severe in North America than in other parts of the world, possibly because type A strains of *F. tularensis* are present in North America but not elsewhere (*4*). Type A strains are associated with rabbits and tick vectors and are biochemically characterized by their ability to ferment glycerol and possession of the enzyme citrulline ureidase (*5-7*). Type B strains are also found in North America but are an uncommon cause of human illness (*4,8*). The isolates from the Tennessee patients fermented glycerol and were probably type A strains.

Bacteremia probably occurs frequently in tularemia, but direct isolates from blood are rarely reported. In the current cases, the blood culture methodology was similar at all three hospitals and was based on use of a Bactec* instrument to detect microbial growth. The blood was inoculated into enriched tryptic soy broth (TSB) for aerobic culture, a prereduced enriched TSB for anaerobic culture and, at one hospital, a resin bottle for antimicrobial inactivation. Neither the aerobic nor the resin-bottle medium contained cystine or cysteine, which probably accounts for the slow growth rate subsequently observed The anaerobic medium contained cysteine, but *F. tularensis* is an aerobe. A low growth index ($> 30 < 40$) was observed only in the aerobic cultures after 7-9 days incubation. Gram stains of the broth were negative at two hospitals and considered positive at the third only because *F. tularensis* had already been isolated from a lung biopsy on the patient. Acridine-orange stain of the broth was positive at one hospital (*9*). Subculture of aerobic, anaerobic, and resin-bottle cultures to supplemented chocolate agar resulted in visible growth at 72 hours. Supplements used in the chocolate agar were cystine only, VX* only, and IsoVitaleX* and cystine. Commercial biochemical system tests did not prove useful in isolate identification at the hospital laboratories.

Controlled studies of antimicrobial therapy for tularemia have not been done for some

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*Use of trade names is for identification only and does not imply endorsement by the Public Health Service or the U.S. Department of Health and Human Services.

Tularemia — Continued

years. Streptomycin is commonly accepted as the drug of choice, and recommended alternative drugs, albeit frequently associated with clinical relapse, are tetracycline or chloramphenicol (*1*). None of these drugs was used in the current cases. Studies at CDC found that the minimum inhibitory concentration (MIC) and the minimum bactericidal concentration (MBS) for isolates from all three patients were 1 μg or less for both gentamicin and tobramycin. Gentamicin has been previously reported effective for tularemia (*10, 11*). The MIC and MBC for the other drugs used in treating the patients indicate probable lack of efficacy.

References

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

Disease	20th Week Ending			Cumulative, 20th Week Ending		
	May 21, 1983	May 22, 1982	Median 1978-1982	May 21, 1983	May 22, 1982	Median 1978-1982
Aseptic meningitis	68	61	64	1,552	1,521	1,238
Encephalitis: Primary (arthropod-borne & unspec.)	12	9	11	310	319	236
Post-infectious	2	2	5	30	26	74
Gonorrhea: Civilian	15,683	17,353	18,056	337,053	356,129	362,024
Military	572	612	568	9,355	10,640	10,640
Hepatitis: Type A	355	352	554	8,799	8,660	10,428
Type B	407	470	369	8,320	7,993	6,227
Non A, Non B	61	52	N	1,257	828	N
Unspecified	172	162	213	3,030	3,219	3,867
Legionellosis	22	14	N	261	151	N
Leprosy	4	4	4	103	76	67
Malaria	13	30	17	249	321	321
Measles: Total	23	28	692	750	578	7,889
Indigenous	16	N	N	614	N	N
Imported*	7	N	N	136	N	N
Meningococcal infections: Total	57	56	56	1,307	1,411	1,327
Civilian	56	56	56	1,294	1,406	1,317
Military	1	-	-	13	5	10
Mumps	105	149	319	1,700	2,968	5,438
Pertussis	24	23	20	647	415	415
Rubella (German measles)	32	130	130	475	1,283	2,127
Syphilis (Primary & Secondary): Civilian	646	591	469	12,398	12,660	10,031
Military	5	6	5	181	156	135
Toxic-shock syndrome	8	N	N	148	N	N
Tuberculosis	472	552	552	8,460	9,483	9,935
Tularemia	2	6	6	65	46	46
Typhoid fever	1	8	8	133	142	146
Typhus fever, tick-borne (RMSF)	29	35	35	99	115	106
Rabies, animal	118	137	137	2,476	2,318	2,318

TABLE II. Notifiable diseases of low frequency, United States

	Cum. 1983		Cum. 1983
Anthrax	-	Plague	2
Botulism: Foodborne (Alaska 1)	9	Poliomyelitis: Total	1
Infant	24	Paralytic	1
Other	-	Psittacosis (Mont. 1)	36
Brucellosis (Va. 1, Tex. 2, Calif. 1)	49	Rabies, human	2
Cholera	-	Tetanus (Nebr. 1, Calif. 1)	18
Congenital rubella syndrome	9	Trichinosis	15
Diphtheria	-	Typhus fever, flea-borne (endemic, murine) (Hawaii 1)	11
Leptospirosis	11		

*Seven of the 16 reported cases for this week were imported from a foreign country or can be directly traceable to a known internationally imported case within two generations.

TABLE III. Cases of specified notifiable diseases, United States, weeks ending May 21, 1983 and May 22, 1982 (20th week)

Reporting Area	Aseptic Meningitis	Encephalitis: Primary	Encephalitis: Post-infectious	Gonorrhea (Civilian)	Gonorrhea (Civilian)	Hepatitis (Viral), by type: A	Hepatitis (Viral), by type: B	Hepatitis (Viral), by type: NA,NB	Hepatitis (Viral), by type: Unspecified	Legionellosis	Leprosy	Malaria
	1983	Cum. 1983	Cum. 1983	Cum. 1983	Cum. 1982	1983	1983	1983	1983	1983	Cum. 1983	Cum. 1983
UNITED STATES	68	310	30	337,053	356,129	355	407	61	172	22	103	249
NEW ENGLAND	3	16	-	8,638	8,524	6	30	3	23	3	3	9
Maine	-	-	-	449	376	-	-	-	-	-	-	-
N.H.	-	1	-	224	281	2	2	-	1	-	2	-
Vt.	-	1	-	154	179	-	-	1	-	-	-	-
Mass.	3	8	-	3,820	3,968	1	15	1	21	-	-	3
R.I.	-	-	-	476	573	-	-	-	-	3	-	2
Conn.	-	6	-	3,515	3,147	3	13	1	1	-	1	4
MID ATLANTIC	9	36	4	42,079	42,544	37	58	1	16	5	17	39
Upstate N.Y.	2	11	-	6,097	6,794	11	15	1	2	-	-	13
N.Y. City	-	7	-	18,184	17,938	13	9	-	-	1	16	13
N.J.	4	8	-	8,242	7,659	13	34	-	14	4	-	10
Pa.	3	10	4	9,556	10,153	U	U	U	U	-	1	3
E.N. CENTRAL	4	56	6	45,746	50,925	23	35	9	9	4	3	11
Ohio	3	22	5	13,077	14,293	8	17	2	5	2	1	2
Ind.	1	6	1	5,091	5,483	4	3	1	1	-	-	-
Ill.	-	-	-	10,612	14,460	3	2	3	-	-	1	2
Mich.	-	26	-	12,826	11,975	8	13	3	3	2	1	7
Wis.	-	2	-	4,140	4,714	-	-	-	-	-	-	-
W.N. CENTRAL	2	39	4	15,894	16,665	17	15	5	4	1	3	9
Minn.	-	18	1	2,308	2,527	2	2	3	-	-	2	3
Iowa	1	17	-	1,801	1,822	1	3	-	1	-	-	2
Mo.	1	2	-	7,620	7,572	7	8	-	2	1	-	2
N. Dak.	-	-	-	156	234	-	-	-	-	-	-	1
S. Dak.	-	-	1	452	478	4	-	1	-	-	-	-
Nebr.	-	2	-	957	1,046	1	2	-	1	-	-	-
Kans.	-	-	2	2,600	2,986	2	-	1	-	-	1	1
S. ATLANTIC	8	47	8	86,681	91,782	35	75	5	17	4	3	33
Del.	-	-	-	1,617	1,408	1	1	-	1	-	-	-
Md.	1	9	-	10,882	11,510	2	7	-	2	-	-	4
D.C.	-	-	-	6,016	4,784	-	5	-	-	-	-	3
Va.	1	15	1	7,265	7,840	1	4	-	3	2	-	5
W. Va.	-	-	-	912	1,049	3	-	-	-	-	-	1
N.C.	-	8	-	12,711	14,790	1	4	-	2	-	-	1
S.C.	3	2	-	8,272	8,658	3	16	-	1	-	-	3
Ga.	-	3	-	18,913	17,135	4	14	1	1	1	1	3
Fla.	3	10	7	20,093	24,608	20	24	4	7	1	2	13
E.S. CENTRAL	8	9	2	28,792	29,822	24	38	7	4	-	-	3
Ky.	-	-	-	3,429	3,922	5	2	1	3	-	-	-
Tenn.	1	1	-	11,450	11,493	8	21	3	1	-	-	-
Ala.	4	8	2	9,095	9,052	4	9	3	-	-	-	1
Miss.	3	-	-	4,818	5,355	7	6	-	-	-	-	2
W.S. CENTRAL	7	32	1	48,718	49,689	66	39	1	66	3	9	28
Ark.	-	4	-	3,549	4,150	2	5	-	1	-	-	1
La.	-	3	-	8,918	8,656	19	9	-	3	1	-	2
Okla.	-	6	1	5,666	5,361	14	8	1	4	2	-	7
Tex.	7	19	-	30,585	31,522	31	17	-	58	-	9	18
MOUNTAIN	5	19	2	10,508	12,526	37	20	3	9	2	11	11
Mont.	-	-	-	461	504	-	-	-	-	-	-	-
Idaho	-	-	-	493	596	1	1	1	-	-	-	1
Wyo.	-	2	-	269	338	-	1	-	-	1	-	-
Colo.	3	8	-	3,001	3,283	6	3	-	1	1	2	4
N. Mex.	-	1	-	1,304	1,583	8	2	2	-	-	-	2
Ariz.	-	1	2	2,863	3,514	18	9	-	6	-	9	3
Utah	2	7	-	510	564	2	-	-	-	-	-	1
Nev.	-	-	-	1,607	2,144	2	4	-	2	-	-	-
PACIFIC	22	56	3	49,997	53,652	110	97	27	24	-	54	106
Wash.	-	4	-	3,528	4,384	4	4	3	-	-	5	2
Oreg.	-	-	1	2,550	2,957	10	4	1	-	-	1	4
Calif.	19	48	2	41,720	44,046	93	85	23	24	-	34	100
Alaska	-	-	-	1,191	1,335	1	1	-	-	-	-	-
Hawaii	3	4	-	1,008	930	2	3	-	-	-	14	-
Guam	U	-	-	54	52	U	U	U	U	U	-	2
P.R.	4	-	1	1,165	1,133	5	11	-	2	-	-	1
V.I.	-	-	-	106	92	-	1	-	-	-	-	-
Pac. Trust Terr.	U	-	-	-	176	U	U	U	U	U	-	-

N: Not notifiable U: Unavailable

TABLE III. (Cont.'d). Cases of specified notifiable diseases, United States, weeks ending May 21, 1983 and May 22, 1982 (20th week)

Reporting Area	Measles (Rubeola)					Menin-gococcal Infections	Mumps			Pertussis			Rubella		
	Indigenous		Imported*		Total										
	1983	Cum. 1983	1983	Cum. 1983	Cum. 1982	Cum. 1983	1983	Cum. 1983	Cum. 1982	1983	Cum. 1983	Cum. 1982	1983	Cum. 1983	Cum. 1982
UNITED STATES	16	614	7	136	578	1,307	105	1,700	2,968	24	647	415	32	475	1,283
NEW ENGLAND	-	2	1	3	8	65	1	68	134	1	19	26	1	7	10
Maine	-	-	-	-	-	6	-	12	32	-	-	1	-	-	-
N.H.	-	-	1†	1	1	2	1	14	13	-	2	4	-	2	8
Vt.	-	-	-	-	2	3	-	7	4	-	2	1	1	3	-
Mass.	-	2	-	-	2	23	-	16	63	1	13	9	-	2	-
R.I.	-	-	-	-	-	4	-	9	10	-	2	9	-	-	1
Conn.	-	-	-	2	3	27	-	10	12	-	-	2	-	-	1
MID ATLANTIC	-	8	1	15	45	194	6	122	204	5	202	70	7	34	69
Upstate N.Y.	-	-	-	2	25	74	-	48	39	3	60	43	1	18	33
N.Y. City	-	8	1†	9	15	30	-	8	32	-	24	15	2	4	24
N.J.	-	-	-	1	2	33	3	25	30	-	11	5	-	3	12
Pa.	-	-	-	3	3	57	3	41	103	2	107	7	4	9	-
E.N. CENTRAL	-	356	-	51	31	218	65	857	1,709	6	148	129	1	71	120
Ohio	-	5	-	13	-	80	46	423	1,256	5	50	22	-	1	-
Ind.	-	270	-	-	1	24	-	18	25	-	13	11	-	13	18
Ill.	-	81	-	33	15	52	6	90	119	-	69	66	1	33	44
Mich.	-	-	-	5	15	45	13	281	238	1	10	7	-	12	38
Wis.	-	-	-	-	-	17	-	45	71	-	6	23	-	12	20
W.N. CENTRAL	2	2	-	-	19	82	4	116	256	-	43	21	4	33	42
Minn.	-	-	-	-	-	12	-	17	154	-	17	7	-	5	2
Iowa	-	-	-	-	-	8	2	35	24	-	4	3	-	-	-
Mo.	2	2	-	-	2	44	1	16	7	-	5	5	4	4	34
N. Dak.	-	-	-	-	-	1	-	-	-	-	1	-	-	-	-
S. Dak.	-	-	-	-	-	3	-	-	1	-	2	3	-	-	1
Nebr.	-	-	-	-	-	1	-	2	-	-	-	1	-	-	-
Kans.	-	-	-	-	17	13	1	46	70	-	14	2	-	24	5
S. ATLANTIC	5	135	-	16	31	286	7	107	176	3	78	43	7	62	44
Del.	-	-	-	-	-	-	-	5	3	-	-	3	-	-	1
Md.	-	-	-	2	2	29	2	17	15	-	8	-	-	1	22
D.C.	-	-	-	-	1	4	-	-	-	-	-	1	-	-	-
Va.	-	1	-	11	14	40	-	20	28	-	28	7	-	1	8
W. Va.	-	-	-	-	1	2	1	20	72	1	3	3	-	-	1
N.C.	-	-	-	-	-	56	-	4	7	-	5	8	-	6	1
S.C.	-	-	-	3	-	35	-	6	10	-	5	5	-	-	1
Ga.	-	6	-	-	-	47	4	35	8	1	21	9	-	8	3
Fla.	5	128	-	-	13	73	-	-	33	1	8	7	7	46	7
E.S. CENTRAL	-	-	4	5	5	79	2	30	27	-	5	10	-	6	35
Ky.	-	-	-	1	1	15	-	13	9	-	2	1	-	5	20
Tenn.	-	-	-	-	4	30	2	14	11	-	2	4	-	-	-
Ala.	-	-	4†	4	-	22	-	-	4	-	-	-	-	1	-
Miss.	-	-	-	-	-	12	-	3	3	-	1	5	-	-	15
W.S. CENTRAL	-	33	-	24	6	151	5	124	115	7	66	23	9	78	56
Ark.	-	-	-	11	-	12	-	2	6	-	3	1	-	-	-
La.	-	-	-	12	-	27	-	-	3	-	2	1	-	9	-
Okla.	-	-	-	-	-	18	-	-	-	7	34	2	-	-	2
Tex.	-	33	-	1	6	94	5	122	106	-	27	19	9	69	54
MOUNTAIN	-	-	-	2	-	50	6	79	52	1	65	23	-	16	40
Mont.	-	-	-	-	-	5	-	2	3	-	1	-	-	3	3
Idaho	-	-	-	-	-	4	-	4	2	-	2	1	-	5	-
Wyo.	-	-	-	-	-	1	-	-	2	-	4	1	-	1	5
Colo.	-	-	-	2	-	22	1	10	10	1	41	7	-	-	3
N. Mex.	-	-	-	-	-	5	-	-	-	-	5	3	-	-	3
Ariz.	-	-	-	-	-	8	5	55	22	-	9	10	-	4	7
Utah	-	-	-	-	-	5	-	6	11	-	3	1	-	2	12
Nev.	-	-	-	-	-	-	-	2	2	-	-	-	-	1	7
PACIFIC	9	78	1	20	433	182	9	197	295	1	21	70	3	168	867
Wash.	-	1	1†	3	23	25	1	28	47	-	1	13	-	6	22
Oreg.	-	5	-	-	-	31	-	-	-	-	5	10	-	9	3
Calif.	9	71	-	17	408	120	7	148	236	1	15	47	3	153	835
Alaska	-	-	-	-	-	-	-	9	6	-	-	-	-	-	1
Hawaii	-	1	-	-	2	6	1	12	6	-	-	-	-	-	6
Guam	U	-	U	-	5	1	U	-	2	U	-	-	U	-	1
P.R.	-	56	-	-	62	7	5	77	30	1	6	12	-	2	4
V.I.	-	-	-	5	-	-	-	-	-	-	-	-	-	1	-
Pac. Trust Terr.	U	-	U	-	-	-	U	-	1	U	-	-	U	-	-

*For measles only, imported cases includes both out-of-state and international importations. U: Unavailable †International §Out-of-state

TABLE III. (Cont.'d). Cases of specified notifiable diseases, United States, weeks ending May 21, 1983 and May 22, 1982 (20th week)

Reporting Area	Syphilis (Civilian) (Primary & Secondary)		Toxic-shock Syndrome	Tuberculosis		Tula-remia	Typhoid Fever	Typhus Fever (Tick-borne) (RMSF)	Rabies, Animal
	Cum. 1983	Cum. 1982	1983	1983	Cum. 1983	Cum. 1983	Cum. 1983	Cum. 1983	Cum. 1983
UNITED STATES	12,398	12,660	8	472	8,460	65	133	99	2,476
NEW ENGLAND	283	235	1	15	224	-	5	1	3
Maine	7	1	-	1	14	-	-	-	2
N.H.	7	1	1	2	18	-	-	-	1
Vt.	2	-	-	-	2	-	-	-	-
Mass.	180	166	-	8	119	-	5	1	-
R.I.	8	12	-	1	17	-	-	-	-
Conn.	79	55	-	3	54	-	-	-	-
MID ATLANTIC	1,531	1,750	-	89	1,546	-	27	-	66
Upstate N.Y.	74	194	-	12	260	-	4	-	31
N.Y. City	931	1,052	-	49	647	-	13	-	-
N.J.	323	216	-	7	323	-	9	-	-
Pa.	203	288	-	21	316	-	1	-	35
E.N. CENTRAL	609	812	2	66	1,120	-	20	8	192
Ohio	189	133	2	10	170	-	5	4	23
Ind.	62	83	-	-	91	-	1	-	11
Ill.	232	426	-	30	498	-	8	1	106
Mich.	95	126	-	22	306	-	6	2	-
Wis.	31	44	-	4	55	-	-	1	52
W.N. CENTRAL	145	240	1	12	288	21	6	6	366
Minn.	62	42	1	-	48	-	-	-	75
Iowa	4	11	-	-	27	-	-	-	99
Mo.	54	149	-	12	164	15	1	4	44
N. Dak.	1	4	-	-	-	-	-	1	25
S. Dak.	3	-	-	-	19	-	-	-	58
Nebr.	7	8	-	-	8	2	-	-	32
Kans.	14	26	-	-	22	4	5	1	33
S. ATLANTIC	3,246	3,433	-	97	1,654	13	19	28	881
Del.	15	7	-	2	12	-	-	-	1
Md.	201	200	-	4	116	5	5	2	366
D.C.	138	221	-	2	67	-	-	-	1
Va.	232	241	-	7	153	1	4	6	328
W. Va.	11	8	-	6	66	-	2	1	64
N.C.	293	244	-	23	206	6	1	11	6
S.C.	206	158	-	2	148	-	1	5	11
Ga.	593	724	-	16	356	1	-	2	89
Fla.	1,557	1,630	-	35	530	-	6	1	15
E.S. CENTRAL	850	897	-	36	809	7	2	6	203
Ky.	48	48	-	3	210	-	-	1	45
Tenn.	245	244	-	22	248	5	1	2	135
Ala.	346	317	-	4	199	-	-	2	23
Miss.	211	288	-	7	152	2	1	1	-
W.S. CENTRAL	3,297	3,139	1	50	947	20	9	47	536
Ark.	85	85	1	11	101	12	-	3	95
La.	696	680	-	3	148	2	2	-	16
Okla.	100	69	-	9	120	5	-	30	55
Tex.	2,416	2,305	-	27	578	1	7	14	370
MOUNTAIN	279	318	-	15	233	1	7	2	83
Mont.	4	1	-	-	22	-	1	1	64
Idaho	3	17	-	-	13	-	-	1	-
Wyo.	6	10	-	-	4	-	-	-	1
Colo.	69	92	-	5	20	-	1	-	-
N. Mex.	90	63	-	3	45	1	-	-	2
Ariz.	66	76	-	7	102	-	3	-	16
Utah	9	11	-	-	18	-	1	-	-
Nev.	32	48	-	-	9	-	1	-	-
PACIFIC	2,158	1,836	3	92	1,639	3	38	1	146
Wash.	60	61	-	8	91	2	2	-	-
Oreg.	39	51	1	3	73	-	-	-	-
Calif.	2,024	1,671	2	75	1,353	1	35	1	139
Alaska	7	6	-	-	13	-	-	-	7
Hawaii	28	47	-	6	109	-	1	-	-
Guam	-	1	U	U	2	-	-	-	-
P.R.	351	239	-	3	182	-	-	-	20
V.I.	8	3	-	-	1	-	-	-	-
Pac. Trust Terr.	-	-	U	U	-	-	-	-	-

U: Unavailable

TABLE IV. Deaths in 121 U.S. cities,* week ending May 21, 1983 (20th week)

Reporting Area	All Causes, By Age (Years)						P&I** Total
	All Ages	≥65	45-64	25-44	1-24	<1	
NEW ENGLAND	630	427	134	35	16	18	49
Boston, Mass.	188	123	39	11	7	8	22
Bridgeport, Conn.	50	35	13	1	-	1	6
Cambridge, Mass.	21	17	4	-	-	-	-
Fall River, Mass.	19	16	3	-	-	-	1
Hartford, Conn.	45	21	12	7	4	1	3
Lowell, Mass.	20	16	3	-	1	-	2
Lynn, Mass.	19	14	3	1	1	-	-
New Bedford, Mass.	32	25	4	1	-	2	1
New Haven, Conn.	49	30	10	5	1	3	3
Providence, R.I.	59	46	10	3	-	-	3
Somerville, Mass.	15	12	3	-	-	-	1
Springfield, Mass.	32	15	13	3	-	1	4
Waterbury, Conn.	27	21	4	1	1	-	1
Worcester, Mass.	54	36	13	2	1	2	2
MID. ATLANTIC	2,523	1,638	577	168	78	62	105
Albany, N.Y.	45	31	7	4	2	1	-
Allentown, Pa.	18	13	4	1	-	-	-
Buffalo, N.Y.	121	87	22	3	5	4	14
Camden, N.J.	40	23	9	3	2	3	1
Elizabeth, N.J.	32	21	10	1	-	-	1
Erie, Pa.†	62	36	19	2	4	1	8
Jersey City, N.J.	53	39	5	4	2	3	-
N.Y. City, N.Y.	1,428	902	352	110	42	22	39
Newark, N.J.	57	31	15	5	4	2	5
Paterson, N.J.	21	14	3	2	1	1	-
Philadelphia, Pa.†	202	120	47	14	9	12	11
Pittsburgh, Pa.†	73	48	19	5	-	1	4
Reading, Pa.	37	30	-	6	-	1	2
Rochester, N.Y.	122	86	21	4	5	6	14
Schenectady, N.Y.	27	20	6	1	-	-	1
Scranton, Pa.†	26	21	4	1	-	-	1
Syracuse, N.Y.	78	55	20	-	-	3	1
Trenton, N.J.	36	27	7	1	-	1	-
Utica, N.Y.	15	13	1	-	1	-	-
Yonkers, N.Y.	30	21	6	1	1	1	3
E.N. CENTRAL	2,357	1,504	547	143	58	105	86
Akron, Ohio	75	54	12	5	3	1	-
Canton, Ohio	41	29	10	1	-	1	5
Chicago, Ill.	613	353	166	44	11	39	17
Cincinnati, Ohio	147	88	36	12	5	6	11
Cleveland, Ohio	159	97	39	7	7	9	-
Columbus, Ohio	131	80	34	10	3	4	7
Dayton, Ohio	103	70	15	9	3	6	4
Detroit, Mich.	234	149	51	19	3	12	8
Evansville, Ind.	45	31	11	1	-	2	-
Fort Wayne, Ind.	56	39	11	3	2	1	-
Gary, Ind.	15	6	6	2	-	1	-
Grand Rapids, Mich.	48	34	8	3	1	2	2
Indianapolis, Ind.	168	110	35	8	7	8	6
Madison, Wis.	52	35	9	4	3	1	4
Milwaukee, Wis.	127	92	26	4	1	4	7
Peoria, Ill.	48	31	12	2	1	2	3
Rockford, Ill.	33	20	8	2	3	-	-
South Bend, Ind.	42	32	6	1	2	1	4
Toledo, Ohio	148	105	31	4	3	5	5
Youngstown, Ohio	72	49	21	2	-	-	3
W.N. CENTRAL	716	486	146	45	16	23	40
Des Moines, Iowa	66	39	16	9	-	2	6
Duluth, Minn.	35	29	4	2	-	-	5
Kansas City, Kans.	45	23	14	4	1	3	1
Kansas City, Mo.	109	81	22	5	1	-	6
Lincoln, Nebr.	21	17	4	-	-	-	3
Minneapolis, Minn.	75	50	12	6	3	4	2
Omaha, Nebr.	77	53	13	4	3	4	7
St. Louis, Mo.	181	121	37	11	5	7	6
St. Paul, Minn.	58	46	11	-	-	1	1
Wichita, Kans.	49	27	13	4	3	2	3

Reporting Area	All Causes, By Age (Years)						P&I** Total
	All Ages	≥65	45-64	25-44	1-24	<1	
S. ATLANTIC	1,187	782	268	67	33	35	41
Atlanta, Ga.	121	78	33	4	3	3	2
Baltimore, Md.	280	172	74	24	5	5	4
Charlotte, N.C.	83	40	36	-	2	5	6
Jacksonville, Fla.	77	50	14	9	2	2	2
Miami, Fla.	82	47	23	7	1	4	1
Norfolk, Va.	64	39	17	3	4	1	1
Richmond, Va.	83	44	23	5	9	2	6
Savannah, Ga.	38	24	11	2	1	-	3
St. Petersburg, Fla.	76	65	8	1	-	2	3
Tampa, Fla.	67	43	18	3	2	1	6
Washington, D.C.§	166	145	2	6	3	8	4
Wilmington, Del.	50	35	9	3	1	2	3
E.S. CENTRAL	721	453	184	45	16	23	34
Birmingham, Ala.	101	59	24	10	4	4	1
Chattanooga, Tenn.	59	40	16	2	-	1	5
Knoxville, Tenn.	52	36	13	2	1	-	2
Louisville, Ky.	122	76	35	9	1	1	11
Memphis, Tenn.	147	90	40	9	6	2	6
Mobile, Ala.	36	20	10	4	1	1	1
Montgomery, Ala.	53	34	13	2	2	2	2
Nashville, Tenn.	151	98	33	7	1	12	6
W.S. CENTRAL	1,175	673	314	89	53	46	52
Austin, Tex.	30	23	5	-	-	2	2
Baton Rouge, La.	60	34	18	3	2	3	5
Corpus Christi, Tex.	42	27	11	1	2	1	-
Dallas, Tex.	184	97	50	20	7	10	6
El Paso, Tex.	62	42	14	2	2	2	2
Fort Worth, Tex.	90	54	22	6	3	5	6
Houston, Tex.	200	88	62	20	23	7	7
Little Rock, Ark.	83	49	25	5	1	3	6
New Orleans, La.	119	68	29	13	4	5	2
San Antonio, Tex.	187	112	55	9	8	3	10
Shreveport, La.	54	34	14	2	1	3	-
Tulsa, Okla.	64	45	9	8	-	2	6
MOUNTAIN	663	428	125	53	26	31	38
Albuquerque, N.Mex.	71	45	15	8	3	-	7
Colo. Springs, Colo.	32	19	6	1	5	1	6
Denver, Colo.	153	92	28	14	1	18	8
Las Vegas, Nev.	69	35	17	10	5	2	5
Ogden, Utah	20	12	3	2	3	-	1
Phoenix, Ariz.	164	107	32	14	5	6	5
Pueblo, Colo.	20	17	3	-	-	-	-
Salt Lake City, Utah	41	30	8	-	1	2	1
Tucson, Ariz.	93	71	13	4	3	2	5
PACIFIC	1,737	1,164	366	102	53	50	104
Berkeley, Calif.	14	10	1	2	-	1	-
Fresno, Calif.	56	37	11	2	4	2	1
Glendale, Calif.	20	11	7	2	-	-	4
Honolulu, Hawaii	64	44	15	2	2	1	5
Long Beach, Calif.	72	53	15	2	-	2	4
Los Angeles, Calif.	512	339	100	35	20	17	20
Oakland, Calif.	80	53	21	3	2	1	6
Pasadena, Calif.	34	22	5	2	1	4	1
Portland, Oreg.	128	88	22	9	2	6	6
Sacramento, Calif.	73	51	15	5	1	1	6
San Diego, Calif.	137	87	39	7	3	1	19
San Francisco, Calif.	139	92	32	6	5	4	6
San Jose, Calif.	166	110	36	10	7	3	14
Seattle, Wash.	148	97	30	10	4	7	6
Spokane, Wash.	55	42	9	4	-	-	5
Tacoma, Wash.	39	28	8	1	2	-	1
TOTAL	11,709††	7,555	2,661	747	349	393	549

* Mortality data in this table are voluntarily reported from 121 cities in the United States, most of which have populations of 100,000 or more. A death is reported by the place of its occurrence and by the week that the death certificate was filed. Fetal deaths are not included.

** Pneumonia and influenza

† Because of changes in reporting methods in these 4 Pennsylvania cities, these numbers are partial counts for the current week. Complete counts will be available in 4 to 6 weeks.

†† Total includes unknown ages.

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

Tularemia — Continued

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Worker Exposure to Perchloroethylene in Commercial Dry-Cleaning Operations — United States

Between 1977 and 1979, workers in commercial dry-cleaning establishments were surveyed for exposure to vapors of the solvent, perchloroethylene (PCE). Industrial hygienists collected samples of breathing-zone air from 144 of 353 workers employed at 44 commercial dry-cleaning establishments: three in Cincinnati, seven in New York City, eight in Detroit, nine in Chicago, and 17 in the San Francisco Bay area. Two types of air samples were collected: 1) long-term samples, which measured the time-weighted-average (TWA) exposures to PCE over most of a work shift (including the time spent cleaning and handling textiles and working at front counters), and 2) short-term (5- and 15-minute) samples, which measured exposures while operators transferred PCE-laden fabrics from washers to dryers, or performed other duties (such as spot removal) involving heavy exposure to PCE.

Exposures were compared by job classification (machine operator, presser, seamstress, and front-counter worker) and by the types of machines used in the establishments. Two types of machines in frequent use were: 1) separate units for washing and drying, which require manual transfer of clothes from washer to dryer, and 2) combined washer-dryer units, which do not require transfer.

Although exposures of most workers, especially those using combined washer-dryer units, were low (Table 2), machine operators who transferred PCE-laden clothes from washers to dryers had relatively high exposures. Machine operators at two of the 44 plants had 8-hr TWA exposures to PCE exceeding the standard set by the Occupational Safety and Health Administration (OSHA)*; workers in seven plants had peak exposures in excess of the OSHA limit. In nine of the 44 plants, machine operators had exposures exceeding the TWA levels recommended by the National Institute for Occupational Safety and Health (NIOSH) on the basis of noncarcinogenic, toxic PCE effects†; workers in seven plants had 15-minute peak exposures in excess of the NIOSH-recommended levels. Of the operators using combined washer-dryer units, only one was exposed to PCE levels above the NIOSH-recommended TWA of 50 ppm; none was exposed to peak levels above either the OSHA standard or the NIOSH-recommended level.

Reported by Industrywide Studies Br, Div of Surveillance, Hazard Evaluations, and Field Studies, NIOSH, CDC.

Editorial Note: An estimated 500,000 workers in 50,000 industrial plants in the United States are exposed to PCE (*3*); over half the 300 million kilograms of PCE used annually are used in an estimated 25,000 dry-cleaning establishments (*4*). PCE vapor, at levels of 75-100 ppm, is irritating to the eyes and upper respiratory tract (*5,6*); after absorption, PCE is toxic

*A maximum 8-hour TWA for PCE of 100 parts per million (ppm), with one 5-minute peak exposure between 200 and 300 ppm is allowed every 3 hours (*1*).

†Based on evidence of toxic PCE effects other than carcinogenesis, NIOSH recommended more stringent standards in 1976, (an 8-hour TWA of 50 ppm and a 15-minute peak of 100 ppm) (*2*).

Perchloroethylene — Continued

to the liver and kidneys (*7-9*). At levels of 100-280 ppm, PCE vapors affect the central nervous system, causing headaches, lightheadedness, confusion, slurred speech, drowsiness, reduced motor coordination, and memory impairment (*5,6,9-11*). Coma and death can occur in persons exposed to levels greater than 2,000 ppm (*7,12*).

A toxicologic study published in 1977 by the National Cancer Institute showed that oral ingestion of PCE in corn oil was associated with increased rates of liver carcinoma in mice (*13*). While humans differ from animals in their susceptibility to specific chemicals, substances causing cancer in experimental animals are considered potential human carcinogens and should be treated as such in the workplace. Therefore, in 1978, NIOSH recommended that PCE be handled in the workplace as a potential human carcinogen and that occupational exposure to it be reduced to the lowest possible limit (*14*).

Most dry-cleaning operations are small, often family owned and operated. The average workforce in the 44 facilities surveyed here numbered about seven; only four establishments had more than 12 employees. Due to the small workforce and low accident rate, dry cleaners are not likely to be inspected by OSHA or by state and local agencies. Non-enforcement groups, such as the dry-cleaning trade organizations and chemical suppliers, are available for consultation and assistance, but how often dry-cleaning owners or managers consult them for current occupational safety and health developments is unknown.

The present study indicates that excessive PCE exposures were not, and probably are not now, pervasive in the dry-cleaning industry. However, machine operators, many of whom are overexposed while operating manual-transfer machines, receive the highest PCE exposures. Substitution of less toxic solvents, engineering redesign, and/or substitution of machines could prevent excess exposure of almost 4,000 operators. Further reductions could be achieved by reengineering the combined machines, improving ventilation systems, and/or using personal protective equipment. Even though most dry-cleaning workers have exposures below the OSHA standards for PCE, the effects of low, chronic doses have not been adequately defined.

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TABLE 2. Exposure of dry-cleaning workers to PCE vapors, by job type and machine used — United States

Job category	Type of sample	Range of PCE (ppm)	Geometric mean (ppm)
Machine operator	TWA	4.0 - 149	22.0*
(by exposure time)	5-minute peak	3.3 - 366	44.0†
	15-minute peak	1.0 - 269	33.0†
Machine operator (by machine)			
combined unit	TWA	5.0 - 65	16.0
separate machines	TWA	4.0 - 149	23.0
Presser	TWA	0.1 - 37	3.3
Seamstress	TWA	0.6 - 29	3.0
Counter-area worker	TWA	0.3 - 26	3.1

*Significantly different ($p < 0.05$) from exposures of presser, seamstress, and counter-area worker.

†Not significantly different ($p > 0.05$) from other peak exposures.

Perchloroethylene — Continued

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Current Trends

Late Season Influenza Type B Virus Activity — United States

Despite a decline in levels of overall influenza activity, reports of influenza B virus activity increased during April and May. Influenza B outbreaks in April or May have been reported in California, New Mexico, North Dakota, Oregon, and Wisconsin, including two nursing home outbreaks in Napa and Solano counties, California. These, and two earlier nursing home outbreaks reported from Maine (*1*) and New York, bring to four the number of influenza B outbreaks in nursing homes reported this season. Other outbreaks in the above states occurred predominately among children.

One outbreak affecting a younger population occurred on the Fort Totten reservation in North Dakota beginning mid-April and continuing for 2 weeks. Absentee rates in the reservation school (grades K-6) peaked at 42%, compared with a normal absentee rate of 10%. All 16 teachers and the school principal also reported influenza-like illness during the outbreak. Records from the reservation clinic showed that patient visits had increased 49% during the outbreak and that almost all the increase was associated with influenza-like illness. During the outbreak, 52% of clinic visits were from patients 9 years of age or younger, and 40% of these involved influenza-like illness. Influenza type B virus was isolated from specimens collected from children with typical influenza during the outbreak.

Since April, 14 states have identified their first influenza type B isolates of the season; 13 states had identified type B isolates before April .

Reported by W Freeman, MD, Ft. Totten Reservation, J Pearson, DrPH, Acting State Epidemiologist, North Dakota State Dept of Health; Respective state epidemiologists and laboratory directors; Div of Surveillance and Epidemiologic Studies, Epidemiology Program Office, Statistical Svcs Activity, WHO Collaborating Center for Influenza, Influenza Br, Div of Viral Diseases, Center for Infectious Diseases, CDC.

Editorial Note: The report of late influenza B activity, including several outbreaks, emphasizes the importance of maintaining surveillance programs that include laboratory diagnosis

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for respiratory virus outbreaks outside the fall and winter months. For example, confirmation of occasional outbreaks throughout the summer months would provide one indicator that the implicated virus strain is likely to have a considerable impact in the next winter season. "Early warning" has occurred in 2 recent years—with isolation of influenza B/Singapore/222/79-like strains during summer 1979 and influenza A/Bangkok/1/79-like strains during summer 1980. Presently available information, however, does not permit any reliable prediction that influenza type B, rather than type A, will be responsible for most influenza infections in the United States next winter. As in other years, monitoring of influenza activity during the next few months in countries with tropical climates (where influenza tends to be endemic) and in the Southern Hemisphere, will also be important in improving knowledge of the virus strain likely to appear in the United States next winter.

Reference

1. CDC. Update: influenza activity—United States, MMWR 1983;32:136-41.

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

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

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