STDs in Women and Infants

Public Health Impact

Women and infants disproportionately bear the long term consequences of STDs. Women infected with *Neisseria gonorrhoeae* or *Chlamydia trachomatis* can develop pelvic inflammatory disease (PID), which, in turn, may lead to adverse effects on the reproductive system such as ectopic pregnancy and tubal factor infertility. If not adequately treated, 20% to 40% of women infected with chlamydia[1] and 10% to 40% of women infected with gonorrhea[2] may develop PID. Among women with PID, scarring sequelae will cause involuntary infertility in 20%, ectopic pregnancy in 9%, and chronic pelvic pain in 18%.[3] Approximately 70% of chlamydial infections and 50% of gonococcal infections in women are asymptomatic.[4-6] These infections are detected primarily through screening programs. The vague symptoms associated with chlamydial and gonococcal PID cause 85% of women to delay seeking medical care, thereby increasing the risk of infertility and ectopic pregnancy.[7] Data from a randomized controlled trial of chlamydia screening in a managed care setting suggest that such screening programs can reduce the incidence of PID by as much as 60%.[8]

Gonorrhea and chlamydia can also result in adverse outcomes of pregnancy, including neonatal ophthalmia and, in the case of chlamydia, neonatal pneumonia. Although topical prophylaxis at delivery is effective for prevention of ophthalmia neonatorum, prevention of neonatal pneumonia requires antenatal detection and treatment.

Genital infections with human papillomavirus (HPV) in women are a major concern because persistent infection with specific types (e.g., types 16, 18, 31, 33, 35, and 45), are causally related to cervical cancer; these types also cause Pap smear abnormalities. Other types (e.g., types 6 and 11) cause genital warts, Pap smear abnormalities and, rarely, recurrent respiratory papillomatosis in infants born to infected mothers.[9]

When a woman has a syphilis infection during pregnancy, she may transmit the infection to the fetus in utero. This may result in fetal death or an infant born with physical and mental developmental disabilities. Most cases of congenital syphilis are preventable if women are screened for syphilis and treated early during prenatal care.[10]

Observations

- Between 1999 and 2000, the reported case rate of chlamydial infections in women increased slightly from 400.8 to 404.0 per 100,000 females (Figure 5, Table 5). Chlamydia rates exceed gonorrhea rates among women in all states (Figures A and B, Tables 5 and 14).
- In 2000, the median state-specific chlamydia test positivity among 15- to 24-year-old women screened in selected prenatal clinics in 23 states and Puerto Rico was 5.9% (range, 2.2% to 14.5%) (Figure F).

- Gonorrhea rates among women were higher than the overall HP 2010 objective of 19.0 cases per 100,000 persons[11] in 42 states and two outlying areas in 2000 (Figure B, Table 14). As in previous years, the highest rates of gonorrhea among women in 2000 occurred in the South (Figure B).
- Like chlamydia, gonorrhea is often asymptomatic in women and can only be identified through screening. Large-scale screening programs for gonorrhea in women began in the late 1970s. After an initial increase in cases detected through screening, gonorrhea rates for both women and men declined steadily throughout the 1980s and early 1990s (Figure 12, Tables 14 and 15). The gonorrhea rate for women in 2000 (128.3 per 100,000 females) was similar to the 1999 rate of 128.7 cases per 100,000 females. The gonorrhea rate among men in 2000 (134.6 cases per 100,000 males) was also similar to the 1999 rate of 134.7 cases per 100,000 males (Table 15). Men with gonorrhea are usually symptomatic and may seek care; therefore, trends in men may be a relatively good indicator of trends in incidence of disease. As with chlamydia, trends in reported gonorrhea rates among women are more likely to reflect screening practices as well as the actual burden of disease.
- In 2000, the median state-specific gonorrhea test positivity among 15- to 24-year-old women screened in selected prenatal clinics in 15 states was 0.9% (range, 0.0% to 3.7%) (Figure G).
- The HP2010 objective for primary and secondary (P&S) syphilis is 0.2 case per 100,000 persons. Primary and secondary syphilis rates for women exceeded the HP2010 objective in 32 states and two outlying areas (Table 26). For congenital syphilis, the HP2010 objective is 1.0 case per 100,000 live births. Twenty-seven states and one outlying area had reported rates higher than this objective in 2000 (Figure D, Table 38).
- The rate of congenital syphilis closely follows the trend of P&S syphilis in women (Figure 29). Peaks in congenital syphilis usually occur one year after peaks in P&S syphilis in women. The congenital syphilis rate peaked in 1991 at 107.3 cases per 100,000 live births and has declined by 87.5% to 13.4 cases per 100,000 live births in 2000 (Figure 30, Table 37). The rate of P&S syphilis in women peaked at 17.3 cases per 100,000 females in 1990 and declined 89.6% to 1.8 cases per 100,000 females in 2000 (Figure 29). During 1991-2000, the average yearly percentage decrease in the rate of congenital syphilis was 22.0% (Table 37), while the average yearly decline in the rate of P&S syphilis reported among women during this period was 21.0%.
- The 2000 reported rate of congenital syphilis for the United States is now well above the HP2010 objective of 1.0 case per 100,000 live births. This objective is many times greater than the rate of congenital syphilis of most industrialized countries where syphilis and congenital syphilis have nearly been eliminated.[12]
- While most cases of congenital syphilis occur in infants whose mothers have had some prenatal care (Figure E), late or limited prenatal care has been associated with congenital syphilis. Lack of health care provider adherence to congenital syphilis screening recommendations also may result in congenital syphilis.[13]
- Accurate estimates of pelvic inflammatory disease (PID) and tubal factor infertility from gonococcal and chlamydial infections are difficult to obtain. Definitive diagnosis of these conditions can be complex, requiring for example, laparoscopy

or laparotomy, while tubal patency studies may be needed to accurately document these conditions. Most cases of PID are treated on the basis of interpretations of clinical findings, which vary between individual practitioners. In addition, the settings in which care is provided can vary considerably over time. For example, women with PID who would have been hospitalized in the 1980s may be treated in outpatient facilities during the 1990s. Trends in hospitalized PID have declined steadily throughout the 1980s and early 1990s but have remained relatively constant from 1995 through 1999 (Figure I). These trends may be more reflective of changes in the etiologic spectrum (with increasing proportions of more indolent chlamydial infection) and clinical management of PID (from inpatient to outpatient) rather than true trends in disease.[14]

- The reported number of initial visits to physicians' offices for PID through the National Disease and Therapeutic Index (NDTI) has generally declined from 1993 through 2000. The reported number of visits in 2000 was slightly lower than the number of initial visits reported in 1999 (Figure J). In 1999, an estimated 268,018 cases of PID were diagnosed in emergency departments among women 15 to 44 years of age (National Hospital Ambulatory Medical Care Survey, NCHS). This estimated number has an approximate relative standard error of 17.5%.
- Evidence suggests that health care practices associated with ectopic pregnancy also changed in the late 1980s and early 1990s. Before that time, treatment of ectopic pregnancy usually required admission to a hospital. Hospitalization statistics were therefore useful for monitoring trends in ectopic pregnancy. Beginning in 1989, hospitalizations for ectopic pregnancy began to decline. The number of reported hospitalizations for ectopic pregnancy decreased in 1999 relative to the number reported in 1998 (Figure H). Data from outpatient care surveys suggest that nearly half of all ectopic pregnancies are treated on an outpatient basis.[15]

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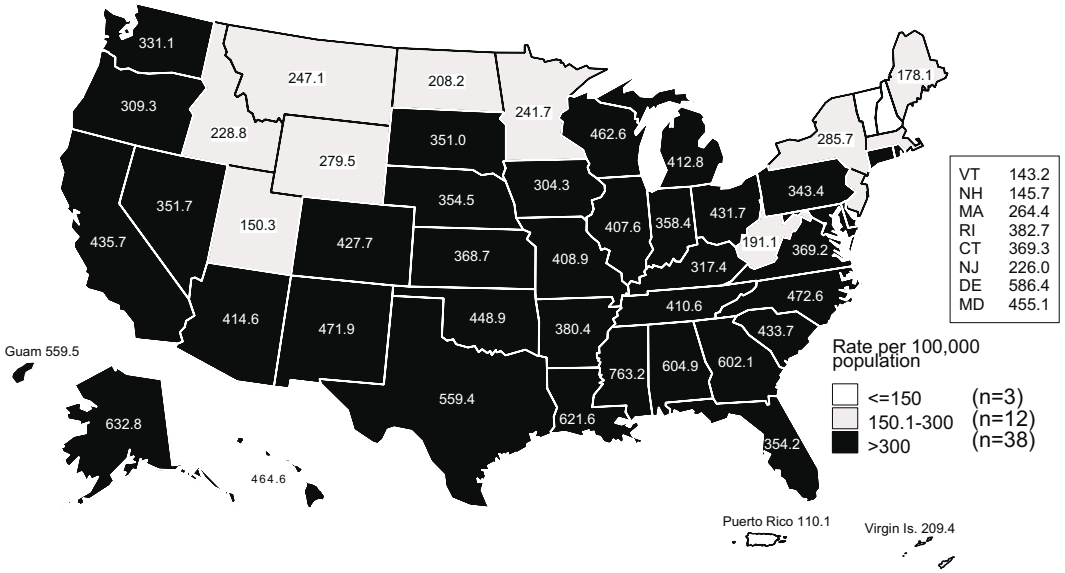
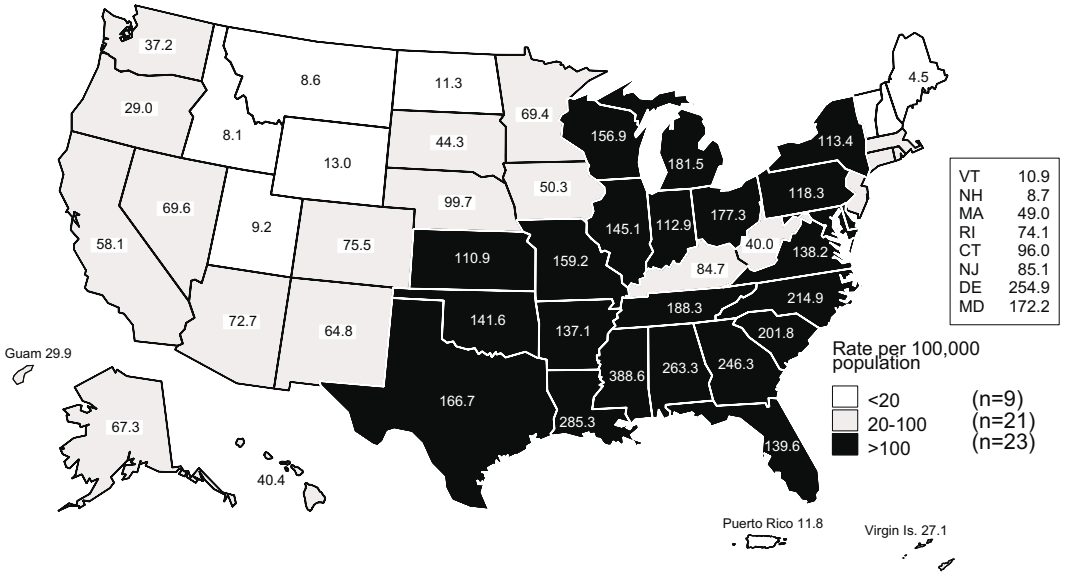
[15]Centers for Disease Control and Prevention. Ectopic pregnancy in the United States, 1990-1992. *MMWR* 1995;44:46-8.

Figure A. Chlamydia — Rates for women by state: United States and outlying areas, 2000



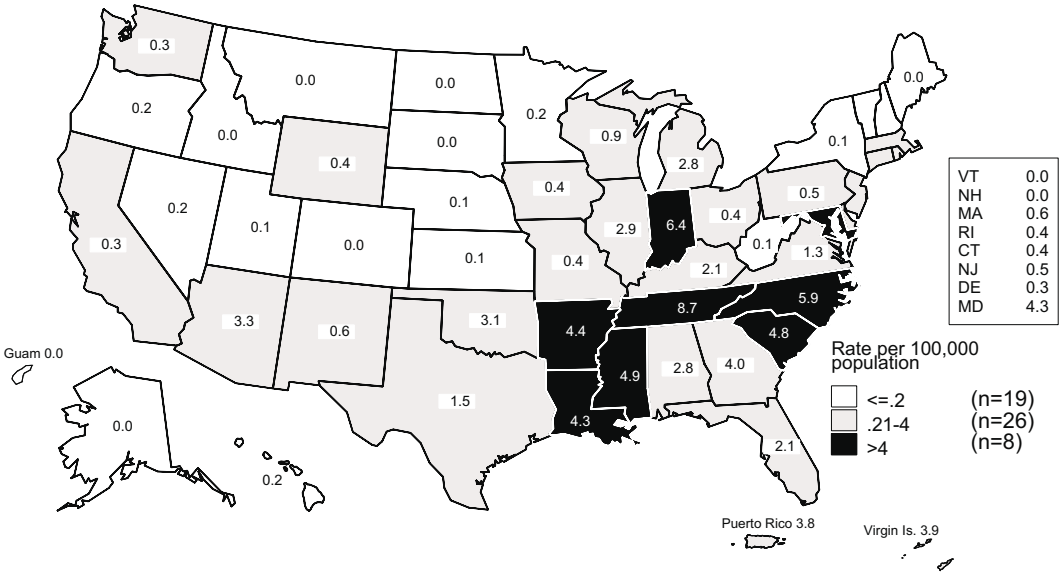
Note: The total rate of chlamydia for women in the United States and outlying areas (including Guam, Puerto Rico and Virgin Islands) was 399.8 per 100,000 population.

Figure B. Gonorrhea — Rates for women by state: United States and outlying areas, 2000



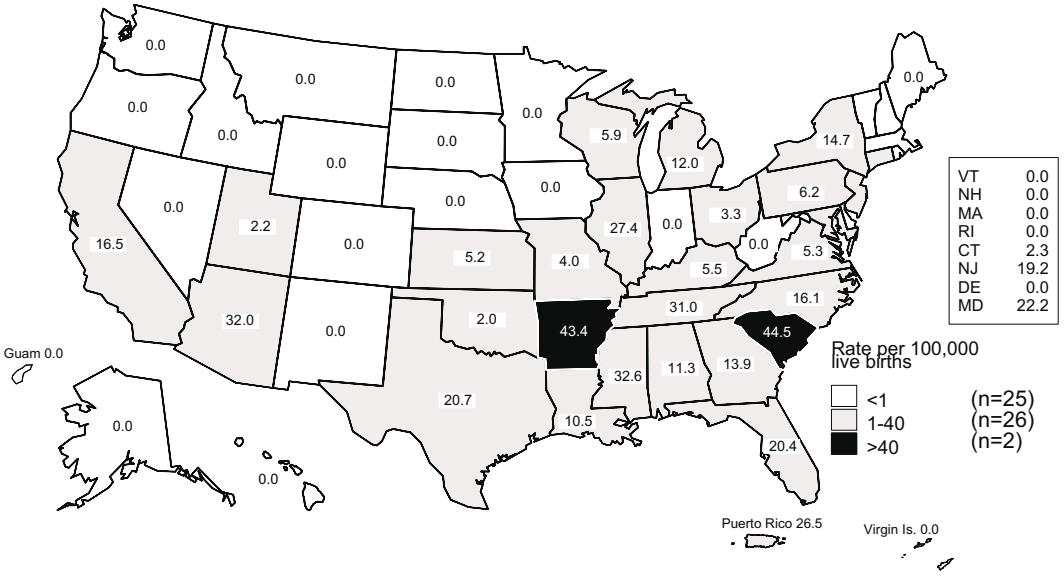
Note: The total rate of gonorrhea for women in the United States and outlying areas (including Guam, Puerto Rico and Virgin Islands) was 126.5 per 100,000 population. The Healthy People year 2010 objective is 19.0 per 100,000 population for women.

Figure C. Primary and secondary syphilis — Rates for women by state: United States and outlying areas, 2000



Note: The total rate of primary and secondary syphilis for women in the United States and outlying areas (including Guam, Puerto Rico and Virgin Islands) was 1.8 per 100,000 population. The Healthy People year 2010 objective is 0.2 per 100,000 population.

Figure D. Congenital syphilis — Rates for infants <1 year of age by state: United States and outlying areas, 2000



Note: The total rate of congenital syphilis for infants <1 year of age for the United States and outlying areas (including Guam, Puerto Rico and Virgin Islands) was 13.6 per 100,000 live births. The Healthy People year 2010 objective is 1.0 per 100,000 live births.

Figure E. Congenital syphilis — Cases by prenatal care utilization: United States, 1995-2000

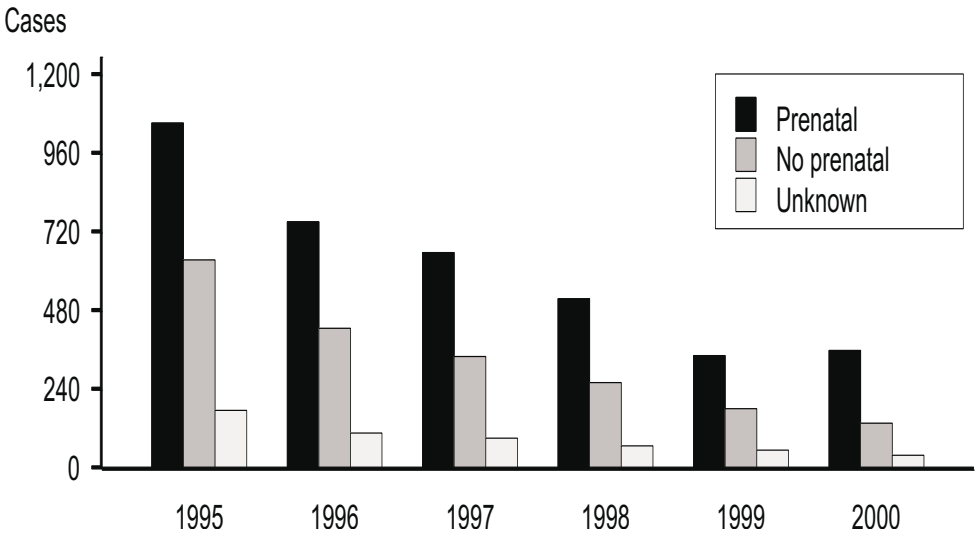
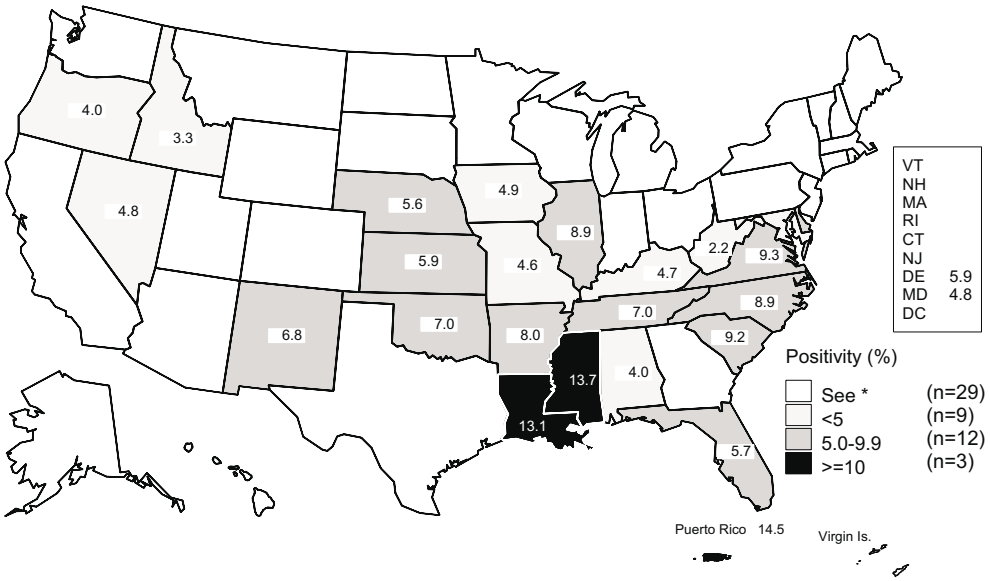


Figure F. Chlamydia — Positivity among 15-24 year old women tested in prenatal clinics by state, 2000

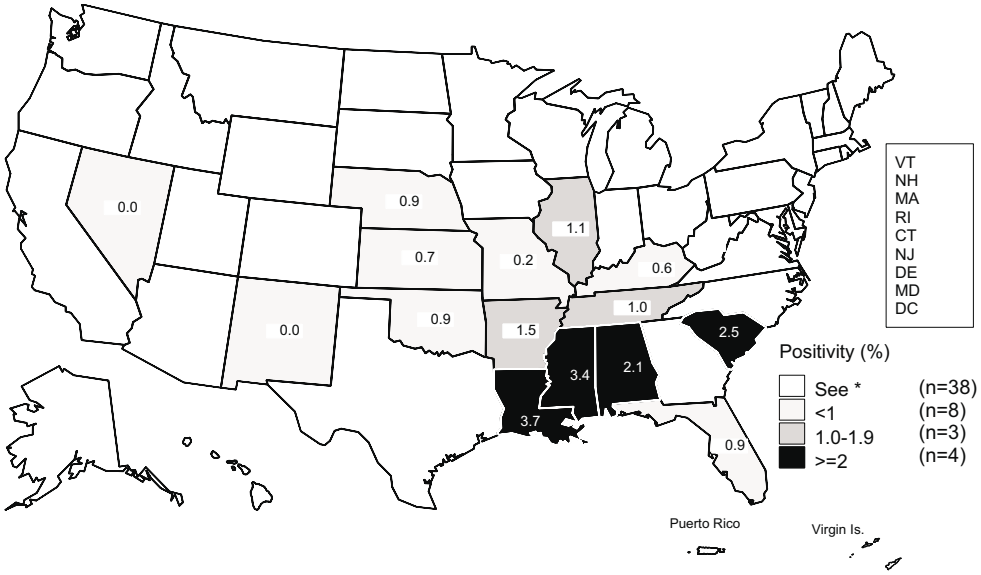


*States not reporting chlamydia positivity data in prenatal clinics.

Note: States reported chlamydia positivity data on at least 100 women aged 15-24 years during 2000.

SOURCE: Regional Infertility Prevention Programs; Office of Population Affairs; Local and State STD Control Programs; Centers for Disease Control and Prevention

Figure G. Gonorrhea — Positivity among 15-24 year old women tested in prenatal clinics by state, 2000

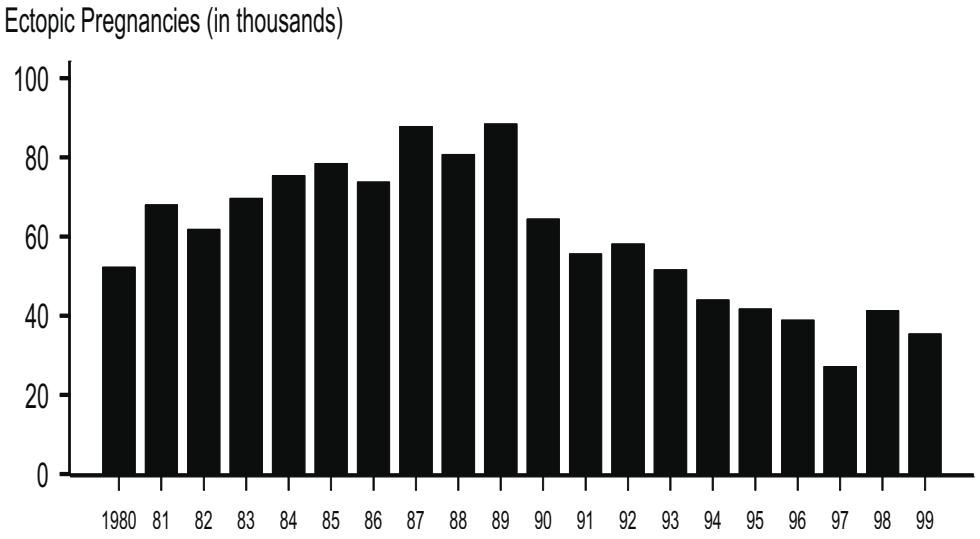


*States not reporting gonorrhea positivity data in prenatal clinics.

Note: States reported gonorrhea positivity data on at least 100 women aged 15-24 years during 2000.

SOURCE: Regional Infertility Prevention Programs; Office of Population Affairs; Local and State STD Control Programs; Centers for Disease Control and Prevention

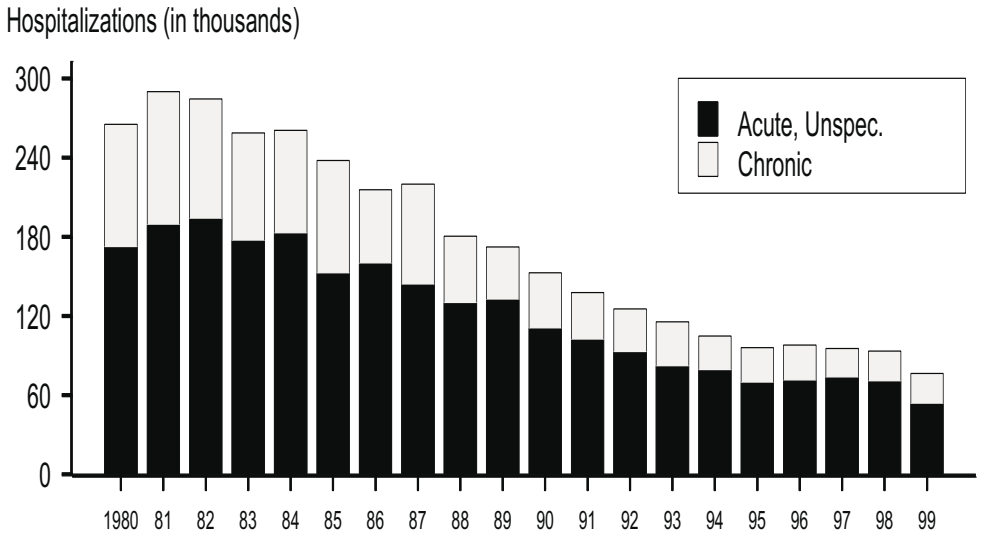
Figure H. Ectopic pregnancy — Hospitalizations of women 15-44 years of age: United States, 1980-1999



Note: Some variations in 1981 and 1988 numbers may be due to changes in sampling procedures. The relative standard error for these estimates ranges from 8% to 11%.

SOURCE: National Hospital Discharge Survey (National Center for Health Statistics, CDC)

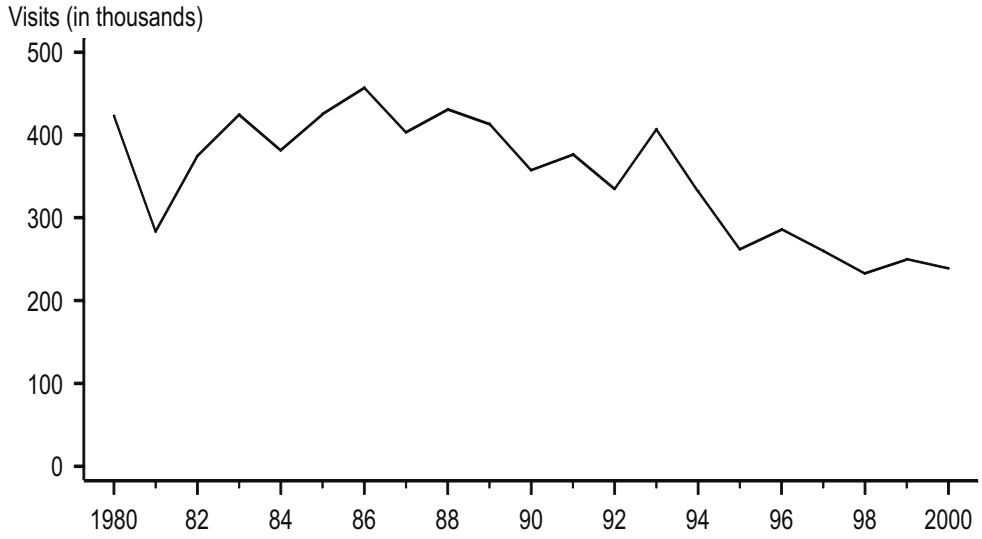
Figure I. Pelvic inflammatory disease — Hospitalizations of women 15-44 years of age: United States, 1980–1999



Note: The relative standard error for the estimates of the overall total number of PID cases range from 6% to 9%.

SOURCE: National Hospital Discharge Survey (National Center for Health Statistics, CDC)

Figure J. Pelvic inflammatory disease — Initial visits to physicians' offices by women 15-44 years of age: United States, 1980–2000



Note: See Appendix.

SOURCE: National Disease and Therapeutic Index (IMS America, Ltd.)