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Recommendation of the Public Health Services Advisory Committee on Immunization Practices

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Recommendation of the Public Health Service
Advisory Committee on Immunization Practice

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Influenza Vaccine — Supplemental Statement*

INTRODUCTION

This Committee's preliminary statement on influenza for 1976-77 was published in early June.* In it there was extensive reference to field trials of prototype vaccines to be used in the National Influenza Immunization Program. The trials were conducted to provide a basis for making specific recommendations on vaccine formulation and vaccine dosage for different age groups and for accurately describing the side effects that might be expected to follow vaccination.

Data from these field trials were analyzed at an Influenza Workshop held in Bethesda, Maryland, on June 21, 1976. The Workshop was sponsored by the National Institute of Allergy and Infectious Diseases (National Institutes of Health), the Bureau of Biologics (Food and Drug Administration), the Center for Disease Control, all in the Department of Health, Education, and Welfare, and by the Department of Defense—the same agencies that had sponsored the vaccine studies. The following summary of results, of partial recommendations on swine influenza vaccination for adults, and of related comments and recommendations has been derived from review of field trial data and consideration of other important issues.

SWINE INFLUENZA VACCINE FIELD TRIALS (SPRING 1976)

Field trials of prototype vaccines from the 4 United States influenza vaccine producers involved more than 5,200 adults and children. The trials were designed to evaluate the immunogenicity and reactogenicity of different doses of swine influenza vaccines. Trials were double-blind with placebo controls and used comparable protocols and analytical methods. All serum samples were tested at CDC.

Vaccines in the field trials were monovalent preparations of swine influenza virus (Hsw1N1), bivalent preparations including both swine influenza virus and A/Victoria/75 (H3N2), and monovalent B preparations containing B/Hong Kong/72. All manufacturers used standard procedures to purify, concentrate, and inactivate the virus. Two manufacturers supplied whole-virus vaccines, and 2 provided split-virus (chemically disrupted) vaccines.

Preliminary analysis of field trial data provides the following general conclusions:

1. Approximately 90% of the vaccinees 25 years of age or older responded well to even the lowest adult dose (200 CCA units) of monovalent swine influenza vaccines; whole-virus and split-virus vaccines induced comparable antibody responses. Vaccine side effects, principally low-grade fever, malaise, and myalgia, among the adult volunteers were most frequent with the highest test dose (800 CCA units) of whole-virus vaccines. Only about 2% of adults receiving 200 CCA unit vaccines had any such effects, a rate essentially equivalent to that following injection of placebo material.

2. Children 3-10 years old had less favorable immune responses to the swine influenza vaccines than did adults. Although whole-virus vaccines were considerably more effective inducers of antibody in this age group than were split-virus vaccines, the whole-virus antigens were also more reactogenic, even at the lowest childhood doses used (50 and 100 CCA units). Additional field trials with children and adolescents will be needed to measure the immunogenicity and reactogenicity of other doses of vaccine and the benefit of second doses.

3. Young adults ages 18-24 had less favorable antibody responses to the swine influenza vaccines than did older adults. Like younger children, their best responses were to whole-virus vaccines, particularly to the most potent ones tested (800 CCA units). However, persons in this age group experienced considerably fewer side effects to the more potent vaccines than did young children.

4. Bivalent A vaccines containing both swine influenza virus and A/Victoria/75 virus, either whole or split, at 200 CCA or 400 CCA units of each component antigen, were about equally immunogenic in persons 25 years of age or older. They were less effective in younger persons. Side effects from these vaccines were similar in adults to those from monovalent swine influenza vaccines.

5. Monovalent B/Hong Kong/72 vaccines containing 500 CCA units of antigen produced good antibody re-

*Supplemental to Influenza Vaccine — Preliminary Statement, published in the MMWR (25)21:165-171, June 4, 1976.

(Influenza - Continued)

sponses in nearly all adult vaccinees tested. The antigen induced few side effects of its own, and, when given simultaneously with bivalent A vaccine, did not appear appreciably to enhance reactogenicity.

6. Vaccines administered by needle/syringe and by jet injector produced comparable rates of seroconversion and levels of antibody response.

INFLUENZA VACCINE RECOMMENDATIONS

General Comments

Results of the recent field trials provide clear evidence that adults of approximately 25 years of age or older can safely and effectively be immunized against A/New Jersey influenza with a single dose of vaccine. Furthermore, the trials indicate that younger adults and children as young as 3 years old can also be safely immunized but that additional data will be needed before specifying the precise vaccine potency and optimal schedule for them. Although data from additional field studies will be needed to substantiate and complete recommendations for the young adult and childhood age groups, plans for vaccinating all age groups of the population should continue.

Studies underway now and others soon to begin should be completed by mid-to-late-September in time for vaccination programs to proceed.

The current recommendations address the population above secondary school age, namely that 18 years of age

and older. Although within this adult group, those 18-24 years old are immunologically distinctive from those 25 years of age and older, as a result of having had less experience with various naturally occurring influenza viruses, all persons in this age group can be given the same potency vaccine. If additional vaccine trials in the 18- to 24- year-old group indicate that sufficient benefit will be derived from a second dose of vaccine, it will be recommended. Furthermore, since whole-virus vaccine produces better antibody responses in the 18- to 24- year-old group, plans should be made to utilize this vaccine for this group.

Swine Influenza Vaccine Formulations

For those 18 years of age and older, influenza vaccines, both monovalent A and bivalent A, will contain 200 CCA units of A/New Jersey/76 (swine influenza virus). The bivalent A vaccine will also contain 200 CCA units of the A/Victoria/75 antigen. A single dose of either vaccine should result in antibody responses against swine influenza generally considered protective in at least 85-90% of vaccinees of approximately age 25 or more. Persons 18-24 years of age will probably not respond as well to the swine influenza antigen, but at least 85% of those receiving whole-virus vaccine should develop demonstrable antibodies.

Side effects from these vaccines, including 1-2 days of low grade fever, malaise, and myalgia, should occur in less than 2-3% of vaccinees 18 years of age or older.

(Continued on page 227)

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

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

DISEASE	28th WEEK ENDING		MEDIAN 1971-1975	CUMULATIVE, FIRST 28 WEEKS		
	July 17, 1976	July 12, 1975		July 17, 1976	July 12, 1975	MEDIAN 1971-1975
Aseptic meningitis	67	115	116	1,088	1,265	1,247
Brucellosis	2	7	6	123	115	85
Chickenpox	1,324	1,144	---	143,535	112,870	---
Diphtheria	1	-	1	115	192	107
Encephalitis	Primary	25	20	421	371	449
	Post-Infectious	9	5	156	176	166
Hepatitis, Viral	Type B	310	228	7,823	5,982	4,963
	Type A	626	603	18,800	18,891	27,271
	Type unspecified	197	130	4,836	4,340	
Malaria	13	16	8	208	178	178
Measles (rubeola)	528	316	316	32,859	19,884	22,969
Meningococcal infections, total	34	38	31	999	895	895
Civilian	34	35	31	992	875	875
Military	-	3	1	7	20	23
Mumps	350	580	666	30,799	43,719	51,729
Pertussis	18	32	---	483	694	---
Rubella (German measles)	145	112	162	10,125	14,193	19,448
Tetanus	3	2	2	24	40	42
Tuberculosis	610	730	---	17,954	17,657	---
Tularemia	11	3	7	74	63	73
Typhoid fever	9	5	9	184	157	163
Typhus, tick-borne (Rky. Mt. spotted fever)	53	21	23	366	344	312
Veneral Diseases:						
Gonorrhea						
Civilian	19,853	18,993	---	521,056	508,137	---
Military	302	441	---	15,357	15,777	---
Syphilis, primary and secondary	482	471	---	13,046	13,626	---
Civilian	6	4	---	185	182	---
Military						
Rabies in animals	39	38	53	1,374	1,321	2,019

Table II. Notifiable Diseases of Low Frequency: United States

	CUM.		CUM.
Anthrax:	2	Poliomyelitis, total:	5
Botulism: Alaska B	18	Paralytic:	5
Congenital rubella syndrome:	15	Psittacosis: Wash. 1, Calif. 1	25
Leprosy: NYC 1, Calif. 1	77	Rabies in man: Md. 1	1
Leptospirosis: Ohio 1	23	Trichinosis:	58
Plague:	8	Typhus, murine: Tex. 4	17

Table III
Cases of Specified Notifiable Diseases: United States
Weeks Ending July 17, 1976 and July 12, 1975 - 28th Week

AREA REPORTING	ASEPTIC MENINGITIS	BRUCELLOSIS	CHICKEN-POX	DIPHTHERIA		ENCEPHALITIS			HEPATITIS, VIRAL			MALARIA	
						Primary: Arthropod-borne and Unspecified		Post Infectious	Type B	Type A	Type Unspecified		
						1976	1975	1976	1976	1976	1976		
UNITED STATES	67	2	1,324	1	115	25	20	9	310	626	197	13	208
NEW ENGLAND	-	-	254	-	-	-	2	-	6	24	16	-	9
Maine	-	-	9	-	-	-	-	-	-	10	-	-	-
New Hampshire	-	-	-	-	-	-	-	-	-	4	-	-	-
Vermont	-	-	-	-	-	-	-	-	-	-	-	-	-
Massachusetts	-	-	230	-	-	-	2	-	2	4	16	-	4
Rhode Island	-	-	20	-	-	-	-	-	3	2	-	-	2
Connecticut	-	-	35	-	-	-	-	-	1	4	-	-	3
MIDDLE ATLANTIC	7	-	154	-	-	5	-	3	74	102	19	3	35
Upstate New York	2	-	37	-	-	3	-	3	19	30	2	1	7
New York City	4	-	116	-	-	-	-	-	21	25	-	1	17
New Jersey *	-	-	NN	-	-	1	-	-	21	31	16	1	3
Pennsylvania *	1	-	1	-	-	1	-	-	13	16	1	-	8
EAST NORTH CENTRAL	7	-	480	-	-	9	4	3	44	100	20	2	16
Ohio	1	-	68	-	-	5	2	2	7	24	-	-	7
Indiana	4	-	33	-	-	2	-	-	-	5	7	-	-
Illinois	-	-	94	-	-	2	-	-	14	17	3	-	2
Michigan	2	-	107	-	-	-	2	-	19	47	10	1	6
Wisconsin	-	-	178	-	-	-	-	1	4	7	-	1	1
WEST NORTH CENTRAL	-	1	34	-	4	3	-	-	8	38	23	3	9
Minnesota	-	1	-	-	-	-	-	-	-	3	4	-	3
Iowa *	-	-	5	-	-	2	-	-	-	4	-	-	-
Missouri *	-	-	1	-	1	-	-	-	6	25	18	3	3
North Dakota	-	-	6	-	-	-	-	-	-	2	-	-	-
South Dakota	-	-	-	-	3	-	-	-	-	2	-	-	2
Nebraska	-	-	14	-	-	-	-	-	-	1	-	-	1
Kansas	-	-	8	-	-	1	-	-	2	1	1	-	-
SOUTH ATLANTIC	12	-	141	-	-	2	1	1	56	123	28	1	37
Delaware	-	-	3	-	-	-	-	-	-	-	-	-	-
Maryland	2	-	15	-	-	2	-	-	11	12	3	-	5
District of Columbia	-	-	16	-	-	-	-	-	4	2	-	-	5
Virginia *	1	-	27	-	-	-	-	-	7	9	9	-	8
West Virginia	-	-	65	-	-	1	-	-	1	4	-	-	1
North Carolina	1	-	NN	-	-	-	-	-	2	10	3	1	4
South Carolina	-	-	2	-	-	-	-	1	1	3	2	-	1
Georgia	-	-	-	-	-	-	-	-	-	24	-	-	4
Florida	8	-	9	-	-	-	-	-	30	59	11	-	9
EAST SOUTH CENTRAL	11	-	63	-	-	3	1	1	20	67	5	-	1
Kentucky *	6	-	58	-	-	1	-	1	2	16	1	-	-
Tennessee	5	-	NN	-	-	1	-	-	15	35	3	-	-
Alabama	-	-	5	-	-	-	1	-	1	2	1	-	-
Mississippi	-	-	-	-	-	1	-	-	2	14	-	-	1
WEST SOUTH CENTRAL	15	1	53	-	1	1	10	-	26	46	39	2	9
Arkansas	1	1	-	-	-	-	1	-	-	7	5	-	-
Louisiana	4	-	NN	-	-	-	-	-	6	5	2	-	1
Oklahoma	-	-	10	-	-	-	4	-	3	11	3	1	1
Texas *	10	-	43	-	1	1	5	-	17	23	29	1	7
MOUNTAIN	1	-	47	-	3	-	-	-	15	21	13	-	8
Montana	1	-	4	-	-	-	-	-	-	-	1	-	-
Idaho	-	-	-	-	-	-	-	-	-	-	-	-	-
Wyoming	-	-	-	-	-	-	-	-	-	-	-	-	-
Colorado	-	-	30	-	3	-	-	-	13	4	8	-	5
New Mexico	-	-	-	-	-	-	-	-	-	3	-	-	1
Arizona	-	-	-	-	-	-	-	-	-	9	3	-	1
Utah	-	-	7	-	-	-	-	-	2	5	1	-	-
Nevada	-	-	6	-	-	-	-	-	-	-	-	-	1
PACIFIC	14	-	58	1	107	2	2	1	61	105	34	2	84
Washington	-	-	31	1	104	-	1	-	4	5	7	-	2
Oregon	-	-	-	-	-	-	-	-	3	6	1	-	5
California *	13	-	-	-	1	2	1	1	53	93	25	2	76
Alaska	-	-	2	-	2	-	-	-	-	-	-	-	-
Hawaii	1	-	25	-	-	-	-	-	1	1	1	-	1
Guam *	-	-	-	-	-	-	-	-	-	-	-	-	-
Puerto Rico	-	-	-	-	1	-	-	-	-	19	-	-	1
Virgin Islands	-	-	-	-	-	-	-	-	-	-	-	-	-

NN: Not notifiable

*Delayed Reports: Asep. Meng: N. J. add 2, Pa. delete 1, Tex. delete 20; Chickenpox: Iowa add 4, Calif. add 8, Guam add 8; Endeph., post: Mo. add 2; Hep. B: Guam add 1; Hep. A: Iowa add 1, Mo. delete 6, Va. delete 2, Ky. delete 1, Guam add 3; Hep. Unsp.: Mo. delete 1, Guam add 1

Table III-Continued
 Cases of Specified Notifiable Diseases: United States
 Weeks Ending July 17, 1976 and July 12, 1975 - 28th Week

REPORTING AREA	MEASLES (Rubella)			MENINGOCOCCAL INFECTIONS TOTAL			MUMPS		PERTUSSIS	RUBELLA		TETANUS
	1976	CUMULATIVE		1976	CUMULATIVE		1976	CUM. 1976	1976	1976	CUM. 1976	CUM. 1976
		1976	1975		1976	1975						
UNITED STATES	528	32,859	19,884	34	999	895	350	30,799	18	145	10,125	24
NEW ENGLAND	3	368	267	1	42	52	34	1,202	1	3	264	-
Maine	-	6	11	-	-	6	4	109	-	-	3	-
New Hampshire	-	10	20	-	3	2	-	25	-	-	11	-
Vermont	1	28	47	-	3	-	-	8	-	-	1	-
Massachusetts	-	39	95	1	12	17	-	147	1	2	132	-
Rhode Island	-	14	2	-	4	3	4	423	-	-	5	-
Connecticut	2	271	92	-	20	24	26	490	-	1	112	-
MIDDLE ATLANTIC	83	6,726	1,573	12	138	97	72	2,702	-	26	2,217	1
Upstate New York	46	2,815	475	4	52	28	7	342	-	22	573	1
New York City	16	418	117	1	35	28	62	1,394	-	2	133	-
New Jersey	2	583	453	7	24	16	-	471	-	1	1,322	-
Pennsylvania	19	2,910	528	-	27	25	3	495	-	1	189	-
EAST NORTH CENTRAL	158	13,867	5,912	4	156	122	96	12,938	3	70	3,795	1
Ohio	7	562	103	1	83	26	18	1,861	1	5	272	1
Indiana	72	3,051	337	1	6	6	15	1,384	-	16	654	-
Illinois	22	1,446	1,556	-	13	19	4	1,718	1	6	1,142	-
Michigan	43	5,557	2,963	2	46	55	22	4,774	1	39	1,341	-
Wisconsin	14	3,251	953	-	8	16	37	3,201	-	4	386	-
WEST NORTH CENTRAL	2	1,094	4,850	-	61	50	8	3,215	1	-	375	3
Minnesota	-	388	180	-	12	12	-	543	-	-	25	-
Iowa*	-	31	483	-	8	5	3	1,140	-	-	81	-
Missouri*	1	17	251	-	21	22	2	301	-	-	29	1
North Dakota	-	3	1,042	-	3	-	2	121	-	-	1	1
South Dakota	-	4	356	-	1	1	-	6	1	-	18	-
Nebraska	1	55	394	-	3	2	-	97	-	-	3	-
Kansas	-	596	2,144	-	13	8	1	1,007	-	-	218	1
SOUTH ATLANTIC	199	2,175	259	5	183	180	39	2,337	1	15	1,250	7
Delaware	-	128	35	2	6	6	1	41	-	1	31	-
Maryland	158	829	41	-	16	19	22	626	-	-	3	2
District of Columbia	3	12	1	-	2	5	3	100	-	-	45	-
Virginia	18	699	22	-	23	17	6	188	-	8	232	1
West Virginia	2	179	123	-	4	5	6	720	1	6	277	-
North Carolina	9	9	1	-	34	34	-	367	-	-	17	-
South Carolina	-	4	-	2	33	29	-	37	-	-	588	-
Georgia	-	1	11	-	16	9	-	-	-	-	1	-
Florida	9	314	25	1	49	56	1	258	-	-	56	4
EAST SOUTH CENTRAL	11	767	262	2	82	134	35	2,606	4	4	323	2
Kentucky	6	717	81	-	14	57	19	934	-	-	148	1
Tennessee	5	35	170	2	37	45	11	1,380	1	4	171	1
Alabama	-	-	3	-	22	23	3	244	1	-	1	-
Mississippi	-	15	8	-	9	9	2	48	2	-	3	-
WEST SOUTH CENTRAL	4	658	259	5	154	142	26	2,137	4	2	481	7
Arkansas	-	-	-	1	9	8	3	71	2	-	189	-
Louisiana	-	184	-	1	27	24	-	20	-	-	85	2
Oklahoma	-	287	116	-	18	9	7	612	-	-	55	-
Texas	4	187	143	3	100	101	16	1,434	2	2	152	5
MOUNTAIN	9	5,003	1,298	1	36	34	1	1,047	-	-	461	1
Montana	-	202	38	-	4	7	-	20	-	-	232	-
Idaho	-	2,020	6	1	4	5	1	433	-	-	18	-
Wyoming	-	3	1	-	-	-	-	1	-	-	2	-
Colorado	1	297	1,097	-	11	9	-	206	-	-	21	-
New Mexico	-	15	13	-	3	4	-	127	-	-	31	-
Arizona	-	225	60	-	8	1	-	-	-	-	-	1
Utah	8	2,178	59	-	4	7	-	146	-	-	139	-
Nevada	-	63	24	-	2	1	-	114	-	-	18	-
PACIFIC	59	2,201	5,204	4	147	84	39	2,615	4	25	959	2
Washington	14	329	270	1	25	15	3	842	-	-	154	-
Oregon	-	143	189	-	13	4	6	324	1	4	128	1
California	45	1,726	4,686	1	94	64	30	1,411	3	19	660	1
Alaska	-	-	-	2	13	-	-	18	-	1	1	-
Hawaii	-	3	59	-	2	1	-	20	-	1	16	-
Guam*	-	9	22	-	1	2	-	10	-	-	5	-
Puerto Rico	15	267	493	-	3	1	6	601	-	1	8	3
Virgin Islands	-	8	8	-	-	-	1	22	-	-	8	1

*Delayed Reports: Men. Inf.: Mo. add 1; Mumps: Iowa add 2, Mo. delete 4, Guam add 1; Pertussis: Mo. add 1

Table III-Continued
 Cases of Specified Notifiable Diseases: United States
 Weeks Ending July 17, 1976 and July 12, 1975 - 28th Week

REPORTING AREA	TUBERCULOSIS		TULA- REMIA	TYPHOID FEVER		TYPHUS-FEVER TICK-BORNE (RMSF)		VENEREAL DISEASES (Civilian Cases Only)					RABIES IN ANIMALS CUM. 1976	
	1976	CUM. 1976	CUM. 1976	1976	CUM. 1976	1976	CUM. 1976	GONORRHEA		SYPHILIS (Pri. & Sec.)				
								1976	CUMULATIVE		1976	CUMULATIVE		
									1976	1975		1976		1975
UNITED STATES	610	17,954	74	9	184	53	366	19,853	521,056	508,137	482	13,046	13,626	1,374
NEW ENGLAND	23	662	1	-	17	-	4	687	14,170	13,913	10	383	468	24
Maine	-	44	-	-	-	-	-	41	1,205	990	-	8	9	14
New Hampshire	1	26	-	-	2	-	-	18	384	391	1	7	10	-
Vermont	-	17	-	-	-	-	-	19	352	327	1	4	5	-
Massachusetts	13	407	1	-	13	-	3	426	6,846	6,589	7	279	304	9
Rhode Island	3	44	-	-	-	-	1	27	915	1,091	-	15	7	1
Connecticut	6	124	-	-	2	-	-	156	4,468	4,525	1	70	133	-
MIDDLE ATLANTIC	99	3,399	1	2	30	1	10	2,956	60,005	59,212	57	2,163	2,501	13
Upstate New York	11	546	1	-	5	-	3	610	9,355	10,483	4	136	233	4
New York City	63	1,394	-	-	15	-	1	1,467	27,099	25,642	29	1,337	1,412	-
New Jersey	14	635	-	1	7	1	6	399	9,376	8,145	12	320	400	3
Pennsylvania	11	824	-	1	3	-	-	480	14,175	14,942	12	370	456	6
EAST NORTH CENTRAL	77	2,447	-	-	15	1	7	2,819	83,098	82,457	51	1,188	1,123	77
Ohio	34	452	-	-	5	1	5	629	20,382	21,721	8	276	264	-
Indiana	16	310	-	-	-	-	-	508	8,206	7,709	4	60	72	16
Illinois	10	823	-	-	3	-	-	963	29,550	28,638	34	659	541	15
Michigan*	17	727	-	-	6	-	2	498	17,170	16,182	3	136	191	2
Wisconsin	-	135	-	-	1	-	-	221	7,790	8,207	2	57	55	44
WEST NORTH CENTRAL	13	635	21	-	11	-	7	1,071	26,876	24,976	5	219	312	339
Minnesota	1	120	3	-	6	-	-	132	4,818	5,243	3	48	62	75
Iowa	3	52	1	-	1	-	-	156	3,381	3,440	1	23	17	77
Missouri*	7	317	16	-	3	-	7	478	10,786	8,980	1	93	170	43
North Dakota	-	15	-	-	-	-	-	15	391	388	-	-	5	73
South Dakota	-	29	-	-	-	-	-	34	746	966	-	2	4	14
Nebraska*	1	33	-	-	-	-	-	109	2,322	2,211	-	16	4	11
Kansas	1	69	1	-	1	-	-	147	4,432	3,748	-	37	50	46
SOUTH ATLANTIC	172	3,981	4	3	23	31	195	5,307	125,987	126,666	168	3,870	4,227	207
Delaware	2	46	-	-	-	-	1	73	1,624	1,696	-	39	53	3
Maryland*	23	563	1	-	-	-	12	700	17,144	14,431	9	333	315	11
District of Columbia	8	168	-	-	-	-	-	334	7,543	7,472	18	351	359	-
Virginia	48	671	-	-	3	10	57	688	13,175	12,477	26	359	313	34
West Virginia	7	165	-	-	2	-	2	34	1,637	1,554	1	18	13	6
North Carolina*	25	708	3	-	1	12	78	570	18,256	17,940	27	724	544	3
South Carolina*	4	312	-	-	3	2	25	919	12,400	12,017	15	215	292	2
Georgia	18	486	-	-	2	7	19	1,039	23,636	23,597	20	419	555	113
Florida	37	862	-	3	12	-	1	950	30,572	35,482	52	1,412	1,783	33
EAST SOUTH CENTRAL	40	1,484	12	-	7	8	59	1,712	46,471	42,813	23	530	593	77
Kentucky*	9	339	1	-	4	-	8	243	5,836	5,564	3	78	92	41
Tennessee	19	437	11	-	3	5	41	663	18,331	16,032	1	200	221	25
Alabama	5	442	-	-	-	-	3	482	13,273	11,824	5	106	141	11
Mississippi	7	266	-	-	-	3	7	324	9,031	8,593	14	146	139	-
WEST SOUTH CENTRAL	48	1,976	26	-	7	12	77	2,171	68,231	63,118	56	1,523	1,180	343
Arkansas	13	269	12	-	2	-	12	96	6,264	6,528	-	47	34	86
Louisiana	6	292	2	-	2	-	-	298	10,118	11,969	9	332	280	2
Oklahoma	4	192	7	-	-	11	61	275	6,365	5,941	3	61	45	88
Texas*	25	1,223	5	-	3	1	4	1,502	45,484	38,680	44	1,083	821	167
MOUNTAIN	14	520	2	1	18	-	2	670	19,796	19,480	10	414	332	73
Montana	1	29	2	-	2	-	-	42	1,052	1,094	-	4	4	49
Idaho	-	16	-	-	1	-	1	38	1,078	956	-	23	9	-
Wyoming	-	11	-	-	-	-	-	4	391	466	1	8	6	1
Colorado*	3	96	-	-	4	-	-	198	5,166	4,798	6	96	58	4
New Mexico*	5	92	-	-	1	-	1	132	3,843	3,435	-	112	94	3
Arizona*	3	232	-	1	9	-	-	234	5,862	5,378	3	131	119	16
Utah	-	22	-	-	1	-	-	2	936	1,238	-	16	10	-
Nevada*	2	22	-	-	-	-	-	20	1,468	2,115	-	24	32	-
PACIFIC	124	2,850	7	3	56	-	5	2,460	76,422	75,502	102	2,756	2,890	221
Washington	19	283	2	1	3	-	4	214	6,465	6,878	-	62	94	1
Oregon	5	99	1	-	-	-	-	55	5,569	5,546	1	60	69	2
California	90	2,063	4	2	52	-	1	2,065	60,731	59,798	97	2,561	2,692	178
Alaska*	-	48	-	-	-	-	-	64	2,161	1,873	-	11	3	40
Hawaii	10	357	-	-	1	-	-	62	1,496	1,407	4	62	32	-
Guam*	-	24	-	-	-	-	-	-	164	250	-	1	4	-
Puerto Rico	12	191	-	-	-	-	-	101	1,478	1,441	15	315	361	28
Virgin Islands	1	5	-	-	-	-	-	5	142	88	1	41	20	-

*Delayed Reports: TB: Mich. delete 1, Md. delete 3, N.C. delete 2, S. C. delete 8, Ky. delete 3, Tex. add 33, Col. delete 1, Guam add 2; Tularemia: Mo. delete 1; RMSF: Mass. add 1, Mo. add 1; GC: N. Mex. add 117, Nev. add 12, Guam add 8; Syphilis: Neb. delete 1, Alaska delete 1; An. Rabies: Ariz. add 2

Table IV
Deaths in 121 United States Cities*
Week Ending July 24, 1976 - 29th Week

REPORTING AREA	ALL CAUSES					Pneumonia and Influenza ALL AGES	REPORTING AREA	ALL CAUSES					Pneumonia and Influenza ALL AGES
	ALL AGES	65 Years and Over	45-64 Years	25-44 Years	Under 1 Year			ALL AGES	65 Years and Over	45-64 Years	25-44 Years	Under 1 Year	
NEW ENGLAND	621	394	154	36	21	39	SOUTH ATLANTIC	1,296	705	377	109	45	38
Boston, Mass.	200	110	56	13	13	17	Atlanta, Ga.	138	78	33	16	5	-
Bridgeport, Conn.	41	26	12	-	-	4	Baltimore, Md.	262	122	94	19	12	6
Cambridge, Mass.	30	23	5	2	-	3	Charlotte, N. C.	42	19	16	4	1	-
Fall River, Mass.	24	21	3	-	-	-	Jacksonville, Fla.	85	53	17	6	4	2
Hartford, Conn.	44	26	12	5	-	1	Miami, Fla.	118	70	33	10	2	2
Lowell, Mass.	19	11	6	2	-	1	Norfolk, Va.	42	22	15	2	1	3
Lynn, Mass.	13	8	3	2	-	-	Richmond, Va.	108	63	32	5	5	9
New Bedford, Mass.	18	16	2	-	-	-	Savannah, Ga.	40	23	13	1	1	4
New Haven, Conn.	49	30	11	4	2	1	St. Petersburg, Fla.	72	60	8	2	1	5
Providence, R.I.	63	45	11	3	2	8	Tampa, Fla.	75	48	15	5	2	2
Somerville, Mass.	6	1	5	-	-	-	Washington, D. C.	253	118	82	29	11	3
Springfield, Mass.	36	22	10	3	1	1	Wilmington, Del.	61	29	19	10	-	2
Waterbury, Conn.	29	21	7	-	1	1							
Worcester, Mass.	49	34	11	2	2	2	EAST SOUTH CENTRAL	688	375	179	52	35	37
							Birmingham, Ala.	116	61	28	9	8	-
MIDDLE ATLANTIC	2,538	1,546	623	187	83	93	Chattanooga, Tenn.	65	40	15	6	3	3
Albany, N. Y.	53	37	12	2	1	-	Knoxville, Tenn.	49	32	10	5	2	-
Allentown, Pa.	22	15	4	-	3	-	Louisville, Ky.	114	57	28	7	9	12
Buffalo, N. Y.	100	60	27	4	5	5	Memphis, Tenn.	157	82	45	11	6	5
Camden, N. J.	30	22	5	2	1	-	Mobile, Ala.	51	27	13	5	4	3
Elizabeth, N. J.	15	10	4	1	-	-	Montgomery, Ala.	36	22	3	3	3	5
Erie, Pa.	25	13	10	2	-	3	Nashville, Tenn.	100	54	37	6	-	9
Jersey City, N. J.	40	23	12	2	2	1							
Newark, N. J.	61	32	18	5	5	1	WEST SOUTH CENTRAL	1,258	666	352	90	62	26
New York City, N. Y.	1,257	781	291	104	25	37	Austin, Tex.	46	33	9	2	1	-
Paterson, N. J.	43	25	10	4	3	1	Baton Rouge, La.	79	41	26	4	2	1
Philadelphia, Pa.	294	171	72	29	10	26	Corpus Christi, Tex.	56	31	14	2	6	3
Pittsburgh, Pa.	184	100	57	7	11	12	Dallas, Tex.	172	98	51	9	3	1
Reading, Pa.	45	32	8	3	2	-	El Paso, Tex.	51	27	14	2	5	3
Rochester, N. Y.	128	87	22	10	6	2	Fort Worth, Tex.	89	55	22	4	4	1
Schenectady, N. Y.	25	15	9	-	-	-	Houston, Tex.	318	139	95	30	25	3
Scranton, Pa.	44	22	13	5	2	1	Little Rock, Ark.	66	36	23	3	3	1
Syracuse, N. Y.	96	54	25	6	7	3	New Orleans, La.	82	39	28	7	2	1
Trenton, N. J.	26	12	12	-	-	-	San Antonio, Tex.	136	76	33	10	7	4
Utica, N. Y.	19	13	5	-	-	-	Shreveport, La.	55	30	10	6	3	2
Yonkers, N. Y.	31	22	7	1	-	1	Tulsa, Okla.	108	61	27	11	1	6
EAST NORTH CENTRAL	2,321	1,290	641	165	107	50	MOUNTAIN	527	311	117	48	30	22
Akron, Ohio	62	28	24	-	8	-	Albuquerque, N. Mex.	46	22	13	7	2	2
Canton, Ohio	44	24	16	2	1	-	Colorado Springs, Colo.	28	19	5	-	2	5
Chicago, Ill.	565	299	168	41	31	11	Denver, Colo.	125	77	30	7	3	6
Cincinnati, Ohio	178	110	48	11	5	1	Las Vegas, Nev.	23	8	8	6	-	1
Cleveland, Ohio	171	90	51	13	9	1	Ogden, Utah	24	14	4	3	1	1
Columbus, Ohio	89	41	25	7	13	1	Phoenix, Ariz.	116	67	29	8	9	1
Dayton, Ohio	112	63	35	8	4	3	Pueblo, Colo.	20	15	-	5	-	3
Detroit, Mich.	314	163	54	33	9	2	Salt Lake City, Utah	49	30	8	1	8	2
Evansville, Ind.	37	25	7	2	1	3	Tucson, Ariz.	96	59	20	11	5	1
Fort Wayne, Ind.	53	34	12	4	2	4							
Gary, Ind.	32	11	11	6	-	2	PACIFIC	1,706	1,025	445	112	59	45
Grand Rapids, Mich.	54	36	13	2	3	6	Berkeley, Calif.	12	8	3	-	-	-
Indianapolis, Ind.	132	75	35	8	6	1	Fresno, Calif.	61	28	15	9	4	3
Madison, Wis.	44	26	10	4	2	2	Glendale, Calif.	29	19	8	2	-	1
Milwaukee, Wis.	137	91	33	4	3	5	Honolulu, Hawaii	43	23	7	3	6	6
Peoria, Ill.	34	22	9	2	-	-	Long Beach, Calif.	107	60	31	10	2	2
Rockford, Ill.	41	25	7	4	2	1	Los Angeles, Calif.	567	344	141	44	20	17
South Bend, Ind.	43	33	7	-	1	3	Oakland, Calif.	79	56	15	5	1	-
Toledo, Ohio	121	65	37	9	5	3	Pasadena, Calif.	34	17	15	-	1	-
Youngstown, Ohio	58	29	19	5	2	1	Portland, Oreg.	123	74	33	8	3	1
							Sacramento, Calif.	52	22	26	1	2	2
WEST NORTH CENTRAL	770	465	182	40	52	31	San Diego, Calif.	135	68	45	5	7	-
Des Moines, Iowa	69	49	12	1	5	2	San Francisco, Calif.	176	108	46	10	8	5
Duluth, Minn.	21	9	8	-	3	-	San Jose, Calif.	49	36	7	4	1	-
Kansas City, Kans.	51	32	14	3	1	4	Seattle, Wash.	151	103	30	10	4	2
Kansas City, Mo.	120	61	30	9	12	6	Spokane, Wash.	48	33	10	1	-	2
Lincoln, Nebr.	29	17	7	2	3	1	Tacoma, Wash.	40	26	13	-	-	4
Minneapolis, Minn.	102	57	27	6	9	2							
Omaha, Nebr.	79	50	15	3	5	1	TOTAL	11,725	6,777	3,090	839	494	381
St. Louis, Mo.	176	111	42	12	6	10	Expected Number	11,589	6,898	3,043	776	375	345
St. Paul, Minn.	47	34	10	2	1	1							
Wichita, Kans.	76	45	17	2	7	4							

†Delayed Report for Week Ending 7/10/76

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*(Influenza — Continued)***High-Risk Persons 18 Years of Age and Older**

Bivalent A Vaccine: *One* dose of *bivalent A* influenza vaccine containing 200 CCA units of A/New Jersey/76 (swine influenza virus) and 200 CCA units of A/Victoria/75 should be given. (As noted, if additional field trials show sufficient benefit from a second dose for persons 18-24 years old, it will be recommended.)

Monovalent B Vaccine: *One* dose of *monovalent B* influenza vaccine containing 500 CCA units of B/Hong Kong/72 should be given. This vaccine will be available only through commercial sources. It can be given at the same time as the bivalent A vaccine or at another time. If given concurrently, slightly enhanced side effects might be observed. In vaccinating an adult who has previously experienced significant side effects from influenza vaccines, it would be prudent to give the 2 vaccines separately, preferably with the bivalent A vaccine's being given a few days or a week or more before the monovalent B vaccine.

General Population 18 Years of Age or Older

Monovalent A Vaccine: *One* dose of *monovalent A* influenza vaccine containing 200 CCA units of A/New Jersey/76 (swine influenza virus) should be given. (As noted, if additional field trials show sufficient benefit from a second dose for persons 18-24 years old, it will be recommended.)

General Population 17 Years of Age or Younger

Monovalent A Vaccine: Recommendations will be made based on results of studies now underway.

Precautions

Before being vaccinated, persons known to be hypersensitive to egg protein should be given a skin test or other allergy-evaluating test using the swine influenza vaccine as the antigen. Persons with adverse reactions to such testing should not be vaccinated.

Persons with acute febrile illnesses should not be vaccinated until they have recovered.

SIDE EFFECTS AND REACTIONS, GENERAL ASPECTS

Side effects of influenza vaccine are generally inconsequential and occur at low frequency. Severe reactions are uncommon, and truly disabling effects appear to be exceedingly rare. Three types of responses to influenza vaccines have been described:

1. Fever, malaise, myalgia, and other systemic symptoms of toxicity occurring 6-12 hours after vaccination and persisting 1-2 days. These responses to influenza vaccine are usually attributed to characteristics of the influenza virus itself (even though it is inactivated in available vaccines) and represent the bulk of the side effects of influenza vaccination. Such effects occur most frequently in children and in others who have had no previous experience with influenza viruses comparable to the vaccine antigen(s).

2. Immediate, presumably allergic, responses, such as flare and wheal or various respiratory expressions of hypersensitivity. These reactions are exceedingly uncommon but can occur after influenza vaccination. They probably derive from exquisite sensitivity to some vaccine component, most likely to residual egg protein. Although current influenza vaccines contain only a minute quantity of egg protein, they do, on rare occasions, provoke hypersensitivity reactions.

3. Neurologic disorders, including such central nervous system conditions as encephalopathy, with at least temporal association with influenza vaccination. A survey of the medical literature since the early 1950s revealed only about a dozen such reports. Almost all persons affected were adults, and the described clinical reactions began as soon as a few hours and as late as 2 weeks after vaccination. Full recovery was almost always reported.

Three fatalities have been reported in temporal association with influenza vaccination. However, in 2 instances, the patients displayed clinical characteristics and had antecedents which strongly suggested causes other than influenza vaccine, and the third was equally compatible with another viral disease.

In summary, influenza vaccine has only rarely, if ever, been associated with severe adverse reactions or permanent disability. Although vaccination relatively frequently causes transient redness and tenderness at the injection site and sometimes causes such systemic reactions as low-grade fever, malaise, and myalgia for 1-2 days, influenza vaccine is considered to be very safe and is quite suitable for widescale, community use.

PREGNANCY

Elevated rates of maternal and fetal mortality and of congenital anomalies and other fetal effects resulting from influenza infection during pregnancy have been widely discussed. Numerous reports during the 1918-19 influenza pandemic and a limited number of small but better controlled studies in 1957-58, when the Asian influenza pandemic occurred, suggest that influenza can result in increased maternal deaths and fetal wastage. However, a number of prospective studies in the past decade or more have failed to corroborate this association. Although there are no persuasive data to document that pregnancy is a risk-factor with influenza, the effect of swine influenza in pregnancy cannot be forecast with assurance.

Physicians generally avoid prescribing unnecessary drugs and biologics for pregnant women, especially in the first trimester; however, there are no data specifically to contraindicate vaccination with the available killed virus vaccine in pregnancy. Women who are pregnant should be considered as having essentially the same balance of benefits and risks regarding influenza vaccination and influenza as the general population.

Epidemiologic Notes and Reports

Thirteen Mississippi Forestry Commission workers developed sporotrichosis in the period December 1975-February 1976. Although sporotrichosis is an occupational hazard of forestry workers, these were the first cases reported to the Commission. Further investigation revealed another 4 cases of sporotrichosis which occurred among non-Forestry Commission workers who planted pine seedlings supplied by the Mississippi Forestry Commission.

Sporotrichosis — Mississippi

Ten of the 13 forestry workers had typical lesions on the hand and arm. The lesions began with an indolent ulcer followed by the development of subcutaneous nodules with overlying erythema along the channels of lymphatic drainage. Two workers had a solitary lesion with no satellite nodules. One person had multiple verrucous appearing lesions on the thumb and forefinger. Laboratory tests on 11 workers—cultures, fluorescent antibody tests, and/or other

Sporotrichosis — Continued

serological tests (tube agglutination or latex agglutination)—were consistent with sporotrichosis (Table 1). All workers were treated with oral potassium iodide. Five stopped medication after 8 to 12 weeks. One of the 5 relapsed and has resumed treatment.

TABLE 1. Laboratory test results of Mississippi Forestry Commission workers with sporotrichosis, 1976

Case	Appearance of Lesions	Culture	FA ¹ Stain	Serological Tests ²	
				February	May
1	Typical	<i>S. schenckii</i>	4+	+	ND ³
2	Typical	<i>S. schenckii</i>	3+	+	+
3	Typical	<i>S. schenckii</i>	3+	+	ND
4	Typical	<i>S. schenckii</i>	ND	ND	+
5	Typical	ND	ND	+	+
6	Typical	ND	ND	+	+
7	Typical	ND	ND	ND	+
8	Typical	ND	ND	ND	+
9	Typical	ND	ND	ND	ND
10	Typical	ND	ND	ND	neg
11	Solitary	<i>S. schenckii</i>	3+	+	+
12	Solitary	<i>S. schenckii</i>	ND	ND	neg
13	Verrucous	<i>S. schenckii</i>	3+	+	+

1. Fluorescent antibody stain of exudate
2. A tube agglutination titer of $\geq 1:16$ or a latex agglutination titer of $\geq 1:8$ is considered positive (+)
3. ND = Not done

Eleven of the 13 workers had planted pine seedlings supplied by a nursery in Mt. Olive, Mississippi, 1 of the 3 Mississippi Forestry Commission nurseries. One of the other 2 men worked at the Mt. Olive nursery. The attack rate was significantly greater ($P < .05$) among workers in Forestry Commission districts which received pine seedlings from the Mt. Olive nursery than among workers in other districts (Table 2). Further investigation revealed the 4 additional cases among non-Forestry Commission workers; all 4 had handled pine seedlings supplied by the Mississippi Forestry Commission; 3 worked with seedlings from the Mt. Olive nursery.

Pine seedlings are harvested after the first frost, packed in bundles of 1,000, and distributed to forestry district offices, to private individuals, or to private businesses. Sphagnum moss is packed around the seedling roots to provide a moist environment. At the planting site the bundles are opened, and the seedlings separated from the moss. *Sporothrix schenckii* was cultured from samples of sphagnum

TABLE 2. Number* of MS Forestry Commission workers with sporotrichosis according to source of pine seedlings, 1976

	Number of Workers	Number with Sporotrichosis	Attack Rate (cases/100 workers)
Districts supplied pine seedlings by Mt. Olive nursery	409	11	2.7
Districts supplied pine seedlings by other nurseries	506	0	0

*Does not include the 2 patients who work at nurseries

moss remaining at the Mt. Olive nursery and from moss at the planting sites of nursery seedlings. *S. schenckii* was not cultured from samples of sphagnum moss from the other 2 Mississippi Forestry Commission nurseries. The Mt. Olive nursery stored the sphagnum moss outside, while the other 2 nurseries stored the moss in buildings. Mississippi nurseries received sphagnum moss in June and July 1975 from a single supplier in Wisconsin.

Reported by A Taylor, Mississippi Forestry Commission; D Blakey, MD, State Epidemiologist, B Phillips, DPH, Mississippi State Board of Health; Fungus Immunology Br, Mycology Div, Bur of Laboratories; and Field Services Div, Bur of Epidemiology, CDC.

Editorial Note: Sporotrichosis is a subcutaneous mycotic disease of man and lower animals found in all parts of the world. It is caused by *Sporothrix schenckii*, a fungus which occurs naturally in soil and on vegetation. The majority of infections are contracted through a traumatic incident that introduces fungal elements into the resulting wound. The infections among the Mississippi workers resulted from their contact with the *S. schenckii* infested moss. At least 3 previous outbreaks of sporotrichosis among forestry workers have been traced to sphagnum moss from Wisconsin (1,2). There are no established methods for eradicating *S. schenckii* from contaminated moss.

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