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Epidemiologic Notes and Reports

Multiple-Antibiotic Resistance of Pneumococci — South Africa

In May 1977, *Streptococcus pneumoniae,* type 19A,* resistant to penicillin, ampicillin, cephalothin, and chloramphenicol, was isolated in the King Edward VIII Hospital in Durban, South Africa. Five patients, aged 3 months, 4 months, 5 months, 22 months, and 2 years, were involved.

Three patients had fatal pneumococcal meningitis, and the other 2 recovered from pneumococcal pneumonia and bacteremia, respectively, after lengthy illnesses and treatment with erythromycin and ampicillin, respectively. Four of the patients had been on kanamycin and prolonged courses of penicillin G before onset of the pneumococcal infection. Three of these, and perhaps the fourth, acquired their infections in the hospital, where they had been admitted for treatment of marasmus and/or kwashiorkor. The fifth patient was admitted to the hospital with pneumococcal meningitis after having been treated at home with ampicillin. Subsequently, carriers of the same multiply-resistant strain were found in other Durban hospitals.

Cases and carriers of multiply-resistant pneumococci were also found in Johannesburg, approximately 300 miles inland from Durban. A 3-year-old boy was admitted to Baragwanath Hospital in Johannesburg on June 15, 1977, for repair of an interventricular septal defect. On the third hospital day, he was found to have measles with secondary bronchopneumonia. He was admitted to the Isolation Hospital, where he remained from June 19-30. He was treated with oral penicillin V during that entire period and briefly with ampicillin and gentamicin before being transferred back to Baragwanath Hospital. Treatment with penicillin V continued for a total of 5 weeks — until he underwent open heart surgery on July 19. Post-operatively, he developed bronchopneumonia. On July 22, a multiply-resistant *Streptococcus pneumoniae,* type 19,† was recovered from his sputum. He recovered uneventfully in spite of the fact that the pneumococcus was relatively resistant in vitro to both antibiotics — cephalothin and ampicillin — used for treatment. The pneumococcus was also resistant to penicillin G, methicillin, erythromycin, clindamycin, tetracycline, chloramphenicol, cotrimoxizole, and all the aminoglycosides tested (Table 1). It was fully sensitive to rifampin, vancomycin, and bacitracin, and moderately susceptible with a minimal inhibitory concentration of 2 μg/ml to fusidic acid.

*Danish nomenclature; under American nomenclature it would be type 57 (*1*).

†Not yet subtyped

Although at the time that the antibiotic resistance was recognized this patient was recovering from pneumonia, rifampin and fusidic acid were administered. With treatment, the organism disappeared from his respiratory secretions within 2 days. Resistance to rifampin and fusidic acid is known to occur readily in bacteria; however, these were the only 2 safe oral antibiotics to which the organism was sensitive, and using the 2 simultaneously might tend to prevent emergence of resistant mutants.

TABLE 1. Pneumococcal antibiotic resistance patterns in minimal inhibitory concentrations (μg/ml)

Drugs	Multiply-resistant type 19[1]	Partially resistant type 19[2]	Partially resistant type 6[2]	Control sensitive strain
Penicillin	4-8(R)[3]	1-2(I)[4]	1-2(I)	<0.005(S)[5]
Ampicillin	4-16(R)	8-16(R)	2-4(I)	<0.005(S)
Cephalothin	4-16(R)	2-4(I)	2-4(I)	<0.03(S)
Carbenicillin	125(R)	31-62(R)	31-62(R)	<0.03(S)
Streptomycin	>250(R)	>250(R)	>250(R)	31-62(R)
Methicillin	16-31(R)	8-16(R)	16-31(R)	0.25(S)
Cloxicillin	31-62(R)	16-31(R)	16-31(R)	0.25(S)
Erythromycin	16-31(R)	8-16(R)	<0.12(S)	<0.12(S)
Clindamycin	>125(R)	<0.12(S)	<0.12(S)	<0.12(S)
Gentamicin	16-31(R)	16-31(R)	16-31(R)	>10(R)
Rifampin	<0.12(S)	<0.12(S)	<0.12(S)	<0.12(S)
Fusidic acid	2(I)	2(I)	4(I)	2(I)
Vancomycin	<0.12(S)	<0.12(S)	0.25(S)	0.25(S)
Chloramphenicol	16-31(R)	31-62(R)	4-8(I)	1-4(S)
Tetracycline	31-62(R)	31-62(R)	62-125(R)	0.06(S)

[1] Found at Baragwanath & Isolation Hospitals
[2] Found at Baragwanath Hospital
[3] R=Resistant
[4] I=Partially resistant
[5] S=Sensitive

Following the recognition of this highly resistant pneumococcus, all patients and staff contacts in the hospital's 3 pediatric wards and its intensive care unit, where the patient had received treatment, were cultured for the presence of multiply-resistant pneumococci in the nasopharynx. Three staff members and 24 patients, all children, were found to harbor the same multiply-resistant pneumococcal serotype 19, while 2 patients harbored penicillin and tetracycline-resistant pneumococci, type 6. When cultured, staff and patients from pediatric wards yielded 11 more isolates of the multiply-resistant type 19 pneumococcus. The positive patients were isolated in one ward, and hospital authorities were advised to treat patients harboring multiply-resis-

tant pneumococci with rifampin and fusidic acid. Negative contacts have not been treated but are being kept under clinical and laboratory surveillance. Almost all of the patients harboring the resistant pneumococci had been on antibiotic treatment for a variety of conditions, including respiratory infections, prior to nasopharyngeal swabbing. Investigations at Baragwanath Hospital are continuing. The carrier rate among healthy adult staff is, to date, relatively low; the rate among sick adult patients has yet to be determined.

Studies at the Isolation Hospital revealed a very high carrier rate of the same multiply-resistant pneumococcus, type 19. Within 2 to 7 days after admission, all of the 80 patients in the measles ward acquired the organism in the upper respiratory tract. Following this finding, these wards were immediately closed to new admissions. Attempts are in progress to eliminate the existing pneumococci from the patients by appropriate chemotherapy, but they are being complicated by emergence of rifampin resistance in several strains. Of the 80 patients, 3 had pneumococcal bacteremia; one of these 3 died while on treatment with rifampin and fusidic acid. Rigid containment measures have been introduced at this hospital. Epidemiologic investigations are being extended to the general population and to other hospitals in the country which have received patients from the hospital.

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Reference

1. Lund E: Laboratory diagnosis of *Pneumococcus* infection. Bull WHO 23:5-13, 1960

Follow-up on Multi-State Outbreak of *Salmonella newport* Transmitted by Precooked Roasts of Beef

Following reports of contamination of precooked roast beef (*1*), the United States Department of Agriculture (USDA) is publishing regulations for the cooking of this product. According to these regulations, precooked roast beef shall be prepared by a cooking procedure that produces a minimum temperature of 145 F (63 C) in all parts of each roast. The purpose of this requirement is to kill *Salmonella* organisms, which have been shown to occur in the interior of beef roasts and which have produced illness in consumers of this product.

Reported by the Meat and Poultry Inspection Program, Food Safety and Quality Service, USDA, Beltsville, Maryland.

Reference

1. MMWR 26:277-278, 1977

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

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

DISEASE	34th WEEK ENDING		MEDIAN 1972–1976	CUMULATIVE, FIRST 34 WEEKS		MEDIAN 1972–1976
	August 27, 1977	August 28, 1976		August 27, 1977	August 28, 1976	
Aseptic meningitis	193	91	131	2,418	1,663	1,835
Brucellosis	15	6	6	151	209	128
Chickenpox	215	264	---	157,459	146,036	---
Diphtheria	1	1	1	58	126	126
Encephalitis, Primary	38	102	52	514	774	614
Encephalitis, Post-Infectious	3	4	6	146	196	200
Hepatitis, Viral, Type B	295	292	192	10,601	9,725	6,190
Hepatitis, Viral, Type A	614	673	860	20,202	22,474	27,696
Hepatitis, Viral, Type unspecified	172	192		5,991	5,543	
Malaria	15	14	13	347	287	268
Measles (rubeola)	99	65	107	52,891	34,121	23,999
Meningococcal infections, total	15	13	14	1,238	1,107	1,012
Civilian	14	12	14	1,230	1,090	987
Military	1	1	-	8	17	24
Mumps	105	150	291	15,394	31,849	46,156
Pertussis	70	22	---	658	645	---
Rubella (German measles)	47	30	87	18,374	10,487	14,654
Tetanus	3	2	2	38	39	57
Tuberculosis	658	749	---	19,949	21,974	---
Tularemia	6	3	3	101	92	92
Typhoid fever	10	6	6	239	256	245
Typhus, tick-borne (Rky. Mt. spotted fever)	53	31	31	882	643	606
Venereal Diseases:						
Gonorrhea, Civilian	20,481	22,579	---	635,219	651,612	---
Gonorrhea, Military	580	596	---	17,484	19,504	---
Syphilis, primary and secondary, Civilian	443	467	---	13,543	15,873	---
Syphilis, primary and secondary, Military	3	8	---	195	229	---
Rabies in animals	47	82	63	1,899	1,916	1,931

Table II. Notifiable Diseases of Low Frequency: United States

	CUM.		CUM.
Anthrax:	-	Poliomyelitis, total:	7
Botulism:	72	Paralytic:	6
Congenital rubella syndrome: Mich. +1	11	Psittacosis:	47
Leprosy: Ariz. +1, Wash. +1, Calif. +3	83	Rabies in man:	1
Leptospirosis: *Texas +1	30	Trichinosis: N. Hamp. +1, Nebr. +1	59
Plague: Ore. +1	6	Typhus, murine: Texas +1	58

*Delayed report: Leptospirosis: La. –1

Table III

Cases of Specified Notifiable Diseases: United States

Weeks Ending August 27, 1977 and August 28, 1976 – 34th 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		
	1976	1976	1976	1976	CUM. 1976	1976	1975	1976	1976	1976	1976	1976	CUM. 1976
UNITED STATES	193	15	215	1	58	38	102	3	295	614	172	15	347
NEW ENGLAND	15	–	11	–	–	1	–	–	3	9	10	3	21
Maine	–	–	–	–	–	–	–	–	–	–	–	–	–
New Hampshire	–	–	–	–	–	–	–	–	–	–	–	–	3
Vermont	–	–	–	–	–	–	–	–	–	1	1	1	2
Massachusetts	6	–	7	–	–	1	–	–	–	–	8	–	3
Rhode Island	–	–	2	–	–	–	–	–	1	4	–	1	5
Connecticut	9	–	2	–	–	–	–	–	2	4	1	1	8
MIDDLE ATLANTIC	31	–	29	–	5	7	8	–	52	55	32	1	76
Upstate New York	16	–	8	–	–	1	2	–	9	19	5	–	19
New York City	1	–	21	–	5	1	–	–	16	9	9	1	34
New Jersey*	12	–	NN	–	–	–	–	–	10	14	11	–	9
Pennsylvania	2	–	–	–	–	5	6	–	17	13	7	–	14
EAST NORTH CENTRAL	50	–	58	–	–	7	22	–	40	103	20	1	27
Ohio	22	–	1	–	–	6	12	–	14	47	–	1	10
Indiana	10	–	7	–	–	–	6	–	6	4	10	–	2
Illinois	–	–	20	–	–	–	–	–	3	21	3	–	2
Michigan	15	–	10	–	–	–	2	–	13	27	7	–	10
Wisconsin	3	–	20	–	–	1	2	–	4	4	–	–	3
WEST NORTH CENTRAL	1	–	5	–	1	4	5	–	11	18	9	–	32
Minnesota	–	–	2	–	–	–	3	–	–	–	1	–	9
Iowa	–	–	1	–	–	–	–	–	4	2	2	–	1
Missouri	1	–	1	–	1	–	2	–	2	7	4	–	17
North Dakota*	–	–	1	–	–	–	–	–	–	1	–	–	1
South Dakota	–	–	–	–	–	1	–	–	–	1	–	–	1
Nebraska	–	–	–	–	–	3	–	–	2	3	2	–	–
Kansas	–	–	–	–	–	–	–	–	3	4	–	–	3
SOUTH ATLANTIC	29	5	14	–	–	6	–	1	59	107	14	2	53
Delaware	–	–	–	–	–	–	–	–	–	1	1	–	–
Maryland	1	–	–	–	–	1	–	–	12	8	4	2	12
District of Columbia*	1	–	–	–	–	–	–	–	8	–	–	–	3
Virginia*	7	4	2	–	–	1	–	–	3	2	1	–	12
West Virginia	3	–	–	–	–	4	–	–	2	6	–	–	1
North Carolina	13	–	NN	–	–	–	–	–	2	6	1	–	5
South Carolina	–	–	1	–	–	–	–	–	–	40	4	–	–
Georgia	–	1	–	–	–	–	–	–	16	17	–	–	8
Florida*	4	–	11	–	–	–	–	1	16	27	3	–	12
EAST SOUTH CENTRAL	15	2	28	–	–	5	57	–	24	39	–	–	9
Kentucky	1	1	27	–	–	1	–	–	7	5	–	–	4
Tennessee	7	1	NN	–	–	4	2	–	13	18	–	–	1
Alabama	7	–	–	–	–	–	2	–	3	9	–	–	4
Mississippi	–	–	1	–	–	–	53	–	1	7	–	–	–
WEST SOUTH CENTRAL	6	8	6	–	2	2	5	1	19	74	25	1	17
Arkansas	–	–	1	–	–	–	1	–	–	9	–	–	–
Louisiana	–	–	NN	–	–	2	1	–	5	15	3	–	2
Oklahoma	1	1	1	–	–	–	–	1	2	4	1	–	–
Texas	5	7	4	–	2	–	3	–	12	46	21	1	15
MOUNTAIN	3	–	33	–	4	3	–	–	8	53	12	1	11
Montana	–	–	1	–	–	1	–	–	–	3	–	1	1
Idaho	–	–	–	–	–	–	–	–	–	4	–	–	–
Wyoming	–	–	–	–	–	–	–	–	–	–	–	–	1
Colorado	–	–	8	–	–	2	–	–	5	13	5	–	6
New Mexico	–	–	–	–	3	–	–	–	–	3	2	–	1
Arizona	–	–	NN	–	1	–	–	–	1	13	4	–	2
Utah	3	–	24	–	–	–	–	–	2	17	1	–	–
Nevada	–	–	–	–	–	–	–	–	–	–	–	–	–
PACIFIC	43	–	31	1	46	3	5	1	79	156	50	6	101
Washington	–	–	24	1	43	1	1	–	6	23	4	–	4
Oregon	1	–	–	–	–	–	–	–	9	15	1	–	1
California*	35	–	–	–	1	2	4	1	60	108	44	6	90
Alaska*	2	–	3	–	2	–	–	–	4	8	1	–	2
Hawaii	5	–	4	–	–	–	–	–	–	2	–	–	4
Guam*	NA	NA	NA	NA	–	NA	–	–	NA	NA	NA	NA	–
Puerto Rico*	–	–	7	–	–	2	–	–	–	13	1	–	2
Virgin Islands	–	–	1	–	–	–	–	–	–	–	–	–	–

NN: Not notifiable

NA: Not available

*Delayed reports: Asep. Meng.: D.C. –3; Chickenpox: Calif. +10, Guam +3; Enceph.: N. Dak. +2, Alaska –1; Hep. B: N.J. +29, Fla. –5, Guam +5; Hep. A: N. J. +24, Fla. –15, Guam +1, P.R. +9; Hep. unsp.: N.J. +27, Va. –1, Guam +4.

Table III-Continued
Cases of Specified Notifiable Diseases: United States
Weeks Ending August 27, 1977 and August 28, 1976 — 34th 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	99	52,891	34,121	15	1,238	1,107	105	15,394	70	47	18,374	38
NEW ENGLAND	5	2,470	379	-	51	53	7	635	-	-	1,182	1
Maine	1	170	7	-	3	1	5	51	-	-	69	-
New Hampshire*	-	510	9	-	3	5	-	91	-	-	240	-
Vermont	2	292	36	-	5	3	-	7	-	-	64	-
Massachusetts*	2	634	35	-	16	16	1	118	-	-	373	-
Rhode Island	-	64	14	-	1	5	1	54	-	-	134	-
Connecticut	-	800	278	-	23	23	-	314	-	-	302	1
MIDDLE ATLANTIC	7	8,308	6,966	-	175	155	10	1,258	4	7	5,994	4
Upstate New York	6	3,791	2,924	-	42	61	-	279	3	2	3,360	1
New York City	1	710	450	-	44	42	4	464	1	3	311	1
New Jersey	-	195	591	-	37	20	5	346	-	2	1,779	2
Pennsylvania	-	3,612	3,001	-	52	32	1	169	-	-	544	-
EAST NORTH CENTRAL	37	11,130	14,525	2	121	139	32	5,256	11	15	3,634	4
Ohio	8	1,844	569	-	44	58	3	647	6	9	1,115	1
Indiana	2	4,302	3,263	-	9	6	1	299	-	2	914	1
Illinois	23	1,660	1,523	1	21	17	8	903	-	-	311	1
Michigan	2	925	5,830	1	35	49	1	1,790	5	1	905	1
Wisconsin	2	2,399	3,340	-	12	9	19	1,617	-	3	389	-
WEST NORTH CENTRAL	6	9,748	1,198	-	67	71	13	3,515	-	-	491	5
Minnesota	2	2,620	414	-	25	14	-	6	-	-	16	2
Iowa	-	4,287	41	-	6	9	2	1,251	-	-	159	-
Missouri	3	987	18	-	25	23	11	1,206	-	-	35	2
North Dakota	-	23	3	-	1	3	-	16	-	-	11	-
South Dakota	1	67	4	-	4	3	-	59	-	-	17	-
Nebraska*	-	209	55	-	1	6	-	68	-	-	2	-
Kansas	-	1,555	663	-	5	13	-	909	-	-	251	1
SOUTH ATLANTIC	14	4,499	2,152	5	272	212	7	711	41	5	1,594	9
Delaware	-	22	128	-	3	6	-	125	-	-	26	-
Maryland	-	371	715	-	18	16	1	60	-	-	5	-
District of Columbia	-	4	12	-	-	2	-	5	-	-	-	-
Virginia	12	2,696	754	1	18	34	1	89	-	-	574	1
West Virginia	2	222	185	-	9	7	-	151	2	4	108	-
North Carolina	-	62	15	2	62	38	2	51	5	1	442	-
South Carolina	-	148	4	-	28	36	-	10	-	-	209	-
Georgia	-	764	2	-	49	19	1	23	11	-	52	1
Florida	-	210	337	2	85	54	2	197	23	-	178	7
EAST SOUTH CENTRAL	4	1,952	820	2	135	102	14	842	4	2	1,912	3
Kentucky	3	1,182	744	-	26	18	2	87	2	1	77	1
Tennessee	-	654	60	1	36	43	9	521	2	1	1,717	1
Alabama	-	77	-	1	49	30	3	204	-	-	109	1
Mississippi	1	39	16	-	24	11	-	30	-	-	9	-
WEST SOUTH CENTRAL	6	2,069	679	2	220	174	8	1,375	4	2	793	4
Arkansas*	-	39	-	1	14	10	-	60	2	-	3	1
Louisiana	-	74	194	-	83	33	-	36	-	-	27	1
Oklahoma	1	55	288	-	10	19	5	471	-	-	29	-
Texas	5	1,901	197	1	113	112	3	808	2	2	734	2
MOUNTAIN	6	2,521	5,006	-	44	32	3	592	1	-	353	2
Montana	3	1,160	204	-	2	4	-	10	-	-	14	1
Idaho	-	162	2,020	-	4	3	-	121	-	-	12	-
Wyoming	-	19	3	-	1	-	-	3	-	-	4	1
Colorado	1	499	245	-	1	5	1	258	-	-	232	-
New Mexico	1	270	15	-	21	4	-	107	-	-	12	-
Arizona*	1	300	226	-	11	10	-	-	-	-	12	-
Utah	-	18	2,230	-	3	4	2	78	1	-	58	-
Nevada	-	93	63	-	1	2	-	15	-	-	9	-
PACIFIC	14	10,194	2,396	4	153	169	11	1,210	5	16	2,421	6
Washington	1	532	333	-	18	29	3	260	1	-	436	-
Oregon	2	368	156	-	11	15	4	221	-	1	109	-
California	11	9,201	1,900	4	96	105	4	682	4	11	1,472	6
Alaska	-	58	4	-	26	17	-	25	-	-	1	-
Hawaii	-	35	3	-	2	3	-	22	-	4	403	-
Guam	NA	4	13	-	-	-	NA	5	NA	NA	8	-
Puerto Rico	34	849	334	-	1	3	22	636	2	-	29	9
Virgin Islands	-	14	10	-	-	-	-	186	-	-	2	-

NA: Not available

*Delayed reports: Measles: Mass. −1, Men. inf.: Ariz. −1, Pertussis: N. Hamp. +2, Ark. +18; Rubella: Nebr. +1

Table III-Continued

Cases of Specified Notifiable Diseases: United States

Weeks Ending August 27, 1977 and August 28, 1976 — 34th Week

REPORTING AREA	TUBERCULOSIS		TULAREMIA	TYPHOID FEVER		TYPHUS FEVER TICK-BORNE (RMSF)		VENEREAL DISEASES (Civilian Cases Only)						RABIES IN ANIMALS
								GONORRHEA			SYPHILIS (Pri. & Sec.)			
	1977	CUM. 1977	CUM. 1977	1977	CUM. 1977	1977	CUM. 1977	1977	CUMULATIVE 1977	CUMULATIVE 1976	1977	CUMULATIVE 1977	CUMULATIVE 1976	CUM. 1977
UNITED STATES	658	19,949	101	10	239	53	882	20,481	635,219	651,612	443	13,543	15,873	1,899
NEW ENGLAND	24	755	1	2	14	1	7	641	16,810	17,758	15	551	510	34
Maine	2	59	–	–	–	–	–	82	1,237	1,520	1	16	14	27
New Hampshire	–	18	–	1	1	–	–	19	661	506	–	3	8	1
Vermont	1	25	–	–	–	–	–	16	440	447	–	6	8	–
Massachusetts	17	433	1	1	10	1	2	181	7,150	8,515	7	393	356	5
Rhode Island	2	61	–	–	2	–	3	55	1,369	1,175	–	7	16	–
Connecticut	2	159	–	–	1	–	2	288	5,953	5,595	7	126	108	1
MIDDLE ATLANTIC	101	3,128	1	1	56	1	56	2,114	64,615	75,737	62	1,871	2,687	56
Upstate New York	24	515	1	–	7	–	26	550	11,076	11,979	6	179	159	29
New York City	27	1,005	–	–	22	–	–	888	25,380	34,225	41	1,177	1,691	–
New Jersey	6	772	–	–	17	1	10	272	11,120	11,323	8	244	379	22
Pennsylvania	44	836	–	1	10	–	20	404	17,039	18,210	7	271	458	5
EAST NORTH CENTRAL	106	3,157	3	1	21	1	22	3,218	99,460	101,408	46	1,424	1,350	81
Ohio*	16	543	1	–	7	–	8	588	25,920	24,825	9	334	322	–
Indiana	9	368	–	–	1	–	2	290	8,923	9,784	5	107	74	8
Illinois	44	1,230	–	1	4	1	11	1,260	32,634	35,605	21	745	706	23
Michigan	34	878	–	–	9	–	1	789	22,901	22,049	7	167	177	4
Wisconsin	3	138	2	–	–	–	–	291	9,082	9,145	4	71	71	46
WEST NORTH CENTRAL	23	665	16	–	13	1	26	1,147	33,425	33,678	9	304	292	470
Minnesota	2	145	–	–	4	–	–	261	6,106	6,056	2	88	64	174
Iowa	2	63	–	–	–	–	–	82	3,852	4,233	1	37	32	76
Missouri*	5	273	14	–	4	–	14	341	14,032	13,358	6	114	115	37
North Dakota	3	19	–	–	1	–	–	22	642	496	–	–	–	73
South Dakota*	2	35	2	–	–	1	2	44	990	938	–	3	4	75
Nebraska	3	27	–	–	1	–	1	138	2,914	2,972	–	24	23	1
Kansas*	6	103	–	–	3	–	9	259	4,889	5,625	–	38	54	34
SOUTH ATLANTIC	133	4,433	9	1	43	29	481	5,151	158,141	160,807	96	3,803	4,815	216
Delaware*	–	36	–	–	–	–	1	83	2,144	2,114	–	18	47	2
Maryland*	21	631	2	–	3	4	63	686	19,839	21,017	2	248	401	–
District of Columbia	11	207	–	–	1	–	–	321	10,316	10,996	6	396	379	–
Virginia	13	517	–	–	9	9	141	681	16,500	17,245	5	372	434	4
West Virginia	5	170	–	–	3	–	5	78	2,141	2,044	–	3	19	5
North Carolina	22	736	2	–	3	11	174	462	23,338	23,028	4	524	874	10
South Carolina	17	391	2	–	–	–	44	463	14,591	15,334	3	161	262	14
Georgia	24	542	3	1	12	5	52	1,116	30,725	30,300	36	805	705	133
Florida	20	1,203	–	–	12	–	1	1,261	38,637	38,729	40	1,276	1,694	48
EAST SOUTH CENTRAL	93	1,814	7	–	4	11	144	1,652	56,139	57,370	10	482	625	52
Kentucky	27	475	2	–	–	5	38	205	7,588	7,363	4	58	91	18
Tennessee	33	554	5	–	1	5	87	677	22,375	22,747	1	148	218	23
Alabama	23	476	–	–	1	1	16	464	15,457	16,307	–	97	131	7
Mississippi	10	309	–	–	2	–	3	306	10,719	10,953	5	179	185	–
WEST SOUTH CENTRAL	51	2,359	54	3	16	9	131	2,576	80,086	83,948	98	1,989	1,849	577
Arkansas*	10	268	36	–	5	3	36	376	6,351	7,894	–	46	60	89
Louisiana	12	450	1	–	–	3	4	482	11,717	12,231	46	470	383	16
Oklahoma	3	209	8	–	1	–	65	286	7,631	7,903	2	53	68	182
Texas*	26	1,432	9	3	10	3	26	1,432	54,387	55,920	50	1,420	1,338	290
MOUNTAIN	19	559	6	–	16	–	12	908	25,844	26,171	28	296	426	110
Montana	4	33	1	–	–	–	5	39	1,325	1,327	–	4	7	33
Idaho	–	25	–	–	–	–	4	41	1,215	1,385	1	10	16	–
Wyoming	2	10	1	–	–	–	2	35	642	517	–	4	3	1
Colorado*	–	74	3	–	8	–	1	312	6,758	6,547	7	88	93	38
New Mexico	7	103	–	–	–	–	–	122	3,777	4,866	17	65	108	–
Arizona*	4	249	1	–	4	–	–	209	7,282	7,824	3	108	153	33
Utah	–	29	–	–	4	–	–	34	1,459	1,275	–	6	17	5
Nevada*	2	36	–	–	–	–	–	116	3,386	2,430	–	11	29	–
PACIFIC	108	3,079	4	2	56	–	3	3,074	100,699	94,735	79	2,823	3,319	303
Washington	NA	189	–	–	1	–	–	255	7,599	8,011	NA	134	101	2
Oregon	3	131	–	–	3	–	–	286	6,942	7,221	2	85	70	4
California	89	2,331	4	2	51	–	3	2,320	80,776	74,989	77	2,561	3,070	282
Alaska	–	35	–	–	–	–	–	105	3,271	2,729	–	18	13	15
Hawaii	16	393	–	–	1	–	–	108	2,111	1,785	–	25	65	–
Guam*	NA	41	–	NA	1	NA	–	NA	132	228	NA	1	2	–
Puerto Rico	10	235	–	–	5	–	–	93	2,127	1,879	8	369	399	42
Virgin Islands	–	1	–	–	–	–	–	6	137	169	–	7	47	–

NA: Not available

*Delayed reports: TB: Ohio –3, Mo. –1, Kans. –1, Md. –3, Ariz. –1, Guam +2; Tularemia: Ark. +1, Typhoid fever: Tex. –1, Nev. +1; RMSF: Dela. +1; GC: Kans. +159 civ. +29 mil., Guam +3 civ. Syphilis: Colo. –1; An. rabies: S. Dak. +19

Table IV
Deaths in 121 United States Cities*
Week Ending August 27, 1977 – 34th 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	594	396	121	34	26	23
Boston, Mass.	160	95	38	8	12	3
Bridgeport, Conn.	47	32	8	4	3	1
Cambridge, Mass.	22	19	3	–	–	4
Fall River, Mass.	24	18	6	–	–	–
Hartford, Conn.	46	27	12	4	2	1
Lowell, Mass.	31	21	4	3	–	2
Lynn, Mass.	20	16	3	1	–	–
New Bedford, Mass.	18	18	–	–	–	–
New Haven, Conn.	47	27	14	5	1	2
Providence, R.I.	51	33	12	2	2	3
Somerville, Mass.	7	6	–	–	–	–
Springfield, Mass.	28	17	8	1	–	1
Waterbury, Conn.	38	25	7	2	4	2
Worcester, Mass.	55	42	6	4	2	4
MIDDLE ATLANTIC	2,452	1,556	602	153	61	120
Albany, N. Y.	48	32	10	1	3	–
Allentown, Pa.	18	11	7	–	–	1
Buffalo, N. Y.	116	72	32	3	5	8
Camden, N. J.	33	20	9	2	1	1
Elizabeth, N. J.	27	20	5	–	–	1
Erie, Pa.	32	22	7	1	1	5
Jersey City, N. J.	59	40	10	6	2	2
Newark, N. J.	42	19	12	4	3	–
New York City, N. Y.	1,218	785	280	89	25	48
Paterson, N. J.	29	16	7	3	2	–
Philadelphia, Pa.	300	172	91	20	7	20
Pittsburgh, Pa.	172	108	48	8	4	8
Reading, Pa.	32	23	6	3	–	3
Rochester, N. Y.	104	66	23	6	5	12
Schenectady, N. Y.	24	17	6	–	1	1
Scranton, Pa.	20	15	4	–	1	1
Syracuse, N. Y.	81	58	13	3	1	3
Trenton, N. J.	47	24	20	3	–	1
Utica, N. Y.	23	17	4	1	–	3
Yonkers, N. Y.	27	19	8	–	–	2
EAST NORTH CENTRAL	2,168	1,229	620	159	89	58
Akron, Ohio	90	56	22	5	4	–
Canton, Ohio	34	23	8	2	1	1
Chicago, Ill.	553	304	163	40	23	9
Cincinnati, Ohio	186	104	58	10	9	8
Cleveland, Ohio	167	95	40	16	11	3
Columbus, Ohio	88	48	26	7	3	10
Dayton, Ohio	98	53	26	11	5	6
Detroit, Mich.	232	115	76	24	6	5
Evansville, Ind.	39	24	11	2	–	3
Fort Wayne, Ind.	37	21	7	5	2	1
Gary, Ind.	23	11	9	2	–	1
Grand Rapids, Mich.	51	30	13	6	1	3
Indianapolis, Ind.	152	79	46	14	9	1
Madison, Wis.	44	23	14	2	3	2
Milwaukee, Wis.	118	73	38	5	1	1
Peoria, Ill.	42	24	11	1	5	1
Rockford, Ill.	37	28	8	–	–	1
South Bend, Ind.	37	27	9	–	1	1
Toledo, Ohio	94	65	19	6	3	–
Youngstown, Ohio	46	26	16	1	2	1
WEST NORTH CENTRAL	710	448	170	38	27	23
Des Moines, Iowa	42	31	5	3	1	1
Duluth, Minn.	21	18	2	–	–	2
Kansas City, Kans.	20	6	7	6	–	1
Kansas City, Mo.	126	76	33	5	7	4
Lincoln, Nebr.	12	8	3	–	–	–
Minneapolis, Minn.	102	67	26	4	2	3
Omaha, Nebr.	88	56	26	2	–	–
St. Louis, Mo.	185	115	47	8	12	6
St. Paul, Minn.	65	43	10	5	3	2
Wichita, Kans.	49	28	11	5	2	4

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	1,151	645	339	89	35	50
Atlanta, Ga.	140	72	47	13	3	5
Baltimore, Md.	249	139	68	23	10	7
Charlotte, N. C.	38	21	9	2	3	–
Jacksonville, Fla.	101	61	25	7	4	5
Miami, Fla.	83	48	27	5	1	2
Norfolk, Va.	55	29	18	4	2	1
Richmond, Va.	81	44	30	2	2	11
Savannah, Ga.	33	17	11	1	2	3
St. Petersburg, Fla.	75	59	12	4	–	1
Tampa, Fla.	52	34	10	7	–	5
Washington, D. C.	175	84	53	18	7	7
Wilmington, Del.	69	37	24	3	1	3
EAST SOUTH CENTRAL	665	382	181	49	27	31
Birmingham, Ala.	121	60	41	10	6	–
Chattanooga, Tenn.	39	30	7	–	1	8
Knoxville, Tenn.	36	22	10	4	–	–
Louisville, Ky.	129	69	36	11	9	12
Memphis, Tenn.	177	95	54	13	6	6
Mobile, Ala.	34	23	4	3	1	3
Montgomery, Ala.	39	29	5	2	–	1
Nashville, Tenn.	90	54	24	6	4	1
WEST SOUTH CENTRAL	1,057	591	268	85	57	19
Austin, Tex.	11	3	4	1	2	–
Baton Rouge, La.	58	28	11	7	10	3
Corpus Christi, Tex.	41	26	10	2	2	–
Dallas, Tex.	185	104	47	16	12	2
El Paso, Tex.	45	25	12	4	1	3
Fort Worth, Tex.	88	55	25	4	1	–
Houston, Tex.	166	85	49	17	2	–
Little Rock, Ark.	58	34	15	5	4	4
New Orleans, La.	146	72	46	11	6	–
San Antonio, Tex.	154	98	28	10	9	5
Shreveport, La.	55	27	16	5	4	1
Tulsa, Okla.	50	34	5	3	4	1
MOUNTAIN	443	272	87	34	15	15
Albuquerque, N. Mex.	59	32	13	6	–	2
Colorado Springs, Colo.	29	15	6	4	1	3
Denver, Colo.	90	52	20	8	5	2
Las Vegas, Nev.	25	15	4	3	–	4
Ogden, Utah	15	11	2	–	–	2
Phoenix, Ariz.	93	63	16	7	4	2
Pueblo, Colo.	21	16	5	–	–	–
Salt Lake City, Utah	50	28	9	4	3	–
Tucson, Ariz.	61	40	12	2	2	–
PACIFIC	1,445	928	314	90	52	29
Berkeley, Calif.	17	11	3	3	–	–
Fresno, Calif.	53	29	6	5	7	2
Glendale, Calif.	26	18	5	2	1	–
Honolulu, Hawaii	52	28	14	3	4	–
Long Beach, Calif.	91	51	28	5	4	–
Los Angeles, Calif.	301	199	61	17	10	7
Oakland, Calif.	79	50	16	8	3	–
Pasadena, Calif.	38	24	10	2	1	–
Portland, Oreg.	167	105	39	7	6	3
Sacramento, Calif.	59	33	18	5	1	2
San Diego, Calif.	125	75	30	8	4	2
San Francisco, Calif.	148	96	36	15	1	2
San Jose, Calif.	49	40	8	1	–	3
Seattle, Wash.	155	110	24	5	8	3
Spokane, Wash.	42	25	12	2	2	1
Tacoma, Wash.	43	34	4	2	–	4
TOTAL	10,685	6,447	2,702	731	389	368
Expected Number	11,195	6,719	2,889	754	385	369

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

The Morbidity and Mortality Weekly Report, circulation 67,500, 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.

Current Trends

Influenza Surveillance Reporting Systems, 1976-77

During the 1976-77 influenza season, epidemiologic and laboratory surveillance for influenza was extensive. Over 4,000 surveillance sites — consisting of 1,572 schools and industries, 848 sentinel physicians and hospitals, 1,651 county-based health units, and 91 laboratories — systematically reported morbidity and virus isolation data to state, territorial, and military epidemiologists. These data were then forwarded to CDC for analysis using a computer-based information system.

Because of the possible appearance of new influenza strains during the upcoming influenza season, CDC is requesting that state and territorial epidemiologists reinstitute intensified influenza surveillance by mid-September. Major indicators of influenza activity include patient visits for influenza to sentinel physicians, school and industry absenteeism rates, hospital clinic and emergency visits for upper respiratory infections, and pneumonia and influenza deaths. During the 1976-77 influenza season, patient visits and school absenteeism data were most helpful in identifying influenza outbreaks. Industrial absenteeism rates were least helpful. Described below are 2 specialized types of surveillance systems which were useful in CDC's overall assessment of influenza last season. Elements of each may be applicable to local and statewide surveillance systems.

United States Air Force (USAF): The Influenza Immunization and Surveillance Program of the USAF utilized a surveillance network of 11 overseas and 11 continental U.S. installations. Each base was requested to submit weekly morbidity rates due to upper respiratory illness and influenza-like illness. Whenever rates exceeded a threshold of 5 new cases/1,000 base population (including dependents)/week, sentinel bases were requested to submit throat wash specimens for viral isolation and acute/convalescent paired sera from randomly selected patients with clinical disease. Specimens were taken from patients that met the following criteria: influenza-like illness, onset <3 days, fever ≥ 101 F, and age >5 years. Non-sentinel bases submitted specimens to a state or federal laboratory whenever the threshold level of illness was exceeded.

Viral specimens were tested at the Epidemiology Division of the School of Aerospace Medicine, Brooks Air Force Base (AFB), and examined primarily for type A and B influenza virus. Acute and convalescent serum specimens were examined by the complement-fixation test against a 9-antigen respiratory battery. When appropriate, hemagglutination inhibition tests for specific influenza strains were performed.

The USAF System was reinstituted on August 15, 1977.

National Institute of Allergy and Infectious Diseases (NIAID): Because of the isolation of an A/New Jersey swine-like virus from humans in February 1976, efforts were made to improve and broaden surveillance of influenza in animals in the United States. These efforts resulted in the NIAID support of a nationwide animal influenza surveillance system during the 1976-77 influenza season.

Based at St. Jude's Hospital, Memphis, Tennessee, and the University of Wisconsin in Madison, the system concentrated surveillance activities on influenza in birds and swine. Bird surveillance consisted of random sampling of migratory waterfowl in Wisconsin, Tennessee, Alaska, and other states. Various methods were used to collect data on influenza in swine: 1) weekly virologic and serologic specimens were collected from swine at slaughterhouses in Memphis and Madison; 2) serum specimens from older breeding stock submitted for routine brucellosis testing were analyzed for the presence of influenza antibodies; 3) serum specimens collected on a random basis by state diagnostic laboratories were examined for the presence of influenza antibodies; and 4) sentinel veterinarians throughout the midwestern states reported on the presence of influenza in animals seen in their practices.

Data from this system were integral to the field investigations of possible outbreaks of A/New Jersey influenza last season. In Wisconsin in November 1976, the first isolation of an A/New Jersey/76-like infection present concurrently in swine and man was made by a sentinel veterinarian and a member of this NIAID-funded group. NIAID will continue to support animal influenza surveillance during the next year.

Reported by LE Blouse, PhD, HJ Dupuy, PhD, Col GD Lathrop, MD, PhD, USAF School of Aerospace Medicine, Brooks AFB; VS Hinshaw, PhD, RG Webster, PhD, St. Jude's Hospital, Memphis; BC Easterday, DVM, PhD, University of Wisconsin, Madison; JR LaMontagne, PhD, NIAID, National Institutes of Health, Bethesda, Maryland; Surveillance and Assessment Br, Immunization Div, Bur of State Services, CDC.

Editorial Note: The USAF's worldwide influenza surveillance network utilized patient-visit rates to assess influenza activity. In semi-closed populations with a single medical delivery system, patient visits can be sensitive indicators of influenza activity and can be used to quantify the extent of influenza morbidity. Coupled with rapid virologic and serologic identification, patient visit rates can effectively aid in identifying prevalent strains of influenza and in providing data on vaccine efficacy against the challenge of epidemic influenza.

The epizootic features of animal influenza are not unlike the epidemic features of the disease that are observed in humans. The pattern, incidence, and nature of the disease are influenced by the level of population immunity and by the antigenic and biologic characteristics of the virus (*1*). No animal-to-animal interspecies influenza infections have been identified under natural conditions.

Reference

1. Easterday BC: Animal influenza, in Kilbourne ED (ed): The Influenza Viruses and Influenza. New York, Academic Press, 1975, pp 270-310

International Notes

Dengue — United States, Dominica

United States: Forty-four suspect imported cases of dengue have been reported to CDC since July 1977. Cases have been reported by 21 states and the District of Columbia, including 8 of 10 states known to be infested with *Aedes aegypti*. No known secondary transmission has occurred. A flavivirus isolated from an imported case in Louisiana

has been identified as dengue type 1 by the Walter Reed Army Institute of Research. This is the first time dengue type 1 has been isolated from a person in the continental United States.

In Puerto Rico, an outbreak of dengue, probably due to type 2, has been recognized (Table 2). Serum specimens on 29 clinically compatible cases were tested in July; 21 of these had antibody rises compatible with dengue type 2 infection.

TABLE 2. Suspect cases of dengue, by week, Puerto Rico, July-August, 1977

Week Ending	Number of cases
July 9	2
July 16	13
July 23	19
July 30	29
August 3*	32
August 10	59
August 17	106
August 24	264

*Reporting day changed from Friday to Wednesday on this date

Five strains of flavivirus have been isolated from mosquitoes inoculated with sera from patients who had onset of illness in July. None of the patients had any history of travel to Jamaica, and thus far there is no evidence of dengue type 1 activity in Puerto Rico.

An islandwide *Aedes aegypti* survey carried out in July showed that house indices* ranged from 2-88% with 77 out of 79 municipalities surveyed; 74 of these had indices of 5% or greater, and 59 were 20% or greater. The Puerto Rico Department of Health has accepted delivery of 8 truck-mounted, ultra-low-volume spraying machines for use in mosquito control.

Dominica: The Dominica Ministry of Health has reported an outbreak of dengue-like illness, with clinically compatible cases occurring primarily in the Roseau area. Laboratory confirmation of flavivirus has been done by the Caribbean Epidemiology Center, Trinidad, and the San Juan Laboratories, Bureau of Laboratories, CDC. The Ministry of Health is currently intensifying surveillance activities.

Reported by J Chiriboga, MD, Environmental Health Dept; Puerto Rico; Dominica Ministry of Health, Dominica; Caribbean Epidemiology Center, Trinidad; J McCown, Walter Reed Army Institute of Research, District of Columbia; San Juan Laboratories, Bur of Laboratories, Bur of Tropical Diseases, and Viral Diseases Div, Bur of Epidemiology, CDC.

*house index = percentage of dwellings visited that had *Aedes aegypti* mosquitoes or larvae present

Current Trends

Follow-up on Western Equine Encephalitis — United States

Following earlier reports of widespread Western Equine Encephalitis (WEE) in horses (*1*), the first cases of WEE infection in humans have been reported: a total of 5 cases, 4 serologically confirmed and 1 presumptive, from North and South Dakota and Colorado.

Three confirmed cases, a 3-month-old child from Minot, North Dakota, an 8-year-old girl from Grand Forks, North Dakota, and a 67-year-old man from Lake Preston, South Dakota, had onset of clinical encephalitis in July.

Two WEE cases have been reported from Colorado, one a confirmed case involving a man from Loveland, the other a presumptive case involving a teenage boy from the Ft. Collins area. A number of suspect clinical cases are being studied. Over 100 confirmed and presumptive equine cases have been identified, most from north and east of Denver.

In late June CDC isolated WEE virus from blood of nestling house sparrows collected in Fort Collins (Larimer County), Colorado, and subsequently made over 200 isolations of WEE virus and 4 of St. Louis Encephalitis (SLE) from pools of *Culex tarsalis* mosquitoes collected in Larimer, Weld, Boulder, Pueblo, Fremont, Morgan, and Logan counties.

The state health departments from Colorado, North Dakota, and South Dakota have alerted the public to the cases and advised persons to protect themselves against mosquitoes (by the use of insect repellent and protective clothing) and to drain any standing water that could breed these vectors.

Reported by K Mosser, State Epidemiologist, North Dakota State Dept of Health; JD Corning, BA, State Epidemiologist, South Dakota State Dept of Health; J Emerson, DVM, L Kutchinsky, MPH, TM Vernon, MD, State Epidemiologist, Colorado State Dept of Health; Vector-Borne Diseases Div, Bur of Laboratories, and Viral Diseases Div, Bur of Epidemiology, CDC.

Reference

1. MMWR 26:265, 1977

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