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Recommendation of the Immunization Practices Advisory Committee (ACIP)

General Recommendations on Immunization

This revision of the "General Recommendations on Immunization" updates the 1980 statement. Changes from that statement clarify information on possible interference with the immune response by spacing immunobiologics. Recommendations for vaccinating persons with allergies are revised. New sections dealing with many aspects of immunization procedures have been added.*

INTRODUCTION

Recommendations for immunization of infants, children, and adults are based on facts about immunobiologics and scientific knowledge about the principles of active and passive immunization and on judgments by public health officials and specialists in clinical and preventive medicine. Benefits and risks are associated with the use of all products—no vaccine is completely safe or completely effective. The benefits range from partial to complete protection from the consequences of disease, and the risks range from common, trivial, and inconvenient side effects to rare, severe, and life-threatening conditions. Thus, recommendations on immunization practices balance scientific evidence of benefits, costs, and risks to achieve optimal levels of protection against infectious or communicable diseases.

These recommendations describe this balance and attempt to minimize the risk by providing specific advice regarding dose, route, and spacing of immunobiologics and by delineating situations warranting precautions or contraindicating their use. These recommendations may apply only in the United States, as epidemiological circumstances and vaccines may differ in other countries. The relative balance of benefits and risks may change as diseases are brought under control or eradicated. For example, because smallpox has been eradicated throughout the world, the very small risk from smallpox vaccine now exceeds the risk of smallpox; consequently, smallpox vaccination of civilians is now indicated only for laboratory workers directly involved with smallpox or closely related orthopox viruses (e.g., monkeypox, vaccinia, and others).

DEFINITIONS

A. Immunobiologic: Immunobiologics include vaccines, toxoids, and antibody containing preparations from human or animal donors, including globulins and antitoxins. These products are used for immunization.

1. *Vaccine:* A suspension of attenuated live or killed microorganisms (bacteria, viruses, or rickettsiae), or fractions thereof administered to induce immunity and thereby prevent infectious disease.

*Replaces previous recommendations on this subject in *MMWR* 1980;29:76,81-83.

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2. *Toxoid:* A modified bacterial toxin that has been rendered nontoxic but that retains the ability to stimulate the formation of antitoxin.
3. *Immune globulin (IG):* A sterile solution containing antibody from human blood. It is a 15%-18% protein obtained by cold ethanol fractionation of large pools of blood plasma. It is primarily indicated for routine maintenance of certain immunodeficient persons, and for passive immunization against measles and hepatitis A.
4. *Specific immune globulin:* Special preparations obtained from donor pools preselected for a high antibody content against a specific disease, e.g., Hepatitis B Immune Globulin (HBIG), Varicella Zoster Immune Globulin (VZIG), Rabies Immune Globulin (RIG), and Tetanus Immune Globulin (TIG).
5. *Antitoxin:* A solution of antibodies derived from the serum of animals immunized with specific antigens (diphtheria, tetanus) used to achieve passive immunity or to effect a treatment.

B. Vaccination and immunization: Today, these terms are often used interchangeably. The words *vaccination* and *vaccine* derive from vaccinia, the cowpox virus once used as smallpox vaccine. Thus, *vaccination* originally meant the inoculation of vaccinia virus to render individuals immune to smallpox. Some people still prefer that the term vaccination be restricted to this use, but many have come to use the term in a more general sense, to denote the administration of any vaccine or toxoid without regard to whether the recipient is successfully made immune.

Immunization is a more inclusive term denoting the process of inducing or providing immunity artificially by administering an immunobiologic. Immunization can be *active* or *passive*.

Active immunization denotes the production of antibody or antitoxin in response to the administration of a vaccine or toxoid. *Passive immunization* denotes the provision of temporary immunity by the administration of preformed antitoxin or antibodies (e.g., immunoglobulin, maternal antibodies). Three types of immunobiologics are used for passive immunization: (1) pooled human IG, (2) specific IG preparations, and (3) antitoxin.

Although there is lack of consensus that vaccination and immunization are completely synonymous, these words are used interchangeably in ACIP statements when referring to active immunization. Regardless of which term is used, it must be emphasized that administration of an immunobiologic cannot be automatically equated with the development of (or conferring of) adequate immunity because of a variety of specific factors, many of which are discussed in this statement.

C. Antigen(s): Substance(s) inducing the formation of antibodies. In some vaccines, the antigen is highly defined (e.g., pneumococcal polysaccharide, hepatitis B surface antigen, tetanus or diphtheria toxoids); in others, it is complex or incompletely defined (e.g., killed pertussis bacteria, live, attenuated viruses).

IMMUNOBIOLOGICS

The specific nature and content of immunobiologics may differ. When immunobiologics against the same infectious agents are produced by different manufacturers, active and inert ingredients among the various products may differ. Practitioners are urged to become familiar with the constituents of the products they use. The constituents of immunobiologics include:

A. Suspending fluid: This frequently is as simple as sterile water or saline, but it may be a complex fluid containing small amounts of proteins or other constituents derived from the medium or biologic system in which the vaccine is produced (serum proteins, egg antigens, cell-culture-derived antigens).

B. Preservatives, stabilizers, antibiotics: These components of vaccines are used to inhibit or prevent bacterial growth in viral culture or the final product, or to stabilize the

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antigen. They include such materials as mercurials and specific antibiotics. Allergic reactions may occur if the recipient is sensitive to one of these additives.

C. Adjuvants: An aluminum compound is used in some vaccines to enhance the immune response to vaccines containing inactivated microorganisms or their products (e.g., toxoids and hepatitis B virus vaccine). Vaccines with such adjuvants must be injected deeply in muscle masses, since subcutaneous or intracutaneous administration may cause local irritation, inflammation, granuloma formation, or necrosis.

ROUTE, SITE, AND TECHNIQUE OF IMMUNIZATION

A. Route: There is a recommended route of administration for each immunobiologic. To avoid unnecessary local or systemic effects and/or ensure optimal efficacy, the practitioner should not deviate from the recommended route of administration.

B. Site: Injectable immunobiologics should be administered in an area where there is minimal opportunity for local, neural, vascular, or tissue injury. Subcutaneous injections are usually administered into the thigh of infants and in the deltoid area of older children and adults. Intradermal injections are generally given on the volar surface of the forearms, except for human diploid cell rabies vaccine, with which reactions are less severe in the deltoid area.

In the past, the upper, outer quadrant of the buttocks was the usual site of intramuscular vaccination. The buttocks should not be routinely used as a vaccination site for infants and children; and, to avoid injury to the sciatic nerves, they are generally not used in adults, The central region of the buttocks should be avoided for all injections; the upper, outer quadrant should be used only for the largest volumes of injection or when multiple doses need to be given, such as when large doses of IG must be administered. The site selected should be well into the upper, outer mass of the gluteus maximus and away from the central region of the buttocks.

Currently, preferred sites for intramuscular injections are the anterolateral aspect of the upper thigh and the deltoid muscle of the upper arm. In most infants, the anterolateral aspect of the thigh provides the largest muscle mass and, therefore, is the preferred site. In older children, the deltoid mass is of sufficient size for intramuscular injection. An individual decision must be made for each child, based on the volume of the injected material and the size of the muscle into which it is to be injected. Many practitioners prefer to continue using the anterolateral thigh until age 3 years before switching to the deltoid area. In adults, the deltoid is generally used for routine intramuscular vaccine administration.

C. Techniques: Before giving the injection, the needle is inserted in the site, and the syringe plunger is pulled back to see if blood appears; if so, the needle should be withdrawn and a new site selected. The same procedure is followed until no blood appears. A separate needle and syringe should be used for each injection. Disposable needles and syringes should be discarded in labeled containers to prevent accidental inoculation or theft. If more than one vaccine preparation is administered, each should be given at a different site.

DOSAGE

The recommended doses of immunobiologics are derived from theoretical considerations, experimental trials, and clinical experience. Administration of dose volumes smaller than those recommended, such as split doses or intradermal administration (unless specifically recommended), may result in inadequate protection. Exceeding the recommended dose volumes might be hazardous because of excessive local or systemic concentrations of antigens.

Some practioners use divided doses of vaccine (particularly diphtheria and tetanus toxoids and pertussis vaccine [DTP]) to reduce reaction rates. There has not been adequate study of

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the efficacy of such practices by serologic confirmation or clinical efficacy or of the effects on the subsequent frequency and severity of adverse reactions. The Committee does not recommend dividing doses of any vaccine.

AGE AT WHICH IMMUNOBIOLOGICS ARE ADMINISTERED

Several factors influence recommendations concerning the age at which vaccine is administered (Tables 1-3). These include: age-specific risks of disease, age-specific risks of complications, ability of individuals of a given age to respond to the vaccine(s), and potential interference with the immune response by passively transferred maternal antibody. In general, vaccines are recommended for the youngest age group at risk with an acceptable level of antibody response following vaccine administration. For example, while infants as young as 6 months of age may be at risk for measles, most are protected by maternal antibody, which may inhibit successful active immunization at this age. In the United States, measles vaccine is routinely administered at 15 months of age, by which time maternal antibody is no longer detectable.

TABLE 1. Recommended schedule for active immunization of normal infants and children (See individual ACIP recommendations for details.)

Recommended age*	Vaccine(s)†	Comments
2 mo.	DTP-1,§ OPV-1¶	Can be given earlier in areas of high endemicity
4 mo.	DTP-2, OPV-2	6-wks-2-mo. interval desired between OPV doses to avoid interference
6 mo.	DTP-3	An additional dose of OPV at this time is optional for use in areas with a high risk of polio exposure
15 mo.**	MMR††	
18 mo.**	DTP-4, OPV-3	Completion of primary series
4-6 yr.§§	DTP-5, OPV-4	Preferably at or before school entry
14-16. yr	Td¶¶	Repeat every 10 years throughout life

*These recommended ages should not be construed as absolute, i.e. 2 mos. can be 6-10 weeks, etc.

†For all products used, consult manufacturer's package enclosure for instructions for storage, handling, and administration. Immunobiologics prepared by different manufacturers may vary, and those of the same manufacturer may change from time to time. The package insert should be followed for a specific product.

§DTP—Diphtheria and tetanus toxoids and pertussis vaccine.

¶OPV—Oral, attenuated poliovirus vaccine contains poliovirus types 1, 2, and 3.

**Simultaneous administration of MMR, DTP, and OPV is appropriate for patients whose compliance with medical care recommendations cannot be assured.

††MMR—Live measles, mumps, and rubella viruses in a combined vaccine (see text for discussion of single vaccines versus combination).

§§Up to the seventh birthday.

¶¶Td—Adult tetanus toxoid and diphtheria toxoid in combination, which contains the same dose of tetanus toxoid as DTP or DT and a reduced dose of diphtheria toxoid.

In certain measles epidemics, public health officials may recommend measles vaccine for infants as young as 6 months of age. Although a smaller proportion of those given vaccine before the first birthday develop antibody to measles, compared with older infants, the higher risk of disease during an epidemic may justify earlier immunization. Such infants should be reimmunized at the recommended age for measles vaccination to achieve protection.

SPACING OF IMMUNOBIOLOGICS

A. Multiple doses of same antigen: Some products require more than one dose for full protection. In addition, it is necessary to give periodic reinforcement (booster) doses of some preparations to maintain protection. In recommending the ages and/or intervals for multiple doses, the Committee takes into account current risks from disease and the objective of inducing satisfactory protection. Intervals between doses that are longer than those recommended do not lead to a reduction in final antibody levels. Therefore, it is unnecessary to restart an interrupted series of an immunobiologic or to add extra doses. By contrast, giving doses of a vaccine or toxoid at less than recommended intervals may lessen the antibody response; doses given at less than recommended intervals should not be counted as part of a primary series.

TABLE 2. Recommended immunization schedule for infants and children up to 7th birthday not immunized at the recommended time in early infancy* (See individual ACIP recommendations for details.)

Timing	Vaccine(s)	Comments
First visit	DTP-1,† OPV-1,§ (if child is ≥ 15 mo. of age, MMR¶)	DTP, OPV, and MMR can be administered simultaneously to children ≥ 15 mo. of age
2 mo. after first DTP, OPV	DTP-2, OPV-2	
2 mo. after second DTP	DTP-3	An additional dose of OPV at this time is optional for use in areas with a high risk of polio exposure
6-12 mo. after third DTP	DTP-4, OPV-3	
Preschool** (4-6 yr.)	DTP-5, OPV-4	Preferably at or before school entry
14-16 yr.	Td††	Repeat every 10 years throughout life

*If initiated in the first year of life, give DTP-1, 2, and 3, OPV-1 and 2 according to this schedule and give MMR when the child becomes 15 months old.

†DTP—Diphtheria and tetanus toxoids with pertussis vaccine. DTP may be used up to the seventh birthday.

§OPV—Oral, attenuated poliovirus vaccine contains poliovirus types 1, 2, and 3.

¶MMR—Live measles, mumps, and rubella viruses in a combined vaccine (see text for discussion of single vaccines versus combination).

**The preschool dose is not necessary if the fourth dose of DTP and third dose of OPV are administered after the fourth birthday.

††Td—Adult tetanus toxoid and diphtheria toxoid in combination, which contains the same dose of tetanus toxoid as DTP or DT and a reduced dose of diphtheria toxoid.

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B. Different antigens: Experimental evidence and extensive clinical experience have strengthened 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 in circumstances that include imminent exposure to several infectious diseases, preparation for foreign travel, or uncertainty that the patient will return for further doses of vaccine.

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 might be accentuated. When practical, these vaccines should be given on separate occasions.

Field observations indicate that simultaneous administration (on the same day) 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 (MMR) vaccine are comparable to those obtained when the same vaccines are given at separate visits. It is reasonable to expect equivalent immunologic responses when other licensed combination or live, attenuated-virus vaccines or their component antigens are given simultaneously with OPV. While data are lacking on potential interference with antibody responses to measles, mumps, rubella, and/or trivalent oral polio vaccines administered at different times within 1 month of one another, there are theoretical concerns and data showing that the immune response to a live virus vaccine might be impaired if the vaccine is adminis-

TABLE 3. Recommended immunization schedule for persons 7 years of age or older (See individual ACIP recommendations for details.)

Timing	Vaccine(s)	Comments
First visit	Td-1,* OPV-1,† and MMR§	OPV not routinely administered to those ≥ 18 years of age
2 mo. after first Td, OPV	Td-2, OPV-2	
6-12 mo. after second Td, OPV	Td-3, OPV-3	OPV-3 may be given as soon as 6 weeks after OPV-2
10 years after Td-3	Td	Repeat every 10 years throughout life

*Td—Tetanus and diphtheria toxoids (adult type) are used after the seventh birthday. The DTP doses given to children under 7 who remain incompletely immunized at age 7 or older should be counted as prior exposure to tetanus and diphtheria toxoids (e.g. a child who previously received 2 doses of DTP, only needs 1 dose of Td to complete a primary series).

†OPV—Oral, attenuated poliovirus vaccine contains poliovirus types 1, 2, and 3. When polio vaccine is to be given to individuals 18 years or older, IPV is preferred. See ACIP statement on polio vaccine for immunization schedule for IPV.

§MMR—Live measles, mumps, and rubella viruses in a combined vaccine. Persons born before 1957 can generally be considered immune to measles and mumps and need not be immunized. Rubella vaccine may be given to persons of any age, particularly to women of childbearing age. MMR may be used since administration of vaccine to persons already immune is not deleterious. (See text for discussion of single vaccines versus combination.)

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tered within the month following another live virus vaccine. When feasible, live virus vaccines not administered on the same day should be given at least 1 month apart.

No data indicate that simultaneous administration of individual measles, mumps, or rubella antigens at different sites yields different results from administration of the combined vaccines in a single site.

Data on the response to simultaneous administration of diphtheria and tetanus toxoids and pertussis vaccine (DTP), OPV, and MMR vaccine are 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 adverse reactions do not increase. Therefore, simultaneous administration of all these antigens is recommended when individuals require multiple antigens and there is doubt that the recipient will return to receive further doses of vaccine. Children 15 months of age or older who have received fewer than the recommended number of DTP and OPV doses fall into this category (Table 2). Simultaneous administration of pneumococcal polysaccharide vaccine and whole-virus influenza vaccine gives satisfactory antibody response without increasing the occurrence of adverse reactions. Simultaneous administration of the pneumococcal vaccine and split-virus influenza vaccine may also be expected to yield satisfactory results. However, it should be kept in mind that influenza vaccine should be administered annually to the target population, whereas, under current recommendations, pneumococcal polysaccharide vaccine should only be administered in a single dose.

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. Some data suggest that the simultaneous administration of cholera and yellow fever vaccines may interfere with the immune response to each other. Decreased levels of antibodies have been observed when the vaccines are administered within 3 weeks of each other, compared with administration of the vaccines at longer intervals. However, there is no evidence that protection to either of these diseases diminishes when these vaccines are administered simultaneously. Therefore, the Committee believes that yellow fever and cholera vaccines can be administered simultaneously, if necessary.

C. Immune globulin: Immune globulin (IG, formerly called Immune Serum Globulin, [ISG]) and various specific immune globulins contain antibodies common to the population from which the pooled plasma used in their preparation was obtained. These antibodies may interfere with the effectiveness of live, attenuated vaccines administered shortly after IG or specific IG has been given.

In general, such interference is of little practical importance with inactivated products. They can, therefore, be given anytime after IG use. With live, attenuated vaccines, passively acquired antibody may interfere with replication of vaccine virus and thus with the antibody response of the patient. Parenterally administered live vaccines (e.g., MMR or other combinations) should, therefore, not be given for at least 6 weeks, but preferably 3 months, after the administration of IG. Preliminary data indicate that IG does not interfere with the immune response either to OPV or yellow fever vaccine.

If IG administration becomes necessary after a live vaccine has been given, interference may occur. In general, vaccine virus replication and stimulation of immunity will occur within 7 to 10 days. Thus, if the interval between vaccine and IG is less than 14 days, vaccine should be repeated about 3 months after IG was given, unless serologic testing indicates that antibodies have been produced; if the interval was longer, vaccine need not be readministered. If administration of IG becomes necessary because of imminent exposure to disease, live virus vaccines may be administered simultaneously with IG, with the recognition that vaccine-induced

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immunity may be compromised. The vaccine should be administered in a site remote from that chosen for IG inoculation. Vaccination should be repeated about 3 months later, unless serologic testing indicates antibodies have been produced.

HYPERSENSITIVITY TO VACCINE COMPONENTS

Vaccine antigens produced in systems or with substrates containing allergenic substances, e.g., antigens derived from growing microorganisms in embryonated chicken eggs, may cause hypersensitivity reactions. These reactions may include anaphylaxis when the final vaccine contains a substantial amount of the allergen. Yellow fever vaccine is such an antigen. Vaccines with such characteristics should not be given to persons with known hypersensitivity to components of the substrates. Contrary to this generalization, influenza vaccine antigens (whole or split), 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.

Live virus vaccines prepared by growing viruses in cell cultures are essentially devoid of potentially allergenic substances related to host tissue. On very rare occasions, hypersensitivity reactions to measles vaccine have been reported in persons with anaphylactic hypersensitivity to eggs. Measles vaccine, however, can be given safely to egg-allergic individuals provided the allergies are not manifested by anaphylactic symptoms. Since mumps vaccine is grown in similar cell cultures, the same precautions apply. *(Continued on page 13)*

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

Disease	1st Week Ending			Cumulative, First Week		
	January 8, 1983	January 9 1982	Median 1978-1982	January 8, 1983	January 9 1982	Median 1978-1982
Aseptic meningitis	58	77	58	58	77	58
Chickenpox	2,000	N	2,322	2,000	N	2,318
Encephalitis: Primary (arthropod-borne & unspec.)	16	8	6	16	8	6
Post-infectious	-	1	1	-	1	1
Gonorrhea: Civilian	17,795	19,641	16,306	17,795	19,641	16,306
Military	326	424	424	326	424	424
Hepatitis: Type A	288	318	355	288	318	355
Type B	299	301	233	299	301	233
Non A, Non B	24	12	N	24	12	N
Unspecified	88	111	121	88	111	121
Legionellosis	5	2	N	5	2	N
Leprosy	7	1	2	7	1	2
Malaria	4	12	12	4	12	12
Measles: Total	4	10	19	4	10	19
Indigenous	3	N	N	3	N	N
Imported*	1	N	N	1	N	N
Meningococcal infections: Total	35	36	29	35	36	29
Civilian	33	36	29	33	36	29
Military	2	-	-	2	-	-
Mumps	40	42	78	40	42	78
Pertussis	6	11	11	6	11	11
Rubella (German measles)	13	16	29	13	16	29
Syphilis (Primary & Secondary): Civilian	609	578	431	609	578	431
Military	2	6	6	2	6	6
Toxic-shock syndrome	4	N	N	4	N	N
Tuberculosis	259	276	257	259	276	257
Tularemia	3	-	1	3	-	1
Typhoid fever	3	4	4	3	4	4
Typhus fever, tick-borne (RMSF)	1	7	2	1	7	2
Rabies, animal	83	73	63	83	73	63

TABLE II. Notifiable diseases of low frequency, United States

	Cum. 1983		Cum. 1983
Anthrax	-	Plague	-
Botulism: Foodborne	-	Poliomyelitis: Total	-
Infant	-	Paralytic	-
Other	-	Psittacosis (Wash. 1, Calif. 1)	2
Brucellosis	-	Rabies, human	-
Cholera	-	Tetanus (Calif. 1)	1
Congenital rubella syndrome	-	Trichinosis	-
Diphtheria	-	Typhus fever, flea-borne (endemic, murine)	-
Leptospirosis	-		

*For measles only, imported cases includes both out-of-state and foreign importations. One of the four reported cases for this week was imported from a foreign country or can be directly traceable to a known foreign imported case within two generations.

TABLE III. Cases of specified notifiable diseases, United States, weeks ending January 8, 1983 and January 9, 1982 (1st week)

Reporting Area	Aseptic Meningitis	Chickenpox	Encephalitis		Gonorrhea (Civilian)		Hepatitis (Viral), by type				Legionellosis	Leprosy
			Primary	Post-infectious			A	B	NA,NB	Unspecified		
	1983	Cum. 1983	Cum. 1983	Cum. 1983	Cum. 1983	Cum. 1982	1983	1983	1983	1983	1983	Cum. 1983
UNITED STATES	58	2,000	16	-	17,795	19,641	288	299	24	88	5	7
NEW ENGLAND	1	639	-	-	437	368	7	3	1	4	-	-
Maine	-	392	-	-	20	32	-	1	-	-	-	-
N.H.	-	-	-	-	12	13	1	-	1	-	-	-
Vt.	-	-	-	-	7	14	-	-	-	-	-	-
Mass.	1	43	-	-	163	106	2	2	-	4	-	-
R.I.	-	124	-	-	29	18	4	-	-	-	-	-
Conn.	-	80	-	-	206	185	-	-	-	-	-	-
MID. ATLANTIC	3	32	1	-	2,129	1,494	19	29	-	7	3	1
Upstate N.Y.	1	7	-	-	-	-	1	1	-	-	-	-
N.Y. City	2	25	1	-	1,550	950	5	3	-	-	1	1
N.J.	-	-	-	-	200	203	13	25	-	7	2	-
Pa.	-	-	-	-	379	341	-	-	-	-	-	-
E.N. CENTRAL	3	516	1	-	1,506	2,134	15	28	2	2	-	-
Ohio	-	22	-	-	289	347	1	-	-	-	-	-
Ind.	U	U	-	-	-	149	U	U	U	U	U	-
Ill.	-	72	-	-	183	600	-	1	-	-	-	-
Mich.	3	422	1	-	829	727	14	27	2	2	-	-
Wis.	-	-	-	-	205	311	-	-	-	-	-	-
W.N. CENTRAL	3	231	1	-	730	1,290	7	9	-	4	-	-
Minn.	-	-	-	-	94	256	3	3	-	-	-	-
Iowa	2	105	1	-	54	115	-	1	-	-	-	-
Mo.	-	-	-	-	311	578	2	3	-	4	-	-
N. Dak.	-	38	-	-	9	15	-	-	-	-	-	-
S. Dak.	-	20	-	-	16	27	2	1	-	-	-	-
Nebr.	1	-	-	-	83	22	-	1	-	-	-	-
Kans.	-	68	-	-	163	277	-	-	-	-	-	-
S. ATLANTIC	12	353	7	-	4,127	6,427	35	76	8	16	-	-
Del.	-	9	-	-	105	72	-	1	-	-	-	-
Md.	2	-	1	-	640	900	7	18	5	9	-	-
D.C.	1	1	-	-	265	186	1	2	-	-	-	-
Va.	4	40	4	-	307	339	4	18	2	3	-	-
W. Va.	-	303	-	-	35	32	1	3	1	1	-	-
N.C.	4	-	1	-	390	1,339	8	13	-	3	-	-
S.C.	-	-	1	-	509	373	8	19	-	-	-	-
Ga.	-	-	-	-	790	942	1	2	-	-	-	-
Fla.	1	-	-	-	1,086	2,244	5	-	-	-	-	-
E.S. CENTRAL	8	66	-	-	1,946	1,534	37	30	1	1	-	-
Ky.	1	49	-	-	232	119	28	2	-	-	-	-
Tenn.	2	-	-	-	597	482	7	23	1	1	-	-
Ala.	5	4	-	-	845	526	2	5	-	-	-	-
Miss.	-	13	-	-	272	407	-	-	-	-	-	-
W.S. CENTRAL	5	73	1	-	2,721	3,554	25	17	-	28	-	1
Ark.	-	-	-	-	216	432	-	-	-	-	-	-
La.	-	-	-	-	76	76	-	-	-	-	-	-
Okla.	-	-	1	-	323	246	-	-	-	2	-	-
Tex.	5	73	-	-	2,106	2,800	25	17	-	26	-	1
MOUNTAIN	-	4	-	-	317	440	7	9	-	2	-	-
Mont.	-	-	-	-	18	45	1	1	-	-	-	-
Idaho	-	-	-	-	9	10	1	-	-	-	-	-
Wyo.	-	-	-	-	26	32	-	-	-	-	-	-
Colo.	-	-	-	-	116	-	2	1	-	-	-	-
N. Mex.	-	-	-	-	57	46	2	3	-	2	-	-
Ariz.	U	U	-	-	-	187	U	U	U	U	U	-
Utah	-	4	-	-	21	25	1	2	-	-	-	-
Nev.	-	-	-	-	70	95	-	2	-	-	-	-
PACIFIC	23	86	5	-	3,882	2,400	136	98	12	24	2	5
Wash.	1	62	-	-	-	229	8	6	4	3	1	-
Oreg.	-	-	-	-	124	183	17	7	2	-	-	-
Calif.	20	13	4	-	3,673	1,862	105	80	6	20	1	5
Alaska	-	2	-	-	27	64	4	-	-	-	-	-
Hawaii	2	9	1	-	58	62	2	5	-	1	-	-
Guam	U	U	-	-	-	4	U	U	U	U	U	-
P.R.	U	U	-	-	-	25	U	U	U	U	U	-
V.I.	-	4	-	-	14	3	-	-	-	-	-	-
Pac. Trust Terr.	U	U	-	-	-	10	U	U	U	U	U	-

N: Not notifiable U: Unavailable

TABLE III. (Cont.'d). Cases of specified notifiable diseases, United States, weeks ending January 8, 1983 and January 9, 1982 (1st week)

Reporting Area	Malaria	Measles (Rubeola)					Menin-gococcal Infections	Mumps		Pertussis			Rubella		
		Indigenous		Imported		Total									
	Cum. 1983	1983	Cum. 1983	1983	Cum. 1983	Cum. 1982	Cum. 1983	1983	Cum. 1983	1983	Cum. 1983	Cum. 1982	1983	Cum. 1983	Cum. 1982
UNITED STATES	4	3	3	1	1	10	33	40	40	6	6	11	13	13	16
NEW ENGLAND	-	-	-	-	-	-	1	1	1	-	-	1	-	-	-
Maine	-	-	-	-	-	-	-	1	1	-	-	-	-	-	-
N.H.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Vt.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mass.	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-
R.I.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Conn.	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-
MID ATLANTIC	2	-	-	-	-	1	1	3	3	1	1	-	-	-	1
Upstate N.Y.	1	-	-	-	-	1	-	2	2	-	-	-	-	-	1
N.Y. City	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
N.J.	-	-	-	-	-	-	1	1	1	1	1	-	-	-	-
Pa.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
E.N. CENTRAL	-	-	-	-	-	1	4	13	13	-	-	3	1	1	-
Ohio	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ind.	-	U	-	U	-	-	-	U	-	U	-	-	U	-	-
Ill.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mich.	-	-	-	-	-	1	4	13	13	-	-	2	-	-	-
Wis.	-	-	-	-	-	-	-	-	-	-	-	1	1	1	-
W.N. CENTRAL	-	-	-	-	-	-	3	4	4	-	-	-	3	3	1
Minn.	-	-	-	-	-	-	-	1	1	-	-	-	2	2	1
Iowa	-	-	-	-	-	-	1	2	2	-	-	-	-	-	-
Mo.	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-
N. Dak.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S. Dak.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nebr.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Kans.	-	-	-	-	-	-	-	1	1	-	-	-	1	1	-
S. ATLANTIC	-	-	-	-	-	5	7	4	4	1	1	2	2	2	4
Del.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Md.	-	-	-	-	-	-	1	-	-	-	-	-	1	1	-
D.C.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Va.	-	-	-	-	-	5	-	3	3	-	-	-	-	-	4
W. Va.	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-
N.C.	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-
S.C.	-	-	-	-	-	-	2	-	-	-	-	1	-	-	-
Ga.	-	-	-	-	-	-	-	1	1	1	1	-	1	1	-
Fla.	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-
E.S. CENTRAL	-	-	-	-	-	-	5	1	1	-	-	-	1	1	1
Ky.	-	-	-	-	-	-	1	-	-	-	-	-	1	1	1
Tenn.	-	-	-	-	-	-	3	1	1	-	-	-	-	-	-
Ala.	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-
Miss.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W.S. CENTRAL	-	-	-	-	-	-	4	3	3	1	1	-	-	-	-
Ark.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
La.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Okla.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tex.	-	-	-	-	-	-	4	3	3	1	1	-	-	-	-
MOUNTAIN	-	-	-	-	-	-	-	-	-	2	2	1	-	-	1
Mont.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Idaho	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Wyo.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Colo.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
N. Mex.	-	-	-	-	-	-	-	-	-	2	2	-	-	-	-
Ariz.	-	U	-	U	-	-	-	U	-	U	-	1	U	-	-
Utah	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nev.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PACIFIC	2	3	3	1	1	3	8	11	11	1	1	4	6	6	8
Wash.	-	-	-	-	-	-	2	2	2	-	-	-	-	-	1
Oreg.	1	-	-	-	-	-	1	-	-	-	-	1	-	-	-
Calif.	1	3	3	1†	1	2	4	8	8	1	1	3	6	6	7
Alaska	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hawaii	-	-	-	-	-	1	1	1	1	-	-	-	-	-	-
Guam	-	U	-	U	-	-	-	U	-	U	-	-	U	-	-
P.R.	-	U	-	U	-	-	-	U	-	U	-	-	U	-	-
V.I.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pac. Trust Terr.	-	U	-	U	-	-	-	U	-	U	-	-	U	-	-

U: Unavailable †International §Out-of-state

TABLE III. (Cont.'d). Cases of specified notifiable diseases, United States, weeks ending January 8, 1983 and January 9, 1982 (1st week)

Reporting Area	Syphilis (Civilian) (Primary & Secondary)		Toxic-shock Syndrome	Tuberculosis		Tula-remia	Typhoid Fever	Typhus Fever (Tick-borne) (RMSF)	Rabies, Animal
	Cum. 1983	Cum. 1982	1983	1983	Cum. 1983	Cum. 1983	Cum. 1983	Cum. 1983	Cum. 1983
UNITED STATES	609	578	4	259	259	3	3	1	83
NEW ENGLAND	26	6	-	2	2	-	-	-	-
Maine	-	-	-	-	-	-	-	-	-
N.H.	-	-	-	-	-	-	-	-	-
Vt.	-	-	-	-	-	-	-	-	-
Mass.	15	6	-	-	-	-	-	-	-
R.I.	-	-	-	-	-	-	-	-	-
Conn.	11	-	-	2	2	-	-	-	-
MID ATLANTIC	62	56	-	36	36	-	2	-	3
Upstate N.Y.	-	-	-	6	6	-	2	-	3
N.Y. City	38	42	-	20	20	-	-	-	-
N.J.	10	3	-	10	10	-	-	-	-
Pa.	14	11	-	-	-	-	-	-	-
E.N. CENTRAL	25	25	-	25	25	-	-	-	5
Ohio	12	5	-	7	7	-	-	-	-
Ind.	-	2	U	U	-	-	-	-	-
Ill.	-	15	-	17	17	-	-	-	1
Mich.	7	2	-	-	-	-	-	-	-
Wis.	6	1	-	1	1	-	-	-	4
W.N. CENTRAL	11	10	-	4	4	2	-	-	9
Minn.	8	-	-	-	-	-	-	-	3
Iowa	1	-	-	4	4	-	-	-	4
Mo.	1	10	-	-	-	2	-	-	1
N. Dak.	-	-	-	-	-	-	-	-	-
S. Dak.	-	-	-	-	-	-	-	-	-
Nebr.	-	-	-	-	-	-	-	-	1
Kans.	1	-	-	-	-	-	-	-	-
S. ATLANTIC	167	178	-	109	109	-	1	-	43
Del.	1	-	-	-	-	-	-	-	-
Md.	5	8	-	16	16	-	-	-	21
D.C.	5	9	-	-	-	-	-	-	-
Va.	4	6	-	40	40	-	-	-	16
W. Va.	-	-	-	4	4	-	1	-	3
N.C.	10	20	-	-	-	-	-	-	-
S.C.	13	7	-	15	15	-	-	-	1
Ga.	36	42	-	10	10	-	-	-	2
Fla.	93	86	-	24	24	-	-	-	-
E.S. CENTRAL	38	47	-	23	23	-	-	1	6
Ky.	-	-	-	6	6	-	-	-	1
Tenn.	-	8	-	6	6	-	-	1	5
Ala.	32	16	-	11	11	-	-	-	-
Miss.	6	23	-	-	-	-	-	-	-
W.S. CENTRAL	142	183	1	7	7	-	-	-	5
Ark.	3	6	1	-	-	-	-	-	3
La.	19	-	-	-	-	-	-	-	-
Okla.	4	1	-	7	7	-	-	-	2
Tex.	116	176	-	-	-	-	-	-	-
MOUNTAIN	5	3	-	5	5	1	-	-	5
Mont.	1	-	-	2	2	-	-	-	5
Idaho	-	-	-	-	-	-	-	-	-
Wyo.	1	-	-	-	-	-	-	-	-
Colo.	3	-	-	-	-	-	-	-	-
N. Mex.	-	-	-	3	3	1	-	-	-
Ariz.	-	-	U	U	-	-	-	-	-
Utah	-	-	-	-	-	-	-	-	-
Nev.	-	3	-	-	-	-	-	-	-
PACIFIC	133	70	3	48	48	-	-	-	7
Wash.	-	2	-	2	2	-	-	-	-
Oreg.	-	-	2	2	2	-	-	-	-
Calif.	132	66	1	44	44	-	-	-	7
Alaska	-	-	-	-	-	-	-	-	-
Hawaii	1	2	-	-	-	-	-	-	-
Guam	-	-	U	U	-	-	-	-	-
P.R.	-	4	U	U	-	-	-	-	-
V.I.	-	-	-	-	-	-	-	-	-
Pac. Trust Terr.	-	-	U	U	-	-	-	-	-

U: Unavailable

TABLE IV. Deaths in 121 U.S. cities,* week ending January 8, 1983 (1st week)

Reporting Area	All Causes, By Age (Years)						P&I** Total
	All Ages	≥65	45-64	25-44	1-24	<1	
NEW ENGLAND	758	546	145	36	11	19	51
Boston, Mass.	200	134	40	12	7	7	28
Bridgeport, Conn.	53	40	8	3	-	2	3
Cambridge, Mass.	19	13	5	1	-	-	3
Fall River, Mass.	39	34	4	1	-	-	1
Hartford, Conn.	61	43	14	1	2	1	-
Lowell, Mass.	28	18	9	1	-	-	2
Lynn, Mass.	25	18	5	1	1	-	-
New Bedford, Mass	37	29	6	2	-	-	2
New Haven, Conn.	56	38	10	5	-	3	2
Providence, R.I.	61	47	10	3	-	1	2
Somerville, Mass.	9	3	5	1	-	-	-
Springfield, Mass.	54	41	7	2	-	3	2
Waterbury, Conn.	30	19	9	1	-	1	2
Worcester, Mass.	86	69	13	2	1	1	4
MID. ATLANTIC	2,858	1,885	629	202	61	79	101
Albany, N.Y.	48	33	12	1	1	1	1
Allentown, Pa.	22	15	2	5	-	-	-
Buffalo, N.Y.	128	90	31	2	2	3	10
Camden, N.J.	47	28	15	1	2	1	-
Elizabeth, N.J.	21	13	5	3	-	-	-
Erie, Pa.†	44	31	11	1	1	-	2
Jersey City, N.J.	68	43	16	8	-	1	1
N.Y. City, N.Y.	1,493	977	326	112	34	44	43
Newark, N.J.	67	31	16	11	4	3	4
Paterson, N.J.	36	20	9	4	1	2	1
Philadelphia, Pa.†	316	200	78	24	8	6	13
Pittsburgh, Pa.†	130	85	28	11	1	5	5
Reading, Pa.	33	26	6	-	-	1	3
Rochester, N.Y.	139	98	26	7	1	7	5
Schenectady, N.Y.	25	19	5	1	-	-	1
Scranton, Pa.†	29	19	7	2	1	-	2
Syracuse, N.Y.	113	84	19	6	1	3	3
Trenton, N.J.	35	25	5	1	3	1	1
Utica, N.Y.	32	23	6	1	1	1	3
Yonkers, N.Y.	32	25	6	1	-	-	2
E.N. CENTRAL	2,242	1,377	557	150	63	95	72
Akron, Ohio	70	46	18	4	-	2	-
Canton, Ohio	40	26	13	1	-	-	-
Chicago, Ill	288	167	74	19	6	22	2
Cincinnati, Ohio	155	107	27	10	6	5	11
Cleveland, Ohio	195	100	62	20	3	10	3
Columbus, Ohio	93	55	24	3	4	7	5
Dayton, Ohio	174	98	51	10	6	9	3
Detroit, Mich.	360	213	96	29	10	12	14
Evansville, Ind.	72	43	18	2	4	5	1
Fort Wayne, Ind.	60	42	9	6	1	2	6
Gary, Ind.	17	10	5	2	-	-	-
Grand Rapids, Mich	28	23	4	-	-	1	2
Indianapolis, Ind.	166	104	39	11	8	4	5
Madison, Wis.	31	19	7	3	1	1	2
Milwaukee, Wis	164	106	40	10	3	5	6
Peoria, Ill.	77	49	15	6	5	2	6
Rockford, Ill.	42	31	5	3	1	2	3
South Bend, Ind.	40	28	9	-	1	2	2
Toledo, Ohio	100	71	18	7	2	2	1
Youngstown, Ohio	70	39	23	4	2	2	-
W.N. CENTRAL	767	532	147	32	21	35	43
Des Moines, Iowa	78	52	22	2	1	1	9
Duluth, Minn.	36	18	13	2	1	2	1
Kansas City, Kans.	34	24	3	5	2	-	-
Kansas City, Mo.	134	98	23	6	5	2	8
Lincoln, Nebr.	40	29	7	2	2	-	2
Minneapolis, Minn	97	62	12	8	5	12	3
Omaha, Nebr.	124	90	22	2	3	7	7
St. Louis, Mo.	69	46	18	1	-	4	9
St. Paul, Minn.	78	62	13	1	1	1	1
Wichita, Kans.	77	51	14	3	3	6	3
S. ATLANTIC	1,245	809	273	69	39	53	52
Atlanta, Ga.	143	75	40	19	5	4	4
Baltimore, Md.	281	177	70	18	9	7	5
Charlotte, N.C.	67	43	16	5	1	2	4
Jacksonville, Fla.	102	67	21	4	4	6	-
Miami, Fla.	91	50	27	4	4	6	5
Norfolk, Va.	65	35	20	4	2	3	9
Richmond, Va.	75	34	24	3	2	12	6
Savannah, Ga.	43	29	8	3	2	1	5
St. Petersburg, Fla.	101	78	17	1	2	3	6
Tampa, Fla.	75	53	13	3	3	3	5
Washington, D.C.§	156	142	2	3	3	5	3
Wilmington, Del.	46	26	15	2	2	1	-
E.S. CENTRAL	702	453	165	42	23	19	16
Birmingham, Ala.	88	60	20	4	2	2	-
Chattanooga, Tenn.	52	31	16	3	2	-	2
Knoxville, Tenn.	61	37	19	2	2	1	-
Louisville, Ky.	139	93	34	6	3	3	5
Memphis, Tenn.	154	103	30	8	6	7	4
Mobile, Ala.	48	25	12	6	2	3	1
Montgomery, Ala.	52	41	7	4	-	-	3
Nashville, Tenn.	108	63	27	9	6	3	1
W.S. CENTRAL	1,787	1,046	429	156	79	77	70
Austin, Tex.	79	53	13	7	4	2	3
Baton Rouge, La.	37	28	7	2	-	-	3
Corpus Christi, Tex.	39	28	5	4	-	2	1
Dallas, Tex.	198	107	56	18	12	5	4
El Paso, Tex.	71	45	17	4	1	4	6
Fort Worth, Tex	97	65	20	4	6	2	8
Houston, Tex.	674	343	191	63	40	37	16
Little Rock, Ark.	77	50	19	4	2	2	9
New Orleans, La.	143	83	36	15	4	5	-
San Antonio, Tex.	183	115	34	19	5	10	11
Shreveport, La.	90	56	16	11	-	7	2
Tulsa, Okla.	99	73	15	5	5	1	7
MOUNTAIN	775	513	163	47	27	25	32
Albuquerque, N.Mex.	101	63	23	9	1	5	2
Colo. Springs, Colo.	31	22	6	1	1	1	4
Denver, Colo.	141	92	36	7	4	2	3
Las Vegas, Nev.	84	51	17	9	7	-	6
Ogden, Utah	19	15	2	1	-	1	4
Phoenix, Ariz.	200	129	41	13	8	9	1
Pueblo, Colo.	26	21	4	-	-	1	4
Salt Lake City, Utah	41	25	9	1	3	3	2
Tucson, Ariz.	132	95	25	6	3	3	6
PACIFIC	2,062	1,419	404	127	51	59	114
Berkeley, Calif.	22	18	1	1	-	2	1
Fresno, Calif.	62	45	11	1	2	3	2
Glendale, Calif.	23	18	4	-	1	-	1
Honolulu, Hawaii	54	36	8	7	1	2	3
Long Beach, Calif.	86	55	24	4	1	2	4
Los Angeles, Calif.	683	452	150	48	15	17	17
Oakland, Calif.	118	78	22	7	4	7	8
Pasadena, Calif.	33	28	3	2	-	-	-
Portland, Oreg.	115	92	16	4	2	1	11
Sacramento, Calif.	61	35	15	6	2	2	3
San Diego, Calif.	138	84	35	11	5	3	13
San Francisco, Calif.	170	118	31	10	1	10	7
San Jose, Calif.	188	124	40	13	7	4	16
Seattle, Wash.	169	125	26	9	6	3	9
Spokane, Wash.	69	54	8	2	3	2	8
Tacoma, Wash.	71	57	10	2	1	1	11
TOTAL	13,196††	8,580	2,912	861	375	461	551

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

** Pneumonia and influenza

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

†† Total includes unknown ages.

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

Immunization – Continued

Screening persons by history of ability to eat eggs without adverse effects is a reasonable way to identify those possibly at risk from receiving measles, mumps and influenza vaccine. Individuals with anaphylactic hypersensitivity to eggs (hives, swelling of the mouth and throat, difficulty breathing, hypotension, or shock)* should not be given these vaccines.

Rubella vaccine is grown in human diploid cell culture and can be safely given, regardless of a history of allergy to eggs or egg proteins.

Bacterial vaccines, such as cholera, DTP, plague, and typhoid, are frequently associated with local or systemic adverse effects; these common reactions do not appear to be allergic.

Some vaccines contain preservatives (e.g., thimerosal, a mercurial) or trace amounts of antibiotics (e.g., neomycin) to which patients may be hypersensitive. Those administering vaccines should carefully review the information provided with the package insert before deciding whether the rare patients with known hypersensitivity to such preservatives or antibiotics should be given the vaccine(s). No currently recommended vaccine contains penicillin or its derivatives.

Some vaccines (e.g., MMR vaccine or its individual component vaccines) contain trace amounts of neomycin. This amount is less than would usually be used for the skin test to determine hypersensitivity. Persons who have experienced anaphylactic reactions to neomycin should not receive these vaccines. Most often, neomycin allergy is a contact dermatitis, a manifestation of a delayed-type (cell-mediated) immune response rather than anaphylaxis. In such individuals, the adverse reaction, if any, to neomycin in the vaccines would be an erythematous, pruritic papule at 48-96 hours. A history of delayed-type reactions to neomycin is not a contraindication to receiving these vaccines.

ALTERED IMMUNOCOMPETENCE

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. Because of the possibility of familial immunodeficiency, live, attenuated-virus vaccines should not be given to a member of a household in which there is a family history of congenital or hereditary immunodeficiency until the immune competence of the potential recipient is known. OPV should not be given to a member of a household in which there is a family history of immunodeficiency or immunosuppression, regardless whether acquired or hereditary, until the immune status of the recipient and the other family members is known. Individuals residing in the household of a immunocompromised individual should not receive OPV, because vaccine viruses are excreted by the recipient of the vaccine and may be communicable to other persons.

SEVERE FEBRILE ILLNESSES

Minor illnesses, such as mild upper-respiratory infections, should not postpone vaccine administration. However, immunization of persons with severe febrile illnesses should generally be deferred until they have recovered. This precaution is to avoid superimposing adverse effects from the vaccine on the underlying illness or mistakenly identifying a manifestation of the underlying illness as a result of the vaccine. In persons whose compliance with medical care cannot be assured, it is particularly important to take every opportunity to provide appropriate vaccinations.

VACCINATION DURING PREGNANCY

On the grounds of a theoretical risk to the developing fetus, live, attenuated-virus vaccines

*Any of these signs or symptoms constitutes a systemic anaphylactic response.

Immunization — Continued

are not generally given to pregnant women or to those likely to become pregnant within 3 months after receiving vaccine(s). With some of these vaccines—particularly rubella, measles, and mumps—pregnancy is a contraindication. Both yellow fever vaccine and OPV can be given to pregnant women at substantial risk of exposure to natural infection. When vaccine is to be given during pregnancy, waiting until the second or third trimester to minimize any concern over teratogenicity is a reasonable precaution. If a pregnant woman receives a live, attenuated-virus vaccine, there is not necessarily any real risk to the fetus. In particular, although there are theoretical risks in giving rubella vaccine during pregnancy, data on previously and currently available rubella vaccines indicate that the risk, if any, of teratogenicity from live rubella vaccine is quite small. There has been no evidence of congenital rubella syndrome in infants born to susceptible mothers who received rubella vaccine during pregnancy.

Since persons given measles, mumps, or rubella vaccine viruses do not transmit them, these vaccines may be administered with safety to children of pregnant women. Although live polio virus is shed by children recently immunized with OPV (particularly following the first dose), this vaccine can also be administered to children of pregnant women. Polio immunization of children should not be delayed because of pregnancy in close adult contacts. Experience to date has not revealed any risks of poliovaccine virus to the fetus.

There is no convincing evidence of risk to the fetus from immunization of pregnant women using inactivated virus vaccines, bacterial vaccines, or toxoids. Tetanus and diphtheria toxoid (Td) should be given to inadequately immunized pregnant women because it affords protection against neonatal tetanus. There is no risk to the fetus from passive immunization of pregnant women with IG (see below). For further information regarding immunization of pregnant women, refer to the American College of Obstetricians and Gynecologists (ACOG) Technical Bulletin Number 14, May 1982.

ADVERSE EVENTS FOLLOWING IMMUNIZATION*

Modern vaccines are extremely safe and effective, but not completely so. Adverse events following immunization have been reported with all vaccines. These range from frequent, minor, local reactions to extremely rare, severe, systemic illness such as paralysis associated with OPV. To improve knowledge about adverse reactions, all temporally associated events severe enough to require the recipient to seek medical attention should be evaluated and reported in detail to local or state health officials and to the vaccine manufacturer. It is frequently impossible to establish cause-and-effect relationships when untoward events occur after receiving vaccine(s) since temporal association alone does not necessarily indicate causation.

DISEASE CONTROL THROUGH CONTINUING PROGRAMS

The best means of reducing the occurrence of vaccine-preventable diseases of childhood (diphtheria, pertussis, tetanus, polio, measles, mumps, and rubella) is by having a highly immune population. Universal immunization is an important part of good health care and should be accomplished through routine and intensive programs carried out in physicians' offices and public health clinics. Programs aimed at ensuring that all children are immunized at the recommended age should be established and maintained in all communities. In addition, all other susceptible persons (regardless of age) should be immunized, unless vaccine is otherwise contraindicated.

Official health agencies should take whatever steps are necessary, including development and enforcement of school immunization requirements, to assure that all persons in schools

*More complete information on adverse reactions to a specific vaccine may be found in the ACIP recommendations for specific vaccines.

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at all grade levels and those in day-care centers are protected against the vaccine-preventable diseases of childhood.

Official personal immunization record cards have been adopted by every state and the District of Columbia to encourage uniformity of records and to facilitate the assessment of immunization status by schools and day-care centers. In many states, these cards are distributed to new mothers while they are still in the hospital following delivery. The records are used as one teaching tool in immunization education programs aimed at increasing parental awareness of the need for vaccines. The Committee recommends the use of these standard records by all health care providers.

A permanent, comprehensive immunization record should be established for each newborn infant and maintained by the parent. Physicians should encourage parents to use the record and should record all immunization data. Parents or guardians should be urged to bring the record every time the child sees a health care provider. Health care providers should review the immunization status of children at each visit. At a minimum, the type of immunobiologic administered and the date of administration should be entered into the patient's immunization record.

Maintenance of personal immunization records is very important, since persons in this country relocate frequently. This will facilitate accurate record-keeping for the patient, assist with physician encounters, and fulfill the need for documentation of immunization in schools and other institutions and organizations.

Every health care provider should maintain a permanent record of the immunization history of each patient so information can be updated when subsequent vaccine(s) are administered, and patients in need of immunization can easily be identified and recalled. These records should contain the type of vaccine or other immunobiologic administered, date of administration, manufacturer, and lot number.

Recall or tickler systems have been developed to identify children who are due for immunizations or behind schedule for immunizations so parents can be contacted to have them immunized. The Committee recommends the use of these systems by all health care providers.

Dates of immunization (at least month and year) should be required on institutional immunization records, such as those kept in schools and day-care centers, to assure that children have received vaccines at an acceptable age and according to an appropriate schedule. This will facilitate assessment that a primary vaccine series has been completed and that any needed boosters have been obtained at the appropriate time. Measles, mumps, and rubella immunizations should be considered adequate only if they were administered on or after the first birthday (the currently recommended age for routine measles immunization is 15 months). Administration of MMR vaccine at 15 months is desirable for use in routine infant-child immunization programs.

SOURCES OF VACCINE INFORMATION

Apart from these general recommendations, which are published at approximately 2-year intervals, the practitioner can draw on a variety of sources for specific data and updated information including:

A. Official package circular—Manufacturers provide product-specific information along with each vaccine; some of these are reproduced in their entirety in the *Physician's Desk Reference* (*PDR*) and dated.

B. *Morbidity and Mortality Weekly Report (MMWR)*—This report is published weekly by CDC and contains vaccine recommendations, reports of specific disease activity, policy

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statements, and the regular and special recommendations of this Committee. The *MMWR* will contain any necessary updated information on the ACIP recommendations. Subscription price for domestic (United States, Canada, and Mexico) is $70.00 (third class) and $90.00 (first class), and the foreign price is $140 (airmail printed matter) and $155 (airmail letter). Write: *MMWR*, National Technical Information Services, 5282 Port Royal Road, Springfield, Virginia 22161.

C. *Health Information for International Travel* — This booklet is published annually by CDC as a guide to requirements and recommendations for specific immunizations and health practices for travel to various countries. It can be obtained for $5 from the Superintendent of Documents, U. S. Government Printing Office, Washington, D.C. 20402.

D. Advisory memoranda — Memoranda are published when necessary by CDC to advise international travelers or those who provide information to travelers about specific outbreaks of communicable diseases abroad. These memoranda include health information for prevention and specific recommendations for immunization and may be obtained at the present time at no cost by writing the Division of Quarantine, Centers for Disease Control, Atlanta, Georgia 30333, to request placement on the mailing list.

E. The Report of the Committee on Infectious Diseases of the American Academy of Pediatrics (Red Book) — The full report containing recommendations on all licensed vaccines is usually updated every 4-5 years. The most recent Red Book was published in 1982. The cost is $15.00, plus mailing. It may be ordered from: American Academy of Pediatrics, P. O. Box 1034, Evanston, Illinois 60204.

F. Red Book Update — The Committee on Infectious Diseases of the American Academy of Pediatrics publishes its recent positions and specific recommendations in *Pediatrics* after each quarterly meeting. A yearly subscription costs $30.00. It may be ordered from the address listed in E above.

G. *Control of Communicable Diseases in Man* — This manual is published by the American Public Health Association at approximately 5-year intervals. The thirteenth edition (1980) is available now. The manual contains valuable information concerning infectious diseases, their occurrence worldwide, immunization, diagnostic and therapeutic information, and up-to-date recommendations on isolation and other control measures for each disease presented. It may be ordered at a cost of $7.50 from: The American Public Health Association, 1015 Fifteenth Street, N.W., Washington, D.C. 20005.

H. *Technical Bulletins of the American College of Obstetricians and Gynecologists (ACOG)* — These bulletins, which are updated periodically, contain important information on immunization of pregnant women. A set may be ordered at a cost of $7.50 from: American College of Obstetricians and Gynecologists, Attention: Distribution Center, 600 Maryland Avenue, S.W., Suite 300 East, Washington, D.C. 20024.

I. Most state and many local health departments provide routine immunizations, immunization cards, and schedules to patients. They also send out routine reports of disease incidence.

J. Additional information can also be obtained from city, county, or state health departments, medical schools, and large hospitals. Specific questions may be addressed to the Division of Immunization, Centers for Disease Control, Atlanta, Georgia 30333, telephone, (404) 329-3311.

PATIENT INFORMATION

Parents and patients should be informed about the benefits and risks of vaccines. It is essential that the patient or responsible person be given information concerning the risks of vaccines as well as the major benefits from vaccines in preventing disease in both individuals and

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the community. Benefit and risk information should be presented in terminology that is as simple as possible. No formal and legally acceptable statement has been universally adopted for the private medical sector. CDC has developed "Important Information Statements" for use with federally purchased vaccines given in public health clinics. Practitioners may wish to consider these or similar materials for parents and patients. The Committee recommends that there be ample opportunity for questions before each immunization.

Epidemiologic Notes and Reports

Update: Influenza in Nursing Homes — Michigan, Minnesota

In Michigan, where one nursing home outbreak of influenza has previously been reported (*1*), an additional 18 nursing homes have reported outbreaks of influenza-like illness occurring from December 16, 1982, to January 10, 1983. Thirteen are located in the southeastern area of the state, and five are located elsewhere in the lower peninsula. So far, influenza virus has been isolated from one outbreak; results of other laboratory studies are pending. Despite these outbreaks, other indicators of influenza activity have increased only slightly in Michigan.

In Minnesota, state and local health officials are investigating outbreaks of influenza-like illness that began from December 25, 1982, to January 7, 1983, at six nursing homes in five counties in central Minnesota. As of January 10, outbreaks of influenza-like illness in 28 nursing homes had been reported to CDC. Investigation of a previously reported outbreak in New York (*2*) has indicated 49 (60%) of 81 residents experienced influenza-like illnesses in December; four have died.

California, Illinois, Massachusetts, and Wisconsin have reported their first influenza virus isolates for this season from sporadic cases in Los Angeles, Chicago, Boston, and Milwaukee. So far this season, influenza virus type A(H3N2) has been isolated in 19 states.

Reported by J Webber, MPH, W Hall, MD, Michigan State Dept of Public Health; D Peterson, MS, J Goods, MPH, Minnesota State Dept of Public Health; V Birnberg, MD, F Sorvillo, MPH, B Weiss, MPH, B Agee, MD, Los Angeles, California; State Laboratory Directors and State Epidemiologists; Consolidated Surveillance Activity, Epidemiology Program Office, Influenza Br, Div of Viral Diseases, Center for Infectious Diseases, CDC.

Editorial Note: Although many reports this winter concerning influenza-like illness relate to nursing homes or homes for the aged, an unusual propensity for current strains to affect the elderly is not necessarily implied. In many states, communications from such facilities about disease outbreaks are actively promoted by the state health department. Furthermore, the closing of schools and colleges for winter vacation may have temporarily prevented outbreaks in these populations, which would likely be reported to state and local health departments. While the current level of reports suggests that influenza activity this winter will be greater than last year's very sporadic outbreaks, reliable forecasts cannot be made with the available information. Persons who are at high risk of serious illness if infected with influenza and who have not yet received vaccine should still be encouraged to do so.

References

1. CDC. Update: influenza—United States. MMWR 1982;31: 702.
2. CDC. Influenza update—United States. MMWR 1982;31:696.

Notice to Readers

Revision of Tables I, II, and III (Notifiable Diseases)

Beginning with this issue, the following changes, recommended by the Conference of State and Territorial Epidemiologists, have been made in the notifiable diseases reportable to CDC:

1. Toxic-shock syndrome has been added to Table I and to the third page of Table III.
2. Brucellosis has been moved to Table II (Notifiable diseases of low frequency).
3. The listing for botulism in Table II now includes foodborne, infant, and other botulism.
4. Measles cases are identified either as indigenous or imported in Table I and on the second page of Table III.
5. Chickenpox has been reinstated for annual reporting.
6. Only the cumulative (year-to-date) totals will be printed in Table III for malaria, meningococcal infections, typhoid fever, and Rocky Mountain spotted fever.

Errata, Vol. 31, No. 52

p. 700. In the article, "Acquired Immune Deficiency Syndrome (AIDS) in Prison Inmates—New York, New Jersey," S. Cunningham-Rundles, PhD, Memorial Sloan Kettering Institute, New York City, was omitted from the credits on p. 701.

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p. 660. In the article, "Update, Influenza Activity—United States and Canada," the first sentence of the third paragraph should read, "Texas: The first reported influenza virus isolates have been identified from specimens collected on November 22 and November 30 from children in Houston with sporadic influenza illness."

The *Morbidity and Mortality Weekly Report* is prepared by the Centers for Disease Control, Atlanta, Georgia, and distributed by the National Technical Information Service, Springfield, Virginia. The data in this report are provisional, based on weekly telegrams to CDC by state health departments. The reporting week concludes at close of business on Friday; compiled data on a national basis are officially released to the public on the succeeding Friday.

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

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