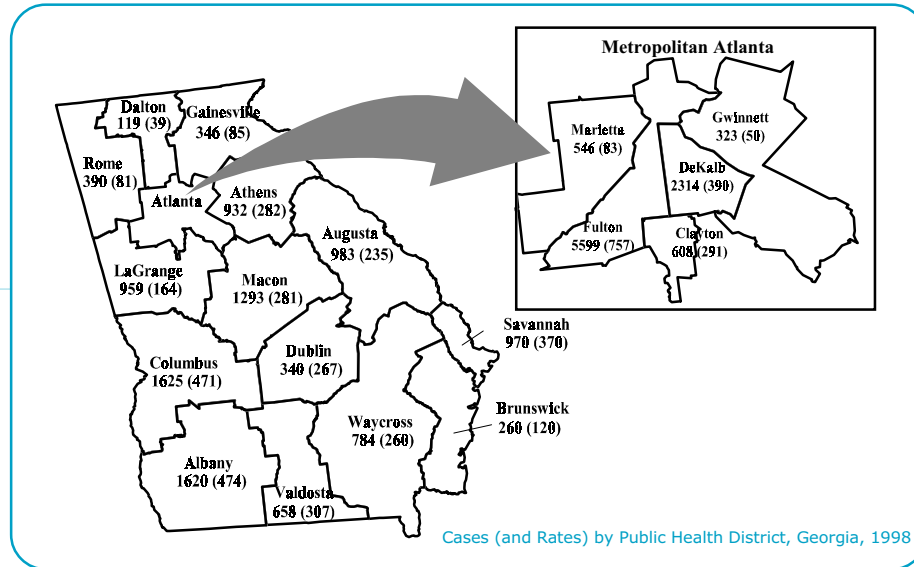


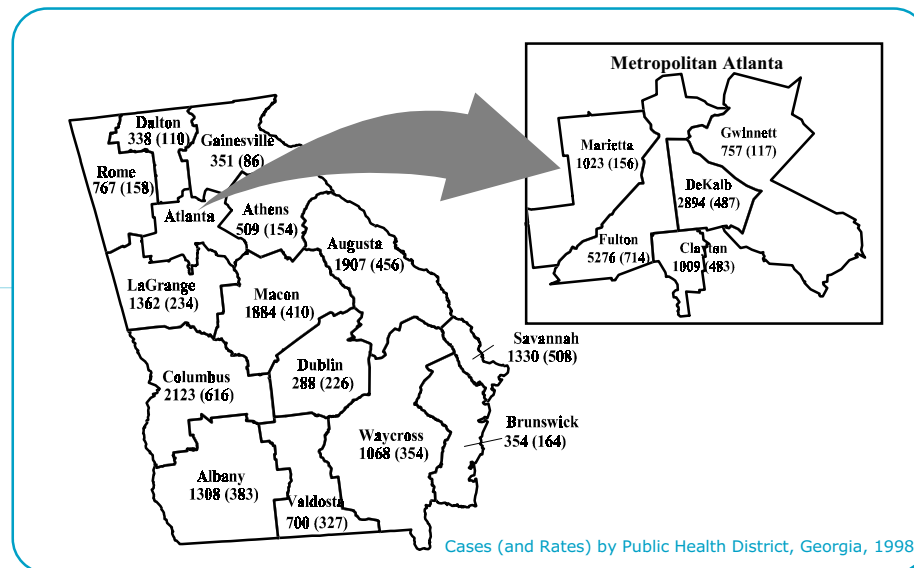
An Overview

Gonorrhea and Chlamydia

Gonorrhea



Chlamydia



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An Overview of Gonorrhea and Chlamydia in Georgia: Epidemiologic data, screening, laboratory tests, treatment, management of sex partners, and case reporting.

Prepared by the Georgia Department of Human Resources, Division of Public Health

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Introduction

Sexually transmitted diseases (STDs) cause a tremendous health and economic burden and are the most frequently reported infectious diseases in the United States. Each year, more than 12 million Americans, 3 million of whom are teenagers, are infected with STDs, resulting in a cost of approximately \$10 billion for the treatment of STDs and resulting complications.¹ STDs are primarily associated with unprotected sexual activity, but other behavioral, biological, and social factors are also known to contribute to STD transmission, including drug and alcohol use. STDs particularly affect young persons, women, minorities, and populations living in the rural South.

In recent years, Georgia has ranked in the top ten among all states for reported cases of STDs, including gonorrhea and chlamydia.² These two STDs cause pelvic inflammatory disease (PID), infertility, ectopic pregnancy, chronic pelvic pain, epididymitis, and an increased risk of human immunodeficiency virus (HIV) transmission. Further, the annual costs for chlamydia alone have been estimated to be over \$50 million. In Georgia, gonorrhea and chlamydia are the two most frequently reported infections; in 1998, 20,669 cases of gonorrhea and 25,248 cases of chlamydia were reported. The actual number of persons with these STDs in Georgia, however, is much higher than has been reported because of unknown asymptomatic infection, incomplete reporting, and persons who are presumptively treated and thus not reported.

Successfully preventing and controlling STDs requires an understanding of several important and related issues such as epidemiologic data, screening, tests, treatment, management of sex partners, and case reporting. This document

focuses on gonorrhea and chlamydia. Data presented in this report are from the gonorrhea and chlamydia surveillance database and the Gonococcal Isolate Surveillance Project (GISP) and Chlamydia Project databases. Laboratory testing information is from recent publications,^{3,4} and screening, treatment, and sex partner management recommendations are from the Centers for Disease Control and Prevention (CDC) 1998 STD treatment guidelines.⁵ The Division of Public Health's STD/HIV Section has previously published the "Sexually Transmitted Diseases Program Manual" which is an additional and thorough reference for standards, guidelines, and laws related to STDs in Georgia.⁶

Gonorrhea surveillance

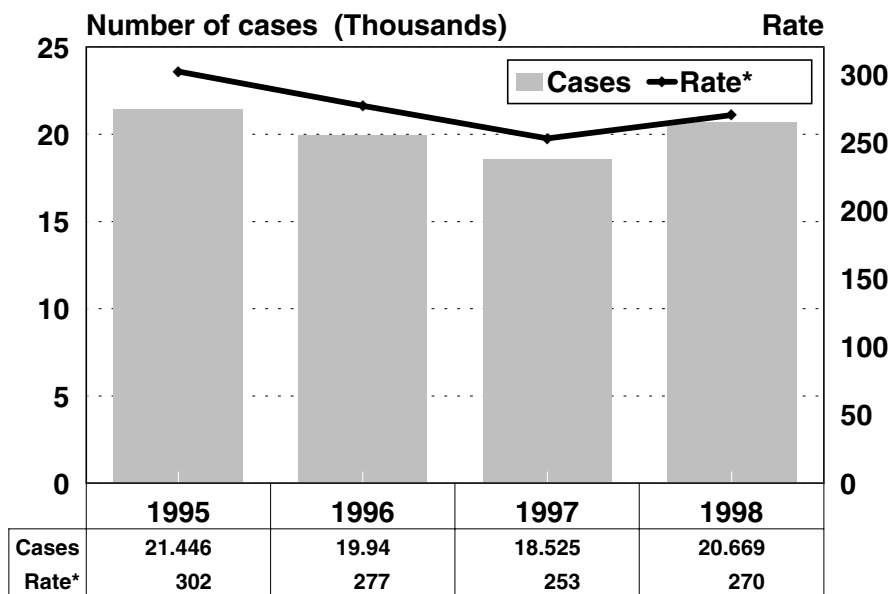
From the mid-1970s to the mid-1990s, the rate of reported gonorrhea cases in the United States has steadily decreased; however, a reversal of this trend occurred from 1997 to 1998.² The rate was 133 cases per 100,000 population in 1998 compared to 122 cases per 100,000 population in 1997, representing a 9% increase. The number of reported cases of gonorrhea in the United States is second only to chlamydia; in 1998, 355,642 cases of gonorrhea were reported.

Charts 1 to 9 help describe the epidemiology of gonorrhea in Georgia. After a gradual decline in the rate and number of reported cases in recent years, a reversal of this trend appears to be beginning. In 1998, 20,669 cases of gonorrhea were reported for a rate of 270 cases per 100,000 population. Of these, 10,056 (49%) were female; 6,095 (29%) were 10 to 19 years old; and 9,149 (44%) were 20 to 29 years old. Among females, the number of reported cases

was highest in the 20 to 29 year old age group (4,236 cases), but the rate was highest among those 10 to 19 years old (769 cases per 100,000 population). Among males, the number of reported cases and the rates were highest among those 20 to 29 years old (4,887 cases, rate of 887 cases per 100,000 population). The five public health districts with the highest number of reported cases were Fulton (5,599), DeKalb (2,314), Columbus (1,625), Albany (1,620),

and Macon (1,293). When the districts were grouped by metropolitan statistical area (MSA), the Atlanta area (which includes the Marietta, Fulton, Clayton, Gwinnett, and DeKalb districts) had the highest number of cases (9,390) in 1998, and the districts which include a small MSA (i.e., Albany, Athens, Augusta, Columbus, Macon, and Savannah) had the highest rate (344 cases per 100,000 population).

Chart 1 Gonorrhea Cases and Rates by Year of Diagnosis Georgia, 1995-1998



* Rate = cases/100,000 population

Chart 2

**Gonorrhea Cases by Sex and Year of Diagnosis
Georgia, 1995-1998**

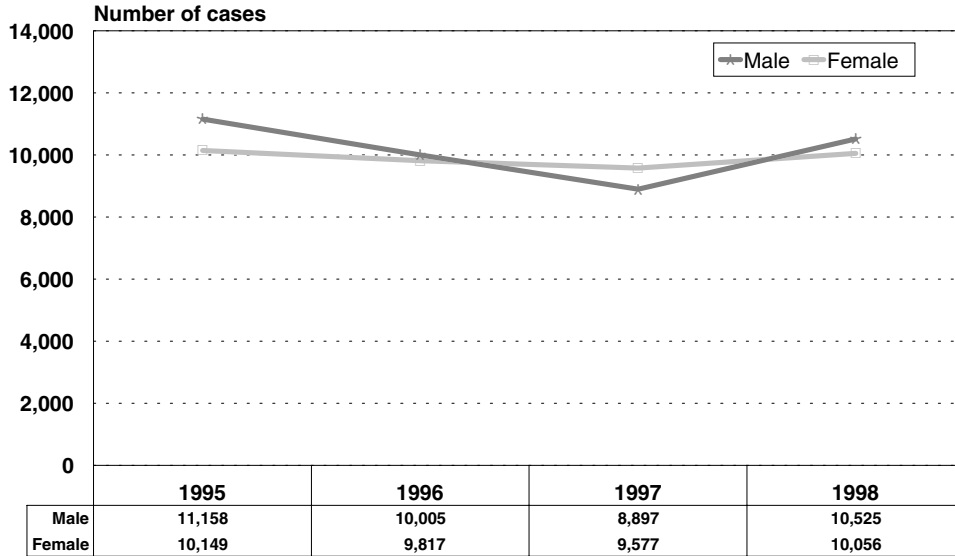
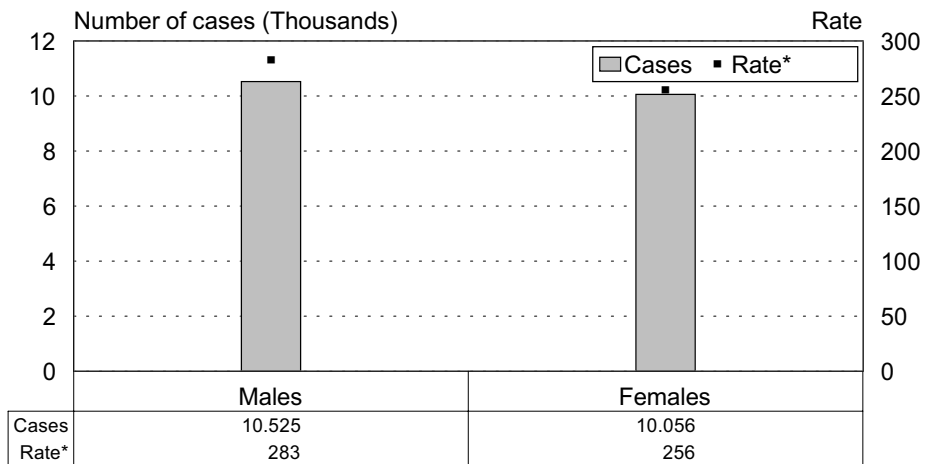


Chart 3

**Gonorrhea Cases and Rates by Sex
Georgia, 1998**



* Rate = cases/100,000 population

Chart 4

**Gonorrhea by Age Group and Year of Diagnosis
Georgia, 1995-1998**

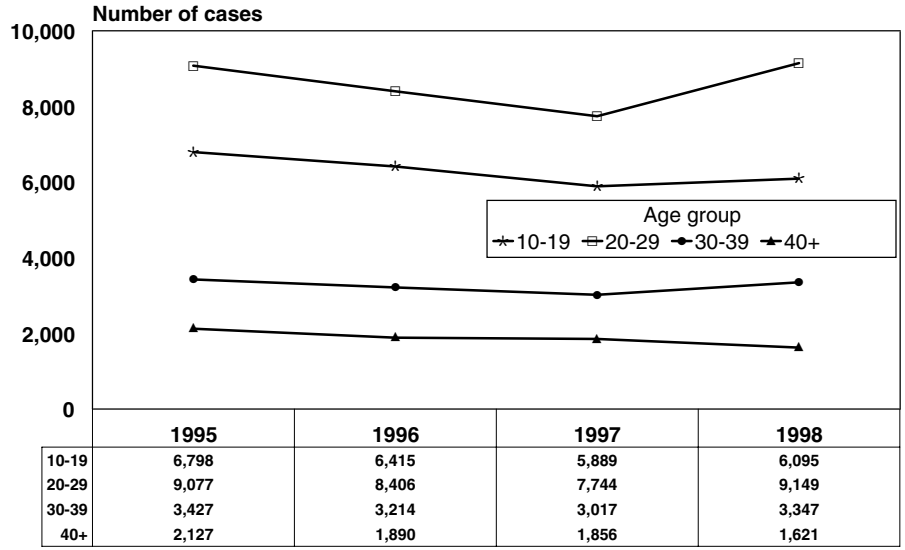
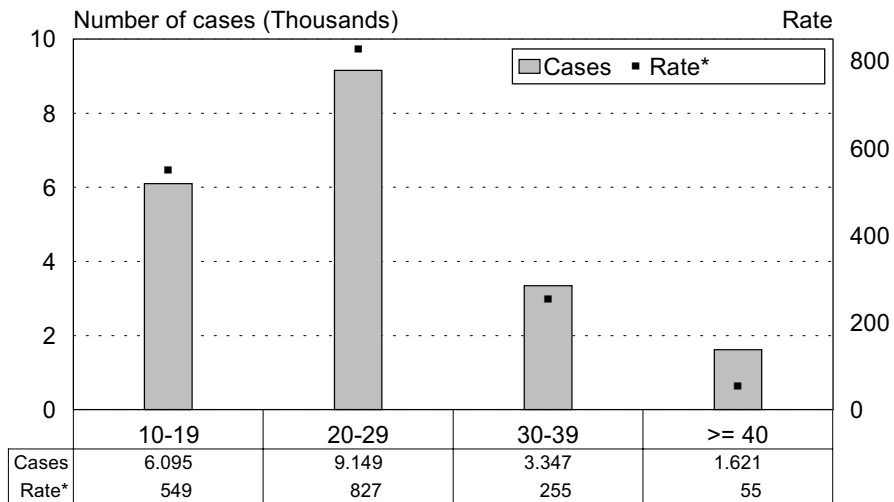


Chart 5

**Gonorrhea Cases and Rates by Age Group
Georgia, 1998**



* Rate = cases/100,000 population

Chart 6

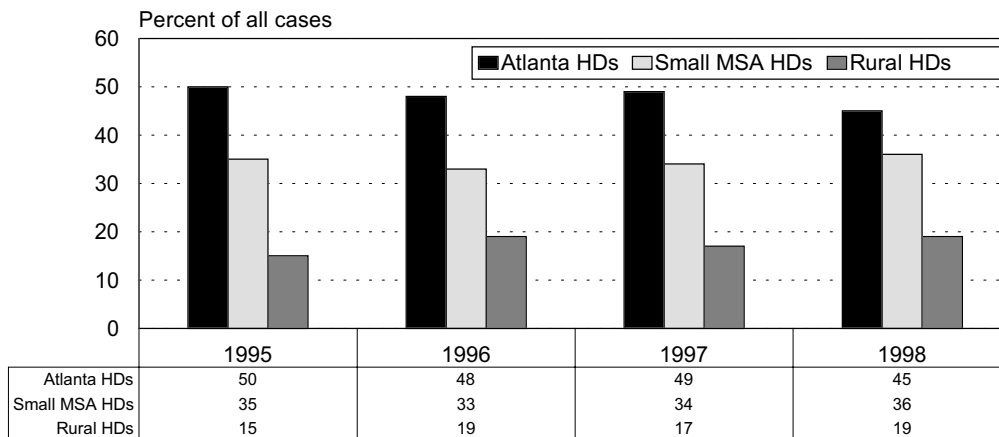
Gonorrhea Cases and Rates by Age Group and Sex
Georgia, 1998

Age Group	Males cases (rate*)	Females cases (rate*)
10 - 19	1913 (336)	4157 (769)
20 - 29	4887 (887)	4236 (763)
30 - 39	2223 (346)	1116 (166)
>= 40	1288 (94)	326 (20)

* Rate = cases/100,000 population

Chart 7

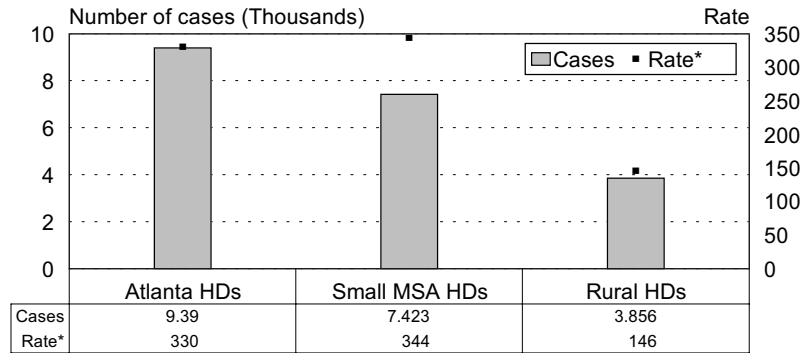
Gonorrhea Cases by Public Health District (HD) Groupings
Georgia, 1995-1998



Note: 8-county metro Atlanta includes the Marietta, Fulton, Clayton, Gwinnett, and DeKalb districts. Districts with a small metropolitan statistical area (MSA) are Albany, Athens, Augusta, Columbus, Macon, and Savannah.

Chart 8

**Gonorrhea Cases and Rates by Health District (HD) Groupings
Georgia, 1998**

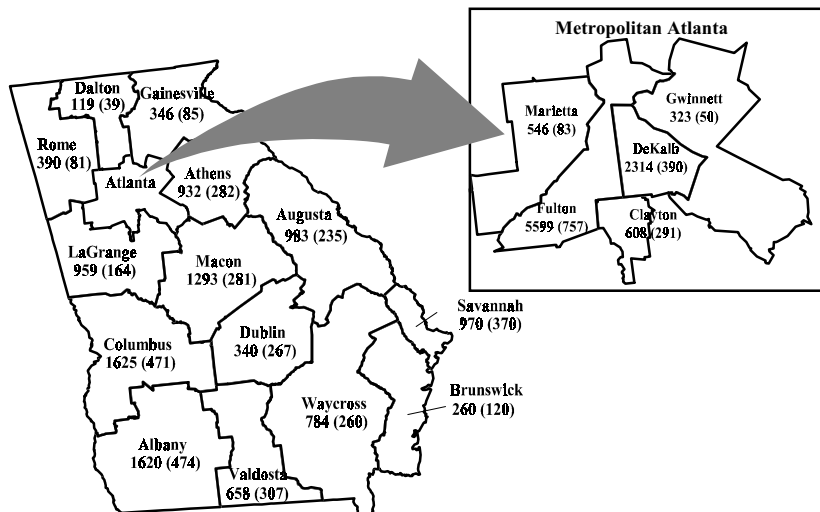


Note: 8-county metro Atlanta includes the Marietta, Fulton, Clayton, Gwinnett, and DeKalb districts. Districts with a small metropolitan statistical area (MSA) are Albany, Athens, Augusta, Columbus, Macon, and Savannah.

* Rate = cases/100,000 population

Chart 9

**Gonorrhea Cases (and Rates) by Public Health District
Georgia, 1998**



N = 20,669 (270 cases/100,000 population)

Gonococcal Isolate Surveillance Project (GISP)

Gonorrhea infections have become increasingly resistant to routine antibiotic treatment, resulting in more expensive treatment options. Since 1976, when all gonorrhea infections were curable by penicillin, antibiotic-resistant strains in the United States have steadily increased to about one-third of all gonorrhea infections. The main purpose of the Gonococcal Isolate Surveillance Project (GISP) is to monitor trends of antimicrobial susceptibilities in *N. gonorrhoeae* and to describe the diversity of antimicrobial resistance. GISP data are useful for determining treatment recommendations.

Each month, *N. gonorrhoeae* specimens from the first 20 men diagnosed with gonorrhea in STD clinics are collected. The Fulton County STD clinic is one of 28 national sites which participates in GISP.

Chart 10 shows the treatment given to patients at the clinic in 1998, and Chart 11 shows the percentage of isolates resistant to specific antibiotics from 1988 to 1998. In 1998, all isolates were sensitive to the antibiotics administered at the clinic.

Chart 10 Gonococcal Isolate Surveillance Project
Treatment for gonorrhea at a Fulton county STD clinic, 1998

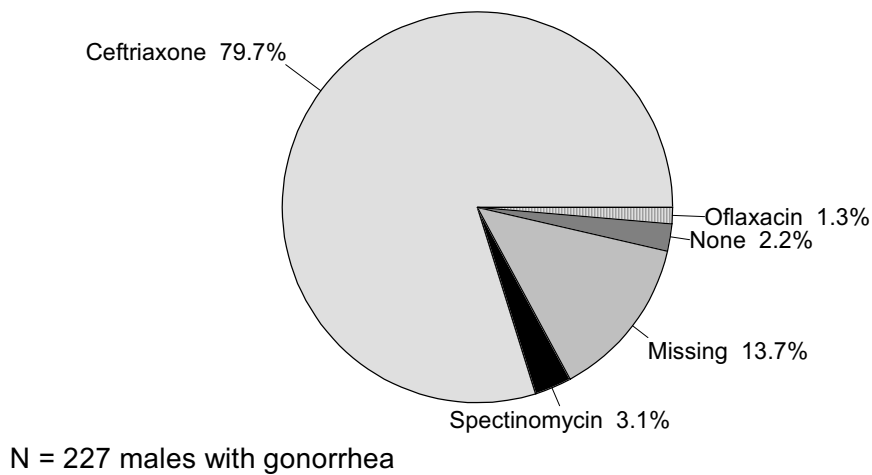


Chart 11

Gonococcal Isolate Surveillance Project (GISP), Fulton County STD Clinic: 1988 to 1998

Percentage of isolates resistant to specific antibiotics by year

Year	Number Tested	PCN ¹	TET ²	PCN & TET ³	Ciprofloxacin ⁴	Cefixime ⁵	Ceftriaxone	Spectinomycin
1988	236	3%	20%	4%	—	—	0%	0%
1989	240	18%	21%	5%	—	—	0%	0%
1990	236	36%	14%	3%	—	—	0%	0%
1991	240	29%	13%	6%	0%	—	0%	0%
1992	236	22%	19%	4%	0%	0%	0%	0%
1993	238	11%	17%	12%	0%	0%	0%	0%
1994	229	11%	25%	9%	0%	0%	0%	0%
1995	227	4%	35%	18%	0%	0%	0%	0%
1996	193	3%	30%	10%	0%	0%	0%	0%
1997	202	4%	20%	12%	1%	0%	0%	0%
1998	227	4%	27%	7%	0%	0%	0%	0%

¹ PCN = Plasmid-mediated penicillinase-producing *N. gonorrhoeae* (PPNG) and chromosomally-mediated resistance to penicillin (PenR)

² TET = Plasmid-mediated tetracycline resistance (TRNG) and chromosomally-mediated resistance to tetracycline (TetR)

³ The “PCN & TET” category is exclusive of the “PCN” and “TET” categories.

⁴ In 1997, there was one resistant isolate and one isolate with decreased susceptibility. In 1998, there were no resistant isolates, but there were 11 isolates with decreased susceptibility.

⁵ For cefixime, there has been no documented resistance for *N. gonorrhoeae*. In 1992, there was one isolate with decreased susceptibility at this clinic.

Chlamydia Surveillance

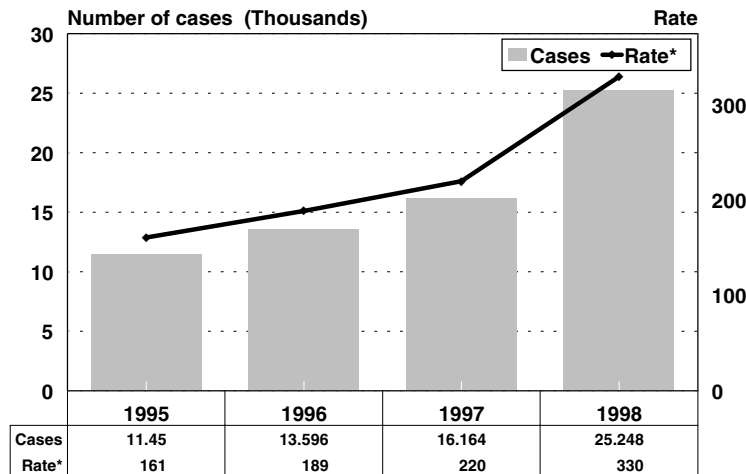
In the last several years, the reporting of chlamydia has improved and become more standardized across the United States. Chlamydial genital infection is now the most common STD in the United States, and 4 million cases are estimated to occur annually. Since 1987, reported rates of chlamydia have steadily increased from 51 cases per 100,000 population to 237 cases per 100,000 population. This trend is considered to be due to high prevalence of disease, increased screening and recognition of asymptomatic infection, and improved case reporting. In 1998, 607,602 cases were reported in the United States.²

Charts 12 to 20 help describe the epidemiology of chlamydia in Georgia. Since 1995, the rate and number of reported cases in the state has increased each year. This trend is partly due to the implementation of the Chlamydia Project,

which is described below. In 1998, 25,248 cases of chlamydia were reported for a rate of 330 cases per 100,000 population. Of these, 21,155 (84%) were female; 10,412 (41%) were 10 to 19 years old; and 11,565 (46%) were 20 to 29 years old. Among females, the number of reported cases and rate were highest in the 10 to 19 and 20 to 29 year old age groups. The five districts with the highest number of cases were Fulton (5,276), DeKalb (2,894), Columbus (2,123), Augusta (1,907), and Macon (1,884). When the districts were grouped by MSA, the Atlanta area (which includes the Marietta, Fulton, Clayton, Gwinnett, and DeKalb districts) had the highest number of cases (10,959) in 1998, and the districts which include a small MSA (i.e., Albany, Athens, Augusta, Columbus, Macon, and Savannah) had the highest rate (420 cases per 100,000 population).

Chart 12

Chlamydia Cases and Rates by Year of Diagnosis
Georgia, 1995-1998



* Rate = cases/100,000 population

Chart 13

**Chlamydia Cases by Sex and Year of Diagnosis
Georgia, 1995-1998**

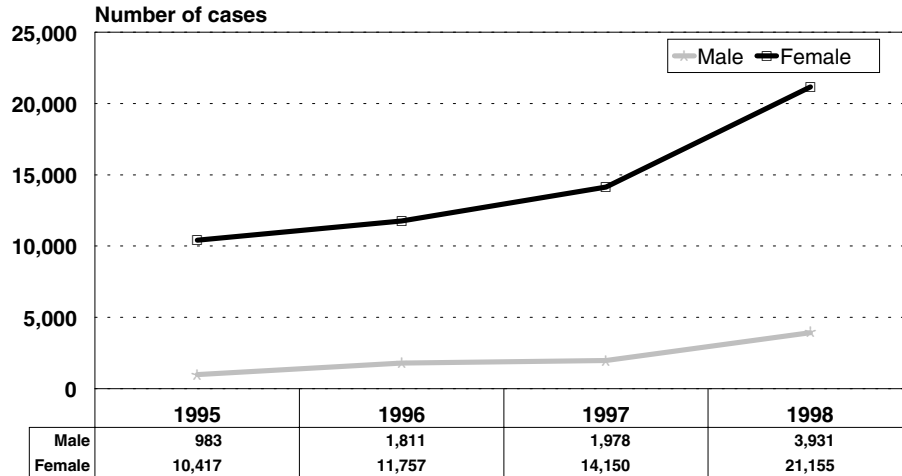
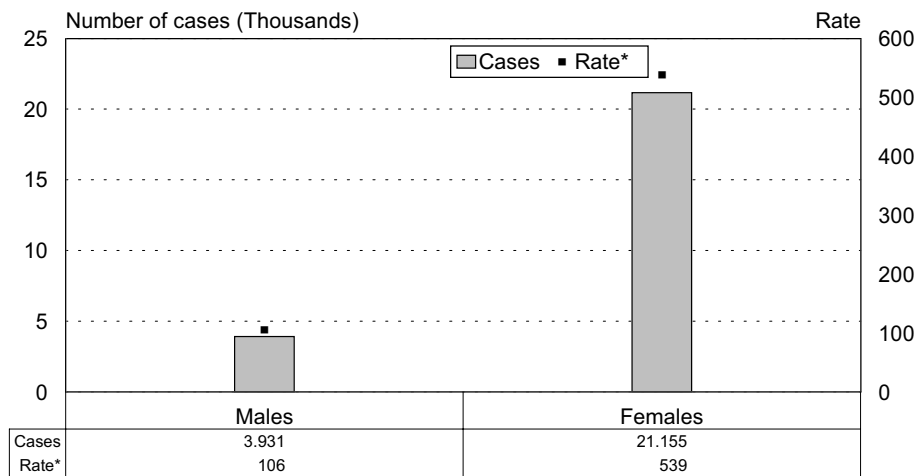


Chart 14

**Chlamydia Cases and Rates by Sex
Georgia, 1998**



* Rate = cases/100,000 population

Chart 15

**Chlamydia by Age Group and Year of Diagnosis
Georgia, 1995 - 1998**

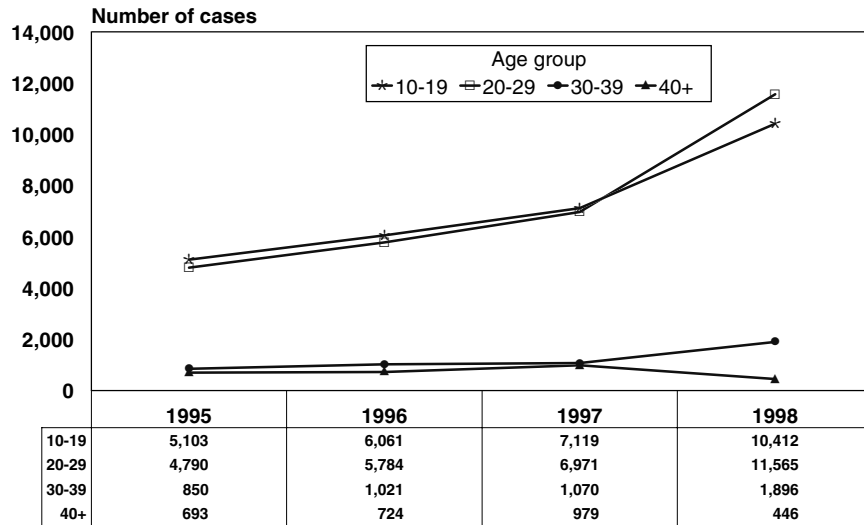
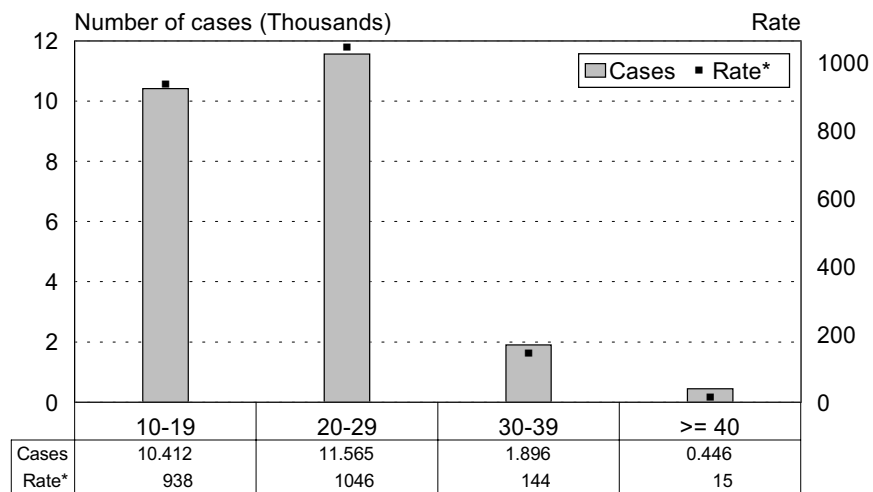


Chart 16

**Chlamydia Cases and Rates by Age Group
Georgia, 1998**



* Rate = cases/100,000 population

Chart 17

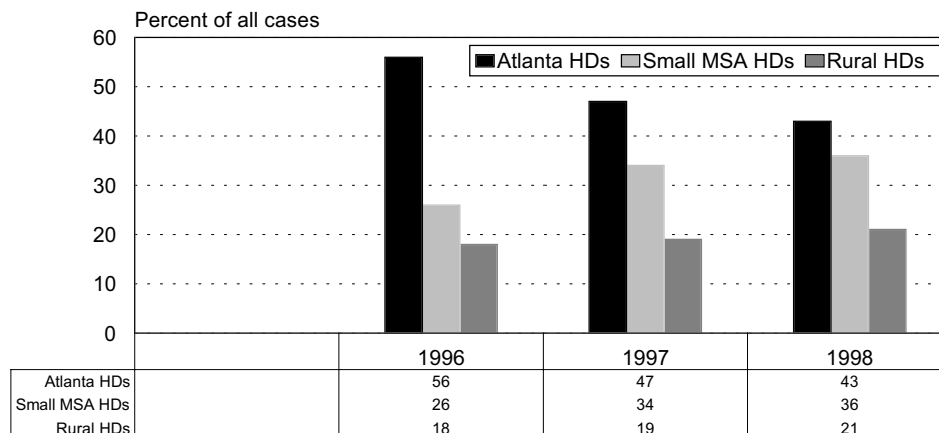
**Chlamydia Cases and Rates by Age Group and Sex
Georgia, 1998**

Age Group	Males cases (rate*)	Females cases (rate*)
10 - 19	950 (167)	9430 (1744)
20 - 29	2037 (370)	9485 (1709)
30 - 39	591 (92)	1299 (193)
>= 40	175 (13)	269 (17)

* Rate = cases/100,000 population

Chart 18

**Chlamydia Cases by Public Health District (HD) Groupings
Georgia, 1996-1998**



Note: 8-county metro Atlanta includes the Marietta, Fulton, Clayton, Gwinnett, and DeKalb districts. Districts with a small metropolitan statistical area (MSA) are Albany, Athens, Augusta, Columbus, Macon, and Savannah.

Chlamydia Project

Of the estimated 4 million cases of chlamydia each year, 2.6 million occur in women. As many as 85% of infections in women and 40% of infections in men may be asymptomatic and will not be identified without screening. Uncomplicated chlamydial infections can be easily treated with antibiotics; however, more than one million women each year develop PID, primarily as a result of unrecognized and untreated cervical infections. In parts of the country where large-scale chlamydia programs have been implemented, the prevalence of disease has steadily declined. For example, in family planning clinics in Region X (Alaska, Idaho, Oregon, Washington), chlamydia positivity declined 60% from 1988 (9.3%) to 1998 (3.7%).² Furthermore, statewide declines were observed in prevalence, incidence, and complications of chlamydia after a comprehensive chlamydia prevention program was implemented in Wisconsin.⁷

Since 1994, the Georgia Division of Public Health has participated in the Region IV Chlamydia Project, whose main goals include determining the prevalence of chlamydia and preventing and controlling chlamydia and its complications, particularly in women. Since the implementation of the project, the number of sites in Georgia that screen and provide treatment for chlamydia has expanded. In 1998, the project expanded to 446 sites, nearly all of which were family planning (FP), STD, teen, or college-based clinics. In general, women who had a pelvic exam during their clinic visit were screened for chlamydia and gonorrhea, and symptoms were defined as

vaginal discharge or bleeding, abdominal pain, and pain with urination or intercourse. The data presented in this text and Charts 21 to 29 focus on women and 265 sites that were involved with collecting and submitting the data to the Division of Public Health in 1998.

In 1998, 59,850 women were screened in this project. Of women with results, 7.6% (4,466/59,106) were infected with chlamydia and 2.9% (1,666/57,316) were infected with gonorrhea. By age group, the chlamydia positivity was 12% (2,226/18,448) in women 10 to 19 years old, 6.3% (1,814/28,761) in women 20 to 29 years old, 2.0% (145/7,251) in women 30 to 39 years old, and 1.0% (16/1,529) in women 40 to 49 years old. By race/ethnicity, the chlamydia positivity was 11% (3,459/32,525) among African Americans, 3.6% (744/20,859) among Whites, and 3.3% (127/3,895) among Hispanics.

Of chlamydia positive women with documented information on symptoms, 65% (2,698/4,131) were asymptomatic, and of the women who were pregnant, 17% (110/645) were infected with chlamydia. The chlamydia positivity was 6.9% (3,158/45,881) at the FP sites, 10% (965/9,760) at the STD sites, 11% (276/2,458) at the teen clinics, and 6.6% (49/743) at the college sites. The five districts with the highest chlamydia positivity rates were Albany (11%), Augusta (10%), Columbus (9.9%), Macon (9.4%), and Valdosta (8.9%).

Chart 21

Georgia Chlamydia Project
265 sites, 1998

- Of women with chlamydia (CT) results, 7.6% (4,466/59,106) were positive
- Of women with CT, 96% (4,287/4,466) were known to be treated
- Of women with gonorrhea (GC) results, 2.9% (1,666/57,316) were positive
- Of women with CT and GC results, 1.0% (543/56,824) were positive for both

Chart 22

Georgia Chlamydia Project
Chlamydia positivity by age group, 1998

Age Group	Percent Positive	
10 - 19	12%	(2,226/18,448)
20 - 29	6%	(1,814/28,761)
30 - 39	2%	(145/7,251)
40 - 49	1%	(16/1,529)
Total	8%	(4,201/55,989)

Chart 23

Georgia Chlamydia Project
Chlamydia positivity by race/ethnicity, 1998

Race/ethnicity	Percent Positive	
Black	11%	(3,459/32,525)
White	4%	(744/20,859)
Hispanic	3%	(127/3,895)
Other	6%	(33/544)
Total	8%	(4,363/57,823)

Chart 24

Georgia Chlamydia Project
Chlamydia positivity by age group and race/ethnicity, 1998

Age Group	Black	White	Hispanic
10 - 19	17% (1,697/9,737)	5% (419/7,730)	7% (32/439)
20 - 29	9% (1,411/15,311)	3% (298/10,514)	3% (54/1,989)
30 - 39	3% (115/4,483)	1% (22/2,133)	1% (5/385)
40 - 49	1% (12/999)	1% (4/420)	0% (0/57)
Total	11% (3,235/30,530)	4% (743/20,797)	3% (91/2,870)

Chart 25

Georgia Chlamydia Project
Chlamydia positivity by age group and symptoms, 1998

Age Group	Symptomatic	Asymptomatic
10 - 19	18% (728/3,997)	10% (1,470/14,228)
20 - 29	8% (620/7,609)	6% (1,157/20,655)
30 - 39	2% (73/2,997)	2% (67/4,072)
40 - 49	2% (12/722)	0.5% (4/757)
Total	9% (1,433/15,325)	7% (2,698/39,712)

Chart 26

Georgia Chlamydia Project
Chlamydia positivity by age group and pregnancy status, 1998

Age Group	Pregnant	Not Pregnant
10 - 19	29% (67/230)	11% (1,985/17,414)
20 - 29	12% (40/346)	6% (1,661/27,083)
30 - 39	5% (3/66)	2% (125/6,621)
40 - 49	0% (0/3)	1% (14/1,365)
Total	17% (110/645)	7% (3,785/52,483)

Chart 27

Georgia Chlamydia Project
Chlamydia positivity by clinic type, 1998

Clinic type	Percent Positive
Family Planning	7% (3,158/45,881)
STD	10% (965/9,760)
Teen	11% (276/2,458)
College	7% (49/743)

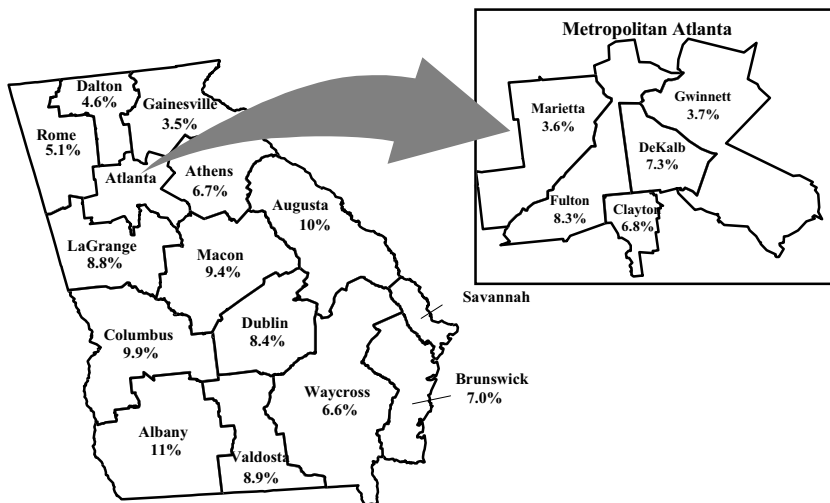
Chart 28

Georgia Chlamydia Project
Chlamydia positivity by reason for visit, 1998

Reason for visit	Percent Positive
STD problem or volunteer	9% (1,441/15,506)
Family planning	7% (2,867/42,073)
Referred by sex partner	13% (92/694)

Chart 29

Chlamydia Positivity by Location of Clinic
Georgia, 1998



Note: Information presented is based on data processed as of May, 1999

Screening for gonorrhea and chlamydia

Early diagnosis and treatment for a specific infection is a primary goal of screening. Several organizations have published guidelines for the screening of gonorrhea and chlamydia, and most recommendations are for young persons, women, and persons at high-risk for acquiring infection. Furthermore, state legislation in Georgia requires that health insurance plans pay for the cost of an annual chlamydia screening for all women less than 30 years old.

For pregnant women, CDC recommends testing for gonorrhea at the first prenatal visit for women at risk or for women living in an area in which the prevalence is high.⁵ Repeat testing for gonorrhea should be done during the third trimester for those at continued risk. Testing for chlamydia should be done in the third trimester

for women at increased risk, i.e., women aged less than 25 years and women who have a new or more than one sex partner or whose partner has other partners.

Laboratory tests for gonorrhea and chlamydia

Several tests are available for detecting gonococcal and chlamydial infections, and advances in diagnostic tests are continually occurring.^{3,4} Table 1 briefly describes some of the tests that are currently available and common sources of specimen collection. The DNA probe (e.g., Gen-Probe Pace 2), polymerase chain reaction (PCR), and ligase chain reaction (LCR) tests offer an advantage because one specimen can be tested for both gonorrhea and chlamydia.

Table 1

Organism	Test	Technology	Common specimen sources
<i>N. gonorrhoeae</i>	Gram's stain	Microscopy	Urethra
	Culture	Culture	Urethra, endocervix, rectum, pharynx
	DNA Probe	Nucleic acid hybridization	Urethra, endocervix
	Polymerase or ligase chain reaction (PCR or LCR)	Nucleic acid amplification	Urethra, endocervix, urine
<i>C. trachomatis</i>	DFA (direct fluorescent-antibody)	Microscopy	Urethra, endocervix, rectum
	EIA (enzyme immunoassay)	Immunohistochemistry	Urethra, endocervix, urine
	DNA Probe	Nucleic acid hybridization	Urethra, endocervix
	Polymerase or ligase chain reaction (PCR or LCR)	Nucleic acid amplification	Urethra, endocervix, urine

Treatment of uncomplicated gonorrhea and chlamydia

Tables 2 and 3 show the CDC recommended treatment regimens for uncomplicated gonococcal and chlamydial infections in adolescents and

adults. The CDC guidelines should be read for alternative regimens and special considerations.⁵

Table 2

Recommended regimens for uncomplicated gonococcal infections of the urethra, cervix, and rectum in adolescents and adults
a) Cefixime 400 mg orally in a single dose plus Azithromycin 1 g orally in a single dose
b) Cefixime 400 mg orally in a single dose plus Doxycycline 100 mg orally twice a day for 7 days
c) Ceftriaxone 125 mg IM in a single dose plus Azithromycin 1 g orally in a single dose
d) Ceftriaxone 125 mg IM in a single dose plus Doxycycline 100 mg orally twice a day for 7 days
e) Ciprofloxacin 500 mg orally in a single dose plus Azithromycin 1 g orally in a single dose
f) Ciprofloxacin 500 mg orally in a single dose plus Doxycycline 100 mg orally twice a day for 7 days
g) Ofloxacin 400 mg orally in a single dose plus Azithromycin 1 g orally in a single dose
h) Ofloxacin 400 mg orally in a single dose plus Doxycycline 100 mg orally twice a day for 7 days
<i>Note: Because persons infected with gonorrhea are often coinfecting with chlamydia, dual therapy is recommended.</i>

Table 3

Recommended regimens for uncomplicated chlamydial infections in adolescents and adults
a) Azithromycin 1 g orally in a single dose
b) Doxycycline 100 mg orally twice a day for 7 days

Management of sex partners

Persons infected with gonorrhea or chlamydia should refer their sex partners for evaluation and treatment. Sex partners should be evaluated and treated if they had sexual contact with the index patient during the 60 days preceding the onset of symptoms or diagnosis of chlamydia.⁵ If the time of the last sexual contact was more than 60 days before the onset of symptoms or diagnosis, then the most recent sex partner should be treated. Sex partners, as well as the index patient, should be instructed to abstain from sex until all treatment is completed and any symptoms have resolved. Timely treatment of sex partners can prevent disease transmission to others and reinfection of the index patient.

Case Reporting

Timely and complete reporting of gonorrhea and chlamydia is an integral component of successful disease control and prevention and important for monitoring accurate morbidity trends and targeting limited resources for public health planning and policy. In Georgia, all physicians, laboratories, and other health care providers are required by law to report persons with gonorrhea or chlamydia to their county, district, or state health department. Both clinical and lab-confirmed diagnoses are reportable within 7 days either by phone or by mail. Persons reporting by mail should use a Notifiable Disease Report Form and mail it in an envelope marked “confidential”. Important information to report includes the disease; the patient’s complete name and address, phone number, date of birth, sex, race/ethnicity, and pregnancy status; the physician’s name and phone number; and the reporting person’s name, institution, and phone number.

Conclusion

This document has provided an overview of several important public health issues related to

STDs. Surveillance data show that gonorrhea appears to be increasing for the first time in several years, and GISP results show that therapeutic regimens are currently available to successfully treat all gonococcal strains at a Fulton county STD clinic, despite a substantial proportion of gonorrhea isolates being resistant to some medications. The expansion of the Chlamydia Project throughout Georgia has resulted in the screening and treatment of chlamydia and gonorrhea in increasingly large numbers of women, many of whom otherwise may not have been diagnosed and treated. This project has also contributed to an improved understanding of STDs in Georgia, sustained health care cost savings based on the prevention of infections and complications, and the treatment of asymptomatic women who might have unknowingly spread their infection to others.

When interpreting surveillance data, it is important to note that there are more cases in a jurisdiction than are actually reported to the health department. Due to persons who are asymptomatic, persons who receive presumptive treatment (e.g., males with symptoms suggestive of gonorrhea), and incomplete reporting, the number of reported cases in this document represents an underestimate of the true number of persons in Georgia with gonorrhea or chlamydia.

In addition to promoting widespread screening and treatment, management of sex partners, and case reporting, individual and group interventions should be considered to further prevent and control STDs. Partner notification is a cost-effective strategy to prevent PID,⁸ and brief, interactive HIV/STD counseling interventions which are tailored to each individual’s risks can increase condom use and prevent new STDs.⁹ In Georgia, much progress has been made in preventing and controlling STDs, but continued efforts are needed. Preventing STDs and overcoming their enormous impact on the citizens of Georgia requires a sustained, multi-faceted approach.

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