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205 ACIP: General Recommendations on Immunization

Recommendations of the Immunization Practices Advisory Committee (ACIP)

General Recommendations on Immunization

This revision of the "General Recommendations on Immunization" updates the 1983 statement (1). Changes or new sections include 1) listing of vaccines available in the United States by type and recommended routes, 2) updated schedules for immunizing infants and children, 3) clarification of the guidelines for spacing administration of immune globulin preparations and different vaccines, 4) an updated table of recommendations for routine immunization of children infected with human immunodeficiency virus, 5) listing of conditions that are often inappropriately considered contraindications to immunization, and 6) addition of information on the National Childhood Vaccine Injury Act of 1986 and the National Vaccine Injury Compensation Program. These recommendations are not comprehensive for each vaccine; Immunization Practices Advisory Committee (ACIP) recommendations on each vaccine should be consulted for more details.

INTRODUCTION

Recommendations for immunizing infants, children, and adults are based on characteristics of immunobiologics, scientific knowledge about the principles of active and passive immunization, and judgments by public health officials and specialists in clinical and preventive medicine. Benefits and risks are associated with the use of all immunobiologics: no vaccine is completely safe or completely effective. Benefits of immunization range from partial to complete protection against the consequences of disease (which range from mild or asymptomatic infection to severe consequences, such as paralysis or death); risks of immunization range from common, trivial, and inconvenient side effects to rare, severe, and life-threatening conditions. Thus, recommendations for immunization practices balance scientific evidence of benefits, costs, and risks to achieve optimal levels of protection against infectious diseases. These recommendations describe this balance and attempt to minimize the risks by providing specific advice regarding dose, route, and spacing of immunobiologics and delineating situations that warrant precautions or contraindicate their use. They are recommendations for use in the United States because epidemiologic circumstances and vaccines often differ in other countries. Individual circumstances may warrant deviations from these recommendations. The relative balance of benefits and risks can change as diseases are controlled or eradicated. For

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example, because smallpox has been eradicated throughout the world, the risk of complications associated with smallpox vaccine now exceeds the risk of the disease; consequently, smallpox vaccination of civilians is now indicated only for laboratory workers directly involved with smallpox or closely related orthopox viruses (e.g., monkeypox and vaccinia).

DEFINITIONS

Immunobiologic

Immunobiologics include both antigenic substances, such as vaccines and toxoids, and antibody-containing preparations, including globulins and antitoxins, from human or animal donors. These products are used for active or passive immunization or therapy. Examples include:

Vaccine (Table 1): A suspension of live (usually attenuated) or inactivated microorganisms (bacteria, viruses, or rickettsiae) or fractions thereof administered to induce immunity and thereby prevent infectious disease. Some vaccines contain highly defined antigens (e.g., the polysaccharide of *Haemophilus influenzae* type b or the surface antigen of hepatitis B); others have antigens that are complex or incompletely defined (e.g., killed *Bordetella pertussis* or live attenuated viruses).

Toxoid: A modified bacterial toxin that has been rendered nontoxic but retains the ability to stimulate the formation of antitoxin.

Immune globulin (IG): A sterile solution containing antibodies from human blood. It is obtained by cold ethanol fractionation of large pools of blood plasma and contains 15%–18% protein. Intended for intramuscular administration, it is primarily indicated for routine maintenance of immunity of certain immunodeficient persons and for passive immunization against measles and hepatitis A. IG does not transmit hepatitis B virus, human immunodeficiency virus (HIV), or other infectious diseases.

Intravenous immune globulin (IGIV): A product derived from blood plasma from a donor pool similar to the IG pool but prepared so it will be suitable for intravenous use. IGIV does not transmit infectious diseases. It is primarily indicated for replacement therapy in antibody-deficiency disorders.

Specific IG: Special preparations obtained from blood plasma from donor pools preselected for a high antibody content against a specific antigen, e.g., hepatitis B immune globulin (HBIG), varicella-zoster immune globulin, rabies immune globulin, and tetanus immune globulin. Like IG and IGIV, these preparations do not transmit infectious diseases.

Antitoxin: A solution of antibodies derived from the serum of animals immunized with specific antigens (e.g., diphtheria antitoxin, botulinum antitoxin) used to achieve passive immunity or for treatment.

Vaccination and Immunization

These terms are often used interchangeably. *Vaccination* and *vaccine* derive from *vaccinia*, the virus once used as smallpox vaccine. Thus, *vaccination* originally meant inoculation with vaccinia virus to render a person immune to smallpox. Although some persons still prefer that *vaccination* be restricted to this use, most use it to denote the administration of any vaccine or toxoid.

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 is the production of antibody or other immune responses to the administration of a vaccine or toxoid. *Passive immunization* means the provision

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TABLE 1. Vaccines available in the United States, by type and recommended routes of administration

Vaccine	Type	Route
BCG (Bacillus of Calmette and Guérin)	Live bacteria	Intradermal or subcutaneous
Cholera	Inactivated bacteria	Subcutaneous or intradermal*
DTP (D = Diphtheria) (T = Tetanus) (P = Pertussis)	Toxoids and inactivated bacteria	Intramuscular
HB (Hepatitis B)	Inactive viral antigen	Intramuscular
Haemophilus influenzae b —Polysaccharide (HbPV)	Bacterial polysaccharide	Subcutaneous or intramuscular†
—or Conjugate (HbCV)	or Polysaccharide conjugated to protein	Intramuscular
Influenza	Inactivated virus or viral components	Intramuscular
IPV (Inactivated Poliovirus Vaccine)	Inactivated viruses of all 3 serotypes	Subcutaneous
Measles	Live virus	Subcutaneous
Meningococcal	Bacterial polysaccharides of serotypes A/C/Y/W-135	Subcutaneous
MMR (M = Measles) (M = Mumps) (R = Rubella)	Live viruses	Subcutaneous
Mumps	Live virus	Subcutaneous
OPV (Oral Poliovirus Vaccine)	Live viruses of all 3 serotypes	Oral
Plague	Inactivated bacteria	Intramuscular
Pneumococcal	Bacterial polysaccharides of 23 pneumococcal types	Intramuscular or subcutaneous
Rabies	Inactivated virus	Subcutaneous or intradermal§
Rubella	Live virus	Subcutaneous
Tetanus	Inactivated toxin (toxoid)	Intramuscular¶
Td or DT** (T = Tetanus) (D or d = Diphtheria)	Inactivated toxins (toxoids)	Intramuscular¶
Typhoid	Inactivated bacteria	Subcutaneous††
Yellow fever	Live virus	Subcutaneous

*The intradermal dose is lower.
†Route depends on the manufacturer; consult package insert for recommendation for specific product used.
§Intradermal dose is lower and used only for preexposure vaccination.
¶Preparations with adjuvants should be given intramuscularly.
**DT = tetanus and diphtheria toxoids for use in children aged <7 years. Td = tetanus and diphtheria toxoids for use in persons aged ≥7 years. Td contains the same amount of tetanus toxoid as DTP or DT but a reduced dose of diphtheria toxoid.
††Boosters may be given intradermally unless acetone-killed and dried vaccine is used.

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of temporary immunity by the administration of preformed antibodies. Three types of immunobiologics are administered for passive immunization: 1) pooled human IG or IGIV, 2) specific IG preparations, and 3) antitoxins.

Vaccination and *immunization* are used interchangeably in ACIP statements in reference to active immunization. Regardless of which term is used, administration of an immunobiologic cannot be automatically equated with the development of adequate immunity for a variety of reasons, many of which are discussed below.

IMMUNOBIOLOGICS

The specific nature and content of immunobiologics can differ. When immunobiologics against the same infectious agents are produced by different manufacturers, active and inert ingredients in the various products are not always the same. Practitioners are urged to become familiar with the constituents of the products they use.

Suspending Fluids

These may be sterile water or saline or complex fluids containing small amounts of protein or other constituents derived from the medium or biologic system in which the vaccine is produced (e.g., serum proteins, egg antigens, cell-culture–derived antigens).

Preservatives, Stabilizers, Antibiotics

These components of vaccines, antitoxins, and globulins are used to inhibit or prevent bacterial growth in viral cultures or the final product or to stabilize the antigens or antibodies. Allergic reactions can occur if the recipient is sensitive to one of these additives (e.g., mercurials, phenols, albumin, glycine).

Adjuvants

Many antigens evoke insufficient immunologic responses when given in their natural state. Efforts to enhance immunogenicity include mixing antigens with a variety of substances or adjuvants (e.g., aluminum adjuvants such as aluminum phosphate).

ROUTE, SITE, AND TECHNIQUE OF IMMUNIZATION

Route

Routes of administration are recommended for each immunobiologic (Table 1). To avoid unnecessary local or systemic effects and/or to ensure optimal efficacy, the practitioner should not deviate from the recommended routes. Vaccines containing adjuvants must be injected deep into the muscle mass; they should not be administered subcutaneously or intradermally because they can cause local irritation, inflammation, granuloma formation, or necrosis.

Site

Injectable immunobiologics should be administered where there is little likelihood of 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 forearm except for human diploid cell rabies vaccine with which reactions are less severe in the deltoid area. The 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 is therefore the preferred site. An individual decision must be made for each child based on the volume of the material to be administered and the size of the muscle into which it is

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to be injected. In adults, the deltoid is recommended for routine intramuscular vaccine administration, particularly for hepatitis B vaccine. *The buttock should not be used routinely as a vaccination site for infants, children, or adults because of the risk of injury to the sciatic nerve.* In addition, injection into the buttock has been associated with decreased immunogenicity of hepatitis B and rabies vaccines, presumably because of inadvertent subcutaneous injection or injection into deep fat tissue. If the buttock is used when very large volumes are to be injected or multiple doses are necessary (e.g., large doses of IG), the central region should be avoided; only the upper, outer quadrant should be used.

Techniques

Syringes and needles used for injections must be sterile and preferably disposable to minimize the risk of contamination. For an intramuscular injection, the needle and syringe should be of sufficient length and bore to reach the muscle mass itself and prevent vaccine from seeping into subcutaneous tissue. For children, a 20- or 22-gauge needle 1 to 1¼ inches long is recommended. For small infants, a 25-gauge ⅝-inch–long needle may be adequate. For adults, the suggested needle length is 1½ inches. For subcutaneous or intradermal injections, a 25-gauge needle ⅝–¾ inches long is recommended.

Before the injection is given, the needle is inserted in the site and the syringe plunger pulled back; if blood appears, the needle should be withdrawn and a new site selected. The process should be repeated until no blood appears. A separate needle and syringe should be used for each vaccine injected. Disposable needles and syringes should be discarded into labeled, puncture-proof containers to prevent accidental needlesticks or reuse. If more than one vaccine preparation is administered or if vaccine and IG are administered simultaneously, each should be given at a different site.

DOSAGE

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

The ACIP strongly discourages any variation from the recommended volume or number of doses of any vaccine. Some practitioners use smaller, divided, doses of vaccine, thereby reducing the total immunizing dose. Others use multiple smaller doses that together equal a full immunizing dose (e.g., diphtheria and tetanus toxoids and pertussis vaccine [DTP]) in an effort to reduce reactions. However, the serologic response, clinical efficacy, and/or frequency and severity of adverse reactions of such schedules have not been adequately studied.

AGE AT WHICH IMMUNOBIOLOGICS ARE ADMINISTERED

Several factors influence recommendations concerning the age at which vaccines are administered (Table 2); they are age-specific risks of disease, age-specific risks of complications, ability of persons 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 whose members are known to develop an acceptable antibody response to vaccination.

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TABLE 2. Recommended schedule for active immunization of normal infants and children*

Recommended age†	Vaccine(s)§	Comments
2 mos	DTP#1¶, OPV#1**	OPV and DTP can be given earlier in areas of high endemicity
4 mos	DTP#2, OPV#2	6-wk to 2-mo interval desired between OPV doses
6 mos	DTP#3	An additional dose of OPV at this time is optional in areas with a high risk of poliovirus exposure
15 mos††	MMR§§, DTP#4, OPV#3	Completion of primary series of DTP and OPV
18 mos	HbCV¶¶	Conjugate preferred over polysaccharide vaccine***
4–6 yrs	DTP#5†††, OPV#4	At or before school entry
14–16 yrs	Td§§§	Repeat every 10 yrs throughout life

*See Table 3 for the recommended immunization schedules for infants and children up to their seventh birthday not immunized at the recommended times.

†These recommended ages should not be construed as absolute, e.g., 2 months can be 6–10 weeks. However, MMR should not be given to children <12 months of age. If exposure to measles disease is considered likely, then children 6 through 11 months old may be immunized with single-antigen measles vaccine. These children should be reimmunized with MMR when they are approximately 15 months of age.

§For all products used, consult the manufacturers' package enclosures for instructions regarding storage, handling, dosage, and administration. Immunobiologics prepared by different manufacturers can vary, and those of the same manufacturer can change from time to time. The package inserts are useful references for specific products, but they may not always be consistent with current ACIP and American Academy of Pediatrics immunization schedules.

¶DTP = Diphtheria and Tetanus Toxoids and Pertussis Vaccine, Adsorbed. DTP may be used up to the seventh birthday. The first dose can be given at 6 weeks of age and the second and third doses given 4–8 weeks after the preceding dose.

**OPV = Poliovirus Vaccine Live Oral, Trivalent: contains poliovirus types 1, 2, and 3.

††Provided at least 6 months have elapsed since DTP#3 or, if fewer than 3 doses of DTP have been received, at least 6 weeks since the last previous dose of DTP or OPV. MMR vaccine should not be delayed to allow simultaneous administration with DTP and OPV. Administering MMR at 15 months and DTP#4 and OPV#3 at 18 months continues to be an acceptable alternative.

§§MMR = Measles, Mumps, and Rubella Virus Vaccine, Live. Counties that report ≥5 cases of measles among preschool children during each of the last 5 years should implement a routine 2-dose measles vaccination schedule for preschoolers. The first dose should be administered at 9 months or the first health-care contact thereafter. Infants vaccinated before their first birthday should receive a second dose at about 15 months of age. Single-antigen measles vaccine should be used for children aged <1 year and MMR for children vaccinated on or after their first birthday. If resources do not allow a routine 2-dose schedule, an acceptable alternative is to lower the routine age for MMR vaccination to 12 months.

¶¶HbCV = Vaccine composed of Haemophilus influenzae b polysaccharide antigen conjugated to a protein carrier. Children <5 years of age previously vaccinated with polysaccharide vaccine between the ages of 18 and 23 months should be revaccinated with a single dose of conjugate vaccine if at least 2 months have elapsed since the receipt of the polysaccharide vaccine.

***If HbCV is not available, an acceptable alternative is to give Haemophilus influenzae b polysaccharide vaccine (HbPV) at age ≥24 months. Children at high risk for *Haemophilus influenzae* type b disease where conjugate vaccine is not available may be vaccinated with HbPV at 18 months of age and revaccinated at 24 months.

†††Up to the seventh birthday.

§§§Td = Tetanus and Diphtheria Toxoids, Adsorbed (for use in persons aged ≥7 years): contains the same amount of tetanus toxoid as DTP or DT but a reduced dose of diphtheria toxoid.

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SPACING OF IMMUNOBIOLOGICS

Multiple Doses of Same Antigen

Some products require administration of more than one dose for development of an adequate antibody response. In addition, some products require periodic reinforcement (booster) doses to maintain protection. In recommending the ages and/or intervals for multiple doses, the ACIP takes into account risks from disease and the need to induce or maintain satisfactory protection (Tables 2, 3, and 4).

Intervals between doses that are longer than those recommended do not lead to a reduction in final antibody levels. Therefore, it is not necessary to restart an interrupted series of an immunobiologic or to add extra doses.

TABLE 3. Recommended immunization schedule for infants and children up to the seventh 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§, MMR¶ if child is aged ≥15 mos and HbCV** if child is aged ≥18 mos	DTP, OPV, and MMR should be administered simultaneously to children aged ≥15 mos, if appropriate. DTP, OPV, MMR, and HbCV may be given simultaneously to children aged 18 mos–5 yrs.
2 mos after DTP#1, OPV#1	DTP#2††, OPV#2	
2 mos after DTP#2	DTP#3††	An additional dose of OPV at this time is optional in areas with a high risk of poliovirus exposure.
6–12 mos after DTP#3	DTP#4, OPV#3	
Preschool§§ (4–6 yrs)	DTP#5, OPV#4	Preferably at or before school entry.
14–16 yrs	Td¶¶	Repeat every 10 yrs throughout life.

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

†DTP = Diphtheria and Tetanus Toxoids and Pertussis Vaccine, Adsorbed. DTP can be used up to the seventh birthday.

§OPV = Poliovirus Vaccine Live Oral, Trivalent: contains poliovirus types 1, 2, and 3.

¶MMR = Measles, Mumps, and Rubella Virus Vaccine, Live (see text for discussion of single vaccines versus combination).

**HbCV = Vaccine composed of Haemophilus influenzae b polysaccharide antigen conjugated to a protein carrier. If HbCV is not available, an acceptable alternative is to give Haemophilus influenzae b polysaccharide vaccine (HbPV) at 24 months of age. If HbCV is unavailable and if the child is at high risk for *Haemophilus influenzae* type b disease, HbPV may be given at 18 months of age with a second dose at 24 months. Children aged <5 years who were previously vaccinated with HbPV between 18 and 23 months of age should be revaccinated with a single dose of HbCV at least 2 months after the initial dose of HbPV. Either HbCV or HbPV can be administered up to the fifth birthday. However, they are not generally recommended for persons ≥5 years of age.

††The second and third doses of DTP can be given 4–8 weeks after the preceding dose.

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

¶¶Td = Tetanus and Diphtheria Toxoids, Adsorbed (for use in persons aged ≥7 years): contains the same dose of tetanus toxoid as DTP or DT and a reduced dose of diphtheria toxoid.

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In contrast, giving doses of a vaccine or toxoid at less than recommended intervals may lessen the antibody response and therefore should be avoided. Doses given at less than recommended intervals should not be counted as part of a primary series.

Some vaccines produce local or systemic symptoms in certain recipients when given too frequently (e.g., Td, DT, and rabies). Such reactions are thought to result from the formation of antigen-antibody complexes. Good recordkeeping, careful patient histories, and adherence to recommended schedules can decrease the incidence of such reactions without sacrificing immunity.

Different Antigens

Experimental evidence and extensive clinical experience have strengthened the scientific basis for giving certain vaccines at the same time. Many of the widely used vaccines can safely and effectively be given simultaneously (i.e., on the same day, *not* at the same site). This knowledge is particularly helpful when there is imminent exposure to several infectious diseases, preparation for foreign travel, or uncertainty that the person will return for further doses of vaccine.

1. **Simultaneous administration**

   In general, inactivated vaccines can be administered simultaneously at separate sites. However, when vaccines commonly associated with local or systemic side effects (e.g., cholera, typhoid, and plague) are given simultaneously, the side effects can be accentuated. Whenever possible, these vaccines should be given on separate occasions.

TABLE 4. Recommended immunization schedule for persons ≥7 years of age not immunized at the recommended time in early infancy
(See individual ACIP recommendations for details)

Timing	Vaccine(s)	Comments
First visit	Td#1*, OPV#1†, and MMR§	OPV not routinely recommended for persons aged ≥18 yrs
2 mos after Td#1, OPV#1	Td#2, OPV#2	OPV may be given as soon as 6 wks after OPV#1
6–12 mos after Td#2, OPV#2	Td#3, OPV#3	OPV#3 may be given as soon as 6 wks after OPV#2
10 yrs after Td#3	Td	Repeat every 10 yrs throughout life

*Td = Tetanus and Diphtheria Toxoids, Adsorbed (For Adult Use) (for use after the seventh birthday). The DTP doses given to children <7 years who remain incompletely immunized at age ≥7 years should be counted as prior exposure to tetanus and diphtheria toxoids (e.g., a child who previously received 2 doses of DTP needs only 1 dose of Td to complete a primary series for tetanus and diphtheria).

†OPV = Poliovirus Vaccine Live Oral, Trivalent: contains poliovirus types 1, 2, and 3. When polio vaccine is to be given to persons ≥18 years, Poliovirus Vaccine Inactivated (IPV) is preferred. See ACIP statement on polio vaccine for immunization schedule for IPV (*2*).

§MMR = Measles, Mumps, and Rubella Virus Vaccine, Live. Persons born before 1957 can generally be considered immune to measles and mumps and need not be immunized. Since medical personnel are at higher risk for acquiring measles than the general population, medical facilities may wish to consider requiring proof of measles immunity for employees born before 1957. Rubella vaccine can be given to persons of any age, particularly to nonpregnant women of childbearing age. MMR can 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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Simultaneous administration of pneumococcal polysaccharide vaccine and whole-virus influenza vaccine elicits satisfactory antibody responses without increasing the incidence or severity of adverse reactions. Simultaneous administration of the pneumococcal vaccine and split-virus influenza vaccine can also be expected to yield satisfactory results. Influenza vaccine should be administered annually to the target population.

In general, simultaneous administration of the most widely used live and inactivated vaccines has not resulted in impaired antibody responses or increased rates of adverse reactions. Administration of combined measles, mumps, and rubella (MMR) vaccine yields results similar to administration of individual measles, mumps, and rubella vaccines at different sites. Therefore, there is no medical basis for giving these vaccines separately for routine immunization instead of the preferred MMR combined vaccine.

There are equivalent antibody responses and no clinically significant increases in the frequency of adverse events when DTP, MMR, and oral polio vaccine (OPV) or inactivated polio vaccine (IPV) are administered either simultaneously at different sites or separately. As a result, routine simultaneous administration of MMR, DTP, and OPV (or IPV) to all children ≥15 months who are eligible to receive these vaccines is recommended. Administration of MMR at 15 months followed by DTP and OPV (or IPV) at 18 months remains an acceptable alternative, especially for children with caregivers known to be generally compliant with other health-care recommendations. Data are lacking on concomitant administration of Haemophilus influenzae b conjugate vaccine (HbCV) or Haemophilus influenzae b polysaccharide vaccine (HbPV) and MMR and OPV vaccine. If the child might not be brought back for future immunizations, the simultaneous administration of all vaccines (including DTP, OPV, MMR, and HbCV or HbPV) appropriate to the age and previous vaccination status of the recipient is recommended. Hepatitis B vaccine given with DTP and OPV or given with yellow fever vaccine is as safe and efficacious as these vaccines administered separately.

The antibody responses of both cholera and yellow fever vaccines are decreased if given simultaneously or within a short time of each other. If possible, cholera and yellow fever vaccinations should be separated by at least 3 weeks. If there are time constraints and both vaccines are necessary, the injections can be given simultaneously or within a 3-week period with the understanding that antibody response may not be optimal. Decisions on the need for yellow fever and cholera immunizations should take into account the amount of protection afforded by the vaccine, the possibility that environmental or hygienic practices may be sufficient to avoid disease exposure, and the existence of vaccination requirements for entry into a country.

2. Nonsimultaneous administration

Inactivated vaccines do not interfere with the immune response to other inactivated vaccines or to live vaccines except, as noted above, with cholera and yellow fever vaccines. In general, an inactivated vaccine can be given either simultaneously or at any time before or after a different inactivated vaccine or a live vaccine.

There are theoretical concerns that the immune response to one live-virus vaccine might be impaired if given within 30 days of another. Whenever

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possible, live-virus vaccines not administered on the same day should be given at least 30 days apart (Table 5, page 219).

Live-virus vaccines can interfere with the response to a tuberculin test. Tuberculin testing can be done either on the same day that live-virus vaccines are administered or 4–6 weeks afterwards.

Immune Globulin

If administration of an IG preparation becomes necessary because of imminent exposure to disease, live-virus vaccines can be given simultaneously with the IG product, with the recognition that vaccine-induced immunity might be compromised. The vaccine should be administered at a site remote from that chosen for the IG inoculation. Vaccination should be repeated about 3 months later unless serologic testing indicates that specific antibodies have been produced. OPV and yellow fever vaccines are exceptions, however, and are not affected by administration of IG at any time.

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

Disease	13th Week Ending			Cumulative, 13th Week Ending		
	Apr. 1, 1989	Apr. 2, 1988	Median 1984-1988	Apr. 1, 1989	Apr. 2, 1988	Median 1984-1988
Acquired Immunodeficiency Syndrome (AIDS)	473	U*	309	7,935	7,886	2,918
Aseptic meningitis	58	76	81	961	1,026	1,045
Encephalitis: Primary (arthropod-borne & unspec)	11	13	17	135	176	208
Post-infectious	2	1	3	20	19	22
Gonorrhea: Civilian	9,936	10,714	15,976	160,595	169,714	204,754
Military	152	171	279	2,838	3,140	4,255
Hepatitis: Type A	568	444	444	8,304	6,250	5,696
Type B	345	449	485	4,895	5,100	6,001
Non A, Non B	26	59	67	542	641	814
Unspecified	36	47	79	653	529	1,100
Legionellosis	20	18	14	223	216	166
Leprosy	1	5	4	35	39	52
Malaria	19	13	13	246	170	170
Measles: Total†	315	23	85	1,963	513	644
Indigenous	301	21	73	1,842	464	561
Imported	14	2	9	121	49	83
Meningococcal infections	76	62	68	877	933	893
Mumps	140	119	105	1,386	1,323	1,055
Pertussis	50	38	38	434	568	460
Rubella (German measles)	11	6	7	61	59	84
Syphilis (Primary & Secondary): Civilian	820	735	655	10,041	9,261	7,209
Military	4	2	4	77	58	58
Toxic Shock syndrome	9	10	9	82	81	81
Tuberculosis	366	429	390	4,514	4,469	4,614
Tularemia	2	-	1	13	20	19
Typhoid Fever	10	10	3	88	90	62
Typhus fever, tick-borne (RMSF)	1	2	2	22	17	15
Rabies, animal	82	129	129	948	878	1,094

TABLE II. Notifiable diseases of low frequency, United States

	Cum. 1989		Cum. 1989
Anthrax	-	Leptospirosis (Hawaii 3)	35
Botulism: Foodborne	6	Plague	-
Infant	3	Poliomyelitis, Paralytic	-
Other (Vt. 1)	3	Psittacosis (Ct. 1, Pa. 1, N.C. 1, Oreg. 1)	24
Brucellosis	6	Rabies, human	-
Cholera	-	Tetanus (N.C. 1, Pa. 1)	11
Congenital rubella syndrome	1	Trichinosis	3
Congenital syphilis, ages <1 year	-		
Diphtheria	-		

*Because AIDS cases are not received weekly from all reporting areas, comparison of weekly figures may be misleading.
†Fourteen of the 301 reported cases for this week were imported from a foreign country or can be directly traceable to a known internationally imported case within two generations.

TABLE III. Cases of specified notifiable diseases, United States, weeks ending April 1, 1989 and April 2, 1988 (13th Week)

Reporting Area	AIDS	Aseptic Meningitis	Encephalitis		Gonorrhea (Civilian)		Hepatitis (Viral), by type				Legionellosis	Leprosy
			Primary	Post-infectious			A	B	NA,NB	Unspecified		
	Cum. 1989	Cum. 1989	Cum. 1989	Cum. 1989	Cum. 1989	Cum. 1988	Cum. 1989	Cum. 1989	Cum. 1989	Cum. 1989	Cum. 1989	Cum. 1989
UNITED STATES	7,935	961	135	20	160,595	169,714	8,304	4,895	542	653	223	35
NEW ENGLAND	363	40	4	1	4,597	5,078	176	277	26	26	18	3
Maine	21	1	1	-	72	111	4	13	3	1	3	-
N.H.	8	1	-	-	51	78	27	18	5	2	-	-
Vt.	3	-	-	-	20	43	6	12	2	-	-	-
Mass.	198	18	1	1	1,753	1,848	62	176	10	19	12	3
R.I.	18	12	-	-	390	416	5	27	2	2	3	-
Conn.	115	8	2	-	2,311	2,582	72	31	4	2	-	-
MID. ATLANTIC	2,291	150	18	1	21,783	26,461	1,221	746	56	64	59	1
Upstate N.Y.	263	54	9	1	3,986	3,385	296	181	17	3	20	-
N.Y. City	1,177	23	1	-	8,950	11,550	81	184	11	47	6	-
N.J.	583	-	8	-	3,414	3,794	153	153	13	5	5	-
Pa.	268	73	-	-	5,433	7,732	691	228	15	9	28	1
E.N. CENTRAL	646	139	46	-	27,856	26,826	425	567	44	18	60	-
Ohio	126	39	14	-	7,430	6,040	101	156	7	2	39	-
Ind.	140	40	15	-	1,723	2,247	24	97	5	2	11	-
Ill.	235	4	2	-	8,443	7,403	168	67	3	7	-	-
Mich.	117	50	11	-	8,364	8,882	97	183	18	7	6	-
Wis.	28	6	4	-	1,896	2,254	35	64	11	-	4	-
W.N. CENTRAL	191	36	3	1	7,215	6,658	244	160	13	3	6	-
Minn.	46	4	-	1	748	931	21	33	1	2	2	-
Iowa	19	8	2	-	530	483	19	14	4	-	2	-
Mo.	101	12	-	-	4,400	3,710	140	91	3	1	-	-
N. Dak.	2	3	-	-	34	50	1	7	2	-	-	-
S. Dak.	3	2	1	-	68	143	2	3	3	-	-	-
Nebr.	9	2	-	-	441	448	42	7	-	-	2	-
Kans.	11	5	-	-	994	893	19	5	-	-	-	-
S. ATLANTIC	1,620	201	19	4	45,876	46,712	634	1,027	75	105	31	-
Del.	35	7	1	-	739	679	17	43	-	1	3	-
Md.	182	21	3	-	5,011	4,728	146	185	11	12	10	-
D.C.	135	4	-	-	2,917	3,172	1	3	1	-	-	-
Va.	155	44	8	-	3,973	3,412	41	67	12	58	1	-
W. Va.	8	2	3	-	361	395	7	22	2	1	-	-
N.C.	104	27	-	1	6,695	7,374	125	286	27	-	8	-
S.C.	57	6	-	-	4,151	3,394	10	126	-	4	1	-
Ga.	272	18	1	-	8,785	8,745	100	103	5	4	2	-
Fla.	672	72	3	3	13,244	14,813	187	192	17	25	6	-
E.S. CENTRAL	186	106	9	1	14,048	12,822	69	357	48	1	5	-
Ky.	34	30	2	1	1,253	1,110	33	101	18	-	1	-
Tenn.	45	12	-	-	4,548	4,153	14	185	9	-	3	-
Ala.	60	52	7	-	4,667	4,484	15	65	20	1	1	-
Miss.	47	12	-	-	3,580	3,075	7	6	1	-	-	-
W.S. CENTRAL	729	57	12	1	17,619	19,686	891	398	37	146	11	7
Ark.	24	3	-	-	1,815	1,746	56	21	2	2	1	-
La.	125	5	1	-	3,798	4,488	59	60	4	-	2	-
Okla.	35	12	5	-	1,613	1,704	114	47	8	7	6	-
Tex.	545	37	6	1	10,393	11,748	662	270	23	137	2	7
MOUNTAIN	229	32	4	1	3,390	3,611	1,308	328	63	65	12	1
Mont.	1	-	-	-	51	102	12	14	1	-	2	1
Idaho	4	-	-	-	58	83	56	23	4	2	-	-
Wyo.	5	-	-	-	34	53	6	1	-	-	-	-
Colo.	64	8	1	1	653	916	183	54	21	35	1	-
N. Mex.	11	4	-	-	352	348	146	54	12	1	-	-
Ariz.	59	15	2	-	1,326	1,256	727	115	12	23	5	-
Utah	16	4	1	-	130	166	76	19	8	3	3	-
Nev.	69	1	-	-	786	687	102	48	5	1	1	-
PACIFIC	1,680	200	20	10	18,211	21,860	3,336	1,035	180	225	21	23
Wash.	104	-	-	-	1,419	1,765	621	148	41	10	2	1
Oreg.	50	-	-	-	738	759	565	95	24	4	1	-
Calif.	1,505	187	18	10	15,697	18,844	1,816	779	111	209	17	18
Alaska	4	-	2	-	247	279	294	12	4	2	1	-
Hawaii	17	13	-	-	110	213	40	1	-	-	-	4
Guam	-	-	-	-	-	42	-	-	-	-	-	-
P.R.	402	27	1	-	229	395	21	61	5	4	-	3
V.I.	15	-	-	-	157	93	-	4	-	-	-	-
Amer. Samoa	-	-	-	-	-	16	-	-	-	-	-	-
C.N.M.I.	-	-	-	-	-	14	-	-	-	-	-	-

N: Not notifiable U: Unavailable C.N.M.I.: Commonwealth of the Northern Mariana Islands

TABLE III. (Cont'd.) Cases of specified notifiable diseases, United States, weeks ending April 1, 1989 and April 2, 1988 (13th Week)

Reporting Area	Malaria	Measles (Rubeola)					Menin-gococcal Infections	Mumps		Pertussis			Rubella		
		Indigenous		Imported*		Total									
	Cum. 1989	1989	Cum. 1989	1989	Cum. 1989	Cum. 1988	Cum. 1989	1989	Cum. 1989	1989	Cum. 1989	Cum. 1988	1989	Cum. 1989	Cum. 1988
UNITED STATES	246	301	1,842	14	121	513	877	140	1,386	50	434	568	11	61	59
NEW ENGLAND	16	-	19	-	5	2	66	-	11	-	12	70	-	-	-
Maine	-	-	-	-	-	-	7	-	-	-	4	11	-	-	-
N.H.	1	-	-	-	-	-	9	-	8	-	5	21	-	-	-
Vt.	-	-	-	-	-	-	4	-	-	-	-	-	-	-	-
Mass.	11	-	-	-	3	1	30	-	2	-	-	31	-	-	-
R.I.	3	-	17	-	2	-	1	-	-	-	2	-	-	-	-
Conn.	1	-	2	-	-	1	15	-	1	-	1	7	-	-	-
MID. ATLANTIC	36	4	56	10	40	135	102	4	45	2	37	17	-	2	4
Upstate N.Y.	8	-	4	10†	26	1	40	1	13	2	18	6	-	1	1
N.Y. City	13	4	15	-	13	16	17	-	-	-	1	1	-	1	1
N.J.	5	-	28	-	1	-	9	-	11	-	14	2	-	-	1
Pa.	10	-	9	-	-	118	36	3	21	-	4	8	-	-	1
E.N. CENTRAL	12	25	140	-	35	38	95	3	128	4	23	57	-	4	20
Ohio	5	-	63	-	34	3	52	-	8	-	1	8	-	-	-
Ind.	1	-	-	-	-	-	11	-	14	4	10	24	-	-	-
Ill.	3	25	77	-	-	24	9	-	51	-	-	3	-	3	16
Mich.	1	-	-	-	-	11	16	3	47	-	6	12	-	-	4
Wis.	2	-	-	-	1	-	7	-	8	-	6	10	-	1	-
W.N. CENTRAL	3	6	75	-	1	-	23	4	228	-	11	33	-	1	-
Minn.	2	-	-	-	-	-	6	-	-	-	-	4	-	-	-
Iowa	-	-	-	-	-	-	-	3	10	-	6	14	-	-	-
Mo.	1	-	60	-	-	-	5	1	33	-	4	5	-	1	-
N. Dak.	-	-	-	-	-	-	-	-	-	-	-	6	-	-	-
S. Dak.	-	-	-	-	-	-	4	-	-	-	-	2	-	-	-
Nebr.	-	-	-	-	-	-	7	-	1	-	-	-	-	-	-
Kans.	-	6	15	-	1	-	1	-	184	-	1	2	-	-	-
S. ATLANTIC	44	8	110	-	7	112	145	22	221	5	36	51	1	1	1
Del.	1	-	-	-	-	-	1	-	-	-	-	3	-	-	-
Md.	10	-	5	-	5	2	24	17	126	-	4	9	1	1	-
D.C.	3	-	-	-	2	-	7	-	35	-	-	-	-	-	-
Va.	6	-	-	-	-	41	16	2	33	-	3	7	-	-	-
W. Va.	1	-	-	-	-	2	6	1	5	2	8	-	-	-	-
N.C.	9	8	103	-	-	1	21	1	7	3	13	21	-	-	-
S.C.	1	-	-	-	-	-	13	-	6	-	-	-	-	-	-
Ga.	3	-	-	-	-	-	20	-	1	-	4	8	-	-	-
Fla.	10	-	2	-	-	66	37	1	8	-	4	3	-	-	1
E.S. CENTRAL	3	-	2	-	-	3	30	5	60	3	24	8	-	-	-
Ky.	-	-	1	-	-	-	18	-	9	-	-	-	-	-	-
Tenn.	-	-	-	-	-	-	2	3	16	2	7	6	-	-	-
Ala.	2	-	1	-	-	-	8	-	4	1	17	-	-	-	-
Miss.	1	-	-	-	-	3	2	N	N	-	-	2	-	-	-
W.S. CENTRAL	14	252	1,184	3	21	8	66	89	504	9	16	29	3	8	4
Ark.	-	-	-	-	2	-	3	3	56	1	4	5	-	-	3
La.	-	-	1	-	-	-	13	39	148	3	4	2	3	3	-
Okla.	1	-	23	-	-	8	6	42	122	5	8	22	-	-	1
Tex.	13	252	1,160	3†	19	-	44	5	178	-	-	-	-	5	-
MOUNTAIN	10	-	13	-	5	109	23	1	54	26	207	206	-	2	2
Mont.	-	-	12	-	1	-	1	-	1	-	-	1	-	1	-
Idaho	2	-	-	-	1	-	-	1	4	8	19	177	-	-	-
Wyo.	1	-	-	-	-	-	-	-	-	-	-	1	-	-	-
Colo.	1	-	-	-	1	109	9	-	5	-	16	3	-	-	1
N. Mex.	1	-	-	-	2	-	1	N	N	1	3	2	-	-	-
Ariz.	2	-	1	-	-	-	11	-	40	17	165	13	-	-	-
Utah	-	-	-	-	-	-	1	-	2	-	3	8	-	-	-
Nev.	3	-	-	-	-	-	-	-	2	-	1	1	-	1	1
PACIFIC	108	6	243	1	7	106	327	12	135	1	68	97	7	43	28
Wash.	3	-	-	-	1	-	24	-	10	-	13	17	-	-	-
Oreg.	4	-	-	-	-	1	24	N	N	-	2	-	-	-	-
Calif.	99	6	242	1†	3	103	276	11	119	1	51	57	6	40	25
Alaska	2	-	-	-	-	-	2	-	-	-	-	3	-	-	-
Hawaii	-	-	1	-	3	2	1	1	6	-	2	20	1	3	3
Guam	-	U	-	U	-	1	-	U	-	U	-	-	U	-	1
P.R.	-	37	164	-	-	94	2	-	1	-	2	3	-	2	-
V.I.	-	-	-	-	-	-	-	-	3	-	-	-	-	-	-
Amer. Samoa	-	U	-	U	-	-	-	U	-	U	-	-	U	-	-
C.N.M.I.	-	U	-	U	-	-	-	U	-	U	-	-	U	-	-

*For measles only, imported cases includes both out-of-state and international importations.

N: Not notifiable U: Unavailable †International §Out-of-state

TABLE III. (Cont'd.) Cases of specified notifiable diseases, United States, weeks ending April 1, 1989 and April 2, 1988 (13th Week)

Reporting Area	Syphilis (Civilian) (Primary & Secondary)		Toxic-shock Syndrome	Tuberculosis		Tula-remia	Typhoid Fever	Typhus Fever (Tick-borne) (RMSF)	Rabies, Animal
	Cum. 1989	Cum. 1988	Cum. 1989	Cum. 1989	Cum. 1988	Cum. 1989	Cum. 1989	Cum. 1989	Cum. 1989
UNITED STATES	10,041	9,261	82	4,514	4,469	13	88	22	948
NEW ENGLAND	399	261	3	105	67	-	9	-	1
Maine	3	3	3	2	2	-	-	-	-
N.H.	-	2	-	4	-	-	-	-	-
Vt.	-	-	-	1	-	-	-	-	-
Mass.	129	108	-	55	39	-	4	-	-
R.I.	11	9	-	18	7	-	4	-	-
Conn.	256	139	-	25	19	-	1	-	1
MID. ATLANTIC	1,960	1,783	13	956	917	1	22	3	134
Upstate N.Y.	172	125	1	63	154	-	2	1	2
N.Y. City	1,089	1,165	1	591	442	-	18	-	-
N.J.	337	195	4	142	149	-	1	-	-
Pa.	362	298	7	160	172	1	1	2	132
E.N. CENTRAL	380	274	15	524	526	1	7	1	15
Ohio	29	29	6	96	95	-	1	1	-
Ind.	13	17	4	38	56	-	1	-	-
Ill.	158	126	-	232	204	-	2	-	2
Mich.	166	95	5	140	137	-	3	-	3
Wis.	14	7	-	18	34	1	-	-	10
W.N. CENTRAL	77	54	17	131	133	3	4	1	75
Minn.	6	4	5	28	23	-	1	-	28
Iowa	12	3	3	24	13	-	2	1	-
Mo.	35	33	2	45	62	3	1	-	6
N. Dak.	1	1	-	3	3	-	-	-	6
S. Dak.	-	-	1	7	13	-	-	-	20
Nebr.	15	7	5	6	4	-	-	-	7
Kans.	8	6	1	18	15	-	-	-	8
S. ATLANTIC	3,696	3,299	6	933	956	1	7	13	314
Del.	47	44	-	6	9	-	-	-	5
Md.	195	162	-	70	80	-	1	1	76
D.C.	234	149	-	44	45	-	2	-	2
Va.	144	107	-	86	112	1	1	-	71
W. Va.	4	1	-	23	24	-	-	-	20
N.C.	202	205	4	87	52	-	2	11	-
S.C.	181	156	1	93	95	-	-	1	52
Ga.	785	517	-	123	149	-	-	-	50
Fla.	1,904	1,958	1	401	390	-	1	-	38
E.S. CENTRAL	664	499	1	355	383	1	1	2	93
Ky.	18	17	-	108	103	1	1	2	45
Tenn.	253	198	-	96	100	-	-	-	24
Ala.	242	145	1	122	110	-	-	-	24
Miss.	151	139	-	29	70	-	-	-	-
W.S. CENTRAL	1,338	1,021	4	495	512	3	5	1	162
Ark.	97	47	-	64	48	1	-	-	19
La.	295	194	-	61	92	-	1	-	-
Okla.	19	42	2	28	49	2	-	1	20
Tex.	927	738	2	342	323	-	4	-	123
MOUNTAIN	208	192	7	116	102	1	1	1	37
Mont.	-	2	-	4	-	-	-	-	22
Idaho	-	-	1	3	-	-	-	-	-
Wyo.	1	-	-	-	-	-	-	-	4
Colo.	36	26	-	2	19	1	-	1	-
N. Mex.	7	17	1	19	24	-	-	-	8
Ariz.	58	53	4	61	46	-	1	-	2
Utah	8	7	-	9	-	-	-	-	-
Nev.	98	87	1	18	13	-	-	-	1
PACIFIC	1,319	1,878	16	899	873	2	32	-	117
Wash.	52	64	1	50	51	-	-	-	-
Oreg.	80	73	-	31	32	-	-	-	-
Calif.	1,179	1,731	14	764	737	2	31	-	70
Alaska	3	2	-	12	10	-	-	-	47
Hawaii	5	8	1	42	43	-	1	-	-
Guam	-	-	-	-	7	-	-	-	-
P.R.	122	165	-	52	46	-	-	-	10
V.I.	1	1	-	1	3	-	-	-	-
Amer. Samoa	-	-	-	-	3	-	-	-	-
C.N.M.I.	-	1	-	-	3	-	-	-	-

U: Unavailable

TABLE IV. Deaths in 121 U.S. cities,* week ending April 1, 1989 (13th Week)

Reporting Area	All Causes, By Age (Years)						P&I**
	All Ages	≥65	45-64	25-44	1-24	<1	Total
NEW ENGLAND	787	552	155	49	19	12	88
Boston, Mass.	193	126	40	15	8	4	37
Bridgeport, Conn.	67	51	9	5	-	2	5
Cambridge, Mass.	24	19	4	1	-	-	2
Fall River, Mass.	41	32	7	1	1	-	2
Hartford, Conn.	61	42	11	6	2	-	6
Lowell, Mass.	41	25	11	5	-	-	4
Lynn, Mass.	24	20	4	-	-	-	-
New Bedford, Mass.	30	22	4	3	-	1	1
New Haven, Conn.	62	38	16	5	1	2	11
Providence, R.I.	73	48	18	2	3	2	9
Somerville, Mass.	4	4	-	-	-	-	-
Springfield, Mass.	47	34	11	1	-	1	6
Waterbury, Conn.	36	22	9	3	2	-	1
Worcester, Mass.	84	69	11	2	2	-	4
MID. ATLANTIC	2,850	1,861	569	289	67	64	220
Albany, N.Y.	53	43	6	3	-	1	2
Allentown, Pa.	23	21	1	1	-	-	-
Buffalo, N.Y.	104	76	22	4	1	1	16
Camden, N.J.	44	32	8	2	-	2	-
Elizabeth, N.J.	32	22	3	5	2	-	2
Erie, Pa.†	40	30	6	2	-	2	6
Jersey City, N.J.	70	39	24	4	2	1	6
N.Y. City, N.Y.	1,505	942	312	184	32	35	89
Newark, N.J.	49	24	13	8	1	3	5
Paterson, N.J.	34	18	4	9	1	2	4
Philadelphia, Pa.	420	263	92	39	20	6	39
Pittsburgh, Pa.†	66	39	17	7	2	1	3
Reading, Pa.	35	30	5	-	-	-	5
Rochester, N.Y.	123	87	23	7	2	4	16
Schenectady, N.Y.	16	15	1	-	-	-	3
Scranton, Pa.†	31	26	2	1	2	-	5
Syracuse, N.Y.	97	75	11	5	2	4	7
Trenton, N.J.	52	38	6	6	-	2	4
Utica, N.Y.	27	22	4	1	-	-	2
Yonkers, N.Y.	29	19	9	1	-	-	6
E.N. CENTRAL	2,379	1,576	499	165	49	90	108
Akron, Ohio	52	36	8	3	2	3	-
Canton, Ohio	40	24	12	4	-	-	3
Chicago, Ill.§	564	362	125	45	10	22	16
Cincinnati, Ohio	118	68	34	7	4	5	10
Cleveland, Ohio	193	120	48	13	2	10	13
Columbus, Ohio	80	47	19	11	2	1	1
Dayton, Ohio	121	88	23	4	2	4	5
Detroit, Mich.	233	143	53	17	8	12	11
Evansville, Ind.	53	38	11	2	1	1	1
Fort Wayne, Ind.	73	46	17	4	4	2	-
Gary, Ind.	27	14	6	3	2	2	1
Grand Rapids, Mich.	53	41	5	3	1	3	6
Indianapolis, Ind.	203	137	43	12	2	9	6
Madison, Wis.§	38	30	5	1	1	1	3
Milwaukee, Wis.	187	138	28	11	2	8	6
Peoria, Ill.	70	54	14	2	-	-	13
Rockford, Ill.	51	32	8	6	4	1	3
South Bend, Ind.	52	31	12	5	-	4	2
Toledo, Ohio	90	66	15	8	1	-	6
Youngstown, Ohio	81	61	13	4	1	2	2
W.N. CENTRAL	857	630	149	41	12	25	59
Des Moines, Iowa	81	68	8	5	-	-	7
Duluth, Minn.	33	28	3	1	1	-	5
Kansas City, Kans.	67	46	13	5	1	2	2
Kansas City, Mo.	126	90	24	7	2	3	12
Lincoln, Nebr.	41	32	8	-	1	-	6
Minneapolis, Minn.	300	207	64	15	5	9	19
Omaha, Nebr.	70	46	15	2	2	5	3
St. Louis, Mo.	67	58	4	1	-	4	5
St. Paul, Minn.	52	39	6	5	-	2	-
Wichita, Kans.§	20	16	4	-	-	-	-

Reporting Area	All Causes, By Age (Years)						P&I**
	All Ages	≥65	45-64	25-44	1-24	<1	Total
S. ATLANTIC	1,316	811	259	147	55	43	79
Atlanta, Ga.	173	98	41	22	5	7	6
Baltimore, Md.	135	76	16	19	19	5	8
Charlotte, N.C.	91	53	21	12	2	3	6
Jacksonville, Fla.	141	91	31	10	6	3	11
Miami, Fla.	132	74	23	31	2	2	1
Norfolk, Va.	67	41	18	2	3	2	3
Richmond, Va.	83	56	15	6	3	3	8
Savannah, Ga.	63	48	4	4	3	4	15
St. Petersburg, Fla.	95	81	6	3	3	2	9
Tampa, Fla.	102	60	26	9	1	6	10
Washington, D.C.	212	114	55	29	8	6	2
Wilmington, Del.	22	19	3	-	-	-	-
E.S. CENTRAL	795	525	173	54	24	19	72
Birmingham, Ala.	113	71	22	12	5	3	1
Chattanooga, Tenn.	85	56	19	7	2	1	12
Knoxville, Tenn.	53	40	9	4	-	-	4
Louisville, Ky.	89	61	18	5	2	3	9
Memphis, Tenn.	209	135	47	11	6	10	22
Mobile, Ala.	75	50	18	3	3	1	11
Montgomery, Ala.	57	39	13	3	1	1	3
Nashville, Tenn.	114	73	27	9	5	-	10
W.S. CENTRAL	1,821	1,162	365	181	60	53	75
Austin, Tex.	60	39	12	5	3	1	5
Baton Rouge, La.	13	7	3	2	1	-	1
Corpus Christi, Tex.§	48	35	10	2	-	1	1
Dallas, Tex.	237	140	52	27	9	9	6
El Paso, Tex.	81	52	13	7	3	6	1
Fort Worth, Tex	128	84	23	11	3	7	13
Houston, Tex.§	734	436	169	89	24	16	18
Little Rock, Ark.	61	42	12	3	1	3	2
New Orleans, La.	119	67	27	15	7	3	-
San Antonio, Tex.	156	120	21	4	6	5	11
Shreveport, La.	72	57	6	7	1	1	7
Tulsa, Okla.	112	83	17	9	2	1	10
MOUNTAIN	822	569	138	68	24	23	37
Albuquerque, N. Mex.	103	72	14	12	4	1	2
Colo. Springs, Colo.	36	25	4	2	2	3	1
Denver, Colo.	142	93	25	20	2	2	5
Las Vegas, Nev.	138	95	27	10	3	3	7
Ogden, Utah	27	21	4	1	-	1	4
Phoenix, Ariz.	158	101	30	11	7	9	6
Pueblo, Colo.	40	30	4	5	1	-	4
Salt Lake City, Utah	48	30	9	1	4	4	1
Tucson, Ariz.§	130	102	21	6	1	-	7
PACIFIC	2,005	1,341	368	175	53	62	147
Berkeley, Calif.	15	11	2	2	-	-	-
Fresno, Calif.	88	63	11	6	3	4	3
Glendale, Calif.	26	22	1	2	-	1	3
Honolulu, Hawaii	95	61	19	6	6	3	16
Long Beach, Calif.§	108	77	19	8	1	3	16
Los Angeles Calif.	417	283	70	40	14	8	30
Oakland, Calif.§	97	62	19	10	3	3	5
Pasadena, Calif.	30	17	5	3	1	4	2
Portland, Oreg.	107	78	17	8	1	3	6
Sacramento, Calif.	135	97	22	10	1	5	16
San Diego, Calif.	161	99	36	12	4	8	12
San Francisco, Calif.	181	108	39	29	3	2	7
San Jose, Calif.	192	125	42	14	6	4	14
Seattle, Wash.	191	133	31	13	5	9	4
Spokane, Wash.	56	37	13	5	1	-	6
Tacoma, Wash.	106	68	22	7	4	5	7
TOTAL	13,632††	9,027	2,675	1,169	363	391	885

*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 3 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 available 4 weeks.

ACIP: General Recommendations — Continued

Live, attenuated vaccine viruses might not replicate successfully, and antibody response could be diminished when the vaccine is given after IG or specific IG preparations. Whole blood or other antibody-containing blood products can interfere with the antibody response to measles, mumps, and rubella vaccines. In general, these parenterally administered live vaccines should not be given for at least 6 weeks, and preferably 3 months, after IG administration. However, the postpartum vaccination of susceptible women with rubella vaccine should not be delayed because of receipt of anti-Rho(D) IG (human) or any other blood product during the last trimester of pregnancy or at delivery. These women should be vaccinated immediately after delivery and, if possible, tested in 3 months to ensure that rubella immunity was established.

If administration of IG preparations becomes necessary after a live-virus vaccine has been given, interference can occur. Usually, vaccine virus replication and stimulation of immunity will occur 1–2 weeks after vaccination. Thus, if the interval between administration of live-virus vaccine and subsequent administration of an IG preparation is <14 days, vaccination should be repeated at least 3 months after the IG product was given, unless serologic testing indicates that antibodies were produced.

In general, there is little interaction between IG preparations and inactivated vaccines. Therefore, inactivated vaccines can be given simultaneously or at any time before or after an IG product is used. For example, postexposure prophylaxis with simultaneously administered hepatitis B, rabies, or tetanus IG and the corresponding inactivated vaccine or toxoid does not impair the immune response and provides immediate protection and long-lasting immunity. The vaccine and IG should be given at different sites, and standard doses of the corresponding vaccine should be used. Increasing the vaccine dose volume or number of immunizations is not indicated (Table 6).

HYPERSENSITIVITY TO VACCINE COMPONENTS

Vaccine components can cause allergic reactions in some recipients. These reactions can be local or systemic, including mild to severe anaphylaxis (e.g., hives, swelling of the mouth and throat, difficulty breathing, hypotension, or shock). The responsible vaccine components can derive from: 1) animal protein, 2) antibiotics, 3) preservatives, and 4) stabilizers. The most common animal protein allergen is egg

TABLE 5. Guidelines for spacing live and killed antigen administration

Antigen combination	Recommended minimum interval between doses
≥2 Killed antigens	None. May be given simultaneously or at any interval between doses.*
Killed and live antigens	None. May be given simultaneously or at any interval between doses.†
≥2 Live antigens	4-wk minimum interval if not administered simultaneously.

*If possible, vaccines associated with local or systemic side effects (e.g., cholera, typhoid, plague vaccines) should be given on separate occasions to avoid accentuated reactions.
†Cholera vaccine with yellow fever vaccine is the exception. If time permits, these antigens should not be administered simultaneously, and at least 3 weeks should elapse between administration of yellow fever vaccine and cholera vaccine. If the vaccines must be given simultaneously or within 3 weeks of each other, the antibody response may not be optimal.

ACIP: General Recommendations — Continued

protein found in vaccines prepared using embryonated chicken eggs or chicken embryo cell cultures (e.g., yellow fever, mumps, measles, and influenza vaccines). Ordinarily, persons who are able to eat eggs or egg products safely can receive these vaccines; persons with histories of anaphylactic allergy to eggs or egg proteins should not.

Asking persons whether they can eat eggs without adverse effects is a reasonable way to screen for those who might be at risk from receiving measles, mumps, yellow fever, and influenza vaccines. Protocols requiring extreme caution have been developed for testing and vaccinating with measles and mumps vaccines those persons with anaphylactic reactions to egg ingestion (*4*). A regimen for administering influenza vaccine to children with egg hypersensitivity and severe asthma has also been developed (*5*).

Rubella vaccine is grown in human diploid cell cultures and can safely be given to persons with histories of severe allergy to eggs or egg proteins.

Some vaccines contain trace amounts of antibiotics to which patients may be hypersensitive. The information provided in the vaccine package insert should be carefully reviewed before a decision is made whether the rare patient with such hypersensitivity should be given the vaccine(s). No currently recommended vaccine contains penicillin or its derivatives.

MMR and its individual component vaccines contain trace amounts of neomycin. Although the amount present is less than would usually be used for the skin test to determine hypersensitivity, persons who have experienced anaphylactic reactions to neomycin should not be given these vaccines. Most often, neomycin allergy is a contact dermatitis, a manifestation of a delayed-type (cell-mediated) immune response rather than anaphylaxis. A history of delayed-type reactions to neomycin is not a contraindication for these vaccines.

TABLE 6. Guidelines for spacing the administration of immune globulin (IG) preparations and vaccines

Simultaneous administration: Immunobiologic combination		**Recommended minimum interval between doses**
IG and killed antigen		None. May be given simultaneously at different sites or at any time between doses.
IG and live antigen		Should generally not be given simultaneously.* If unavoidable to do so, give at different sites and revaccinate or test for seroconversion in 3 mos.
Nonsimultaneous administration: Immunobiologic administered		
First	**Second**	**Recommended minimum interval between doses**
IG	Killed antigen	None
Killed antigen	IG	None
IG	Live antigen	6 wks and preferably 3 mos*
Live antigen	IG	2 wks

*The live-virus vaccines, oral polio and yellow fever, are exceptions to these recommendations. Either vaccine may be administered simultaneously or at any time before or after IG without significantly decreasing the antibody response (*3*).

ACIP: General Recommendations — Continued

Bacterial vaccines, such as cholera, DTP, plague, and typhoid, are frequently associated with local or systemic adverse effects, such as redness, soreness, and fever. These reactions are difficult to link with a specific sensitivity to vaccine components and appear to be toxic rather than hypersensitive. On rare occasions, urticarial or anaphylactic reactions in DTP, DT, or Td recipients have been reported. When such events are reported, appropriate skin tests should be performed to determine sensitivity to tetanus toxoid before its use is discontinued (*6*).

ALTERED IMMUNOCOMPETENCE

Virus replication after administration of live, attenuated-virus vaccines can be enhanced in persons with immunodeficiency diseases and in persons with suppressed capacity for immune response as occurs with leukemia, lymphoma, generalized malignancy, symptomatic HIV infections, or therapy with alkylating agents, antimetabolites, radiation, or large amounts of corticosteroids. Severe complications have followed vaccination with live, attenuated-virus vaccines and with live-bacteria vaccines (e.g., BCG) in patients with leukemia, lymphoma, or suppressed immune responses. In general, these patients should not be given live vaccines, with the exceptions noted below.

If polio immunization is indicated for immunosuppressed patients, their household members, or other close contacts, these persons should be given IPV rather than OPV. Although a protective immune response cannot be assured in the immunocompromised patient, some protection may be provided. Because of the possibility of immunodeficiency in other children born to a family in which one such case has occurred, no family members should receive OPV unless the immune statuses of the intended recipient and all other children in the family are known.

Patients with leukemia in remission whose chemotherapy has been terminated for at least 3 months can be given live-virus vaccines. Short-term, low-to-moderate dose systemic corticosteroid therapy (<2 weeks), topical steroid therapy (e.g., nasal, skin), long-term alternate-day treatment with low to moderate doses of short-acting systemic steroids, and intra-articular, bursal, or tendon injection with corticosteroids are not immunosuppressive in their usual doses and do not contraindicate live-virus vaccine administration.

The growing number of infants and preschoolers infected with HIV has directed special attention to the appropriate immunization of such children. The evaluation and testing for HIV infection of asymptomatic children presenting for vaccines is not necessary before decisions concerning immunization are made. The inactivated childhood vaccines (e.g., DTP or HbCV) should be given to HIV-infected children regardless of whether HIV symptoms are present. Although OPV has not been harmful when administered to asymptomatic HIV-infected children, IPV is the vaccine of choice if the child is known to be infected. The use of IPV not only eliminates any theoretical risk to the vaccinee but also prevents the possibility of vaccine virus spread to immunocompromised close contacts. Asymptomatically infected persons in need of MMR should receive it. Also, MMR should be considered for all symptomatic HIV-infected children since measles disease can be severe in symptomatic HIV-infected children. Limited studies of MMR immunization in both asymptomatic and symptomatic HIV-infected patients have not documented serious or unusual adverse events. In addition, pneumococcal vaccine is recommended for any child infected with HIV. Influenza vaccine is recommended for children with symptoms of HIV infection (Table 7).

ACIP: General Recommendations — Continued

FEBRILE ILLNESS

The decision to administer or delay vaccination because of a current or recent febrile illness depends largely on the severity of symptoms and on the etiology of the disease.

Although a moderate or severe febrile illness is reason to postpone immunizations, minor illnesses such as mild upper-respiratory infections (URI) with or without low-grade fever are not contraindications for vaccination. In persons whose compliance with medical care cannot be assured, it is particularly important to take every opportunity to provide appropriate vaccinations.

Children with moderate or severe febrile illnesses can be vaccinated as soon as the child has recovered. This precaution to wait avoids superimposing adverse effects of the vaccine on the underlying illness or mistakenly attributing a manifestation of the underlying illness to the vaccine.

Routine physical examinations or measuring temperatures are not prerequisites for vaccinating infants and children who appear to be in good health. Asking the parent or guardian if the child is ill, postponing vaccination in those with moderate or severe febrile illnesses, and immunizing those without contraindications to vaccination are appropriate procedures in childhood immunization programs.

VACCINATION DURING PREGNANCY

Because of a theoretical risk to the developing fetus, pregnant women or women likely to become pregnant within 3 months after vaccination should not be given live, attenuated-virus vaccines. With some of these vaccines—particularly rubella, measles, and mumps—pregnancy is a contraindication. Both yellow fever vaccine and OPV, however, can be given to pregnant women who are at substantial risk of exposure to natural infection. When a vaccine is to be given during pregnancy, waiting until the second or third trimester is a reasonable precaution to minimize concern over teratogenicity. Although there are theoretical risks, there is no evidence

TABLE 7. Recommendations for routine immunization of HIV-infected children — United States

Vaccine	Known HIV infection	
	Asymptomatic	Symptomatic
DTP*	Yes	Yes
OPV†	No	No
IPV§	Yes	Yes
MMR¶	Yes	Yes**
HbCV††	Yes	Yes
Pneumococcal	Yes	Yes
Influenza	No §§	Yes

*DTP = Diphtheria and Tetanus Toxoids and Pertussis Vaccine, Adsorbed. DTP may be used up to the seventh birthday.
†OPV = Poliovirus Vaccine Live Oral, Trivalent: contains poliovirus types 1, 2, and 3.
§IPV = Poliovirus Vaccine Inactivated: contains poliovirus types 1, 2, and 3.
¶MMR = Measles, Mumps, and Rubella Virus Vaccine, Live.
**Should be considered.
††HbCV = Vaccine composed of Haemophilus influenzae b polysaccharide antigen conjugated to a protein carrier.
§§Not contraindicated.

ACIP: General Recommendations — Continued

of congenital rubella syndrome in infants born to susceptible mothers who inadvertently were given rubella vaccine during pregnancy.

Persons given measles, mumps, or rubella vaccines can shed but not transmit these viruses. These vaccines can be administered safely to the children of pregnant women. Although live polio virus is shed by persons recently immunized with OPV (particularly after the first dose), this vaccine can also be administered to the children of pregnant women because experience has not revealed any risk of polio vaccine virus to the fetus.

There is no convincing evidence of risk to the fetus from immunizing the pregnant woman with inactivated virus or bacteria vaccines or toxoids. Previously immunized pregnant women who have not received a Td immunization within the last 10 years should receive a booster dose once past the first trimester. Women who are unimmunized or only partially immunized against tetanus should complete as much of the primary series as possible during the last two trimesters of the pregnancy. Depending on when the woman seeks prenatal care and the required interval between doses, one or two doses of Td can be administered before delivery. Eligible women who do not complete the required three-dose series during pregnancy should be followed after delivery to assure they receive the doses necessary for protection.

All pregnant women should be evaluated for immunity to rubella. Women susceptible to rubella should be immunized immediately after delivery. In addition, a woman's status as a carrier of hepatitis B should also be assessed during pregnancy. A woman infected with hepatitis B virus should be followed carefully so that her child can receive HBIG and the hepatitis B vaccine series shortly after delivery.

There is no known risk to the fetus from passive immunization of pregnant women with IG. Further information regarding immunization of pregnant women is available in the American College of Obstetricians and Gynecologists Technical Bulletin Number 64, May 1982.

MISCONCEPTIONS CONCERNING CONTRAINDICATIONS TO VACCINATION

Some health-care providers inappropriately consider certain conditions or circumstances contraindications to vaccination. Conditions most often *inappropriately* regarded as routine contraindications include the following:

1. Reaction to a previous dose of DTP vaccine that involved only soreness, redness, or swelling in the immediate vicinity of the vaccination site or temperature of <105 F (40.5 C).
2. Mild acute illness with low-grade fever or mild diarrheal illness in an otherwise well child.
3. Current antimicrobial therapy or the convalescent phase of illnesses.
4. Prematurity. The appropriate age for initiating immunizations in the prematurely born infant is the usual chronologic age. Vaccine doses should not be reduced for preterm infants.
5. Pregnancy of mother or other household contact.
6. Recent exposure to an infectious disease.
7. Breastfeeding. The only vaccine virus that has been isolated from breast milk is rubella vaccine virus. There is no good evidence that breast milk from women immunized against rubella is harmful to infants.
8. A history of nonspecific allergies or relatives with allergies.
9. Allergies to penicillin or any other antibiotic, except anaphylactic reactions to

ACIP: General Recommendations — Continued

neomycin (e.g., MMR-containing vaccines) or streptomycin (e.g., OPV). None of the vaccines licensed in the United States contain penicillin.

10. Allergies to duck meat or duck feathers. No vaccine available in the United States is produced in substrates containing duck antigens.
11. Family history of convulsions in persons considered for pertussis or measles vaccination (*7,8*).
12. Family history of sudden infant death syndrome in children considered for DTP vaccination.
13. Family history of an adverse event, unrelated to immunosuppression, following vaccination.

ADVERSE EVENTS FOLLOWING VACCINATION

Modern vaccines are safe and effective but not completely so. Adverse events have been reported following the administration of all vaccines. These events range from frequent, minor, local reactions to extremely rare, severe, systemic illness, such as paralysis associated with OPV. It is often impossible to establish evidence for cause-and-effect relationships when untoward events occur after vaccination because temporal association alone does not necessarily indicate causation. More complete information on adverse reactions to a specific vaccine may be found in the ACIP recommendations for each vaccine.

The National Vaccine Injury Compensation Program established by the National Childhood Vaccine Injury Act of 1986 requires physicians and other health-care providers who administer vaccines to maintain permanent immunization records and to report occurrences of certain adverse events to the U.S. Department of Health and Human Services. Recording and reporting requirements took effect on March 21, 1988. Reportable reactions include those listed in the Act for each vaccine (*9,10*) and events specified in the manufacturer's vaccine package insert as contraindications to further doses of that vaccine.

Although there will be one system for reporting adverse events following immunizations in the future, at present there are two separate systems. The appropriate method depends on the source of funding used to purchase the vaccine. Events that occur after receipt of a vaccine purchased with public (federal, state, and/or local government) funds must be reported by the administering health provider to the appropriate local, county, or state health department. The state health department completes and submits the correct forms to CDC. Reportable events that follow administration of vaccines purchased with private money are reported by the health-care provider directly to the Food and Drug Administration (FDA).

PATIENT INFORMATION

Parents, the responsible caregiver, or adult patients should be informed about the benefits and risks of vaccine in understandable language. Ample opportunity for questions and answers should be provided before each immunization. CDC has developed "Important Information Statements" for use with federally purchased vaccines given in public health clinics, but similar statements have not been universally adopted for the private medical-care sector.

An Important Information Statement must be developed for each vaccine covered by the National Childhood Vaccine Injury Act (DTP or component antigens, MMR or component antigens, IPV, and OPV). These statements are to be used by *all public and private* providers of vaccines. Until the Important Information Statements estab-

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lished by the Act become available, the current CDC Important Information Statements should be used in public health clinics and other settings where publicly purchased vaccines are used. The use of similar statements in the private sector is encouraged.

VACCINE PROGRAMS

The best way to reduce vaccine-preventable diseases is to have 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 in public health clinics. Programs aimed at ensuring that all children are immunized at the recommended ages should be established and maintained in all communities. In addition, appropriate immunizations should be available for all adults.

Every visit to a health-care provider is an opportunity to update a patient's immunization status with needed vaccines. All adults should complete a primary series of tetanus and diphtheria toxoids, then receive a booster dose every 10 years. Persons ≥65 years old and all adults with medical conditions that place them at risk for pneumococcal disease or serious complications of influenza should receive one dose of pneumococcal polysaccharide vaccine and annual injections of influenza vaccine. In addition, immunization programs for adults should provide MMR vaccine whenever possible to anyone believed susceptible to measles, mumps, or rubella. Use of MMR ensures that the recipient has been immunized against three different diseases and causes no harm if the vaccinee is already immune to one or more of its components.

Official health agencies should take necessary steps, including developing and enforcing school immunization requirements, to assure that students at all grade levels, including college students, and those in child-care centers are protected against vaccine-preventable diseases. Agencies should also encourage institutions such as hospitals and extended-care facilities to adopt policies regarding the appropriate immunization of residents and employees.

Dates of immunization (day, month, and year) should be recorded on institutional immunization records, such as those kept in schools and child-care centers. This will facilitate assessments that a primary vaccine series has been completed according to an appropriate schedule and that needed boosters have been obtained at the correct time.

Tickler or recall systems can identify children who are due for immunizations or are behind schedule so parents can be contacted and reminded to have their children immunized. The ACIP recommends the use of these systems by all health-care providers. Such systems should also be developed by health-care providers who treat adults to ensure that at-risk persons receive influenza vaccine annually.

IMMUNIZATION RECORDS

Documentation of patient immunizations will help ensure that persons in need of vaccine receive it and that adequately vaccinated patients are not overimmunized with increased risk of hypersensitivity (e.g., tetanus toxoid hypersensitivity).

Patient's Personal Record

Official immunization 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 child-care centers. The records are also impor-

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tant tools in immunization education programs aimed at increasing parental and patient awareness of the need for vaccines. A permanent immunization record card should be established for each newborn infant and maintained by the parent. In many states, these cards are distributed to new mothers before discharge from the hospital.

Provider Records

The National Vaccine Injury Compensation Program requires each health-care provider to record in the vaccine recipient's permanent medical record (or in a permanent office log or file) the provider's name, address, and title (if appropriate), the type of immunobiologic administered, the manufacturer, lot number, and date of administration. *Health-care provider* is any licensed health-care professional, organization, or institution, whether private or public (including federal, state, and local departments and agencies), under whose authority a specified vaccine is administered. The vaccines covered under this new law include: DTP and MMR (or any of their components given singly or in combination), OPV, and IPV. A permanent immunization record should also be established and maintained for adults and children who receive vaccines not covered by the National Vaccine Injury Act. The ACIP recommends use of standard records that note the type, manufacturer, lot number, and date of administration for each immunobiologic administered. Serologic test results for vaccine-preventable diseases, such as those for rubella screening, as well as documented episodes of adverse events, should also be recorded in the vaccine recipient's permanent medical record.

SOURCES OF VACCINE INFORMATION

In addition to these general recommendations, the practitioner can draw on a variety of sources for specific data and updated information including:

Official vaccine package circulars. Manufacturer-provided product-specific information approved by the FDA with each vaccine. Some of these materials are reproduced in the *Physician's Desk Reference* (*PDR*).

***Morbidity and Mortality Weekly Report* (*MMWR*).** Published weekly by CDC, *MMWR* contains regular and special ACIP recommendations on vaccine use and statements of vaccine policy as they are developed and reports of specific disease activity. Subscriptions are available through Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402. Also available through MMS Publications, C.S.P.O. Box 9120, Waltham, MA 02254.

Health Information for International Travel. Booklet published annually by CDC as a guide to national requirements and with recommendations for specific immunizations and health practices for travel to foreign countries. Purchase from the Superintendent of Documents (address above).

Advisory memoranda are published as needed by CDC to advise international travelers or persons who provide information to travelers about specific outbreaks of communicable diseases abroad. They include health information for prevention and specific recommendations for immunization. Memoranda and/or placement on mailing list are available from Division of Quarantine, Center for Prevention Services (CPS), CDC, Atlanta, GA 30333.

***The Report of the Committee on Infectious Diseases* of the American Academy of Pediatrics (Red Book).** This report, which contains recommendations on all licensed vaccines, is updated every 2–3 years, most recently in 1988. Policy changes for individual recommendations for immunization practices are published as needed by

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the American Academy of Pediatrics in the journal *Pediatrics*. They are available from American Academy of Pediatrics, Publications Division, 141 Northwest Point Blvd., P.O. Box 927, Elk Grove Village, IL 60009-0927.

Control of Communicable Diseases in Man is published by the American Public Health Association every 5 years, most recently in 1985 (14th ed.) The manual contains information about infectious diseases, their occurrence worldwide, diagnoses and therapy, and up-to-date recommendations on isolation and other control measures for each disease presented. It is available from the American Public Health Association, 1015 Fifteenth St. N.W., Washington, DC 20005.

Guide for Adult Immunization (1985) is produced by the American College of Physicians for physicians caring for adults. It emphasizes use of vaccines in healthy adults and adults with specific disease problems. It is available from American College of Physicians, Division of Scientific Activities, Health and Public Policy, 4200 Pine Street, Philadelphia, PA 19104.

Technical bulletins of the American College of Obstetricians and Gynecologists are updated periodically. These bulletins contain important information on immunization of pregnant women. They are available from American College of Obstetricians and Gynecologists, Attention: Resource Center, 409 12th Street S.W., Washington, DC 20024-2188.

State and many local health departments frequently provide technical advice, printed information on vaccines and immunization schedules, posters, and other educational materials.

Division of Immunization, CPS, CDC, Atlanta, GA 30333, telephone (404) 639-3311, offers technical advice on vaccine recommendations, disease outbreak control, and sources of immunobiologics. In addition, a course on the epidemiology, prevention, and control of vaccine preventable diseases is offered each year in Atlanta and, on occasion, in different states.

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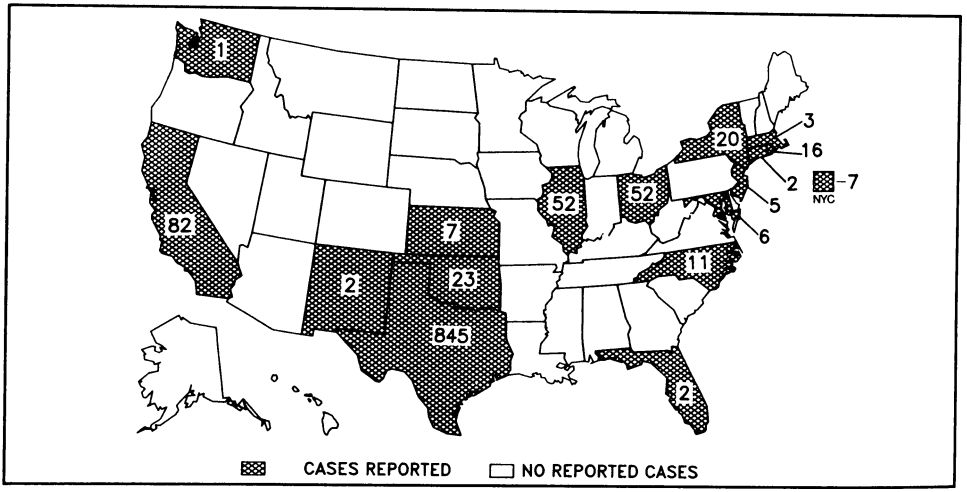
FIGUE I. Reported measles cases — United States, Weeks 9–12, 1989



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The data in this report are provisional, based on weekly reports to CDC by state health departments. The reporting week concludes at close of business on Friday; compiled data on a national basis are officially released to the public on the succeeding Friday. The editor welcomes accounts of interesting cases, outbreaks, environmental hazards, or other public health problems of current interest to health officials. Such reports and any other matters pertaining to editorial or other textual considerations should be addressed to: Editor, *Morbidity and Mortality Weekly Report*, Centers for Disease Control, Atlanta, Georgia 30333; telephone (404) 332-4555.

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