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Revised Surveillance Case Definitions for HIV Infection Among Adults, Adolescents, and Children Aged <18 Months and for HIV Infection and AIDS Among Children Aged 18 Months to <13 Years — United States, 2008

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Revised Surveillance Case Definitions for HIV Infection Among Adults, Adolescents, and Children Aged <18 Months and for HIV Infection and AIDS Among Children Aged 18 Months to <13 Years — United States, 2008

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Summary

For adults and adolescents (i.e., persons aged ≥13 years), the human immunodeficiency virus (HIV) infection classification system and the surveillance case definitions for HIV infection and acquired immunodeficiency syndrome (AIDS) have been revised and combined into a single case definition for HIV infection (1–3). In addition, the HIV infection case definition for children aged <13 years and the AIDS case definition for children aged 18 months to <13 years have been revised (1,3,4). No changes have been made to the HIV infection classification system (4), the 24 AIDS-defining conditions (1,4) for children aged <13 years, or the AIDS case definition for children aged <18 months. These case definitions are intended for public health surveillance only and not as a guide for clinical diagnosis. Public health surveillance data are used primarily for monitoring the HIV epidemic and for planning on a population level, not for making clinical decisions for individual patients. CDC and the Council of State and Territorial Epidemiologists recommend that all states and territories conduct case surveillance of HIV infection and AIDS using the 2008 surveillance case definitions, effective immediately.

Introduction

Since the beginning of the human immunodeficiency virus (HIV) epidemic, case definitions for HIV infection and acquired immunodeficiency syndrome (AIDS) have undergone several revisions to respond to diagnostic and therapeutic advances and to improve standardization and comparability of surveillance data regarding persons at all stages of HIV disease. HIV testing is now widely available, and diagnostic testing has continued to improve; these changes are reflected in the 2008 revised case definition for HIV infection, which now requires laboratory-confirmed evidence of HIV infection to meet the case definition among adults, adolescents, and children aged 18 months to <13 years.

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Methods

CDC collaborated with the Council of State and Territorial Epidemiologists (CSTE) to develop the revisions in this report. CDC obtained additional input through consultations regarding the pediatric case definitions (April 2005) and adult and adolescent case definition (August 2005 and June 2006) and through peer review by health-care professionals, in compliance with the Office of Management and Budget requirements for the dissemination of influential scientific information.

Adults and Adolescents

For adults and adolescents (aged ≥13 years), the case definitions for HIV infection and AIDS have been revised into a single case definition for HIV infection that includes AIDS and incorporates the HIV infection classification system. Laboratory-confirmed evidence of HIV infection is now required to meet the surveillance case definition for HIV infection, including stage 3 HIV infection (AIDS). Diagnostic confirmation of an AIDS-defining condition alone (Appendix A), without laboratory-confirmed evidence of HIV infection, is no longer sufficient to classify an adult or adolescent as HIV

infected for surveillance purposes. The 2007 World Health Organization (WHO) revised surveillance case definition for HIV infection also requires laboratory confirmation of HIV infection (Appendix B).

Historically, the case definition for AIDS included adults and adolescents without laboratory-confirmed evidence of HIV infection if other clinical criteria were met. In 1993, the existing case definition for AIDS (*1*) was expanded to include 1) all HIV-infected persons with a CD4+ T-lymphocyte count of <200 cells/μL or a CD4+ T-lymphocyte percentage of total lymphocytes of <14 and 2) three additional clinical conditions (pulmonary tuberculosis, recurrent pneumonia, and invasive cervical cancer), in addition to retaining the 23 clinical conditions in the previous AIDS case definition (*2*). Despite these changes, the case definition for AIDS continued to include a subset of adults and adolescents without laboratory-confirmed evidence of HIV infection whose illness still met the surveillance case definition for AIDS. Illness in a person who did not have any other known cause of immunodeficiency met the surveillance case definition for AIDS if the illness met any of the following three criteria: 1) no laboratory testing performed or inconclusive laboratory evidence of HIV infection but a definitive diagnosis of a condition included in a subset of AIDS-defining conditions, 2) negative laboratory results for HIV infection but a definitive diagnosis of *Pneumocystis jirovecii* pneumonia, or 3) negative laboratory results for HIV infection but a definitive diagnosis of a condition included in a subset of AIDS-defining conditions and a CD4+ T-lymphocyte count of <400 cells/μL. Because of improvements in diagnostic capabilities and treatment, including increased use of new HIV-testing technologies, CDC collaborated with CSTE to recommend in 2005 an interim change in the AIDS case definition, which required laboratory confirmation of HIV infection. This recommended change required laboratory-confirmed evidence of HIV infection in addition to a CD4+ T-lymphocyte count of <200 cells/μL, a CD4+ T-lymphocyte percentage of total lymphocytes of <14, or diagnosis of an AIDS-defining condition (*5*). This CDC/CSTE interim recommendation has been incorporated into the 2008 HIV infection case definition, which includes AIDS (stage 3).

In 1993, the revised classification system for HIV infection and the expanded AIDS surveillance case definition for adults and adolescents were based on three clinical categories (i.e., A, B, and C) and three ranges of CD4+ T-lymphocyte counts (i.e., ≥500 cells/μL, 200–499 cells/μL, and <200 cells/μL) or the concordant CD4+ T-lymphocyte percentages (*2*). Clinical category A comprised asymptomatic acute or primary HIV infection or persistent generalized lymphadenopathy. Clinical category B comprised symptomatic conditions in an HIV-infected adult or adolescent that were not included in clinical categories A or C but were attributed to a cell-mediated immunity defect or for which the clinical course or management was complicated by HIV infection. Clinical category C comprised the 26 AIDS-defining conditions. In the context of treatment and diagnostic improvements since 1993, clinical categories A and B pose particular difficulties because they include many conditions that are not discrete diseases, are not necessarily indicators of immunodeficiency, poorly match current treatment guidelines, and are not integrated into routine surveillance practices. The classification system of the 2008 case definition for HIV infection, which includes AIDS, has been simplified, with less emphasis on clinical conditions by elimination of clinical categories A and B while retaining the 26 AIDS-defining conditions in clinical category C (*1,2*).

The role of CD4+ T-lymphocyte counts and percentages also has been clarified. The 2008 case definition highlights the central role of the CD4+ T-lymphocyte counts and percentages, which are objective measures of immunosuppression that are routinely used in the care of HIV-infected persons and are available to surveillance programs. The three CD4+ T-lymphocyte count categories have been renamed for HIV infection, increasing in severity from stage 1 through stage 3 (AIDS); an unknown stage also is included. For surveillance purposes, HIV disease progression is classified from less to more severe; once cases are classified into a surveillance severity stage, they cannot be reclassified into a less severe stage.

Children

Aged <18 Months

The 1999 surveillance guidelines recommended four categories of HIV infection for children aged <18 months: definitively HIV infected, presumptively HIV infected, definitively uninfected with HIV, and presumptively uninfected with HIV (*3*). Because of improved accuracy and the widespread availability of viral detection and antibody tests to diagnose HIV infection, changes have been made in the surveillance case definition of presumptively uninfected with HIV for children aged <18 months at the time of diagnosis (*1,3,4*). Thus, compared with infants categorized using the previous surveillance case definition, fewer HIV-exposed infants who have a very low probability of infection will be categorized as having indeterminate infections (*3*). No major revisions have been made to the remaining three categories for children aged <18 months, and no changes have been made to the AIDS surveillance case definition for children in this age group (*1,3,4*). Because of the greater uncertainty associated with diagnostic testing for HIV in this population (i.e., because maternal antibodies from the HIV-infected mother might exist in the infant after

birth, possibly affecting HIV diagnostic testing of the infant that occurs soon after birth), children in this age group whose illness meets clinical criteria for the AIDS case definition but does not meet laboratory criteria for definitive or presumptive HIV infection are still categorized as HIV infected when the mother has laboratory-confirmed HIV infection.

Aged 18 Months to <13 Years

For children aged 18 months to <13 years, laboratory-confirmed evidence of HIV infection is now required to meet the surveillance case definition for HIV infection and AIDS. Diagnostic confirmation of an AIDS-defining condition alone, without laboratory-confirmed evidence of HIV infection, is no longer sufficient to classify a child as HIV infected for surveillance purposes (*1,3,4*). No changes have been made to the 24 AIDS-defining conditions (*1,4*) or the HIV infection classification system for children aged <13 years (*4*).

2008 Surveillance Case Definition for HIV Infection Among Adults and Adolescents

The 2008 HIV infection case definition for adults and adolescents (aged ≥13 years) replaces the HIV infection and AIDS case definitions and the HIV infection classification system (*1–3,5*). The case definition is intended for public health surveillance only and not as a guide for clinical diagnosis. The definition applies to all HIV variants (e.g., HIV-1 or HIV-2) and excludes confirmation of HIV infection through diagnosis of AIDS-defining conditions alone. For surveillance purposes, a reportable case of HIV infection among adults and adolescents aged ≥13 years is categorized by increasing severity as stage 1, stage 2, or stage 3 (AIDS) or as stage unknown (Table).

Criteria for HIV Infection

Laboratory Criteria

- Positive result from an HIV antibody screening test (e.g., reactive enzyme immunoassay [EIA]*) confirmed by a positive result from a supplemental HIV antibody test (e.g., Western blot or indirect immunofluorescence assay test).

or

- Positive result or report of a detectable quantity (i.e., within the established limits of the laboratory test) from any of the following HIV virologic (i.e., non-antibody) tests†:
  - — HIV nucleic acid (DNA or RNA) detection test (e.g., polymerase chain reaction [PCR])
  - — HIV p24 antigen test, including neutralization assay
  - — HIV isolation (viral culture)

Other Criterion (for Cases that Do Not Meet Laboratory Criteria)

- HIV infection diagnosed by a physician or qualified medical-care provider§ based on the laboratory criteria and documented in a medical record.¶ Oral reports of prior laboratory test results are not acceptable.

Case Classification

A confirmed case meets the laboratory criteria for diagnosis of HIV infection and one of the four HIV infection stages (stage 1, stage 2, stage 3, or stage unknown) (Table). Although cases with no information on CD4+ T-lymphocyte count or percentage and no information on AIDS-defining conditions can be classified as stage unknown, every effort should be made to report CD4+ T-lymphocyte counts or percentages and the presence of AIDS-defining conditions at the time of diagnosis. Additional CD4+ T-lymphocyte counts or percentages and any identified AIDS-defining conditions can be reported as recommended (*6*).

HIV Infection, Stage 1

- No AIDS-defining condition and either CD4+ T-lymphocyte count of ≥500 cells/μL or CD4+ T-lymphocyte percentage of total lymphocytes of ≥29.

HIV Infection, Stage 2

- No AIDS-defining condition and either CD4+ T-lymphocyte count of 200–499 cells/μL or CD4+ T-lymphocyte percentage of total lymphocytes of 14–28.

* Rapid tests are EIAs that do not have to be repeated but require a confirmatory test if reactive. Most conventional EIAs require a repeatedly reactive EIA that is confirmed by a positive result with a supplemental test for HIV antibody. Standard laboratory testing procedures should always be followed.

† For HIV screening, HIV virologic (non-antibody) tests should not be used in lieu of approved HIV antibody screening tests. A negative result (i.e., undetectable or nonreactive) from an HIV virologic test (e.g., viral RNA nucleic acid test) does not rule out the diagnosis of HIV infection.

§ Qualified medical-care providers might differ by jurisdiction and might include physicians, nurse practitioners, physician assistants, or nurse midwives.

¶ An original or copy of the laboratory report is preferred; however, in the rare instance the laboratory report is not available, a description of the laboratory report results by a physician or qualified medical-care provider documented in the medical record is acceptable for surveillance purposes. Every effort should be made to obtain a copy of the laboratory report for documentation in the medical record.

TABLE. Surveillance case definition for human immunodeficiency virus (HIV) infection among adults and adolescents (aged ≥13 years) — United States, 2008

Stage	Laboratory evidence*	Clinical evidence
Stage 1	Laboratory confirmation of HIV infection *and* CD4+ T-lymphocyte count of ≥500 cells/μL *or* CD4+ T-lymphocyte percentage of ≥29	None required (but no AIDS-defining condition)
Stage 2	Laboratory confirmation of HIV infection *and* CD4+ T-lymphocyte count of 200–499 cells/μL *or* CD4+ T-lymphocyte percentage of 14–28	None required (but no AIDS-defining condition)
Stage 3 (AIDS)	Laboratory confirmation of HIV infection *and* CD4+ T-lymphocyte count of <200 cells/μL *or* CD4+ T-lymphocyte percentage of <14†	*or* documentation of an AIDS-defining condition (with laboratory confirmation of HIV infection)†
Stage unknown§	Laboratory confirmation of HIV infection *and* no information on CD4+ T-lymphocyte count or percentage	*and* no information on presence of AIDS-defining conditions

* The CD4+ T-lymphocyte percentage is the percentage of total lymphocytes. If the CD4+ T-lymphocyte count and percentage do not correspond to the same HIV infection stage, select the more severe stage.

† Documentation of an AIDS-defining condition (Appendix A) supersedes a CD4+ T-lymphocyte count of ≥200 cells/μL and a CD4+ T-lymphocyte percentage of total lymphocytes of ≥14. Definitive diagnostic methods for these conditions are available in Appendix C of the 1993 revised HIV classification system and the expanded AIDS case definition (CDC. 1993 Revised classification system for HIV infection and expanded surveillance case definition for AIDS among adolescents and adults. MMWR 1992;41[No. RR-17]) and from the National Notifiable Diseases Surveillance System (available at http://www.cdc.gov/epo/dphsi/casedef/case_definitions.htm).

§ Although cases with no information on CD4+ T-lymphocyte count or percentage or on the presence of AIDS-defining conditions can be classified as stage unknown, every effort should be made to report CD4+ T-lymphocyte counts or percentages and the presence of AIDS-defining conditions at the time of diagnosis. Additional CD4+ T-lymphocyte counts or percentages and any identified AIDS-defining conditions can be reported as recommended. (Council of State and Territorial Epidemiologists. Laboratory reporting of clinical test results indicative of HIV infection: new standards for a new era of surveillance and prevention [Position Statement 04-ID-07]; 2004. Available at http://www.cste.org/ps/2004pdf/04-ID-07-final.pdf.)

HIV Infection, Stage 3 (AIDS)

- CD4+ T-lymphocyte count of <200 cells/μL or CD4+ T-lymphocyte percentage of total lymphocytes of <14 or documentation of an AIDS-defining condition (Appendix A). Documentation of an AIDS-defining condition supersedes a CD4+ T-lymphocyte count of ≥200 cells/μL and a CD4+ T-lymphocyte percentage of total lymphocytes of ≥14. Definitive diagnostic methods for these conditions are available in Appendix C of the 1993 revised HIV classification system and the expanded AIDS case definition (*2*) and from the National Notifiable Diseases Surveillance System (available at http://www.cdc.gov/epo/dphsi/casedef/case_definitions.htm).

HIV Infection, Stage Unknown

- No information available on CD4+ T-lymphocyte count or percentage and no information available on AIDS-defining conditions. (Every effort should be made to report CD4+ T-lymphocyte counts or percentages and the presence of AIDS-defining conditions at the time of diagnosis.)

Discussion

To meet the surveillance case definition for HIV infection among adults and adolescents, laboratory-confirmed evidence of HIV infection is required. The lowest CD4+ T-lymphocyte count (or concordant CD4+ T-lymphocyte percentage of total lymphocytes) or the presence of AIDS-defining conditions is used to determine the stage of infection. If the CD4+ T-lymphocyte count and the CD4+ T-lymphocyte percentage are both available but do not correspond to the same severity stage, select the more severe stage. For surveillance purposes, disease progression is from less to more severe; once cases are classified in a more severe surveillance stage, they cannot be reclassified into a less severe surveillance stage.

A diagnosis of acute HIV infection indicates documented evidence of detectable HIV RNA or DNA or of p24 antigen in plasma or serum in the presence of a documented negative or indeterminate result from an HIV antibody test. These laboratory tests should be conducted on the same specimen or on specimens obtained on the same day. Acute HIV infection occurs approximately during the time from viral acquisition until seroconversion (i.e., the development of measurable levels of HIV-specific antibodies). During this period, early immune responses to the virus produce distinctive characteristics; 40% to 80% of patients develop clinical symptoms of a nonspecific viral illness (e.g., fever, fatigue, or rash) typically lasting 1–2 weeks (*7*–*12*). Acute HIV infection often is not detected because the date of HIV acquisition is unknown, no specific clinical signs are present, no single laboratory marker is present, and the diagnostic window is small. High viral loads typically are associated with acute HIV infection, potentially increasing the risk for transmission. CD4+ T-lymphocyte counts have decreased in certain patients with acute HIV

infection, especially during the months immediately following viral acquisition (*7,11,12*). However, the viral load and CD4+ T-lymphocyte count usually stabilize once equilibrium is reached between HIV and the immune response (i.e., the viral set point). The changing CD4+ T-lymphocyte counts associated with acute HIV infection might have implications when using these counts to stage HIV infection for surveillance purposes; for example, persons might experience a particularly low, but temporary, CD4+ T-lymphocyte count and be categorized as having a more severe stage of HIV infection than they actually have after reaching the viral set point.

2008 Surveillance Case Definition for HIV Infection Among Children Aged <18 Months

The 2008 case definition of HIV infection among children aged <18 months replaces the definition published in 1999 (*3*) and applies to all variants of HIV (e.g., HIV-1 or HIV-2). The 2008 definition is intended for public health surveillance only and not as a guide for clinical diagnosis.

The 2008 definition takes into account new available testing technologies. Laboratory criteria for children aged <18 months at the time of diagnosis include revisions to one category: presumptively uninfected with HIV. No substantial changes have been made to the remaining three categories (definitively HIV infected, presumptively HIV infected, and definitively uninfected with HIV), and no changes have been made to the conditions listed under the AIDS criteria in the 1987 pediatric surveillance case definition for AIDS for children aged <18 months (*1,3,13*). Because diagnostic laboratory testing for HIV infection among children aged <18 months might be unreliable, children in this age group with perinatal HIV exposure whose illness meets the AIDS case definition on the basis of clinical criteria are considered presumptively HIV infected when the mother has laboratory-confirmed HIV infection. The definitive or presumptive exclusion of HIV infection for surveillance purposes does not mean that clinical HIV infection can be ruled out. For the purposes of calculating the exact timing of tests (e.g., when a specimen was obtained for laboratory testing) based on the surveillance case definition, 1 month corresponds to 30 days.

Criteria for Definitive or Presumptive HIV Infection

A child aged <18 months is categorized for surveillance purposes as definitively or presumptively HIV infected if born to an HIV-infected mother and if the laboratory criterion or at least one of the other criteria is met.

Laboratory Criterion for Definitive HIV Infection

A child aged <18 months is categorized for surveillance purposes as definitively HIV infected if born to an HIV-infected mother and the following laboratory criterion is met.

- Positive results on two separate specimens (not including cord blood) from one or more of the following HIV virologic (non-antibody) tests:
  - HIV nucleic acid (DNA or RNA) detection**
  - HIV p24 antigen test, including neutralization assay, for a child aged ≥1 month
  - HIV isolation (viral culture)

Laboratory Criterion for Presumptive HIV Infection

A child aged <18 months is categorized for surveillance purposes as presumptively HIV infected if 1) born to an HIV-infected mother, 2) the criterion for definitively HIV infected is not met, and 3) the following laboratory criterion is met.

- Positive results on one specimen (not including cord blood) from the listed HIV virologic tests (HIV nucleic acid detection test; HIV p24 antigen test, including neutralization assay, for a child aged ≥1 month; or HIV isolation [viral culture] for definitively HIV infected) and no subsequent negative results from HIV virologic or HIV antibody tests.

Other Criteria (for Cases that Do Not Meet Laboratory Criteria for Definitive or Presumptive HIV Infection)

- HIV infection diagnosed by a physician or qualified medical-care provider based on the laboratory criteria and documented in a medical record. Oral reports of prior laboratory test results are not acceptable.

or

** HIV nucleic acid (DNA or RNA) detection tests are the virologic methods of choice for the diagnosis or exclusion of infection in children aged <18 months. Although HIV culture can be used, culture is less standardized and less sensitive than nucleic acid detection tests. The use of p24 antigen testing to exclude infection in children aged <18 months is not recommended because of poor sensitivity, especially in the presence of HIV antibody. Commercial tests for RNA and DNA detection have become widely available. Quantitative RNA tests have been approved by the Food and Drug Administration (FDA) for monitoring HIV infection, and qualitative RNA tests have been approved to aid diagnosis. The quantitative and qualitative RNA tests meet FDA standards for high analytic and clinical sensitivity and specificity (*14–16*). All available tests detect the subtypes of group M and strains of group O. HIV-2 can be diagnosed with HIV-2 DNA PCR. HIV RNA tests sometimes do not detect HIV-2 because the viral loads in some HIV-2–infected persons are below detectable levels. Because of the possibility of mutation or recombination involving the sequences detected by a particular test, occasionally, virus might not be detected in a specimen from an HIV-2 infected individual. If HIV-2 infection seems likely but results are negative, testing with a different assay might be advisable.

- When test results regarding HIV infection status are not available, documentation of a condition that meets the criteria in the 1987 pediatric surveillance case definition for AIDS (*1*) (Appendix A).

Criteria for Uninfected with HIV, Definitive or Presumptive

A child aged <18 months born to an HIV-infected mother is categorized for surveillance purposes as either definitively or presumptively uninfected with HIV if 1) the criteria for definitive or presumptive HIV infection are not met and 2) at least one of the laboratory criteria or other criteria are met.

Laboratory Criteria for Uninfected with HIV, Definitive

A child aged <18 months born to an HIV-infected mother is categorized for surveillance purposes as definitively uninfected with HIV if 1) the criteria for definitive or presumptive HIV infection are not met and 2) at least one of the laboratory criteria or other criteria are met.[††]

- At least two negative HIV DNA or RNA virologic tests from separate specimens, both of which were obtained at age ≥1 month and one of which was obtained at age ≥4 months.

or

- At least two negative HIV antibody tests from separate specimens obtained at age ≥6 months.

and

- No other laboratory or clinical evidence of HIV infection (i.e., no positive results from virologic tests [if tests were performed] and no current or previous AIDS-defining condition) (Appendix A).

Laboratory Criteria for Uninfected with HIV, Presumptive

A child aged <18 months born to an HIV-infected mother is categorized for surveillance purposes as presumptively uninfected with HIV if 1) the criteria for definitively uninfected with HIV are not met and 2) at least one of the laboratory criteria are met.

- Two negative RNA or DNA virologic tests, from separate specimens, both of which were obtained at age ≥2 weeks and one of which was obtained at age ≥4 weeks.[§§]

or

- One negative RNA or a DNA virologic test from a specimen obtained at age ≥8 weeks.

or

- One negative HIV antibody test from a specimen obtained at age ≥6 months.

or

- One positive HIV virologic test followed by at least two negative tests from separate specimens, one of which is a virologic test from a specimen obtained at age ≥8 weeks or an HIV antibody test from a specimen obtained at age ≥6 months.

and

- No other laboratory or clinical evidence of HIV infection (i.e., no subsequent positive results from virologic tests if tests were performed, and no AIDS-defining condition for which no other underlying condition indicative of immunosuppression exists) (Appendix A).

Other Criteria (for Cases that Do Not Meet Laboratory Criteria for Uninfected with HIV, Definitive or Presumptive)

- Determination of uninfected with HIV by a physician or qualified medical-care provider based on the laboratory criteria and who has noted the HIV diagnostic test results in the medical record. Oral reports of prior laboratory test results are not acceptable.

and

- No other laboratory or clinical evidence of HIV infection (i.e., no positive results from virologic tests [if tests were performed] and no AIDS-defining condition for which no other underlying condition indicative of immunosuppression exists) (Appendix A).

Criteria for Indeterminate HIV Infection

A child aged <18 months born to an HIV-infected mother is categorized as having perinatal exposure with an indeterminate HIV infection status if the criteria for infected with HIV and uninfected with HIV are not met.

Discussion

The exclusion of HIV infection (definitive or presumptive) for surveillance purposes does not mean that clinical HIV infection can be ruled out. These categories are used for surveillance classification purposes and should not be used to guide clinical practice. A child with perinatal HIV exposure should continue to be monitored clinically according to nationally accepted treatment and care guidelines (*17–19*) to 1) monitor for potential complications of exposure to antiretroviral medications during

[††] Suspected cases of HIV infection among children aged <18 months who are born to a documented HIV-uninfected mother should be assessed on a case-by-case basis by the appropriate health care and public health specialists.

[§§] If specimens for both negative RNA or DNA virologic tests are obtained at age ≥4 weeks, specimens should be obtained on separate days.

the perinatal period and 2) confirm the absence of HIV infection with repeat clinical and laboratory evaluations.

No changes have been made to the existing classification system for HIV infection among children aged <18 months (*4*). To classify HIV-infected children in this age group, use the 1994 revised classification system for HIV infection among children aged <13 years (*4*).

2008 Surveillance Case Definitions for HIV Infection and AIDS Among Children Aged 18 Months to <13 Years

These 2008 surveillance case definitions of HIV infection and AIDS supersede those published in 1987 (*1*) and 1999 (*3*) and apply to all variants of HIV (e.g., HIV-1 or HIV-2). They are intended for public health surveillance only and are not a guide for clinical diagnosis.

The 2008 laboratory criteria for reportable HIV infection among persons aged 18 months to <13 years exclude confirmation of HIV infection through the diagnosis of AIDS-defining conditions alone. Laboratory-confirmed evidence of HIV infection is now required for all reported cases of HIV infection among children aged 18 months to <13 years (*20*).

Criteria for HIV Infection

Children aged 18 months to <13 years are categorized as HIV infected for surveillance purposes if at least one of laboratory criteria or the other criterion is met.¶¶

Laboratory Criteria

- Positive result from a screening test for HIV antibody (e.g., reactive EIA), confirmed by a positive result from a supplemental test for HIV antibody (e.g., Western blot or indirect immunofluorescence assay).

or

- Positive result or a detectable quantity by any of the following HIV virologic (non-antibody) tests***:
  - HIV nucleic acid (DNA or RNA) detection (e.g., PCR)
  - HIV p24 antigen test, including neutralization assay
  - HIV isolation (viral culture)

Other Criterion (for Cases that Do Not Meet Laboratory Criteria)

- HIV infection diagnosed by a physician or qualified medical-care provider based on the laboratory criteria and documented in a medical record. Oral reports of prior laboratory test results are not acceptable.

Criteria for AIDS

Children aged 18 months to <13 years are categorized for surveillance purposes as having AIDS if the criteria for HIV infection are met and at least one of the AIDS-defining conditions has been documented (Appendix A).

The 2008 surveillance case definition for AIDS retains the 24 clinical conditions in the AIDS surveillance case definition published in 1987 (*1*) and revised in 1994 (*4*) for children aged <13 years (Appendix A). Because the 2008 definition requires that all AIDS diagnoses have laboratory-confirmed evidence of HIV infection, the presence of any AIDS-defining condition listed in Appendix A indicates a surveillance diagnosis of AIDS. Guidance on the diagnosis of these diseases in the context of all nationally notifiable diseases is available at http://www.cdc.gov/epo/dphsi/casedef/case_definitions.htm.

Discussion

To meet the surveillance case definition for HIV infection, laboratory confirmation of HIV infection is now required for children aged 18 months to <13 years. To meet the surveillance case definition for AIDS, in addition to the presence of one or more AIDS-defining conditions, laboratory-confirmed evidence of HIV infection is now required for children aged 18 months to <13 years. These revisions will increase the specificity of the HIV infection and AIDS surveillance case definitions by excluding patients without laboratory-confirmed evidence of HIV infection, reinforcing the public health message that HIV infection is the cause of AIDS. Improved specificity will provide more accurate data regarding number of HIV infection cases, which can be used to refine public health policies and determine appropriate use of HIV resources.

No changes have been made to the existing classification system for HIV infection among children aged 18 months to <13 years (*4*). To classify HIV-infected children in this age group, refer to the 1994 revised classification system for HIV infection among children aged <13 years (*4*).

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¶¶ Children aged 18 months to <13 years with perinatal exposure to HIV are categorized as uninfected with HIV if the criteria for uninfected with HIV among children aged <18 months are met.

*** For HIV screening among children aged 18 months to <13 years infected through exposure other than perinatal exposure, HIV virologic (non-antibody) tests should not be used in lieu of approved HIV antibody screening tests. A negative result (i.e., undetectable or nonreactive) by an HIV virologic test (e.g., viral RNA nucleic acid test) does not rule out the diagnosis of HIV infection.

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Appendix A
AIDS-Defining Conditions

- Bacterial infections, multiple or recurrent*
- Candidiasis of bronchi, trachea, or lungs
- Candidiasis of esophagus†
- Cervical cancer, invasive§
- Coccidioidomycosis, disseminated or extrapulmonary
- Cryptococcosis, extrapulmonary
- Cryptosporidiosis, chronic intestinal (>1 month's duration)
- Cytomegalovirus disease (other than liver, spleen, or nodes), onset at age >1 month
- Cytomegalovirus retinitis (with loss of vision)†
- Encephalopathy, HIV related
- Herpes simplex: chronic ulcers (>1 month's duration) or bronchitis, pneumonitis, or esophagitis (onset at age >1 month)
- Histoplasmosis, disseminated or extrapulmonary
- Isosporiasis, chronic intestinal (>1 month's duration)
- Kaposi sarcoma†
- Lymphoid interstitial pneumonia or pulmonary lymphoid hyperplasia complex*†
- Lymphoma, Burkitt (or equivalent term)
- Lymphoma, immunoblastic (or equivalent term)
- Lymphoma, primary, of brain
- *Mycobacterium avium* complex or *Mycobacterium kansasii,* disseminated or extrapulmonary†
- *Mycobacterium tuberculosis* of any site, pulmonary,†§ disseminated,† or extrapulmonary†
- *Mycobacterium*, other species or unidentified species, disseminated† or extrapulmonary†
- *Pneumocystis jirovecii* pneumonia†
- Pneumonia, recurrent†§
- Progressive multifocal leukoencephalopathy
- *Salmonella* septicemia, recurrent
- Toxoplasmosis of brain, onset at age >1 month†
- Wasting syndrome attributed to HIV

* Only among children aged <13 years. (CDC. 1994 Revised classification system for human immunodeficiency virus infection in children less than 13 years of age. MMWR 1994;43[No. RR-12].)
† Condition that might be diagnosed presumptively.
§ Only among adults and adolescents aged ≥13 years. (CDC. 1993 Revised classification system for HIV infection and expanded surveillance case definition for AIDS among adolescents and adults. MMWR 1992;41[No. RR-17].)

Appendix B

Comparison of the Revised World Health Organization and CDC Surveillance Case Definitions and Staging Systems for HIV Infection

In 2007, the World Health Organization (WHO) revised the standard human immunodeficiency virus (HIV) infection and acquired immunodeficiency syndrome (AIDS) clinical staging system and the clinical and surveillance case definitions (*1*). The definitions were revised to 1) provide standardized HIV infection and AIDS surveillance case definitions, 2) simplify clinical staging, 3) coordinate the WHO 2002 three-stage pediatric staging system with the WHO 1990 four-stage adult system, 4) include immunologic criteria and clinical staging in case definitions, and 5) coordinate the clinical staging and surveillance case definitions. This appendix summarizes the revised criteria for WHO case surveillance and compares the 2007 revised WHO definitions with the 2008 revised CDC definitions. Despite differences in WHO and CDC disease classification and staging and because CDC recommends reporting all CD4+ T-lymphocyte counts for persons, the revised WHO case definition still allows comparison of CDC surveillance data from the United States with WHO data from other countries.

Revised WHO Definitions

Surveillance Case Definitions

WHO recommends reporting cases of HIV infection as HIV infection or advanced HIV disease (AHD), including AIDS. All cases of HIV infection, AHD, and AIDS require a confirmed diagnosis of HIV infection based on laboratory testing, using the appropriate national testing algorithm (*1*). The revised WHO surveillance case definitions include the following: HIV infection (stages 1 and 2), AHD (stage 3), and AIDS (stage 4) (*1*).

Clinical Staging and Immunologic Criteria

Four clinical stages have been established for persons with confirmed HIV infection. These stages include the full spectrum of HIV infection and coincide with WHO clinical treatment recommendations: 1) no symptoms, 2) mild symptoms, 3) advanced symptoms, and 4) severe symptoms (*1*). The revised staging systems include presumptive clinical diagnoses that can be made in the absence of laboratory tests and definitive clinical criteria that require confirmatory laboratory tests. The clinical stage provides useful information when HIV infection is first diagnosed, when a person begins receiving care for HIV infection, for tracking patients in treatment programs, and to guide decisions on when to initiate cotrimoxazole prophylaxis and antiretroviral therapy (ART).

Age-specific immunologic criteria for the disease classification are presented. For children aged <5 years, the CD4+ T-lymphocyte percentage of total lymphocytes rather than the absolute CD4+ T-lymphocyte count should be used because the absolute count tends to vary, more than the percentage, per individual child in this age group. Immunologic and clinical criteria should be documented (when available) to describe a case of HIV infection.

Comparison of the WHO and CDC Definitions

Both the WHO and CDC surveillance case definitions for HIV infection now require laboratory confirmation of HIV infection. Differences between the WHO and CDC definitions and staging systems include the following (Table):

1. WHO recommends reporting cases of HIV infection as HIV infection or AHD (including AIDS), whereas CDC recommends reporting cases of HIV infection by stage (i.e., stage 1, stage 2, stage 3, or stage unknown).
2. WHO presents four clinical stages for disease classification to reflect the WHO ART treatment guidelines, whereas CDC presents three, combining WHO stages 2 and 3 into CDC stage 2.
3. Because of increased, although not universal, availability of CD4+ T-lymphocyte testing, WHO recommends using clinical and immunologic criteria for clinical staging. CDC recommends using only immunologic criteria for staging, with the exception of stage 3, for which cases must have a CD4+ T-lymphocyte count of <200 cells/μL or a CD4+ T-lymphocyte percentage of <14 or one of 26 AIDS-defining conditions.

Despite these differences in disease classification and clinical staging and because CDC recommends reporting all CD4+ T-lymphocyte counts, CDC and WHO stages can still be compared.

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1. World Health Organization (WHO). WHO case definitions of HIV for surveillance and revised clinical staging and immunological classification of HIV-related disease in adults and children. Geneva, Switzerland: WHO Press; 2007. Available at http://www.who.int/hiv/pub/guidelines/hivstaging/en/index.html.

TABLE. Comparison of World Health Organization (WHO) and CDC stages of human immunodeficiency virus (HIV) infection,* by CD4+ T-lymphocyte count and percentage of total lymphocytes

WHO stage†	WHO T-lymphocyte count and percentage§	CDC stage¶	CDC T-lymphocyte count and percentage
Stage 1 (HIV infection)	CD4+ T-lymphocyte count of ≥500 cells/μL	Stage 1 (HIV infection)	CD4+ T-lymphocyte count of ≥500 cells/μL *or* CD4+ T-lymphocyte percentage of ≥29
Stage 2 (HIV infection)	CD4+ T-lymphocyte count of 350–499 cells/μL	Stage 2 (HIV infection)	CD4+ T-lymphocyte count of 200–499 cells/μL *or* CD4+ T-lymphocyte percentage of 14–28
Stage 3 (advanced HIV disease [AHD])	CD4+ T-lymphocyte count of 200–349 cells/μL	Stage 2 (HIV infection)	CD4+ T-lymphocyte count of 200–499 cells/μL *or* CD4+ T-lymphocyte percentage of 14–28
Stage 4 (acquired immunodeficiency syndrome [AIDS])	CD4+ T-lymphocyte count of <200 cells/μL *or* CD4+ T-lymphocyte percentage of <15	Stage 3 (AIDS)	CD4+ T-lymphocyte count of <200 cells/μL *or* CD4+ T-lymphocyte percentage of <14

* For reporting purposes only.
† Among adults and children aged ≥5 years.
§ Percentage applicable for stage 4 only.
¶ Among adults and adolescents (aged ≥13 years). CDC also includes a fourth stage, stage unknown: laboratory confirmation of HIV infection but no information on CD4+ T-lymphocyte count or percentage *and* no information on AIDS-defining conditions.

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