Sexually Transmitted Disease Surveillance 2001 Supplement

Division of STD Prevention
October 2002

Gonococcal Isolate Surveillance Project (GISP)
Annual Report - 2001

DEPARTMENT OF HEALTH AND HUMAN SERVICES
Centers for Disease Control and Prevention
National Center for HIV, STD, and TB Prevention
Division of STD Prevention
Atlanta, Georgia 30333

Centers for Disease Control and Prevention ..... Julie L. Gerberding, M.D., M.P.H.
Director

National Center for
HIV, STD, and TB Prevention ..... Harold W. Jaffe, M.D.
Director

Division of STD Prevention ..... Harold W. Jaffe, M.D.
Acting Director

Epidemiology and
Surveillance Branch ..... Stuart M. Berman, M.D., Sc.M.
Chief

Surveillance and Special
Studies Section ..... Hillard S. Weinstock, M.D., M.P.H.
Chief

Gonococcal Isolate
Surveillance Project..... Susan A. Wang, M.D., M.P.H.
Coordinator

Statistics and Data
Management Branch ..... Owen J. Devine, Ph.D.
Chief

National Center for
Infectious Diseases ..... James M. Hughes, M.D.
Director

Division of AIDS, STD, and
TB Laboratory Research ..... Jonathan E. Kaplan, M.D.
Acting Director

Gonorrhea Research Branch ..... Joan S. Knapp, Ph.D.
Chief

Copyright Information

All material contained in this report is in the public domain and may be used and reprinted without special permission; citation to source, however, is appreciated.

Suggested Citation

CDC. *Sexually Transmitted Disease Surveillance 2001 Supplement: Gonococcal Isolate Surveillance Project (GISP) Annual Report - 2001*. Atlanta, Georgia: U.S. Department of Health and Human Services, October 2002.

Copies can be obtained from the Epidemiology and Surveillance Branch, Division of STD Prevention, National Center for HIV, STD, and TB Prevention, Centers for Disease Control and Prevention, 1600 Clifton Road, NE, Mailstop E-02, Atlanta, Georgia 30333.

This report is available from the Internet via the CDC home page address at http://www.cdc.gov/std/GISP2001/

The 2001 STD Surveillance Report may be found at http://www.cdc.gov/std/stats/.

Acknowledgments

Publication of this report would not have been possible without the substantial contributions of the sexually transmitted diseases clinics that participated in the Gonococcal Isolate Surveillance Project, and the laboratories that performed all the susceptibility testing. We appreciate the contributions of the regional laboratory directors and laboratorians: Carlos del Rio and James Thomas (Emory University, Atlanta, Georgia); King K. Holmes, Judith Hale, Wil Whittington, and Karen Winterscheid (University of Washington, Seattle, Washington); Edward W. Hook and Connie Lenderman (University of Alabama, Birmingham, Alabama); Franklyn N. Judson and Josephine Ehret (Denver Health and Hospitals, Denver, Colorado); and Gary W. Procop and Laura Doyle (The Cleveland Clinic Foundation, Cleveland, Ohio).

This report was prepared by the following staff members of the Division of STD Prevention, National Center for HIV, STD, and TB Prevention, Centers for Disease Control and Prevention: Susan A. Wang, Alesia B. Harvey, Susan M. Conner, LuEtta Schneider, and Hillard S. Weinstock.

Contents

Introduction and Overview 1

Demographic and Clinical Data 2

Susceptibility Data 3

Non-GISP Susceptibility Reporting 6

Additional Resources 8

References 9

Project Figures 11

Clinic-specific Figures 22

GONOCOCCAL ISOLATE SURVEILLANCE PROJECT (GISP)
ANNUAL REPORT - 2001

Introduction

With 361,705 gonorrhea cases reported in 2001, gonorrhea is the second most frequently reported communicable disease in the United States. Gonorrhea rates in the United States declined 73.8% during 1975-1997. However, in 1998, the reported rate of gonococcal infections in the United States (131.9 cases per 100,000 persons) increased by 7.8% compared with the 1997 rate (122.4 cases per 100,000 persons). In 2001, the gonorrhea rate was 128.5 cases per 100,000 population which represented little change from 1998 (**Figure 1**).[1] Gonorrhea rates remain high in the southeastern states, among minorities, and among adolescents of all racial and ethnic groups (**Figures 2, 3, and 4**).[1-3] The health impact of gonorrhea is largely related to its role as a major cause of pelvic inflammatory disease, which frequently leads to infertility or ectopic pregnancy.[4] In addition, data suggest that gonorrhea facilitates HIV transmission.[5, 6]

The treatment and control of gonorrhea has been complicated by the ability of *Neisseria gonorrhoeae* to develop resistance to antimicrobial agents. The appearance of penicillinase-producing *N. gonorrhoeae* (PPNG) and chromosomally mediated penicillin- and tetracycline-resistant *N. gonorrhoeae* (CMRNG) in the 1970s eventually led to the abandonment of these drugs as therapies for gonorrhea. The current CDC recommended primary therapies for gonorrhea are two broad-spectrum cephalosporins (ceftriaxone and cefixime), and three fluoroquinolones (ciprofloxacin, ofloxacin, and levofloxacin).[7] However, since the 1990s, fluoroquinolone-resistant *N. gonorrhoeae* (QRNG) have been reported from many parts of the world, including the United States.[8-11] The increased prevalence of QRNG in Asia (where prevalence in several countries exceeds 40%[12]), the Pacific Islands, Hawaii, and, most recently, California, prompted CDC to recommend that fluroquinolones not be used to treat patients with gonorrhea acquired in these areas with high QRNG prevalence.[7, 11]

GISP Overview

The Gonococcal Isolate Surveillance Project (GISP) was established in 1986 to monitor trends in antimicrobial susceptibilities of strains of *N. gonorrhoeae* in the United States in order to establish a rational basis for the selection of gonococcal therapies.[13] GISP is a collaborative project among selected sexually transmitted diseases (STD) clinics, five regional laboratories, and the Centers for Disease Control and Prevention (CDC) (Division of STD Prevention, National Center for HIV, STD, and TB Prevention, and the Division of AIDS, STD, and TB Laboratory Research, National Center for Infectious Diseases).

In GISP, *N. gonorrhoeae* isolates are collected from the first 25 men with urethral gonorrhea attending STD clinics each month in 26 cities in the United States. At regional laboratories, the susceptibilities of these isolates to penicillin, tetracycline, spectinomycin, ciprofloxacin, ceftriaxone, cefixime, and azithromycin are determined by agar dilution. Minimum inhibitory concentrations (MICs) are measured, and values are interpreted according to criteria recommended by the National Committee for Clinical Laboratory Standards (NCCLS).[14-16]

Important GISP findings have included:

- the ongoing high prevalence of resistance to penicillin and tetracycline;
- the emergence and increasing prevalence of resistance to the fluoroquinolones;[8-11]
- the appearance, with low level prevalence, of decreased susceptibility to the macrolides;[11]
- the absence of resistance to the broad-spectrum cephalosporins;
- the emergence of multi-drug resistant isolates (resistant to penicillin, tetracycline, and ciprofloxacin) with decreased susceptibility to cefixime;[17] and
- the increasing proportion of gonorrhea cases identified in men who have sex with men.[18, 19]

GISP findings contributed to the development of CDC's STD treatment recommendations in 1993, 1998, and 2002,[7, 20, 21] and stimulated further investigation of the increase in gonorrhea among men who have sex with men (MSM).[18, 19]

2001 GISP Sites

A total of 26 STD clinics contributed 5,472 gonococcal isolates to GISP in 2001 (**Figure 5**). Sixteen sites have participated continuously since 1988: Albuquerque, Anchorage, Atlanta, Baltimore, Birmingham, Cincinnati, Denver, Honolulu, Long Beach, New Orleans, Philadelphia, Phoenix, Portland, San Diego, San Francisco, and Seattle. Eight sites joined GISP after 1988: Cleveland, Kansas City, and Orange County in 1991; Minneapolis in 1992; Chicago in 1996; Miami in 1998; Dallas in 2000, and Tripler in 2001. Two sites have had intermittent participation in GISP: Fort Bragg 1987-1990 and 1997-2001, and St. Louis 1987-1993 and 1995-2001. The GISP Regional Laboratories are located in Atlanta, Birmingham, Cleveland, Denver, and Seattle.

DESCRIPTION OF GISP DATA

Aggregate data from all GISP sites are described and illustrated in the first part of this report. The clinic-specific data illustrate substantial geographic variation in patient characteristics and antimicrobial susceptibility of gonococcal strains; clinic-specific figures are provided in the second part of this report.

Demographic and Clinical Characteristics

Age The age distribution of GISP participants compared with nationally reported male gonorrhea patients in 2001 is shown in **Figure 6**. In 2001, GISP had proportionally fewer 20-24 year olds and fewer <20 year olds than were reported nationally for male gonorrhea cases; otherwise the two groups had similar age distributions. GISP participants in 2001 ranged in age from 10 to 75 years.

Race/Ethnicity The race/ethnicity distribution of GISP participants compared with nationally reported male gonorrhea patients in 2001 is shown in **Figure 7**. White, Hispanic, and Asian males were slightly over represented in GISP while Black males were slightly under represented compared with the race/ethnicity distribution of nationally reported male gonorrhea patients in 2001.

Sexual Orientation Overall, the proportion of GISP isolates coming from MSM increased from 4.0% in 1988 to 17.2% in 2001. The proportion of GISP participants who were MSM has increased every year since 1993 (**Figure 8**). The interval increase between 2000 and 2001, from 13.9% to 17.2%, was the largest single year increase in the history of GISP. The number of clinics having >5% of GISP isolates from MSM rose from seven clinics in 1990 to fourteen clinics in 2000 to sixteen clinics in 2001. These sixteen clinics reported 95.2% (853/896) of the MSM in GISP in 2001. For each of the sixteen clinics, the median percentage of patients who were MSM in 2001 was 20.2% (range, 5.7% to 66.4%) (**Figure 9**). A 1996 study of eight of these clinics showed that in five of the eight (Honolulu,

Portland, San Diego, San Francisco, and Seattle) the proportional increases corresponded to absolute increases in numbers of MSM with gonorrhea.[18]

Reason for Clinic Attendance Most (96.7%) GISP participants in 2001 presented to the clinic as volunteers; others were gonorrhea contacts or presented for test-of-cure cultures (**Figure 10**). There has been little change in this distribution over time. Dysuria and/or urethral discharge was present in 97.6% of GISP participants in 2001 and 2.4% had no symptoms; these proportions have been stable over time.

History of Gonorrhea The percentage of GISP participants who reported a history of gonorrhea (ever) peaked at 49.9% in 1996, declined to 45.0% in 1999, increased to 47.6% in 2000, and was stable in 2001 at 47.3%. The percentage of GISP participants with a documented previous episode of gonorrhea in the last 12 months decreased from 21.5% in 1992, the first year this information was collected, to 17.2% in 1999, but then increased to 23.6% in 2000 and was 22.0% in 2001 (**Figure 11**).

Antimicrobial Treatment The antimicrobial agents given to GISP participants for gonorrhea therapy are shown in **Figure 12**. The proportion of GISP patients treated with cephalosporins decreased from a high of 84.7% in 1990 to 58.5% in 2001, while the proportion treated with fluoroquinolones (ciprofloxacin or ofloxacin) increased from none in 1988 to 38.9% in 2001. The antimicrobial agents given to GISP participants for treatment of *Chlamydia trachomatis* infection are shown in **Figure 13**. The proportion of GISP patients treated with doxycycline or tetracycline decreased from a high of 99.4% in 1990 to 67.0% in 2001, while the proportion treated with azithromycin increased from 0.2% in 1992 (the first year of GISP that azithromycin was identified as being used for *C. trachomatis* therapy) to 30.4% in 2001.

Susceptibility to Antimicrobial Agents

Antimicrobial Resistance Criteria

Antimicrobial resistance in *N. gonorrhoeae* is defined by the criteria recommended by the National Committee on Clinical Laboratory Standards (NCCLS):[14-16]

Penicillin, MIC ≥2.0 μg/ml
Tetracycline, MIC ≥2.0 μg/ml
Spectinomycin, MIC ≥128.0 μg/ml
Ciprofloxacin, MIC 0.125 - 0.5 μg/ml (intermediate resistance)
Ciprofloxacin, MIC ≥1.0 μg/ml (resistance)
Ceftriaxone, MIC ≥0.5 μg/ml (decreased susceptibility)
Cefixime, MIC ≥0.5 μg/ml (decreased susceptibility)

NCCLS criteria for resistance to ceftriaxone, cefixime, erythromycin, and azithromycin and for susceptibility to erythromycin and azithromycin have not been established for *N. gonorrhoeae*.

Susceptibility to Penicillin and Tetracycline

Overall, 20.9% (1144/5472) of isolates collected in 2001 were resistant to penicillin, tetracycline, or both (**Figure 14**); this proportion peaked at 43.6% in 1992 and has been decreasing annually since 1998. For GISP analyses, six mutually exclusive categories of resistance are used for describing chromosomally and plasmid-mediated resistance to penicillin and tetracycline[8]: (1) penicillinase-producing *N. gonorrhoeae* (PPNG): β-lactamase-positive and tetracycline MIC <16.0 μg/ml; (2) plasmid-mediated tetracycline resistant *N. gonorrhoeae* (TRNG): β-lactamase-negative and tetracycline MIC ≥16.0 μg/ml; (3) PPNG-TRNG: β-lactamase-positive and tetracycline MIC ≥16.0 μg/ml; (4) chromosomally mediated penicillin-resistant *N. gonorrhoeae* (PenR): non-PPNG and penicillin MIC ≥2.0 μg/ml and tetracycline MIC <2.0 μg/ml; (5) chromosomally mediated tetracycline-resistant *N. gonorrhoeae* (TetR): non-PPNG and penicillin MIC <2.0 μg/ml and tetracycline MIC 2.0-8.0

μg/ml; and (6) chromosomally mediated resistance to both penicillin and tetracycline (CMRNG): non-PPNG and penicillin MIC ≥2.0 μg/ml and tetracycline MIC 2.0-8.0 μg/ml. The percentage of PPNG declined annually from a peak of 11.0% in 1991 to 1.5% in 2001 (**Figure 15**). In contrast, the percentage of PenR isolates increased annually from 0.5% in 1988 to 5.7% in 1999 and then decreased two years in a row to 2.9% in 2001 (**Figure 16**). The prevalence of TRNG, which was 5.2% in 2001, has varied little since 1988 (**Figure 15**). TetR prevalence increased in 1995 to 11.5% and subsequently declined to 4.4% in 2001 (**Figure 16**). However, the prevalence of CMRNG increased from 3.0% in 1989, peaking at 8.7% in 1997, and was 6.4% in 2001. The prevalence of PPNG-TRNG isolates continues to be very low and was 0.5% in 2001.

Susceptibility to Spectinomycin

All isolates were susceptible to spectinomycin in 2001. There have been five spectinomycin-resistant isolates in GISP; their locations and years were: St. Louis-1988, Honolulu-1989, San Francisco-1989, Long Beach-1990, and West Palm Beach-1994.

Susceptibility to Ceftriaxone

The distributions of MICs to ceftriaxone in 1988 and 2001 are shown in **Figure 17**. Over this time period, there has been a subtle shift towards higher ceftriaxone MICs. In 2001, all isolates were susceptible to ceftriaxone. There have been four isolates with decreased susceptibility to ceftriaxone in GISP; all four had MICs of 0.5 μg/ml. Their locations and years were: San Diego-1987, Cincinnati-1992 and 1993, and Philadelphia-1997.

Susceptibility to Cefixime

The distributions of MICs to cefixime in 1992 (the first year of cefixime susceptibility testing) and 2001 are shown in **Figure 18**. In 2001, there were four isolates with decreased susceptibility to cefixime; all had cefixime MICs of 0.5 μg/ml. One isolate was from Phoenix; the other three isolates were from Honolulu and were resistant to penicillin, tetracycline, and ciprofloxacin.[17] There have been 41 isolates with decreased susceptibility to cefixime in GISP; their MICs have ranged from 0.5-2.0 μg/ml.

Susceptibility to Ciprofloxacin

The correlation of ciprofloxacin MICs of 0.125-0.5 μg/ml with treatment failure when a fluoroquinolone is used to treat a gonococcal infection is not well established. However, one study of infections with resistant strains treated with ciprofloxacin 500 mg orally showed a treatment failure rate of 45% for strains with MICs of ≥4.0 μg/ml.[22] Gonococcal isolates with intermediate resistance and resistance to ciprofloxacin also have intermediate resistance and resistance to other fluoroquinolones. Criteria recommended for interpreting ofloxacin MICs are: intermediate resistance, MICs 0.5-1.0 μg/ml; resistance, MICs ≥2.0 μg/ml.[15]

The distributions of MICs to ciprofloxacin in 1990 (the first year of ciprofloxacin susceptibility testing) and 2001 are shown in **Figure 19**. A total of 2.6% (140/5472) of isolates exhibited intermediate resistance or resistance to ciprofloxacin (MICs ≥0.125 μg/ml) in 2001 compared with 1.9% (104/5461) of isolates tested in 2000 (**Figure 20**).

Intermediate resistance In 2001, 1.9% (102/5472) of all GISP isolates exhibited intermediate resistance to ciprofloxacin (MICs 0.125-0.5 μg/ml). Of these isolates, 50.0% (51/102) came from San Francisco where they accounted for 17.2% (51/297) of isolates; 18.6% (19/102) came from Cincinnati where they accounted for 7.2% (19/264) of isolates tested; 6.9% (7/102) came from Seattle where they accounted for 2.8% (7/254) of isolates tested; and 5.9% (6/102) came from Phoenix where they accounted for 2.1% (6/285) of isolates tested in 2001. In 2001, isolates of *N. gonorrhoeae* exhibiting intermediate resistance to ciprofloxacin were also found in Anchorage (1), Atlanta (1), Honolulu (3), Long

Beach (1), Miami (1), New Orleans (1), Orange County (2), Philadelphia (1), Portland (4), and San Diego (4).

Resistance Thirty-eight isolates (0.7%; 38/5472) were resistant to ciprofloxacin (MICs ≥1.0 μg/ml) in 2001, which was nearly twice the proportion identified in 2000 (0.4%; 19/5461). Of note, 42.1% (16/38) of these ciprofloxacin-resistant isolates came from Honolulu where they accounted for 20.3% (16/79) of GISP isolates (range of MICs, 1.0-8.0 μg/ml) which was an increase from 2000 (14.3%; 6/42). Additionally, 26.3% (10/38) of the ciprofloxacin-resistant isolates were from San Francisco where they accounted for 3.4% (10/297) of GISP isolates (range of MICs 1.0-8.0 μg/ml). The remaining twelve ciprofloxacin-resistant 2001 GISP isolates came from: Long Beach where they accounted for 3.0% (3/99) of isolates; Orange County where they accounted for 2.3% (3/129) of isolates; San Diego where they accounted for 2.1% (5/235) of isolates; and Denver where they accounted for 0.3% (1/299) of isolates.

Susceptibility to Azithromycin

The correlation of azithromycin MICs ≥0.5 μg/ml with clinical treatment failure when the 2.0 gm azithromycin dose is used to treat a gonococcal infection is not known. However, clinical treatment failures have been reported with the 1.0 gm azithromycin dose for strains with MICs of 0.125-0.5 μg/ml.[23-26]

The distributions of MICs to azithromycin in 1992 (the first year of azithromycin susceptibility testing) and in 2001 are shown in **Figure 21**. Over this time period, there has been a shift towards higher azithromycin MICs. In 1992, 0.9% (34/3928) of isolates had azithromycin MIC ≥0.5 μg/ml compared with 1.5% (82/5472) of such isolates in 2001. In 1992, there were no isolates with azithromycin MIC ≥1.0 μg/ml. In 2001, there were 15 isolates with azithromycin MIC ≥1.0 μg/ml (range, 1.0-4.0 μg/ml); these isolates by location and number are: Atlanta (4); Baltimore (2); Chicago (1); Denver (4); Honolulu (1); New Orleans (1); Orange County (1); San Francisco (1).

NON-GISP SUSCEPTIBILITY REPORTING

The Association of Public Health Laboratories and STD project areas were informally surveyed in 2001-2002 to identify cities or states that routinely performed antimicrobial susceptibility testing of *N. gonorrhoeae* in 2001. Information was not available for 17 of the 65 STD project areas. In 2001, no testing outside GISP occurred in 30 STD project areas: Alabama, Arkansas, Arizona, Baltimore, Colorado, Connecticut, Delaware, Idaho, Iowa, Kansas, Kentucky, Louisiana, Maine, Maryland, Missouri, Nevada, New Mexico, North Carolina, North Dakota, Ohio, Oklahoma, Oregon, Rhode Island, San Francisco, South Carolina, Tennessee, Vermont, Washington, D.C., Washington, or Wyoming. Information on testing in 2001 was available for 18 STD project areas (**Table 1**).

Table 1. Non-GISP antimicrobial susceptibility testing data for *N. gonorrhoeae* in 18 STD project areas in 2001.

Project Area	Total # Isolates	Cip S	Cip I	Cip R	Spc S	Spc R	Cfx S	Cfx DS	Cro S	Cro DS	Azi S	Azi DS[a]
CA												
Orange Co.	160	154	2	4	160	0	160	0	160	0	154	6
San Diego	98	96[c]	0	2[c]	-	-	-	-	98	0	-	-
FL	40	40	0	0	-	-	-	-	40	0	40	0
GA	244	244[c]	0	0	141	0	-	-	244	0	140	0
HI	189	146	2	41	189	0	188	1	189	0	189	0
IL	45	43	1	1	45	0	44	1	45	0	44	1
Los Angeles	62	62[b]	0	0	-	-	-	-	62	0	-	-
MA	386	386	0	0	386	0	-	-	386	0	-	-
MI	59	58[c]	0	1[c]	1	0	59	0	59	0	-	-
MN	92	92	0	0	92	0	92	0	92	0	-	-
MS	986	986	0	0	-	-	-	-	44	0	-	-
MT	13	-	-	-	13	0	-	-	12	1	-	-
NH	34	32	1	1	34	0	-	-	34	0	-	-
NJ	246	246[b]	0	0	246	0	246	0	246	0	-	-
NYC	3144	3141[c]	0	3[c]	3144	0	-	-	3144	-	-	-
TX	83	83	0	0	-	-	-	-	83	-	-	-
UT	78	74	0	4	-	-	-	-	78	0	-	-
VA	9	9	0	0	9	0	-	-	9	0	-	-
WI	144	141	3	0	-	-	-	-	143	1	-	-
Total	6112	6033	9	57	4460	0	789	2	5168	2	567	7

Cip=ciprofloxacin; Spc=spectinomycin; Cfx=cefixime; Cro=ceftriaxone; Azi=azithromycin; S=susceptible; DS=decreased susceptibility; I=intermediate resistant; R=resistant. Cells containing only "-" indicate that the antimicrobial for that column was not tested.
The testing methodology for all sites except Minnesota, Texas, and Florida was by disk diffusion; Minnesota, Texas, and Florida used the E-test method. Illinois used both methods.
[a]For this table, AziDS is defined as an isolate with azithromycin disk inhibition zone size $\leq$ 30mm or minimum inhibitory concentration (MIC) $\geq$1.0.
[b]Los Angeles, CA tested all isolates against levofloxacin and ciprofloxacin. New Jersey tested all isolates against ofloxacin and ciprofloxacin.
[c] San Diego, Georgia, Michigan, and New York City tested all isolates against ofloxacin, rather than against ciprofloxacin. The resistant isolates in Michigan and San Diego were resistant to ofloxacin.

Discussion

Susceptibility data from a total of 6112 non-GISP isolates were available. Non-GISP isolates from most STD project areas do not consist of a representative or systematic sample of the gonorrhea patient population but rather a convenience sample of patients who happen to undergo culture rather than non-culture testing. In addition, in contrast to GISP, multiple non-GISP isolates from various anatomic sites may be submitted from a single patient, so the 6112 non-GISP isolates are likely to represent fewer than 6112 gonorrhea patients.

These data reveal that 0.9% (57/6099) of non-GISP isolates were resistant to ciprofloxacin or ofloxacin, which is comparable to the 0.7% (38/5472) identified for GISP isolates in 2001. Fluoroquinolone-resistant isolates were identified in California (6/320; 1.9%), Hawaii (41/189; 21.7%), Illinois (1/45; 2.2%), Michigan (1/59; 1.7%), New Hampshire (1/34; 2.9%), New York City (3/3144; 0.1%), and Utah (4/78; 5.1%).

Acknowledgments

For their assistance in providing these susceptibility data, we acknowledge and thank: Orange County, CA - Paul Hannah and Karen Galliher; San Diego, CA - Nahid Mahdavi, Connie Urmeneta, and Gerry Washabaugh; FL - Ronald M. Baker; GA - Marsha Ray and Barbara Wallace; HI - Norman O'Connor; IL - Richard Zimmerman and Roman Golash; Los Angeles, CA - Leonard Lawani; MA - Al Foley; MI - Frances Pouch Downes, William Schneider, James Rudrik, and Patricia Somsel; MN - Geri Salo and Peter Carr; MS - Degina Booker; MT - Susanne Norris Zanto; NH - Peggy McSweeney; NJ - Keith Pilot; NYC – Yvonne Lue and Gladys Schlanger; TX - Bruce Elliott and Tamara Baldwin; UT - Dan Andrews; VA - Judith Carroll, Thomas York, and Barbara Hill; WI - Ajaib Singh.

ADDITIONAL RESOURCES

Recent publications using GISP data include an MMWR article in September 2000[11] and a June 2001 article in the American Journal of Public Health.[19] Presentations of GISP data were made at the International Conference on Emerging Infectious Diseases in Atlanta in March 2002,[17] the International Pathogenic *Neisseria* Conference in Oslo, Norway in September 2002,[27] and the Annual Meeting of the Infectious Diseases Society of America in Chicago, Illinois in October 2002.[28, 29]

Additional information on GISP, as well as useful resources and links, may be found on the new GISP website (http://www.cdc.gov/std/gisp/). Additional surveillance data on *N. gonorrhoeae* and other STDs may be found in the 2001 STD Surveillance Report[1] (http://www.cdc.gov/std/stats/).

Information on the Public Health Action Plan to Combat Antimicrobial Resistance may be found on the CDC webpage (http://www.cdc.gov/drugresistance/actionplan/). The World Health Organization (WHO) webpage contains information on the WHO Global Strategy for Containment of Antimicrobial Resistance (http://www.who.int/emc/amr.html), on the WHO Surveillance Standards for Antimicrobial Resistance (http://www.who.int/emc/pdfs/CDSsurveillance1.pdf), and on the UNAIDS/WHO Guidelines for Sexually Transmitted Infections Surveillance (http://www.who.int/emc-documents/STId/docs/whocdscsredc993.pdf).

The current CDC recommendations for the treatment of gonorrhea may be found in the CDC Sexually transmitted diseases treatment guidelines 2002[7] (http://www.cdc.gov/mmwr/PDF/rr/rr5106.pdf or http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5106a1.htm).

REFERENCES

1. CDC. Sexually Transmitted Disease Surveillance, 2001. Atlanta, Georgia: U.S. Department of Health and Human Services, Public Health Service, September 2002.

2. CDC. Gonorrhea — United States, 1998 *MMWR* 2000;49:538-542.

3. Fox KK, Whittington WL, Levine WC, Moran JS, Zaidi AA, Nakashima AK. Gonorrhea in the United States, 1981-1996: Demographic and geographic trends. *Sex Transm Dis* 1998;386-93.

4. McCormack WM. Pelvic inflammatory disease. *N Engl J Med* 1994;330:115-119.

5. Laga M, Manoka A, Kivuvu M, Malele B, Tuliza M, Nzila N, Goeman J, Behets F, Batter V, Alary M. Non-ulcerative sexually transmitted diseases as risk factors for HIV-1 transmission in women: results from a cohort study. *AIDS* 1993;7:95-102.

6. Cohen MS, Hoffman IF, Royce RA, Kazembe P, Dyer JR, Daly CC, Zimba D, Vernazza PL, Maida M, Fiscus SA, Eron JJ. Reduction of concentration of HIV-1 in semen after treatment of urethritis: implications for prevention of sexual transmission of HIV-1. AIDSCAP Malawi Research Group. *Lancet* 1997;349:1868-73.

7. CDC. Sexually transmitted diseases treatment guidelines 2002. *MMWR* 2002;51 (no. RR-6).

8. Fox KK, Knapp JS, Holmes KK, Hook EW, Judson FN, Thompson SE, Washington JA, Whittington WL. Antimicrobial resistance in *Neisseria gonorrhoeae* in the United States 1988-1994: the emergence of resistance to the fluoroquinolones. *J Infect Dis* 1997;175:1396-1403.

9. CDC. Fluoroquinolone resistance in *Neisseria gonorrhoeae* - Colorado and Washington, 1995. *MMWR* 1995;44:761-4.

10. CDC. Fluoroquinolone-resistant *Neisseria gonorrhoeae* - San Diego, California, 1997. *MMWR* 1998;47:405-408.

11. CDC. Fluoroquinolone-resistance in *Neisseria gonorrhoeae*, Hawaii, 1999, and decreased susceptibility to azithromycin in *N. gonorrhoeae*, Missouri, 1999. *MMWR* 2000;49:833-837.

12. WHO Western Pacific Gonococcal Antimicrobial Surveillance Programme. Surveillance of antibiotic resistance in *Neisseria gonorrhea* in the WHO Western Pacific Region, 2000. Communicable Disease Intelligence 2001;25:274-7.

13. Schwarcz SK, Zenilman JM, Schnell D, Knapp JS, Hook EW, Thompson S, Judson FN, Holmes KK, The Gonococcal Isolate Surveillance Project. National surveillance of antimicrobial resistance in *Neisseria gonorrhoeae*. *JAMA* 1990;264:1413-1417.

14. National Committee for Clinical Laboratory Standards. 1993. Approved standard M7 - A3. Methods for dilution antimicrobial susceptibility tests for bacteria that grow aerobically. National Committee for Clinical Laboratory Standards, Villanova, PA.

15. National Committee for Clinical Laboratory Standards. 1998. Approved standard M100-38. Performance standards for antimicrobial susceptibility testing. National Committee for Clinical Laboratory Standards, Wayne, PA.

16. National Committee for Clinical Laboratory Standards. 2002. Approved standard M100-S12, 22. Performance standards for antimicrobial susceptibility testing. National Committee for Clinical Laboratory Standards, Wayne, PA.

17. Wang SA, Lee MV, Iverson CJ, O'Connor N, Ohye RG, Hale JA, Knapp JS, Effler PV, Weinstock HS. Multi-drug resistant *Neisseria gonorrhoeae* with decreased susceptibility to cefixime, Hawaii, 2001. [Abstract] International Conference on Emerging Infectious Diseases, Atlanta, GA, March 25, 2002.

18. CDC. Gonorrhea among men who have sex with men--selected sexually transmitted diseases clinics, 1993-1996. *MMWR* 1997;46:889-892.

19. Fox KK, del Rio C, Holmes KK, Hook EW, Judson FN, Knapp JS, Procop GW, Wang SA, Whittington WL, and Levine WC. Gonorrhea in the HIV era: a reversal in trends among men who have sex with men. *Am J Public Health* 2001;91:959-64.

20. CDC. 1993 Sexually transmitted diseases treatment guidelines. *MMWR* 1993;42 (no. RR-14).CDC.

21. 1998 Guidelines for treatment of sexually transmitted diseases. *MMWR* 1998;47 (no.RR-1).

22. Aplasca MR, Pato-Mesola V, Klausner JD, Manalastas R, Tuazon CU, Dallabetta G, Whittington WL, Holmes KK. A randomized trial of ciprofloxacin versus cefixime for treatment of gonorrhea after rapid emergence of gonococcal ciprofloxacin resistance in The Philippines. *Clin Infect Dis* 2001; 32(9):1313-8.

23. Steingrimsson O, Olafsson JH, Thorarinsson H, Ryan RW, Johnson RB, Tilton RC. Azithromycin in the treatment of sexually transmitted disease. *J Antimicrob Chemother* 1990; 25 (Suppl A):109-114.

24. Waugh MA. Open study of the safety and efficacy of a single dose of azithromycin for the treatment of uncomplicated gonorrhea in men and women. *J Antimicrob Chemother* 1993;31 (Suppl E):193-198.

25. Young H, Moyes A, McMillan A. Azithromycin and erythromycin resistant *Neisseria gonorrhoeae* following treatment with azithromycin. *Int J STD AIDS* 1997;8:299-302.

26. Tapsall JW, Shultz TR, Limnios EA, Donovan B, Lum G, Mulhall BP. Failure of azithromycin therapy in gonorrhea and discorrelation with laboratory test parameters. *Sex Transm Dis* 1998;25:505-508.

27. Wang SA, Harvey AB, Weinstock HS, and GISP Investigators. Antimicrobial susceptibilities of *Neisseria gonorrhoeae* in the United States [Abstract]. Thirteenth International Pathogenic *Neisseria* Conference, Oslo, Norway, September 1-6, 2002.

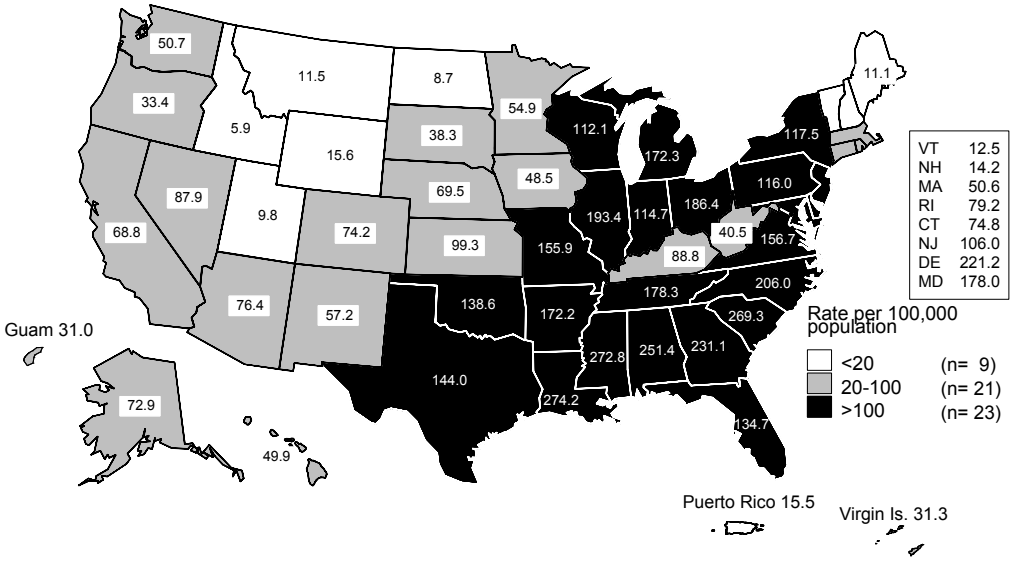
28. Newman LM, Wang SA, Weinstock HS. Emergence of ciprofloxacin-resistant *Neisseria gonorrhoeae*: prevalence and risk factors for infection - United States, 1998-2000 [Abstract 651]. 40th Annual Meeting of the Infectious Diseases Society of America, Chicago, Illinois, October 24-27, 2002.

29. Mark KE, Bauer HM, Gunn RA, Wang SA, Knapp JS, Moore DS, Weismuller P, Klausner JD, DeAugustine N, Bolan G, and the California Resistance Working Group. Increase in fluoroquinolone-resistant *Neisseria gonorrhoeae* – California, 2001 [Abstract 21]. 40th Annual Meeting of the Infectious Diseases Society of America, Chicago, Illinois, October 24-27, 2002.

Figure 1. Gonorrhea - Reported rates: United States, 1970-2001 and the Healthy People year 2010 objective

Note: Healthy People 2010 (HP2010) objective for gonorrhea is 19.0 cases per 100,000 population.

Figure 2. Gonorrhea — Rates by state: United States and outlying areas, 2001



Note: The total rate of gonorrhea for the United States and outlying areas (including Guam, Puerto Rico and Virgin Islands) was 126.9 per 100,000 population. The Healthy People year 2010 objective is 19.0 per 100,000 population.

Figure 3. Gonorrhea — Rates by race and ethnicity: United States, 1981-2001 and the Healthy People year 2010 objective

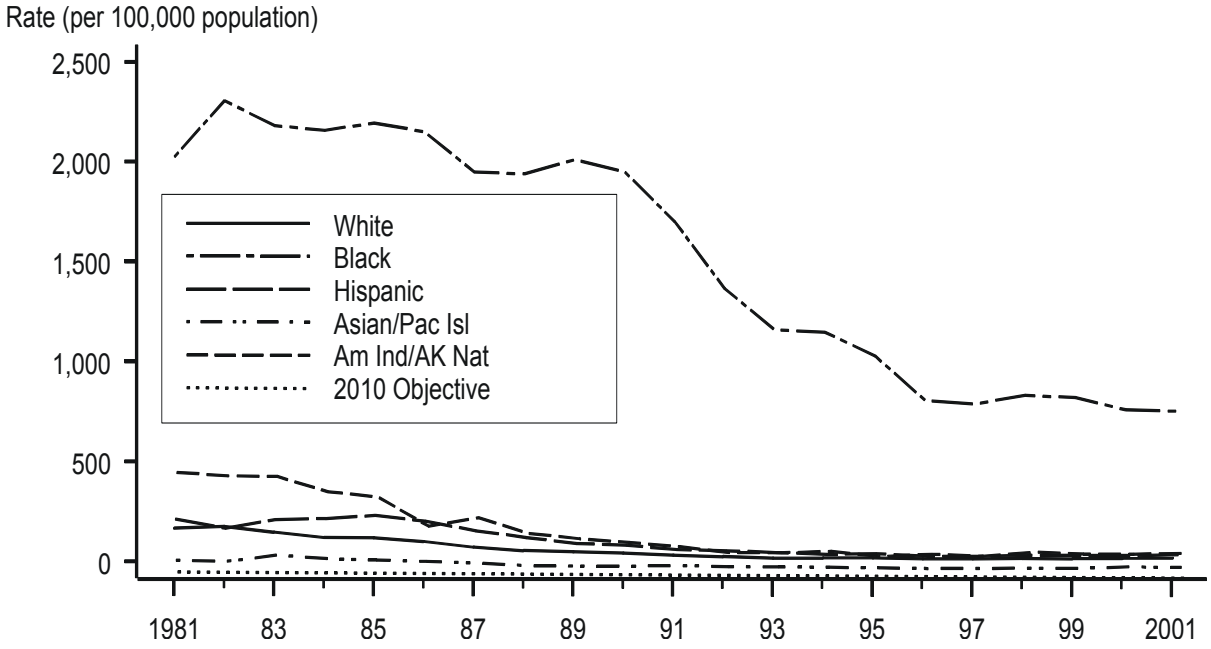


Figure 4. Gonorrhea — Age- and sex-specific rates: United States, 2001

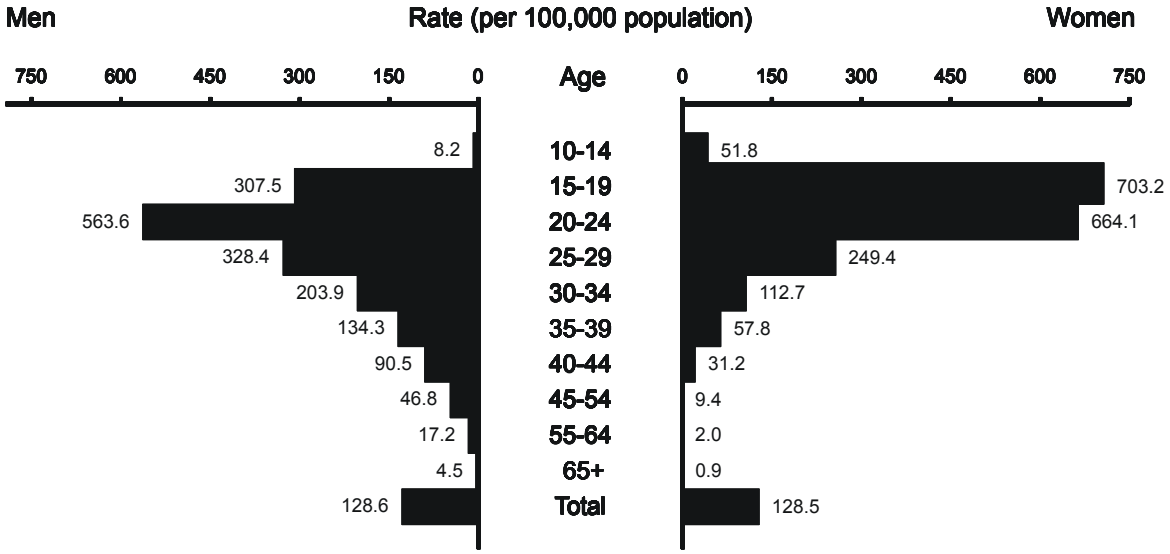


Figure 5. Gonococcal Isolate Surveillance Project (GISP) – Location of participating clinics and regional laboratories: United States, 2001

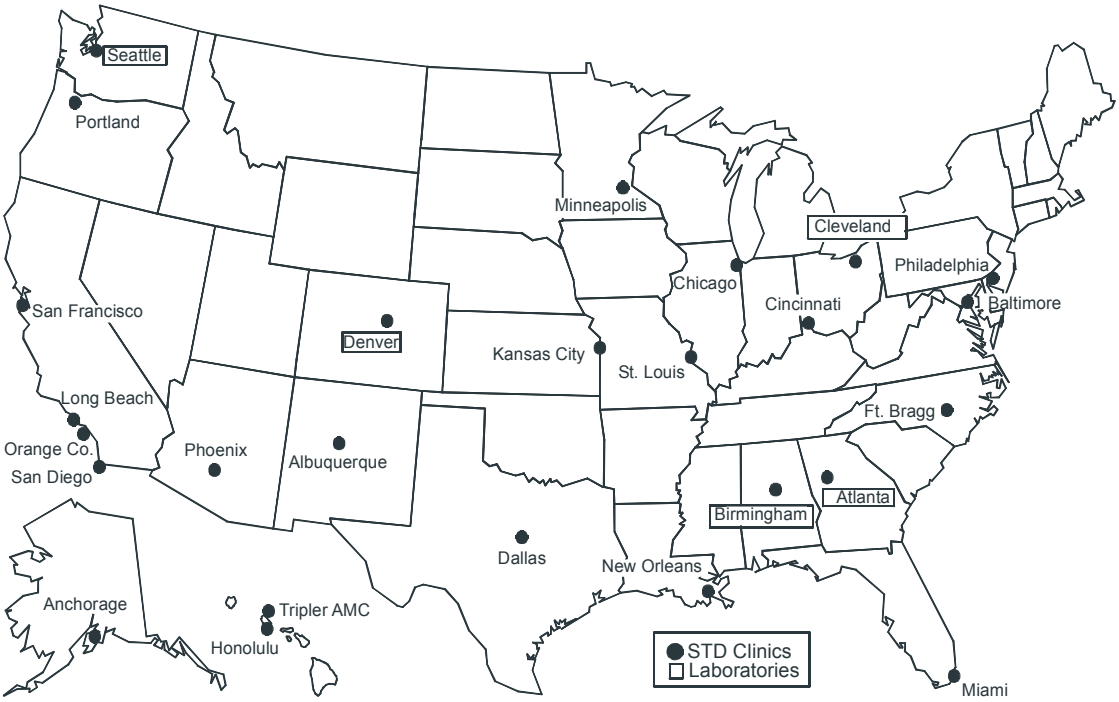
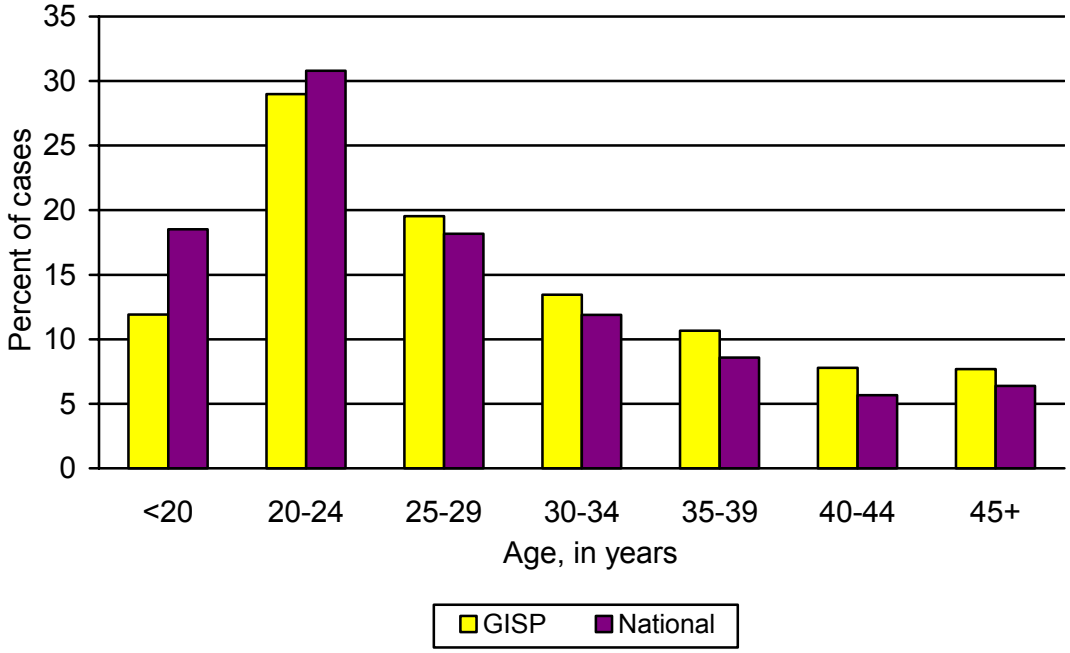
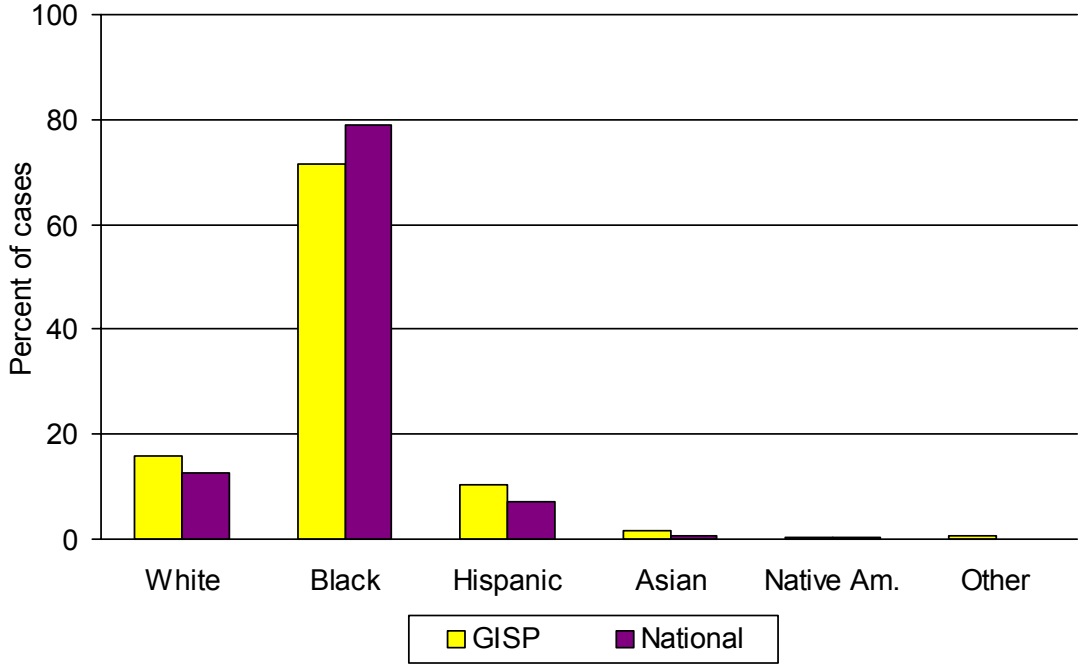


Figure 6. Age distribution of GISP participants and nationally reported gonorrhea cases in men, 2001



Note: The age <20 category includes ages 10-19 for national cases, and ages 10-19 for GISP; over 98% of the GISP cases in the <20 category are ages 15-19. National cases with unknown ages were excluded.

Figure 7. Race distribution of GISP participants and nationally reported cases of gonorrhea in men, 2001



Note: The "Other" category is not used in national gonorrhea reporting. National cases with unknown race were excluded.

Figure 8. Percentage of GISP cases that occurred among men who have sex with men (MSM), 1988-2001

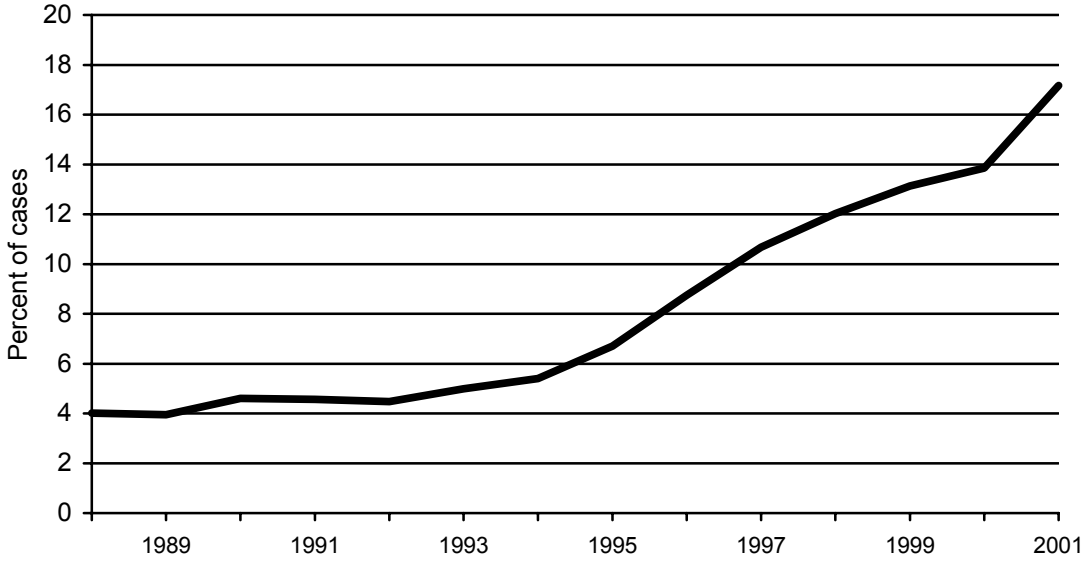
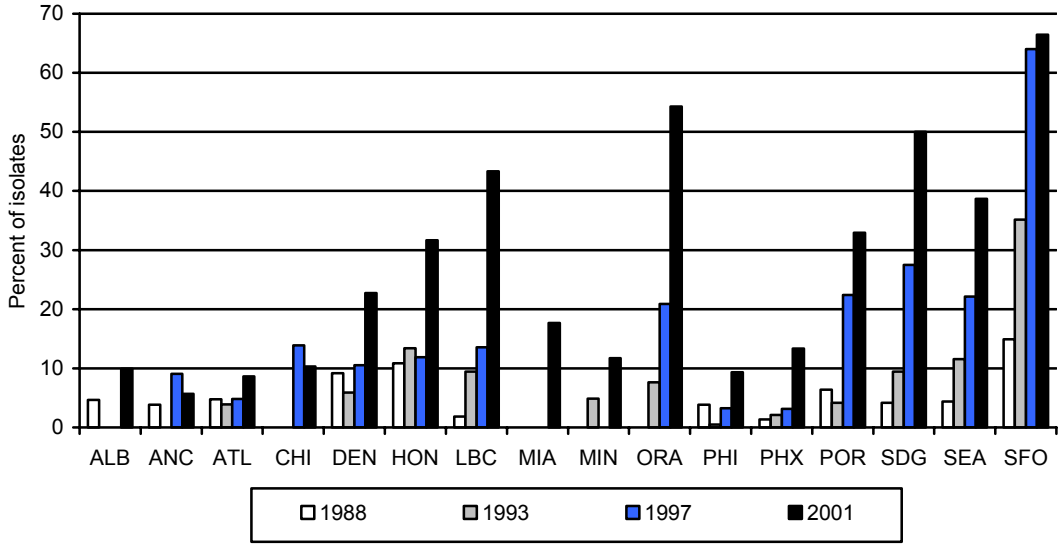
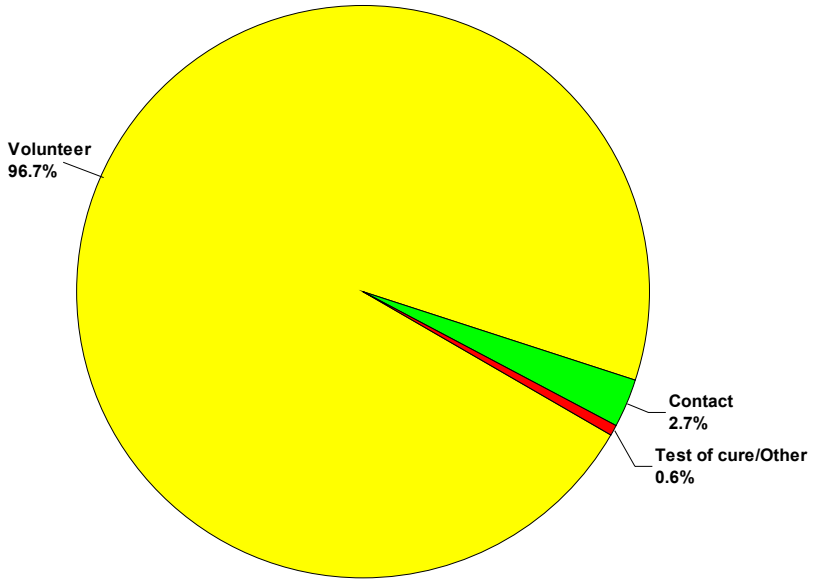


Figure 9. Percentage of GISP isolates from men who have sex with men in sixteen clinics, 1988, 1993, 1997, and 2001



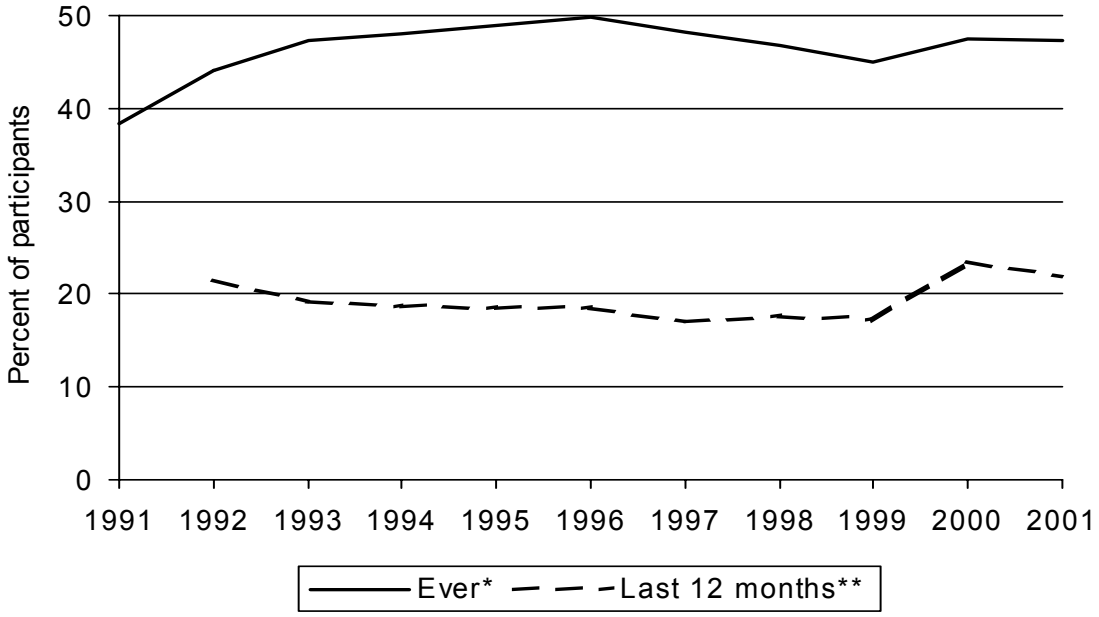
Note: In 2001, these sixteen clinics reported 95.2% (853/896) of GISP gonorrhea cases in men who have sex with men (MSM). Clinics include: ALB=Albuquerque, NM; ANC=Anchorage, AK; ATL=Atlanta, GA; CHI=Chicago, IL; DEN=Denver, CO; HON=Honolulu, HI; LBC=Long Beach, CA; MIA=Miami, FL; MIN=Minneapolis, MN; ORA=Orange County, CA; PHI=Philadelphia, PA; PHX=Phoenix, AZ; POR=Portland, OR; SDG=San Diego, CA; SEA=Seattle, WA; and SFO=San Francisco, CA.

Figure 10. Reason for clinic attendance among GISP participants, 2001



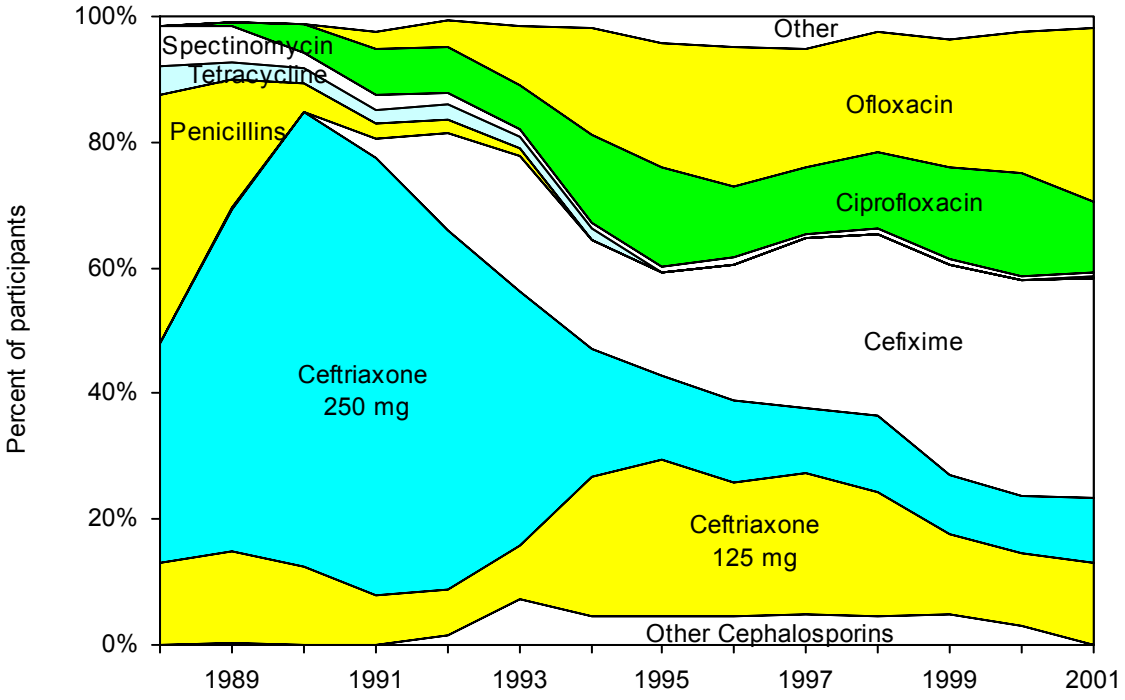
Contact=has sexual partner with gonorrhea

Figure 11. History of gonorrhea in GISP participants, 1991-2001



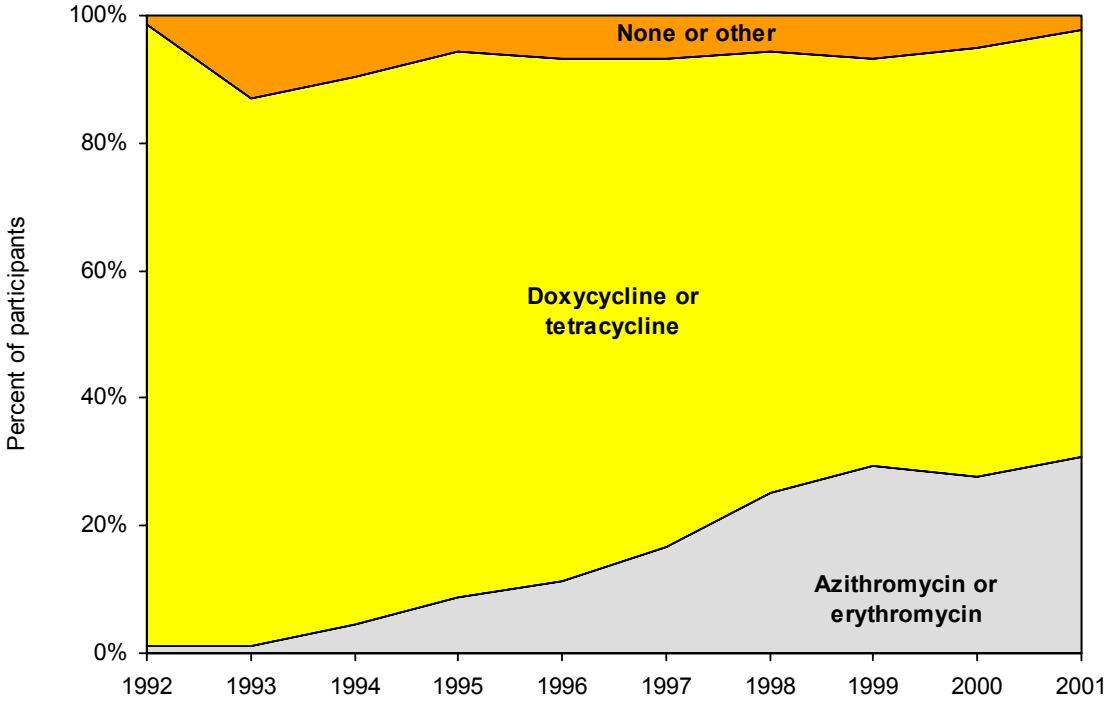
*Data first collected in 1991.
**Data first collected in 1992.

Figure 12. Drugs used to treat gonorrhea in GISP participants, 1988-2001



Note: “Other” includes macrolide or no drug therapy.

Figure 13. Drugs used to treat *Chlamydia trachomatis* infection in GISP participants 1992-2001



For each year, "Other" accounted for only 0 - 0.9% of *C. trachomatis* treatment and erythromycin accounted for only 0.1 - 1.0% of *C. trachomatis* treatment.

Figure 14. Penicillin and tetracycline resistance among GISP isolates, 2001

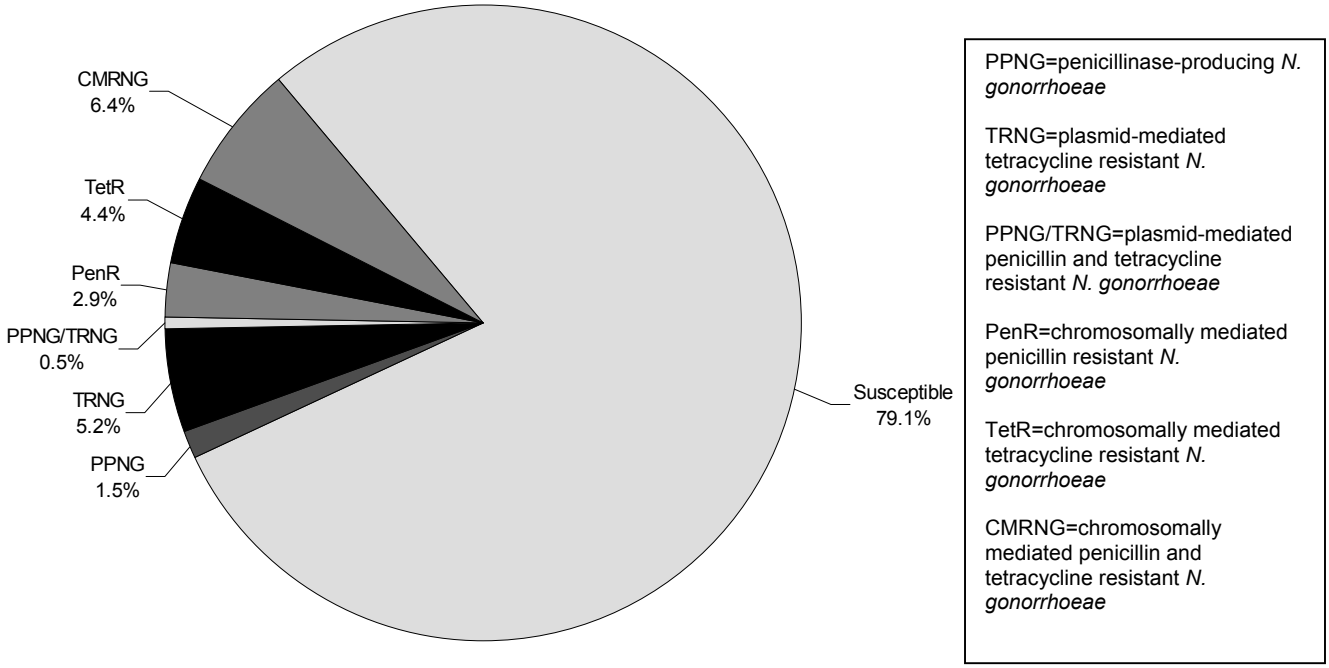


Figure 15. Plasmid-mediated resistance to penicillin and tetracycline among GISP isolates, 1988-2001

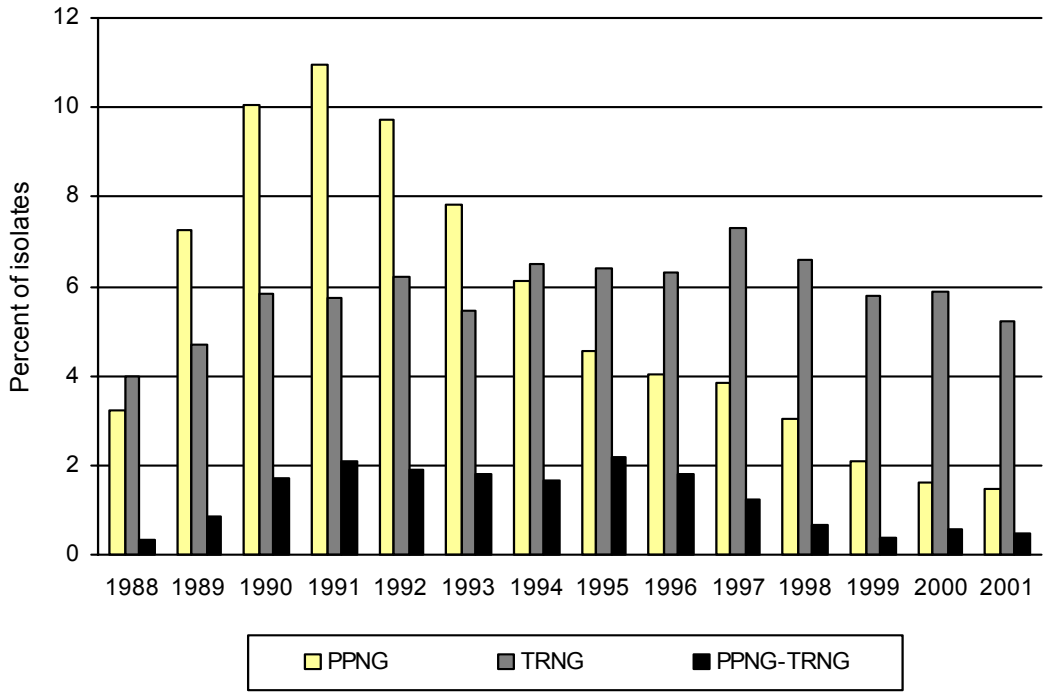


Figure 16. Chromosomally mediated resistance to penicillin and tetracycline among GISP isolates, 1988-2001

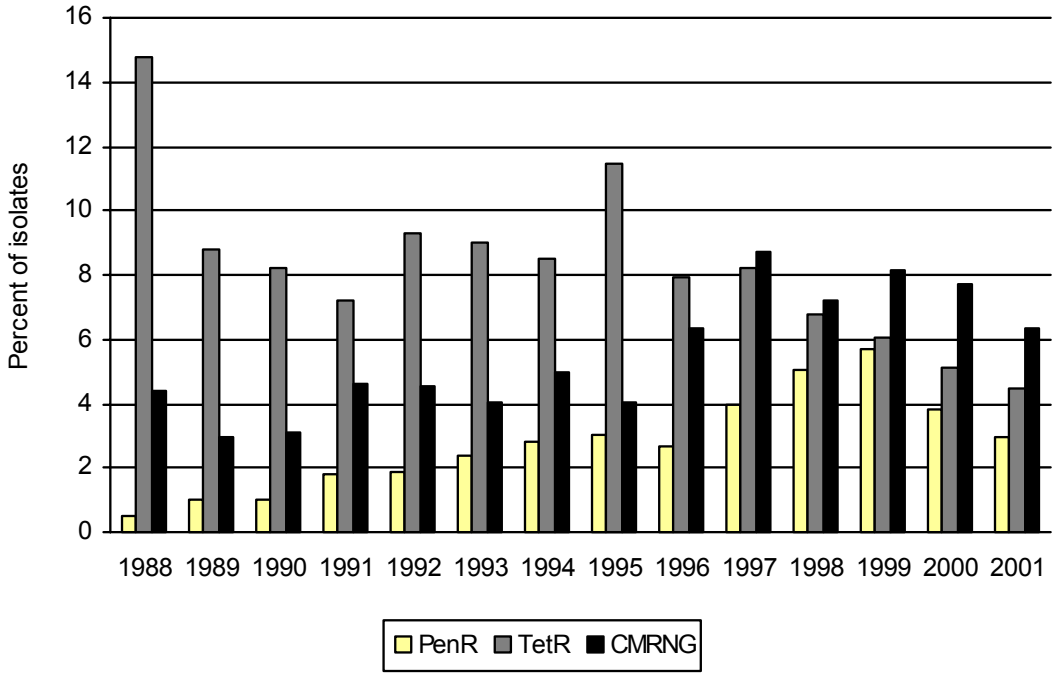
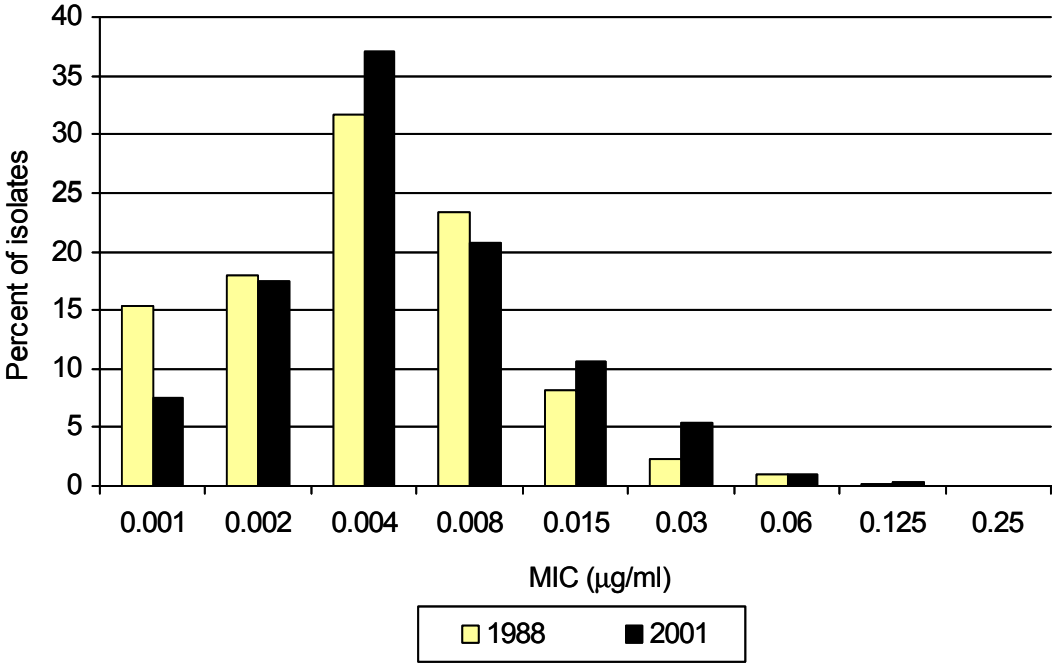
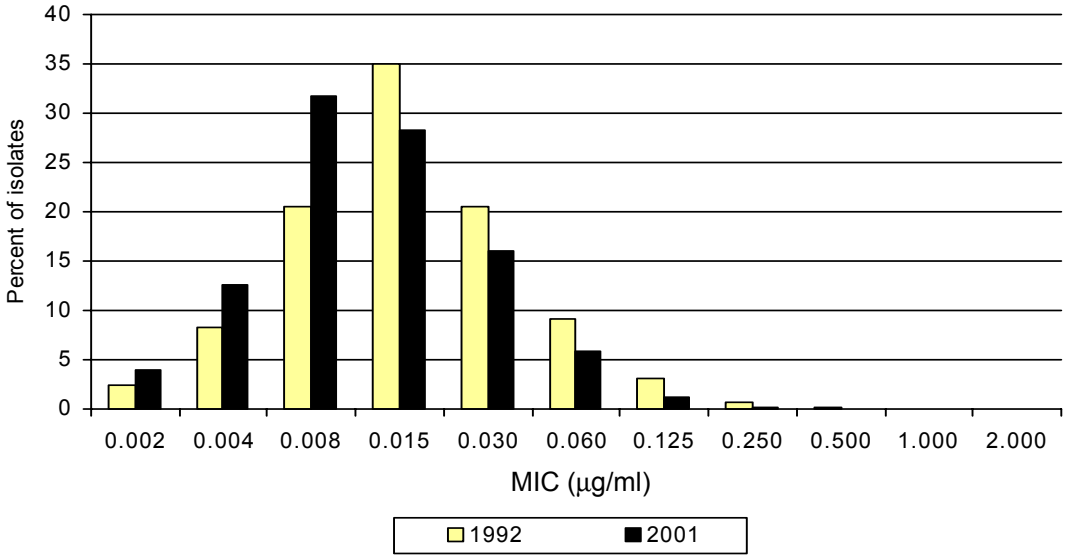


Figure 17. Distribution of MICs to ceftriaxone among GISP isolates, 1988 and 2001



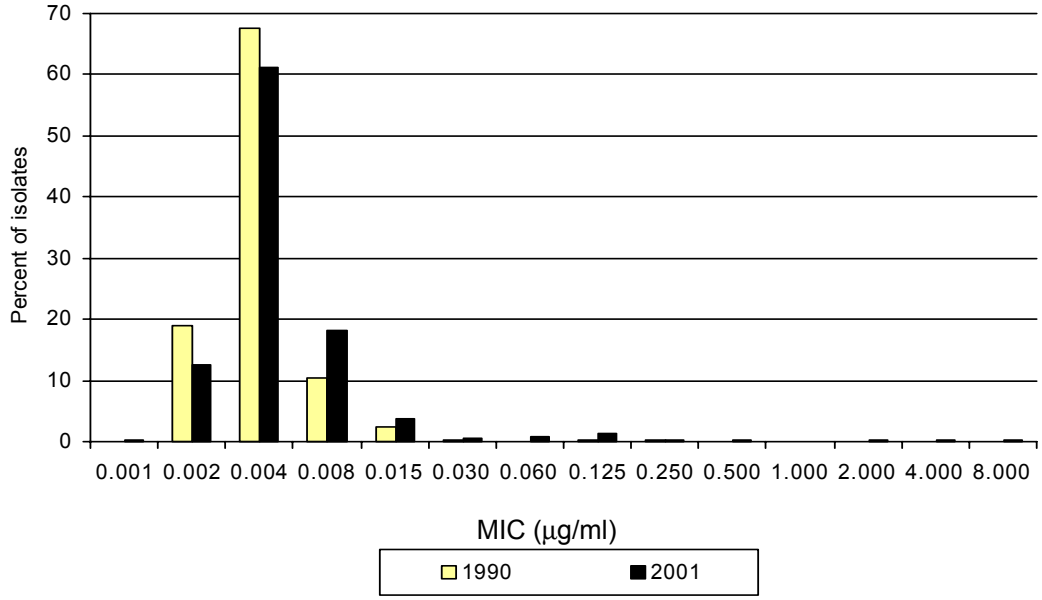
In 1988, there was one isolate with MIC 0.25 µg/ml. In 2001, there were two isolates with MIC 0.25 µg/ml.

Figure 18. Distribution of MICs to cefixime among GISP isolates, 1992 and 2001



In 1992, there were six isolates with MIC 0.5 µg/ml, three isolates with MIC 1.0 µg/ml, and two isolates with MIC 2.0 µg/ml. In 2001, there were four isolates with MIC 0.5 µg/ml.

Figure 19. Distribution of MICs to ciprofloxacin among GISP isolates, 1990 and 2001



In 1990, there were no isolates with MIC > 0.25 µg/ml. In 2001, there were nine isolates with MIC 0.5 µg/ml, seven isolates with MIC 1.0 µg/ml, eleven isolates with MIC 2.0 µg/ml, eight isolates with MIC 4.0 µg/ml, and twelve isolates with MIC 8.0 µg/ml.

Figure 20. Percentage of GISP isolates with intermediate resistance or resistance to ciprofloxacin, 1990-2001

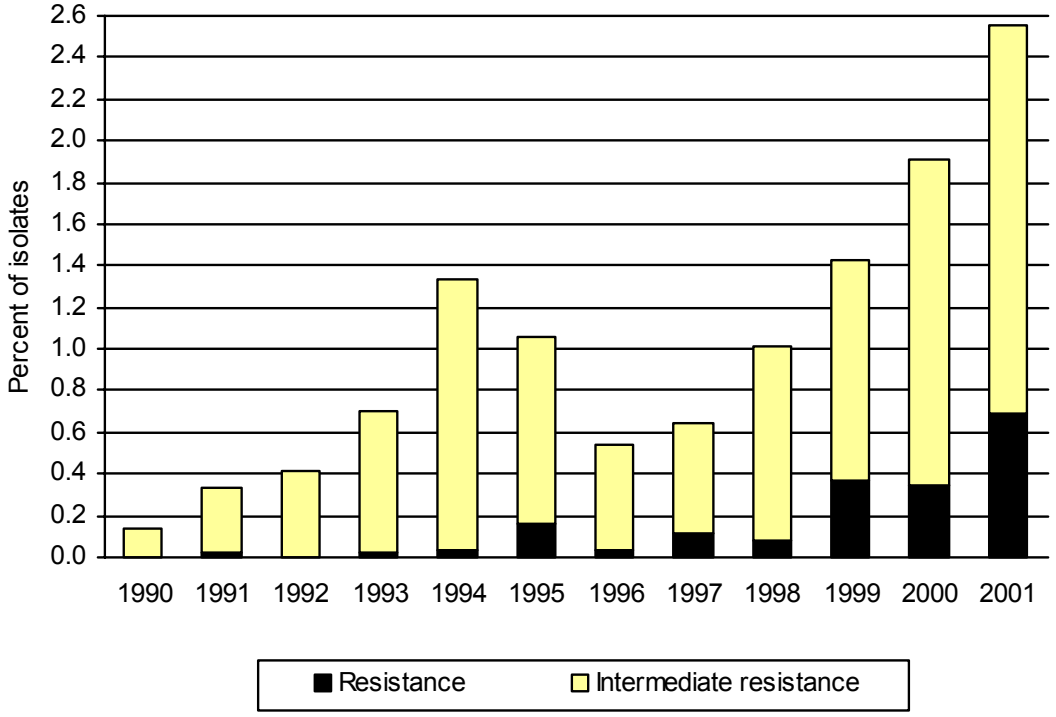
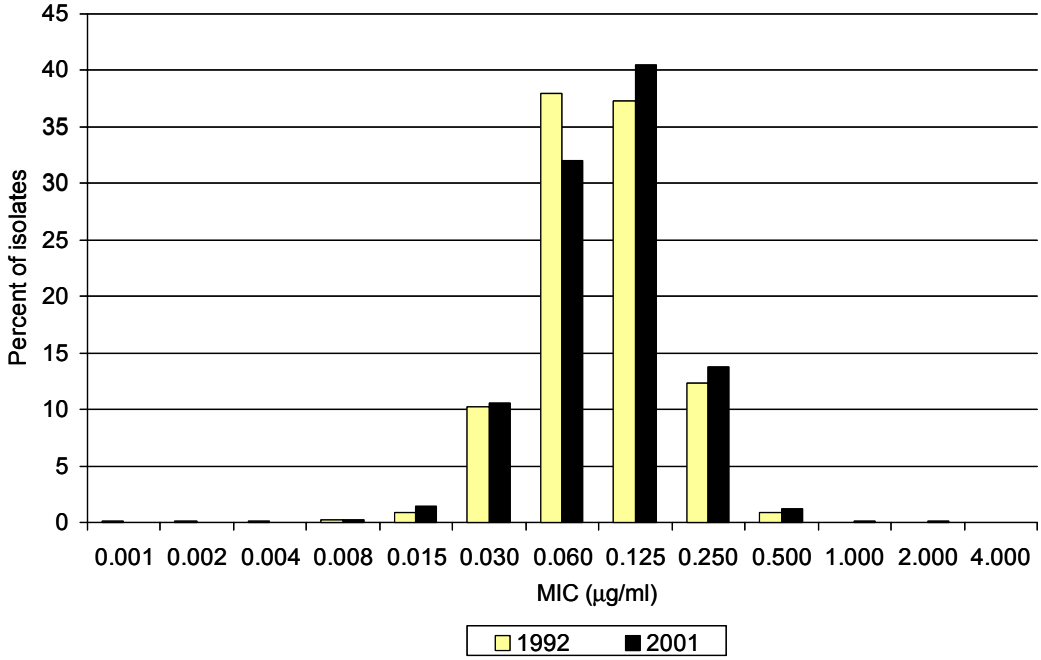


Figure 21. Distribution of MICs to azithromycin among GISP isolates, 1992 and 2001



In 1992, there were no isolates with MIC > 0.5 µg/ml. In 2001, there were seven isolates with MIC 1.0 µg/ml, six isolates with MIC 2.0 µg/ml, and two isolates with MIC 4.0 µg/ml.

CLINIC-SPECIFIC DEMOGRAPHIC, CLINICAL, AND LABORATORY DATA

The remainder of this report provides clinic-specific figures for each of 25 of the 26 currently participating clinics. Because the Tripler Army Medical Center Sentinel Site had <50 GISP isolates for 2001 (n=2), figures for Tripler are not included. Individual figures for each clinic show demographic and clinical characteristics of the men with gonorrhea enrolled in GISP, as well as antimicrobial susceptibilities for the *N. gonorrhoeae* isolates. The number of isolates submitted by each clinic is 300 when the full sample of 25 isolates per month is obtained. However, the number of isolates submitted is lower for many clinics located in areas with low gonorrhea rates. Each page of figures is labeled with the city of the participating clinic and the actual number of isolates on which the clinic's 2001 data are based.

Definitions of terms and abbreviations used in the clinic-specific figures are given below.

Figure D: Contact=has sexual partner with gonorrhea
TOC/Other=test of cure/other

Figure G: Azi/Ery=azithromycin/erythromycin
Doxy/Tet=doxycycline/tetracycline

Figure H: PPNG=penicillinase-producing *N. gonorrhoeae*
TRNG=plasmid-mediated tetracycline resistant *N. gonorrhoeae*
PPNG-TRNG=plasmid-mediated penicillin and tetracycline resistant *N. gonorrhoeae*
PenR=chromosomally mediated penicillin resistant *N. gonorrhoeae*
TetR=chromosomally mediated tetracycline resistant *N. gonorrhoeae*
CMRNG=chromosomally mediated penicillin and tetracycline resistant *N. gonorrhoeae*

Albuquerque, New Mexico – 2001 (N=147)

Figure A. Age of GISP participants, in years, 2001

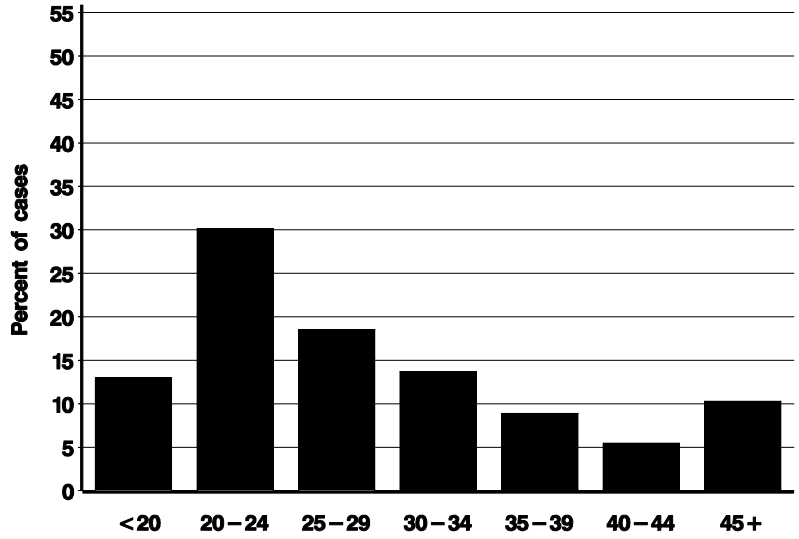


Figure B. Race/ethnicity of GISP participants, 2001

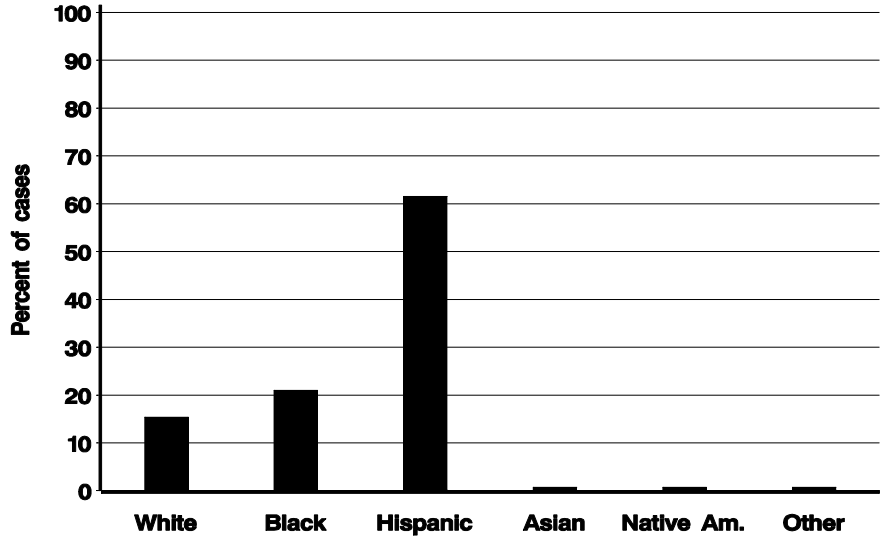


Figure C. Percentage of GISP participants identifying as men who have sex with men, 1988–2001

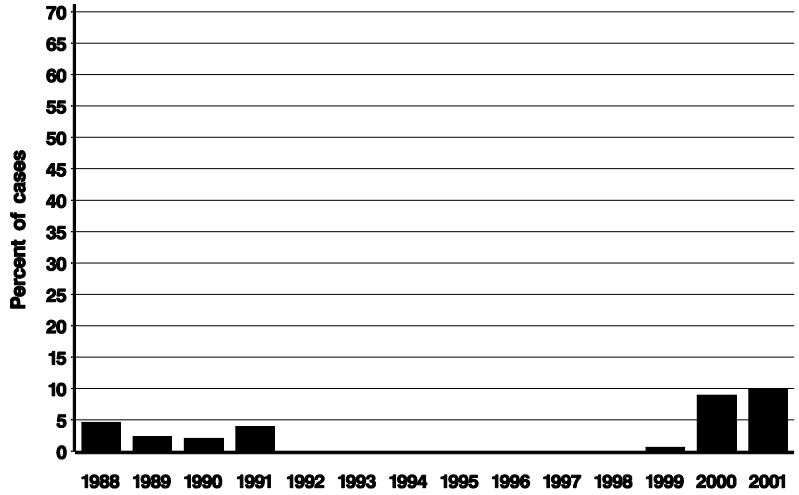
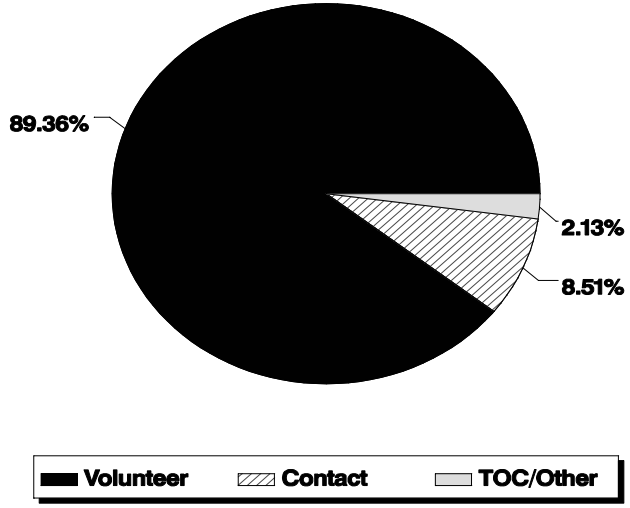
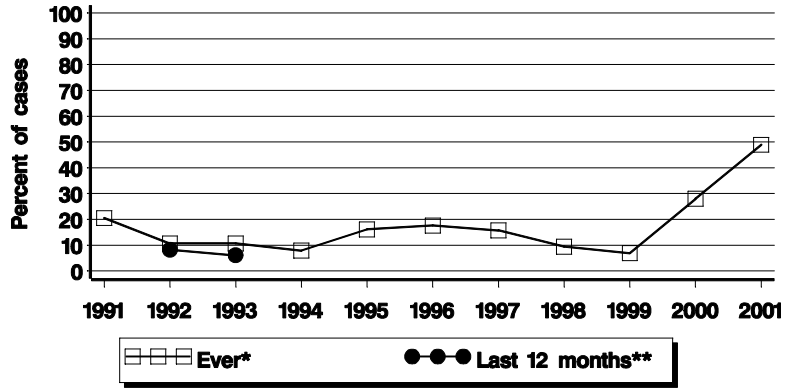


Figure D. Reason for visit among GISP participants, 2001



Albuquerque, New Mexico – 2001 (N=147)

Figure E. Previous episode of gonorrhea among GISP participants, 1991–2001



*Data first collected in 1991.
**Data first collected in 1992.
Note: Data points not shown when >30% data missing.

Figure F. Drugs used to treat gonorrhea among GISP participants, 2001

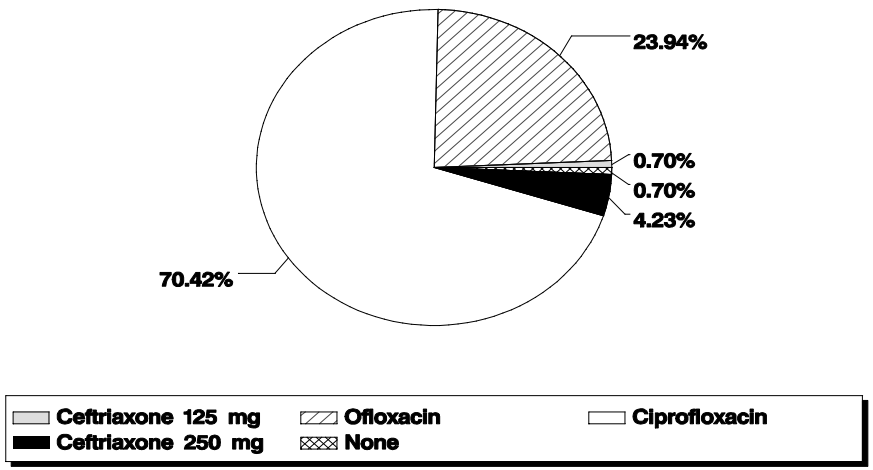


Figure G. Drugs used to treat *Chlamydia trachomatis* infection among GISP participants, 2001

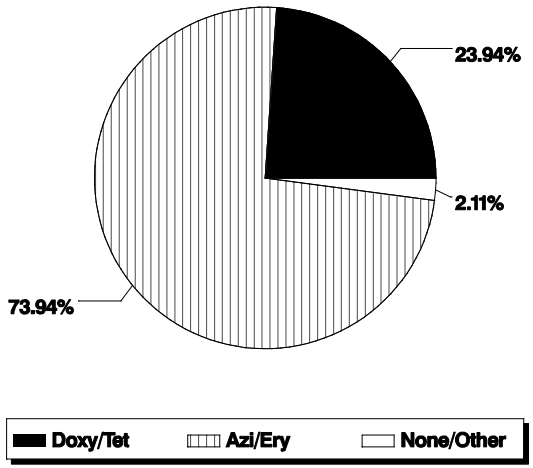
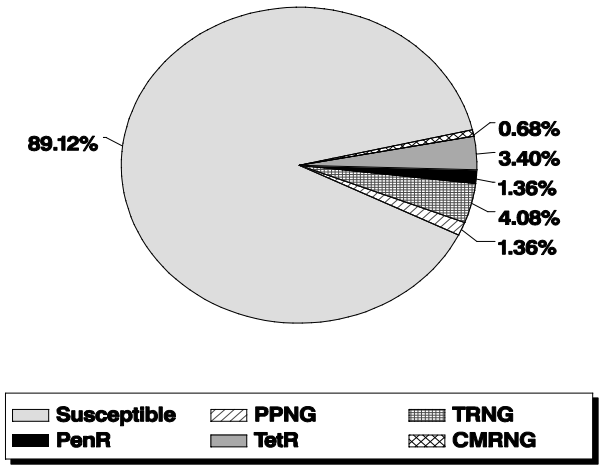


Figure H. Resistance to penicillin and tetracycline among GISP isolates, 2001



Albuquerque, New Mexico – 2001 (N=147)

Figure I. Decreased susceptibility to ceftriaxone among GISP isolates, 1988–2001

No isolates with decreased susceptibility to ceftriaxone have been identified at this clinic.

Figure J. Decreased susceptibility to cefixime among GISP isolates, 1992–2001

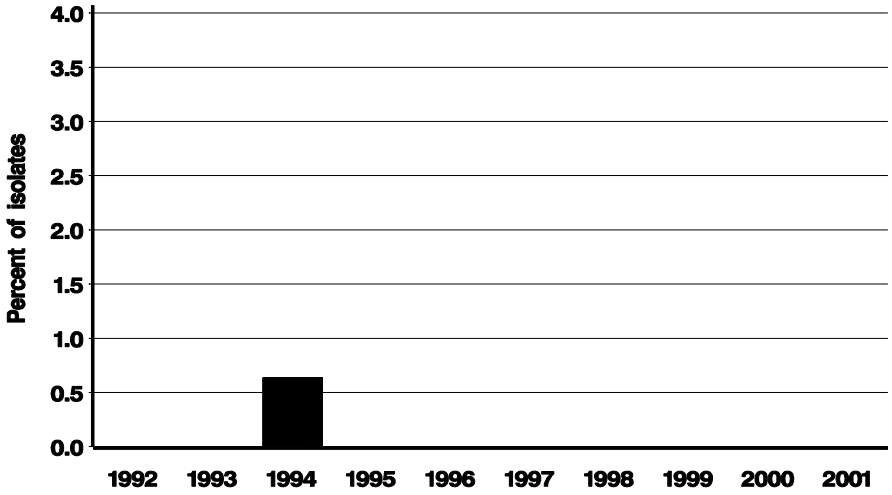
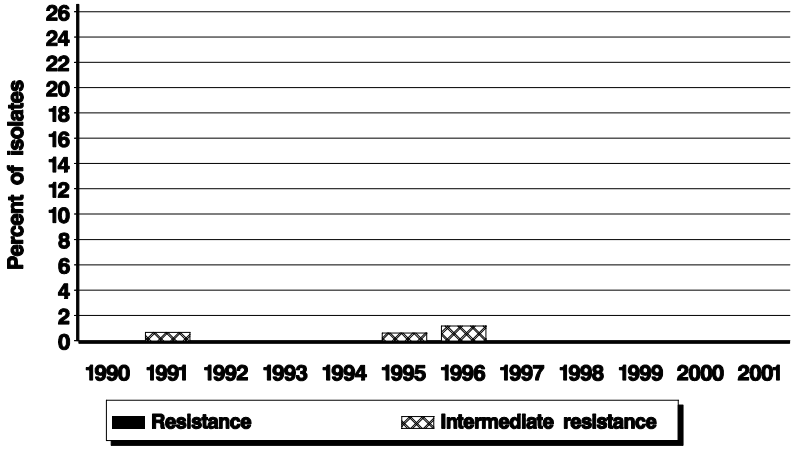
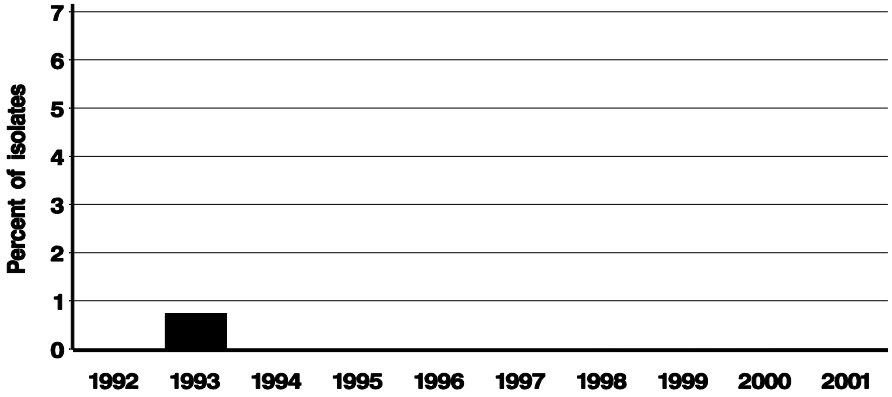


Figure K. Intermediate resistance and resistance to ciprofloxacin among GISP isolates, 1990–2001



Note: Susceptibility to ciprofloxacin first measured in 1990.

Figure L. Decreased susceptibility to azithromycin among GISP isolates, 1992–2001



Note: Susceptibility to azithromycin first measured in 1992.
Note: Decreased susceptibility to azithromycin is defined here as > or = 1.0 ug/ml. No NCCLS criteria currently exist.

Anchorage, Alaska – 2001 (N=53)

Figure A. Age of GISP participants, in years, 2001

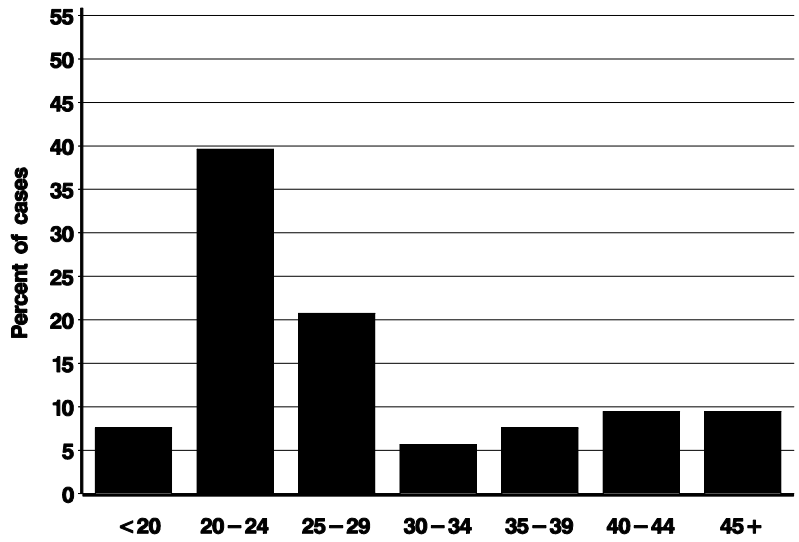


Figure B. Race/ethnicity of GISP participants, 2001

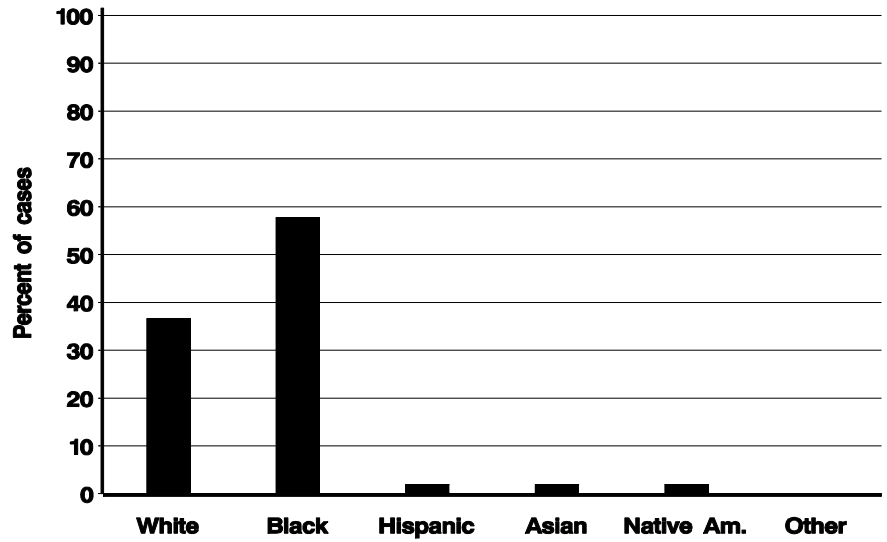


Figure C. Percentage of GISP participants identifying as men who have sex with men, 1988–2001

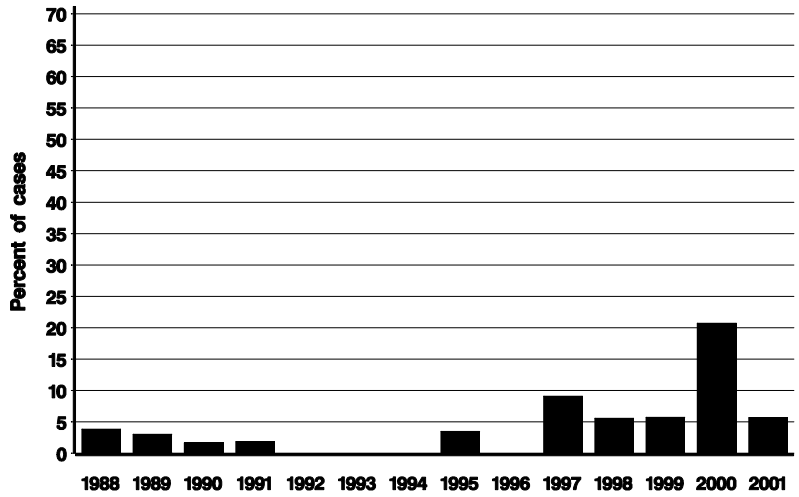
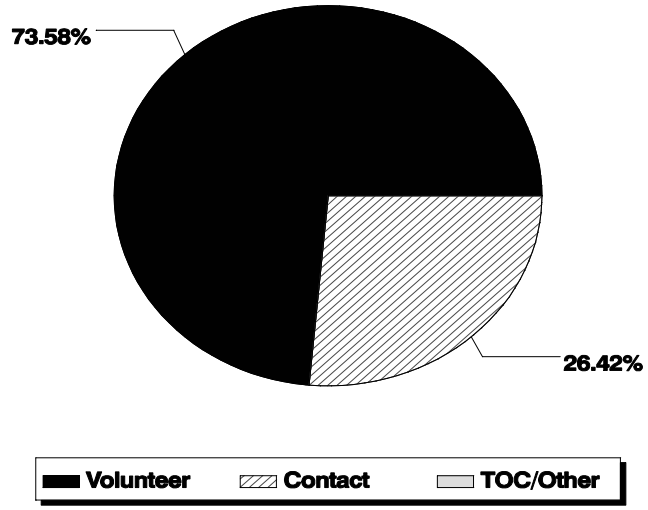
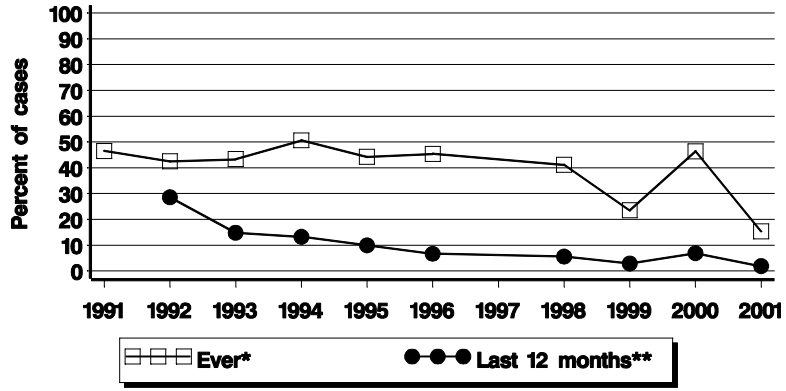


Figure D. Reason for visit among GISP participants, 2001



Anchorage, Alaska – 2001 (N=53)

Figure E. Previous episode of gonorrhea among GISP participants, 1991–2001



*Data first collected in 1991.
**Data first collected in 1992.
Note: Data points not shown when >30% data missing.

Figure F. Drugs used to treat gonorrhea among GISP participants, 2001

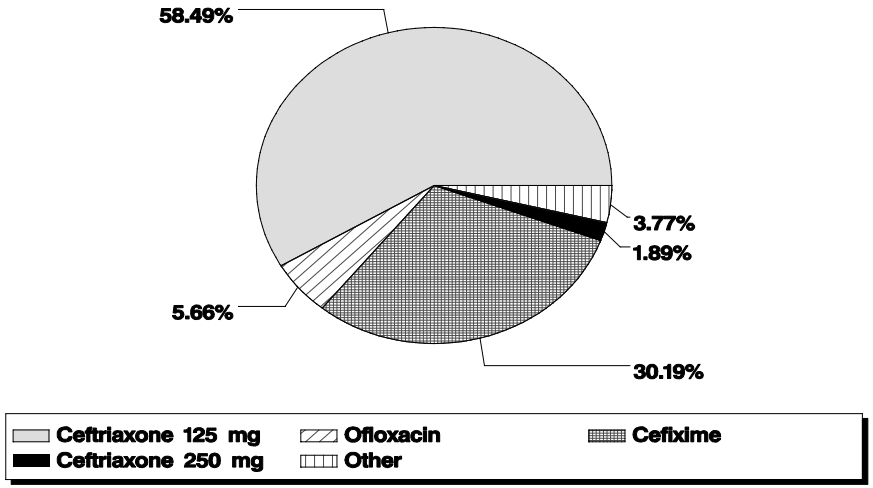


Figure G. Drugs used to treat *Chlamydia trachomatis* infection among GISP participants, 2001

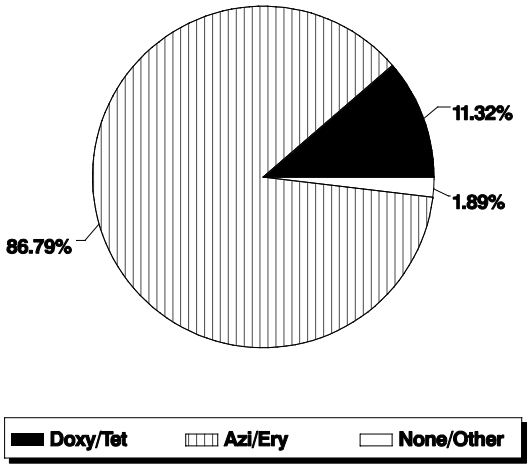
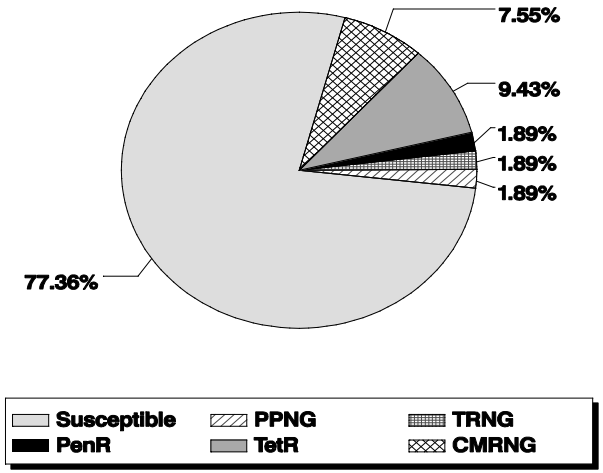


Figure H. Resistance to penicillin and tetracycline among GISP isolates, 2001



Anchorage, Alaska – 2001 (N=53)

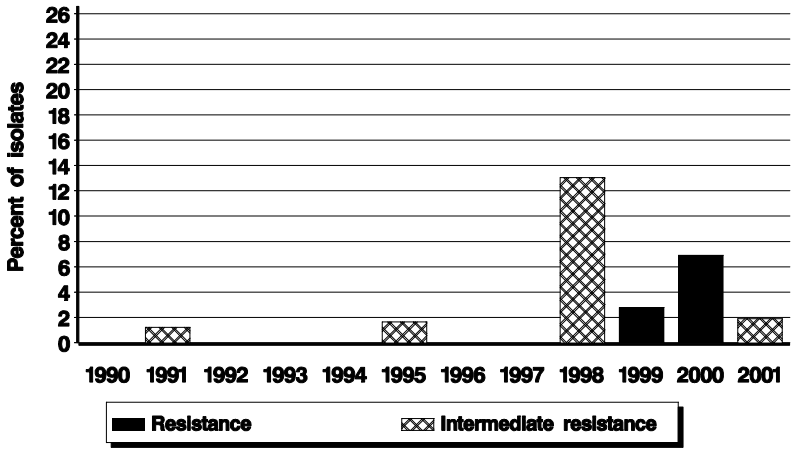
Figure I. Decreased susceptibility to ceftriaxone among GISP isolates, 1988–2001

No isolates with decreased susceptibility to ceftriaxone have been identified at this clinic.

Figure J. Decreased susceptibility to cefixime among GISP isolates, 1992–2001

No isolates with decreased susceptibility to cefixime have been identified at this clinic.

Figure K. Intermediate resistance and resistance to ciprofloxacin among GISP isolates, 1990–2001



Note: Susceptibility to ciprofloxacin first measured in 1990.

Figure L. Decreased susceptibility to azithromycin among GISP isolates, 1992–2001

No isolates with decreased susceptibility to azithromycin have been identified at this clinic.

Atlanta, Georgia – 2001 (N = 201)

Figure A. Age of GISP participants, in years, 2001

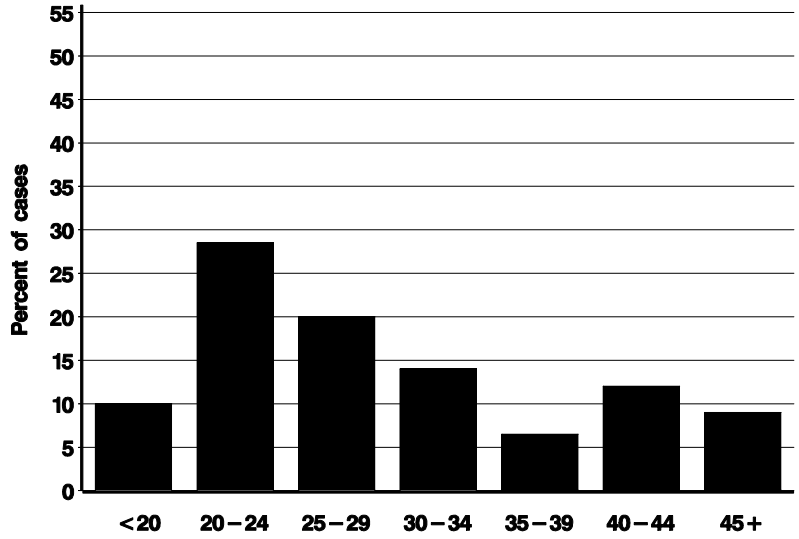


Figure B. Race/ethnicity of GISP participants, 2001

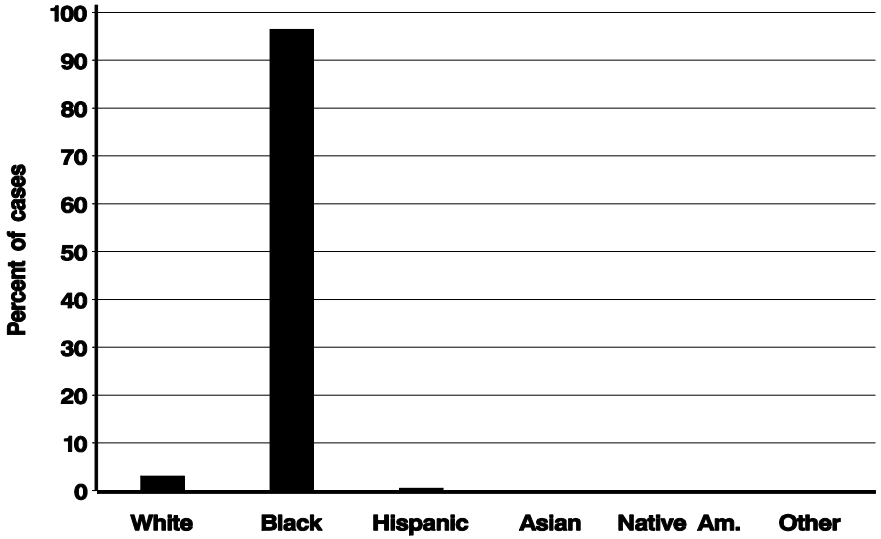


Figure C. Percentage of GISP participants identifying as men who have sex with men, 1988–2001

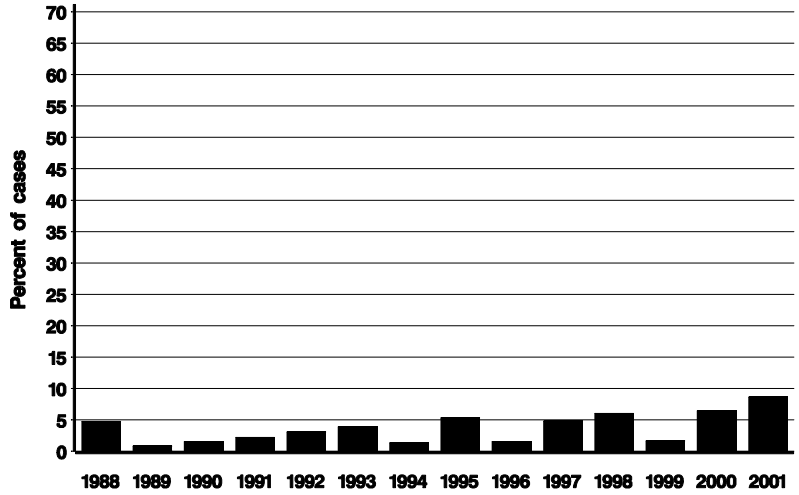
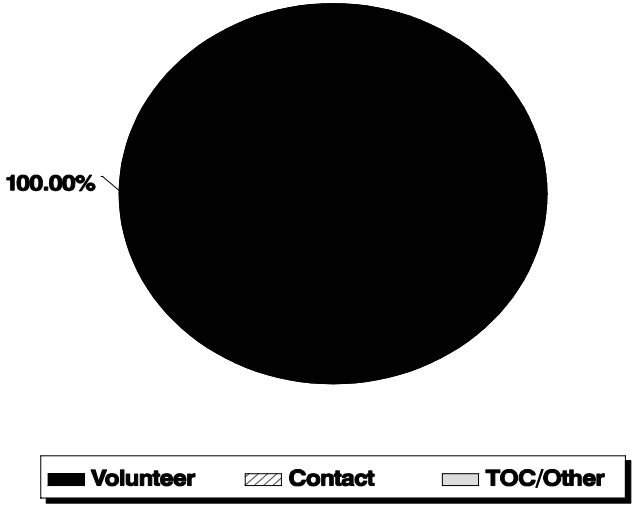
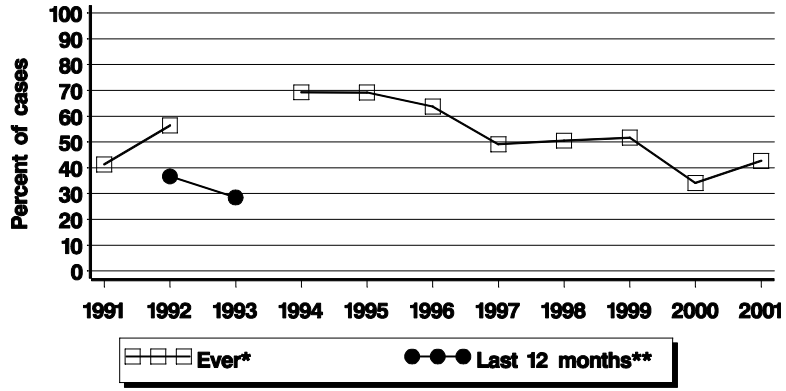


Figure D. Reason for visit among GISP participants, 2001



Atlanta, Georgia – 2001 (N = 201)

Figure E. Previous episode of gonorrhea among GISP participants, 1991 – 2001



*Data first collected in 1991.
**Data first collected in 1992.
Note: Data points not shown when >30% data missing.

Figure F. Drugs used to treat gonorrhea among GISP participants, 2001

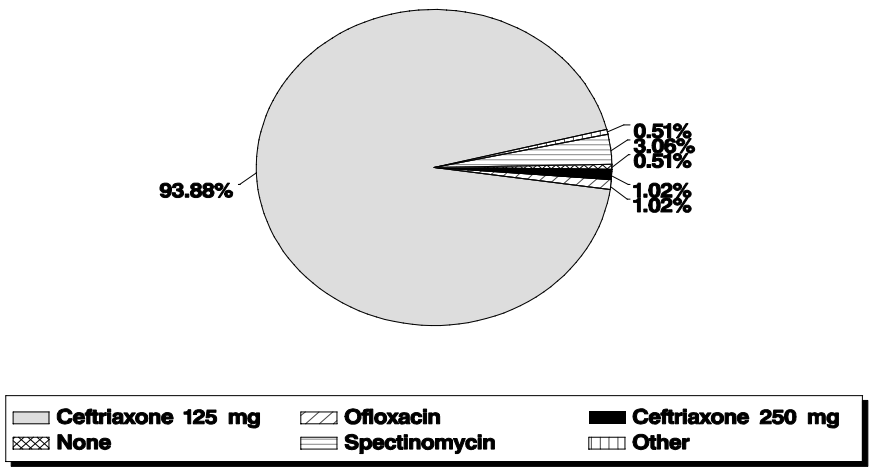


Figure G. Drugs used to treat *Chlamydia trachomatis* infection among GISP participants, 2001

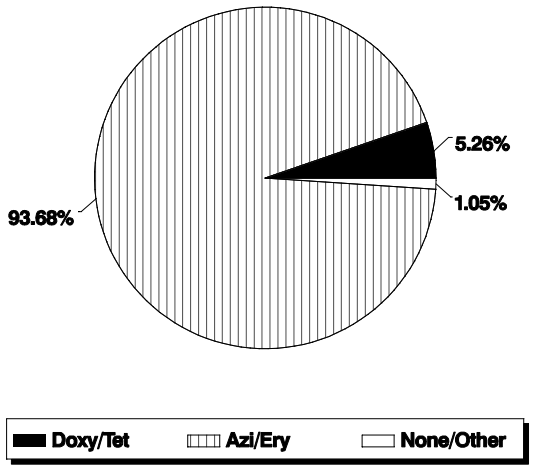
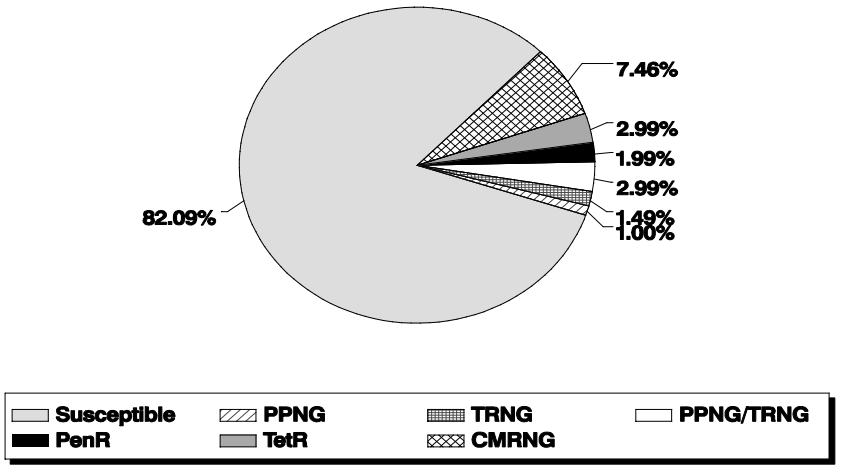


Figure H. Resistance to penicillin and tetracycline among GISP isolates, 2001



Atlanta, Georgia – 2001 (N = 201)

Figure I. Decreased susceptibility to ceftriaxone among GISP isolates, 1988 – 2001

No isolates with decreased susceptibility to ceftriaxone have been identified at this clinic.

Figure J. Decreased susceptibility to cefixime among GISP isolates, 1992 – 2001

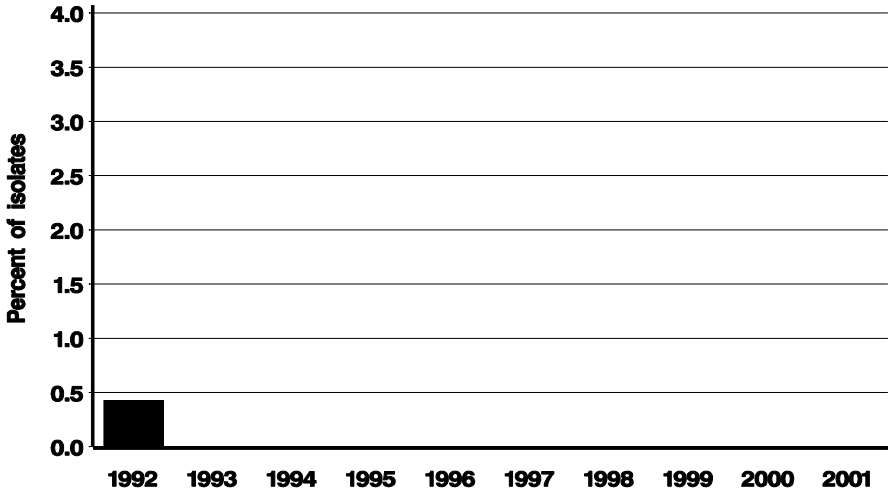
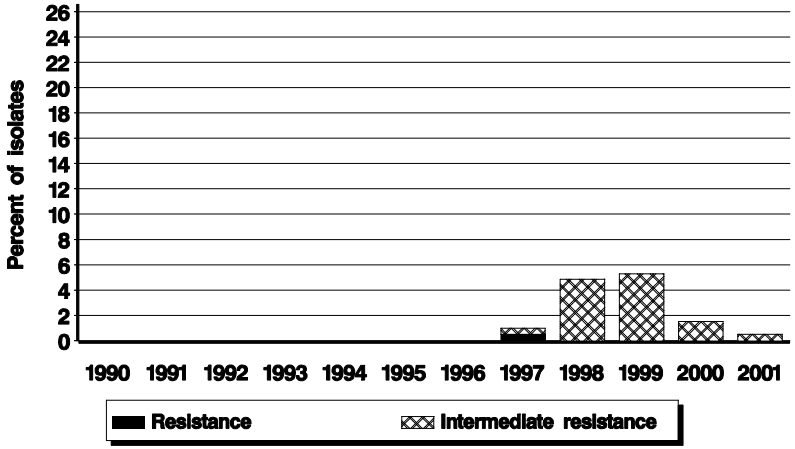
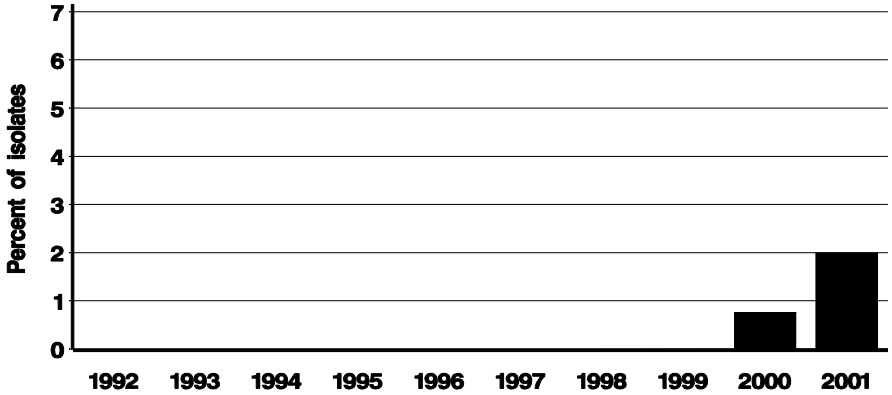


Figure K. Intermediate resistance and resistance to ciprofloxacin among GISP isolates, 1990 – 2001



Note: Susceptibility to ciprofloxacin first measured in 1990.

Figure L. Decreased susceptibility to azithromycin among GISP isolates, 1992 – 2001



Note: Susceptibility to azithromycin first measured in 1992.
Note: Decreased susceptibility to azithromycin is defined here as > or = 1.0 ug/ml. No NCCLS criteria currently exist.

Baltimore, Maryland – 2001 (N=293)

Figure A. Age of GISP participants, in years, 2001

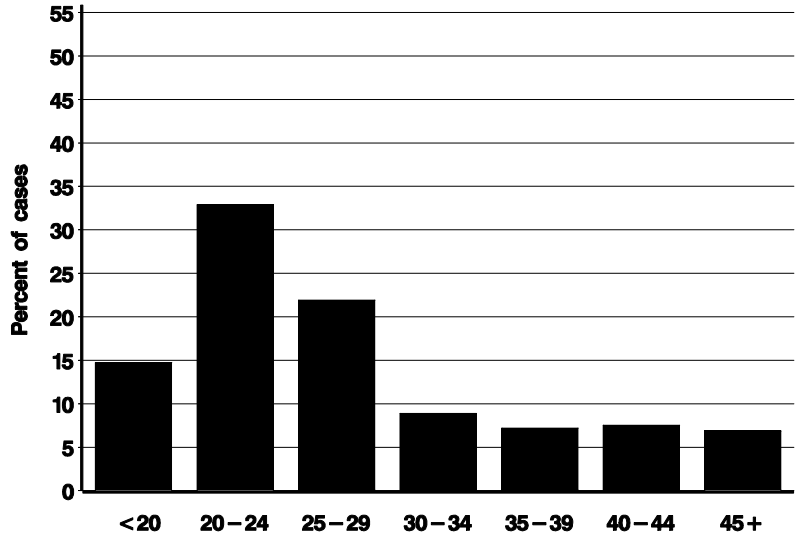


Figure B. Race/ethnicity of GISP participants, 2001

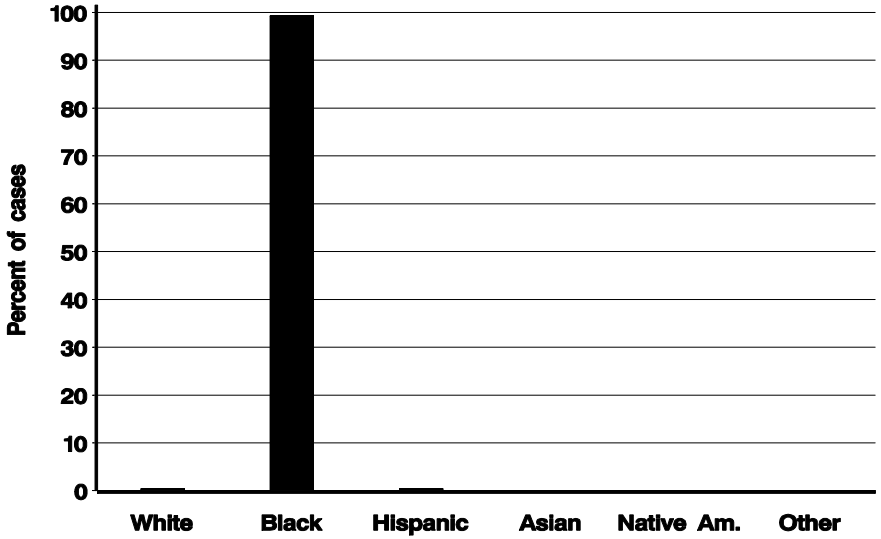


Figure C. Percentage of GISP participants identifying as men who have sex with men, 1988–2001

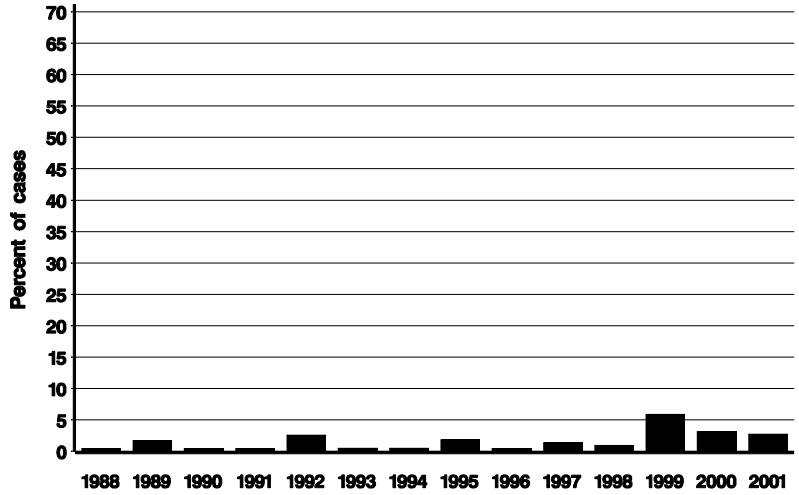
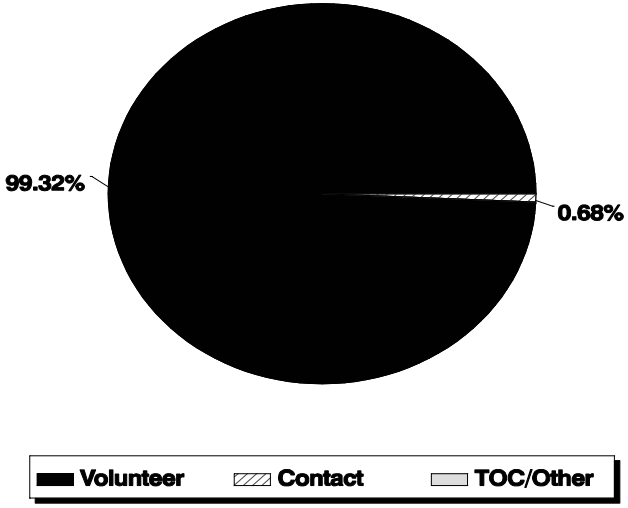
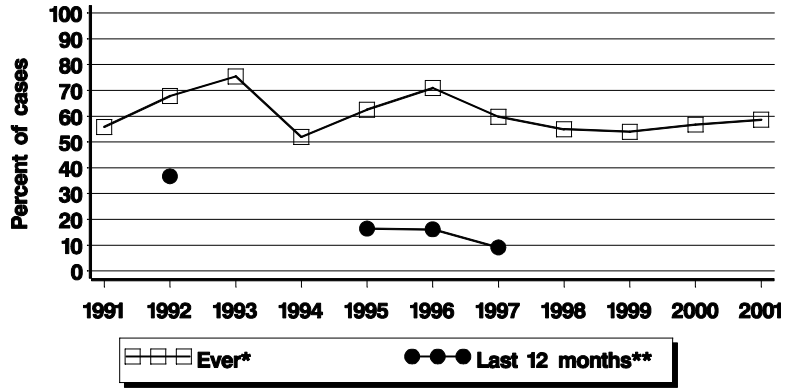


Figure D. Reason for visit among GISP participants, 2001



Baltimore, Maryland – 2001 (N=293)

Figure E. Previous episode of gonorrhea among GISP participants, 1991–2001



*Data first collected in 1991.
**Data first collected in 1992.
Note: Data points not shown when >30% data missing.

Figure F. Drugs used to treat gonorrhea among GISP participants, 2001

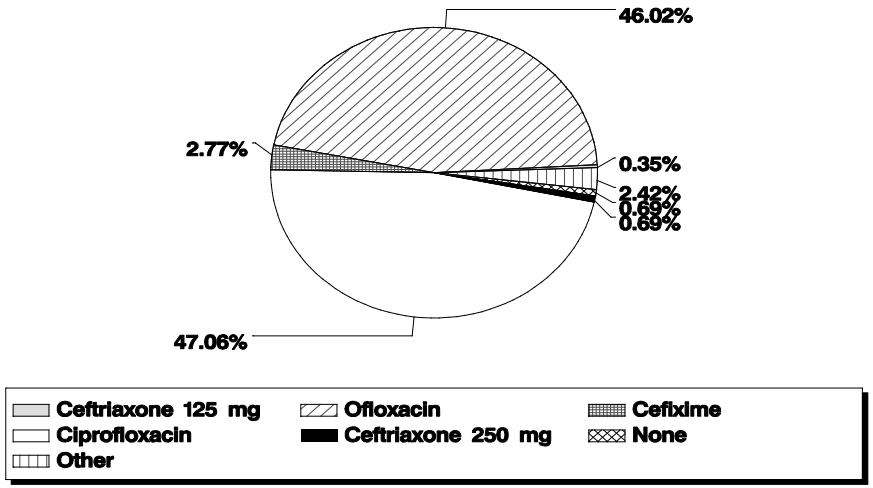


Figure G. Drugs used to treat *Chlamydia trachomatis* infection among GISP participants, 2001

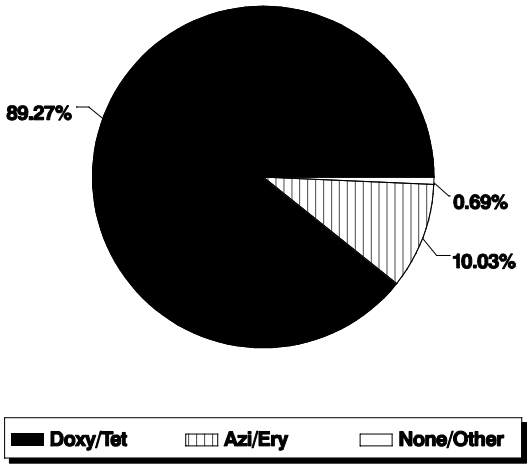
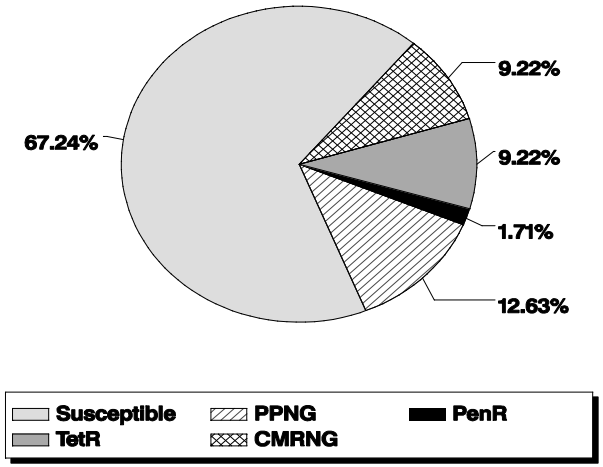


Figure H. Resistance to penicillin and tetracycline among GISP isolates, 2001



Baltimore, Maryland – 2001 (N=293)

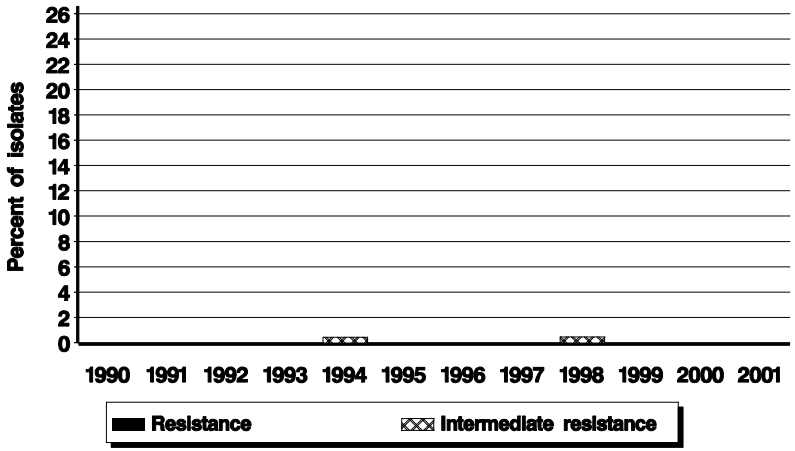
Figure I. Decreased susceptibility to ceftriaxone among GISP isolates, 1988–2001

No isolates with decreased susceptibility to ceftriaxone have been identified at this clinic.

Figure J. Decreased susceptibility to cefixime among GISP isolates, 1992–2001

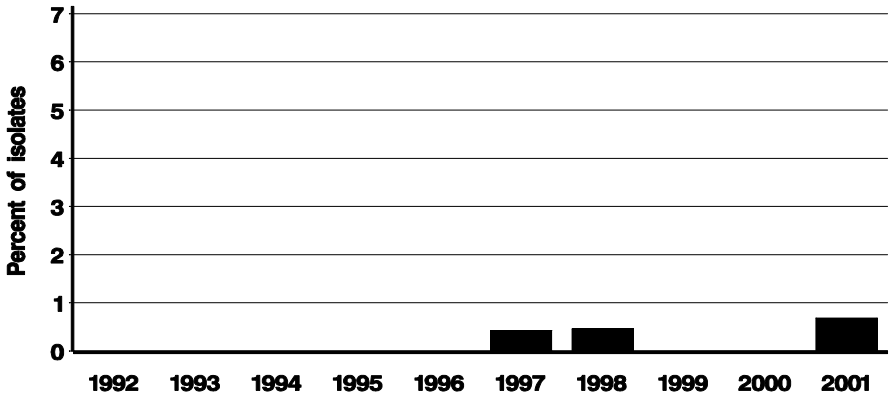
No isolates with decreased susceptibility to cefixime have been identified at this clinic.

Figure K. Intermediate resistance and resistance to ciprofloxacin among GISP isolates, 1990–2001



Note: Susceptibility to ciprofloxacin first measured in 1990.

Figure L. Decreased susceptibility to azithromycin among GISP isolates, 1992–2001



Note: Susceptibility to azithromycin first measured in 1992.
Note: Decreased susceptibility to azithromycin is defined here as > or = 1.0 ug/ml. No NCCLS criteria currently exist.

Birmingham, Alabama – 2001 (N=299)

Figure A. Age of GISP participants, in years, 2001

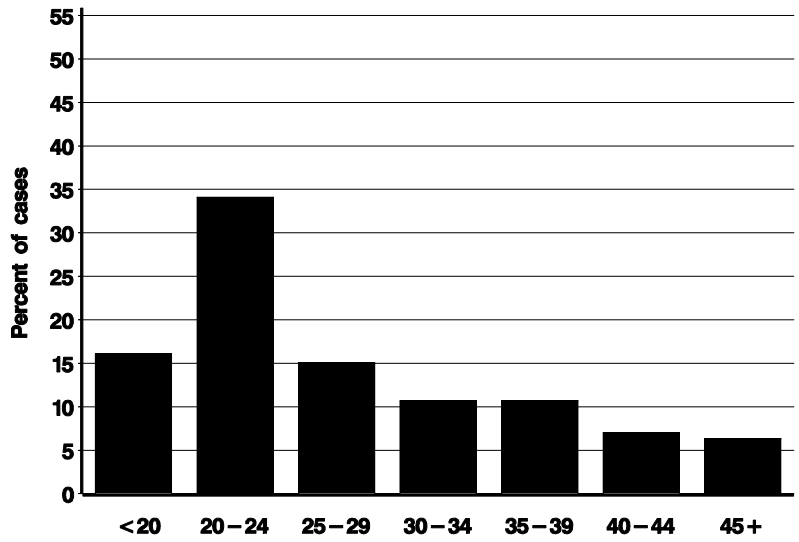


Figure B. Race/ethnicity of GISP participants, 2001

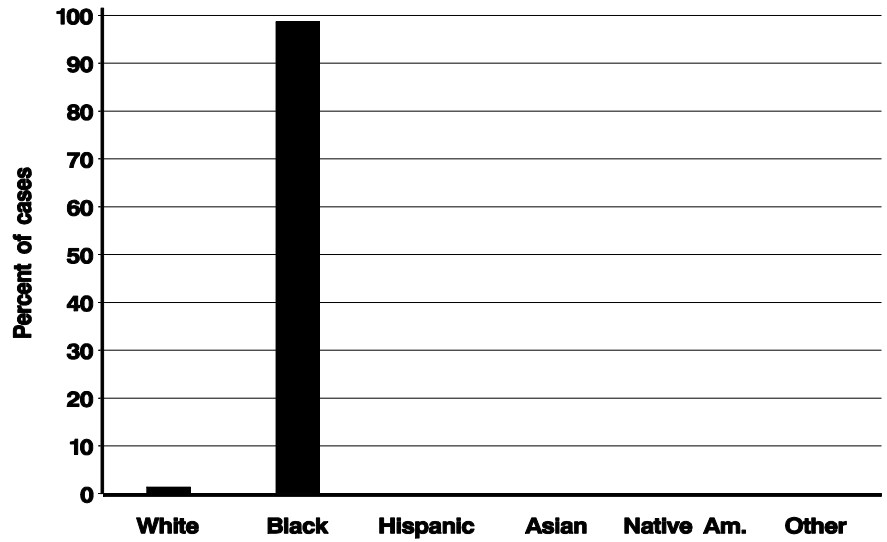


Figure C. Percentage of GISP participants identifying as men who have sex with men, 1988–2001

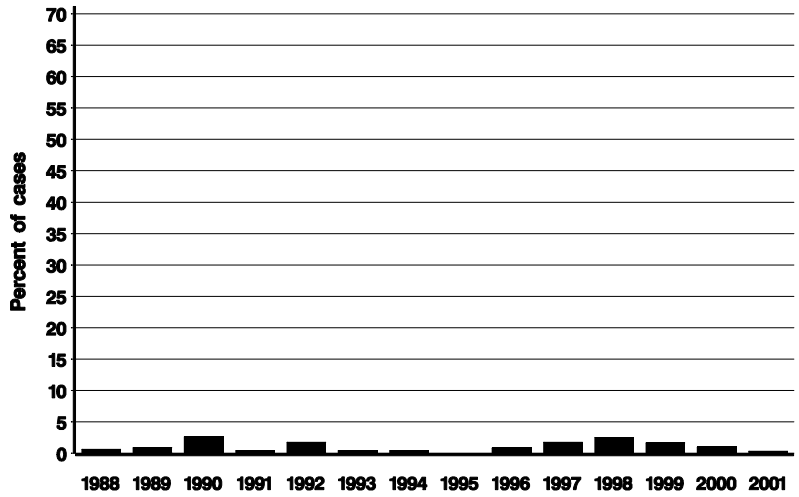
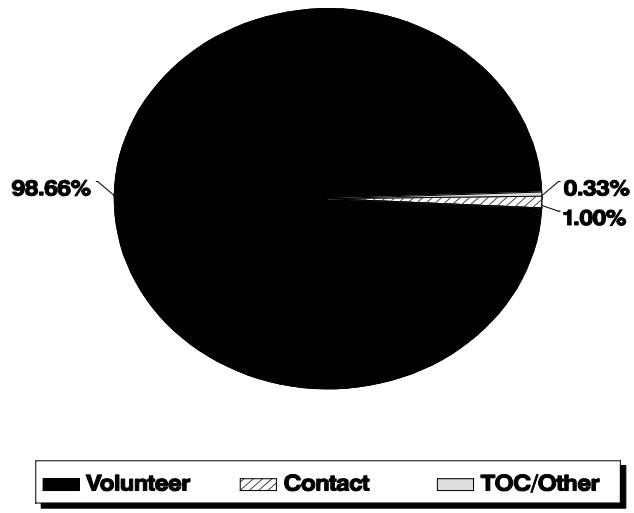
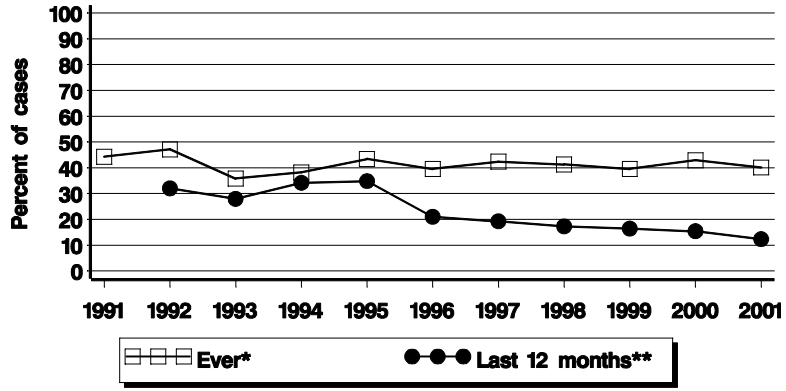


Figure D. Reason for visit among GISP participants, 2001



Birmingham, Alabama – 2001 (N=299)

Figure E. Previous episode of gonorrhea among GISP participants, 1991–2001



*Data first collected in 1991.
**Data first collected in 1992.
Note: Data points not shown when >30% data missing.

Figure F. Drugs used to treat gonorrhea among GISP participants, 2001

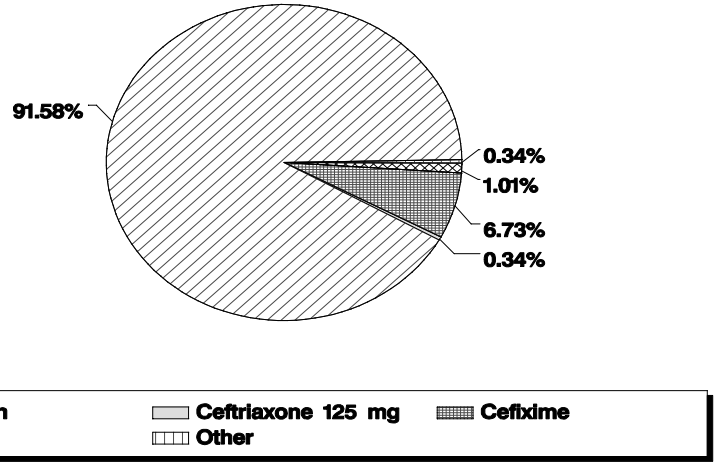


Figure G. Drugs used to treat *Chlamydia trachomatis* infection among GISP participants, 2001

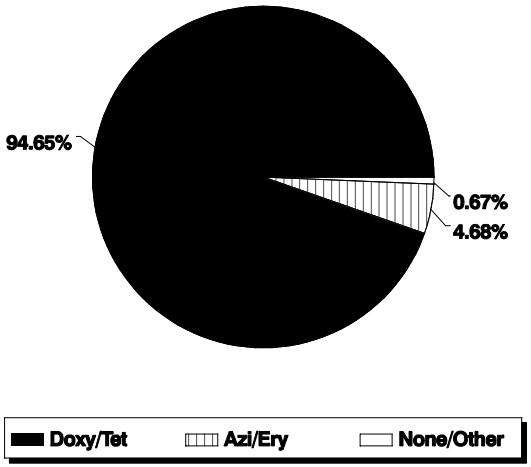
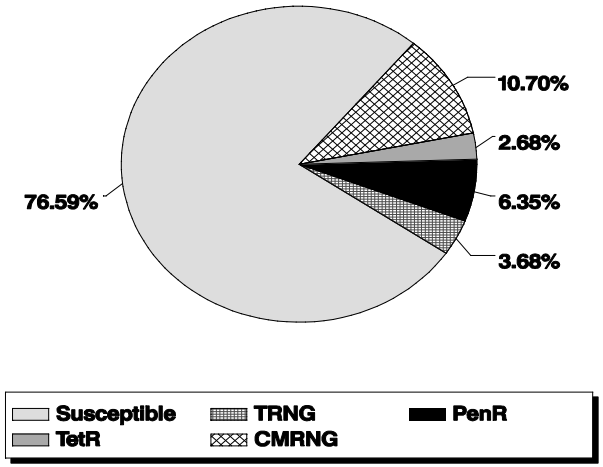


Figure H. Resistance to penicillin and tetracycline among GISP isolates, 2001



Birmingham, Alabama – 2001 (N=299)

Figure I. Decreased susceptibility to ceftriaxone among GISP isolates, 1988–2001

No isolates with decreased susceptibility to ceftriaxone have been identified at this clinic.

Figure J. Decreased susceptibility to cefixime among GISP isolates, 1992–2001

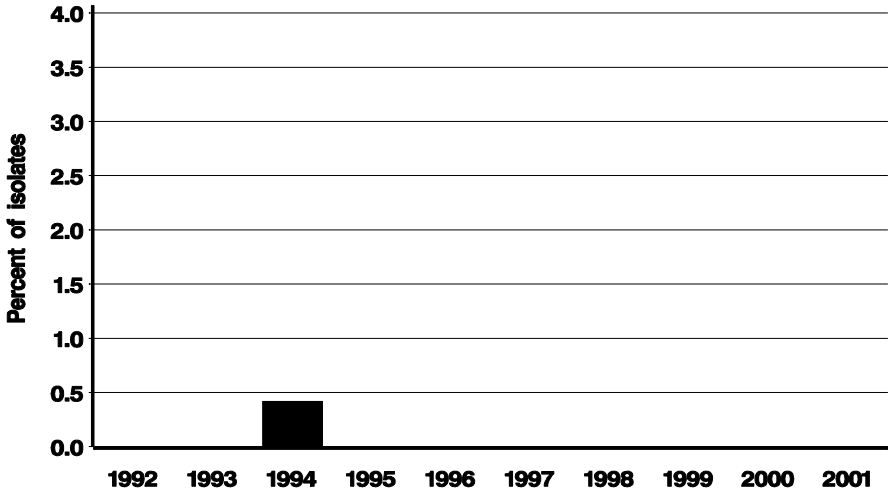
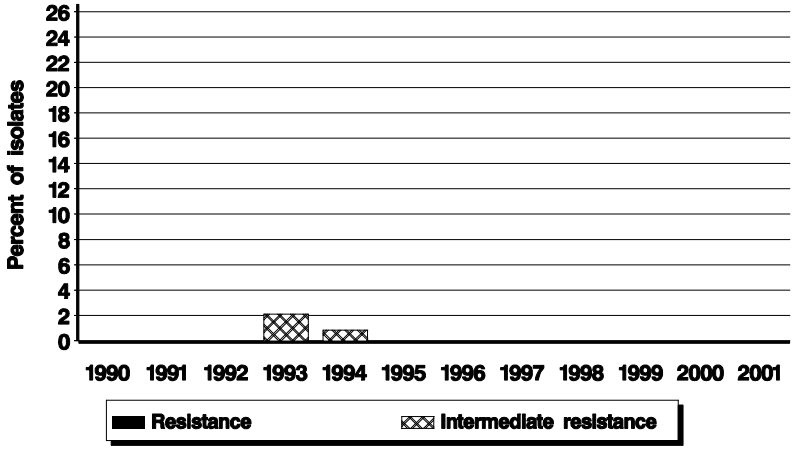
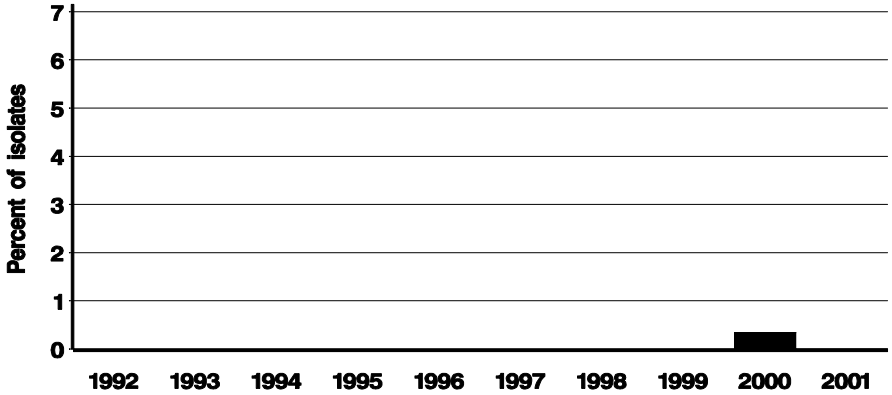


Figure K. Intermediate resistance and resistance to ciprofloxacin among GISP isolates, 1990–2001



Note: Susceptibility to ciprofloxacin first measured in 1990.

Figure L. Decreased susceptibility to azithromycin among GISP isolates, 1992–2001



Note: Susceptibility to azithromycin first measured in 1992.
Note: Decreased susceptibility to azithromycin is defined here as > or = 1.0 ug/ml. No NCCLS criteria currently exist.

Chicago, Illinois – 2001 (N=272)

Figure A. Age of GISP participants, in years, 2001

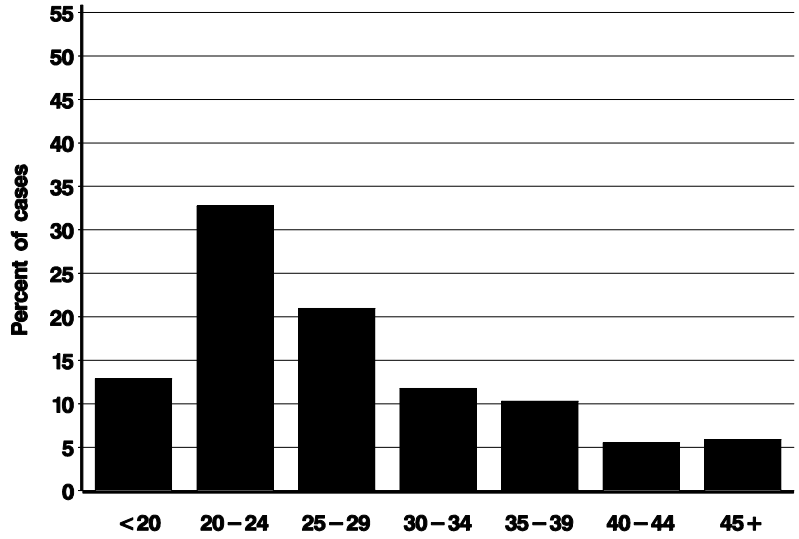


Figure B. Race/ethnicity of GISP participants, 2001

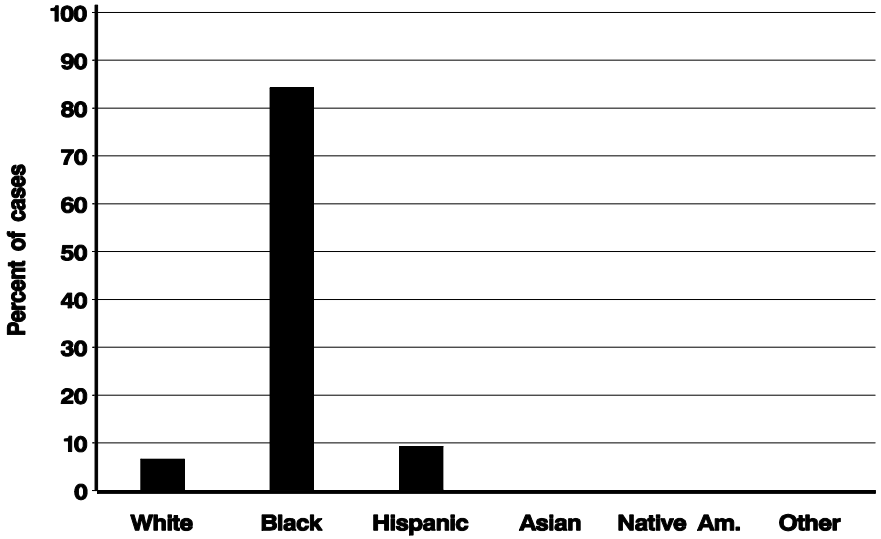


Figure C. Percentage of GISP participants identifying as men who have sex with men, 1988–2001

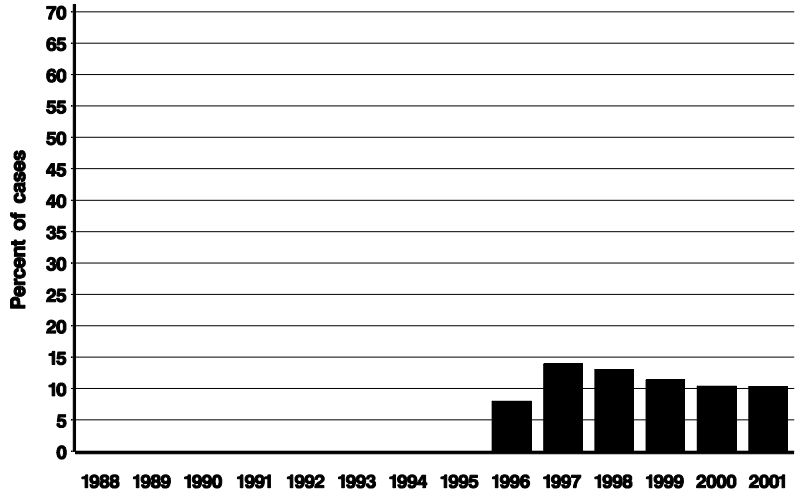
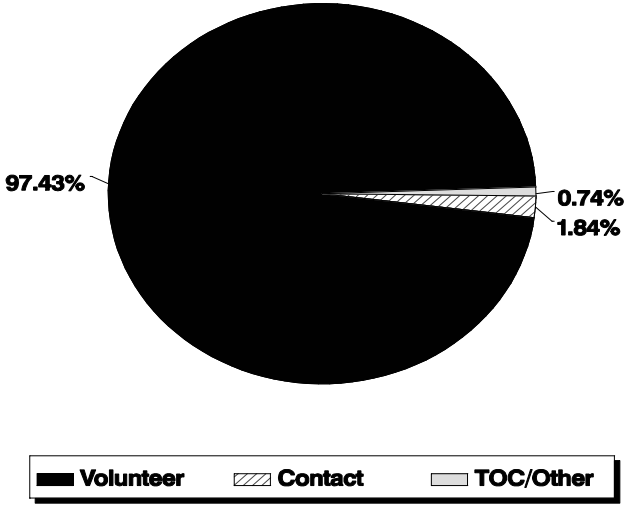
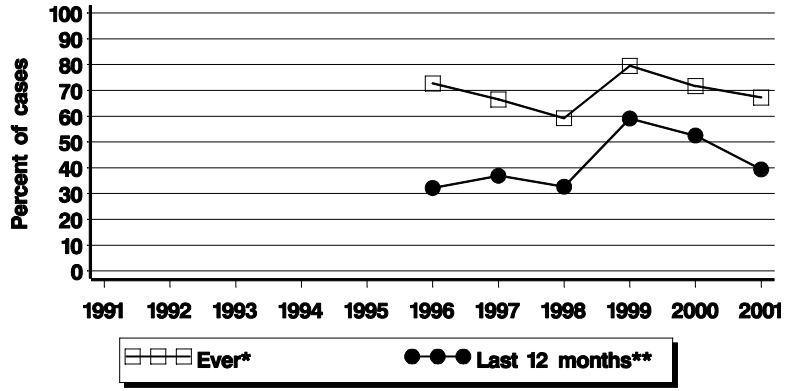


Figure D. Reason for visit among GISP participants, 2001



Chicago, Illinois – 2001 (N=272)

Figure E. Previous episode of gonorrhea among GISP participants, 1991–2001



*Data first collected in 1991.
**Data first collected in 1992.
Note: Data points not shown when >30% data missing.

Figure F. Drugs used to treat gonorrhea among GISP participants, 2001

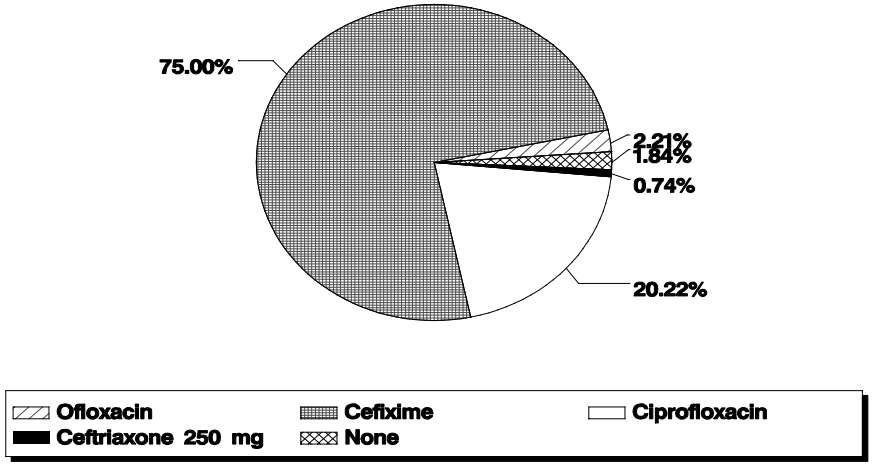


Figure G. Drugs used to treat *Chlamydia trachomatis* infection among GISP participants, 2001

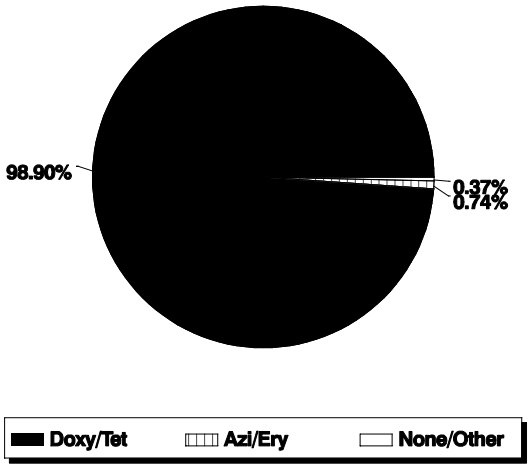
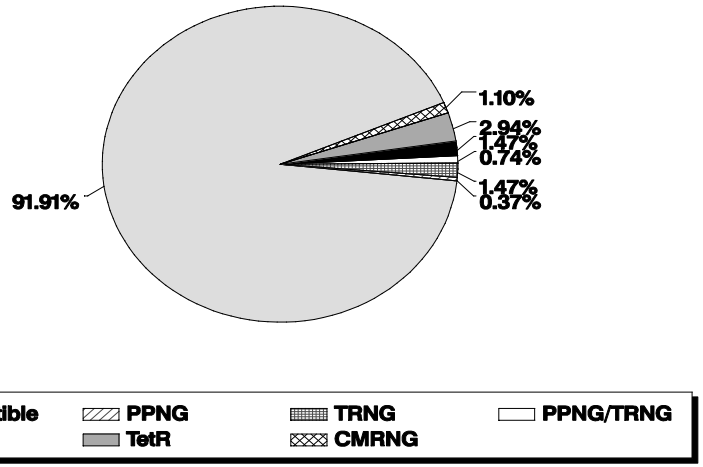


Figure H. Resistance to penicillin and tetracycline among GISP isolates, 2001



Chicago, Illinois – 2001 (N=272)

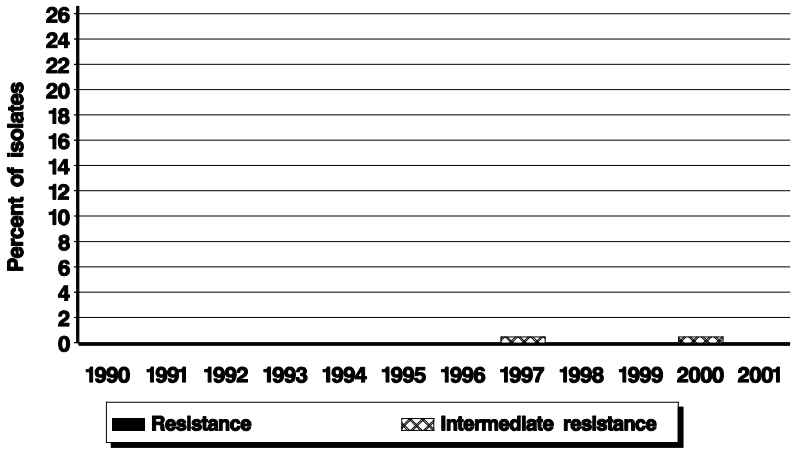
Figure I. Decreased susceptibility to ceftriaxone among GISP isolates, 1988–2001

No isolates with decreased susceptibility to ceftriaxone have been identified at this clinic.

Figure J. Decreased susceptibility to cefixime among GISP isolates, 1992–2001

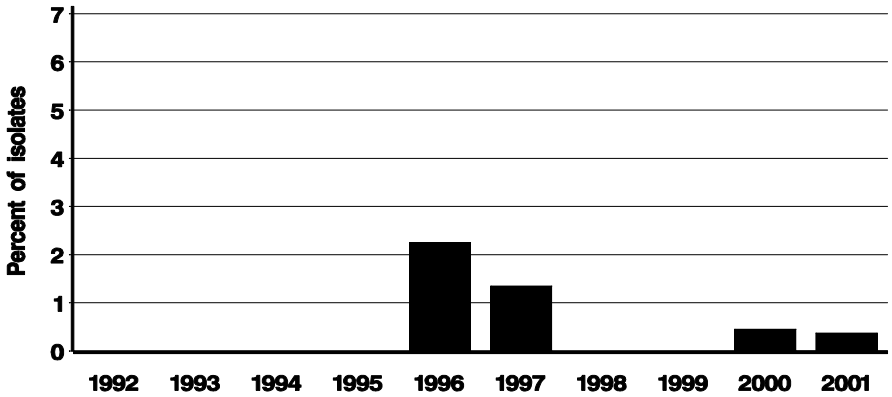
No isolates with decreased susceptibility to cefixime have been identified at this clinic.

Figure K. Intermediate resistance and resistance to ciprofloxacin among GISP isolates, 1990–2001



Note: Susceptibility to ciprofloxacin first measured in 1990.

Figure L. Decreased susceptibility to azithromycin among GISP isolates, 1992–2001



Note: Susceptibility to azithromycin first measured in 1992.
Note: Decreased susceptibility to azithromycin is defined here as > or = 1.0 ug/ml. No NCCLS criteria currently exist.

Cincinnati, Ohio – 2001 (N=264)

Figure A. Age of GISP participants, in years, 2001

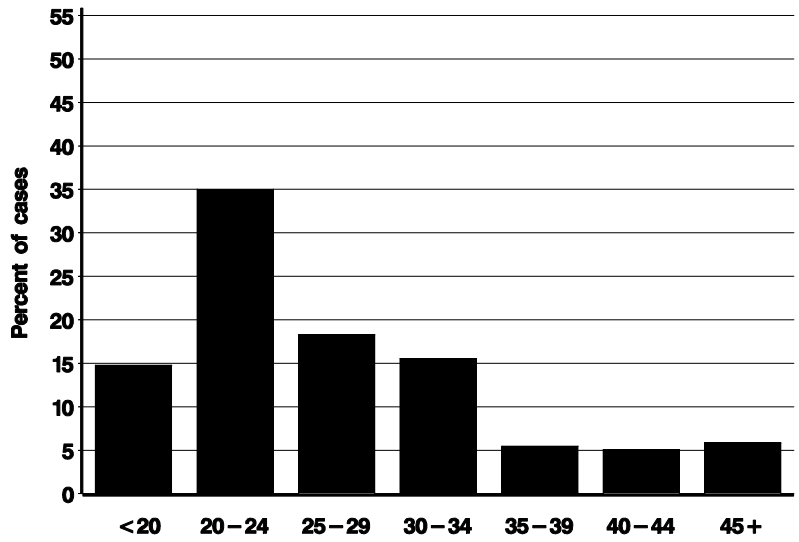


Figure B. Race/ethnicity of GISP participants, 2001

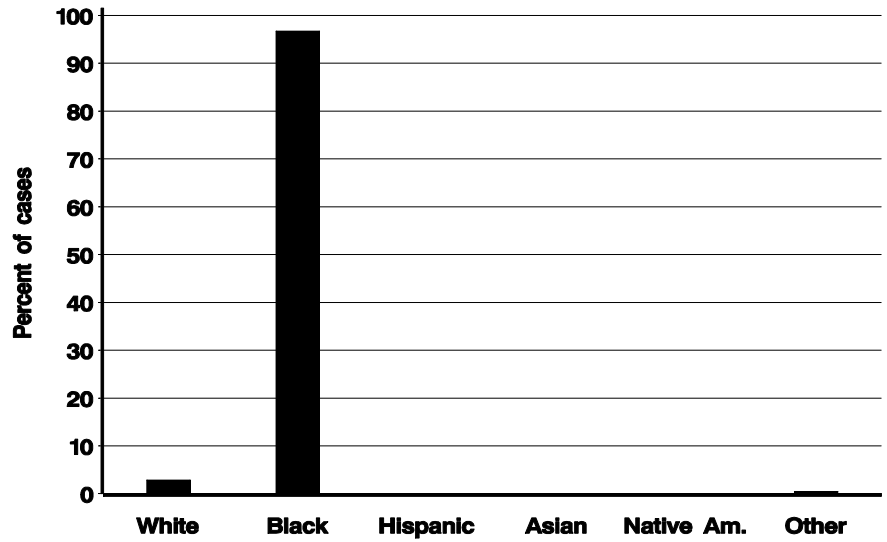


Figure C. Percentage of GISP participants identifying as men who have sex with men, 1988–2001

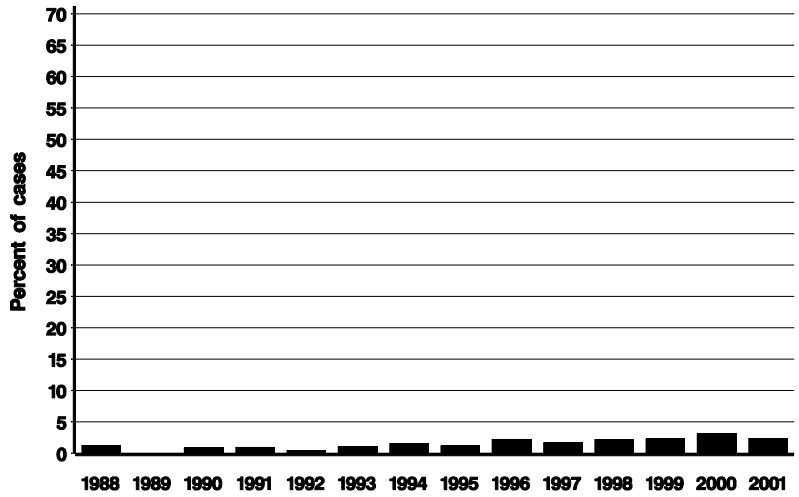
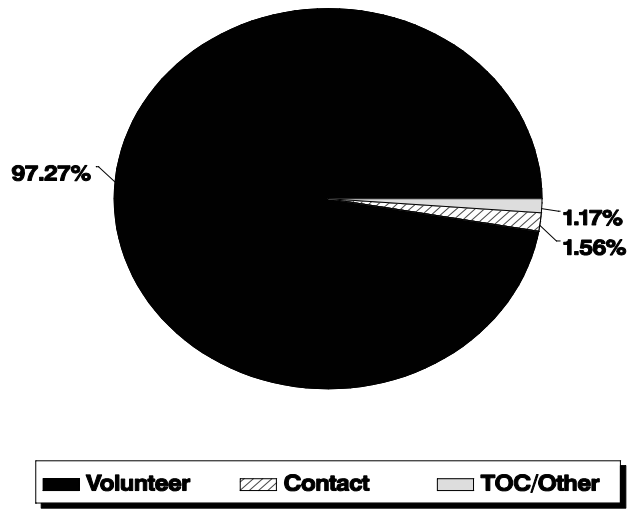
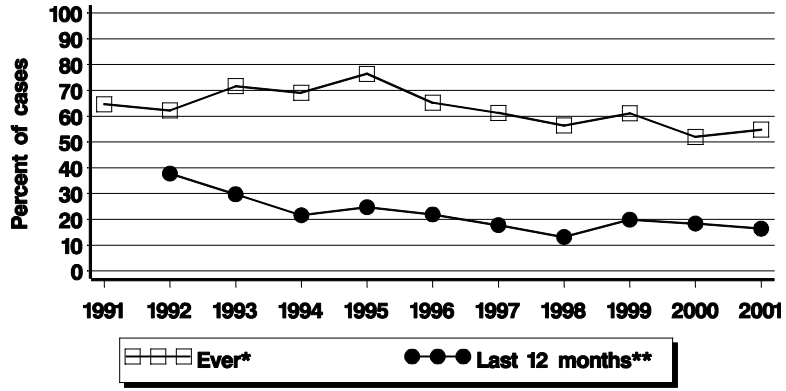


Figure D. Reason for visit among GISP participants, 2001



Cincinnati, Ohio – 2001 (N=264)

Figure E. Previous episode of gonorrhea among GISP participants, 1991–2001



*Data first collected in 1991.
**Data first collected in 1992.
Note: Data points not shown when >30% data missing.

Figure F. Drugs used to treat gonorrhea among GISP participants, 2001

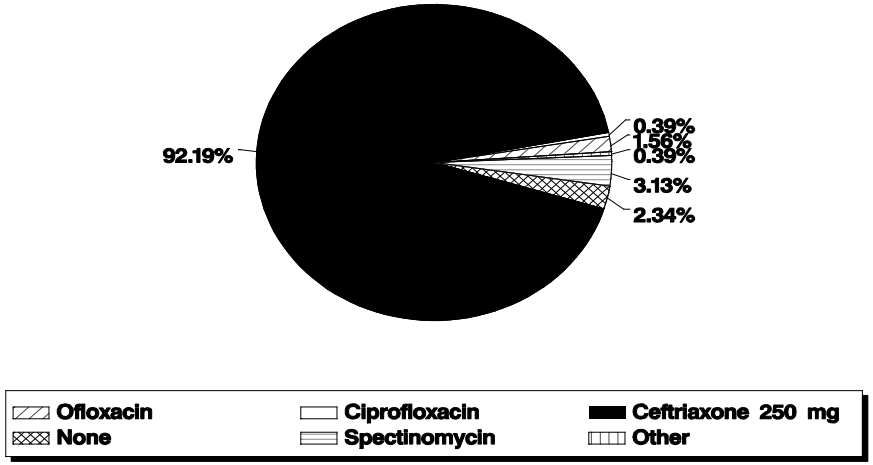


Figure G. Drugs used to treat *Chlamydia trachomatis* infection among GISP participants, 2001

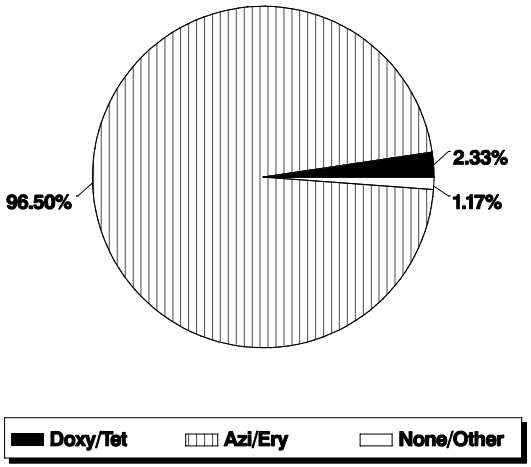
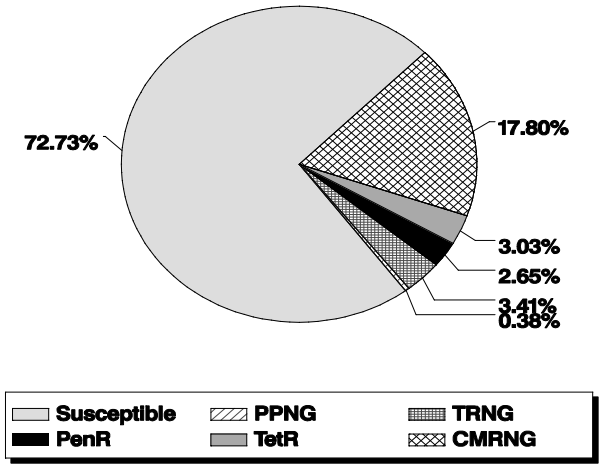


Figure H. Resistance to penicillin and tetracycline among GISP isolates, 2001



Cincinnati, Ohio – 2001 (N=264)

Figure I. Decreased susceptibility to ceftriaxone among GISP isolates, 1988–2001

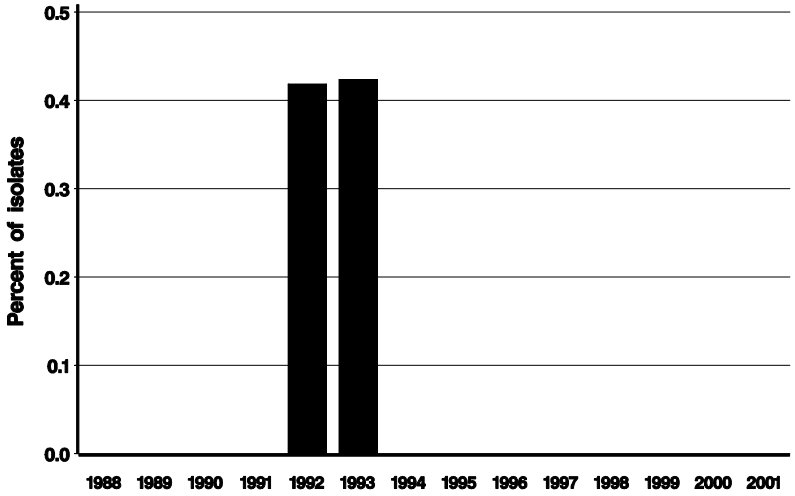


Figure J. Decreased susceptibility to cefixime among GISP isolates, 1992–2001

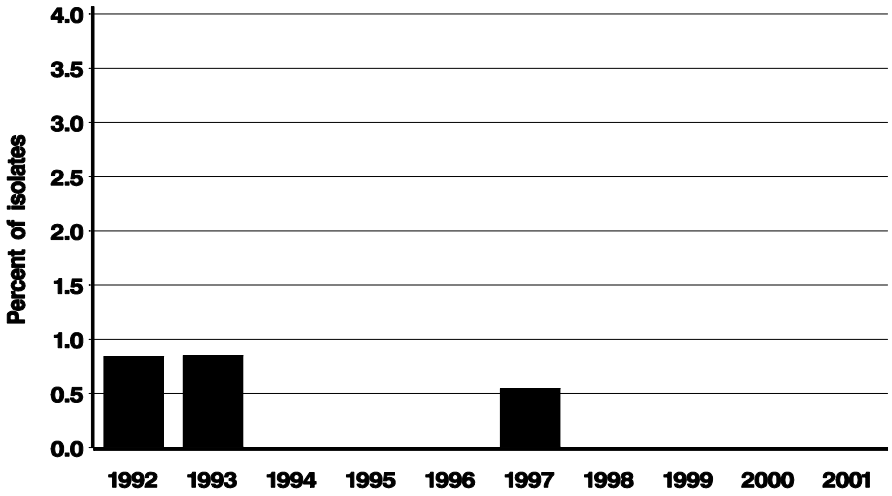
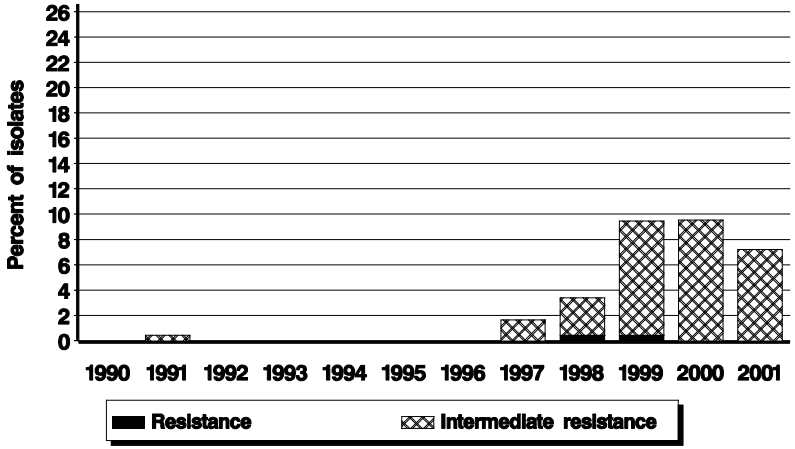
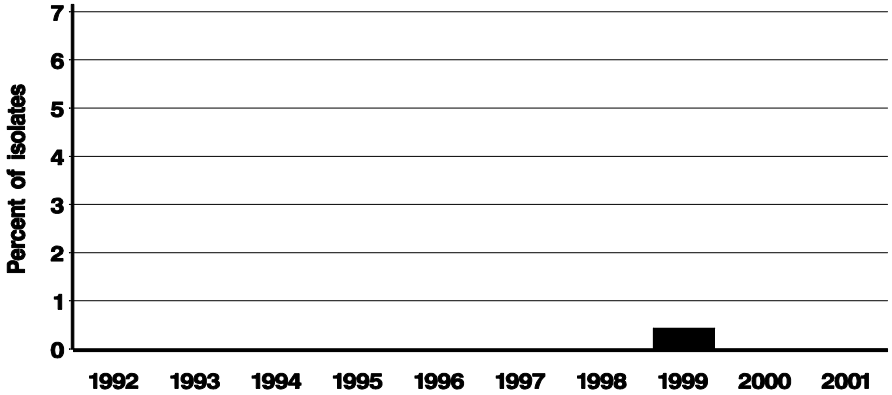


Figure K. Intermediate resistance and resistance to ciprofloxacin among GISP isolates, 1990–2001



Note: Susceptibility to ciprofloxacin first measured in 1990.

Figure L. Decreased susceptibility to azithromycin among GISP isolates, 1992–2001



Note: Susceptibility to azithromycin first measured in 1992.
Note: Decreased susceptibility to azithromycin is defined here as > or = 1.0 ug/ml. No NCCLS criteria currently exist.

Cleveland, Ohio – 2001 (N=270)

Figure A. Age of GISP participants, in years, 2001

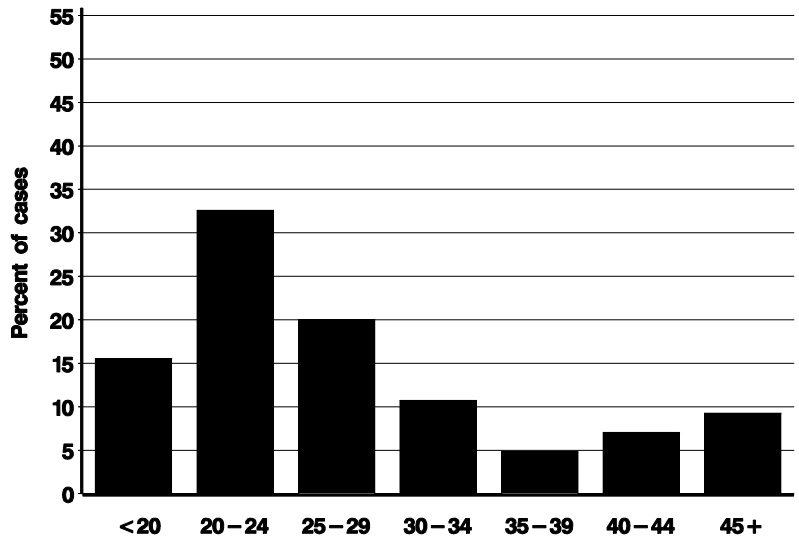


Figure B. Race/ethnicity of GISP participants, 2001

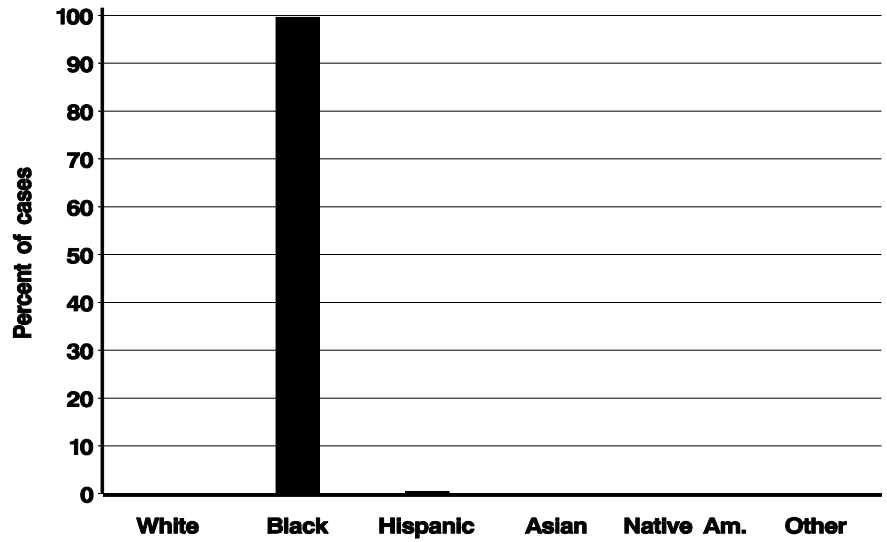


Figure C. Percentage of GISP participants identifying as men who have sex with men, 1988–2001

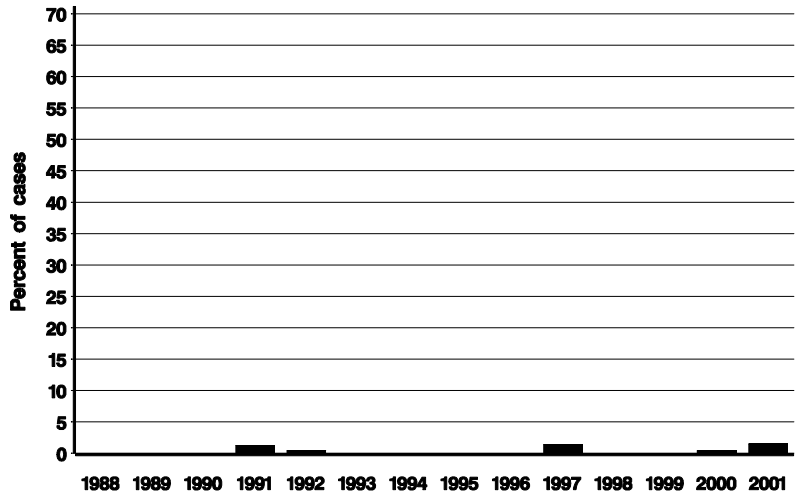
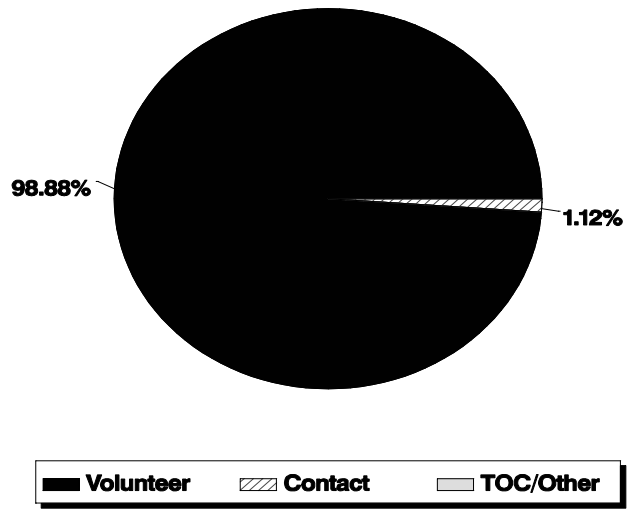
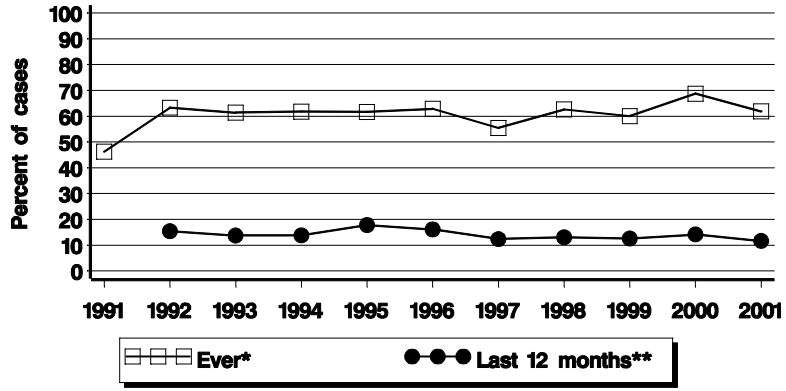


Figure D. Reason for visit among GISP participants, 2001



Cleveland, Ohio – 2001 (N=270)

Figure E. Previous episode of gonorrhea among GISP participants, 1991–2001



*Data first collected in 1991.
**Data first collected in 1992.
Note: Data points not shown when >30% data missing.

Figure F. Drugs used to treat gonorrhea among GISP participants, 2001

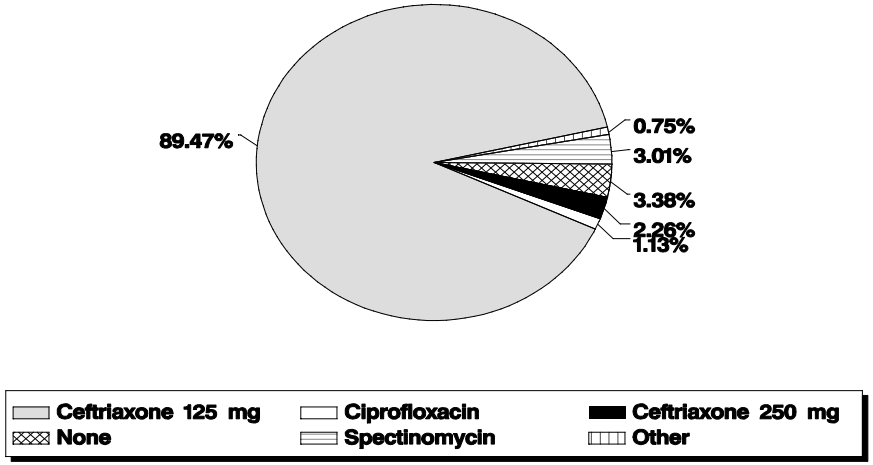


Figure G. Drugs used to treat *Chlamydia trachomatis* infection among GISP participants, 2001

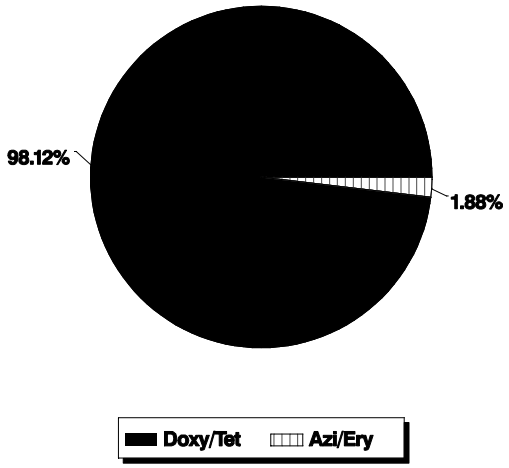
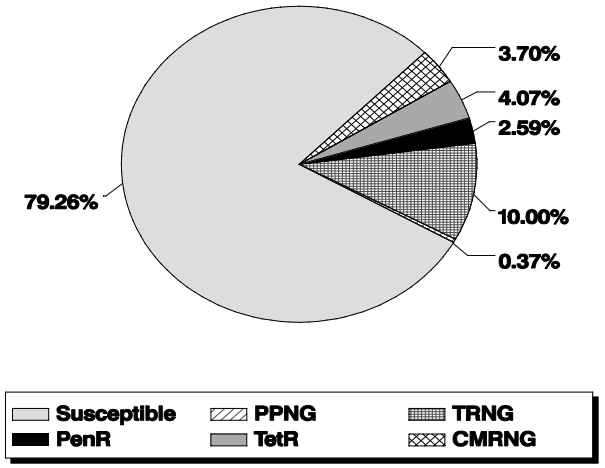


Figure H. Resistance to penicillin and tetracycline among GISP isolates, 2001



Cleveland, Ohio – 2001 (N=270)

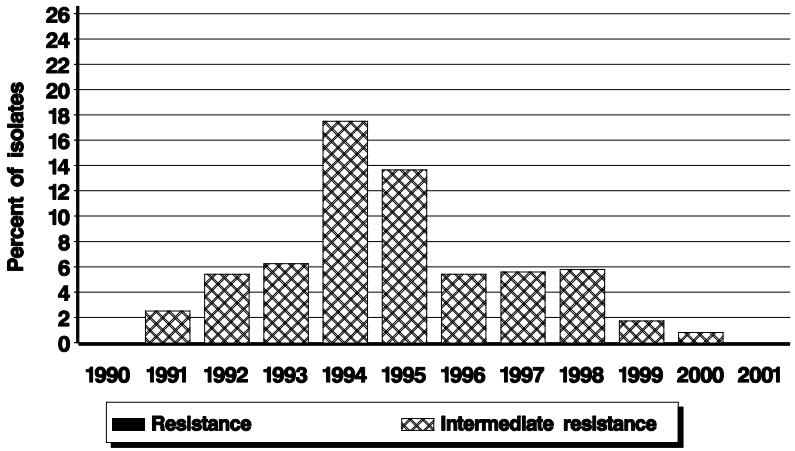
Figure I. Decreased susceptibility to ceftriaxone among GISP isolates, 1988–2001

No isolates with decreased susceptibility to ceftriaxone have been identified at this clinic.

Figure J. Decreased susceptibility to cefixime among GISP isolates, 1992–2001

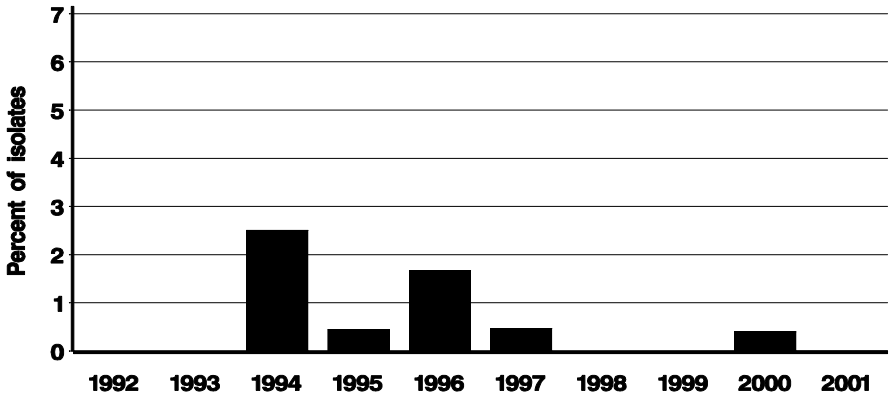
No isolates with decreased susceptibility to cefixime have been identified at this clinic.

Figure K. Intermediate resistance and resistance to ciprofloxacin among GISP isolates, 1990–2001



Note: Susceptibility to ciprofloxacin first measured in 1990.

Figure L. Decreased susceptibility to azithromycin among GISP isolates, 1992–2001



Note: Susceptibility to azithromycin first measured in 1992.
Note: Decreased susceptibility to azithromycin is defined here as > or = 1.0 ug/ml. No NCCLS criteria currently exist.

Dallas, Texas – 2001 (N=297)

Figure A. Age of GISP participants, in years, 2001

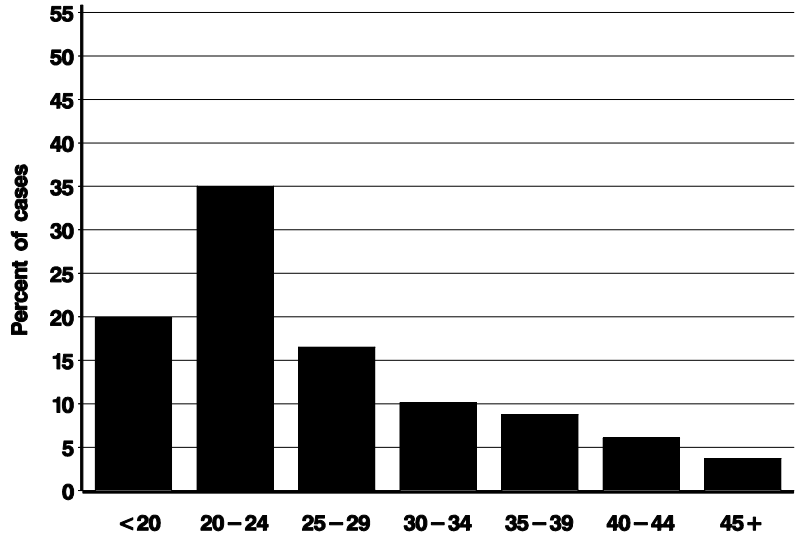


Figure B. Race/ethnicity of GISP participants, 2001

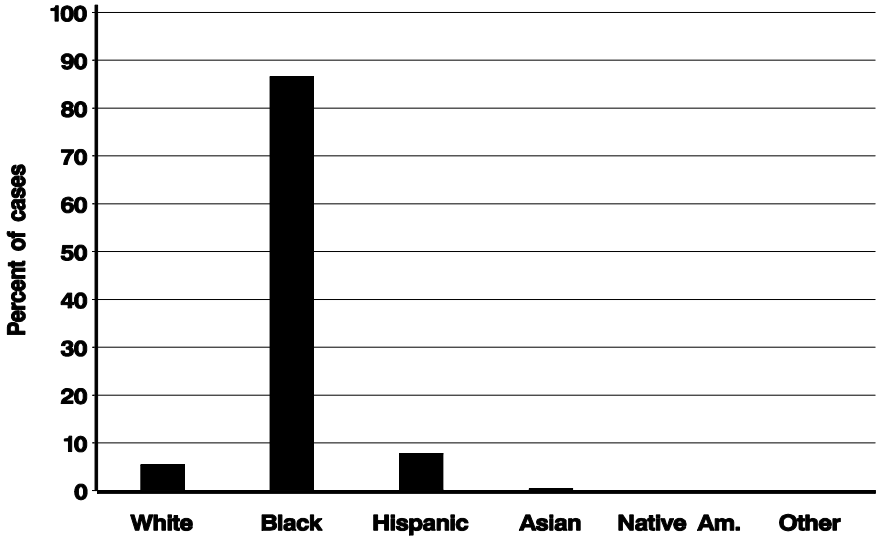


Figure C. Percentage of GISP participants identifying as men who have sex with men, 1988–2001

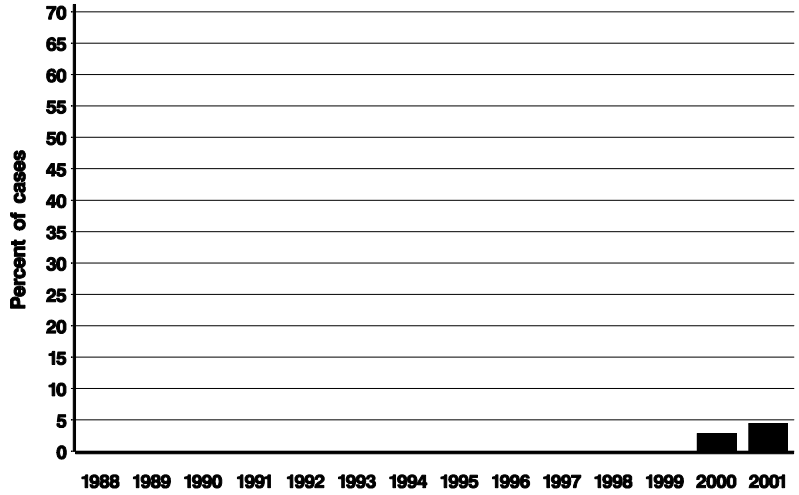
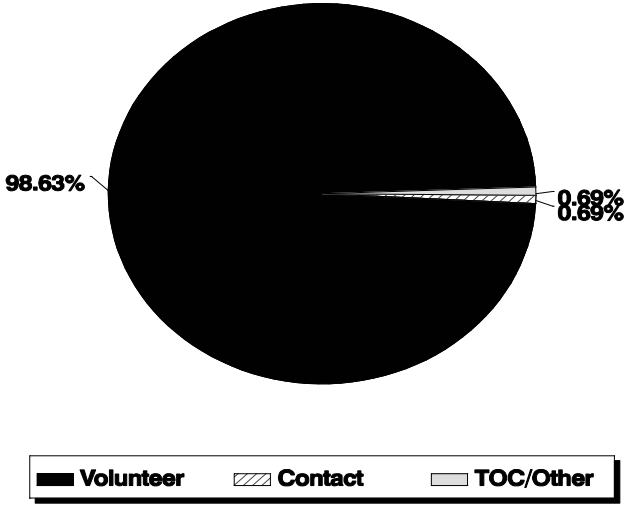
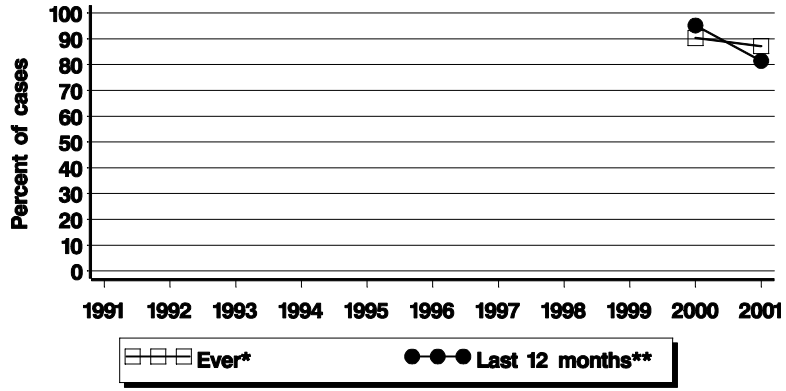


Figure D. Reason for visit among GISP participants, 2001



Dallas, Texas – 2001 (N=297)

Figure E. Previous episode of gonorrhea among GISP participants, 1991–2001



*Data first collected in 1991.
**Data first collected in 1992.
Note: Data points not shown when >30% data missing.

Figure F. Drugs used to treat gonorrhea among GISP participants, 2001

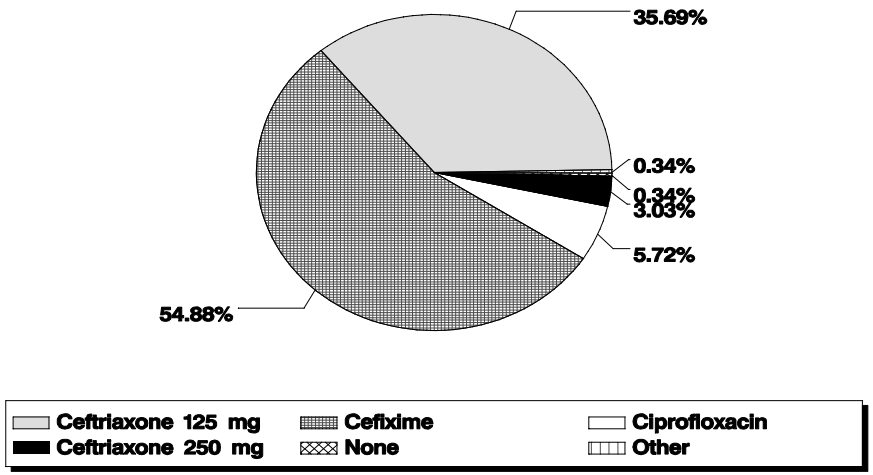


Figure G. Drugs used to treat *Chlamydia trachomatis* infection among GISP participants, 2001

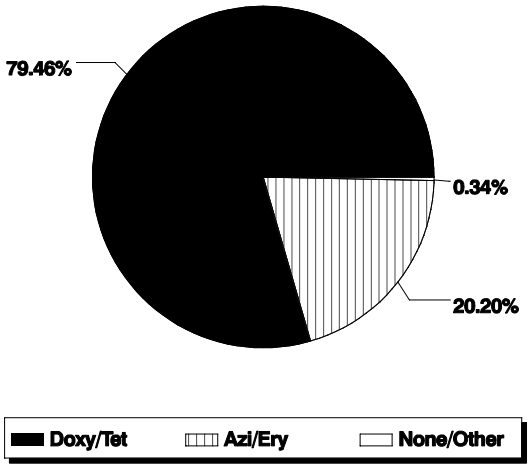
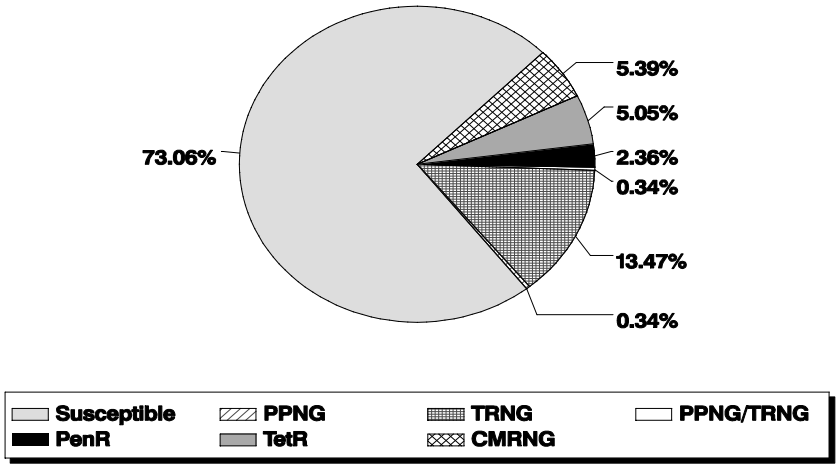


Figure H. Resistance to penicillin and tetracycline among GISP isolates, 2001



Dallas, Texas – 2001 (N=297)

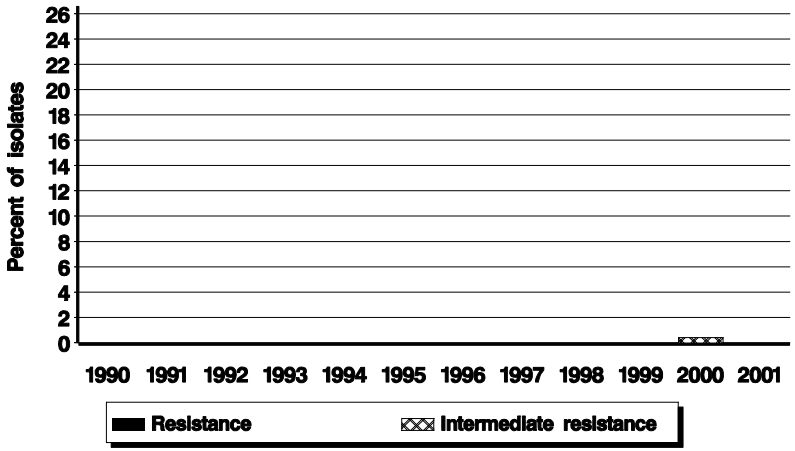
Figure I. Decreased susceptibility to ceftriaxone among GISP isolates, 1988–2001

No isolates with decreased susceptibility to ceftriaxone have been identified at this clinic.

Figure J. Decreased susceptibility to cefixime among GISP isolates, 1992–2001

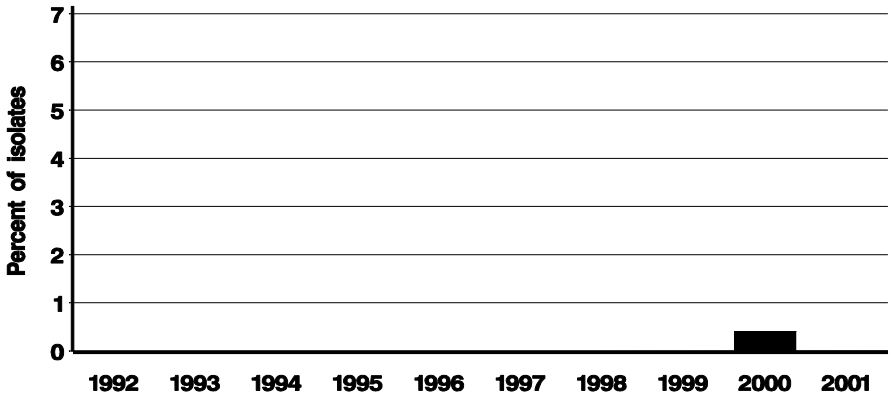
No isolates with decreased susceptibility to cefixime have been identified at this clinic.

Figure K. Intermediate resistance and resistance to ciprofloxacin among GISP isolates, 1990–2001



Note: Susceptibility to ciprofloxacin first measured in 1990.

Figure L. Decreased susceptibility to azithromycin among GISP isolates, 1992–2001



Note: Susceptibility to azithromycin first measured in 1992.
Note: Decreased susceptibility to azithromycin is defined here as > or = 1.0 ug/ml. No NCCLS criteria currently exist.

Denver, Colorado – 2001 (N=299)

Figure A. Age of GISP participants, in years, 2001

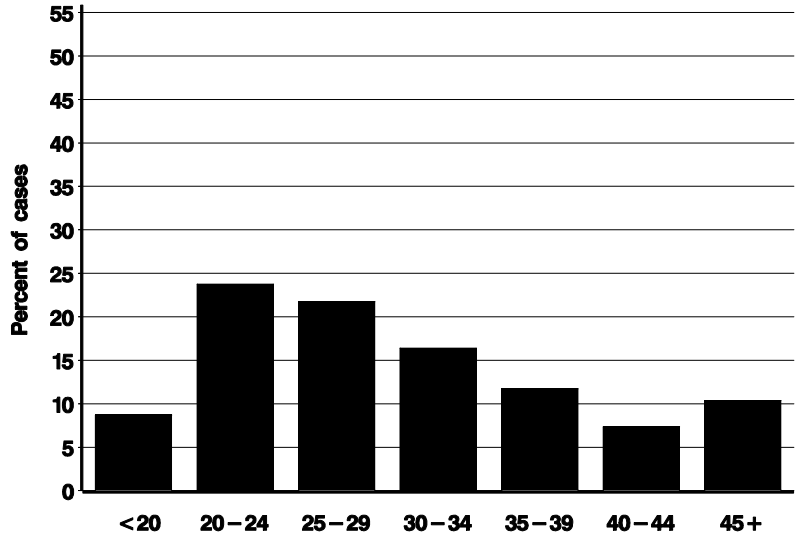


Figure B. Race/ethnicity of GISP participants, 2001

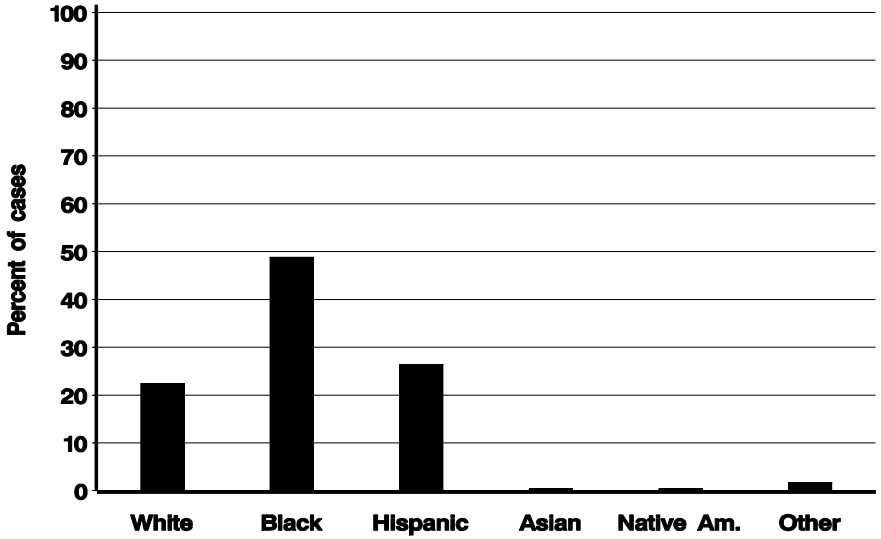


Figure C. Percentage of GISP participants identifying as men who have sex with men, 1988–2001

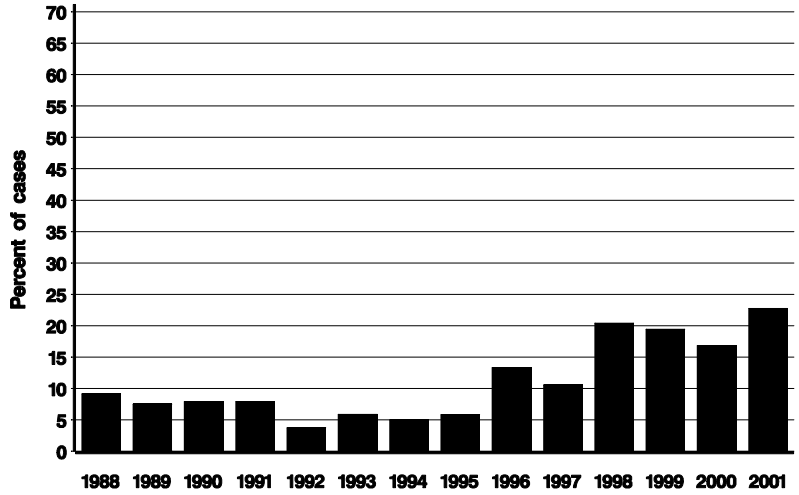
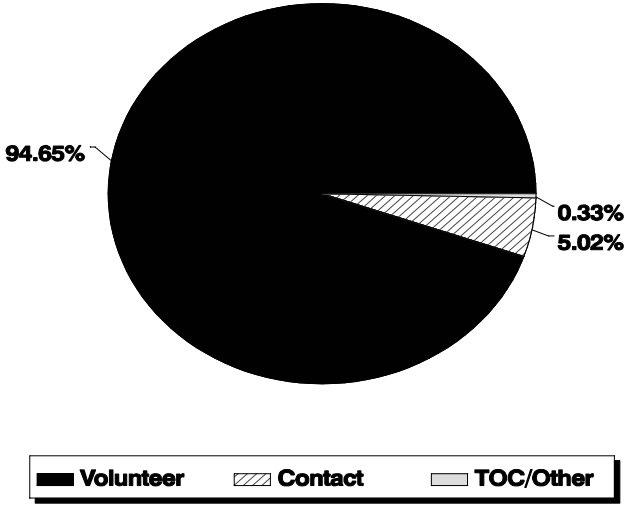
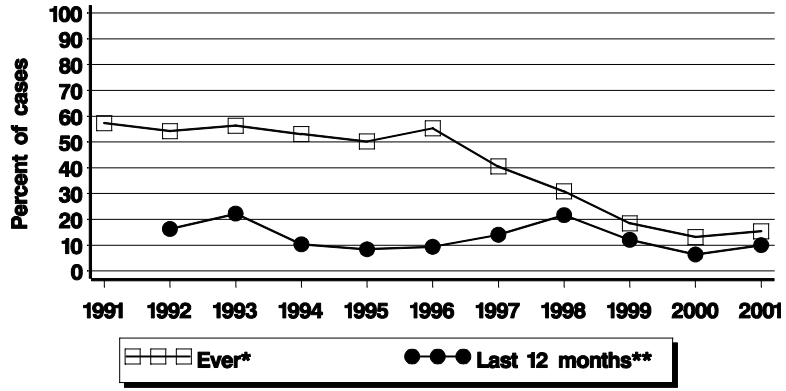


Figure D. Reason for visit among GISP participants, 2001



Denver, Colorado – 2001 (N=299)

Figure E. Previous episode of gonorrhea among GISP participants, 1991–2001



*Data first collected in 1991.
**Data first collected in 1992.
Note: Data points not shown when >30% data missing.

Figure F. Drugs used to treat gonorrhea among GISP participants, 2001

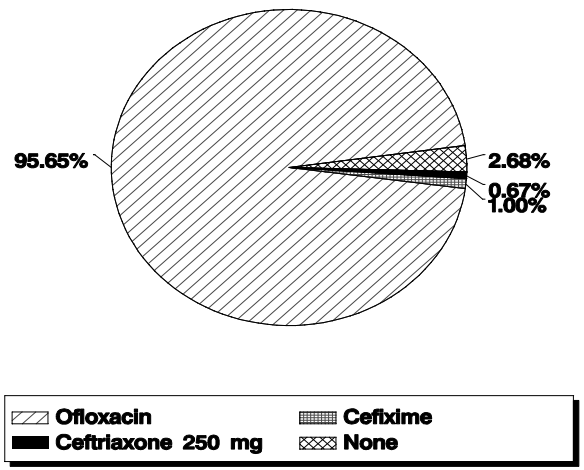


Figure G. Drugs used to treat *Chlamydia trachomatis* infection among GISP participants, 2001

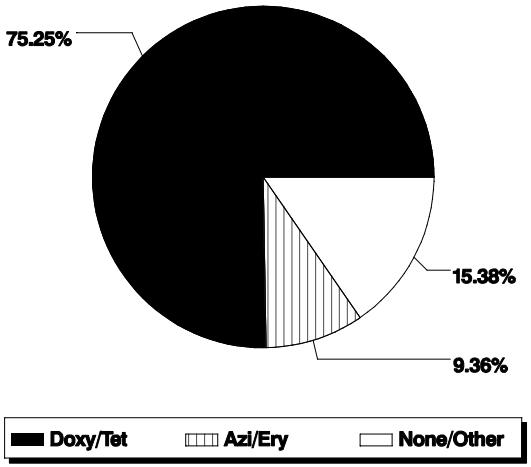
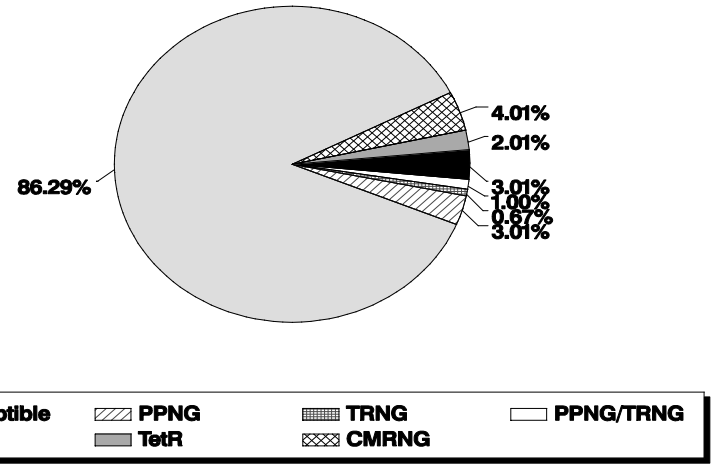


Figure H. Resistance to penicillin and tetracycline among GISP isolates, 2001



Denver, Colorado – 2001 (N=299)

Figure I. Decreased susceptibility to ceftriaxone among GISP isolates, 1988–2001

No isolates with decreased susceptibility to ceftriaxone have been identified at this clinic.

Figure J. Decreased susceptibility to cefixime among GISP isolates, 1992–2001

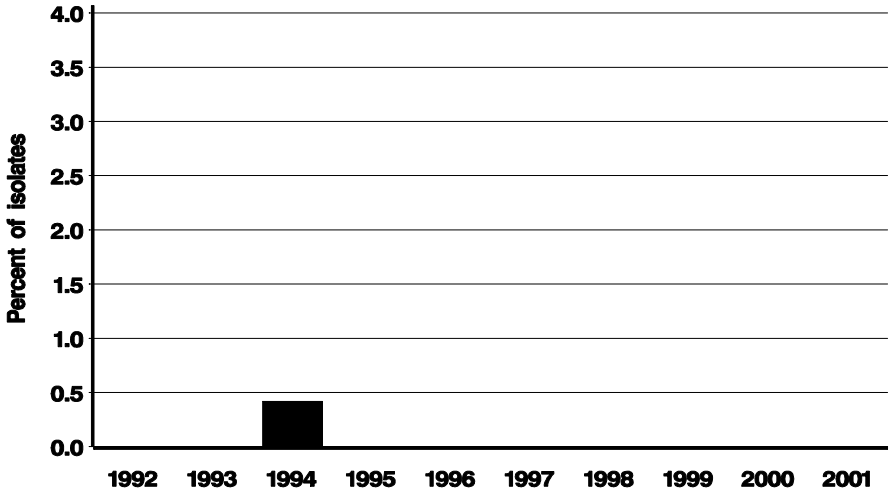
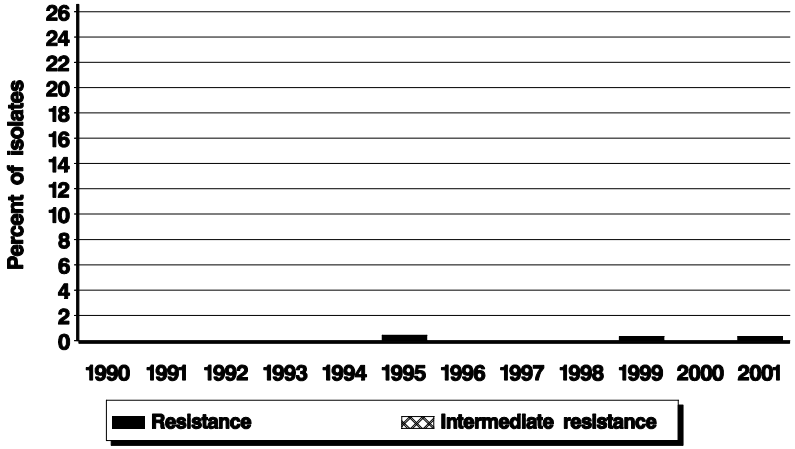
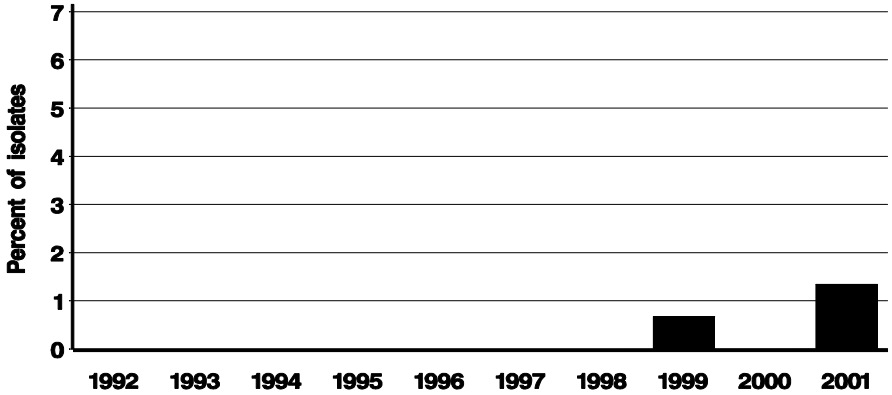


Figure K. Intermediate resistance and resistance to ciprofloxacin among GISP isolates, 1990–2001



Note: Susceptibility to ciprofloxacin first measured in 1990.

Figure L. Decreased susceptibility to azithromycin among GISP isolates, 1992–2001



Note: Susceptibility to azithromycin first measured in 1992.
Note: Decreased susceptibility to azithromycin is defined here as > or = 1.0 ug/ml. No NCCLS criteria currently exist.

Fort Bragg, North Carolina – 2001 (N=95)

Figure A. Age of GISP participants, in years, 2001

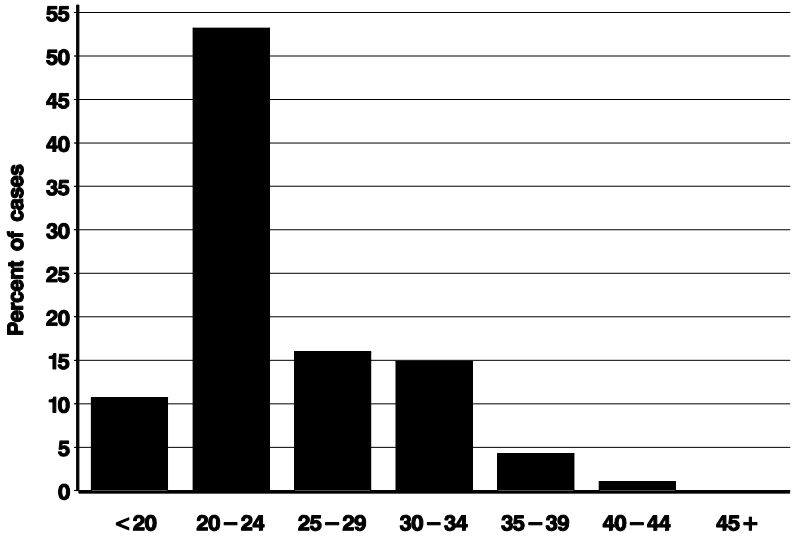


Figure B. Race/ethnicity of GISP participants, 2001

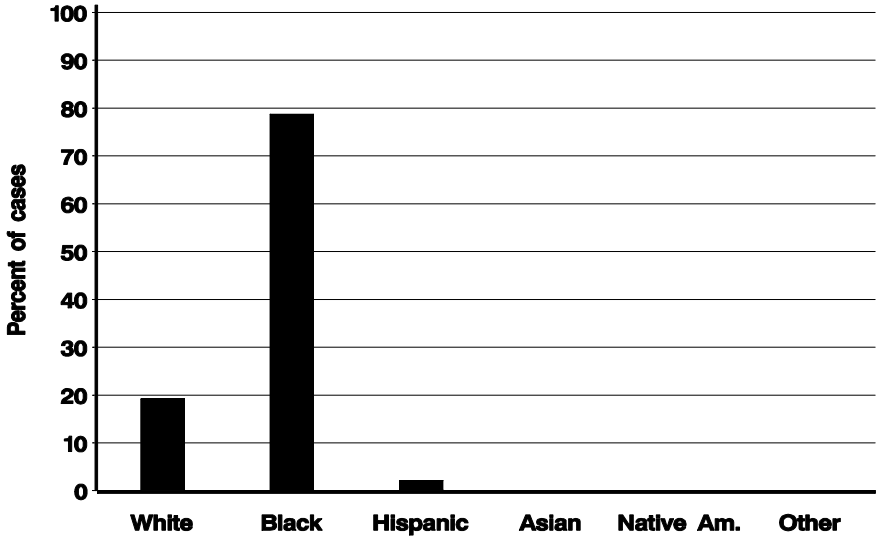
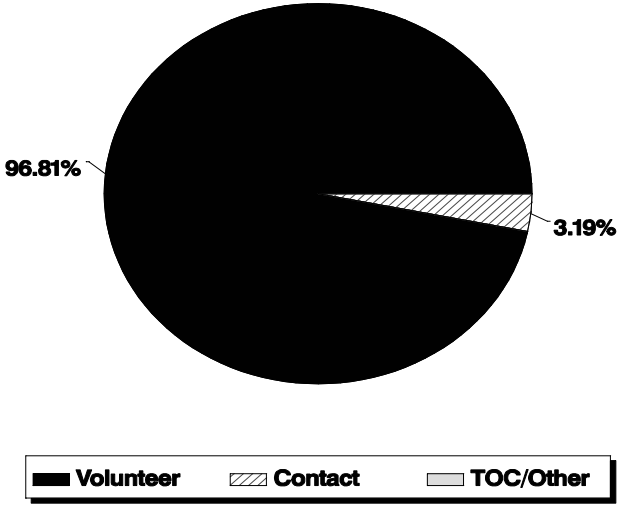


Figure C. Percentage of GISP participants identifying as men who have sex with men, 1988–2001

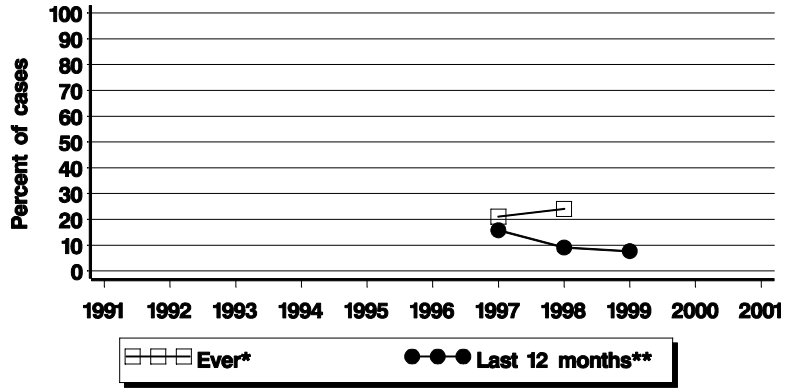
Data not collected

Figure D. Reason for visit among GISP participants, 2001



Fort Bragg, North Carolina – 2001 (N=95)

Figure E. Previous episode of gonorrhea among GISP participants, 1991–2001



*Data first collected in 1991.
**Data first collected in 1992.
Note: Data points not shown when >30% data missing.

Figure F. Drugs used to treat gonorrhea among GISP participants, 2001

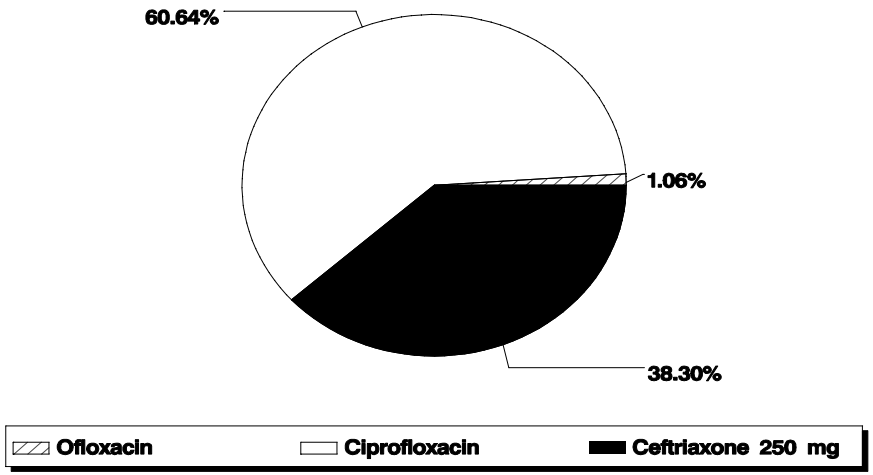


Figure G. Drugs used to treat *Chlamydia trachomatis* infection among GISP participants, 2001

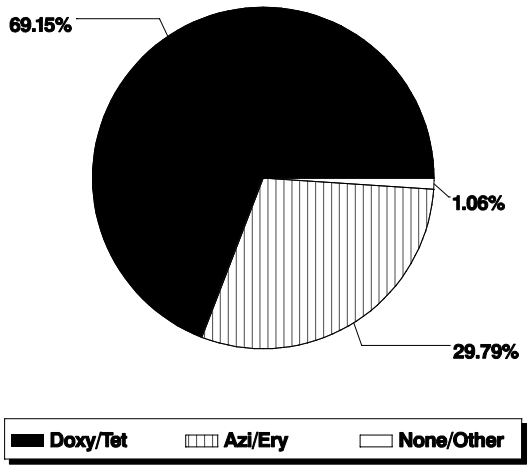
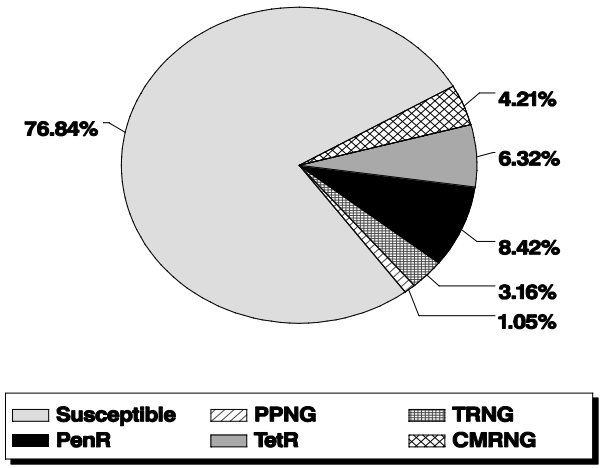


Figure H. Resistance to penicillin and tetracycline among GISP isolates, 2001



Fort Bragg, North Carolina – 2001 (N=95)

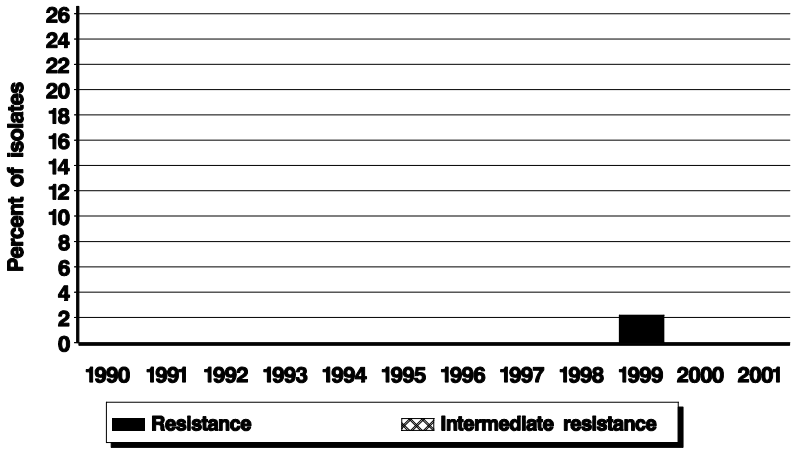
Figure I. Decreased susceptibility to ceftriaxone among GISP isolates, 1988–2001

No isolates with decreased susceptibility to ceftriaxone have been identified at this clinic.

Figure J. Decreased susceptibility to cefixime among GISP isolates, 1992–2001

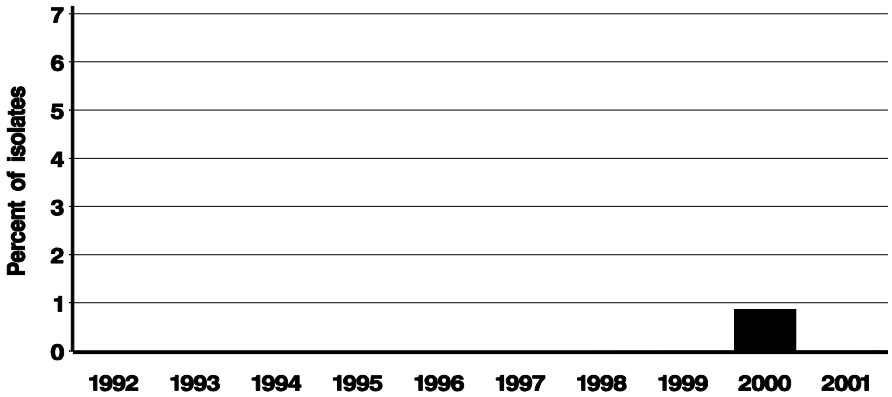
No isolates with decreased susceptibility to cefixime have been identified at this clinic.

Figure K. Intermediate resistance and resistance to ciprofloxacin among GISP isolates, 1990–2001



Note: Susceptibility to ciprofloxacin first measured in 1990.

Figure L. Decreased susceptibility to azithromycin among GISP isolates, 1992–2001



Note: Susceptibility to azithromycin first measured in 1992.
Note: Decreased susceptibility to azithromycin is defined here as > or = 1.0 ug/ml. No NCCLS criteria currently exist.

Honolulu, Hawaii – 2001 (N=79)

Figure A. Age of GISP participants, in years, 2001

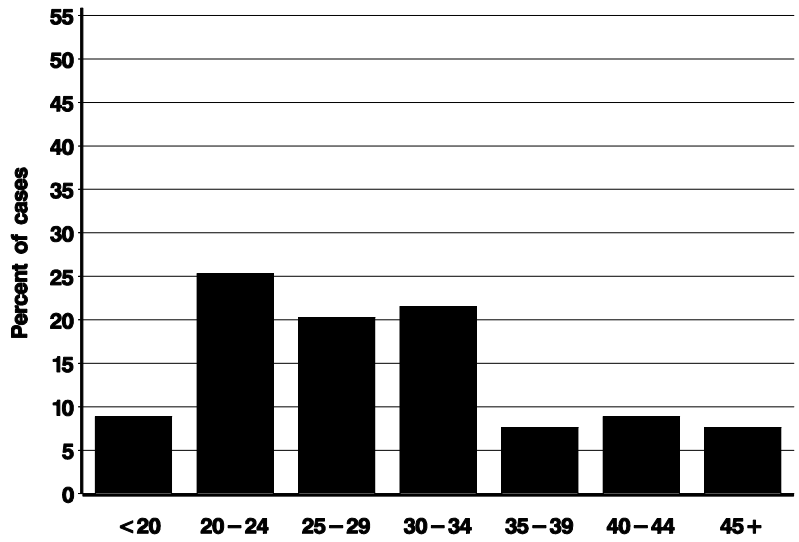


Figure B. Race/ethnicity of GISP participants, 2001

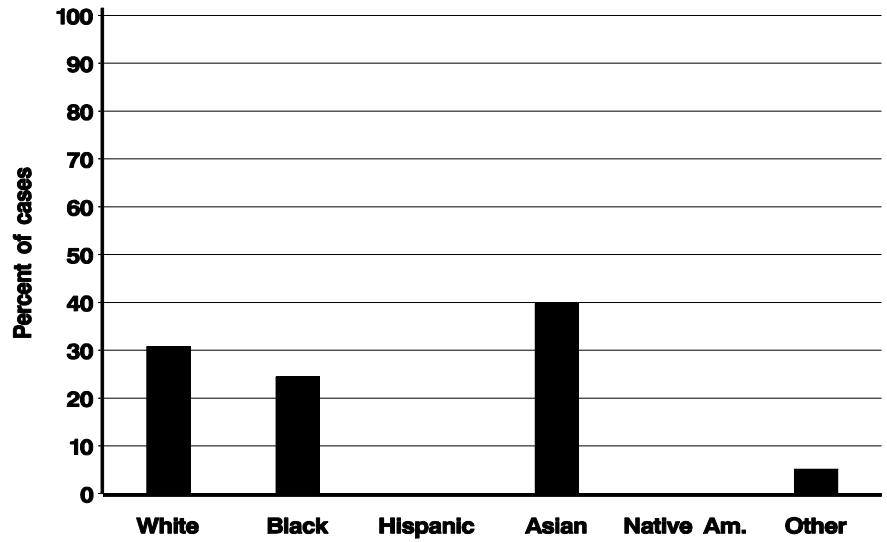


Figure C. Percentage of GISP participants identifying as men who have sex with men, 1988–2001

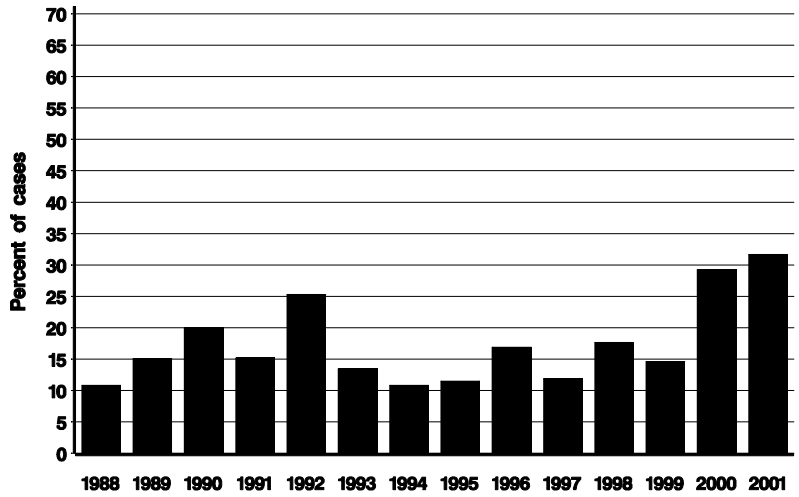
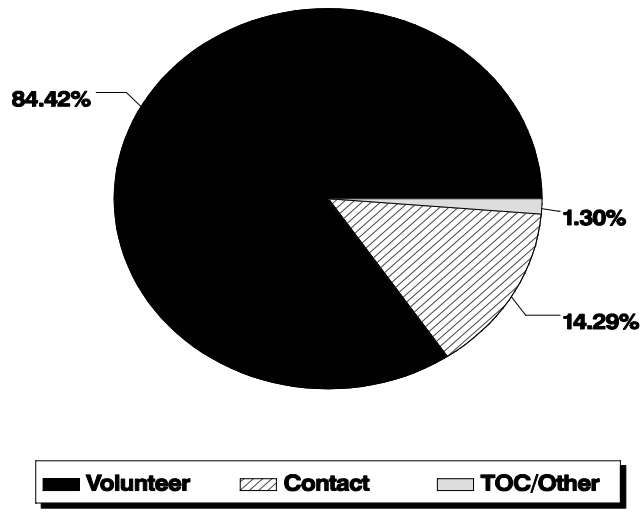
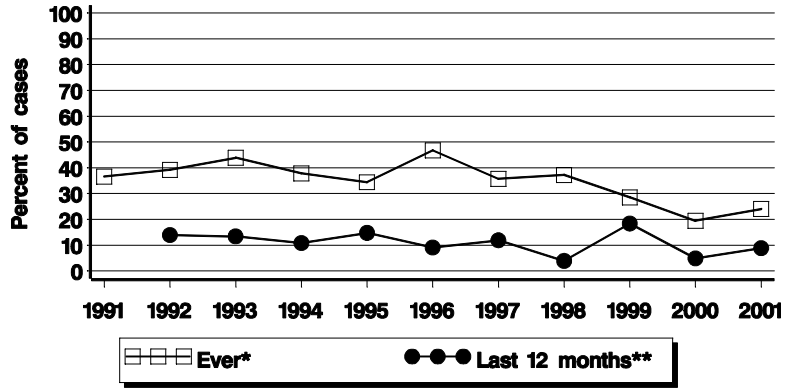


Figure D. Reason for visit among GISP participants, 2001



Honolulu, Hawaii – 2001 (N=79)

Figure E. Previous episode of gonorrhea among GISP participants, 1991–2001



*Data first collected in 1991.
**Data first collected in 1992.
Note: Data points not shown when >30% data missing.

Figure F. Drugs used to treat gonorrhea among GISP participants, 2001

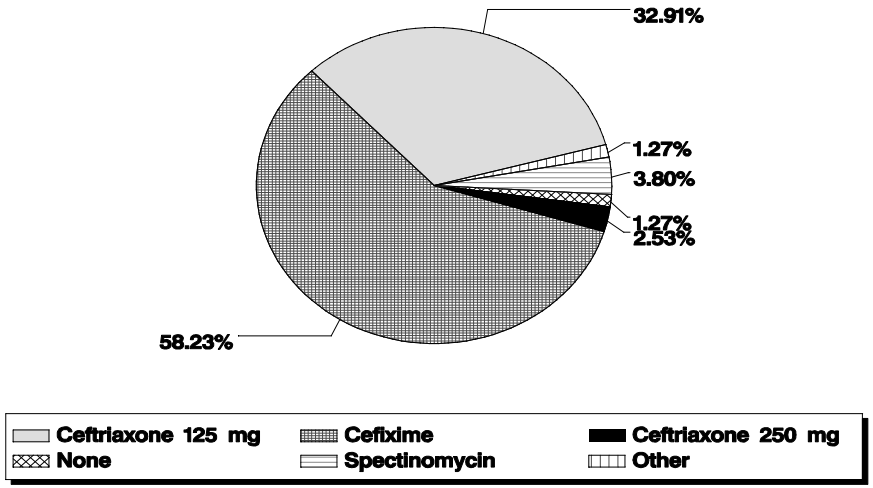


Figure G. Drugs used to treat *Chlamydia trachomatis* infection among GISP participants, 2001

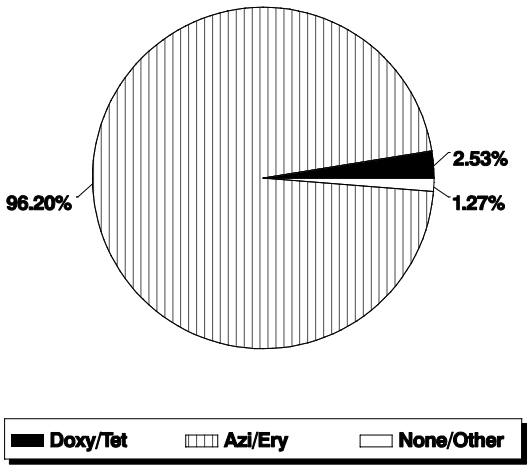
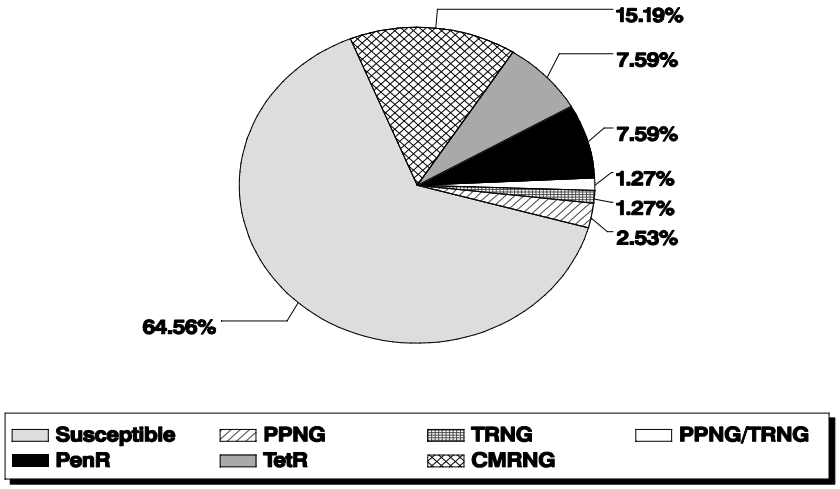


Figure H. Resistance to penicillin and tetracycline among GISP isolates, 2001



Honolulu, Hawaii – 2001 (N=79)

Figure I. Decreased susceptibility to ceftriaxone among GISP isolates, 1988–2001

No isolates with decreased susceptibility to ceftriaxone have been identified at this clinic.

Figure J. Decreased susceptibility to cefixime among GISP isolates, 1992–2001

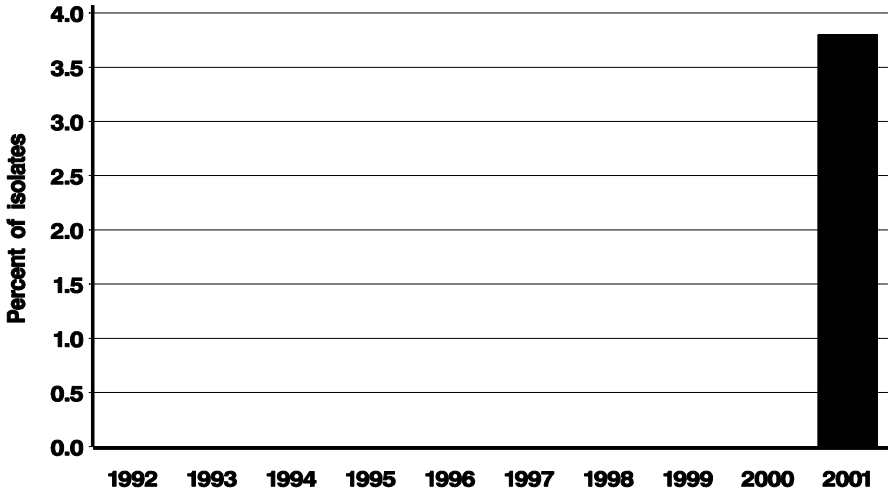
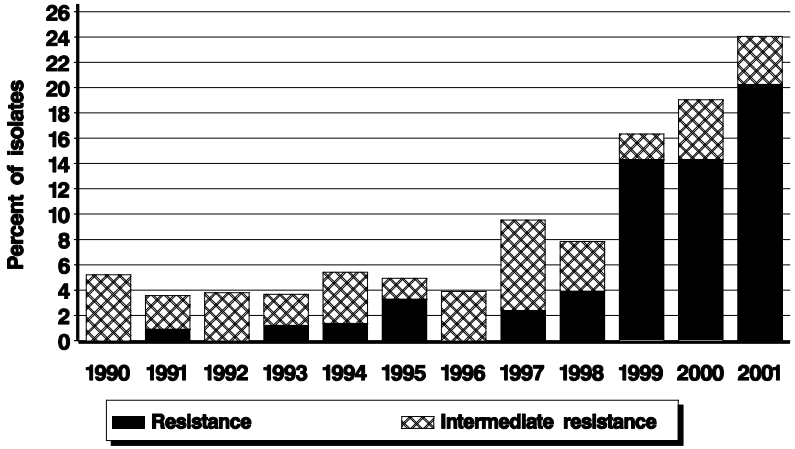
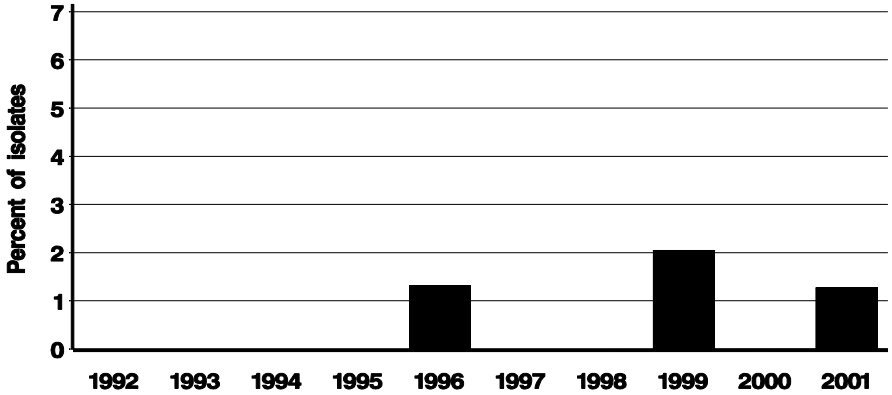


Figure K. Intermediate resistance and resistance to ciprofloxacin among GISP isolates, 1990–2001



Note: Susceptibility to ciprofloxacin first measured in 1990.

Figure L. Decreased susceptibility to azithromycin among GISP isolates, 1992–2001



Note: Susceptibility to azithromycin first measured in 1992.
Note: Decreased susceptibility to azithromycin is defined here as > or = 1.0 ug/ml. No NCCLS criteria currently exist.

Kansas City, Missouri – 2001 (N=289)

Figure A. Age of GISP participants, in years, 2001

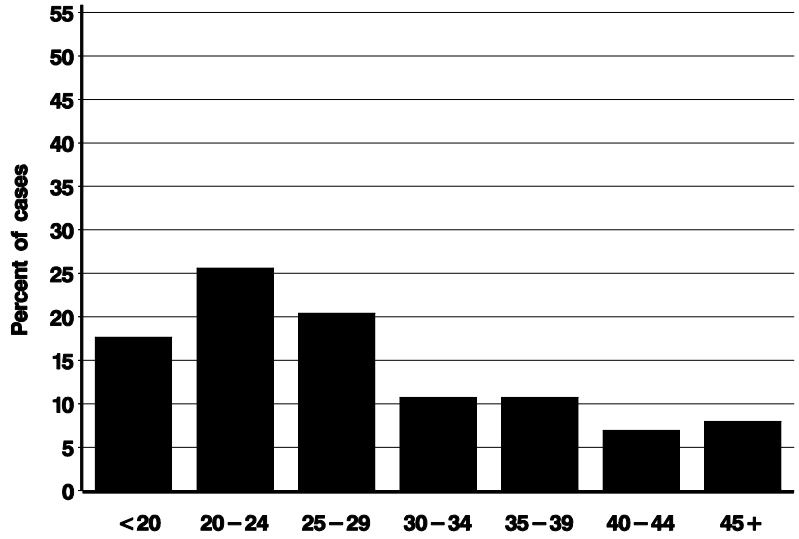


Figure B. Race/ethnicity of GISP participants, 2001

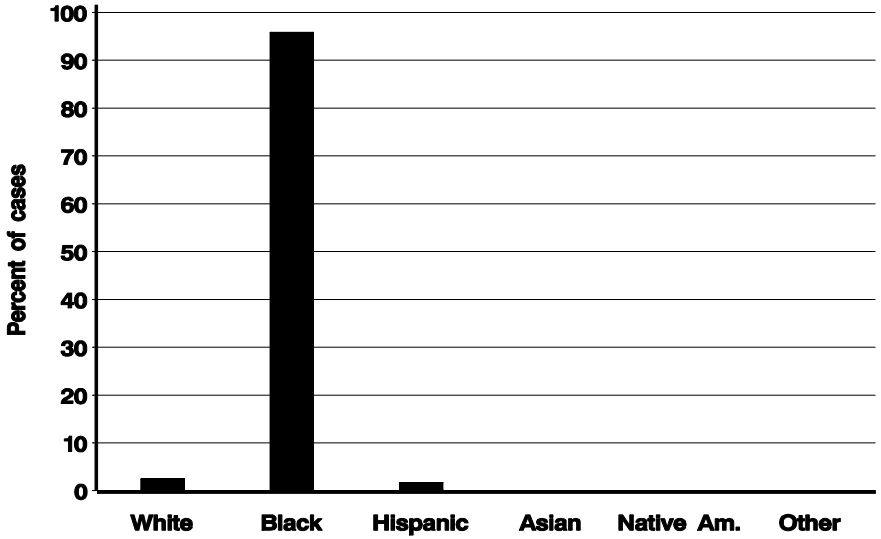


Figure C. Percentage of GISP participants identifying as men who have sex with men, 1988–2001

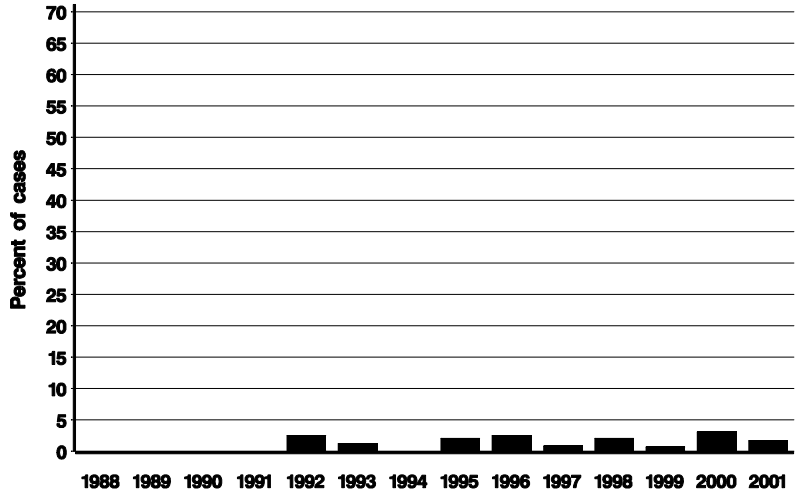
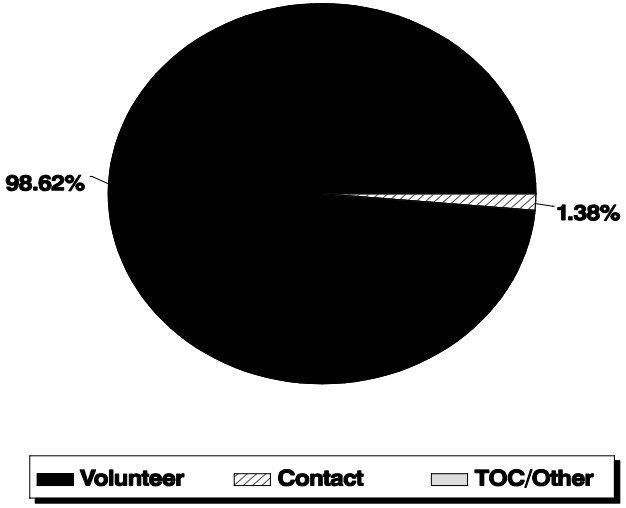
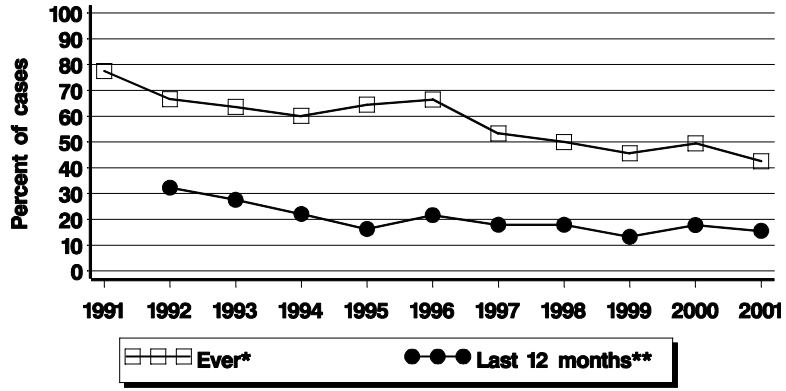


Figure D. Reason for visit among GISP participants, 2001



Kansas City, Missouri – 2001 (N=289)

Figure E. Previous episode of gonorrhea among GISP participants, 1991–2001



*Data first collected in 1991.
**Data first collected in 1992.
Note: Data points not shown when >30% data missing.

Figure F. Drugs used to treat gonorrhea among GISP participants, 2001

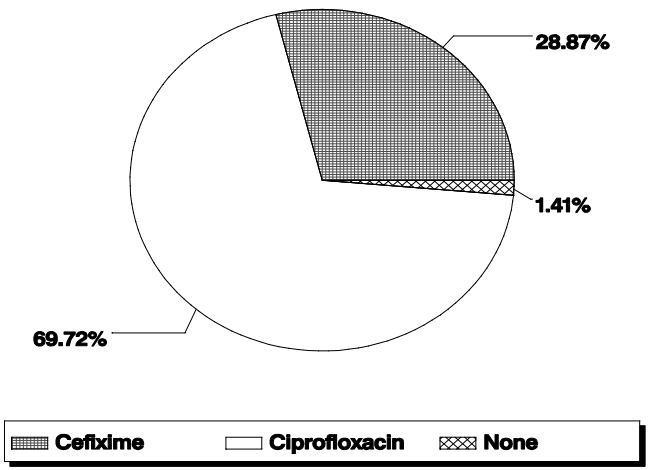


Figure G. Drugs used to treat *Chlamydia trachomatis* infection among GISP participants, 2001

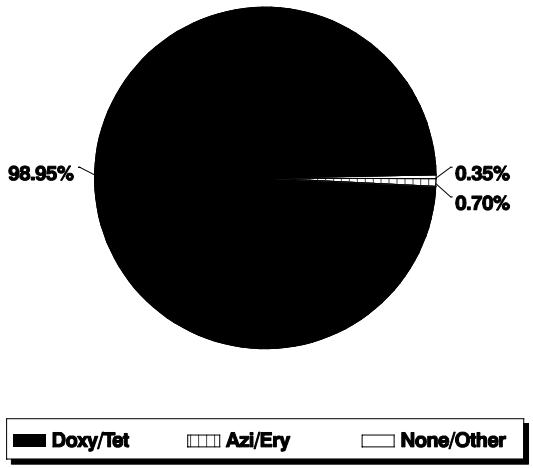
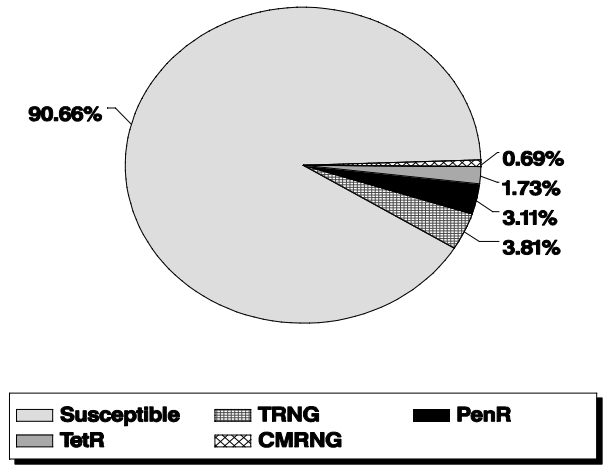


Figure H. Resistance to penicillin and tetracycline among GISP isolates, 2001



Kansas City, Missouri – 2001 (N=289)

Figure I. Decreased susceptibility to ceftriaxone among GISP isolates, 1988–2001

No isolates with decreased susceptibility to ceftriaxone have been identified at this clinic.

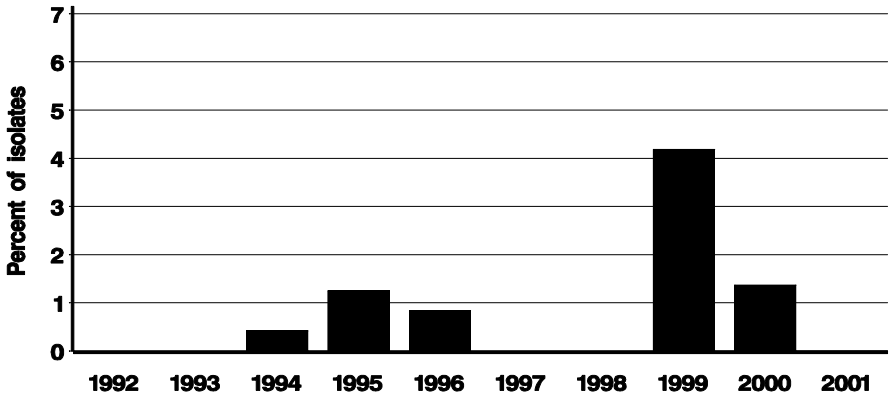
Figure J. Decreased susceptibility to cefixime among GISP isolates, 1992–2001

No isolates with decreased susceptibility to cefixime have been identified at this clinic.

Figure K. Intermediate resistance and resistance to ciprofloxacin among GISP isolates, 1990–2001

No isolates with intermediate resistance or resistance to ciprofloxacin have been identified at this clinic.

Figure L. Decreased susceptibility to azithromycin among GISP isolates, 1992–2001



Note: Susceptibility to azithromycin first measured in 1992.
Note: Decreased susceptibility to azithromycin is defined here as > or = 1.0 ug/ml. No NCCLS criteria currently exist.

Long Beach, California – 2001 (N=99)

Figure A. Age of GISP participants, in years, 2001

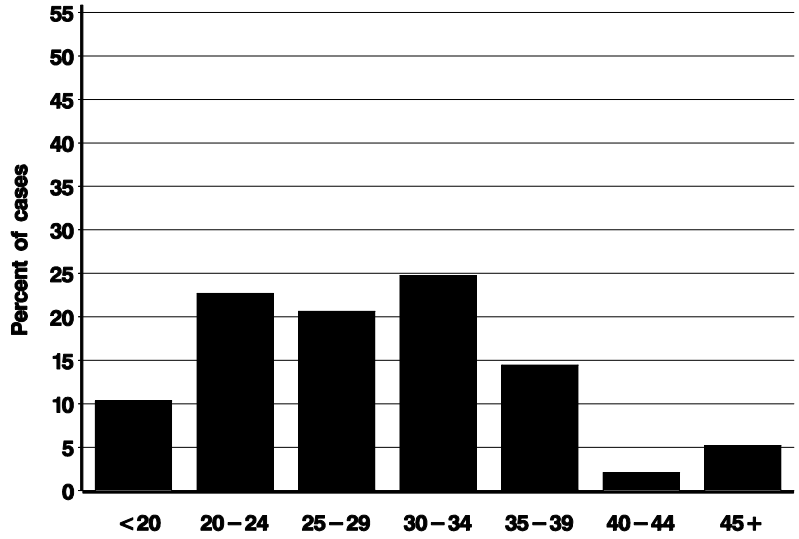


Figure B. Race/ethnicity of GISP participants, 2001

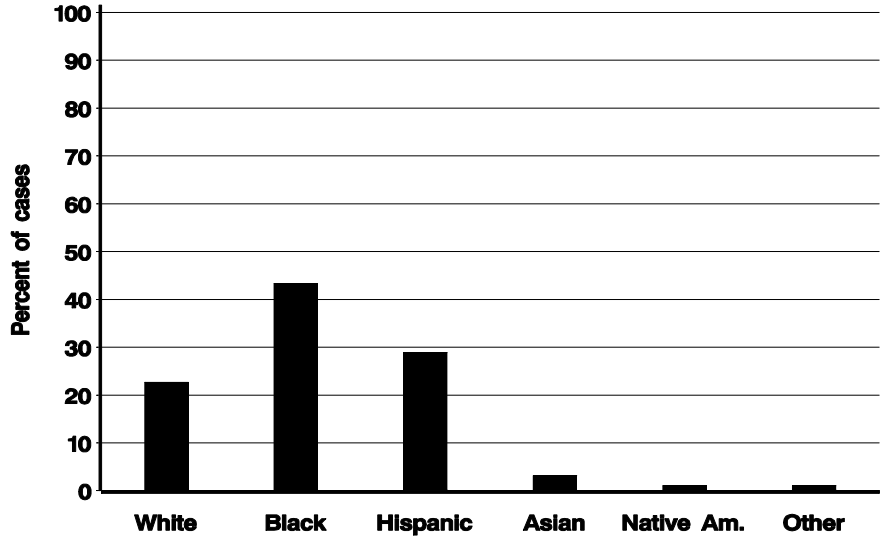


Figure C. Percentage of GISP participants identifying as men who have sex with men, 1988–2001

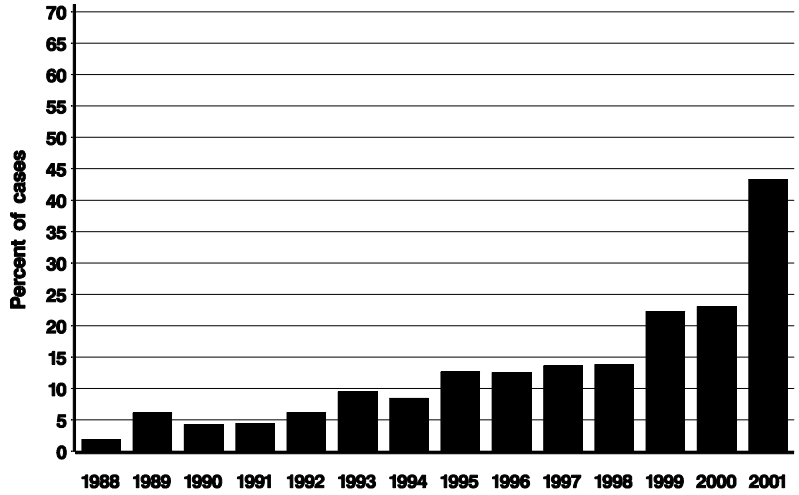
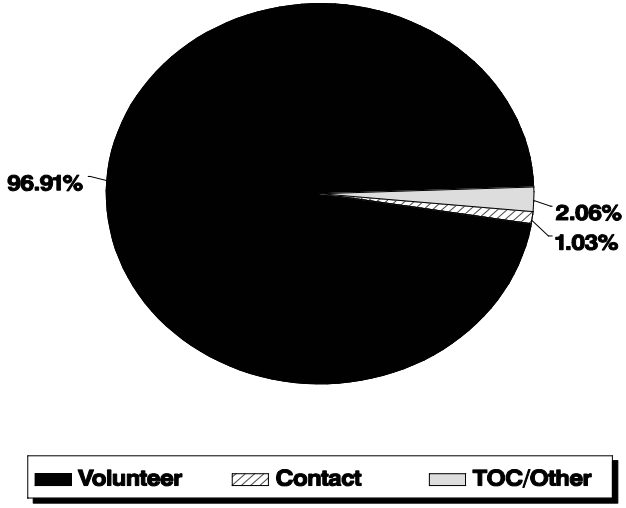
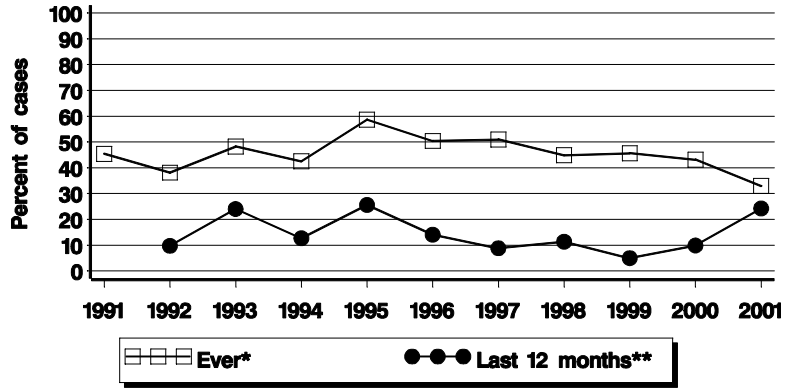


Figure D. Reason for visit among GISP participants, 2001



Long Beach, California – 2001 (N=99)

Figure E. Previous episode of gonorrhea among GISP participants, 1991–2001



*Data first collected in 1991.
**Data first collected in 1992.
Note: Data points not shown when >30% data missing.

Figure F. Drugs used to treat gonorrhea among GISP participants, 2001

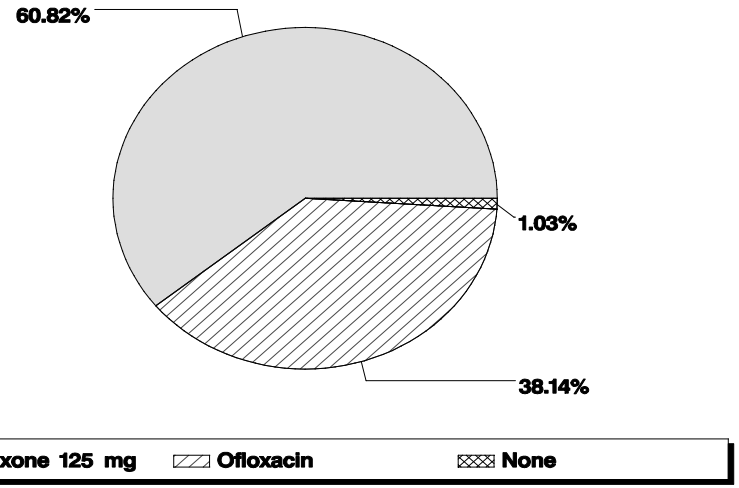


Figure G. Drugs used to treat *Chlamydia trachomatis* infection among GISP participants, 2001

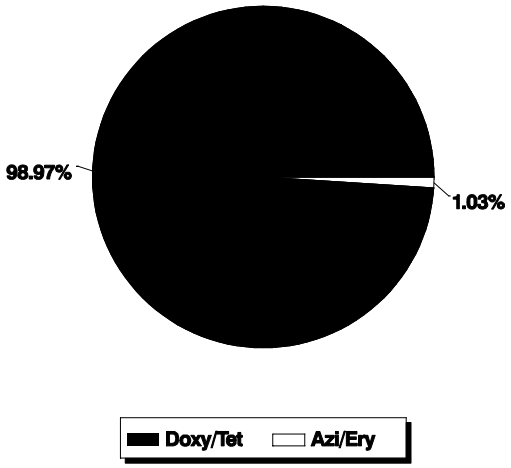
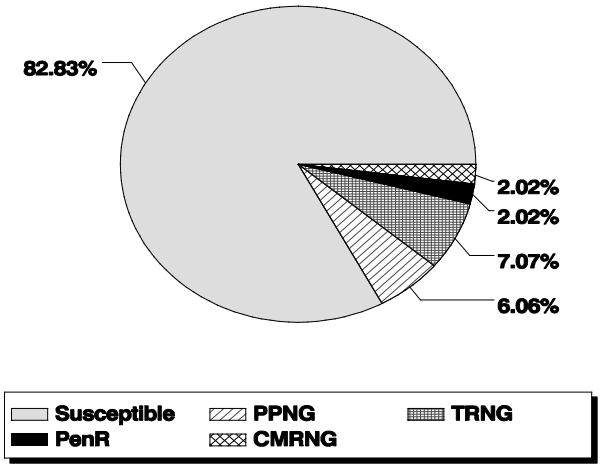


Figure H. Resistance to penicillin and tetracycline among GISP isolates, 2001



Long Beach, California – 2001 (N=99)

Figure I. Decreased susceptibility to ceftriaxone among GISP isolates, 1988–2001

No isolates with decreased susceptibility to ceftriaxone have been identified at this clinic.

Figure J. Decreased susceptibility to cefixime among GISP isolates, 1992–2001

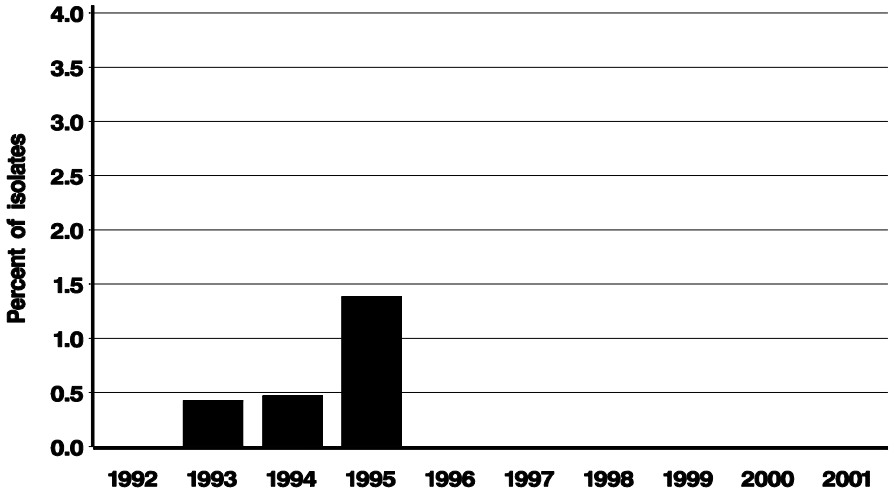
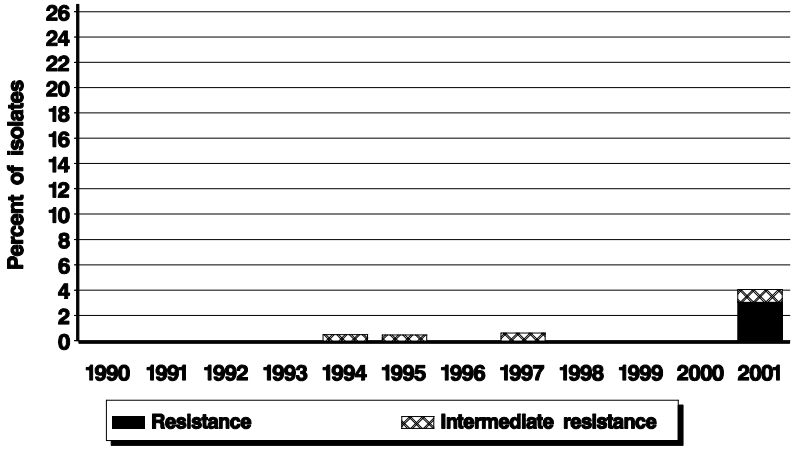
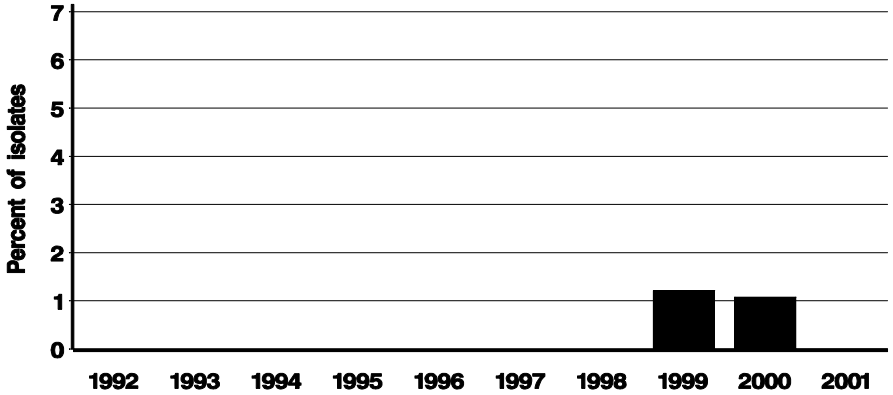


Figure K. Intermediate resistance and resistance to ciprofloxacin among GISP isolates, 1990–2001



Note: Susceptibility to ciprofloxacin first measured in 1990.

Figure L. Decreased susceptibility to azithromycin among GISP isolates, 1992–2001



Note: Susceptibility to azithromycin first measured in 1992.
Note: Decreased susceptibility to azithromycin is defined here as > or = 1.0 ug/ml. No NCCLS criteria currently exist.

Miami, Florida – 2001 (N=234)

Figure A. Age of GISP participants, in years, 2001

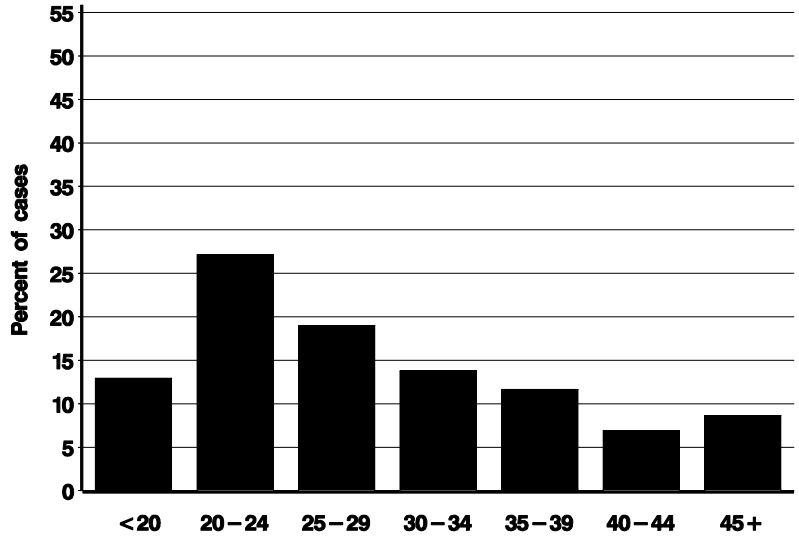


Figure B. Race/ethnicity of GISP participants, 2001

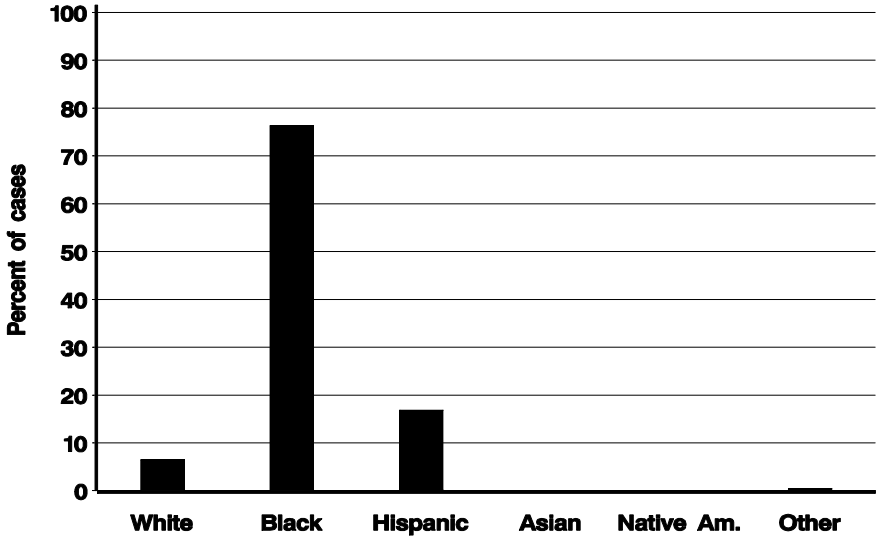


Figure C. Percentage of GISP participants identifying as men who have sex with men, 1988–2001

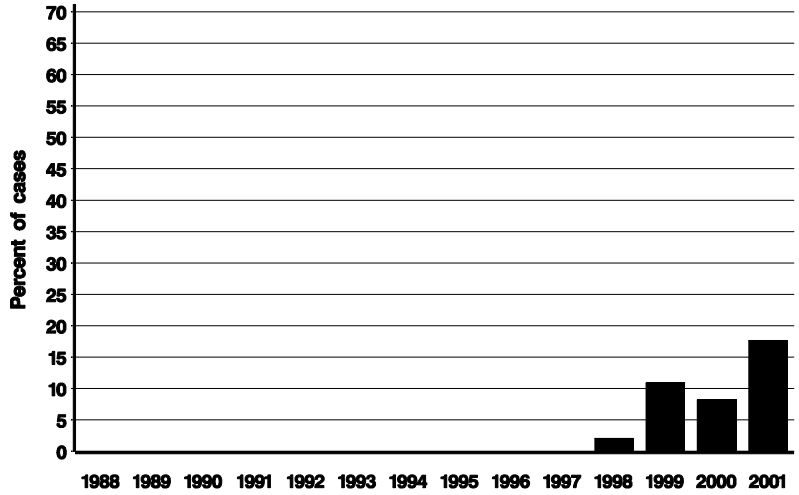
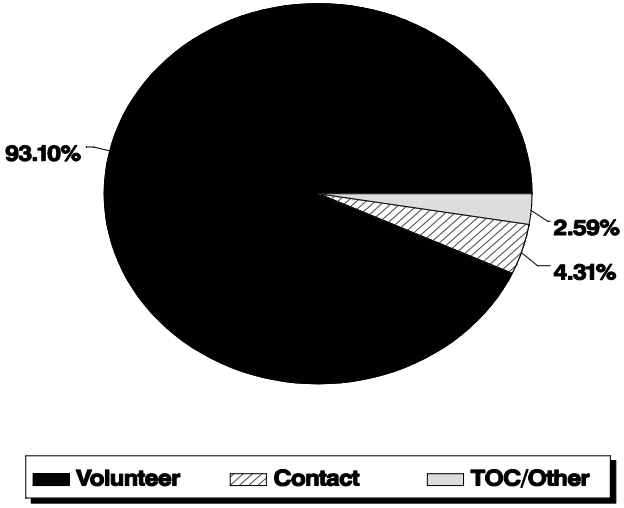
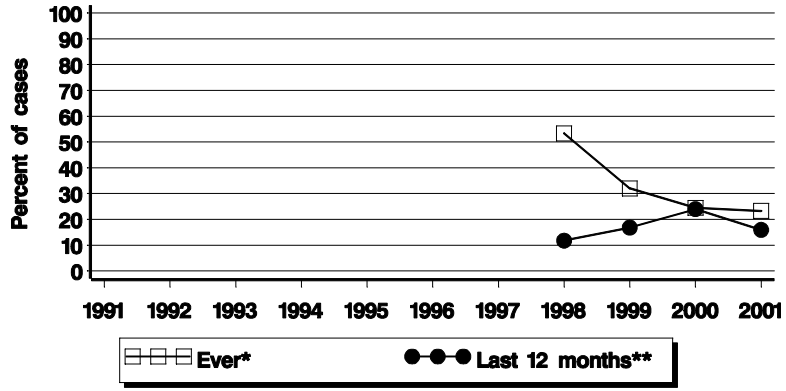


Figure D. Reason for visit among GISP participants, 2001



Miami, Florida – 2001 (N=234)

Figure E. Previous episode of gonorrhea among GISP participants, 1991–2001



*Data first collected in 1991.
**Data first collected in 1992.
Note: Data points not shown when >30% data missing.

Figure F. Drugs used to treat gonorrhea among GISP participants, 2001

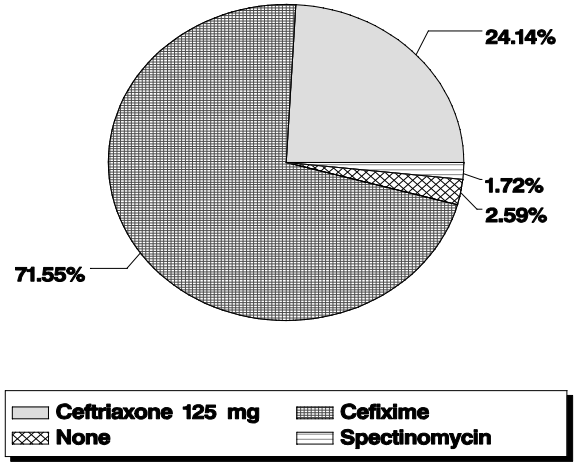


Figure G. Drugs used to treat *Chlamydia trachomatis* infection among GISP participants, 2001

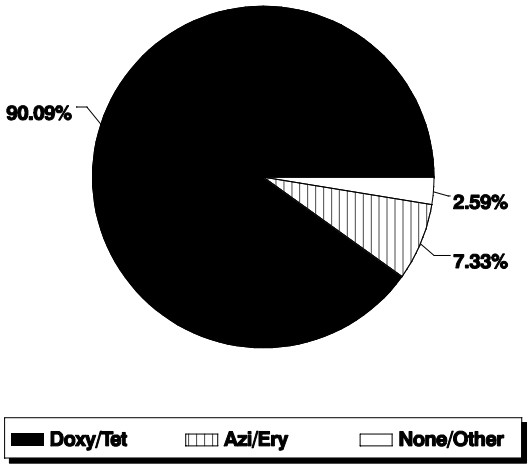
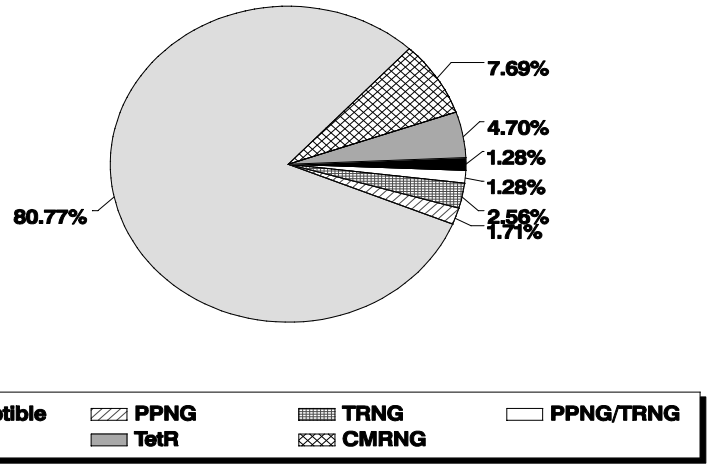


Figure H. Resistance to penicillin and tetracycline among GISP isolates, 2001



Miami, Florida – 2001 (N=234)

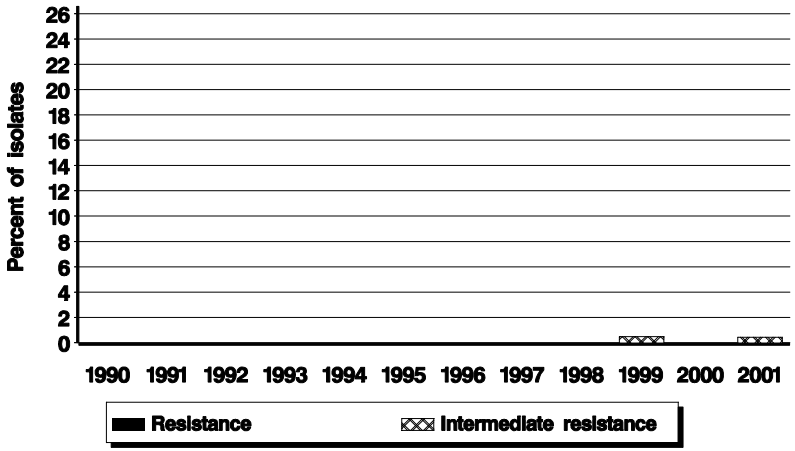
Figure I. Decreased susceptibility to ceftriaxone among GISP isolates, 1988–2001

No isolates with decreased susceptibility to ceftriaxone have been identified at this clinic.

Figure J. Decreased susceptibility to cefixime among GISP isolates, 1992–2001

No isolates with decreased susceptibility to cefixime have been identified at this clinic.

Figure K. Intermediate resistance and resistance to ciprofloxacin among GISP isolates, 1990–2001



Note: Susceptibility to ciprofloxacin first measured in 1990.

Figure L. Decreased susceptibility to azithromycin among GISP isolates, 1992–2001

No isolates with decreased susceptibility to azithromycin have been identified at this clinic.

Minneapolis, Minnesota – 2001 (N=171)

Figure A. Age of GISP participants, in years, 2001

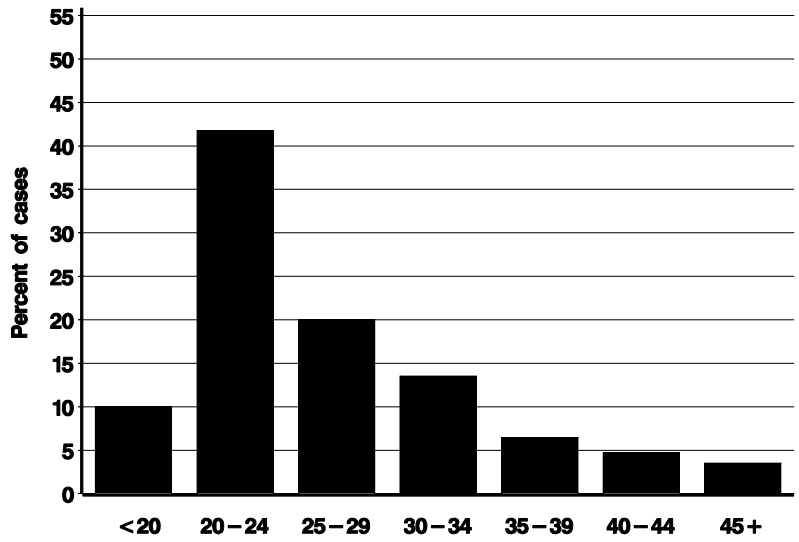


Figure B. Race/ethnicity of GISP participants, 2001

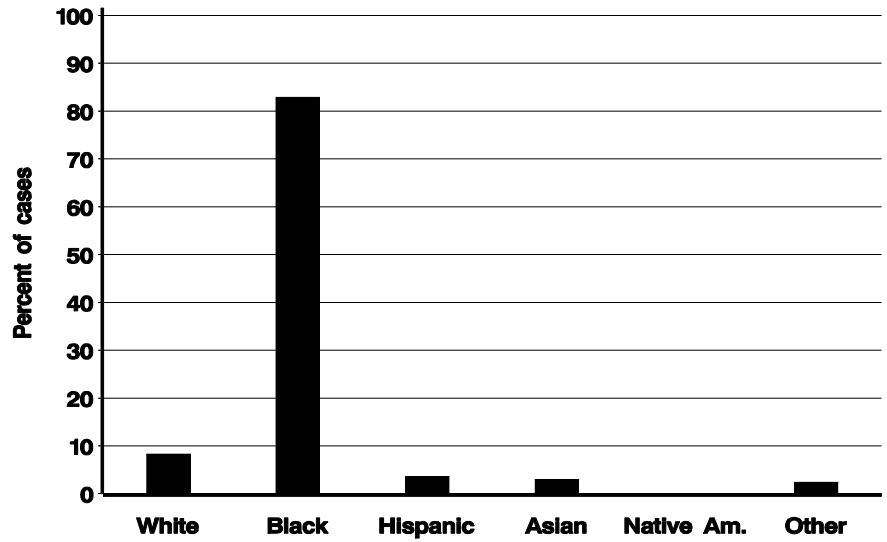


Figure C. Percentage of GISP participants identifying as men who have sex with men, 1988–2001

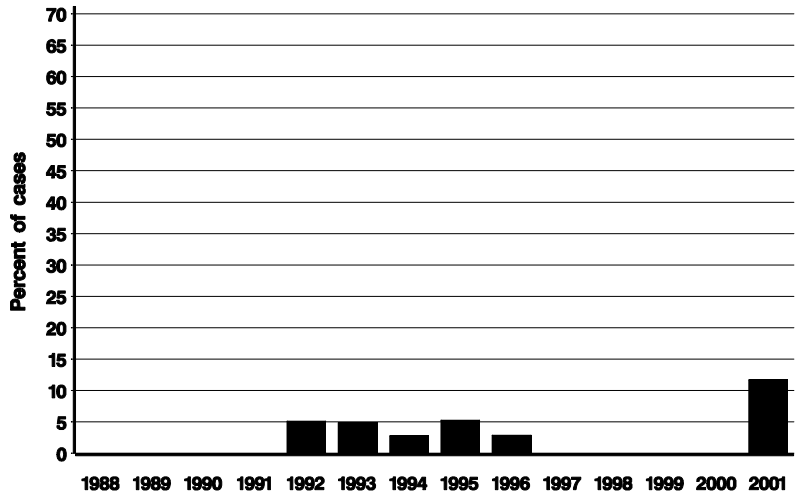
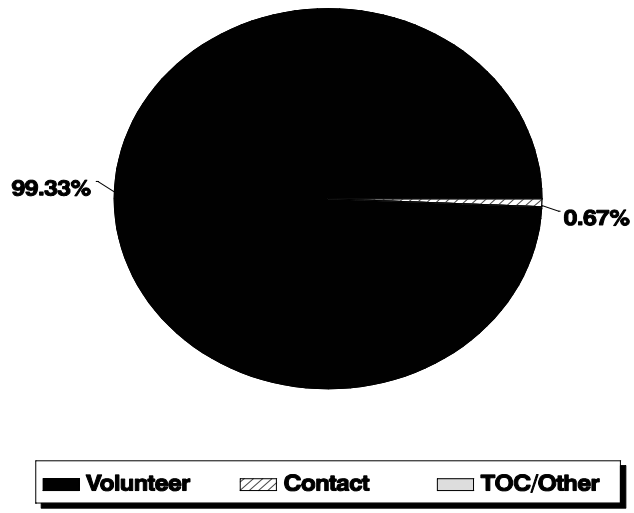
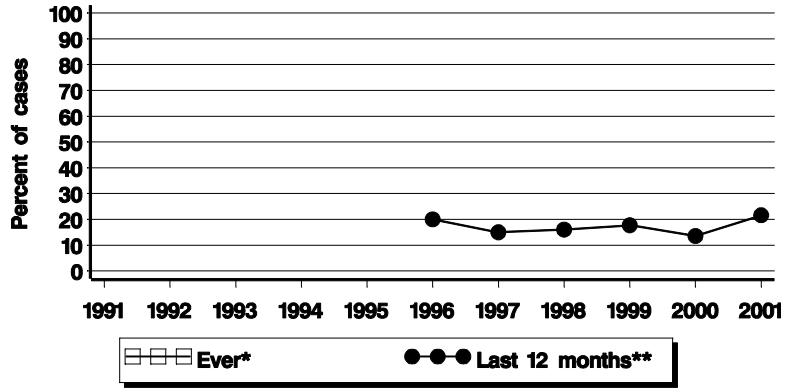


Figure D. Reason for visit among GISP participants, 2001



Minneapolis, Minnesota – 2001 (N=171)

Figure E. Previous episode of gonorrhea among GISP participants, 1991–2001



*Data first collected in 1991.
**Data first collected in 1992.
Note: Data points not shown when >30% data missing.

Figure F. Drugs used to treat gonorrhea among GISP participants, 2001

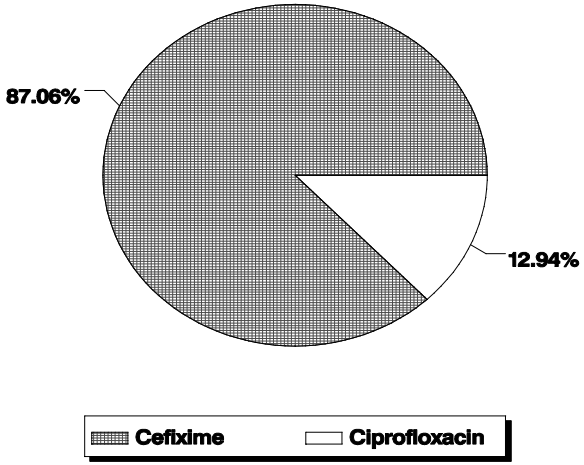


Figure G. Drugs used to treat *Chlamydia trachomatis* infection among GISP participants, 2001

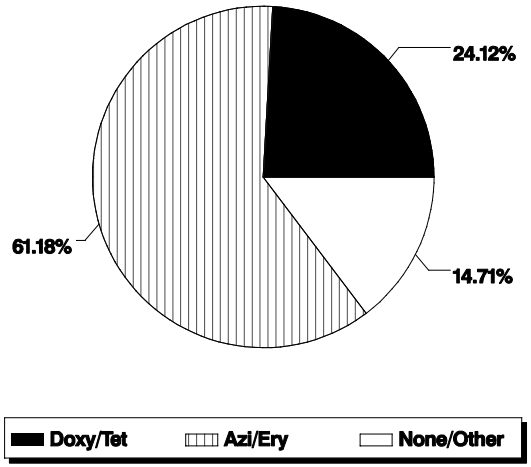
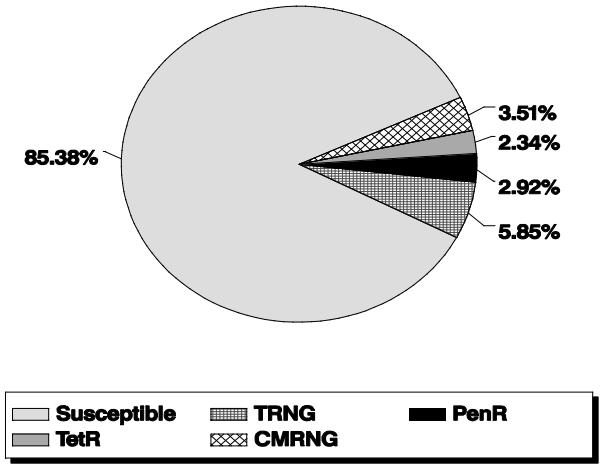


Figure H. Resistance to penicillin and tetracycline among GISP isolates, 2001



Minneapolis, Minnesota – 2001 (N=171)

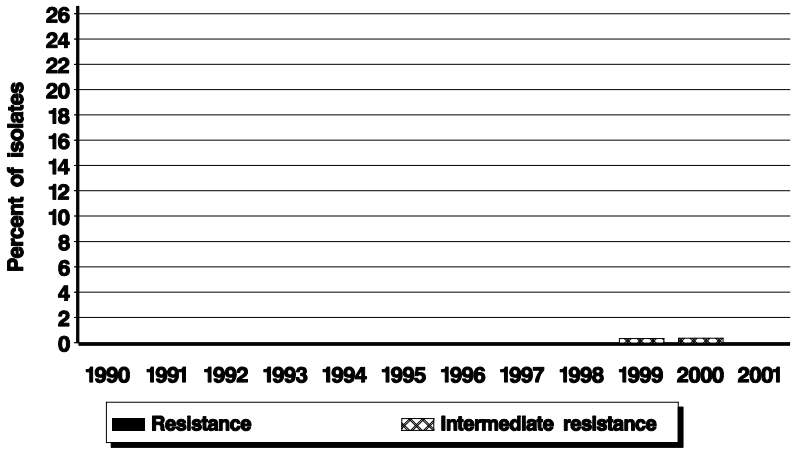
Figure I. Decreased susceptibility to ceftriaxone among GISP isolates, 1988–2001

No isolates with decreased susceptibility to ceftriaxone have been identified at this clinic.

Figure J. Decreased susceptibility to cefixime among GISP isolates, 1992–2001

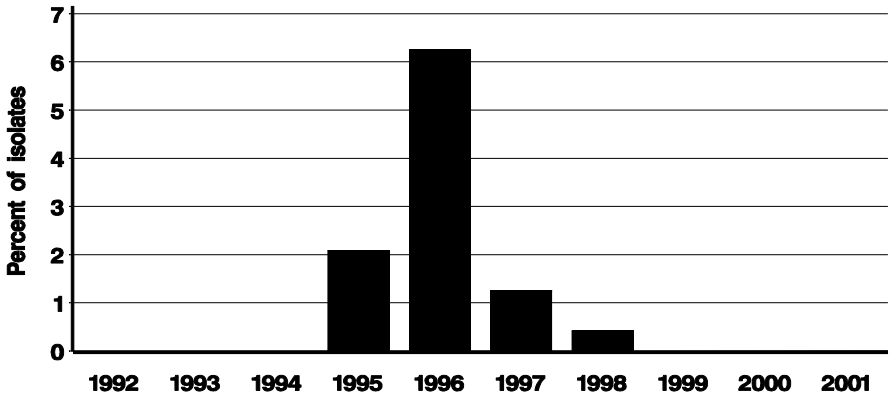
No isolates with decreased susceptibility to cefixime have been identified at this clinic.

Figure K. Intermediate resistance and resistance to ciprofloxacin among GISP isolates, 1990–2001



Note: Susceptibility to ciprofloxacin first measured in 1990.

Figure L. Decreased susceptibility to azithromycin among GISP isolates, 1992–2001



Note: Susceptibility to azithromycin first measured in 1992.
Note: Decreased susceptibility to azithromycin is defined here as > or = 1.0 ug/ml. No NCCLS criteria currently exist.

New Orleans, Louisiana – 2001 (N=126)

Figure A. Age of GISP participants, in years, 2001

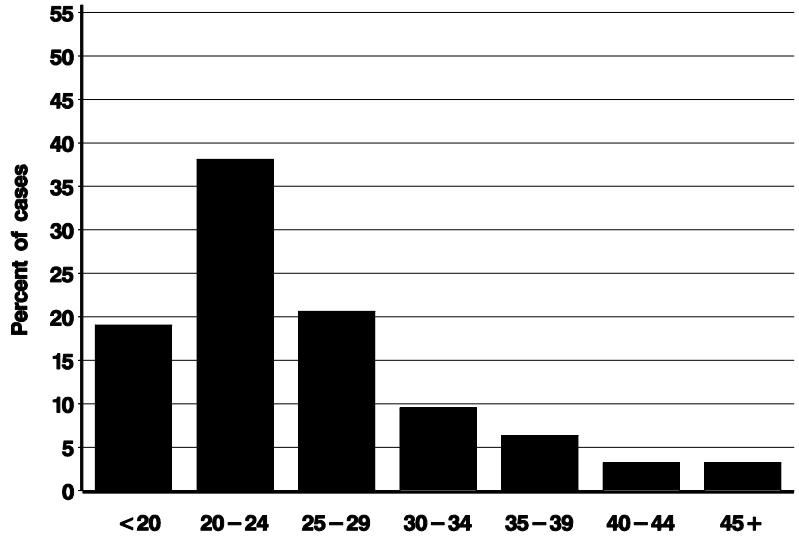


Figure B. Race/ethnicity of GISP participants, 2001

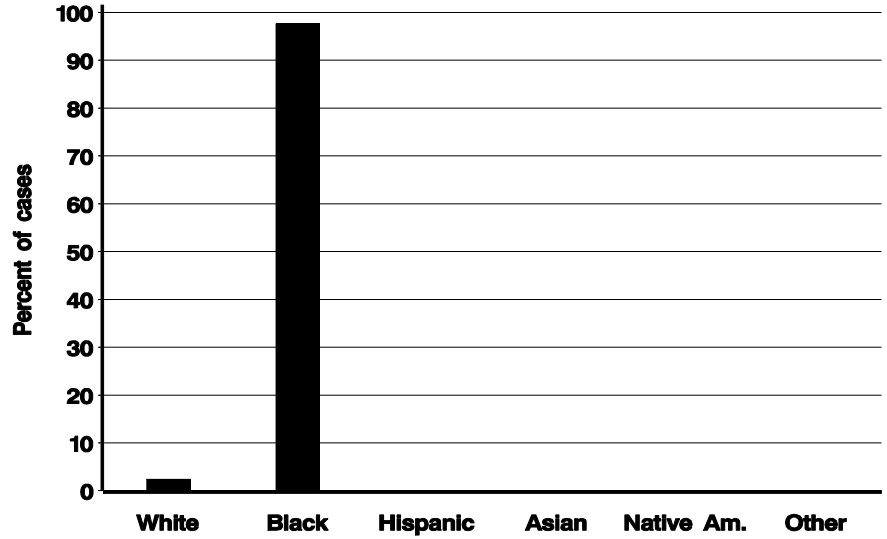


Figure C. Percentage of GISP participants identifying as men who have sex with men, 1988–2001

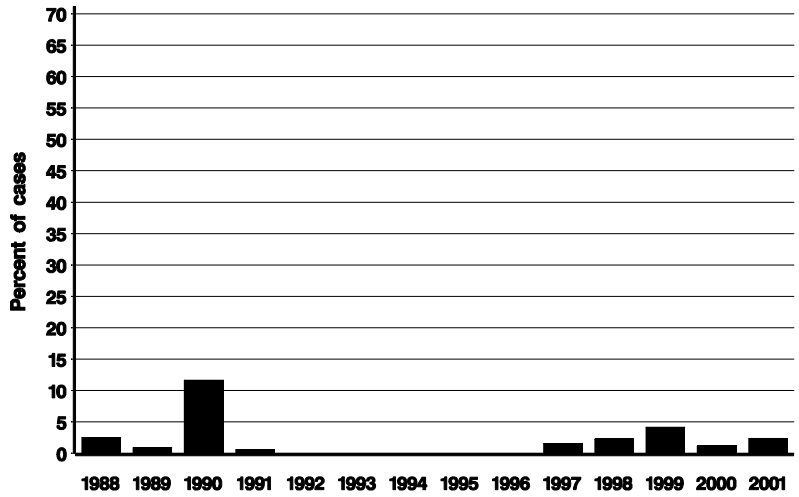
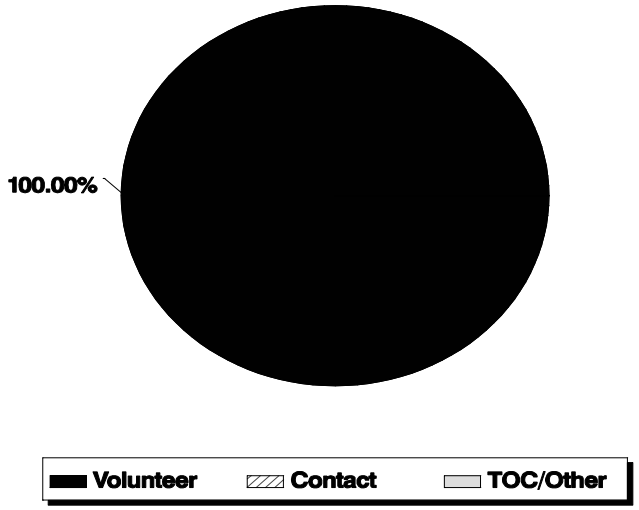
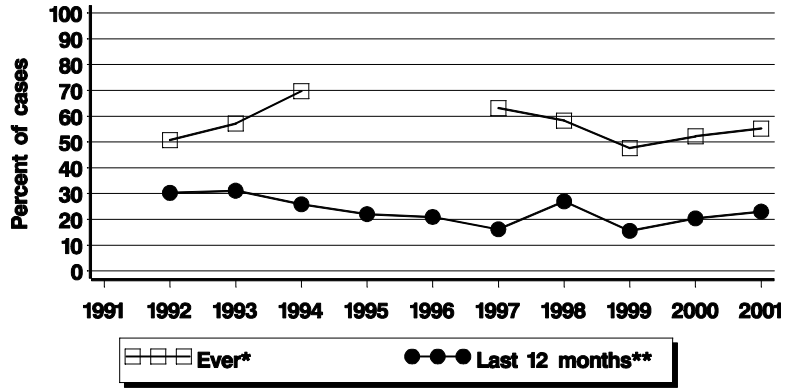


Figure D. Reason for visit among GISP participants, 2001



New Orleans, Louisiana – 2001 (N=126)

Figure E. Previous episode of gonorrhea among GISP participants, 1991–2001



*Data first collected in 1991.
**Data first collected in 1992.
Note: Data points not shown when >30% data missing.

Figure F. Drugs used to treat gonorrhea among GISP participants, 2001

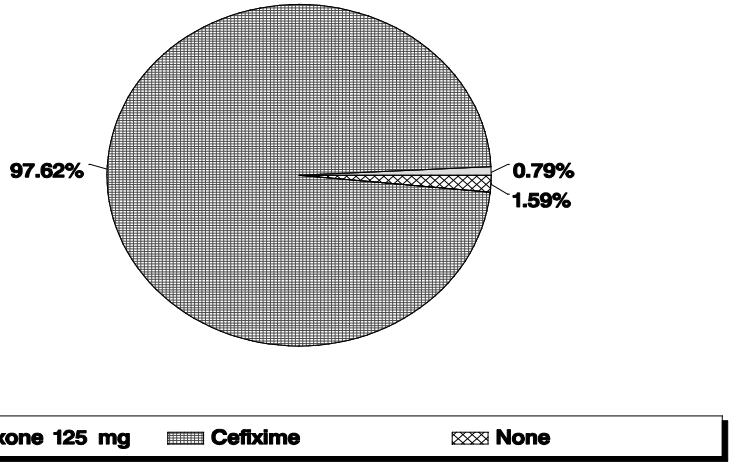


Figure G. Drugs used to treat *Chlamydia trachomatis* infection among GISP participants, 2001

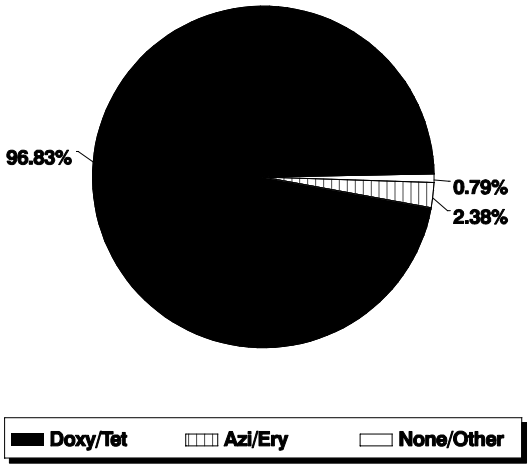
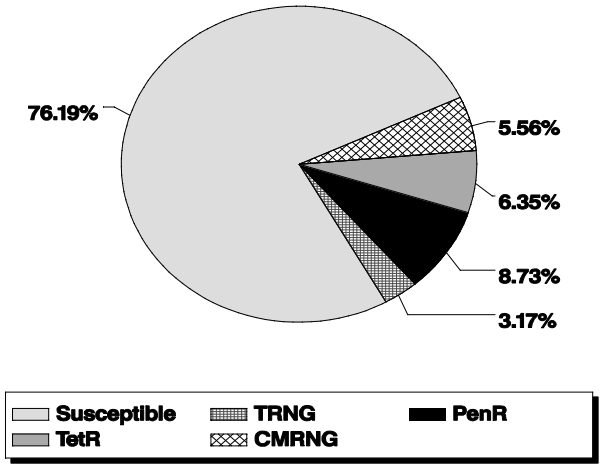


Figure H. Resistance to penicillin and tetracycline among GISP isolates, 2001



New Orleans, Louisiana – 2001 (N=126)

Figure I. Decreased susceptibility to ceftriaxone among GISP isolates, 1988–2001

No isolates with decreased susceptibility to ceftriaxone have been identified at this clinic.

Figure J. Decreased susceptibility to cefixime among GISP isolates, 1992–2001

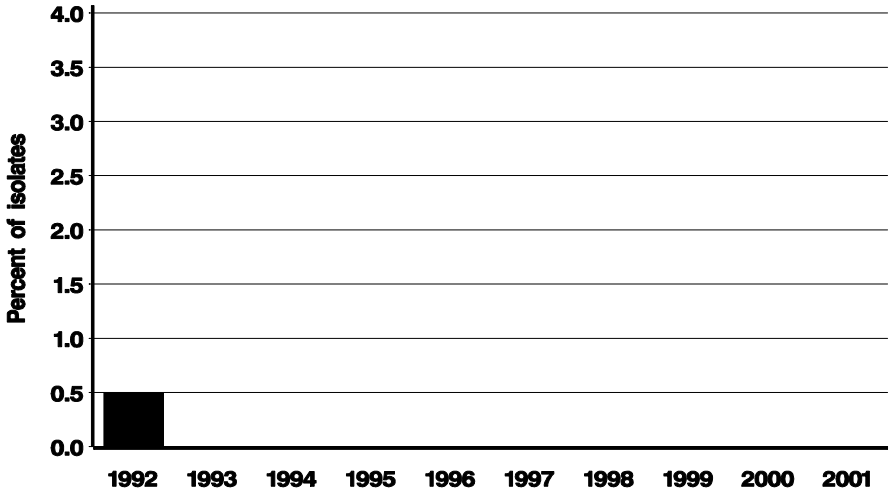
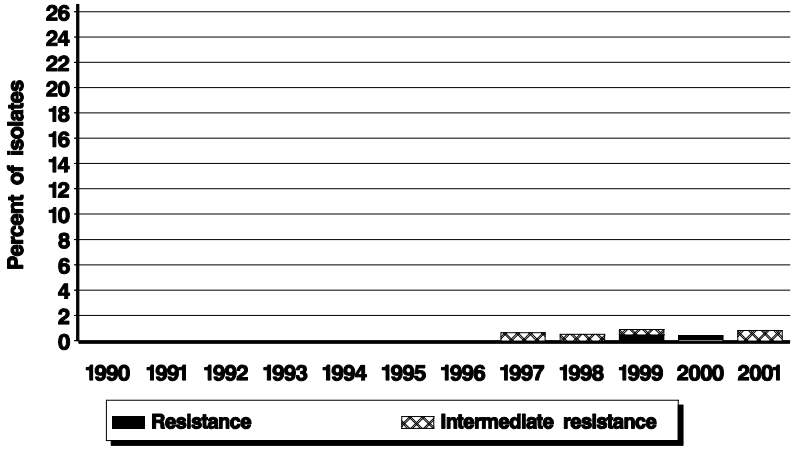
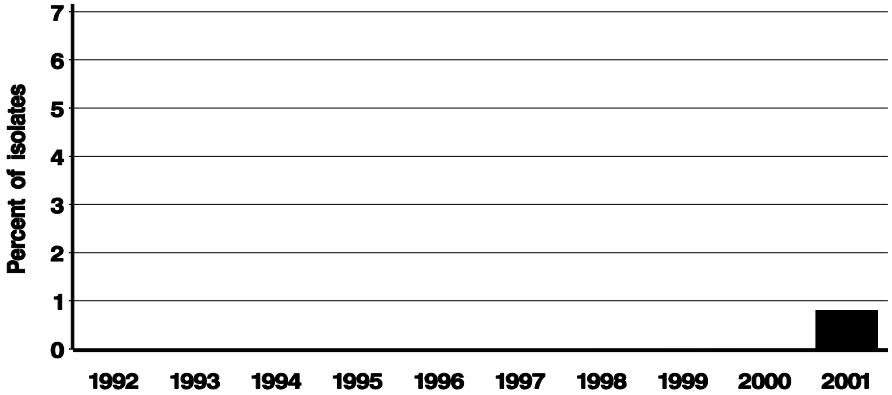


Figure K. Intermediate resistance and resistance to ciprofloxacin among GISP isolates, 1990–2001



Note: Susceptibility to ciprofloxacin first measured in 1990.

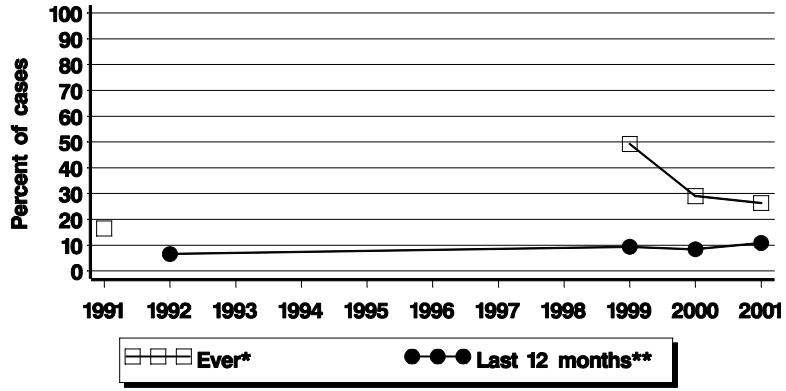
Figure L. Decreased susceptibility to azithromycin among GISP isolates, 1992–2001



Note: Susceptibility to azithromycin first measured in 1992.
Note: Decreased susceptibility to azithromycin is defined here as > or = 1.0 ug/ml. No NCCLS criteria currently exist.

Orange County, California – 2001 (N=129)

Figure E. Previous episode of gonorrhea among GISP participants, 1991–2001



*Data first collected in 1991.
**Data first collected in 1992.
Note: Data points not shown when >30% data missing.

Figure F. Drugs used to treat gonorrhea among GISP participants, 2001

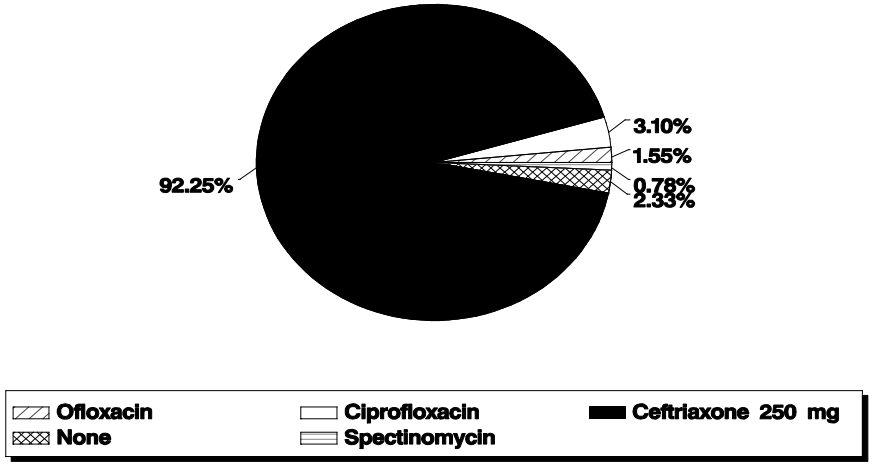


Figure G. Drugs used to treat *Chlamydia trachomatis* infection among GISP participants, 2001

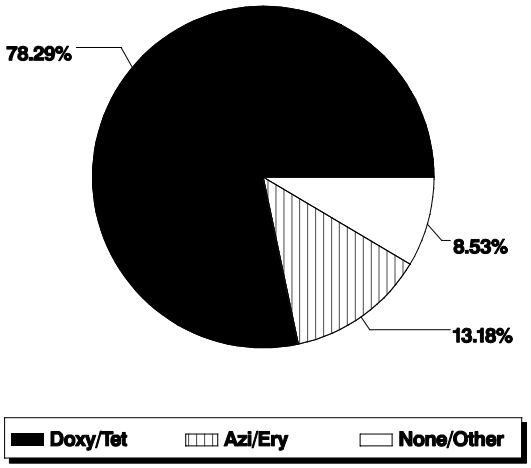
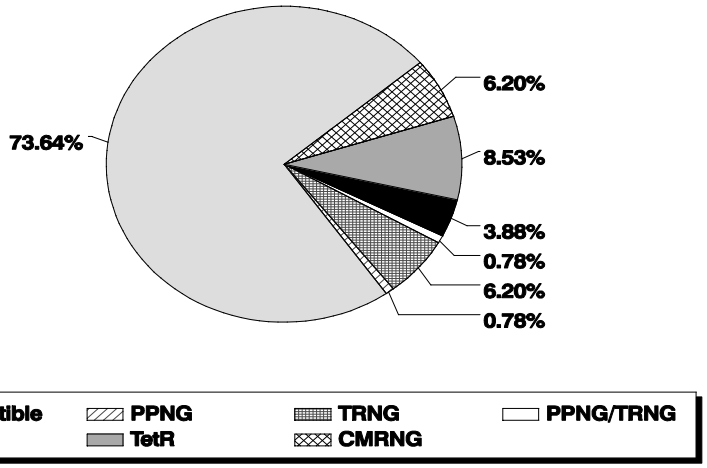


Figure H. Resistance to penicillin and tetracycline among GISP isolates, 2001



Orange County, California – 2001 (N=129)

Figure I. Decreased susceptibility to ceftriaxone among GISP isolates, 1988–2001

No isolates with decreased susceptibility to ceftriaxone have been identified at this clinic.

Figure J. Decreased susceptibility to cefixime among GISP isolates, 1992–2001

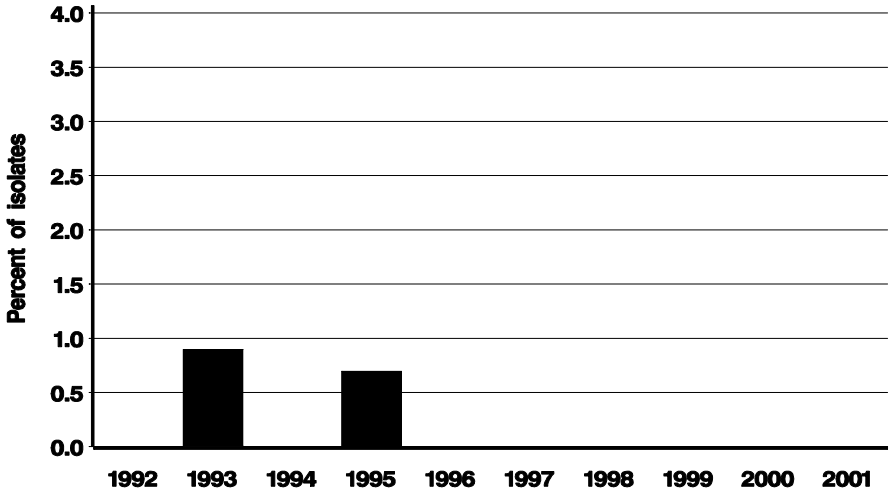
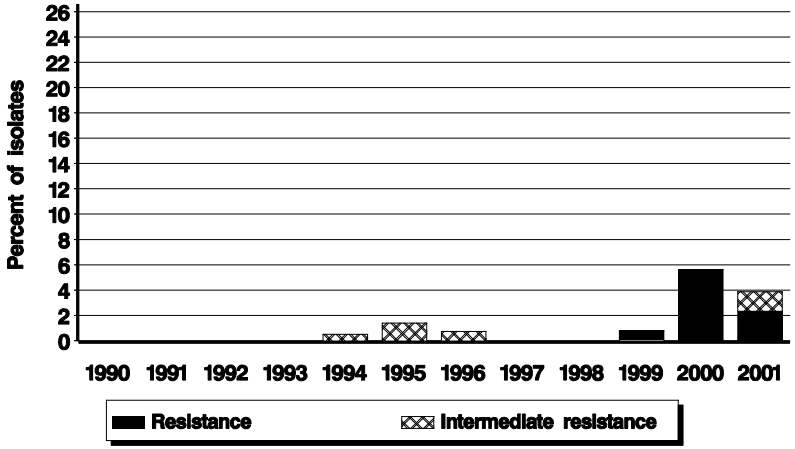
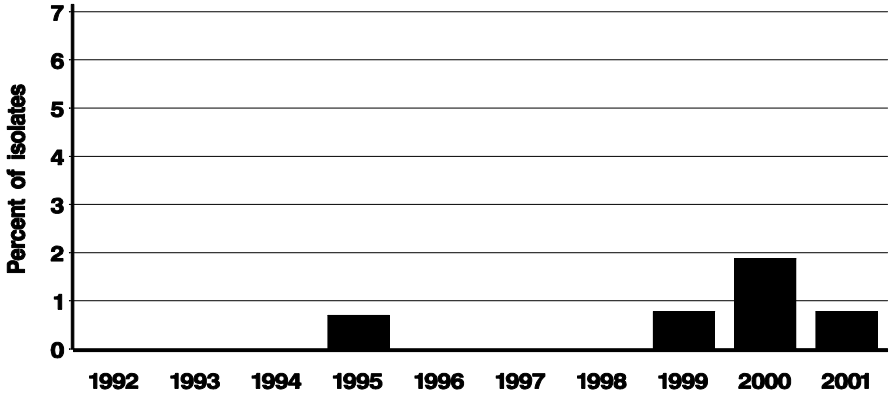


Figure K. Intermediate resistance and resistance to ciprofloxacin among GISP isolates, 1990–2001



Note: Susceptibility to ciprofloxacin first measured in 1990.

Figure L. Decreased susceptibility to azithromycin among GISP isolates, 1992–2001



Note: Susceptibility to azithromycin first measured in 1992.
Note: Decreased susceptibility to azithromycin is defined here as > or = 1.0 ug/ml. No NCCLS criteria currently exist.

Philadelphia, Pennsylvania – 2001 (N=300)

Figure A. Age of GISP participants, in years, 2001

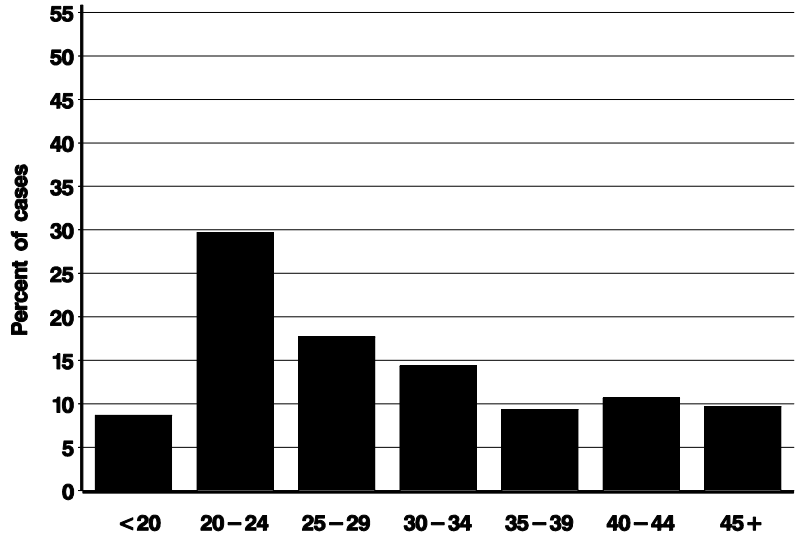


Figure B. Race/ethnicity of GISP participants, 2001

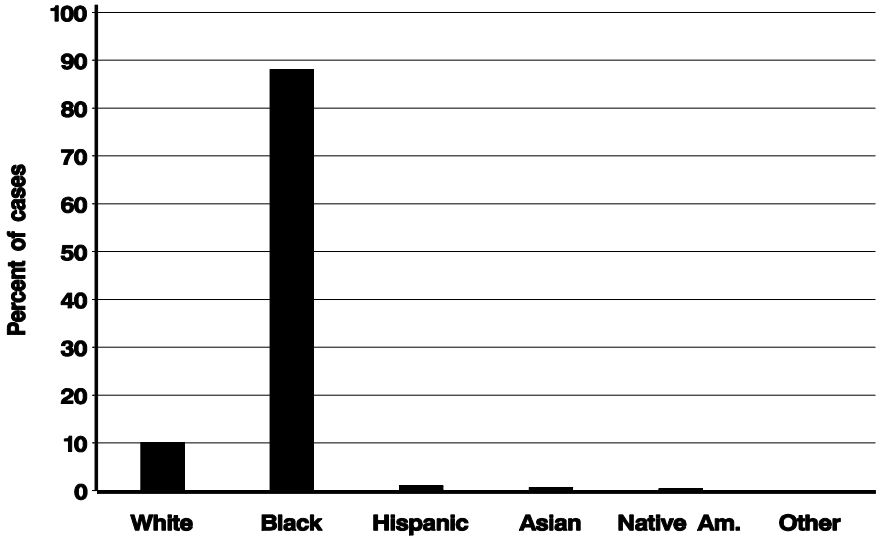


Figure C. Percentage of GISP participants identifying as men who have sex with men, 1988–2001

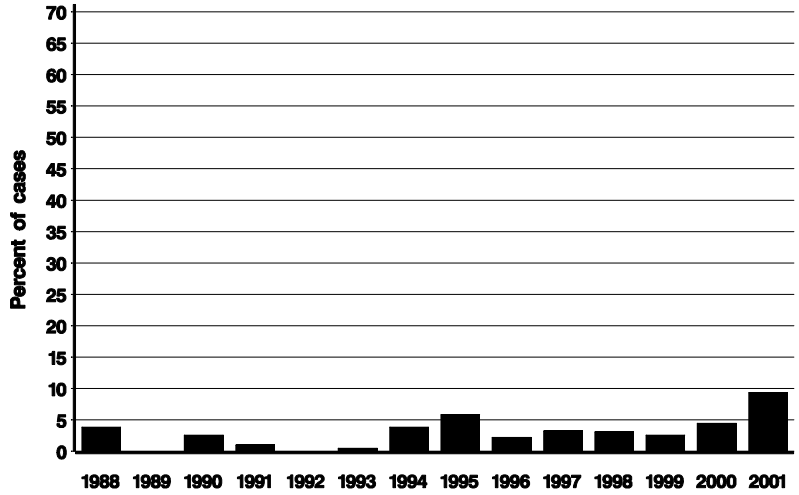
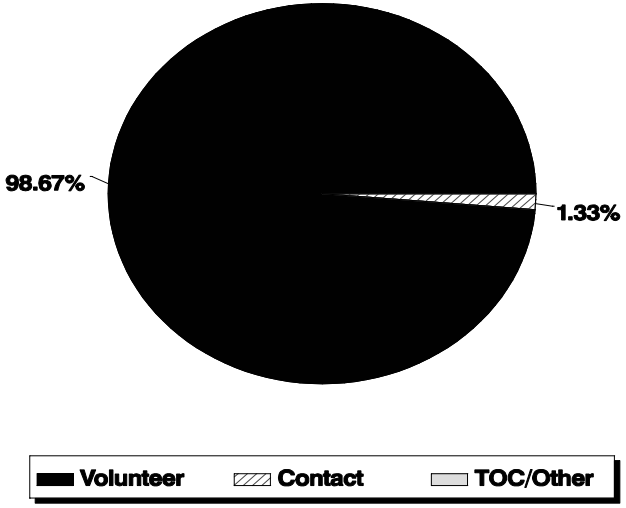
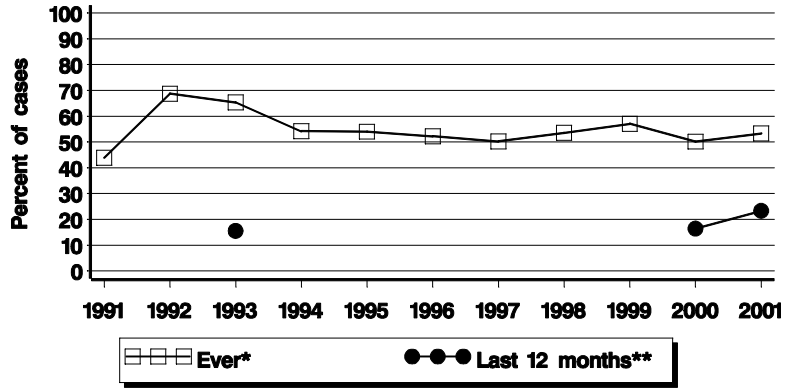


Figure D. Reason for visit among GISP participants, 2001



Philadelphia, Pennsylvania – 2001 (N=300)

Figure E. Previous episode of gonorrhea among GISP participants, 1991–2001



*Data first collected in 1991.
**Data first collected in 1992.
Note: Data points not shown when >30% data missing.

Figure F. Drugs used to treat gonorrhea among GISP participants, 2001

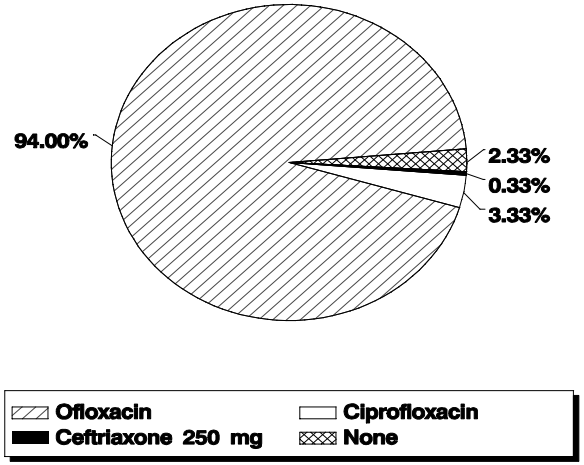


Figure G. Drugs used to treat *Chlamydia trachomatis* infection among GISP participants, 2001

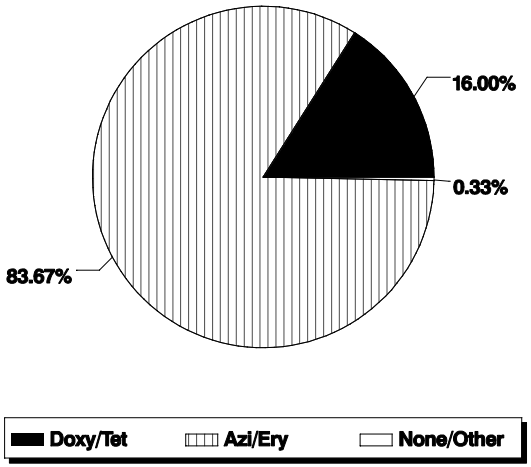
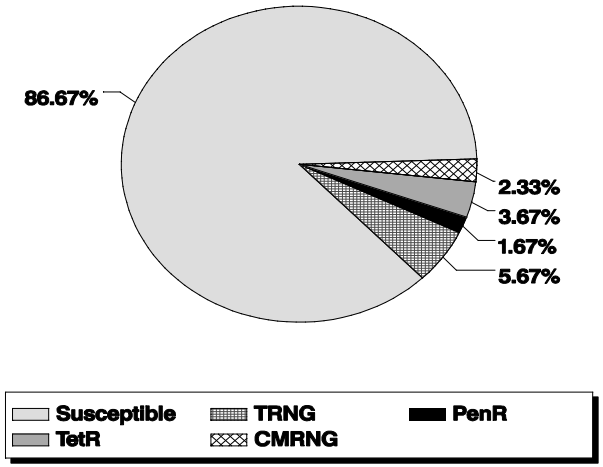


Figure H. Resistance to penicillin and tetracycline among GISP isolates, 2001



Philadelphia, Pennsylvania – 2001 (N=300)

Figure I. Decreased susceptibility to ceftriaxone among GISP isolates, 1988–2001

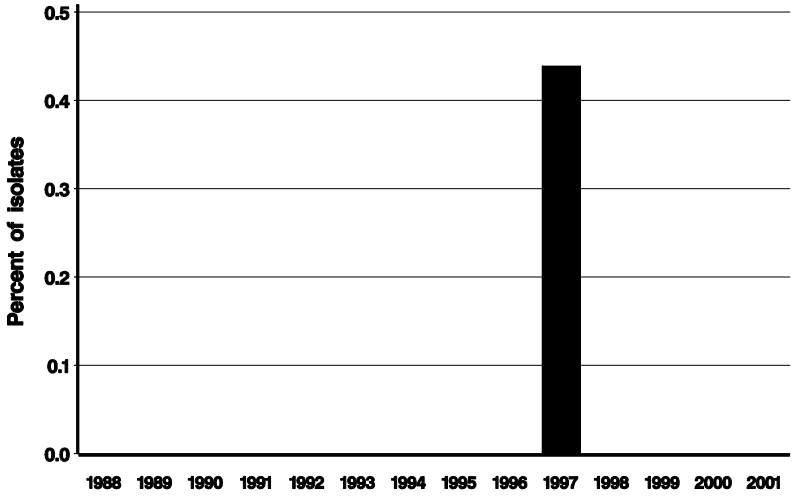


Figure J. Decreased susceptibility to cefixime among GISP isolates, 1992–2001

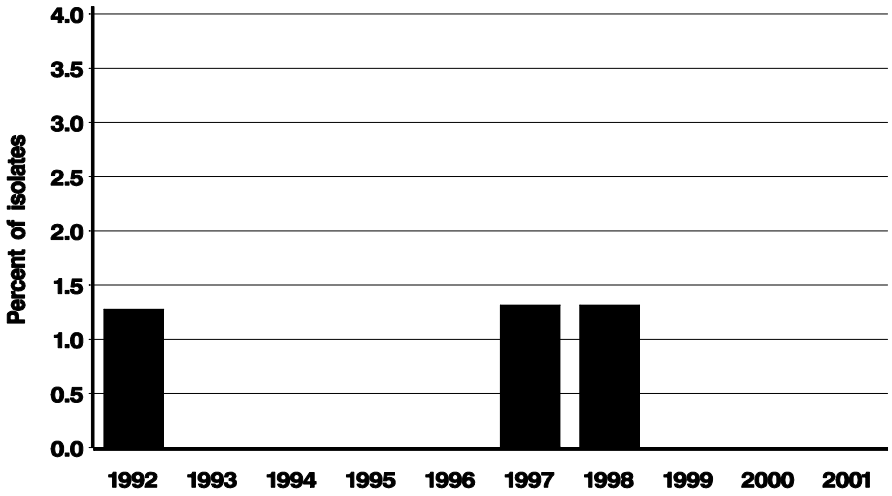
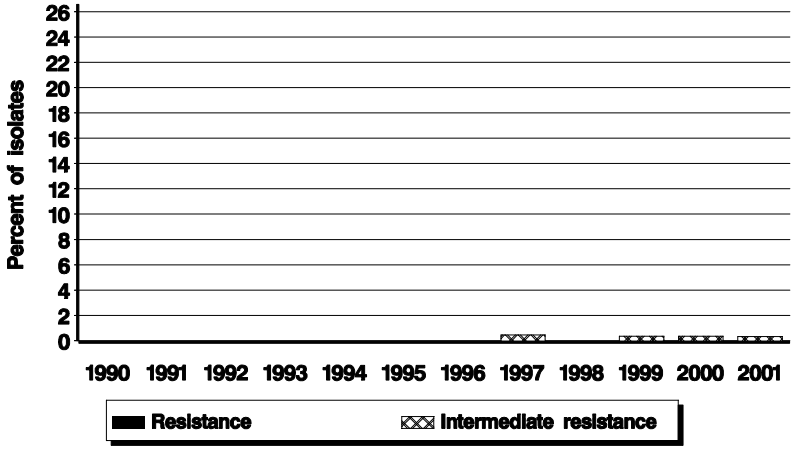
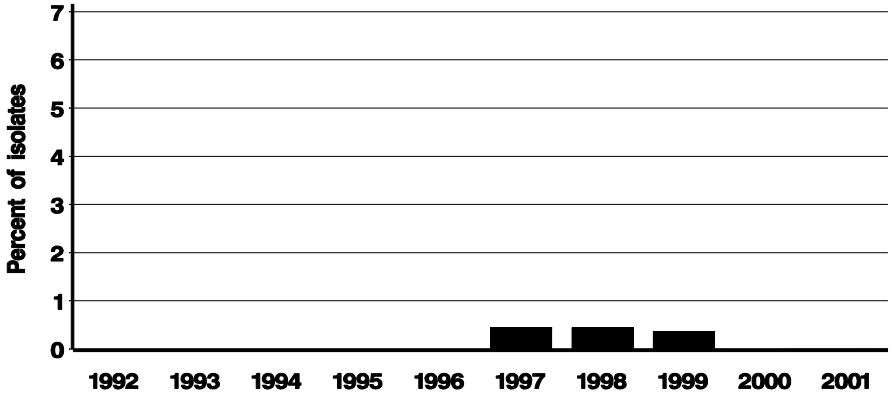


Figure K. Intermediate resistance and resistance to ciprofloxacin among GISP isolates, 1990–2001



Note: Susceptibility to ciprofloxacin first measured in 1990.

Figure L. Decreased susceptibility to azithromycin among GISP isolates, 1992–2001



Note: Susceptibility to azithromycin first measured in 1992.
Note: Decreased susceptibility to azithromycin is defined here as > or = 1.0 ug/ml. No NCCLS criteria currently exist.

Phoenix, Arizona – 2001 (N=285)

Figure A. Age of GISP participants, in years, 2001

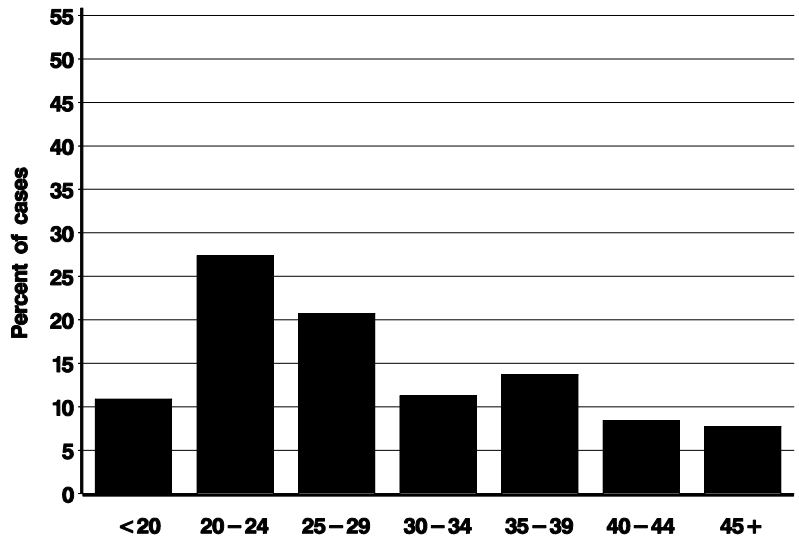


Figure B. Race/ethnicity of GISP participants, 2001

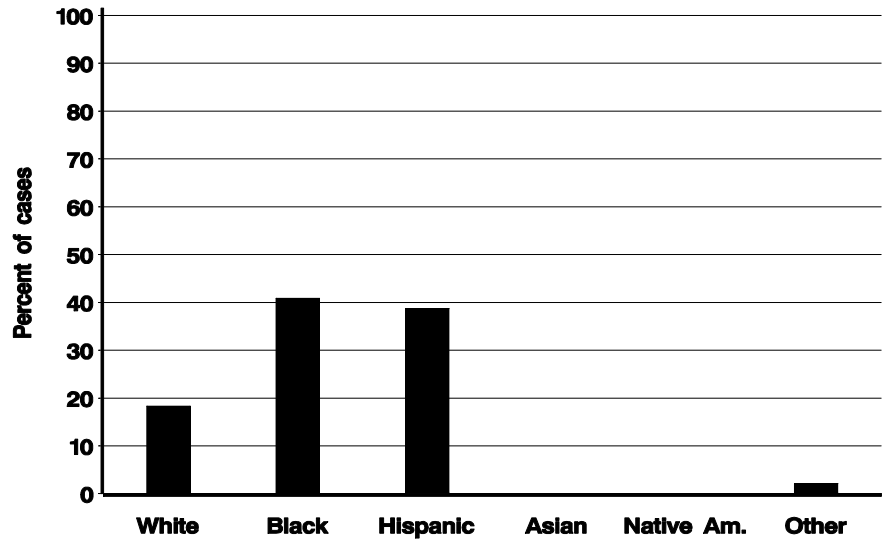


Figure C. Percentage of GISP participants identifying as men who have sex with men, 1988–2001

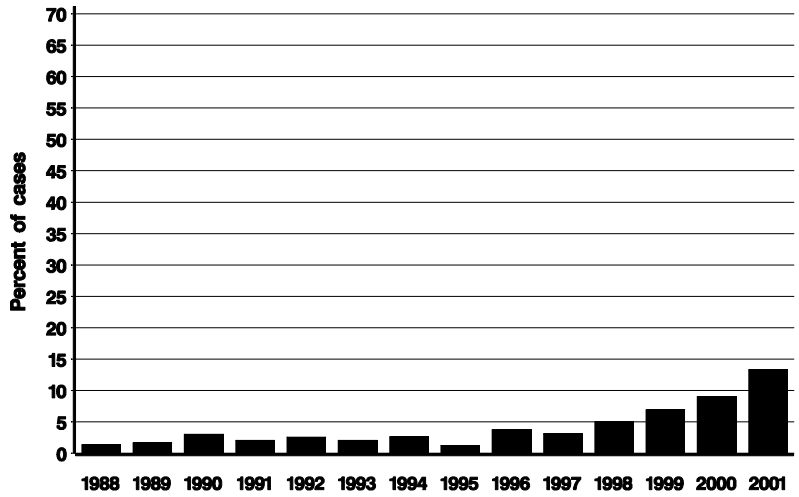
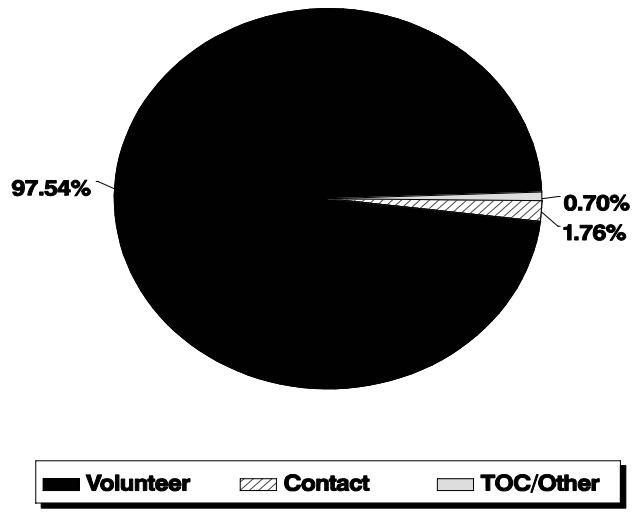
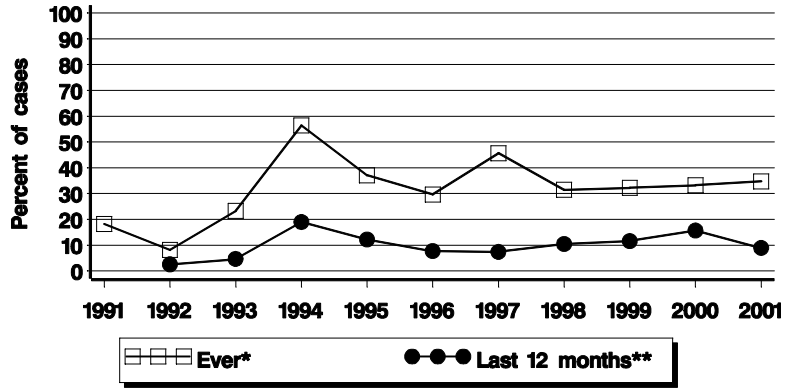


Figure D. Reason for visit among GISP participants, 2001



Phoenix, Arizona – 2001 (N=285)

Figure E. Previous episode of gonorrhea among GISP participants, 1991–2001



*Data first collected in 1991.
**Data first collected in 1992.
Note: Data points not shown when >30% data missing.

Figure F. Drugs used to treat gonorrhea among GISP participants, 2001

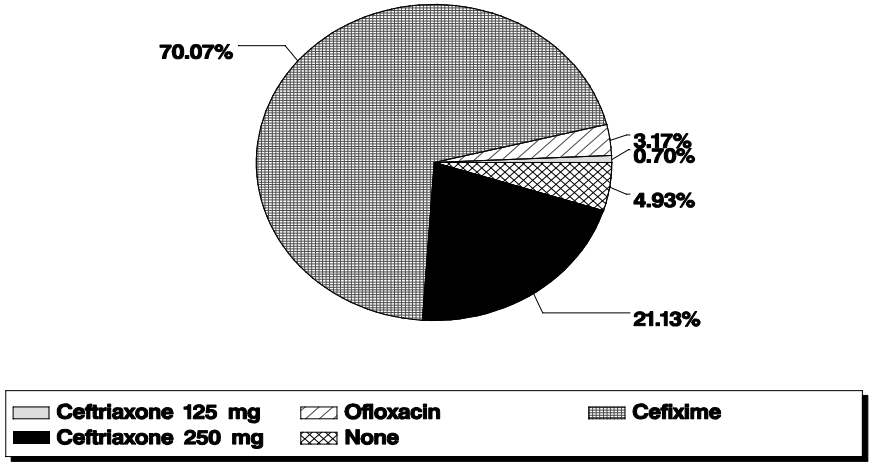


Figure G. Drugs used to treat *Chlamydia trachomatis* infection among GISP participants, 2001

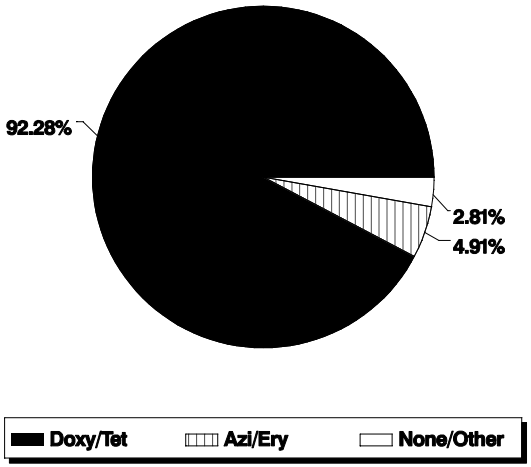
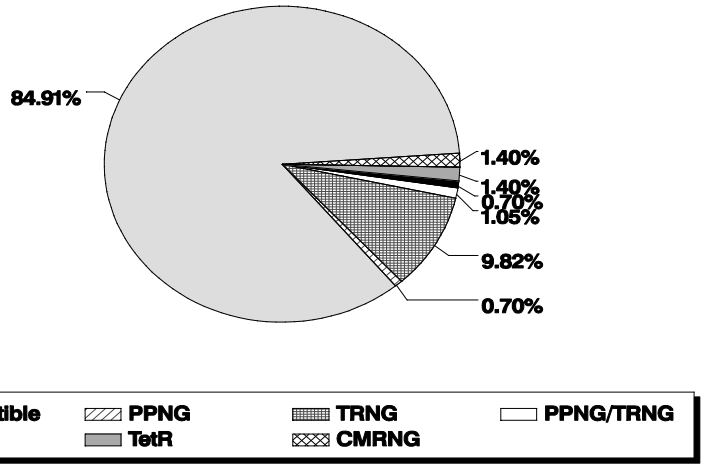


Figure H. Resistance to penicillin and tetracycline among GISP isolates, 2001



Phoenix, Arizona – 2001 (N=285)

Figure I. Decreased susceptibility to ceftriaxone among GISP isolates, 1988–2001

No isolates with decreased susceptibility to ceftriaxone have been identified at this clinic.

Figure J. Decreased susceptibility to cefixime among GISP isolates, 1992–2001

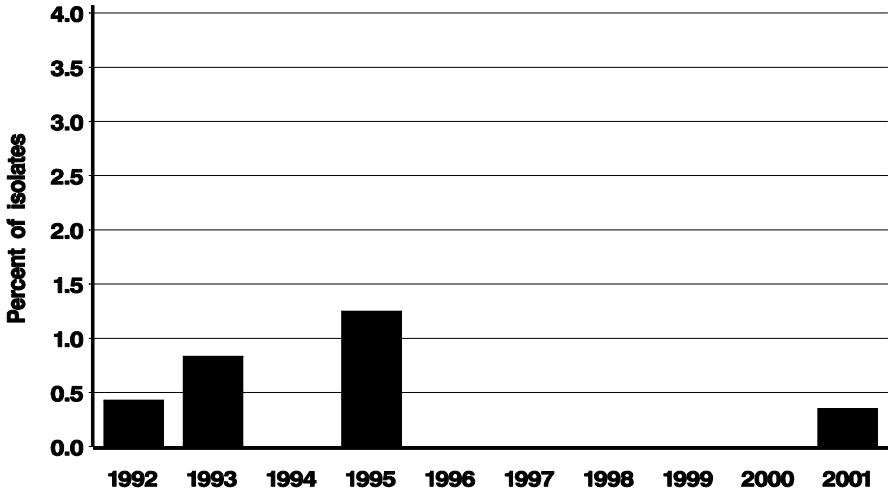
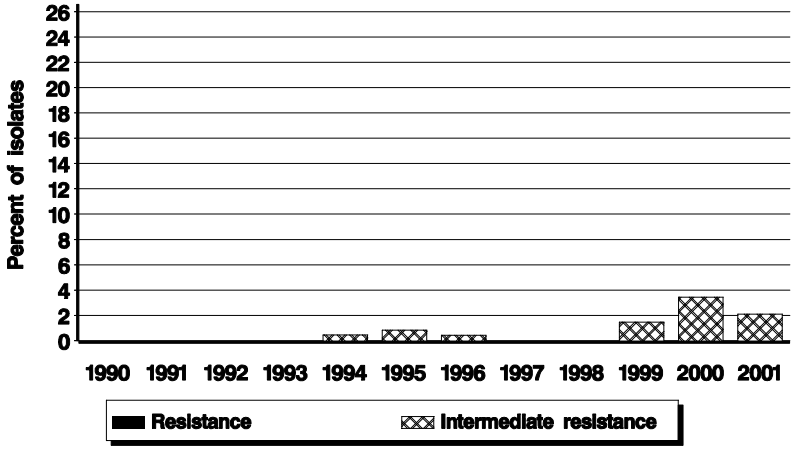
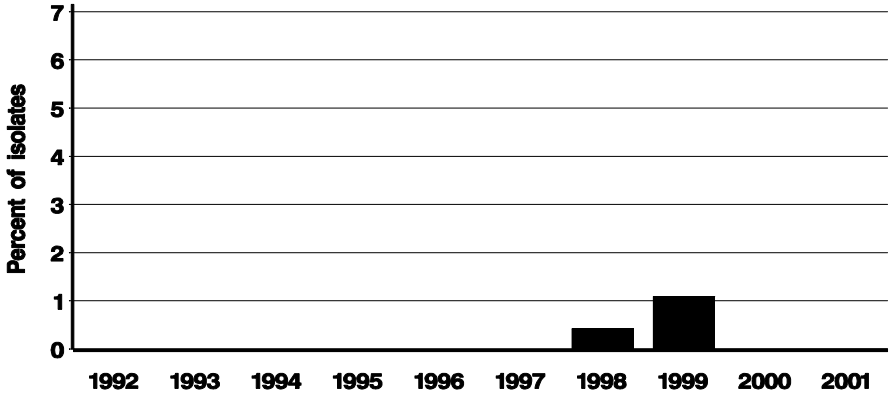


Figure K. Intermediate resistance and resistance to ciprofloxacin among GISP isolates, 1990–2001



Note: Susceptibility to ciprofloxacin first measured in 1990.

Figure L. Decreased susceptibility to azithromycin among GISP isolates, 1992–2001



Note: Susceptibility to azithromycin first measured in 1992.
Note: Decreased susceptibility to azithromycin is defined here as > or = 1.0 ug/ml. No NCCLS criteria currently exist.

Portland, Oregon – 2001 (N=187)

Figure A. Age of GISP participants, in years, 2001

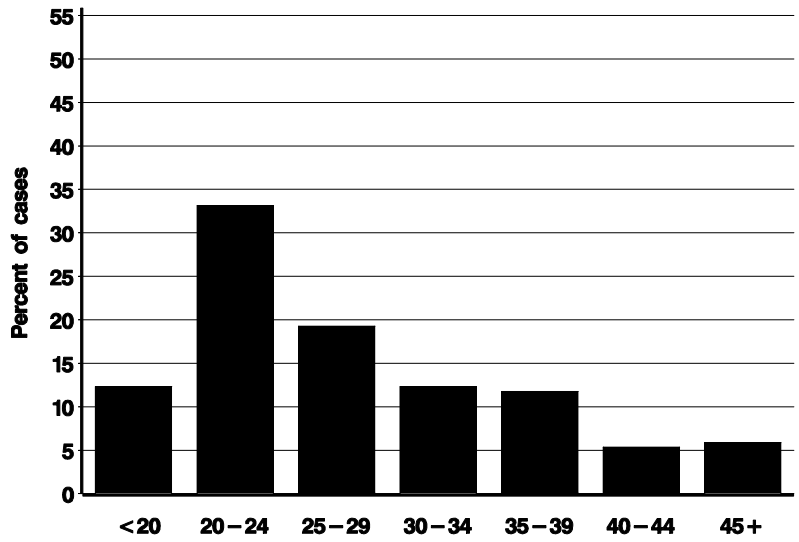


Figure B. Race/ethnicity of GISP participants, 2001

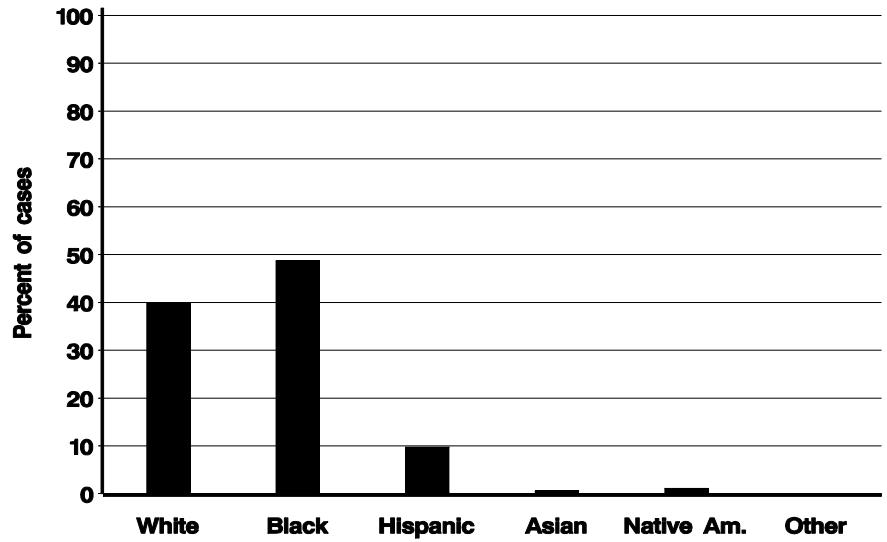


Figure C. Percentage of GISP participants identifying as men who have sex with men, 1988–2001

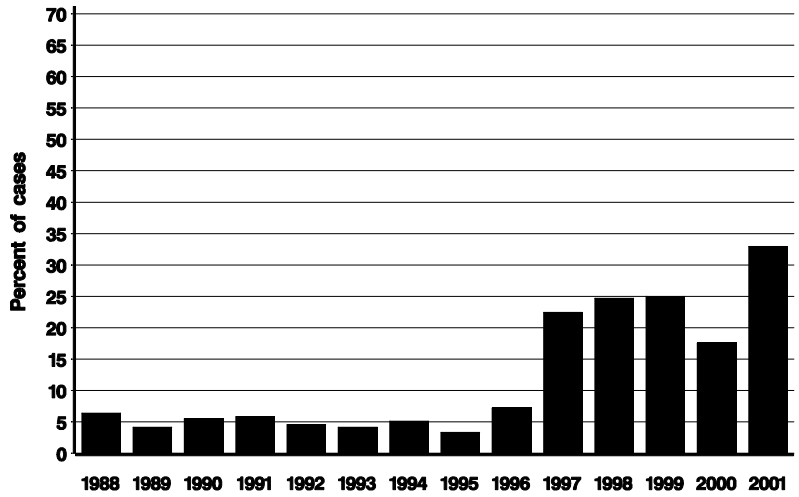
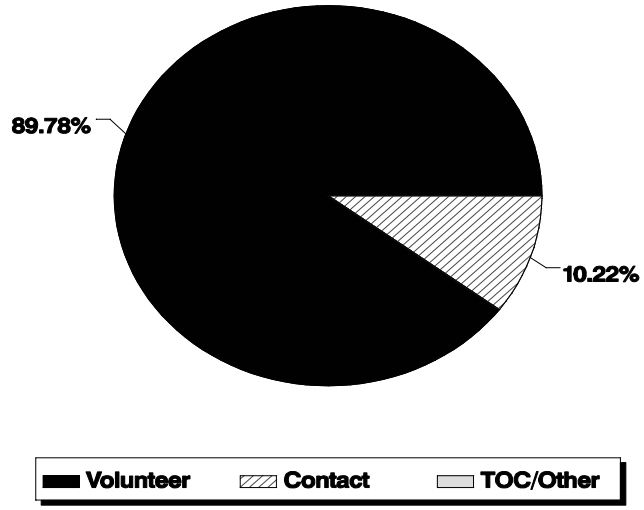
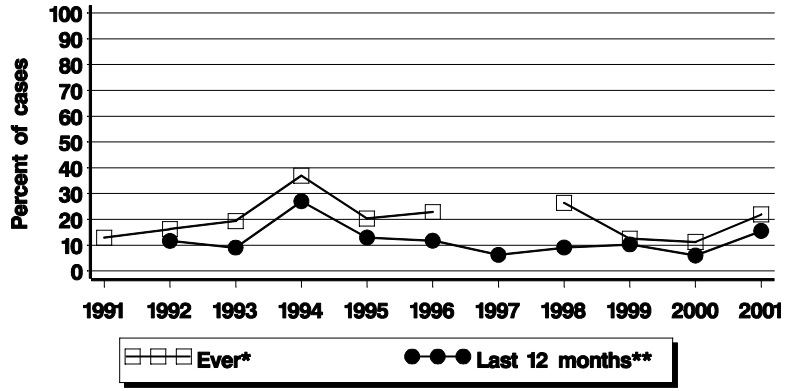


Figure D. Reason for visit among GISP participants, 2001



Portland, Oregon – 2001 (N=187)

Figure E. Previous episode of gonorrhea among GISP participants, 1991–2001



*Data first collected in 1991.
**Data first collected in 1992.
Note: Data points not shown when >30% data missing.

Figure F. Drugs used to treat gonorrhea among GISP participants, 2001

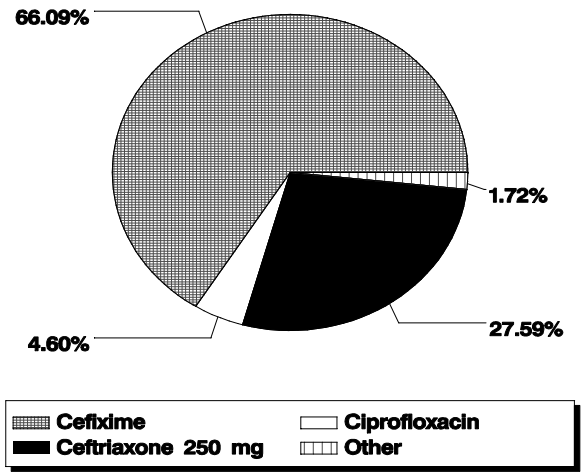


Figure G. Drugs used to treat *Chlamydia trachomatis* infection among GISP participants, 2001

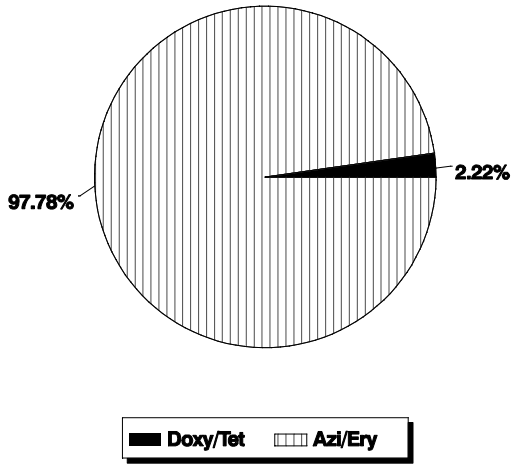
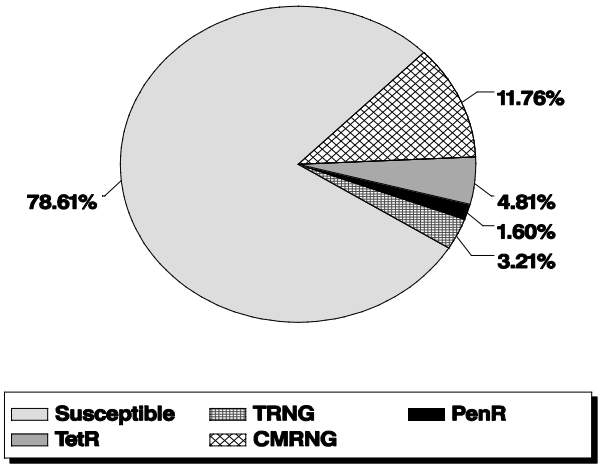


Figure H. Resistance to penicillin and tetracycline among GISP isolates, 2001



Portland, Oregon – 2001 (N=187)

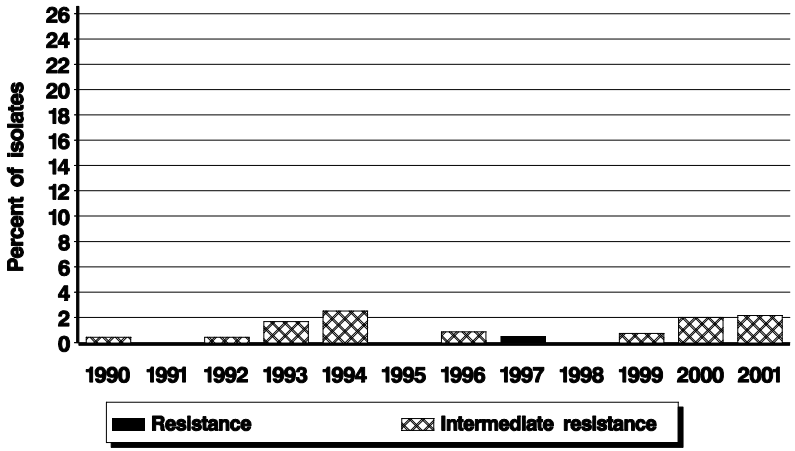
Figure I. Decreased susceptibility to ceftriaxone among GISP isolates, 1988–2001

No isolates with decreased susceptibility to ceftriaxone have been identified at this clinic.

Figure J. Decreased susceptibility to cefixime among GISP isolates, 1992–2001

No isolates with decreased susceptibility to cefixime have been identified at this clinic.

Figure K. Intermediate resistance and resistance to ciprofloxacin among GISP isolates, 1990–2001



Note: Susceptibility to ciprofloxacin first measured in 1990.

Figure L. Decreased susceptibility to azithromycin among GISP isolates, 1992–2001

No isolates with decreased susceptibility to azithromycin have been identified at this clinic.

San Diego, California – 2001 (N=235)

Figure A. Age of GISP participants, in years, 2001

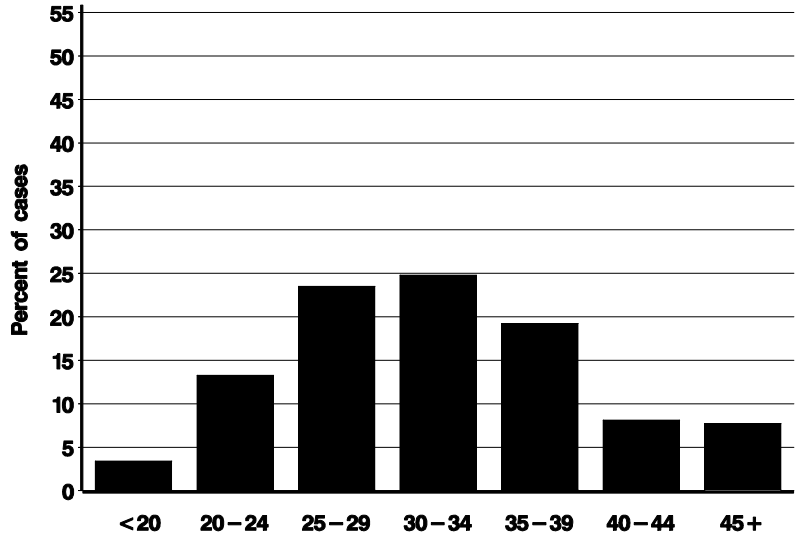


Figure B. Race/ethnicity of GISP participants, 2001

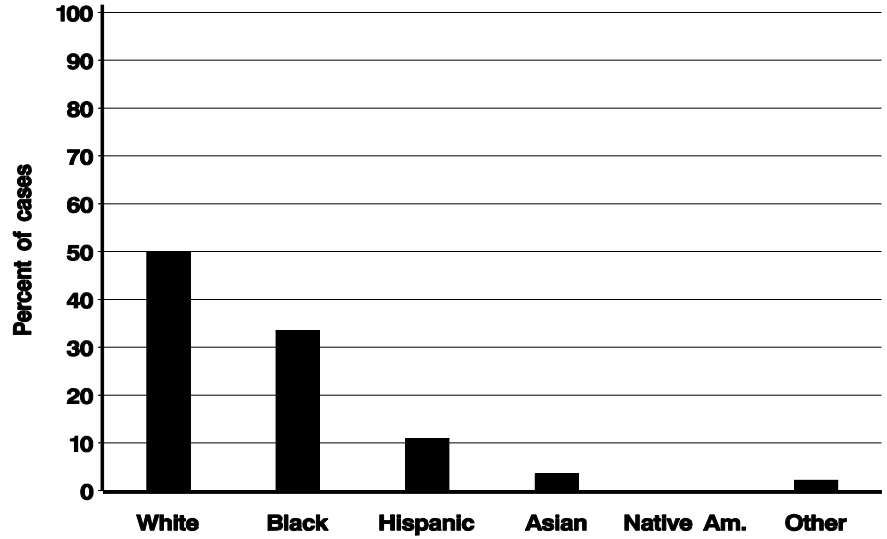


Figure C. Percentage of GISP participants identifying as men who have sex with men, 1988–2001

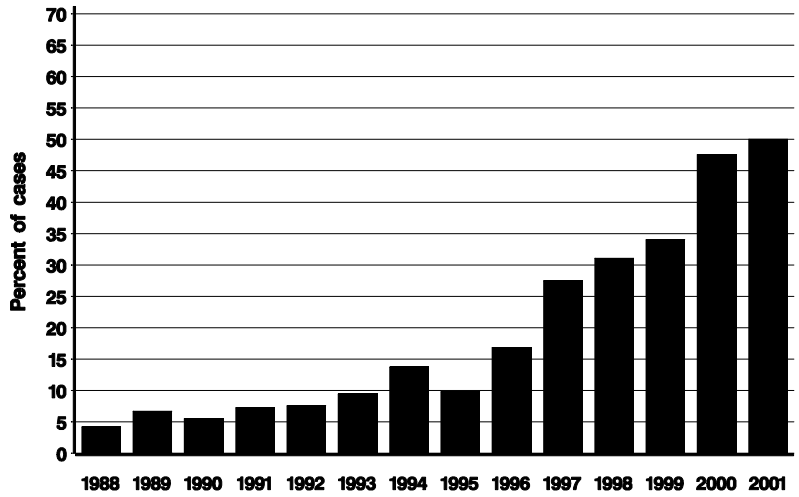
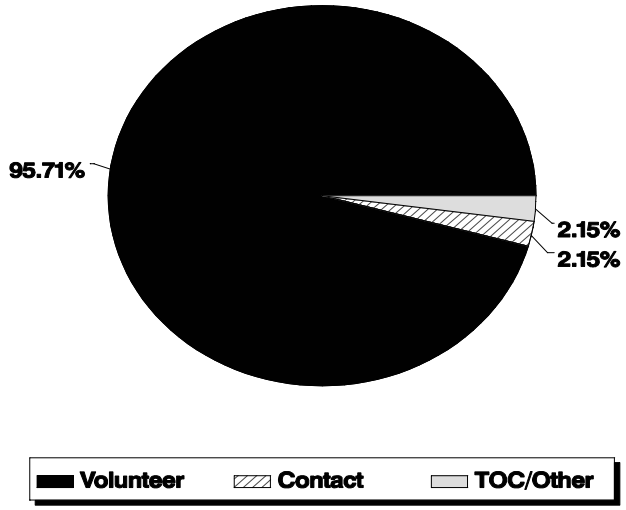
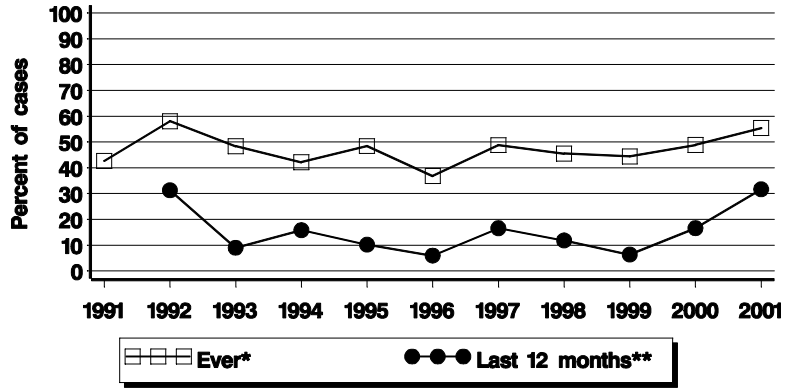


Figure D. Reason for visit among GISP participants, 2001



San Diego, California – 2001 (N=235)

Figure E. Previous episode of gonorrhea among GISP participants, 1991–2001



*Data first collected in 1991.
**Data first collected in 1992.
Note: Data points not shown when >30% data missing.

Figure F. Drugs used to treat gonorrhea among GISP participants, 2001

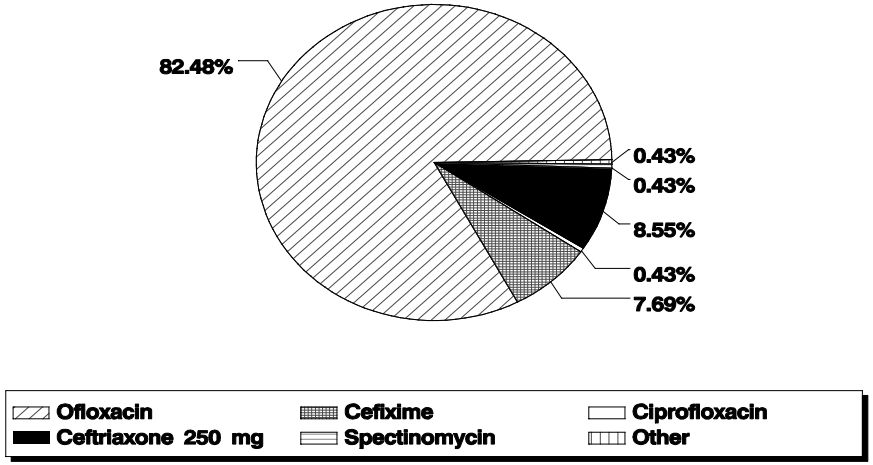


Figure G. Drugs used to treat *Chlamydia trachomatis* infection among GISP participants, 2001

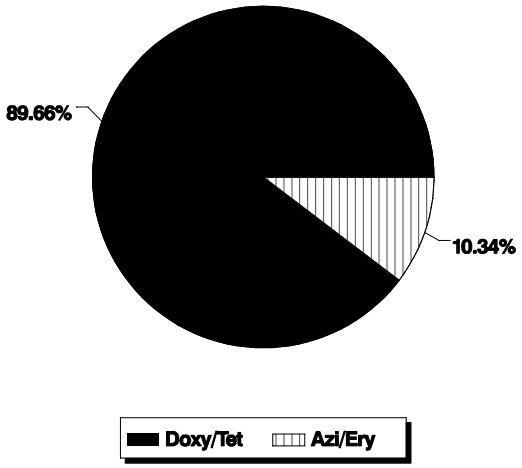
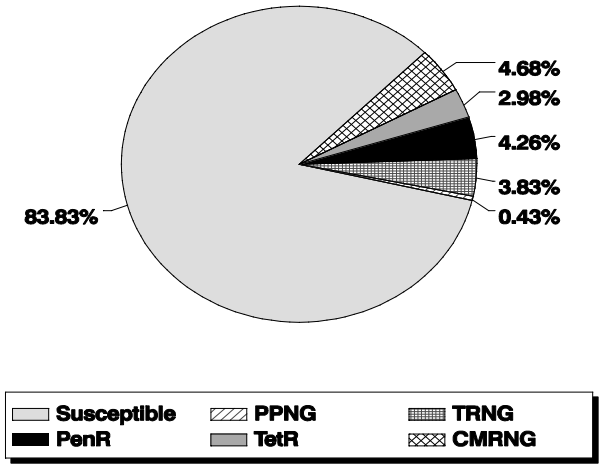


Figure H. Resistance to penicillin and tetracycline among GISP isolates, 2001



San Diego, California – 2001 (N=235)

Figure I. Decreased susceptibility to ceftriaxone among GISP isolates, 1988–2001

No isolates with decreased susceptibility to ceftriaxone have been identified at this clinic.

Figure J. Decreased susceptibility to cefixime among GISP isolates, 1992–2001

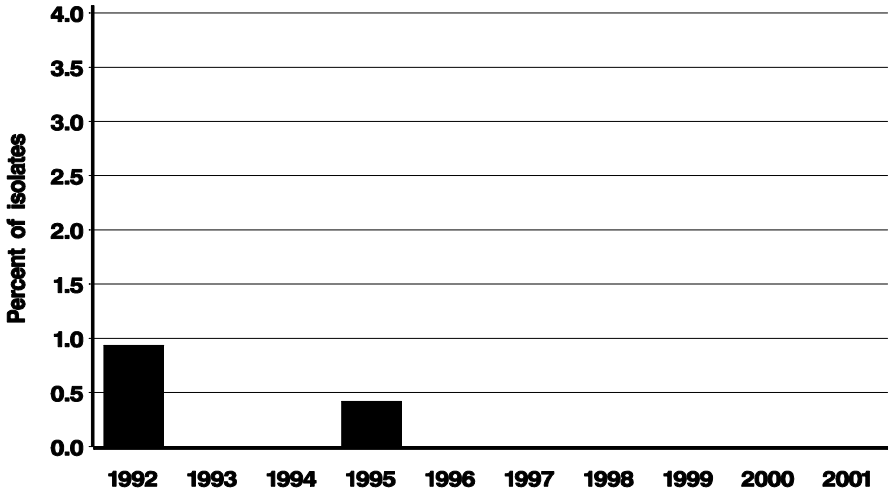
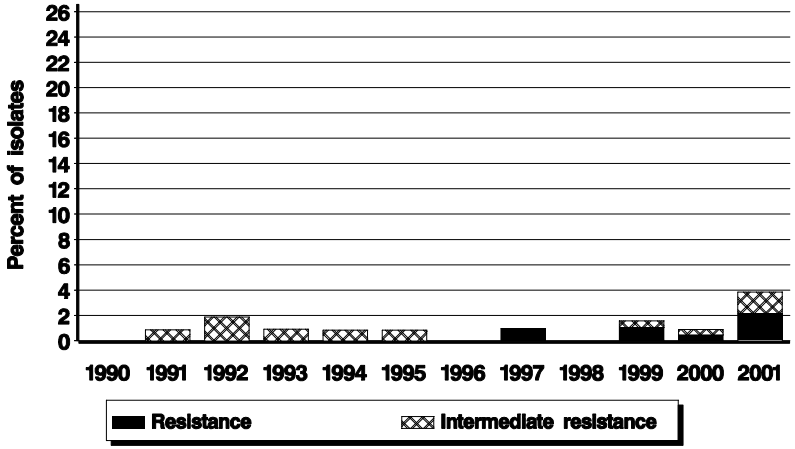
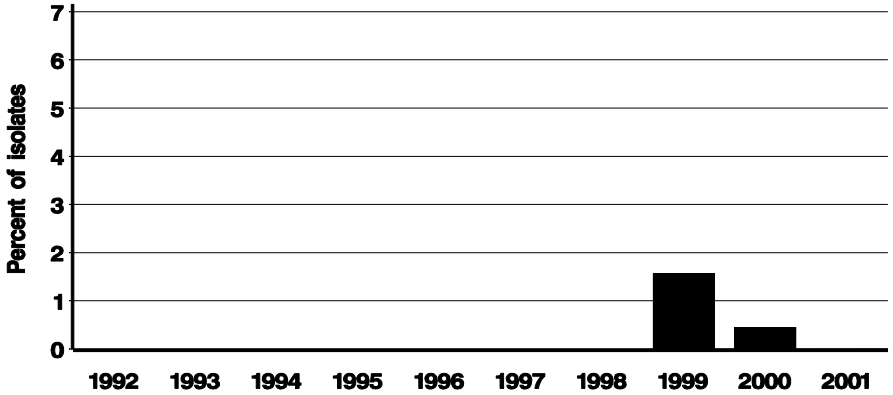


Figure K. Intermediate resistance and resistance to ciprofloxacin among GISP isolates, 1990–2001



Note: Susceptibility to ciprofloxacin first measured in 1990.

Figure L. Decreased susceptibility to azithromycin among GISP isolates, 1992–2001



Note: Susceptibility to azithromycin first measured in 1992.
Note: Decreased susceptibility to azithromycin is defined here as > or = 1.0 ug/ml. No NCCLS criteria currently exist.

San Francisco, California – 2001 (N=297)

Figure A. Age of GISP participants, in years, 2001

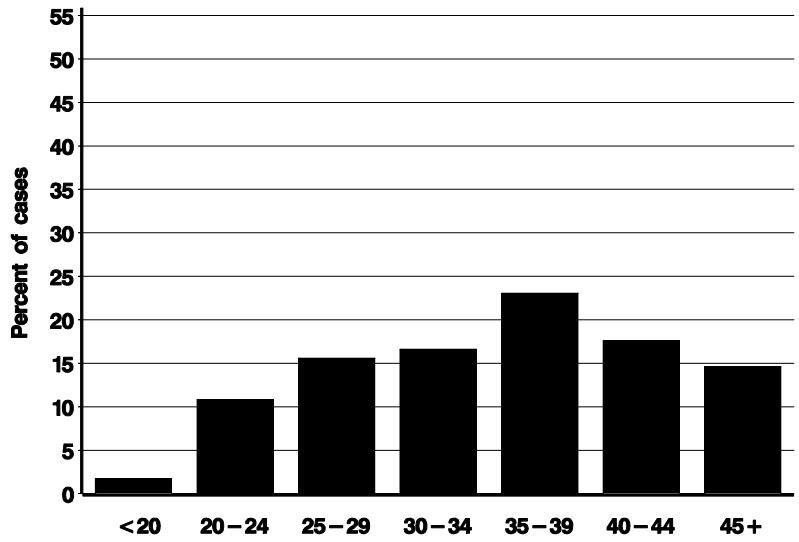


Figure B. Race/ethnicity of GISP participants, 2001

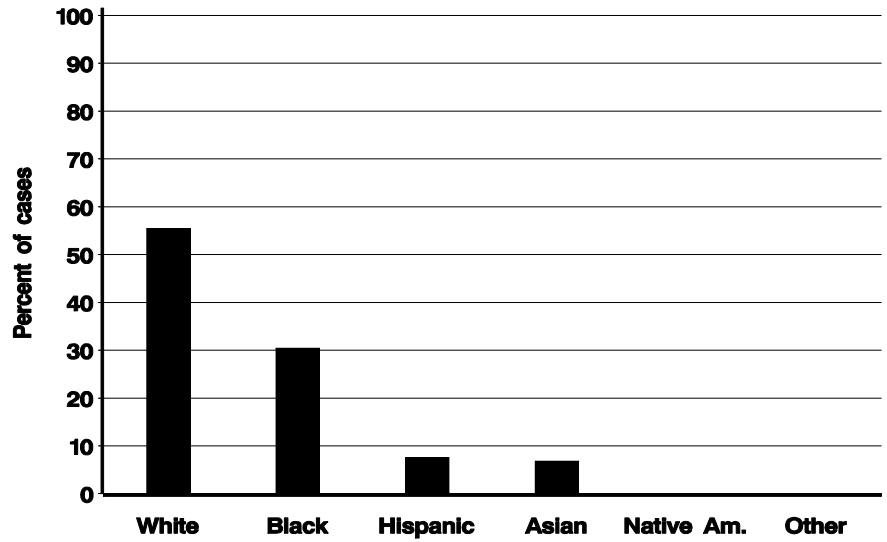


Figure C. Percentage of GISP participants identifying as men who have sex with men, 1988–2001

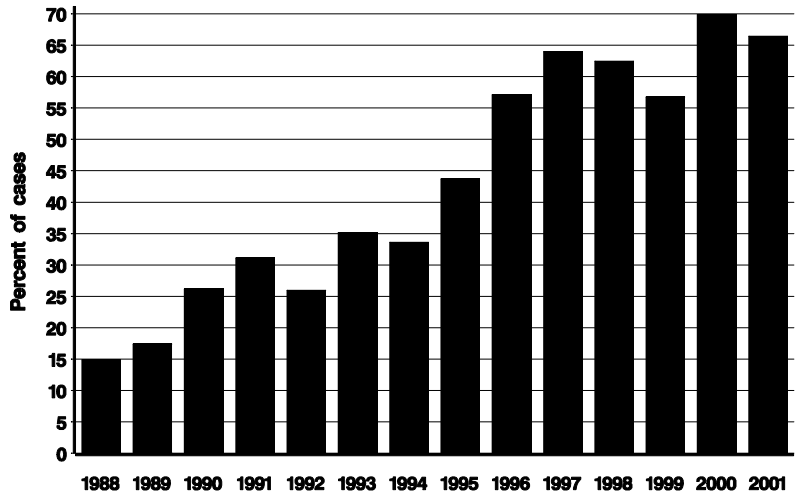
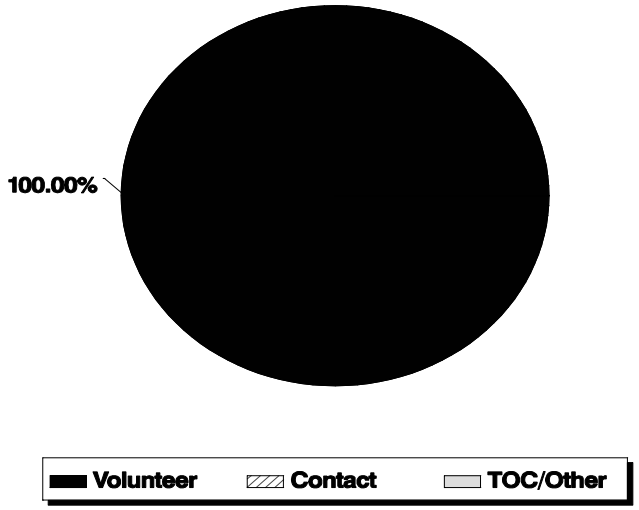
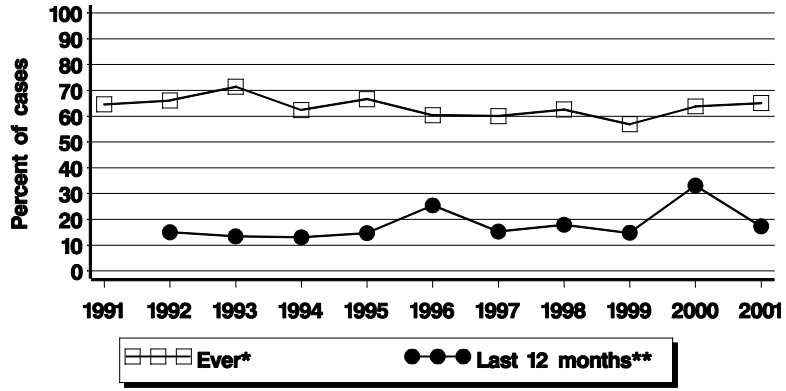


Figure D. Reason for visit among GISP participants, 2001



San Francisco, California – 2001 (N=297)

Figure E. Previous episode of gonorrhea among GISP participants, 1991–2001



*Data first collected in 1991.
**Data first collected in 1992.
Note: Data points not shown when >30% data missing.

Figure F. Drugs used to treat gonorrhea among GISP participants, 2001

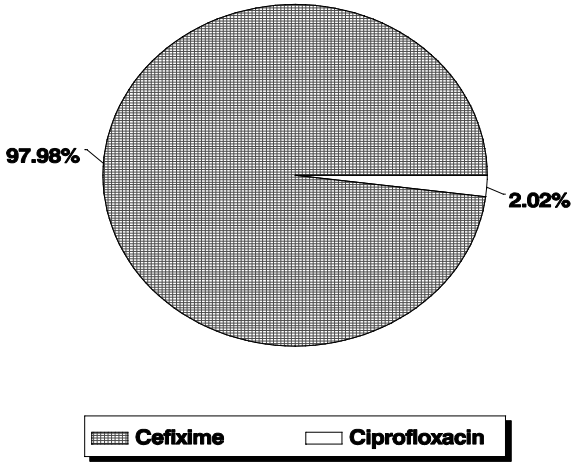


Figure G. Drugs used to treat *Chlamydia trachomatis* infection among GISP participants, 2001

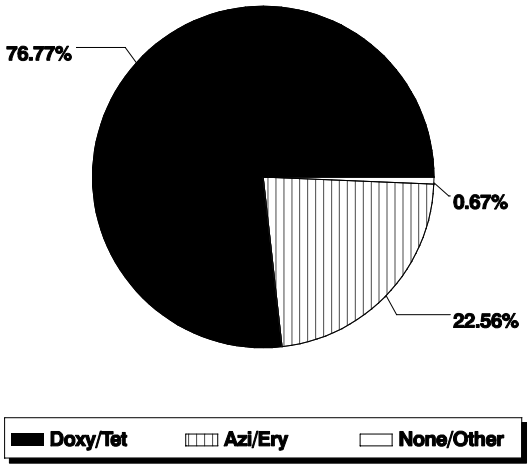
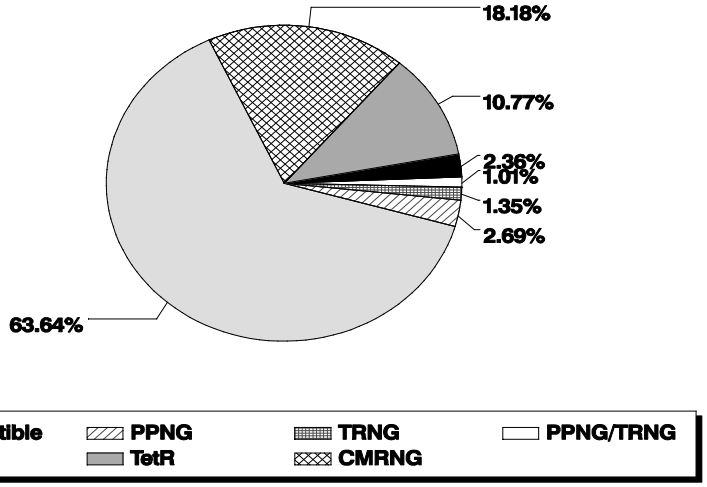


Figure H. Resistance to penicillin and tetracycline among GISP isolates, 2001



San Francisco, California – 2001 (N=297)

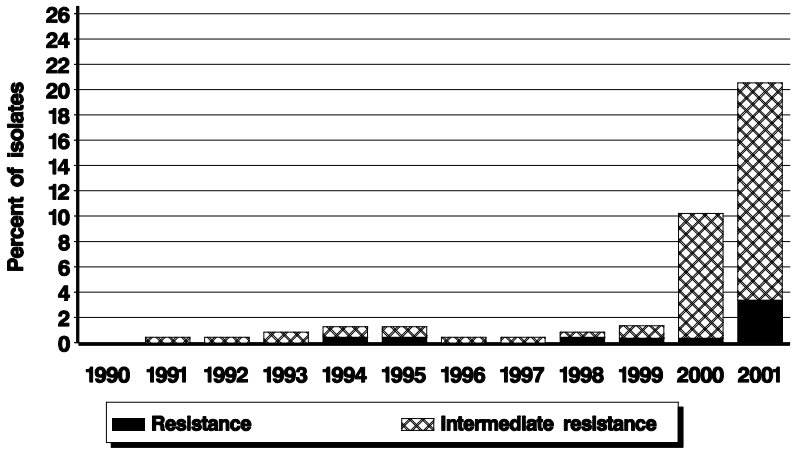
Figure I. Decreased susceptibility to ceftriaxone among GISP isolates, 1988–2001

No isolates with decreased susceptibility to ceftriaxone have been identified at this clinic.

Figure J. Decreased susceptibility to cefixime among GISP isolates, 1992–2001

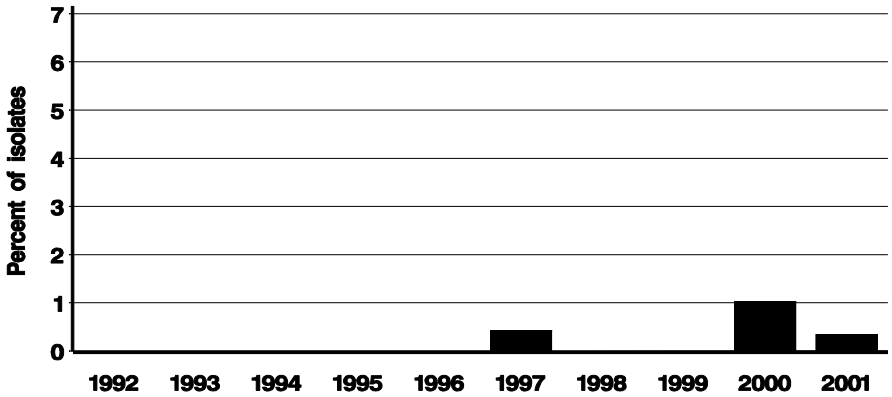
No isolates with decreased susceptibility to cefixime have been identified at this clinic.

Figure K. Intermediate resistance and resistance to ciprofloxacin among GISP isolates, 1990–2001



Note: Susceptibility to ciprofloxacin first measured in 1990.

Figure L. Decreased susceptibility to azithromycin among GISP isolates, 1992–2001



Note: Susceptibility to azithromycin first measured in 1992.
Note: Decreased susceptibility to azithromycin is defined here as > or = 1.0 ug/ml. No NCCLS criteria currently exist.

Seattle, Washington – 2001 (N=254)

Figure A. Age of GISP participants, in years, 2001

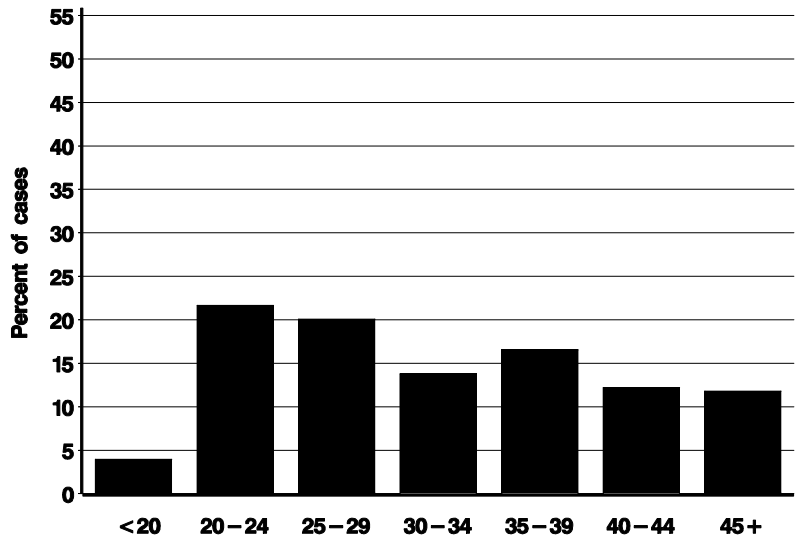


Figure B. Race/ethnicity of GISP participants, 2001

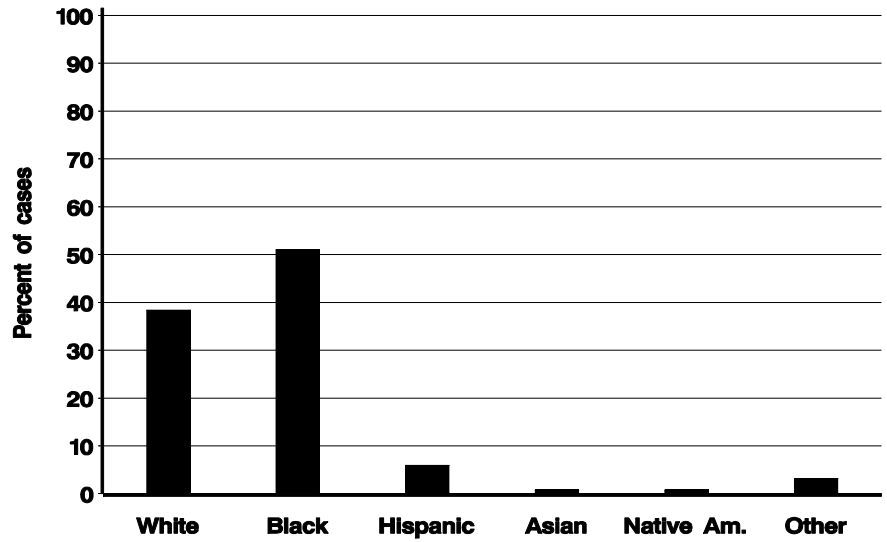


Figure C. Percentage of GISP participants identifying as men who have sex with men, 1988–2001

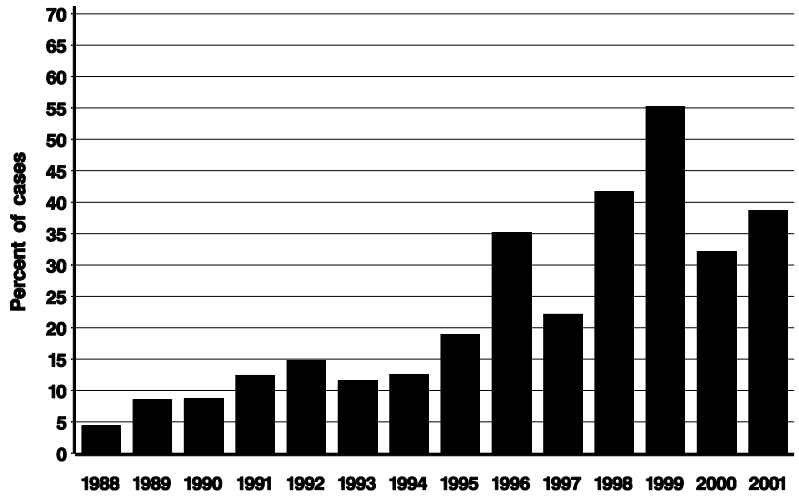
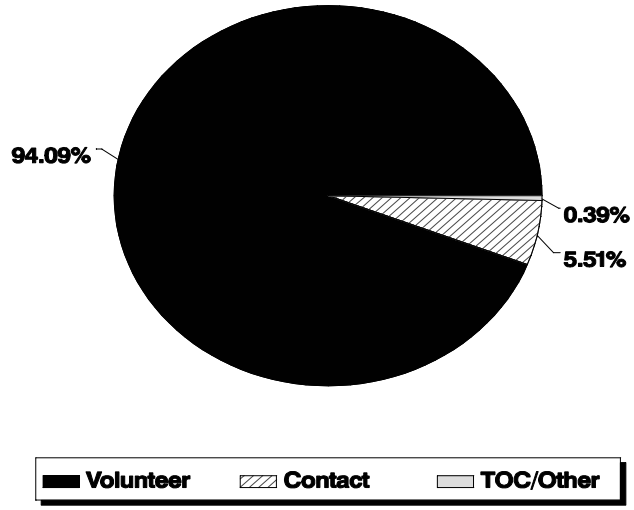
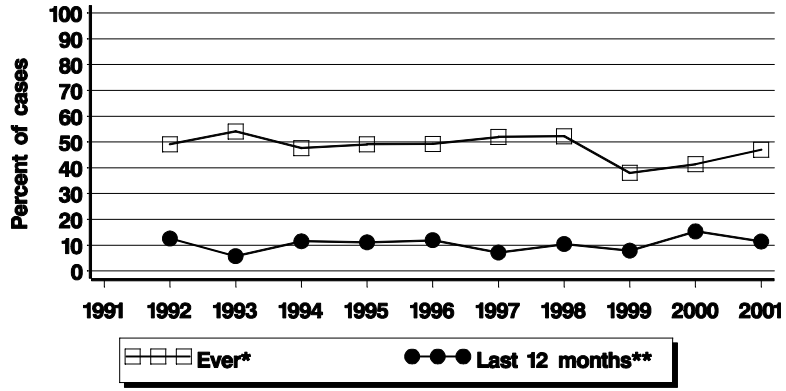


Figure D. Reason for visit among GISP participants, 2001



Seattle, Washington – 2001 (N=254)

Figure E. Previous episode of gonorrhea among GISP participants, 1991–2001



*Data first collected in 1991.
**Data first collected in 1992.
Note: Data points not shown when >30% data missing.

Figure F. Drugs used to treat gonorrhea among GISP participants, 2001

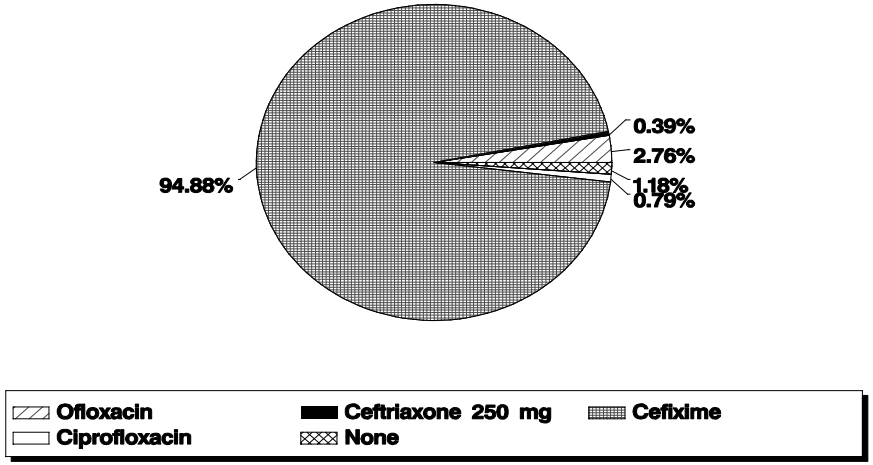


Figure G. Drugs used to treat *Chlamydia trachomatis* infection among GISP participants, 2001

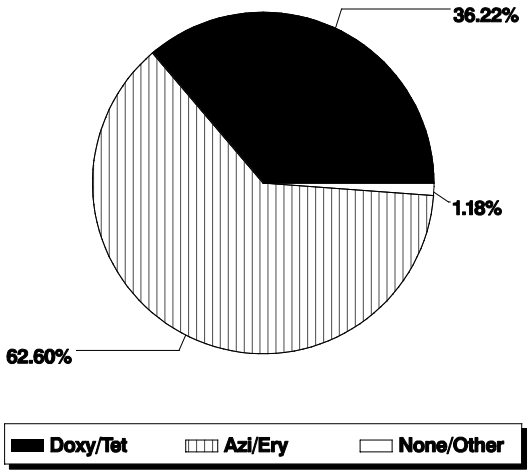
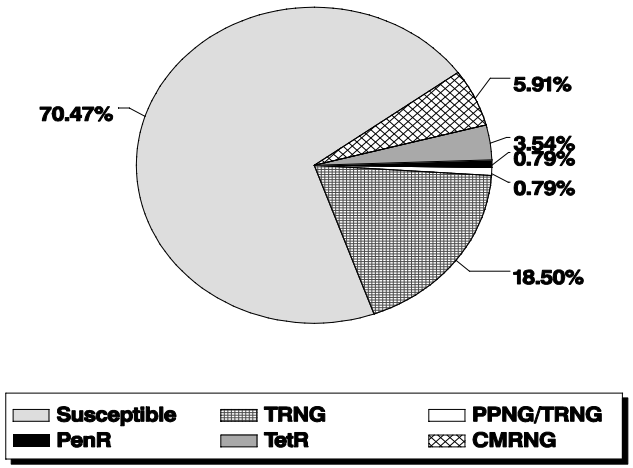


Figure H. Resistance to penicillin and tetracycline among GISP isolates, 2001



Seattle, Washington – 2001 (N=254)

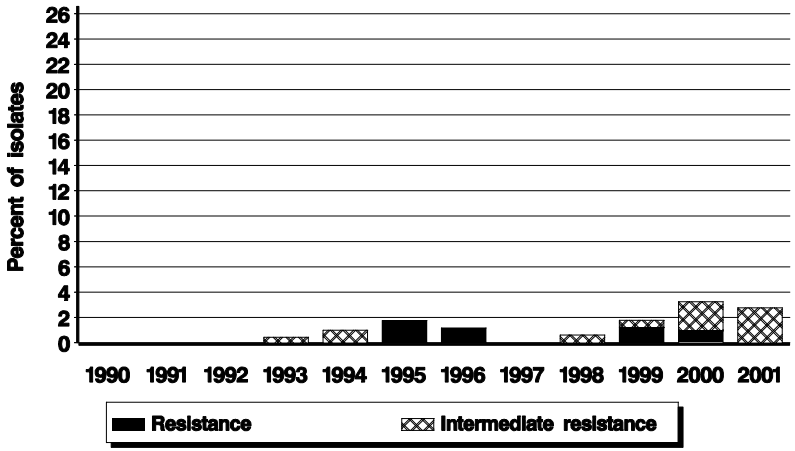
Figure I. Decreased susceptibility to ceftriaxone among GISP isolates, 1988–2001

No isolates with decreased susceptibility to ceftriaxone have been identified at this clinic.

Figure J. Decreased susceptibility to cefixime among GISP isolates, 1992–2001

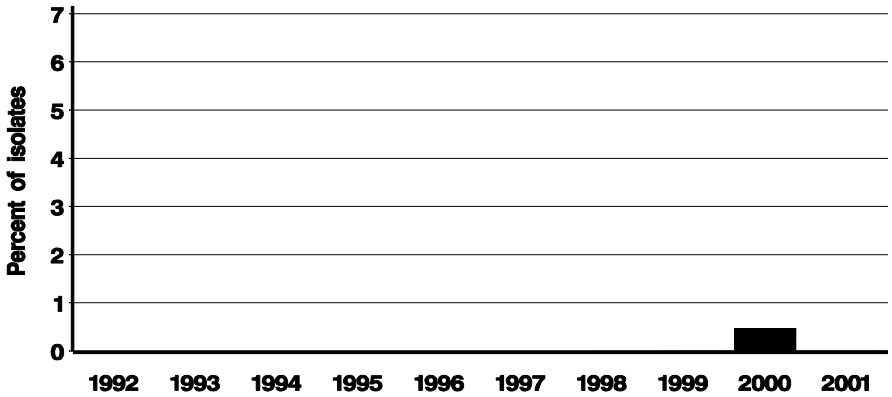
No isolates with decreased susceptibility to cefixime have been identified at this clinic.

Figure K. Intermediate resistance and resistance to ciprofloxacin among GISP isolates, 1990–2001



Note: Susceptibility to ciprofloxacin first measured in 1990.

Figure L. Decreased susceptibility to azithromycin among GISP isolates, 1992–2001



Note: Susceptibility to azithromycin first measured in 1992.
Note: Decreased susceptibility to azithromycin is defined here as > or = 1.0 ug/ml. No NCCLS criteria currently exist.

St. Louis, Missouri – 2001 (N=295)

Figure A. Age of GISP participants, in years, 2001

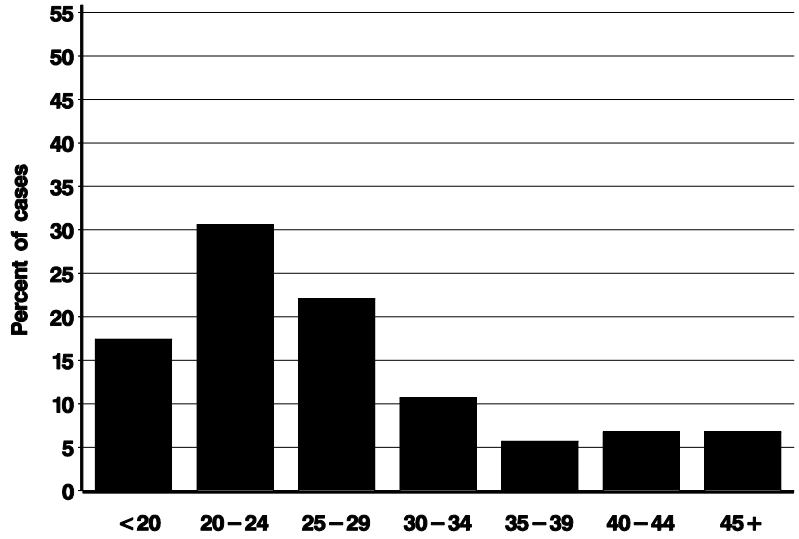


Figure B. Race/ethnicity of GISP participants, 2001

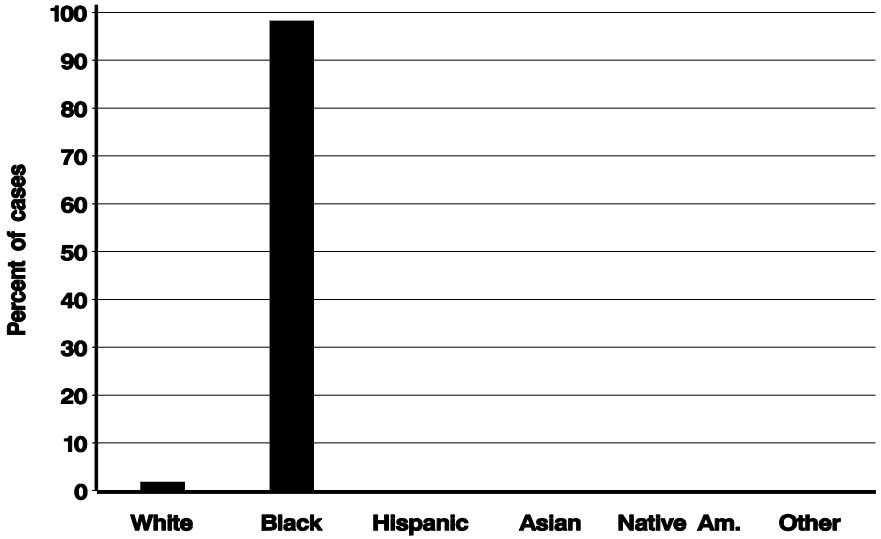


Figure C. Percentage of GISP participants identifying as men who have sex with men, 1988–2001

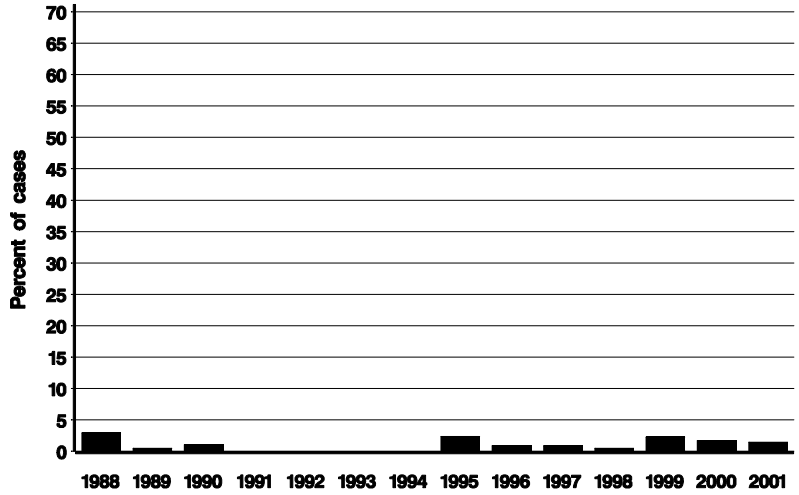
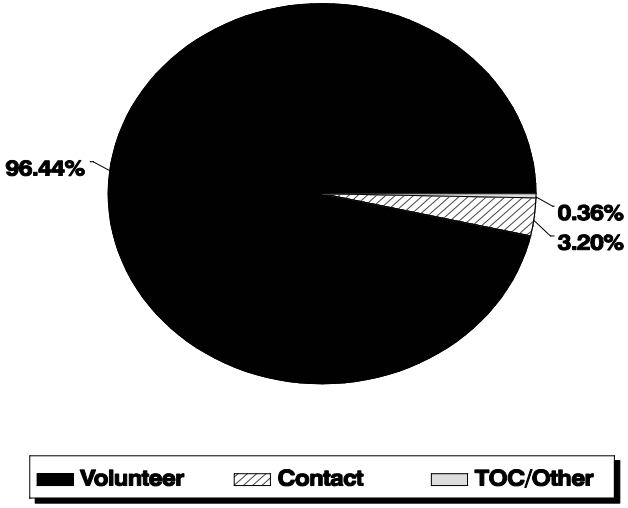
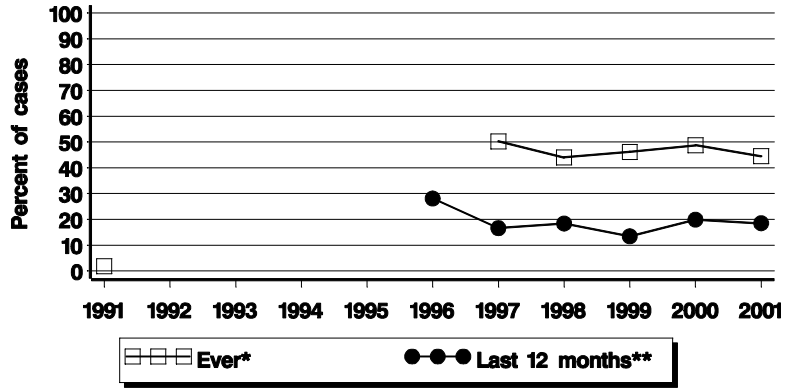


Figure D. Reason for visit among GISP participants, 2001



St. Louis, Missouri – 2001 (N=295)

Figure E. Previous episode of gonorrhea among GISP participants, 1991–2001



*Data first collected in 1991.
**Data first collected in 1992.
Note: Data points not shown when >30% data missing.

Figure F. Drugs used to treat gonorrhea among GISP participants, 2001

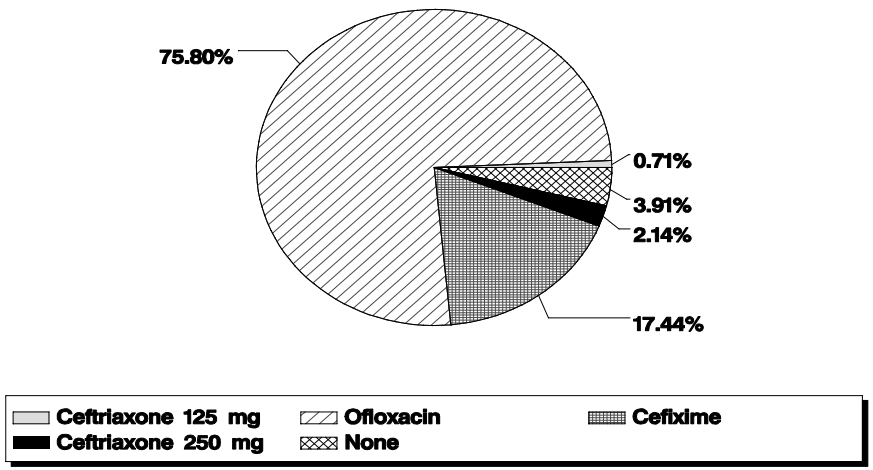


Figure G. Drugs used to treat *Chlamydia trachomatis* infection among GISP participants, 2001

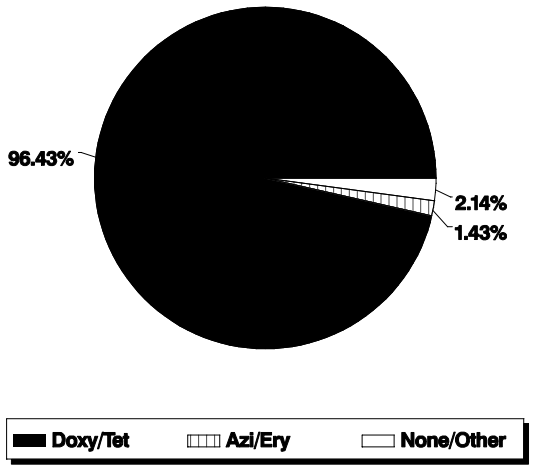
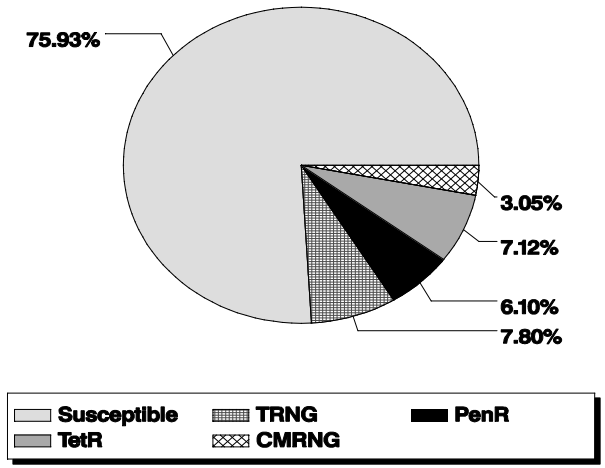


Figure H. Resistance to penicillin and tetracycline among GISP isolates, 2001



St. Louis, Missouri – 2001 (N=295)

Figure I. Decreased susceptibility to ceftriaxone among GISP isolates, 1988–2001

No isolates with decreased susceptibility to ceftriaxone have been identified at this clinic.

Figure J. Decreased susceptibility to cefixime among GISP isolates, 1992–2001

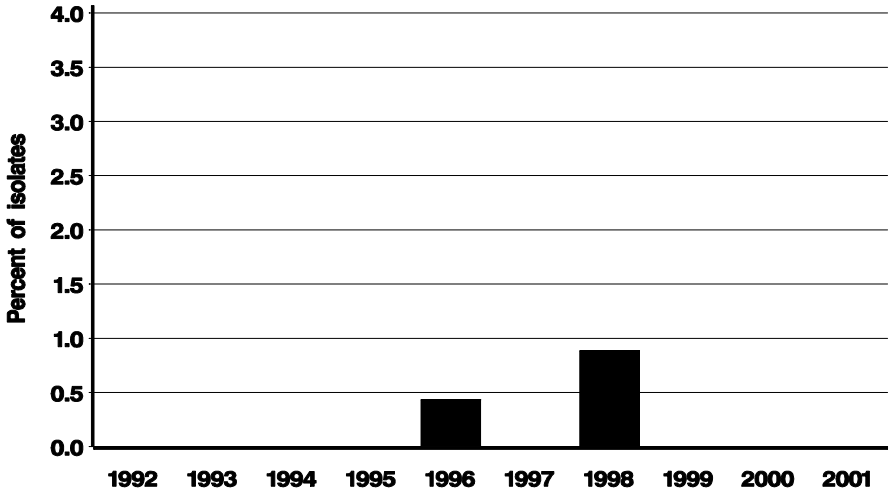
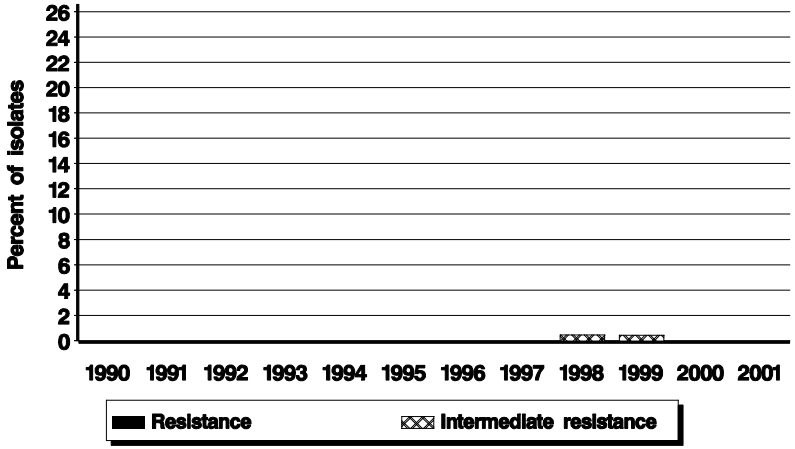
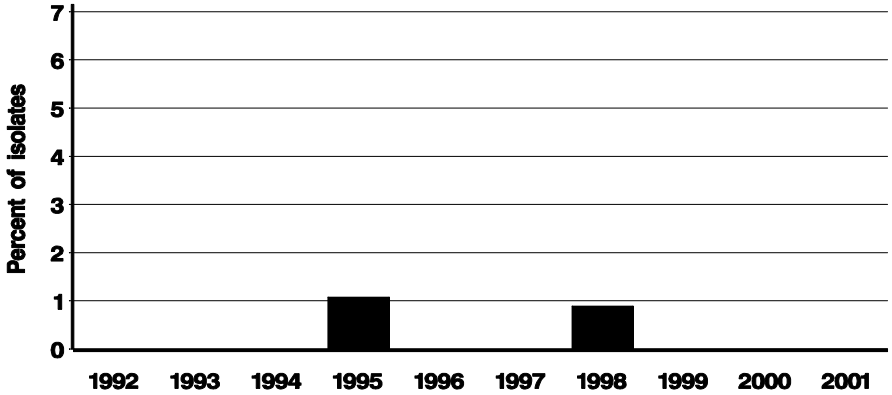


Figure K. Intermediate resistance and resistance to ciprofloxacin among GISP isolates, 1990–2001



Note: Susceptibility to ciprofloxacin first measured in 1990.

Figure L. Decreased susceptibility to azithromycin among GISP isolates, 1992–2001



Note: Susceptibility to azithromycin first measured in 1992.
Note: Decreased susceptibility to azithromycin is defined here as > or = 1.0 ug/ml. No NCCLS criteria currently exist.