
Communicating Surveillance, Epidemiologic, and Laboratory Information on HIV Infection and AIDS

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Synopsis

As the epidemic of human immunodeficiency virus (HIV) infection and acquired immunodeficiency syndrome (AIDS) has evolved over the past 10 years, the Centers for Disease Control (CDC) has been at the forefront of the scientific efforts that have characterized HIV-AIDS research. Be-

cause of CDC's central role in these efforts, the medical and public health communities have come to depend on the agency for prompt reporting of new developments related to the epidemiology of HIV infection and AIDS and for advice on risk management, prevention, and control.

CDC disseminates this information through epidemiologic updates and prevention guidelines published in the periodical, Morbidity and Mortality Weekly Report, through articles in scientific journals and summary tabulations of AIDS case data and HIV seroprevalence data, and through interviews and presentations at scientific meetings. These formal information dissemination activities are supplemented with training and support efforts directed at health care providers, health department and laboratory personnel, educators, and centralized HIV-AIDS information resources. As questions are answered, controversies resolved, and new research applications explored, CDC will continue to provide the medical and public health communities with the most recent epidemiologic information and recommendations developed to help direct efforts in HIV prevention and risk reduction.

THE CENTERS FOR DISEASE CONTROL (CDC) has a long history of informing the public about unusual occurrences of disease and outbreaks of illness. The medical and public health communities worldwide have come to depend on CDC for prompt reporting of new or unusual medical developments and for advice on disease prevention and control. Within CDC, the responsibility for surveillance, epidemiologic studies, and laboratory investigation of selected infectious diseases is focused in the National Center for Infectious Diseases (NCID).

As the epidemic of human immunodeficiency virus (HIV) infection and acquired immunodeficiency syndrome (AIDS) has evolved over the past 10 years, extensive HIV-AIDS activities have developed in NCID. Most of these activities are now centered in NCID's Division of HIV/AIDS, which has responsibility for surveillance, epidemiologic research, and laboratory study. The Center's Hospital Infections Program is charged with assessing the risk of HIV transmission in health care settings

and developing and evaluating prevention strategies to reduce this risk. Because of CDC's central role in HIV-AIDS research, a growing audience of clinicians, researchers, educators, news reporters, and legislators increasingly rely on CDC staff for the latest information on risk management, prevention, and control. CDC disseminates this information via a range of communication channels.

Epidemiologic Reports in MMWR

CDC's primary vehicle for informing the world of important epidemiologic findings and public health developments is the Morbidity and Mortality Weekly Report (MMWR), published by the Epidemiology Program Office. Since the first reports in mid-1981 of an unusual cluster of opportunistic infections and cancers—primarily *Pneumocystis carinii* pneumonia (PCP) and Kaposi's sarcoma—in young homosexual men, the MMWR has been a key component of the Public Health Service's information dissemination strategy related to HIV

MMWR Articles Available from the National AIDS Clearinghouse

Summary: recommendations for preventing transmission of infection with HTLV-III/LAV in the workplace. MMWR 34: 681-686, 691-695, Nov. 15, 1985.

Revision of the CDC surveillance case definition for AIDS. MMWR 36: Supp. 1S, Aug. 14, 1987.

Public Health Service guidelines for counseling and antibody testing to prevent HIV infection and AIDS. MMWR 36: 509-515, Aug. 14, 1987.

Update: AIDS—United States. MMWR 36: 522-526, Aug. 14, 1987.

Recommendations for prevention of HIV transmission in health-care settings. MMWR 36: Supp. 2S, Aug. 21, 1987.

HIV infection in the United States: a review of current knowledge. MMWR 36: Supp. S-6, Dec. 18, 1987.

Guidelines for effective school health education to prevent the spread of AIDS. MMWR 37: Supp. S-2, Jan. 29, 1988.

Condoms for the prevention of sexually transmitted diseases. MMWR 37: 133-137, Mar. 11, 1988.

1988 Agent summary statement for human immunodeficiency virus and report on laboratory-acquired infection with human immunodeficiency virus. MMWR 37: (S-4), Apr. 1, 1988.

Quarterly report to the Domestic Policy Council on the prevalence and rate of spread of HIV and AIDS in the United States. MMWR 37: 223-226, Apr. 15, 1988.

Update: universal precautions for prevention of transmission of human immunodeficiency virus, hepatitis B virus, and other bloodborne pathogens in health-care settings. MMWR 37: 377-382, 387-388, June 24, 1988.

HIV-related beliefs, knowledge, and behaviors among high school students. MMWR 37: 717-721, Dec. 2, 1988.

Update: acquired immunodeficiency syndrome associated with intravenous-drug use—United States, 1988. MMWR 38: 165-170, Mar. 17, 1989.

Update: acquired immunodeficiency syndrome—United States, 1981-1988. MMWR 38: 229-235, Apr. 14, 1989.

Tuberculosis and human immunodeficiency virus infection: recommendations of the Advisory Committee for the Elimination of Tuberculosis (ACET). MMWR 38: 236-250, Apr. 14, 1989.

AIDS and human immunodeficiency virus infection in the United States: 1988 update. MMWR 38: (S-4), May 12, 1989.

HIV epidemic and AIDS: trends in knowledge—United States, 1987 and 1988. MMWR 38: 353-363, May 26, 1989.

Guidelines for prophylaxis against *Pneumocystis carinii* pneumonia for persons infected with human immunodeficiency virus. MMWR 38: (S-5), June 16, 1989.

Guidelines for prevention of transmission of human immunodeficiency virus and hepatitis B virus to health-care and public-safety workers. MMWR 38: (S-6), June 23, 1989.

Interpretation and use of the Western blot assay for serodiagnosis of human immunodeficiency virus type 1 infections. MMWR 38: (S-7), July 21, 1989.

First 100,000 cases of acquired immunodeficiency syndrome—United States. MMWR 38: 561-563, Aug. 18, 1989.

Public Health Service statement on management of occupational exposure to human immunodeficiency virus, including considerations regarding zidovudine postexposure use. MMWR 39: Reports and Recommendations 1, Jan. 26, 1990.

Estimates of HIV prevalence and projected AIDS cases: summary of a workshop, October 31-November 1, 1989. MMWR 39: 110-119, Feb. 23, 1990.

Publicly funded HIV counseling and testing—United States, 1985-1989. MMWR 39: 137-140, Mar. 9, 1990.

Possible transmission of human immunodeficiency virus to a patient during an invasive dental procedure. MMWR 39: 489-493, July 27, 1990.

Surveillance for AIDS and HIV infection among black and Hispanic children and women of child-bearing age, 1981-1989. MMWR 39: Surveillance Summary-3, July 1990.

infection and AIDS. During that year, CDC formed a task force to determine risk factors, carry out laboratory studies, and disseminate timely information on the disease now known as AIDS.

These first AIDS cases were reported from Los Angeles in the June 5, 1981, issue of the MMWR (1). Over the ensuing months, additional cases were reported and other opportunistic conditions were described (2-7). Soon the term "AIDS" was used to describe the occurrence of PCP, Kaposi's sarcoma, or other serious opportunistic infections in a person with unexplained immune dysfunction (8). In retrospect, sporadic cases may have occurred in the United States and other countries as early as the 1950s, but for all practical purposes these early reports in the MMWR mark the recognition of AIDS as an emerging public health problem (9).

As knowledge about the clinical, epidemiologic, and immunologic features of AIDS increased dramatically over the next few years, CDC staff documented these findings regularly in the MMWR. The recognition of AIDS in homosexual men and intravenous drug users and in a cluster of cases linked by sexual contact led researchers to suggest by 1982 that a transmissible agent was the likely cause of the illness (7). This theory soon increased in probability with reports in the MMWR of the occurrence of AIDS in persons with hemophilia, in recipients of blood transfusions, and in female sex partners of men with AIDS (10-12). Little more than a year later, a retrovirus, now termed HIV, was isolated in laboratories in both the United States and France and shown to be the cause of AIDS (13,14); in 1985, a test was licensed to detect HIV antibody and was used to screen all blood and plasma in the United States (15). Scientific studies in 1984 and 1985 showed that virtually everyone who had confirmed antibody to HIV remained infected with the virus.

Updates published in the MMWR have alerted the public to newly identified HIV-related illnesses, changing trends in AIDS incidence and prevalence, and improved diagnostic and preventive measures. Between 1981 and 1990, NCID prepared more than 100 articles on HIV-AIDS for publication in the MMWR, in addition to more than 900 articles published in the medical and scientific literature.

Yearly paid subscriptions to the MMWR are available from the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402-9371 (telephone: 202-783-3238). Single free copies of selected MMWR articles (see box), as well as other publications concerning HIV-AIDS, can be obtained from the National AIDS Clearinghouse

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(NAC), P.O. Box 6003, Rockville, MD 20850 (telephone: 1-800-458-5231).

Prevention Guidelines

As the epidemiologic data on the transmission and natural history of HIV infection have accumulated, CDC staff have collaborated with consultants from the medical, public health, and scientific communities to produce an evolving series of guidelines for reducing the risk of HIV transmission (16). These guidelines were developed based on findings from disease surveillance, trend analysis, and laboratory studies. CDC guidelines often form the basis for policies and recommendations developed independently by international, national, State, and local agencies; professional organizations; medical and educational facilities; and private companies. The development and dissemination of risk reduction guidelines for infectious diseases is an important component of HIV-AIDS prevention worldwide.

In November 1982, evidence that an infectious agent was the cause of AIDS led CDC to issue the first compilation of blood and body-fluid precautions for clinical and laboratory personnel (17). Modeled on existing recommendations to prevent the transmission of hepatitis B virus, the guidelines also noted for the first time that airborne spread and person-to-person transmission of HIV through casual contact were not likely. Although these early recommendations were written before the cause of AIDS was known and when the number of AIDS cases totalled only about 700, they remain relevant and form the basis for subsequently revised and expanded guidelines.

For the last 6 years, a major focus of NCID's Hospital Infections Program has been the development of guidelines for prevention of transmission of HIV and other bloodborne pathogens in health care facilities, other workplaces, and home care

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settings. In 1985, the strategy of "universal blood and body fluid precautions" was developed through collaborative efforts among CDC; other PHS agencies; and consultants from medical, public health, and scientific organizations (18). This strategy, now referred to simply as "universal precautions," is the foundation for prevention recommendations in health care settings. It is based on the premise that—because it is often impossible to know a patient's infection status—all patients should be assumed to be infectious for HIV and other bloodborne pathogens. Universal precautions are designed to prevent transmission of bloodborne pathogens from patient to health care worker, health care worker to patient, and patient to patient.

The universal precautions guidelines were expanded in the August 1987 "Recommendations for Prevention of HIV Transmission in Health-Care Settings" (19) and updated in June 1988 (20). These recommendations have formed the basis for the "Guidelines for Prevention of Transmission of Human Immunodeficiency Virus and Hepatitis B Virus to Health-Care and Public-Safety Workers" published by the National Institute for Occupational Safety and Health (21), and they are being incorporated into proposed regulations by the Occupational Safety and Health Administration to prevent occupational transmission of HIV, hepatitis B virus, and other bloodborne pathogens.

In early 1991, identification of HIV transmission from a dentist with AIDS to five patients during their dental care increased public and professional concern about this mode of transmission, prompting the American Medical Association and the American Dental Association to issue preliminary guidelines (22–26). On July 12, 1991, CDC pub-

lished additional recommendations to prevent transmission of HIV and hepatitis B virus specifically during exposure-prone invasive procedures (27).

While CDC's Epidemiology Program Office edits and publishes the weekly MMWR, NCID compiles annual compendiums of both the HIV-AIDS reports and the recommendations and guidelines on HIV-AIDS published in the MMWR. These compendiums, which facilitate easy reference to MMWR articles for researchers, clinicians, and the general public, are available for a fee from the National Technical Information Service, 5285 Port Royal Rd., Springfield, VA 22161 (telephone 703-487-4650).

Surveillance Guidelines and Reports

CDC maintains national surveillance of AIDS through case reports submitted by State and local health departments. For reporting and surveillance purposes, a standard case definition for AIDS has been developed and revised twice by CDC to reflect the growing understanding of the disease. In 1982, before HIV was identified as the disease agent causing AIDS, CDC defined a case of AIDS as a disease, at least moderately indicative of a defect in cell-mediated immunity, occurring in persons with no known cause for diminished resistance to the disease (8). With the identification of HIV as the causative agent for AIDS and the availability of laboratory tests to detect HIV antibody, the case definition has been expanded to reflect an increased understanding of HIV infection. The definition was revised in 1985 and again in 1987; both revisions were published and widely disseminated via the MMWR (28,29). CDC is currently planning a comprehensive change in the AIDS surveillance definition to correspond closely with current recommended medical management of HIV-infected persons and to reflect more accurately the level of severe HIV-related illness in the United States (MMWR, Reports and Recommendations, in press).

Reporting of cases fitting the surveillance definition has allowed CDC to track the severe illness and death associated with HIV infection from 1981 to the present and to compile statistics on the occurrence and distribution of AIDS cases in the United States. NCID collects data from AIDS case surveillance and releases summary tabulations every month in the widely distributed "HIV/AIDS Surveillance" report. Surveillance data are also dispersed through presentations at scientific meetings, through periodic MMWR reports and journal arti-

cles, and through the distribution of public use data sets.

As an adjunct to AIDS case surveillance, CDC provides assistance to State and local health departments to conduct HIV seroprevalence studies in selected populations such as women of reproductive age, persons in various clinical settings, and large groups that are tested over time (30). NCID collects data from these surveys and provides summary information through its annual publication, "National HIV Seroprevalence Surveys: Summary of Results." Survey findings are also presented through journal articles and at national and international scientific meetings and conferences. Seroprevalence data from the surveys provide invaluable information to public health officials who must plan, administer, and evaluate HIV-AIDS prevention programs.

Single copies of both the monthly "HIV/AIDS Surveillance" report and the annual "National HIV Seroprevalence Surveys: Summary of Results" are available free of charge from NAC.

Training Support

CDC has the responsibility for ensuring the continued professional development and training of public health advisors assigned to AIDS surveillance and HIV seroprevalence programs in State and local health departments throughout the United States and for conducting surveillance and seroprevalence training courses for State and local staff. Additionally, CDC has designed and sponsored an international course in HIV-AIDS surveillance and applied epidemiology to provide training for public health and medical officials primarily from developing countries. CDC's laboratory personnel provide further training in HIV-related diagnostic procedures and interpretation, including Western blot analysis, polymerase chain reaction, and virus isolation.

In addition to formal training efforts, NCID has developed 12 HIV-AIDS slide sets for distribution to medical institutions and organizations, State and local health departments, and public health educators. Accompanied by scripts to facilitate audience comprehension and ease of presentation, the slide sets cover topics such as the AIDS case definition, universal precautions for infection control, pediatric AIDS, HIV-AIDS in minorities, and HIV seroprevalence surveys. Their use ensures that accurate technical information on HIV infection and AIDS is disseminated throughout the national and international academic and public health communi-

ties. Free single copies of slide sets with accompanying scripts may be requested by topic by writing to CDC at Still Pictures Archives, Public Health Practice Program Office, Mailstop F02, 1600 Clifton Rd, Atlanta, GA 30333, and describing the planned purpose and target audience of the presentation.

Information Directed at General Public

NCID staff serve as a technical resource to both the National AIDS Hotline (NAH) and NAC, providing NAH and NAC with the most up-to-date technical, policy, and programmatic information related to HIV-AIDS. Professional staff also review NAH training materials to ensure accuracy, consistency, and timeliness and are available on an ad hoc basis to provide technical assistance and advice to both groups.

Complementing the services of NAH, CDC's integrated telephone system enables the general public to access up-to-date, standardized HIV-AIDS information directly from CDC. Incoming calls to CDC for technical information are routinely referred to the Voice Information Services line, 404-332-4555, by switchboard operators. By using a touch-tone telephone, callers may select prerecorded messages on HIV infection and AIDS and other topics. The segment on HIV-AIDS, which is updated regularly, provides information on transmission modes and prevention, statistics and projections, testing and treatment, publications and information services, and topics of interest to health care workers.

Conclusion

As the Federal agency charged with stemming the HIV-AIDS epidemic in the United States, CDC also has a broad communications mission. Both directly, through published reports in the MMWR and the journal literature, and indirectly, through dissemination of standardized slide series and provision of training and support services to health care providers, health department personnel, and centralized information resources, CDC provides reasoned, timely, and authoritative information on HIV infection and AIDS. Although much has already been learned about HIV infection and AIDS, questions and controversies persist, and the pace of new HIV infections in many groups shows no evidence of slowing. As epidemiologic studies, laboratory research, and surveillance efforts continue and expand, CDC will continue to play a

highly visible part in the communication of important HIV-AIDS information to the national and international public health communities.

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