CENTER FOR DISEASE CONTROL

MMWR

MORBIDITY AND MORTALITY WEEKLY REPORT

February 22, 1980 / Vol. 29 / No. 7

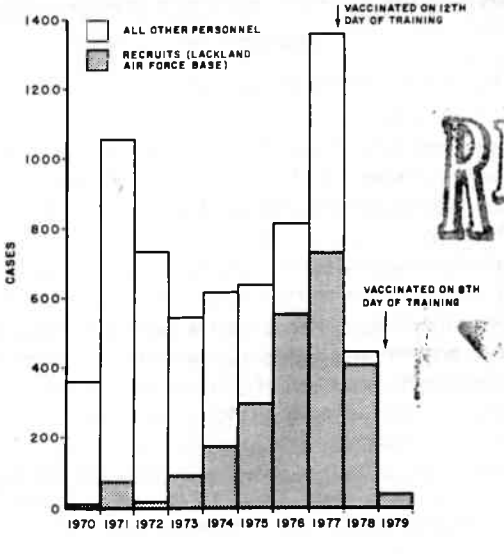
Epidemiologic Notes and Reports

Rubella in Air Force Recruits — Texas, 1977-1978

Rubella has been a chronic problem among Air Force personnel, particularly among the recruits at Lackland Air Force Base, Texas. Between 1970 and 1977, the number and proportion of reported cases* among recruits increased dramatically (Figure 1).

In October 1977, the Air Force began a selective rubella immunization program; recruits determined to be susceptible† on the basis of a reciprocal rubella hemagglutination-inhibition (HI) titer of <10 were vaccinated on the 12th day of training, 10 days after having received influenza vaccine, meningococcal vaccine, and tetanus and diphtheria toxoids. In 1978, apparently as a result of that program, the reported number of cases in recruits was reduced by 45.3% (403 cases compared to 736 in 1977). Reported rubella activity on all the bases, worldwide, decreased 67.3% when compared to 1977. Cases of rubella in Air Force personnel not in basic training fell 93.3% (from 625 in 1977 to 42 in 1978).

FIGURE 1. Rubella in Air Force personnel, worldwide, 1970-1979*



*1979 total for Air Force personnel other than recruits unavailable.

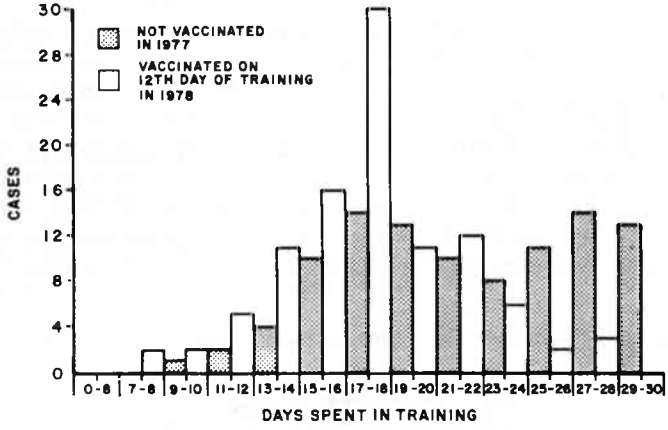
*The case count is based on a physician's clinical diagnosis of rubella; no standardized case definition was used.

†The overall susceptibility rate among 120,000 recruits per year is approximately 20%.

Rubella — Continued

Figure 2 depicts rubella cases, by the number of days spent in training at the time of onset, for 100 recruits in 1977 (before initiation of the immunization program) and in 1978. In 1977, there were 2 peaks in incidence: on the 17th and 18th days of training, and again about 1 incubation period later in the training period. In 1978, 1 peak in cases occurred, probably representing individuals in whom the virus was incubating at the time they were vaccinated. There was no second peak in cases. The data indicate that clinical rubella may be preventable if susceptible individuals are vaccinated at approximately the time of, or shortly after, exposure to disease; vaccine efficacy exceeds 90% if given before exposure.

FIGURE 2. Rubella in Air Force recruits, by days spent in training at time of onset of rash, Lackland Air Force Base, Texas, 1977-1978*



*100 recruits investigated each year.

Since vaccination on the 12th day of training was not preventing rubella in recruits for 2 weeks, vaccination was moved up to the 8th day of training in March 1979. This resulted in a 90.8% decrease in reported rubella activity among recruits between 1978 (403 cases) and 1979 (37 cases).

To determine whether vaccine administration was associated with significant adverse reactions, groups of unvaccinated recruits (347 men and 244 women) and vaccinated recruits (194 men, 55 women) from the same training units were compared. Although the number of immunized women was small, no significant increase in the immunized groups was found with respect to the number of hospital admissions or dispensary visits and the number of complaints of fever, eye pain, pharyngitis, cough, coryza, myalgia, arthralgia or arthritis, diarrhea, and headache.

Reported by GE Crawford, Maj, MC, DH Gremillion, Lt Col, MC, RE Harris, Col, MC, Wilford Hall Medical Center, Lackland Air Force Base, Texas; LE Blouse, PhD, GD Lathrop, Col, MC, Brooks Air Force Base, Texas; Immunization Div, Bur of State Services, CDC.

Editorial Note: Rubella infection among young adults is still a problem, not only in the military, but also in secondary schools, universities, and places of employment (*1,2*). The susceptibility rate of the Lackland Air Force Base recruits is consistent with other recent estimates in comparable age groups (*1,3*). The results of the vaccination program corroborate other data indicating that rubella vaccination of susceptible adults is not associated with significant morbidity and interferes minimally with routine, daily activities (*4*).

Rubella – Continued

References
1. MMWR 1979;28:374-5.
2. MMWR 1978;27:495-7.
3. Gremillion DH, Gengler RE, Lathrop GD. Epidemic rubella in military recruits. South Med J 1978; 71:932-4.
4. MMWR 1979;28:325-7.

Current Trends

Conference Reviews Recent Developments in Dengue Activity in North America

A conference was held January 9-10 at CDC to review the recent history of dengue fever in North America. Participants included epidemiologists and vector-control experts from the Mexican Ministry of Health, CDC, and the southeastern states.

The last pandemic in the Caribbean began in 1977 and involved major outbreaks on many of the islands, including Puerto Rico (*1*). The Caribbean outbreaks probably led to the introduction of confirmed dengue into southeast Mexico in 1978. In that year and the next, dengue-like disease spread northward through Mexico. The most recent recognized outbreaks were in October and November, 1979, in the vicinity of Tampico, 300 miles south of the U.S.-Mexican border.

If dengue outbreaks occur in northern Mexico during the spring and summer of 1980, the disease could be imported and perhaps established in the United States because of the extensive exchange of travelers and the prevalence of *Aedes aegypti*—the mosquito vector of the virus—in both countries. Populations of this mosquito are abundant in parts of Texas, Louisiana, Mississippi, Alabama, Georgia, Florida, North and South Carolina, Tennessee, and Arkansas. The areas of the United States considered most at risk of introduction of dengue from Mexico include communities in south Texas and cities on the Gulf Coast where many travelers arrive from Mexico. The last dengue outbreak in the continental United States was reported in Louisiana in 1945.

At the conference, vector-control experts and epidemiologists from the southeastern states emphasized the need for the following: 1) adequate surveillance of clinical disease and vector-mosquito populations in higher-risk areas, 2) strengthening of laboratory competence for dengue diagnosis in some of the southeastern states, 3) elimination of mosquito-breeding sites for long-term reduction of vector mosquito populations, and 4) increased coordination among public health officials responsible for the detection and control of dengue.

Final guidelines for dengue activities in the southeastern states and at CDC are being jointly developed by the staff of CDC and the state health departments. A training workshop in dengue serology for diagnostic laboratorians from the southeastern states will be held at CDC on March 4-6. In addition, CDC staff will visit Mexico to acquire first-hand knowledge of dengue surveillance and control in that country.

Reported by Vector Biology and Control Div, Bur of Tropical Diseases, San Juan Laboratories, Bur of Laboratories, and Viral Diseases Div, Bur of Epidemiology, CDC.

Editorial Note: Local and state health departments should be contacted to assist in laboratory confirmation of compatible febrile illness in persons who have recently traveled in Mexico. Physicians and public health officials may obtain more information about the clinical presentation, diagnosis, and control of dengue on request from the Dengue Work Group, Bldg. 1, Room 6115, CDC, Atlanta, GA 30333.

Reference
1. MMWR 1978;27:304-6.

Recommendation of the Immunization Practices Advisory Committee (ACIP)

General Recommendations on Immunization

This revision of the "General Recommendations on Immunization" represents an updating of the 1976 statement, based on current knowledge and experience. Major changes from the 1976 statement clarify the recommendations on simultaneous administration of vaccines and emphasize the need to report adverse reactions to vaccines.

INTRODUCTION

Certain basic principles underlie the immunization practices recommended for infants, children, and adults. Most of these principles depend on scientific knowledge about active and passive immunization. Others represent judgments of public health officials and specialists in clinical and preventive medicine. Thus, recommendations on immunization practices represent a balancing of scientific evidence of benefits and risks in order to achieve optimal levels of protection against infectious or communicable diseases.

MULTIPLE-DOSE VACCINES

Some vaccines must be given in more than 1 dose for full protection. In recommending the times and intervals for multiple doses, the Committee takes into account current

(Continued on page 81)

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

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

DISEASE	7th WEEK ENDING		MEDIAN	CUMULATIVE, FIRST 7 WEEKS		
	February 16, 1980	February 17, 1979*	1975-1979	February 16, 1980	February 17, 1979*	MEDIAN 1975-1979
Aseptic meningitis	44	50	33	397	356	272
Brucellosis	5	1	5	21	10	19
Chickenpox	5,198	5,653	5,270	30,247	37,154	34,841
Diphtheria	–	13	4	–	32	32
Encephalitis: Primary (arthropod-borne & unspec.)	12	4	9	73	61	79
Post-infectious	3	1	3	15	14	20
Hepatitis, Viral: Type B	239	241	241	1,832	1,667	1,741
Type A	490	591	636	3,246	3,739	4,524
Type unspecified	214	212	149	1,312	1,272	1,170
Malaria	14	13	6	146	56	34
Measles (rubeola)	238	265	411	901	1,432	2,090
Meningococcal infections: Total	48	77	39	382	433	265
Civilian	47	77	39	379	433	264
Military	1	–	–	3	–	–
Mumps	360	322	604	1,674	2,068	3,994
Pertussis	14	32	28	124	208	177
Rubella (German measles)	52	278	386	364	1,038	1,552
Tetanus	–	1	1	4	3	5
Tuberculosis	388	456	542	2,759	3,374	3,505
Tularemia	1	–	–	11	15	11
Typhoid fever	1	11	6	21	45	41
Typhus fever, tick-borne (Rky. Mt. spotted)	–	2	1	6	11	9
Venereal diseases:						
Gonorrhea: Civilian	14,985	17,376	17,148	119,882	128,853	128,853
Military	535	494	494	3,527	3,699	4,015
Syphilis, primary & secondary: Civilian	382	466	444	3,236	3,241	3,241
Military	2	8	5	57	39	42
Rabies in animals	84	48	34	551	344	288

TABLE II. Notifiable diseases of low frequency, United States

	CUM. 1980		CUM. 1980
Anthrax	–	Poliomyelitis: Total	–
Botulism	3	Paralytic†	–
Congenital rubella syndrome (Mich. 1)	8	Psittacosis† (Ups. NY 1)	10
Leprosy † (Hawaii 1)	16	Rabies in man	–
Leptospirosis†	5	Trichinosis	7
Plague	–	Typhus fever, flea-borne (endemic, murine) (Texas 1)	2

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

†Delayed reports: Leprosy: Calif. +4 (1980); Leptospirosis: Ohio +2 (1979); Polio, para.: N.C. +1 (1979); Psittacosis: Md. +1 (1979).

TABLE III. Cases of specified notifiable diseases, United States, weeks ending February 16, 1980, and February 17, 1979, (7th week)

REPORTING AREA	ASEPTIC MENINGITIS	BRUCELLOSIS	CHICKENPOX	DIPHTHERIA		ENCEPHALITIS			HEPATITIS (VIRAL), BY TYPE			MALARIA	
						Primary		Post-infectious	B	A	Unspecified		
	1980	1980	1980	1980	CUM. 1980	1980	1979*	1980	1980	1980	1980	1980	CUM. 1980
UNITED STATES	44	5	5,198	–	–	12	4	3	239	490	214	14	146
NEW ENGLAND	3	–	628	–	–	2	–	1	16	9	14	3	13
Maine†	–	–	72	–	–	–	–	–	4	1	1	–	–
N.H.	–	–	99	–	–	–	–	–	–	1	–	–	1
Vt.	–	–	36	–	–	–	–	–	–	2	–	–	–
Mass.	–	–	211	–	–	2	–	–	6	2	10	2	9
R.I.	2	–	26	–	–	–	–	–	1	–	–	–	1
Conn.	1	–	184	–	–	–	–	1	5	3	3	1	2
MID. ATLANTIC	19	–	544	–	–	5	–	–	36	35	15	5	21
Upstate N.Y.	14	–	116	–	–	2	–	–	8	11	8	–	1
N.Y. City	2	–	72	–	–	–	–	–	9	6	2	5	12
N.J.†	3	–	NN	–	–	2	–	–	15	10	4	–	3
Pa.	–	–	356	–	–	1	–	–	4	8	1	–	5
E.N. CENTRAL	–	–	2,467	–	–	–	1	–	21	68	29	–	2
Ohio	–	–	325	–	–	–	–	–	7	27	18	–	1
Ind.	NA	NA	NA	NA	–	NA	–	–	NA	NA	NA	NA	–
Ill.†	–	–	808	–	–	–	–	–	2	27	2	–	–
Mich.	–	–	767	–	–	–	1	–	10	8	9	–	–
Wis.	–	–	567	–	–	–	–	–	2	6	–	–	1
W.N. CENTRAL	1	1	672	–	–	–	–	–	6	28	5	–	5
Minn.	–	–	3	–	–	–	–	–	2	10	–	–	4
Iowa	–	–	365	–	–	–	–	–	2	3	4	–	1
Mo.	–	–	33	–	–	–	–	–	1	11	1	–	–
N. Dak.†	–	–	33	–	–	–	–	–	–	–	–	–	–
S. Dak.	–	–	5	–	–	–	–	–	–	–	–	–	–
Nebr.	–	1	10	–	–	–	–	–	–	–	–	–	–
Kans.	1	–	223	–	–	–	–	–	1	4	–	–	–
S. ATLANTIC	6	2	384	–	–	–	–	–	73	89	31	3	18
Del.	–	–	7	–	–	–	–	–	–	–	1	–	–
Md.†	–	–	13	–	–	–	–	–	12	14	9	–	2
D.C.	1	–	10	–	–	–	–	–	–	2	–	–	–
Va.†	–	–	–	–	–	–	–	–	9	7	8	1	7
W. Va.	–	–	122	–	–	–	–	–	1	4	–	–	1
N.C.	1	1	NN	–	–	–	–	–	11	4	3	1	3
S.C.	–	–	4	–	–	–	–	–	4	3	2	–	–
Ga.	–	1	–	–	–	–	–	–	12	24	–	–	–
Fla.†	4	–	228	–	–	–	–	–	24	31	8	1	5
E.S. CENTRAL	7	1	120	–	–	1	2	–	17	24	–	–	–
Ky.	2	–	115	–	–	–	–	–	1	7	–	–	–
Tenn.	–	–	NN	–	–	1	1	–	12	7	–	–	–
Ala.	5	1	3	–	–	–	1	–	4	4	–	–	–
Miss.	–	–	2	–	–	–	–	–	–	6	–	–	–
W.S. CENTRAL	5	1	213	–	–	1	–	2	37	125	83	1	17
Ark.	–	–	1	–	–	–	–	1	7	6	4	–	1
La.	3	1	NN	–	–	1	–	–	13	32	11	1	14
Okla.	–	–	–	–	–	–	–	–	1	13	6	–	1
Tex.	2	–	212	–	–	–	–	1	16	74	62	–	1
MOUNTAIN	1	–	121	–	–	1	–	–	27	83	35	1	9
Mont.	–	–	19	–	–	–	–	–	–	6	–	–	–
Idaho	–	–	1	–	–	–	–	–	–	3	–	–	–
Wyo.	–	–	–	–	–	–	–	–	–	2	3	–	1
Colo.†	–	–	99	–	–	1	–	–	5	19	5	1	4
N. Mex.	–	–	–	–	–	–	–	–	–	–	–	–	–
Ariz.	–	–	NN	–	–	–	–	–	19	41	21	–	3
Utah†	–	–	1	–	–	–	–	–	1	3	2	–	–
Nev.	1	–	1	–	–	–	–	–	2	9	4	–	1
PACIFIC	2	–	49	–	–	2	1	–	6	29	2	1	61
Wash.†	–	–	9	–	–	1	–	–	2	15	2	–	9
Oreg.	–	–	2	–	–	–	–	–	2	12	–	1	3
Calif.†	NA	NA	NA	NA	–	NA	1	–	NA	NA	NA	NA	48
Alaska	–	–	12	–	–	–	–	–	1	–	–	–	1
Hawaii	2	–	26	–	–	1	–	–	1	2	–	–	–
Guam†	NA	NA	NA	NA	–	NA	–	–	NA	NA	NA	NA	–
P.R.	1	–	11	–	–	–	–	–	4	18	12	–	–
V.I.	NA	NA	NA	NA	–	NA	–	–	NA	NA	NA	NA	–
Pac. Trust Terr.	NA	NA	NA	NA	–	NA	–	–	NA	NA	NA	NA	–

NN: Not notifiable. NA: Not available.

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

†The following delayed reports will be reflected in next week's cumulative totals: Asep. meng.: N.J. +2, Md. +2, Fla. –1, Calif. +28; Bruc.: Md. +1, Calif. +6; Chickenpox: Ill. +29, Md. +6, Fla. +17, Utah +37, Wash. +452; Calif. +83; Guam +2; Enceph.: Ohio +1, Calif. +5; Hep.B: Maine –1, N.J. +9, Ill. +9, Md. +10, Utah +3, Wash. +5, Calif. +81; Hep.A: N.J. +9, Ill. +8, N.Dak. +1, Md. +5, Colo. –3, Utah +8, Wash. +5, Calif. +113; Hep. unsp.: N.J. +7, Ill. +1, Md. +5, Fla. +2, Utah +11, Calif. +67, Guam +3; Malaria: N.J. +1, Va. –1, Calif. +7.

TABLE III (Cont.'d). Cases of specified notifiable diseases, United States, weeks ending February 16, 1980, and February 17, 1979, (7th week)

REPORTING AREA	MEASLES (RUBEOLA)			MENINGOCOCCAL INFECTIONS TOTAL			MUMPS		PERTUSSIS	RUBELLA		TETANUS
	1980	CUM. 1980	CUM. 1979*	1980	CUM. 1980	CUM. 1979*	1980	CUM. 1980	1980	1980	CUM. 1980	CUM. 1980
UNITED STATES	238	901	1,432	48	382	433	360	1,674	14	52	364	4
NEW ENGLAND	34	66	101	–	11	11	17	236	1	2	34	–
Maine†	–	–	–	–	1	–	11	72	–	–	4	–
N.H.	31	41	2	–	–	2	–	1	–	1	14	–
Vt.	3	23	3	–	1	–	–	–	–	–	–	–
Mass.	–	–	–	–	6	5	3	85	1	1	9	–
R.I.	–	1	96	–	–	–	–	8	–	–	–	–
Conn.	–	1	–	–	3	4	3	70	–	–	7	–
MID. ATLANTIC	62	194	67	10	62	63	20	146	5	7	28	1
Upstate N.Y.	9	51	43	4	29	24	5	18	3	2	13	–
N.Y. City	6	48	18	–	13	15	–	18	1	2	9	–
N.J.†	–	14	–	5	13	22	2	29	–	–	2	–
Pa.	47	81	6	1	7	2	13	81	1	3	4	1
E.N. CENTRAL	24	102	412	6	37	33	119	557	1	8	100	–
Ohio	10	18	2	2	17	8	73	229	1	–	1	–
Ind.	NA	5	30	–	3	11	NA	19	NA	NA	45	–
Ill.†	–	12	195	–	2	–	14	69	–	–	3	–
Mich.	7	29	136	–	11	12	21	157	–	5	36	–
Wis.	7	38	49	4	4	2	11	83	–	3	15	–
W.N. CENTRAL	23	95	169	1	10	11	6	77	–	10	36	1
Minn.	16	69	11	1	5	1	–	3	–	1	4	1
Iowa	1	1	1	–	–	3	–	11	–	1	1	–
Mo.	1	18	149	–	3	6	–	37	–	1	7	–
N. Dak.	–	–	1	–	1	–	–	1	–	–	1	–
S. Dak.	–	–	–	–	1	–	–	–	–	–	–	–
Nebr.	–	2	–	–	–	–	–	7	–	–	–	–
Kans.	5	5	7	–	–	1	6	18	–	7	23	–
S. ATLANTIC	65	267	110	12	93	125	41	204	3	7	41	1
Del.	–	–	–	–	–	2	5	18	–	–	–	–
Md.†	–	1	1	1	10	6	14	70	–	–	–	–
D.C.	–	–	–	–	–	–	1	1	–	–	–	–
Va.	26	48	7	3	11	14	4	17	–	–	2	–
W. Va.	–	2	22	–	2	3	9	21	–	–	4	–
N.C.	–	1	1	3	17	18	3	39	–	5	6	–
S.C.	–	1	11	–	10	15	–	7	–	–	21	1
Ga.	33	166	1	4	20	22	–	–	3	–	–	–
Fla.†	6	48	67	1	23	45	5	31	–	2	8	–
E.S. CENTRAL	4	38	27	8	38	31	144	261	3	6	24	–
Ky.	3	28	7	3	9	10	143	240	2	1	8	–
Tenn.	1	3	3	1	12	9	1	6	1	5	15	–
Ala.	–	6	16	2	12	5	–	4	–	–	1	–
Miss.	–	1	1	2	5	7	–	11	–	–	–	–
W.S. CENTRAL	24	43	136	9	43	71	9	54	1	10	16	–
Ark.	–	1	5	–	2	5	2	5	–	–	1	–
La.	5	5	14	3	12	32	2	4	1	1	1	–
Okla.	–	1	–	1	4	10	–	–	–	–	–	–
Tex.	19	36	117	5	25	24	5	45	–	9	14	–
MOUNTAIN	2	27	42	1	18	22	1	57	–	1	6	–
Mont.	–	–	13	–	1	2	–	16	–	–	–	–
Idaho	–	–	1	1	2	1	–	4	–	–	–	–
Wyo.	–	–	–	–	1	–	–	–	–	–	–	–
Colo.	–	1	2	–	7	1	1	10	–	–	–	–
N. Mex.	–	–	9	–	–	2	–	–	–	–	–	–
Ariz.	–	10	2	–	4	13	–	9	–	–	1	–
Utah†	2	14	13	–	1	2	–	15	–	–	2	–
Nev.	–	2	2	–	2	1	–	3	–	1	3	–
PACIFIC	–	69	368	1	70	66	3	82	–	1	79	1
Wash.†	–	15	254	1	30	7	1	17	–	1	8	–
Oreg.	–	–	2	–	5	5	1	24	–	–	9	–
Calif.†	NA	52	104	–	35	52	NA	36	NA	NA	61	1
Alaska	–	–	–	–	–	–	–	3	–	–	1	–
Hawaii	–	2	8	–	–	2	1	2	–	–	–	–
Guam	NA	–	–	–	–	–	NA	–	NA	NA	–	–
P.R.	5	8	12	–	3	–	2	10	–	–	2	1
V.I.	NA	–	1	–	–	–	NA	–	NA	NA	–	–
Pac. Trust Terr.	NA	–	2	–	–	1	NA	–	NA	NA	–	–

NA: Not available.

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

†The following delayed reports will be reflected in next week's cumulative totals: Measles: Ill. +5, Fla. +2, Utah +2, Calif. +10; Men. inf.: Wash. –20, Calif. +4; Mumps: N.J. +1, Ill. +3, Md. +4, Wash. +18, Calif. +13; Pertussis: Wash. +1, Calif. +4; Rubella: Maine +2, Wash. +2, Calif. +13.

TABLE III (Cont.'d). Cases of specified notifiable diseases, United States, weeks ending February 16, 1980, and February 17, 1979, (7th week)

REPORTING AREA	TUBERCULOSIS		TULAREMIA	TYPHOID FEVER		TYPHUS FEVER (Tick-borne) (RMSF)		VENEREAL DISEASES (Civilian)						RABIES (in Animals)
								GONORRHEA			SYPHILIS (Pri. & Sec.)			
	1980	CUM. 1980	CUM. 1980	1980	CUM. 1980	1980	CUM. 1980	1980	CUM. 1980	CUM. 1979*	1980	CUM. 1980	CUM. 1979*	CUM. 1980
UNITED STATES	388	2,759	11	1	21	–	6	14,985	119,882	128,853	382	3,236	3,241	551
NEW ENGLAND	19	89	–	–	3	–	–	463	3,675	3,515	10	112	68	5
Maine	3	4	–	–	–	–	–	18	234	248	–	–	1	5
N.H.	–	2	–	–	–	–	–	13	128	101	–	–	3	–
Vt.	–	3	–	–	–	–	–	13	113	54	1	1	–	–
Mass.	7	36	–	–	2	–	–	207	1,406	1,453	5	64	44	–
R.I.	4	13	–	–	1	–	–	29	203	285	–	2	1	–
Conn.	5	31	–	–	–	–	–	183	1,591	1,374	4	45	19	–
MID. ATLANTIC	73	503	–	–	–	–	1	1,817	13,300	13,176	45	479	504	–
Upstate N.Y.	32	91	–	–	–	–	–	328	2,022	1,573	–	27	33	–
N.Y. City	11	199	–	–	–	–	–	800	6,037	5,308	31	348	352	–
N.J.†	17	86	–	–	–	–	–	201	1,715	2,481	7	43	67	–
Pa.	13	127	–	–	–	–	1	488	3,526	3,814	7	61	52	–
E.N. CENTRAL	51	378	1	–	2	–	–	2,076	19,019	20,227	25	224	457	54
Ohio†	6	68	–	–	–	–	–	703	5,810	5,484	4	57	95	–
Ind.	NA	40	–	NA	–	NA	–	NA	1,853	1,423	NA	30	20	6
Ill.	31	164	–	–	–	–	–	461	4,312	6,914	–	54	278	30
Mich.†	11	81	1	–	2	–	–	620	4,661	4,653	19	73	49	–
Wis.	3	25	–	–	–	–	–	292	2,383	1,753	2	10	15	18
W.N. CENTRAL	12	104	3	–	–	–	2	733	5,620	6,093	9	38	45	168
Minn.	1	16	–	–	–	–	–	181	1,089	1,037	3	11	19	23
Iowa	1	11	–	–	–	–	–	90	684	817	–	3	4	45
Mo.	10	50	2	–	–	–	2	183	2,173	2,565	6	22	14	45
N. Dak.	–	2	–	–	–	–	–	13	73	97	–	–	–	12
S. Dak.	–	4	–	–	–	–	–	39	191	226	–	–	–	31
Nebr.	–	6	1	–	–	–	–	67	503	368	–	2	–	1
Kans.	–	15	–	–	–	–	–	160	907	983	–	–	8	11
S. ATLANTIC	119	657	3	1	7	–	3	5,026	31,455	30,635	156	836	815	56
Del.†	3	11	–	–	–	–	–	82	492	485	1	3	7	–
Md.†	24	84	1	1	1	–	–	725	2,772	3,558	5	60	53	–
D.C.	14	40	–	–	2	–	–	386	2,341	1,940	13	62	63	–
Va.	NA	64	–	–	1	–	–	346	2,680	2,936	15	81	82	–
W. Va.	2	36	–	–	–	–	–	79	381	479	1	3	16	1
N.C.	22	115	–	–	–	–	2	828	4,992	4,708	15	71	83	–
S.C.	10	56	–	–	–	–	–	455	3,273	2,739	7	31	48	13
Ga.	21	66	2	–	–	–	1	640	5,651	5,696	48	233	202	30
Fla.†	23	185	–	–	3	–	–	1,485	8,873	8,094	51	292	261	12
E.S. CENTRAL	38	269	1	–	1	–	–	1,169	9,885	11,499	44	290	239	27
Ky.†	7	53	–	–	1	–	–	284	1,644	1,619	–	15	23	15
Tenn.	10	84	1	–	–	–	–	535	3,694	3,952	15	118	112	11
Ala.	14	92	–	–	–	–	–	NA	2,312	3,500	14	56	43	1
Miss.	7	40	–	–	–	–	–	350	2,235	2,428	15	101	61	–
W.S. CENTRAL	53	243	–	–	–	–	–	2,614	16,596	17,571	87	673	510	185
Ark.	4	5	–	–	–	–	–	240	1,216	1,584	7	25	17	26
La.	14	72	–	–	–	–	–	470	2,463	3,075	15	146	100	1
Okla.	11	34	–	–	–	–	–	221	1,729	1,495	4	9	8	23
Tex.	24	132	–	–	–	–	–	1,683	11,188	11,417	61	493	385	135
MOUNTAIN	12	106	1	–	1	–	–	590	4,663	5,254	4	76	44	12
Mont.	–	3	–	–	1	–	–	26	180	288	–	–	3	1
Idaho	1	4	–	–	–	–	–	22	249	226	–	3	3	–
Wyo.	–	7	–	–	–	–	–	13	145	143	–	3	3	–
Colo.†	–	31	–	–	–	–	–	146	1,226	1,358	–	24	18	–
N. Mex.	5	21	–	–	–	–	–	57	717	715	3	12	6	1
Ariz.†	5	33	1	–	–	–	–	158	1,047	1,546	–	20	6	10
Utah†	–	3	–	–	–	–	–	24	215	244	–	4	–	–
Nev.	1	4	–	–	–	–	–	144	884	734	1	10	5	–
PACIFIC	11	410	2	–	7	–	–	497	15,669	20,883	2	508	559	44
Wash.†	7	44	–	–	–	–	–	213	1,785	1,851	–	47	32	–
Oreg.	1	36	–	–	–	–	–	176	1,363	1,510	–	12	29	–
Calif.†	NA	318	2	NA	7	NA	–	NA	11,761	16,546	NA	437	489	44
Alaska	–	1	–	–	–	–	–	56	500	643	–	1	2	–
Hawaii	3	11	–	–	–	–	–	52	260	333	2	11	7	–
Guam†	NA	–	–	NA	–	NA	–	NA	–	16	NA	–	–	–
P.R.	1	13	–	–	–	–	–	84	253	222	19	62	73	3
V.I.	NA	–	–	NA	–	NA	–	NA	13	21	NA	4	–	–
Pac. Trust Terr.	NA	–	–	NA	–	NA	–	NA	–	59	NA	–	–	–

NA: Not available.

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

†The following delayed reports will be reflected in next week's cumulative totals: TB: N.J. +27, Del. –1, Md. +9, Fla. –4, Colo. +8, Calif.: +108, Guam +1; T. fever: Md. +1; GC: N.J. +985 civ., +38 mil., Md. +267 civ., +13 mil., Ariz. +165 civ., Utah +38 civ., Wash. –18 civ., Calif. +3773 civ., +45 mil., Guam +8 mil., Syphilis: N.J. +11 civ., Mich. –3 civ., Md. +7 civ., Wash. +45 civ. +4 mil. Calif. +159 civ.; An. rabies: N.J. +2, Ohio +1, Ky. +1, Calif. +8.

TABLE IV. Deaths in 121 U.S. cities,* week ending February 16, 1980 (7th week)

REPORTING AREA	ALL CAUSES, BY AGE (YEARS)					P&I** TOTAL
	ALL AGES	>65	45-64	25-44	<1	
NEW ENGLAND	856	583	201	38	15	74
Boston, Mass.	219	127	60	19	7	23
Bridgeport, Conn.	56	39	15	1	–	5
Cambridge, Mass.	38	29	8	1	–	2
Fall River, Mass.	26	20	3	3	–	–
Hartford, Conn.	81	58	19	2	1	3
Lowell, Mass.	41	30	7	–	–	1
Lynn, Mass.	24	22	2	–	–	3
New Bedford, Mass.	32	21	9	1	–	1
New Haven, Conn.	63	41	17	3	1	1
Providence, R.I.	74	49	21	2	1	13
Somerville, Mass.	13	9	4	–	–	2
Springfield, Mass.	59	45	8	2	2	6
Waterbury, Conn.	54	39	14	–	1	7
Worcester, Mass.	76	54	14	4	2	7
MID. ATLANTIC	2,895	1,924	648	187	71	201
Albany, N.Y.	61	35	18	6	1	1
Allentown, Pa.	20	18	2	–	–	1
Buffalo, N.Y.	133	77	33	12	7	3
Camden, N.J.	42	28	11	–	2	1
Elizabeth, N.J.	41	29	8	3	1	4
Erie, Pa.†	27	17	8	–	1	–
Jersey City, N.J.	67	50	10	4	2	3
Newark, N.J.	76	35	25	5	8	4
N.Y. City, N.Y.	1,676	1,143	354	112	32	131
Paterson, N.J.	25	20	2	2	1	–
Philadelphia, Pa.†	258	148	73	22	8	12
Pittsburgh, Pa.†	49	28	14	3	3	2
Reading, Pa.	35	27	6	1	1	5
Rochester, N.Y.	129	93	24	6	–	17
Schenectady, N.Y.	32	23	4	3	–	3
Scranton, Pa.†	33	26	6	1	–	4
Syracuse, N.Y.	101	63	26	5	4	3
Trenton, N.J.	38	23	13	2	–	2
Utica, N.Y.	17	12	5	–	–	1
Yonkers, N.Y.	35	29	6	–	–	4
E.N. CENTRAL	2,417	1,507	570	144	97	99
Akron, Ohio	81	55	14	4	1	–
Canton, Ohio	21	11	8	–	1	–
Chicago, Ill.	578	339	153	45	21	22
Cincinnati, Ohio	148	102	32	5	3	17
Cleveland, Ohio	207	117	47	16	15	4
Columbus, Ohio	130	78	31	7	7	8
Dayton, Ohio	117	74	26	8	5	5
Detroit, Mich.	285	170	75	17	11	4
Evansville, Ind.	57	42	14	1	–	4
Fort Wayne, Ind.	70	48	13	1	3	8
Gary, Ind.	16	9	4	2	1	1
Grand Rapids, Mich.	52	32	12	4	1	2
Indianapolis, Ind.	186	109	45	13	8	4
Madison, Wis.	38	31	3	1	2	4
Milwaukee, Wis.	128	91	24	9	4	4
Peoria, Ill.	55	37	13	1	3	7
Rockford, Ill.	41	24	10	2	4	2
South Bend, Ind.	24	17	6	–	–	2
Toledo, Ohio	115	75	28	2	6	1
Youngstown, Ohio	68	46	12	6	1	–
W.N. CENTRAL	748	492	167	33	32	39
Des Moines, Iowa	43	31	7	1	4	4
Duluth, Minn.	16	13	2	–	–	1
Kansas City, Kans.	37	18	12	5	–	1
Kansas City, Mo.	115	64	36	6	6	5
Lincoln, Nebr.	30	20	7	1	1	4
Minneapolis, Minn.	114	75	25	3	8	8
Omaha, Nebr.	102	71	20	4	4	4
St. Louis, Mo.	172	111	41	7	5	7
St. Paul, Minn.	70	52	11	3	1	2
Wichita, Kans.	49	37	6	3	3	3

REPORTING AREA	ALL CAUSES, BY AGE (YEARS)					P&I** TOTAL
	ALL AGES	>65	45-64	25-44	<1	
S. ATLANTIC	1,548	962	381	97	57	77
Atlanta, Ga.	171	99	49	12	6	9
Baltimore, Md.	380	244	87	28	8	10
Charlotte, N.C.	65	44	9	6	3	5
Jacksonville, Fla.	111	56	37	4	5	8
Miami, Fla.	154	97	44	8	1	5
Norfolk, Va.	83	50	23	4	3	7
Richmond, Va.	83	43	26	8	3	7
Savannah, Ga.	55	32	14	2	4	4
St. Petersburg, Fla.	134	116	11	1	4	7
Tampa, Fla.	79	53	18	6	1	6
Washington, D.C.	179	93	53	14	16	8
Wilmington, Del.	54	35	10	4	3	1
E.S. CENTRAL	792	471	204	48	33	48
Birmingham, Ala.	133	82	30	5	7	3
Chattanooga, Tenn.	78	46	21	7	1	4
Knoxville, Tenn.	59	42	13	1	2	2
Louisville, Ky.	135	71	49	7	3	18
Memphis, Tenn.	189	115	42	13	11	11
Mobile, Ala.	72	47	16	4	3	3
Montgomery, Ala.	47	27	6	5	5	–
Nashville, Tenn.	79	41	27	6	1	7
W.S. CENTRAL	1,441	844	358	116	52	49
Austin, Tex.	56	36	15	3	1	5
Baton Rouge, La.	47	34	9	3	1	7
Corpus Christi, Tex.	27	14	9	1	2	–
Dallas, Tex.	201	130	37	13	12	2
El Paso, Tex.	63	34	14	9	3	1
Fort Worth, Tex.	91	64	12	6	3	–
Houston, Tex.	383	182	124	43	10	9
Little Rock, Ark.	80	48	18	7	2	5
New Orleans, La.	167	96	48	8	5	–
San Antonio, Tex.	190	115	44	16	8	9
Shreveport, La.	34	23	5	2	3	–
Tulsa, Okla.	102	68	23	5	2	11
MOUNTAIN	644	362	173	53	30	29
Albuquerque, N.Mex.	72	43	14	9	1	6
Colo. Springs, Colo.	38	28	9	1	–	6
Denver, Colo.	130	73	33	9	12	8
Las Vegas, Nev.	89	44	34	7	1	3
Ogden, Utah	14	5	5	–	1	1
Phoenix, Ariz.	120	69	36	8	5	1
Pueblo, Colo.	33	20	6	6	–	3
Salt Lake City, Utah	43	20	11	2	8	1
Tucson, Ariz.	105	60	25	11	2	–
PACIFIC	1,759	1,160	362	126	58	85
Berkeley, Calif.	24	19	2	1	2	–
Fresno, Calif.	65	41	11	6	4	3
Glendale, Calif.	17	15	2	–	–	1
Honolulu, Hawaii	69	45	17	3	2	10
Long Beach, Calif.	102	61	32	5	3	5
Los Angeles, Calif.	417	267	81	37	13	17
Oakland, Calif.	71	50	15	1	3	3
Pasadena, Calif.	37	24	9	2	1	–
Portland, Oreg.	149	104	30	7	3	8
Sacramento, Calif.	87	49	21	12	3	3
San Diego, Calif.	158	101	33	9	7	1
San Francisco, Calif.	160	121	23	14	1	5
San Jose, Calif.	147	88	37	16	2	5
Seattle, Wash.	145	94	26	8	12	8
Spokane, Wash.	68	46	17	4	1	10
Tacoma, Wash.	43	35	6	1	1	6
TOTAL	13,100	8,305	3,064	842	445	701

*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.

Immunization – Continued

risks from disease and the objective of inducing satisfactory clinical immunity. Intervals between doses that are longer than those recommended do not usually lead to a reduction in final antibody levels. Therefore, it is not necessary to restart an interrupted series of vaccinations or to add extra doses.

SIMULTANEOUS ADMINISTRATION OF CERTAIN VACCINES

Experimental evidence and extensive clinical experience are strengthening the scientific basis for giving certain vaccines at the same time. Most of the widely used antigens can safely and effectively be given simultaneously. This knowledge is particularly helpful when circumstances call for giving several vaccines at the same time—such as imminent exposure to several infectious diseases, preparation for foreign travel, or uncertainty that the patient will return for future vaccinations.

In general, inactivated vaccines can be administered simultaneously at separate sites. It should be noted, however, that when vaccines commonly associated with local or systemic side effects—such as cholera, typhoid, and plague vaccines—are given simultaneously, the side effects theoretically could be accentuated. Generally, persons known to experience such side effects should be given these vaccines on separate occasions.

An inactivated vaccine and a live, attenuated-virus vaccine can be administered simultaneously at separate sites, with the precautions that apply to the individual vaccines.

Previously it has been recommended that individual live-virus vaccines be given at least 1 month apart whenever possible. The reason for this was the theoretical concern that more frequent or severe side effects as well as diminished antibody responses might otherwise result. Field observations indicate, however, that simultaneous administration of the most widely used live-virus vaccines has not resulted in impaired antibody response or increased rates of adverse reactions.

Observation of children indicates that antibody responses to trivalent oral polio vaccine (OPV) given simultaneously with licensed combination measles-mumps-rubella vaccine are comparable to those obtained when the same vaccines are given at different times. It is reasonable to expect equivalently good immunologic responses when other licensed, combination, live attenuated-virus vaccines or their component antigens are given simultaneously with OPV.

Direct evidence on the response to simultaneous administration of diphtheria and tetanus toxoid and pertussis vaccine (DTP), OPV, and measles-mumps-rubella vaccines is lacking. However, field experience and antibody data regarding simultaneous administration of either DTP and measles vaccine or DTP and OPV indicate that the protective response is satisfactory and that the incidence of side effects is not increased. Therefore, simultaneous administration of all of these antigens is feasible, particularly if there is doubt that the recipient will return to receive further doses of vaccine.

There is no evidence to indicate that simultaneous administration of individual measles, mumps, or rubella antigens at different sites will yield different results from administration of the combined vaccines in a single site.

Simultaneous administration of pneumococcal polysaccharide vaccine and whole-virus influenza vaccine has been found to give satisfactory antibody response without increasing the incidence of side effects. Although not yet studied, simultaneous administration of the pneumococcal vaccine and split-virus influenza vaccine may also be expected to yield satisfactory results.

HYPERSENSITIVITY TO VACCINE COMPONENTS

Vaccine antigens produced in systems or with substrates that contain allergenic substances—for example, those antigens derived from growing microorganisms in the em-

Immunization – Continued

bryonated eggs of chickens or ducks—may cause hypersensitivity reactions. These may possibly include anaphylaxis, when the final vaccine contains a significant amount of the allergen. Such antigens include those grown in eggs and used against typhus, rabies (duck embryo vaccine), and yellow fever. Vaccines with such characteristics should not be given to persons known to be hypersensitive to components of the substrates. Contrary to this generalization, influenza vaccine antigens, although prepared from viruses grown in embryonated eggs, are highly purified during preparation and have only very rarely been reported to be associated with hypersensitivity reactions. Screening persons by history of ability to eat eggs without adverse effects is a reasonable way to identify those possibly at risk from influenza vaccination. Individuals with anaphylactic hypersensitivity to eggs should not be given influenza vaccine. This would include persons who, upon ingestion of eggs, develop swelling of the lips or tongue or who experience acute respiratory distress or collapse.

Live-virus vaccines prepared by growing viruses in cell cultures are essentially devoid of potentially allergenic substances related to host tissue. No severe hypersensitivity reactions have been reported with the live, attenuated measles, mumps, or rubella vaccines prepared from viruses grown in cell cultures. These vaccines can be given safely regardless of a history of allergy to eggs or egg protein.

Vaccines, such as cholera, DTP, plague, and typhoid, that are derived from organisms grown in simple bacteriologic media, are frequently associated with local, and occasionally systemic, side effects, but they do not appear to be allergenic *per se*. They should not be given, however, to individuals who have experienced any serious side effects from them.

Some vaccines contain preservatives or trace amounts of antibiotics to which patients may be hypersensitive. Those giving vaccines should review carefully the information provided with the package insert before deciding whether the rare patients with known hypersensitivity to such preservatives or antibiotics can be vaccinated safely.

ALTERED IMMUNITY

Virus replication after administration of live, attenuated-virus vaccines may be enhanced in persons with immune deficiency diseases, and in those with suppressed capability for immune response, as occurs with leukemia, lymphoma, generalized malignancy, or therapy with corticosteroids, alkylating agents, antimetabolites, or radiation. Patients with such conditions should not be given live, attenuated-virus vaccines. Similarly, individuals residing in the household of a susceptible immunocompromised individual should not receive OPV because vaccine viruses are excreted by the recipient of the vaccine and are communicable to other persons.

SEVERE FEBRILE ILLNESSES

Vaccination of persons with severe febrile illnesses should generally be deferred until these persons have recovered. This precaution is to avoid superimposing adverse side effects from the vaccine on the underlying illness or mistakenly identifying a manifestation of the underlying illness as having been caused by the vaccine. The presence of minor illnesses such as mild upper-respiratory infections should not preclude vaccination.

LIVE VACCINES AND PREGNANCY

On grounds of a theoretical risk to the developing fetus, live, attenuated-virus vaccines are not generally given to pregnant women or to those likely to become pregnant within 3 months after vaccination. With some of these antigens, particularly rubella, measles, and mumps vaccines, pregnancy is a contraindication to the vaccination. With OPV and yellow fever vaccine, however, vaccine should be given if there is a substantial risk of exposure to natural infection. There is no convincing evidence of risk to the fetus from

Immunization — Continued

vaccination of pregnant women with inactivated viral vaccines, bacterial vaccines, or toxoids.

RECENT ADMINISTRATION OF IMMUNE SERUM GLOBULIN OR HYPERIMMUNE GLOBULIN

Passively acquired antibody can interfere with the response to live, attenuated-virus vaccines. Therefore, administration of such vaccines should be deferred until approximately 3 months after passive immunization. By the same token, immunoglobulins should not be administered for at least 2 weeks after a vaccine has been given, if possible. Inactivated vaccines are sometimes administered concurrently with passive antibody to induce active immunity, as is done for postexposure rabies prophylaxis.

REPORTING ADVERSE REACTIONS

All vaccines have been reported to cause some adverse effects. These range from minor local reactions to severe systemic illness such as paralysis associated with OPV. To improve knowledge about adverse effects, all severe reactions should be evaluated and reported in detail to local or state health officials and to the manufacturer.

Replaces previous recommendation on this subject, published in MMWR 1976;25:349-50,355.

▲Reprints of this article will be available in approximately 8 weeks from Public Inquiries, Center for Disease Control, 1/B63, Atlanta, Georgia 30333.

Current Trends

Influenza — United States, Worldwide

United States: As of February 9, 1980, 15 states and territories had reported widespread influenza activity. Influenza B virus isolates have been identified in 34 states, with the addition of Iowa, Louisiana, and Maryland since the last report (*1*). For the fourth consecutive week, pneumonia and influenza (P&I) deaths reported from 117 U.S. cities exceeded the epidemic threshold. During the week ending February 16, deaths increased in 4 regions of the country. Such deaths continued to increase in the ≥65-year age group and, for the first time this season, in the 45- to 64-year age group.

Influenza A (H3N2) viruses have been isolated from 8 sporadic cases in 6 states this season, with the addition of Alaska, Arizona, and Hawaii to states previously reported (*2*).

As of February 19, 135 cases of Reye syndrome with onset after November 30, 1979, were reported to CDC. The highest numbers of cases were reported from Ohio (75), Michigan (17), and Minnesota (8).

Influenza A(H1N1) viruses have been isolated from 6 of 20 specimens collected from students from the Eastern Shore area of Maryland, where an outbreak occurred at 1 high

---

The Morbidity and Mortality Weekly Report, circulation 96,486, 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.

Influenza – Continued

school in Talbot County, beginning the week of February 5, and at another high school in Caroline County, beginning approximately February 14. Absenteeism in the Talbot County high school reached 26% during the course of the outbreak, compared to a normal rate of 5% to 8%. Influenza B viruses had previously been isolated in Maryland, but they have not yet been identified in these schools. Laboratory studies are continuing.

Worldwide: Antigenic analysis of influenza A(H3N2) strains isolated in the Far East during the past year indicates that whereas some of the viruses are still well-inhibited by antiserum to A/Texas/1/77, others, including strains received from Thailand, Northern China, and Taiwan, exhibit variation from A/Texas/1/77. In preliminary tests with the influenza A(H3N2) strains isolated in the U.S.S.R., Europe, and the United States this winter, several viruses were found to be more closely related to the new variant (reference strain A/Bangkok/1/79) than to A/ Texas/1/77, although other isolates continue to be well-inhibited by antiserum to A/Texas/1/77.

Reported by CG Ray, MD, Depts of Pathology and Pediatrics, University of Arizona, Tucson, Arizona; D Ritter (Fairbanks), F Pauls, DrPH (Juneau), Alaska State Dept of Health and Social Services; GY Kobayaski, Virus Section, Hawaii State Dept of Health; YW Wong, State Hygiene Laboratory, Iowa City, Iowa; JM Joseph, PhD, Maryland Bureau of Laboratories, Baltimore, Maryland; R Gohd, MD, Virus Laboratory, Charity Hospital, New Orleans, Louisiana; State Epidemiologists from Alaska, Arizona, Hawaii, Iowa, Louisiana, and Maryland; World Health Organization Collaborating Center for Influenza, Virology Div, Bur of Laboratories, Immunization Div, Bur of State Services, Consolidated Surveillance and Communications Activity, and Viral Diseases Div, Bur of Epidemiology, CDC.

References

1. MMWR 1980,29:71-2.
2. MMWR 1980;29:37-8.

Erratum, Vol. 29, No. 5

p52 In the article "Follow-up on Yellow Fever – Trinidad," second paragraph, more than **95%** of the population of Trinidad has been vaccinated against yellow fever, not 75%, as stated.

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

Postage and Fees Paid
U.S. Department of HEW
HEW 396

AIR MAIL

Director, Center for Disease Control
William H. Foege, M.D.
Director, Bureau of Epidemiology
Philip S. Brachman, M.D.
Editor
Michael
Managing E
Anne D.
Mathematic
Keewha

HEW Publication No. (CDC) 80-8017