(2) detect clusters, (3) document changes in demographics and geographic distribution of cases, (4) describe the natural history of the disease, and (5) guide health professionals in disease intervention. The system should be sustained by the cooperative efforts of health care providers, clinical laboratories, and health facilities, as well as by cooperation from congregate facilities such as jails and prisons, day-care centers, and shelters for the homeless.

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TOPIC: SEXUALLY TRANSMITTED DISEASES

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Few areas of medicine and public health have been more dynamic in recent years than the field of sexually transmitted diseases (STDs). During the past two decades, this discipline broadened from one that emphasized the "traditional" diseases, such as syphilis and gonorrhea, to one concerned with numerous bacterial and viral syndromes, including, but not limited to, chlamydia, herpes simplex, human papilloma virus, and HIV, the dominant disease.

Numerous organisms and syndromes previously not recognized as being transmitted sexually now are. Though STDs are extremely diverse, they are inter-related historically, biologically, economically, behaviorally, and programmatically.

Syphilis is the classic STD that is cyclic in nature and that can be controlled by vigorous public health interventions. In the US, the incidence of primary and secondary syphilis reached a peak of 76 cases per 100,000 after World War II and then began to fall, reaching a nadir of approximately 4 cases per 100,000 in the years 1955 to 1958.¹ In 1959, the incidence began to rise rapidly in both men and women, to 12 cases per 100,000—triple the level of a decade earlier.² Factors that, at the time, were considered responsible for this increase included declining

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governmental appropriations for STD control and a shift in the management of syphilis from the public health sector to the private sector. From 1986 through 1990, an epidemic of syphilis occurred throughout the US, and the rate reached 20 cases per 100,000.³ In 1990, more than 50,000 cases of primary and secondary syphilis were reported, the highest number since 1948.⁴ The epidemic occurred in both men and women, but was largely driven by the dramatically increasing rates among very young African-American women and young African-American men.

As the male-to-female ratio decreased for syphilis, there was a concomitant increase in the incidence of congenital syphilis. Several hypotheses attempted to explain this phenomenon; one theory examined the abuse of crack cocaine, which mediated high-risk behavior such as exchange of sex for drugs and money or having multiple sexual partners.^{5,6} A second hypothesis theorized that the change in use from penicillin to spectinomycin for the treatment of gonorrhea adversely affected the treatment of incubating syphilis. A third hypothesis posited that HIV lowered the threshold for syphilis transmission.

Gonorrhea is the most commonly reported STD in the US. Unlike syphilis, the incidence of gonorrhea has been in decline in the US since 1975.⁷ Recent gonorrhea trends reveal two major themes: a sustained decrease in cases caused by penicillin-sensitive organisms and the continued increase in the number and variety of antibiotic-resistant strains.⁸ Antibiotic resistance can be mediated by plasmid and chromosomal mechanisms. Plasmid-mediated strains include penicillin-resistant gonorrhea and tetracycline-resistant gonorrhea. Chromosomally mediated resistance occurs as a result of one or more mutations in the gonococcal genome, which may result in a number of phenotypic expressions, such as altered membrane permeability.

Genital infections caused by *Chlamydia trachomatis* are probably the most common bacterial STDs in the country. However, no precise trend data on the prevalence and incidence of chlamydia are available because no comprehensive national surveillance system for it exists. Factors contributing to the lack of surveillance system include (1) the historic lack of an inexpensive and widely available diagnostic test; (2) the fact that asymptomatic infections can only be detected through active screening programs, and there are limited resources to support such aggressive surveillance; and (3) a lack of public health laws in some states to require health care providers to report cases of chlamydia. The states that do report the incidence of chlamydia provide those data to CDC. Examined in the aggregate, the data provide limited insight into whether chlamydia rates are increasing, remaining stable, or decreasing.

Sexual contact is a major mode of HIV transmission worldwide. It must be emphasized that HIV is itself an STD, and that heterosexual transmission is playing an important role in certain US populations. The two major described interactions between HIV and other STDs are (1) STDs may increase transmissibility of, or susceptibility to, HIV infection, and (2) HIV may alter the clinical presentation, natural history, diagnosis, and response to therapy of other STDs. Several prospective studies in Africa and a prospective study in New York provide compelling evidence to support the role of genital ulcer disease, particularly chancroid, in enhancing the efficiency of HIV transmission.⁹⁻¹¹ Other studies have found increased relative risks of HIV seroconversion among prostitutes with nonulcerative lower genital tract infections.¹²

HIV also has an impact on other STDs. Numerous reports have documented unusual clinical presentations of syphilis, notably neurosyphilis, in HIV-infected patients.¹³ Investigators have also found differences in serologic tests, the mainstay of diagnosis and monitoring response to therapy, for syphilis among HIV-infected patients.¹⁴ Dramatic differences in clinical presentations of genital herpes simplex virus infections and rates of resistance to acyclovir have also been noted.¹⁵

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**TOPIC: METHICILLIN-RESISTANT *STAPHYLOCOCCUS AUREUS* AND
PENICILLIN-RESISTANT PNEUMOCOCCI**

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We are witnessing the geographic expansion of both methicillin-resistant *Staphylococcus aureus* (MRSA) and penicillin-resistant pneumococci over large geographic areas. With both of these developments, it appears that, as resistance to the β -lactam antibiotic increases, the more homogenous the strain is genetically and the more likely it is that the strain will develop multiresistant factors. Molecular fingerprinting techniques have played an important role in identifying these trends.

An example of the capacity of these strains to spread geographically occurred with the spread in Brazil of a single strain of MRSA from Porto Alegre, through Rio, to Manaus, a distance of 5,000 kilometers.¹ An analogous example can be seen in New York City, which has a unique clone of MRSA that is widely distributed from Stony Brook, Long Island, to Westchester County, to hospitals in Manhattan and Queens. The mechanism of this spread has yet to be completely understood.

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