APPENDIX

Sources and Limitations of CDC Surveillance Data

Much of the information in this document is based on cases of nationally notifiable sexually transmitted diseases (STDs) reported to the Division of STD Prevention (DSTDP), National Center for HIV, STD, and TB Prevention (NCHSTP), Centers for Disease Control and Prevention (CDC), by the STD control programs and health departments in the 50 states, the District of Columbia, selected cities, 3,140 U.S. counties, U.S. dependencies and possessions, and independent nations in free association with the United States. Included among the dependencies, possessions, and independent nations are Guam, Puerto Rico, and the Virgin Islands. These entities are identified as "outlying areas" of the United States in selected figures and tables.

In the past, STD data were submitted to CDC on a variety of hardcopy summary reporting forms (monthly, quarterly, and annually). As of December 31, 2003, all 50 states and Washington, DC (with the exception of outlying areas Guam, Puerto Rico and Virgin Islands) had converted from summary hardcopy reporting to electronic submission of line-listed (i.e., case-specific) STD data via the National Electronic Telecommunications System for Surveillance (NETSS). Data reported through NETSS comprise the notifiable disease information that is published in the *Morbidity and Mortality Weekly Report (MMWR)*.

The data through 2002 used in this report are based on a combination of aggregated final NETSS electronic data and summary hardcopy reporting forms. Monthly hardcopy reporting forms (CDC 73.998) include summary data for syphilis by county and state. Quarterly hardcopy reporting forms (CDC 73.688) include summary data for early syphilis, gonorrhea, chlamydia, and other STDs by sex and source of report (STD clinic or non-STD clinic) for the 50 states, 64 selected cities (including San Juan, PR) and outlying areas of the United States. Annual hardcopy reporting forms (CDC 73.2638) include summary data for P&S syphilis, gonorrhea, and chlamydia by age, race, and sex for the 50 states and 6 large cities.

Areas differ in their ability to resolve differences in total cases derived from hardcopy monthly, quarterly, and annual reports (as well as electronically submitted line-listed data). Thus, depending on the database used, there may be discrepancies in the total number of cases among the figures and tables for earlier years. In most instances, these discrepancies are less than 5% of total reported cases and have minimal impact on national case totals and rates. However, for a specific area, the discrepancies may be larger.

Reports and corrections sent to CDC on hardcopy forms and for NETSS electronic data through April 30, 2004 have been included in this report. Data received after this date will appear in subsequent issues. The data in the figures and tables in this document supersede those in all earlier publications.

Population Denominators and Rate Calculations

Crude incidence rates (new cases/population) were calculated on an annual basis per 100,000 population. In this report, the 2003 rates for the United States, all states, cities and outlying areas were calculated by dividing the number of cases reported from each area in 2003 by the estimated area-specific 2002 population (the most current detailed population file available at time of publication). For the United States, rates were calculated using Bureau of the Census population estimates for 1981 through 1989 (Bureau of the Census; United States Population Estimates by Age, Sex and Race: 1980-1989 [Series P-25, No. 1045]; Washington: U.S. Government Printing Office, 1990; and United States Population Estimates by Age, Sex and Race: 1989 [Series P-25, No. 1057]; Washington: U.S. Government Printing Office, 1990). Rates for states and counties were calculated using published intercensal estimates based on Bureau of the Census population estimates for 1980-1989 (Irwin R; 1980-1989 Intercensal Population Estimates by Race, Sex, and Age; Alexandria, [VA]: Demo-Detail, 1992; machine-readable data file). The National Center for Health Statistics released bridged race population counts for 2000-2002 resident population based on the Census 2000 counts. These estimates resulted from bridging the 31 race categories used in Census 2000, as specified in the 1997 Office of Management and Budget (OMB) standards, to the four race groups specified under the 1977 OMB standards. The files were prepared under a collaborative arrangement with the U.S. Census Bureau. The population counts for 1990-1999 were also updated to incorporate the bridged single-race estimates of the April 1, 2000 resident population. These files were prepared by the U.S. Census Bureau with support from the National Cancer Institute. **Due to the updated population, rates for the period 1990-2002 may be different from prior Surveillance Reports**.

Many cities do not have a separate health jurisdiction that collects and reports cases of STDs. For these cities, case numbers and crude incidence rates are equal to those of the county, a proportion of county, or a combination of counties in which the city is located. These city population numbers are updated yearly, based on estimates from the Bureau of Census, and verified by the city STD project areas.

Population estimates for 1980-1988 for areas outside the United States were obtained from the Bureau of the Census (Bureau of the Census; population estimates for Puerto Rico and the outlying areas: 1980 to 1988; Current Population Reports [Series P-25, No. 1049]; Washington: U.S. Government Printing Office, 1989). After 1988, population estimates for outlying areas were obtained from various sources located in these areas. Population estimates for Guam were obtained from the Guam Bureau of Statistics and Plans, estimates for Puerto Rico were obtained from the Bureau of Census, and estimates for the Virgin Islands were obtained from the University of the Virgin Islands. The 2002-2003 rates were calculated using the 2002 population estimates.

The percentage of reported cases for which race/ethnicity and age information was missing differed substantially by year, area and disease. States were excluded from comparison across race/ethnicity categories if race/ethnicity data were missing from 50% or more of the state's reported cases (these exclusions, if any, are described in the footnote in the race-specific tables). Similarly, states in which age information was missing from the majority of reported cases were excluded from comparison across age categories. Missing values for race/ethnicity and age were imputed for records missing these data from states in which more than half of the reported cases contained race/ethnicity and age information. In previous years, missing age and race/ethnicity information was not imputed if a record was missing either of these pieces of information. Beginning in 2000, the imputation method was altered so that missing data were not imputed only for records missing both age and sex information.

Rates of congenital syphilis for 1989-2003 were calculated using live births from the National Center for Health Statistics (NCHS) (Vital Statistics: Natality Tapes 1989-2002 or Vital Statistics Reports, United States 1999, Vol. 48 No.10-Natality). Race-specific rates for 2002-2003 were calculated using live births for 2002. Rates before 1989 were calculated using published live birth data (NCHS; Vital Statistics Report, United States, 1988 [Vol.1–Natality]).

Reporting Practices

Although most areas generally adhere to the case definitions for STDs found in *Case Definitions for Infectious Conditions under Public Health Surveillance*,[1] there may be differences in the policies and systems for collecting surveillance data. Thus, comparisons of case numbers and rates among areas should be interpreted with caution. However, since case definitions and surveillance activities within a given area remain relatively stable, trends should be minimally affected by these differences. In many areas, the reporting from publicly supported institutions (e.g., STD clinics) has been more complete than from other sources (e.g., private practitioners). Thus, trends may not be representative of all segments of the population. Since many cities do not have a separate health jurisdiction that collects and reports cases of STDs, the definition for a selected city can depend on a particular county code, city code, and/or locally-assigned site code from the NETSS record.

Reporting Sources

Prior to 1996, states classified the source of case reports as either private source (including private physicians, and private hospitals and institutions) or public (clinic) source (primarily STD clinics). As states began reporting morbidity data electronically in 1996, the classification categories for source of case reports expanded to include the following data sources: STD clinics, HIV counseling and testing sites, drug treatment clinics, family planning clinics, prenatal/obstetrics clinics, tuberculosis clinics, private physicians/HMOs, hospitals (inpatient), emergency rooms, correctional facilities, laboratories, blood banks, National Job Training Program (Job Corps), school-based clinics, mental health providers, Indian Health Service, military, and other unspecified sources. Limited data analysis of the data reported electronically after 1996 confirmed that the new STD clinic source of report data corresponded to the earlier reporting source category, public (clinic) source. Therefore, source of case report data for the period 1984-2003 are presented as STD clinic or non-STD clinic only.

Reporting of Chlamydia Cases

Trends in chlamydia morbidity reporting from many areas are more reflective of changes in diagnosis and reporting of cases rather than actual trends in disease incidence. Cases and rates of reported chlamydia in sex-specific tables are underestimated due to some reported cases with unknown sex. Despite problems with under-reporting, it is important to publish available data to emphasize the large numbers of cases of chlamydia being detected in the United States. As areas develop chlamydia prevention and control programs, including improved surveillance systems to monitor trends, the data should improve and become more representative of true trends in disease.

New York City has been reporting chlamydia cases since 1984. However, the State of New York, with the exception of New York City, initiated chlamydia reporting during the year 2000. As a result, the number of chlamydia cases reported by the state of New York (including the cities of Buffalo, Rochester and Yonkers) prior to the year 2001 may be incomplete, and the rate for New York State is underestimated. To be consistent with the practice used in earlier years, New York State chlamydia morbidity data were included in the calculation of overall national chlamydia rates. The number of

chlamydia cases occurring in the fourth quarter of 2000 for the State of Colorado was projected based on case counts from the first three quarters.

Reporting of Syphilis Cases

"Total syphilis" or "all stages of syphilis" includes primary, secondary, early latent, late (including neurosyphilis, late latent, late with clinical manifestations, and unknown latent), and congenital syphilis. Cases of latent syphilis of unknown duration, neurosyphilis, and late syphilis with clinical manifestations are included in late and late latent syphilis totals.

Reporting of Congenital Syphilis Cases

In 1988, the surveillance case definition for congenital syphilis was changed. This case definition has greater sensitivity than the former definition.[2] In addition, many areas have greatly enhanced active case finding for congenital syphilis since 1988. For these reasons, the number of reported cases increased dramatically during 1989-1991. As a result of this change in surveillance activity a period of transition during which trends cannot be clearly interpreted has resulted; however, all reporting areas had implemented the new case definition for reporting congenital syphilis by January 1, 1992. Therefore, the reliability of trends is expected to have stabilized after this date.

In addition to changing the case definition for congenital syphilis, CDC introduced a new data collection form (CDC 73.126) in 1990 (revised October 2003). Since 1995, the data collected on this form have been used for reporting congenital syphilis reported cases and associated rates. This form is used to collect individual case information which allows more thorough analysis of case characteristics. For the purpose of analyses by race/ethnicity, if either the race or ethnicity question was answered, the case was included. For example, if "white" race was marked, but ethnicity was left blank, the individual was counted as "non-Hispanic white". Congenital syphilis cases were reported by state and city of residence of the mother for the period of 1995 through 2003.

Chlamydia, Gonorrhea, and Syphilis Prevalence Monitoring

Chlamydia and gonorrhea test positivity and syphilis seroreactivity were calculated for the following: women attending family planning clinics, prenatal clinics, Indian Health Service clinics, the National Job Training Program, men attending STD clinics and a large primary care clinic participating in the MSM Prevalence Monitoring Project, adolescent women attending organizations participating in the Adolescent Women Reproductive Health Monitoring Project, and men and women entering corrections facilities. Positivity was calculated by dividing the number of positive tests for chlamydia, gonorrhea, or syphilis (numerator) by the total number of positive and negative tests for each disease (denominator) and was expressed as a percentage. Except for the National Job Training Program screening data, the denominators for these data sources may include more than one test from the same individual if that person was tested more than once during a year. Various laboratory test methods were used for all of these data sources except the National Job Training Program and, for most of the figures shown, no adjustments of test positivity were made based on laboratory test type and sensitivity. However, for Figure 9 and Figure K, the chlamydia test results for each test type were weighted to reflect the sensitivity of the test used.[3] The weights used in this adjustment are the reciprocals of the sensitivities of the laboratory test methods used. These test-specific sensitivities were defined as estimates from published evaluations of chlamydia screening tests.[4,5] Limitations of this adjustment include: unknown dates when laboratories changed tests, missing information on the test method, variation of test sensitivity within a technology type, and no adjustment for supplemental testing such as negative grey zone testing.

For more details on chlamydia prevalence, refer to the following annual publication: Centers for Disease Control and Prevention. *Sexually Transmitted Disease Surveillance 2003 Supplement: Chlamydia Prevalence Monitoring Project Annual Report 2003*. Atlanta, GA: U.S. Department of Health and Human Services (in press).

Data on antimicrobial susceptibility in *Neisseria gonorrhoeae* were collected through the Gonococcal Isolate Surveillance Project (GISP), a sentinel system of 30 STD clinics and five regional laboratories located throughout the United States. For more details on findings from GISP gonorrhea surveillance activities, refer to the following annual publication: Centers for Disease Control and Prevention. *Sexually Transmitted Disease Surveillance 2003 Supplement: Gonococcal Isolate Surveillance Project (GISP) Annual Report 2003*. Atlanta, GA: U.S. Department of Health and Human Services (in press).

In the MSM Prevalence Monitoring Project the seroreactivity data in most instances do not reflect confirmatory testing and thus biologic false positive test results were not systematically excluded. The extent to which these data reflect prevalence of active syphilis infection varies by site.

Prevalence data for region- and state-specific figures were published with permission from the Regional Infertility Prevention Program, selected state STD prevention programs, the National Job Training Program, U.S. Department of Labor, and the Indian Health Service.

Definition of HHS Regions

The ten Health and Human Services (HHS) regions referred to in the text and figures are as follows: Region I = Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, and Vermont; Region II = New Jersey, New York, Puerto Rico, and U.S. Virgin Islands; Region III = Delaware, District of Columbia, Maryland, Pennsylvania, Virginia, and West Virginia; Region IV = Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, and Tennessee; Region V = Illinois, Indiana, Michigan, Minnesota, Ohio, and Wisconsin; Region VI = Arkansas, Louisiana, New Mexico, Oklahoma, and Texas; Region VII = Iowa, Kansas, Missouri, and Nebraska; Region VIII = Colorado, Montana, North Dakota, South Dakota, Utah, and Wyoming; Region IX = Arizona, California, Guam, Hawaii, and Nevada; and Region X = Alaska, Idaho, Oregon, and Washington.

Definition of IHS Areas

The 12 Indian Health Service (IHS) Areas referred to in the text and figures are as follows, with overlap in some states: Aberdeen Area (Iowa, North Dakota, Nebraska, and South Dakota); Alaska Area (Alaska); Albuquerque Area (Colorado and New Mexico); Bemidji Area (Illinois, Indiana, Michigan, Minnesota, and Wisconsin); Billings Area (Montana and Wyoming); California Area (California); Nashville Area (Alabama, Connecticut, Florida, Louisiana, Maine, Maryland, Massachusetts, Mississippi, New York, North Carolina, Rhode Island, South Carolina, and Tennessee); Navajo Area (Arizona, New Mexico, and Utah); Oklahoma City Area (Kansas, Oklahoma, and Texas); Phoenix Area (Arizona, Nevada and Utah); Portland Area (Idaho, Oregon, and Washington); and Tucson Area (Arizona).

Other Data Sources

The information on the number of initial visits to private physicians' offices for sexually transmitted diseases was based on analysis of data from the National Disease and Therapeutic Index (NDTI) (machine-readable files or summary statistics for the period 1966 through 2003). For more information on this database, contact IMS Health, 660 W. Germantown Pike, Plymouth Meeting, PA 19462; Telephone: (800) 523-5333.

The information on patients hospitalized for pelvic inflammatory disease or ectopic pregnancy was based on analysis of data from the National Hospital Discharge Survey (machine-readable files for years 1980-2002), an ongoing nationwide sample survey of short-stay hospitals in the United States, conducted by the National Center for Health Statistics. For more information, see Graves EJ; 1988 Summary: National Hospital Discharge Survey; Advance data No. 185; Hyattsville (MD): National Center for Health Statistics, 1990. The National Hospital Ambulatory Medical Care Survey (NHAMCS-ER) (machine-readable files for 1995-2002) was used to obtain estimates of the number of emergency room visits for pelvic inflammatory disease among women ages 15 to 44. The estimates generated using these data sources (NHDS and NHAMCS) are based on statistical surveys and therefore have sampling variability associated with the estimates.

Healthy People 2010 Objectives

In January 2000, CDC released objectives for Healthy People 2010 (HP2010).[6] The year 2010 targets for the diseases addressed in this report are: primary and secondary syphilis–0.2 case per 100,000 population; congenital syphilis–1.0 case per 100,000 live births; and gonorrhea–19.0 cases per 100,000 population. An additional target established in the HP2010 objectives is to reduce the *Chlamydia trachomatis* test positivity to 3.0% among females aged 15 to 24 years who attend family planning and STD clinics and among males aged 15 to 24 who attend STD clinics (Table A1).

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[1] Centers for Disease Control and Prevention. Case definitions for infectious conditions under public health surveillance, 1997. *MMWR* 1997;46(No. RR-10;1).

[2] Kaufman RE, Jones, OG, Blount, JH, Wiesner PJ. Questionnaire survey of reported early congenital syphilis: problems in diagnosis, prevention, and treatment. *Sex Transm Dis* 1977;4:135-9.

[3] Webster Dicker L, Mosure DJ, Levine WC, Black CM, Berman SM. The impact of switching laboratory tests on reported trends in *Chlamydia trachomatis* infections. *Am J Epidemiol* 2000;151:430-435.

[4] Newhall WJ, DeLisle, S, Fine D, et al. Head-to-head evaluation of five different non-culture chlamydia tests relative to a quality-assured culture standard. *Sex Transm Dis* 1994;21:S165-6.

[5] Black CM, Marrazzo J, Johnson RE, et al. Head-to-head multicenter comparision of DNA probe and nucleic acid amplification tests for *Chlamydia trachomatis* infection in women performed with an improved reference standard. *J Clin Micro* 2002;40:3757-3763.

[6] U.S. Department of Health and Human Services. *Healthy People 2010*. 2nd ed. With Understanding and Improving Health and Objectives for Improving Health. 2 vols. Washington, DC: U.S. Government Printing Office, November 2000.