

Manual for the Surveillance of Vaccine-Preventable Diseases

Edited by

Sandra W. Roush, MT, MPH

Linda M. Baldy, MPH

Mary Ann Kirkconnell Hall, MPH

**National Center for Immunization and Respiratory Diseases
Centers for Disease Control and Prevention
Department of Health and Human Services**

Manual for the Surveillance of Vaccine-Preventable Diseases

Available on the internet at: www.cdc.gov/vaccines/pubs/surv-manual/

Suggested citation

Centers for Disease Control and Prevention. Manual for the surveillance of vaccine-preventable diseases. Centers for Disease Control and Prevention, Atlanta, GA.

This manual is not intended to be a therapeutic guide; therefore, while dosages of antimicrobials and immunobiologics are discussed in the context of prophylaxis and treatment for case-patients and contacts, physicians and other health-care professionals should review the package inserts prepared by the manufacturers to determine appropriate dosages.

This manual is designed to provide general guidance regarding surveillance activities for vaccine-preventable diseases. Because recommendations for use of vaccines may change, readers should consult their local or state health departments or CDC's Vaccines website at www.cdc.gov/vaccines/.

Use of trade names and commercial sources is for identification only and does not imply endorsement by the U.S. Public Health Service or the U.S. Department of Health and Human Services.

Acknowledgments

This manual was prepared by the Centers for Disease Control and Prevention (CDC), National Center for Immunization and Respiratory Diseases.

We thank colleagues in the National Center for Immunization and Respiratory Diseases, CDC, and others who offered advice, made specific recommendations on format and content, reviewed drafts, or assisted in other ways in the preparation of this manual.

We particularly wish to acknowledge the valuable assistance of the following:

Cathy Hogan
Curt Wommack

Table of Contents

Introduction

Acronyms

Definition of Terms

Chapter 1: Diphtheria

Chapter 2: *Haemophilus influenzae* Type b Invasive Disease

Chapter 3: Hepatitis A

Chapter 4: Hepatitis B

Chapter 5: Human Papillomavirus

Chapter 6: Influenza

Chapter 7: Measles

Chapter 8: Meningococcal Disease

Chapter 9: Mumps

Chapter 10: Pertussis

Chapter 11: Pneumococcal Disease

Chapter 12: Polio (not available)

Chapter 13: Rotavirus

Chapter 14: Rubella

Chapter 15: Congenital Rubella Syndrome

Chapter 16: Tetanus

Chapter 17: Varicella

Chapter 18: Surveillance Indicators

Chapter 19: Enhancing Surveillance

Chapter 20: Analysis of Surveillance Data

Chapter 21: Surveillance for Adverse Events Following Immunization

Chapter 22: Laboratory Support for the Surveillance of Vaccine-Preventable Diseases

Chapter 23: National Surveillance of Vaccine-Preventable Diseases

Chapter 24: State-Specific Surveillance of Vaccine-Preventable Diseases

Appendices

Introduction

This manual was first developed in 1996 to provide general guidance to state and local health department personnel who are involved in surveillance activities for vaccine-preventable diseases. This manual answers commonly asked questions regarding the surveillance and reporting of vaccine-preventable diseases and provides information on enhancing existing surveillance systems.

Several reference documents, tables, and worksheets have been included in this manual for your convenience and information. The worksheets in this manual are in the public domain and may be copied and distributed for use in public health surveillance activities.

Please forward any suggestions and comments regarding this manual to:

Surveillance Officer
National Center for Immunization and Respiratory Diseases
Centers for Disease Control and Prevention
1600 Clifton Road NE, MS-A27
Atlanta, GA 30333
Phone: 404-639-8741

Acronyms

ACIP	Advisory Committee on Immunization Practices
APHL	Association of Public Health Laboratories
CDC	Centers for Disease Control and Prevention
CF	Complement fixation
CMV	Cytomegalovirus
CPHA	Commission on Professional and Hospital Activities
CRS	Congenital rubella syndrome
CSF	Cerebrospinal fluid
CSTE	Council of State and Territorial Epidemiologists
DAT	Diphtheria antitoxin
DFA	Direct fluorescent antibody
DHHS	Department of Health and Human Services
DRSP	Drug-resistant <i>Streptococcus pneumoniae</i>
DT	Diphtheria and tetanus toxoids
DTP	Diphtheria and tetanus toxoids and whole-cell pertussis vaccine
DTaP	Diphtheria and tetanus toxoids and acellular pertussis vaccine
EBV	Epstein-Barr virus
EIA	Enzyme-immunoassay
ELISA	Enzyme-linked immunosorbent assay
ELR	Electronic laboratory reporting
FAMA	Fluorescent antibody to membrane antigen
FDA	Food and Drug Administration
HA	Hemagglutinin
HAV	Hepatitis A virus
HBcAg	Hepatitis B core antigen
HBIG	Hepatitis B immune globulin
HBeAg	Hepatitis B e antigen
HBsAg	Hepatitis B surface antigen
HBV	Hepatitis B virus
HCV	Hepatitis C virus
HDV	Hepatitis D virus
HI	Hemagglutination inhibition
Hi	<i>Haemophilus influenzae</i>
Hib	<i>Haemophilus influenzae</i> type b
HMO	Health maintenance organization
IFA	Indirect fluorescent antibody
IG	Immune globulin
IOM	Institute of Medicine

IPV	Inactivated poliovirus vaccine
LA	Latex agglutination
MMR	Measles-mumps-rubella vaccine
MMWR	Morbidity and Mortality Weekly Report
MR	Measles-rubella vaccine
MSAEFI	Monitoring System for Adverse Events Following Immunization
NA	Neuraminidase
NCCLS	National Committee for Clinical Laboratory Standards
NCHS	National Center for Health Statistics
NCIRD	National Center for Immunization and Respiratory Diseases
NCRSR	National Congenital Rubella Syndrome Registry
NCVIA	National Childhood Vaccine Injury Act of 1986
NEDSS	National Electronic Disease Surveillance System
NETSS	National Electronic Telecommunications System for Surveillance
NHANES	National Health and Nutrition Examination Survey
NHIS	National Health Interview Survey
NNDSS	National Notifiable Diseases Surveillance System
NVICP	National Vaccine Injury Compensation Program
OPV	Oral poliovirus vaccine
P&I	Pneumonia and influenza
PCR	Polymerase chain reaction
PHA	Passive hemagglutination
RASH	Rapid Surveillance Helper
RET	Reportable Events Table
RIA	Radioimmunoassay
SIDS	Sudden Infant Death Syndrome
SHC	State health coordinator
SPSS	Supplementary Pertussis Surveillance System
TIG	Tetanus immune globulin
TT	Tetanus toxoid
VAE	Vaccine adverse event
VAERS	Vaccine Adverse Event Reporting System
VAPP	Vaccine-associated paralytic poliomyelitis
VHSP	Viral Hepatitis Surveillance Program
VPD	Vaccine-preventable disease
VZIG	Varicella-zoster immune globulin
VZV	Varicella-zoster virus
WBC	White blood-cell count
WHO	World Health Organization

Definitions of Terms

Attenuated virus	A strain of virus whose virulence has been lowered by physical or chemical processes or by repeated passage through the cells of another species.
Breakthrough	The appearance of clinical disease in an individual who has previously been vaccinated against the agent causing the disease.
Clinically compatible case	A case featuring a clinical syndrome generally compatible with the disease, but for which specific clinical criteria may not have been met unless they are noted in the case classification.
Confirmed case	A case that is classified as confirmed for reporting purposes.
Contraindication	A characteristic or attribute of an individual that may be temporary or permanent that prohibits the administration of a drug, vaccine, or other therapeutic intervention.
Encephalitis	An inflammatory condition of brain tissue caused by a variety of infectious and non-infectious diseases. In varicella, influenza, and measles, this is sometimes referred to as post-infectious encephalitis.
Epidemiologically linked case	A case in which the patient has or has had contact with one or more persons who have or have had the disease, and transmission of the agent by the usual modes of transmission is plausible. In general, a case may be considered epidemiologically linked to a laboratory-confirmed case if at least one case in the chain of transmission is laboratory confirmed.
Erythema	Redness (or inflammation) of the skin or mucous membranes that is the result of dilation and congestion of superficial capillaries.
Exanthem	A skin eruption or rash that may have specific diagnostic features of an infectious disease. Chickenpox, measles, roseola infantum, rubella, and smallpox are usually characterized by a particular type of exanthem.
Immunocompromised	A state in which an individual has either a decreased or absent ability to mount an antibody and/or cell-mediated immune response to infectious agents.
Incubation period	The period of time from exposure to an infecting agent to the onset of symptoms of disease.
Laboratory confirmed case	A case that is confirmed by one or more of the laboratory methods listed in the case definition under "Laboratory criteria." Although other laboratory methods may be used in clinical diagnosis, only those listed are accepted for laboratory confirmation for reporting purposes.
Line listing	A tool used during epidemiologic investigations to allow investigators to record case information and to review and follow up case reports or conduct data analysis.
Meets the clinical case definition	Meets precisely the clinical case definition. Although in clinical practice the diagnosis may be made with the use of other criteria, for reporting purposes the stated criteria must be met.
Primary vaccine failure	The absence of seroconversion after vaccination. This is manifest as the occurrence of disease in a vaccinated individual in which the disease occurrence closely resembles that found in natural infection with wild-type virus, i.e., more commonly moderate or severe disease.
Probable case	A case that is classified as probable for reporting purposes.
Secondary vaccine failure	Loss of immunity acquired after vaccination.
Sentinel event	A preventable disease, disability, or untimely death that serves as a warning signal of a possible underlying problem.

Sentinel surveillance	Activities focused on monitoring key health indicators in the general population or in special populations. The primary intent is to obtain timely information needed for public health or medical action in a relatively inexpensive manner rather than to derive precise estimates of prevalence or incidence in the general population.
Supportive laboratory results	Specified laboratory results consistent with the diagnosis but not meeting the criteria for laboratory confirmation.
Susceptible	Being sensitive to effects of an infectious disease, allergen, or other pathogenic agent; lacking immunity or resistance.
Thermolability	A characteristic of vaccines that cause them to lose potency when stored or held at temperatures other than that recommended by the manufacturer.
Vaccine coverage	The proportion or percentage of persons that have received a vaccine among all individuals in a particular group who are eligible to receive the vaccine.
Vaccine effectiveness	The ability of a vaccine to provide protection against disease when used under field conditions (e.g., use of the vaccine in routine practice).
Vaccine efficacy	The ability of a vaccine to provide protection against disease under ideal circumstances (e.g., during a clinical trial).