

# Sexually Transmitted Disease and Teen Births in New London, CT

*Chlamydia & Gonorrhea (1997 – 2007)*  
*Teen Births (1998 – 2006)*

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A Report from the Ledge Light Health District Epidemiology Program

**January 2010**





Forward:

According to national guidelines stipulating the “ten essential services” for health departments in the U.S., the most important functions the Ledge Light Health District should perform include:

- Monitor the health status of the community
- Diagnose and investigate health problems
- Inform, educate and empower people
- Mobilize community partnerships
- Develop policies and interventions

To fulfill these functions, the District is initiating a series of reports on Communicable Disease Prevention for our communities, beginning with this report on ***Sexually Transmitted Diseases and Teen Births***. We deem this enormously sensitive subject to be of the highest priority, both because the problem tends to be “hidden” in our community – and thus go unchecked – and because of well documented adverse health outcomes, especially for adolescents and young adults.

A careful reading of this report will reveal the problem of sexually transmitted diseases to resemble an “equal opportunity” public health issue; that is, all ages, all races and every neighborhood show the impact of this steadily worsening situation, though, as with every other health issue in the U.S., denser urban areas and low income neighborhoods suffer disproportionately.

This report, covering Groton and New London, constitutes phase one of this STD report; phase two, reporting on Waterford, East Lyme and Ledyard, will be completed and released next summer.

Let me offer a special salute to Susan Starkey, MPH, RD, the health district’s staff epidemiologist, for conducting the research, compilation and analyses for these reports.

Baker Salisbury, MPH, MSW, MHSA  
Director of Health

## Executive Summary

Sexually transmitted disease (STD) and teen pregnancy are issues of public health concern because they have a tremendous impact on individuals, families and communities. Eleven years of STD data and nine years of teen birth data were collected and analyzed by Ledge Light Health District to assess the occurrence of these two major reproductive health issues in New London. New London rates were compared to national rates to determine if New London is experiencing unacceptably high levels of STDs or teen pregnancies. In general, New London chlamydia infection rates were higher and gonorrhea rates were lower than U.S. rates. New London teen pregnancy rates have decreased and are now lower than U.S. rates except among Hispanics.

National data indicate that there are STD health disparities; females, non-Whites and young people age 15-24 are most often infected. These disparities are also seen in New London, but they are more extreme — particularly among 15-29 year-old females. Compared to Whites, chlamydia infection rates among young Black females were up to 14 times higher and rates among Hispanics were five times higher. In addition to female gender, Black race, and Hispanic ethnicity, this analysis suggests that New London residents age 15-29 years are at highest risk for STD infections. This study also suggests that a past history of a chlamydia infection is a predictor of future chlamydia infections.

Births to New London teens below age 15 are rare; over the past nine years there were between 14 and 24 occurrences per year among 15-17 year-olds and 29-42 per year among 18-19 year-olds. New London birth rates among 15-17 year-olds are trending lower than the national Healthy People 2010 target birth rate except among Hispanics. Likewise, birth rates among New London 18-19 year-olds are trending lower than U.S. rates except among Hispanics.

There are racial/ethnic disparities in teen births in New London. In 2006, in comparison to Whites, the 15-17 year-old birth rates among Blacks and Hispanics were over three times higher and rates among 18-19 year-olds were three times higher among Blacks and six times higher among Hispanics.

Limitations to the STD and teen pregnancy analysis must be recognized. All New London rates presented herein are based on Census 2000 data (there is no more recent census data). New London rates are distorted if the New London population changed since 2000. For example, if the number of Hispanics has grown, rates among Hispanics are overestimated. Because most STDs are never reported, the numbers in this report underestimate actual numbers. However, comparisons between New London and U.S. STD rates are not impacted by undercounting because both groups are equally affected. To adjust for the problem of missing race/ethnicity data on STD reports, the number of infections by race/ethnicity was estimated using established methods; these methods may have distorted the final results.

STD and teen pregnancy rates appear to be stable or in decline in New London but increasing across the rest of the U.S. Failure to sustain or improve STD and teen pregnancy prevention efforts that are currently in place in New London may result in rebounding rates. Culturally appropriate interventions will be required to reduce the profound disparities between Whites and those who are Black or Hispanic, but broad-based efforts will be required as Whites account for approximately 20% of STD infections and teen births. Successfully reducing the numbers of STDs and teen births in New London will require the cooperative efforts of many public health partners including Ledge Light Health District, health care providers, Lawrence and Memorial Hospital, the New London School System, municipal officials, local community agencies and concerned residents.

Supplementary STD data for the years 2008 – 2009 are provided in Appendix A.

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## Introduction

Sexually transmitted disease (STD) and teen pregnancy are associated with decreased maternal and child well-being, welfare dependency, out-of-wedlock births, single parenthood and problems with workforce development (National Campaign to Prevent Teen and Unplanned Pregnancy, 2008). The report that follows summarizes data describing the burden of STDs and teen births in New London, CT. The data are useful for assessing trends and identifying demographic groups that have high STD or teen birth rates (*i.e.*, high-risk groups). Reducing STDs and teen births among high-risk groups is an effective means of decreasing health disparities.

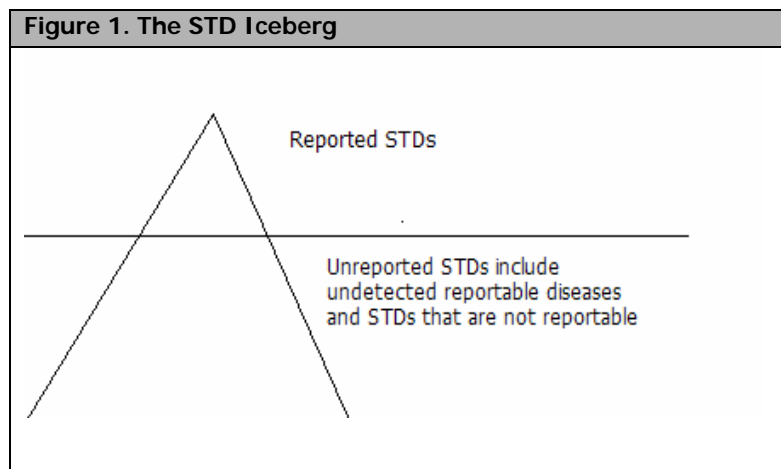
In the fall of 2007, the Ledge Light Health District (Ledge Light) established a secure electronic database to track reportable infectious disease, vital statistics, and other health data. Eleven years of data on disease and nine years of data on births in New London were analyzed to create this report. Limitations to the data include missing data on STD reports, unreliable population estimates and, most importantly, unreported disease. Notwithstanding these limitations, Ledge Light can use these numbers to plan its STD and teen pregnancy prevention efforts.

In this report, New London statistics for chlamydia, gonorrhea, and births to teens are presented and compared, where possible, to national figures to assess trends and to identify high-risk groups.

## Section 1. Sexually Transmitted Disease

“Despite the burdens, costs, complications, and preventable nature of STDs, they remain a significant public health problem, largely unrecognized by the public, policymakers, and public health and health care professionals in the United States” (Institute of Medicine, 1997). Many factors contribute to the ongoing STD epidemic in the U.S. Biological issues such as the asymptomatic nature of most STDs and the lag time between exposure and infection cause infections to go undetected. Social and behavioral factors such as access to care, poverty, substance abuse and sex work are all associated with STDs (U.S. Department of Health and Human Services [DHHS], 2000). STD rates reflect STD health disparities; in general, STDs are more common among young people, females, and non-White individuals. (The term *Health Disparities* is defined in the *Notes* section of this report.)

The STD statistics in this report are based on reported STDs, and reported STDs are known to underestimate actual STDs. More than 25 diseases can be transmitted sexually, but only four – chlamydia, gonorrhea, chancroid, and syphilis – must



be reported to the CT Department of Public Health (DPH) and local health departments (see the *Notes* section page 49 of this report for more information on reportable disease). Reported infections also underestimate the actual number of infections because STDs can remain undetected. STDs, especially chlamydia, are often asymptomatic and, consequently, infected individuals do not always seek treatment. Additionally, health care providers and laboratories do not always report infections nor do they report in a timely manner. Reported STDs are often described as the “tip of the iceberg” because what we see is only a small part of a much bigger problem (Figure 1).

## **CHLAMYDIA**

*Chlamydia trachomatis* is a bacterial infection that can be treated with antibiotics, but it is usually asymptomatic, often goes undiagnosed, and can lead to serious complications (Centers for Disease Control and Prevention [CDC], 2007). It is estimated that 75% to 85% of infected women are asymptomatic (Risser, 2005). Chlamydia infections among females are related to cervicitis, urethritis, cervical cancer, and adverse birth outcomes including miscarriage, premature rupture of membranes, pre-term labor, low birth weight, infant mortality, neonatal chlamydial infection, and postpartum endometriosis. About 40% of untreated chlamydia infections progress to pelvic inflammatory disease (PID), and approximately 20% of women with PID become infertile (CDC, 2007; Meyers, 2007). Only about 5% of infected men experience adverse outcomes, which include urethritis, acute epididymitis and, rarely, urethral strictures and sterility (Meyers, 2007). Chlamydia is the most commonly reported infectious disease in the U.S. (CDC, 2007). Based on the estimated incidence of chlamydia in the U.S. and the actual number of infections reported it is estimated that less than 50% of chlamydia infections are reported (CDC, 2007). The number of chlamydia infections in the U.S. has been increasing for over a decade (CDC, 2007).

### **Chlamydia Infection Numbers**

Gender, age, and race/ethnicity are strong predictors of chlamydia infection risk (CDC, 2007; DHHS, 2000). Tables and figures depicting the number of infections by gender, age and race/ethnicity follow. It is necessary to know the number of infections in order to assess the burden of disease and to estimate resource requirements for prevention and control activities.

### **Chlamydia Infection Rates**

The magnitude of chlamydia disease burden can be evaluated by comparing New London numbers to national chlamydia numbers. Because there are many more people in the entire U.S. than in New London and, accordingly, many more infections, rates are calculated to compare these two groups of different size. Rates are calculated for total

population, gender groups (females and males), race/ethnic groups (Whites, Blacks, Others and Hispanics), gender/race/ethnicity, gender/age groups (15-19, 20-24, 25-29 and 30-34 year-olds), and by age/race/ethnicity for females but not males for statistical considerations (see *Notes, Understanding Public Health Data: Rates and Numbers*, page 51, for further information on rates).

Two comparisons are made for each rate presented; New London rates are compared to U.S. rates to determine if New London rates are high relative to the rest of the country, and rates among New London Whites, Blacks, Others, and Hispanics are compared to determine if there are racial/ethnic disparities in New London. U.S. data from the year 2006 is used because, at the time this report was written, 2006 data were the most recent U.S. data available.

## **Assessing Gender as a Risk Factor for Chlamydia Infection**

### **Numbers of Chlamydia Infections in New London by Gender**

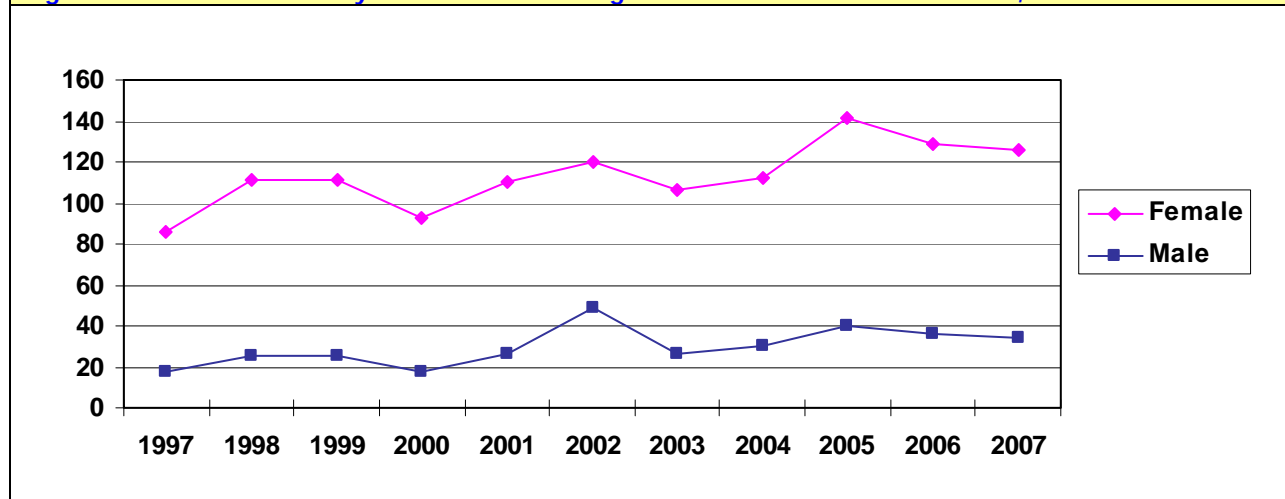
Since 2005, there have been over 150 chlamydia infections a year in New London. (Table 1, Figure 2).

Over the past 11 years, females accounted for approximately 79% of chlamydia infections in New London. The most current national STD statistics are from the years 2002 to 2006. In that time period, the number of U.S. chlamydia infections increased 19% among females and 41%

Year	Females		Males		Total
	Number	Percent	Number	Percent	Number
1997	86	82.7	18	17.3	104
1998	111	81.6	25	18.4	136
1999	111	81.6	25	18.4	136
2000	93	83.8	18	16.2	111
2001	110	80.9	26	19.1	136
2002	120	71.0	49	29.0	169
2003	106	80.3	26	19.7	132
2004	112	78.9	30	21.1	142
2005	141	77.9	40	22.1	181
2006	129	78.2	36	21.8	165
2007	126	78.8	34	21.3	160
<b>Total (Average)</b>	<b>1,245</b>	<b>(79.2)</b>	<b>327</b>	<b>(20.8)</b>	<b>1,572</b>

among males (data not shown); in New London, the number of infections increased 8% among females and decreased 27% among males. Note that the number of chlamydia infections among New London males was inexplicably high in 2002; from 2003 to 2006, infections among New London males increased 38%.

**Figure 2. Number of Chlamydia Infections among New London Females and Males, 1997-2007**



### ***Moving from Number of Infections to Infection Rates***

#### **Comparison of New London and U.S. Chlamydia Infection Rates by Gender**

Table 2 (page 12) lists the number of chlamydia infections that occurred in New London in 2006, the corresponding New London rate and the comparable U.S. rate. As seen in Table 2, the 2006 chlamydia infection rate for the entire New London population was 85% higher than the U.S. rate. However, rates among subsets of the population often differ significantly from the population rate. The 2006 chlamydia infection rates among New London females and males were higher than the U.S. rates (91% and 66%, respectively).

#### **Using Rates to Assess Gender Disparities in New London**

Again referring to Table 2 (page 12) and looking at New London data only, we see that rates among females are much higher than rates among males. In 2006 in New London, the infection rate among females was over 3 times (242%) higher than the rate among males. This is slightly higher than the national average; the 2006 chlamydia infection rate among U.S. females was 198% higher than the rate among males.

**Table 2. Chlamydia Infections: New London (Number and Rate per 100,000), U.S. (Rate per 100,000), Extent (Percent) to Which New London Rates are Higher or Lower than U.S. Rates, and Extent (Percent) to Which New London Rates are Higher or Lower than New London Comparison Group Rates, 2006**

	New London		U.S.	NL % Higher (Lower) than U.S.	NL % Higher (Lower) than Comparison:
	Number	Rate	Rate		
<b>Total Population</b>	165	642.7	347.8	85	
<b>Female</b>	129	982.6	515.8	91	242
<b>Male</b>	36	287.0	173.0	66	XXX
<b>Race/Ethnicity</b>					
White, Non-Hispanic	30	208.4	153.1	36	XXX
Black, Non-Hispanic	80	1,821.1	1,275.0	43	774
Other, Non-Hispanic	6	329.1	(N.R.)	(N.R.)	58
Hispanic	49	968.2	477.0	103	365
<b>Gender and Race/Ethnicity</b>					
<b>Females</b>					
White, Non-Hispanic	25	342.7	236.7	45	XXX
Black, Non-Hispanic	62	2,747.0	1,760.9	56	702
Other, Non-Hispanic	5	528.0	(N.R.)	(N.R.)	54
Hispanic	37	1,406.8	761.3	85	311
<b>Males</b>					
White, Non-Hispanic	5	70.4	66.0	7	XXX
Black, Non-Hispanic	17	795.9	741.2	7	1,031
Other, Non-Hispanic	1	114.2	(N.R.)	(N.R.)	62
Hispanic	12	493.6	211.0	134	601
<b>Gender, Age Group (15-34 Year-Olds)</b>					
<b>Females</b>					
15-19	49	4,163.1	2,862.7	45	XXX
20-24	34	2,269.7	2,797.0	(19)	(45)
25-29	31	3,242.7	1,141.2	184	(22)
30-34	9	1,178.2	415.7	183	(72)
<b>Males</b>					
15-19	4	358.1	545.1	(34.3)	XXX
20-24	16	1,027.0	856.9	20	187
25-29	6	485.8	480.8	1	36
30-34	6	675.7	222.3	204	89
<b>Females by Race/Ethnicity, Age Group (15-29 Year-Olds)*</b>					
<b>White, Non-Hispanic</b>					
15-19	7	1,070.3	1,378.4	(22)	XXX
20-24	9	925.0	1,506.3	(39)	
25-29	8	1,666.7	569.1	193	
<b>Black, Non-Hispanic</b>					
15-19	27	15,083.8	9,073.9	66	1,309
20-24	18	10,344.8	7,973.0	30	1,018
25-29	9	5,389.2	3,212.8	68	223
<b>Hispanic</b>					
15-19	14	5,809.1	2,981.6	95	443
20-24	6	2,608.7	3,346.6	(22)	182
25-29	12	4,938.3	1,525.5	224	196
<p><i>Note.</i> Numbers may differ from those in Tables 1 due to rounding. Reports missing race/ethnicity data have been apportioned according to the distribution among reports with race/ethnicity data. Reports missing age data have been excluded from age group analyses. XXX=comparison group. NL=New London. N.R. =not reported *Other race excluded from race/ethnicity, age group analysis (see <i>Notes, Understanding Public Health Data: Rates and Numbers</i>, page 50).</p>					

## Assessing Race/Ethnicity as a Risk Factor for Chlamydia Infection

### Numbers of Chlamydia Infections by Race/Ethnicity

The numbers of chlamydia infections in New London by race/ethnicity over the past 11 years are

depicted in Table 3, and the racial/ethnic distribution of the numbers of chlamydia infections in New London in 2006 is displayed in Figure 3.

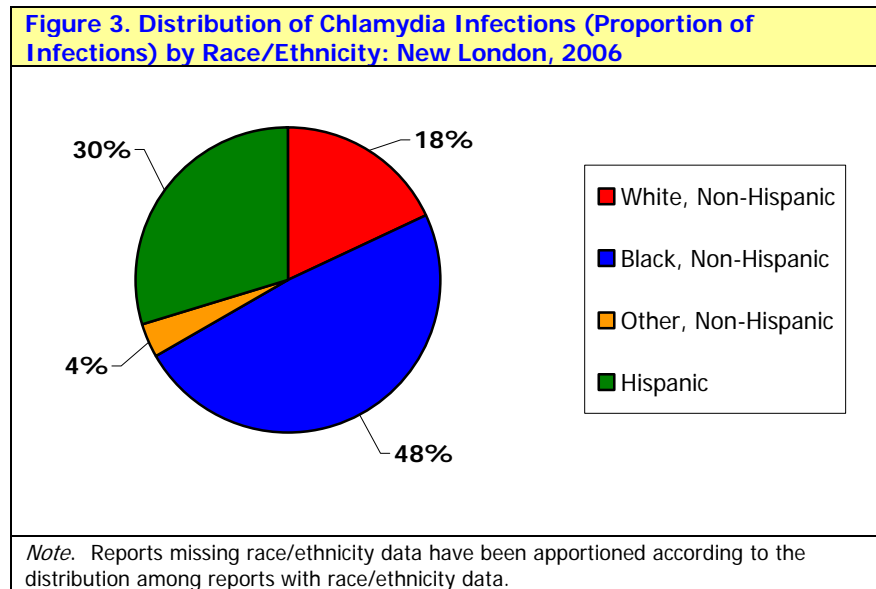
Table 3. Number of Chlamydia Infections by Race/Ethnicity: New London, 1997-2007				
Year	White, Non-Hispanic	Black, Non-Hispanic	Other, Non-Hispanic	Hispanic
1997	23	57	0	24
1998	40	58	3	34
1999	31	65	2	37
2000	35	38	4	34
2001	33	69	5	30
2002	38	82	0	49
2003	43	46	1	42
2004	30	53	3	56
2005	39	87	0	55
2006	30	80	6	49
2007	30	70	2	58
<b>Total</b>	<b>372</b>	<b>705</b>	<b>26</b>	<b>468</b>

*Note.* Reports missing race/ethnicity data have been apportioned according to the distribution among reports with race/ethnicity data. Numbers may differ from those in Table 1 due to rounding.

It appears that Black and Hispanic residents bear a disproportionate burden of

chlamydia: in 2006 Whites accounted for 56% of the population and 18% of the infections; Blacks accounted for 17% of the population and 48% of the infections; Others for 7% of the population and 4% of the infections; and Hispanics accounted for

20% of the population and 30% of the chlamydia infections.

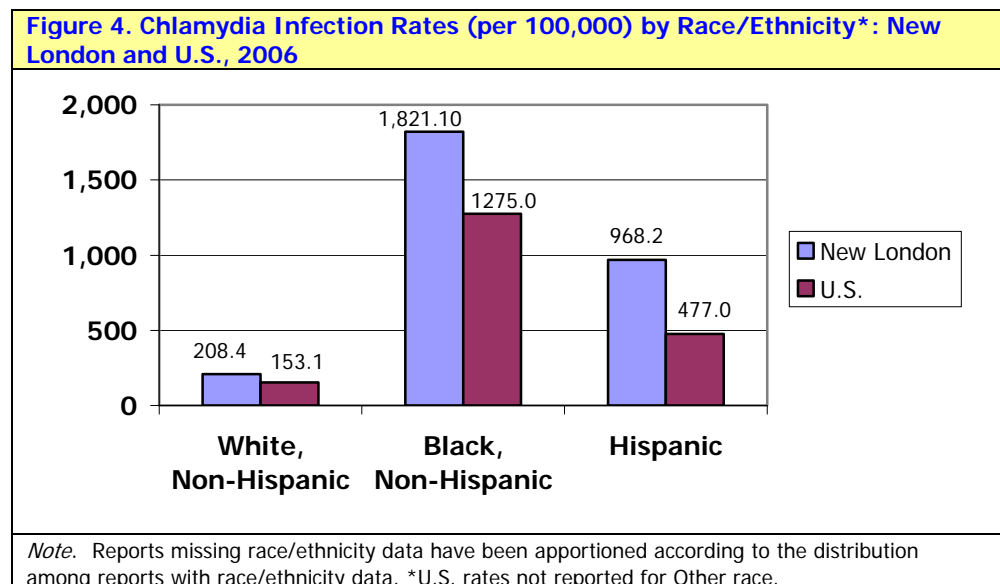


## ***Moving from Number of Infections to Infection Rates***

### **Comparison of New London and U.S. Chlamydia Infection Rates by Race/Ethnicity**

Table 2 (page 12) and Figure 4 show that, in 2006, the New London chlamydia infection rates were higher than the U.S. rates among Whites, Blacks and Hispanics (36%, 43% and 103%, respectively). U.S. rates are not reported for Other race.

In both the U.S. and New London, chlamydia infection rates were higher among Blacks than Whites or Hispanics.



### **Using Rates to Assess Racial/Ethnic Disparities in New London**

Table 2 (page 12) and Figure 4 show that the 2006 U.S. chlamydia infection rate among Hispanics was over three times (212%) higher than the rate among Whites, and the New London rate among Hispanics was over four times (365%) higher than the rate among Whites (*i.e.*, disparities between Whites and Hispanics in New London were more extreme than they were in the U.S.). Disparities between New London Blacks and Whites were comparable to disparities between U.S. Blacks and Whites; in both instances rates among Blacks were over eight times higher than rates among Whites.

## **Assessing Gender and Race/Ethnicity as Risk Factors for Chlamydia Infection**

We have looked at gender as well as race/ethnicity as risk factors for chlamydia. In this section we look at the combination of gender and race/ethnicity. As previously stated, rates for large groups (such as males and females or Whites, Blacks, Others, and Hispanics) do not necessarily reflect rates for smaller subsets of the population. Rates for Whites, Blacks, Others and Hispanics differ for females and males.

### **Numbers of Chlamydia Infections by Gender and Race/Ethnicity**

The numbers of chlamydia infections among New London females and males by race/ethnicity are depicted in Table 4.

Year	White, Non-Hispanic		Black, Non-Hispanic		Other, Non-Hispanic		Hispanic	
	Females	Males	Females	Males	Females	Males	Females	Males
1997	22	2	45	11	0	0	19	5
1998	37	2	42	17	1	2	30	4
1999	27	4	48	18	1	1	34	3
2000	31	5	32	6	3	1	28	6
2001	30	2	52	17	1	4	26	4
2002	28	10	54	28	0	0	38	10
2003	36	8	30	15	1	0	39	3
2004	25	5	40	13	3	0	44	12
2005	33	6	60	27	0	0	48	7
2006	25	5	62	17	5	1	37	12
2007	26	4	50	20	2	0	48	10
<b>TOTAL</b>	<b>320</b>	<b>53</b>	<b>515</b>	<b>190</b>	<b>17</b>	<b>9</b>	<b>391</b>	<b>76</b>

*Note.* Reports missing race/ethnicity data have been apportioned according to the distribution among reports with race/ethnicity data. Numbers may differ from those in Table 1 and 3 due to rounding.

### ***Moving from Numbers of Infections to Infection Rates***

#### **Chlamydia Infection Rates By Gender and Race/Ethnicity**

The chlamydia infection rates that correspond to the numbers in Table 4 are presented in Table 5.

Year	White, Non-Hispanic		Black, Non-Hispanic		Other, Non-Hispanic		Hispanic	
	Females	Males	Females	Males	Females	Males	Females	Males
1997	301.6	28.2	1,993.8	515.0	0.0	0.0	722.4	205.7
1998	507.3	28.2	1,860.9	795.9	105.6	228.3	1,140.7	164.5
1999	370.2	56.3	2,126.7	842.7	105.6	114.2	1,292.8	123.4
2000	425.0	70.4	1,417.8	280.9	316.8	114.2	1,064.6	246.8
2001	411.3	28.2	2,303.9	795.9	105.6	456.6	988.6	164.5
2002	383.9	140.8	2,392.6	1,310.9	0.0	0.0	1,444.9	411.4
2003	493.6	112.7	1,329.2	702.2	105.6	0.0	1,482.9	123.4
2004	342.7	70.4	1,772.3	608.6	316.8	0.0	1,673.0	493.6
2005	452.4	84.5	2,658.4	1,264.0	0.0	0.0	1,825.1	287.9
2006	342.7	70.4	2,747.0	795.9	528.0	114.2	1,406.8	493.6
2007	356.5	56.3	2,215.3	936.3	211.2	0.0	1,825.1	411.4

*Note.* Reports missing race/ethnicity data have been apportioned according to the distribution among reports with race/ethnicity data.

### **Comparison of New London and U.S. Chlamydia Infection Rates by Gender and Race/Ethnicity**

In 2006 among females (Table 2, page 12), the New London chlamydia infection rate was:

- 45% higher than the U.S. rate among Whites;
- 56% higher than the U.S. rate among Blacks;
- 85% higher than the U.S. rate among Hispanics.

In 2006 among males (Table 2, page 12), the New London chlamydia infection rate was:

- 7% higher than the U.S. rate among Whites;
- 7% higher than the U.S. rate among Blacks;
- 134% higher than the U.S. rate among Hispanics.

### **Using Rates to Assess Gender/Race/Ethnicity Disparities in New London**

Looking at New London data only (Table 2, page 12), we see that the 2006 chlamydia infection rate among females was:

- 702% higher among Blacks compared to Whites;
- 54% higher among Others compared to Whites;
- 311% higher among Hispanics compared to Whites;

and, the 2006 chlamydia infection rate among New London males was:

- 1,031% higher among Blacks compared to Whites;
- 62% higher among Others compared to Whites;
- 601% higher among Hispanics compared to Whites.

## **Assessing Age as a Risk Factor for Chlamydia Infection**

### **Number of Chlamydia Infections by Gender and Age Group**

Chlamydia infections among the very young and old are rare (Tables 6-7). There have been four congenitally transmitted chlamydia infections in New London over the past 11 years (two male, two female). There have been no sexually transmitted chlamydia infections among New London males below age 15 and 18 cases among females below age 15 between 1997 and 2007. There have been only two chlamydia infections among females below age 15 over the past five years (2003-2007). The annual number of infections increases dramatically after age 14 among females and after age 19 among males. The annual number of infections tends to drop off after age 34 among both females and males.

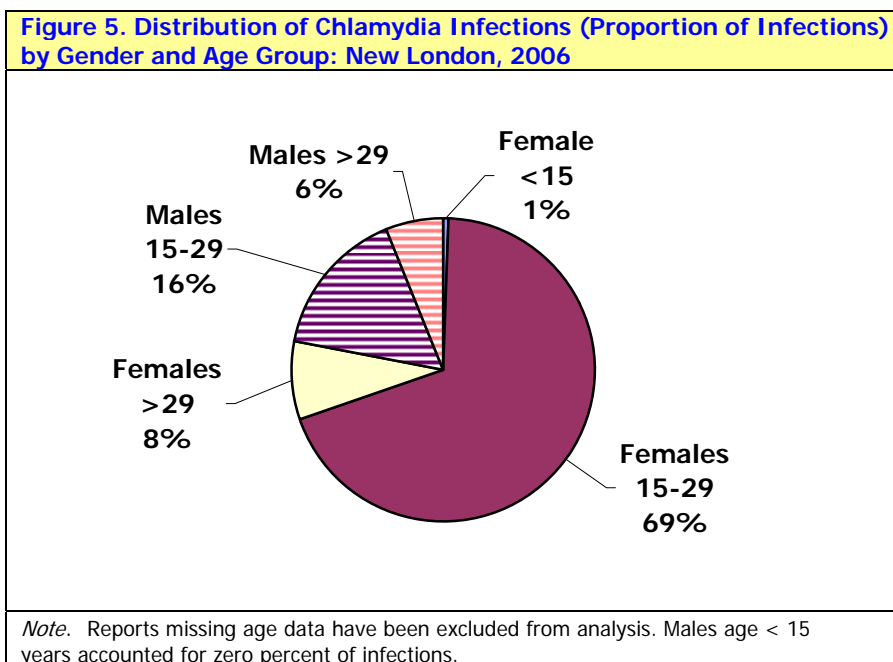
Year	<10*	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-54	55-64	Unknown	Total
1997	0	4	39	28	12	2	0	1	0	0	0	86
1998	2	2	54	38	11	2	0	2	0	0	0	111
1999	0	0	50	40	17	3	1	0	0	0	0	111
2000	0	4	36	26	18	4	3	1	1	0	0	93
2001	0	3	50	32	14	7	3	1	0	0	0	110
2002	0	3	42	40	21	9	1	1	0	2	1	120
2003	0	0	46	33	14	8	2	0	2	0	1	106
2004	0	1	45	34	17	7	5	2	1	0	0	112
2005	0	0	49	52	24	11	1	1	1	0	2	141
2006	0	1	49	34	31	9	2	1	1	1	0	129
2007	0	0	47	37	26	13	2	0	1	0	0	126
<b>TOTAL</b>	<b>2</b>	<b>18</b>	<b>507</b>	<b>394</b>	<b>205</b>	<b>75</b>	<b>20</b>	<b>10</b>	<b>7</b>	<b>3</b>	<b>4</b>	<b>1,245</b>

*Note.* \* Congenitally transmitted.

Table 7. Number of Chlamydia Infections by Age Group: New London Males, 1997-2007												
Year	<10*	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-54	55-64	Unknown	Total
1997	0	0	6	8	3	0	0	1	0	0	0	18
1998	0	0	5	11	6	2	0	1	0	0	0	25
1999	0	0	8	4	5	5	1	0	2	0	0	25
2000	0	0	3	9	2	3	1	0	0	0	0	18
2001	1	0	9	8	3	3	2	0	0	0	0	26
2002	0	0	6	28	6	6	0	1	0	2	0	49
2003	0	0	4	7	8	4	1	1	1	0	0	26
2004	1	0	3	11	10	3	2	0	0	0	0	30
2005	0	0	9	23	4	2	1	1	0	0	0	40
2006	0	0	4	16	6	6	3	0	1	0	0	36
2007	0	0	6	14	4	6	2	1	0	0	1	34
<b>TOTAL</b>	<b>2</b>	<b>0</b>	<b>63</b>	<b>139</b>	<b>57</b>	<b>40</b>	<b>13</b>	<b>6</b>	<b>4</b>	<b>2</b>	<b>1</b>	<b>327</b>

Note. \* Congenitally transmitted.

In 2006, 85% of chlamydia infections in New London occurred among 15-29 year-olds (Figure 5). This was comparable to U.S. statistics; in 2006, 15-29 year-olds accounted for 86% of U.S. chlamydia infections (data not shown).



### ***Moving from Numbers of Infections to Infection Rates***

In this section, chlamydia infection rates are only calculated for New London residents age 15-34 because most infections occur among residents in that age group.

## **Comparison of New London and U.S. Chlamydia Infection Rates by Gender and Age**

Again referring to Table 2 (page 12), in 2006 the chlamydia infection rate among New London females was:

- 45% higher than the U.S. rate among 15-19 year-olds;
- 19% lower than the U.S. rate among 20-24 year-olds;
- 184% higher than the U.S. rate among 25-29 year-olds;
- 183% higher than the U.S. rate among 30-34 year-olds.

Among males, the 2006 New London infection rate was:

- 34% lower than the U.S. rate among 15-19 year-olds;
- 20% higher than the U.S. rate among 20-24 year-olds;
- 1% higher than the U.S. rate among 25-29 year-olds;
- 204% higher than the U.S. rate among 30-34 year-olds.

## **New London Chlamydia Infection Rate Trends by Gender and Age**

New London chlamydia infection rates have been increasing in some, but not all age groups over the past 11 years (1997-2007 [Table 8, Figures 6-7]).

Among New London females, chlamydia infection rates increased:

- 21% among 15-19 year-olds;
- 32% among 20-24 year-olds;
- 117% among 25-29 year-olds;
- 430% among 30-34 year-olds.

Among New London males, chlamydia infection rates have not changed among 15-19 year-olds, but increased:

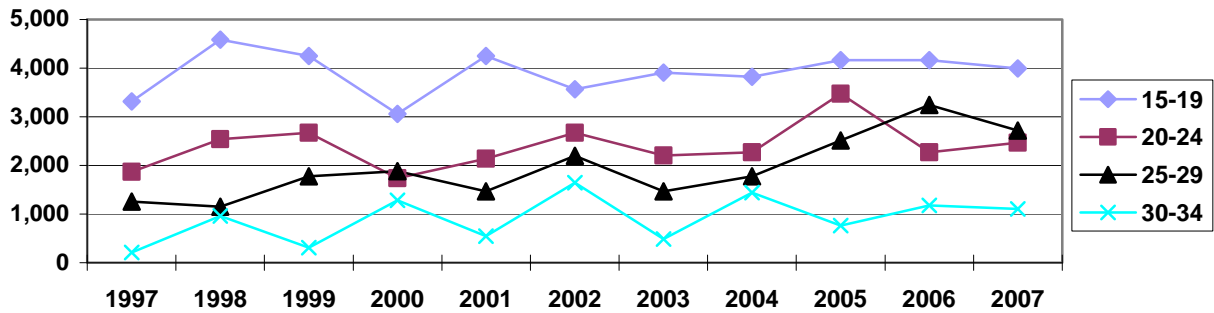
- 75% among 20-24 year-olds;
- 33% among 25-29 year-olds;
- 676% among 30-34 year-olds. In 1997 infections were zero; rates increased 200% between 1998 and 2007.

**Table 8. Chlamydia Infection Rates (per 100,000) by Age Group and Gender: New London 15-34 Year-Olds, 1997-2007**

Year	15-19		20-24		25-29		30-34	
	Females	Males	Females	Males	Females	Males	Females	Males
1997	3,313.5	537.2	1,869.2	513.5	1,255.2	242.9	208.3	0.0
1998	4,587.9	447.6	2,536.7	706.0	1,150.6	485.8	960.0	225.2
1999	4,248.1	716.2	2,670.2	256.7	1,778.2	404.9	312.5	563.1
2000	3,058.6	268.6	1,735.6	577.7	1,882.8	161.9	1,280.0	337.8
2001	4,248.1	805.7	2,136.2	513.5	1,464.4	242.9	546.9	337.8
2002	3,568.4	537.2	2,670.2	1,797.2	2,196.7	485.8	1,645.7	675.7
2003	3,908.2	358.1	2,202.9	449.3	1,464.4	647.8	486.1	450.5
2004	3,823.3	268.6	2,269.7	706.0	1,778.2	809.7	1,440.0	337.8
2005	4,163.1	805.7	3,471.3	1,476.3	2,510.5	323.9	763.9	225.2
2006	4,163.1	358.1	2,269.7	1,027.0	3,242.7	485.8	1,178.2	675.7
2007	3,993.2	537.2	2,470.0	898.6	2,719.7	323.9	1,103.4	675.7

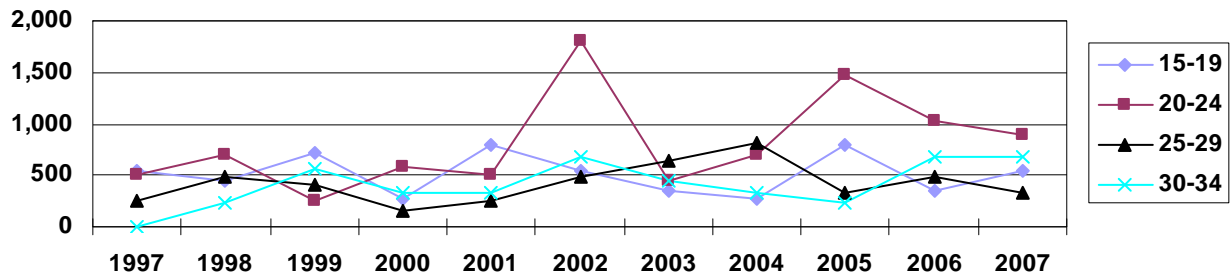
Note. Reports missing age data have been excluded from analysis.

**Figure 6. Chlamydia Infection Rates (per 100,000) by Age Group: 15-34 Year-Old New London Females, 1997-2007**



Note. Reports missing age data have been excluded from analysis.

**Figure 7. Chlamydia Infection Rates (per 100,000) by Age Group: 15-34 Year-Old New London Males, 1997-2007**



Note. Reports missing age data have been excluded from analysis.

## **Using Rates to Assess Gender and Age Disparities in New London**

Looking at 2006 New London data only (Table 2, page 12), we see that there are disparities between age groups. The chlamydia infection rate among females was:

- 45% lower among 20-24 year-olds compared to 15-19 year-olds;
- 22% lower among 25-29 year-olds compared to 15-19 year-olds;
- 72% lower among 30-34 year-olds compared to 15-19 year-olds;

and the rate among males was:

- 187% higher among 20-24 year-olds compared to 15-19 year-olds;
- 36% higher among 25-29 year-olds compared to 15-19 year-olds;
- 89% higher among 30-34 year-olds compared to 15-19 year-olds.

## **Assessing Age and Race/Ethnicity as Risk Factors for Chlamydia Infection among Females**

Thus far, we have reviewed chlamydia data for females and males by race/ethnicity or by age group. Sufficient data exist to examine the combination of age and race/ethnicity as a risk factor for chlamydia infections among 15-29 year-old females but not among males (see *Notes, Understanding Public Health Data: Rates and Numbers*, page 50, for further information).

## **Number of Chlamydia Infections among 15-29 Year-Old Females by Age and Race/Ethnicity**

Over the past 11 years, there have been more infections among Black 15-29 year-old females than among White, Hispanic or Other females (Table 9), although during the more recent years of 2005-2007, the proportion of infections among 25-29 year-old Hispanics has increased (Figure 10).

**Table 9. Number of Chlamydia Infections by Race/Ethnicity and Age Group: 15-29 Year-Old New London Females, 1997-2007**

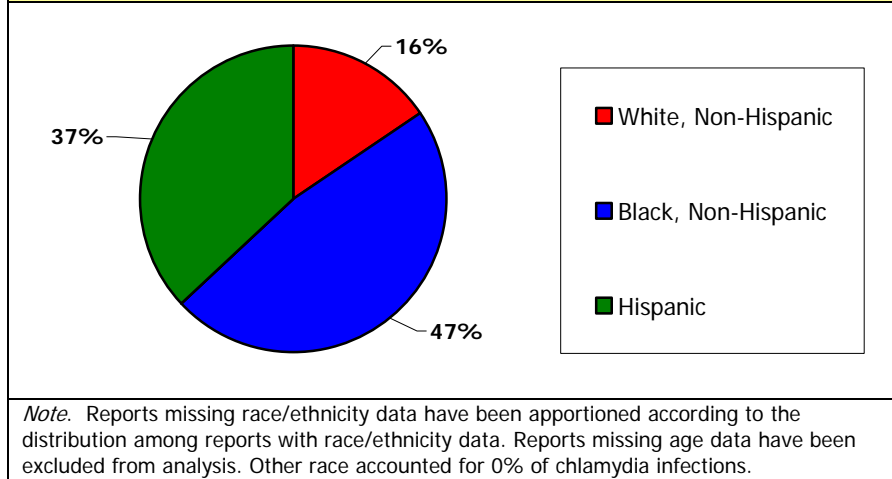
Year	15-19				20-24				25-29			
	White, Non-Hispanic	Black, Non-Hispanic	Other	Hispanic	White, Non-Hispanic	Black, Non-Hispanic	Other	Hispanic	White, Non-Hispanic	Black, Non-Hispanic	Other	Hispanic
1997	10	16	0	13	6	21	0	1	5	5	0	2
1998	22	20	1	11	14	9	0	15	0	8	0	3
1999	15	21	1	13	8	15	0	17	2	11	0	5
2000	11	13	2	10	10	10	0	7	5	8	0	5
2001	20	23	0	7	4	16	1	11	5	5	1	5
2002	10	16	0	17	6	21	0	13	6	10	0	5
2003	12	8	0	26	11	18	0	4	9	1	0	2
2004	8	18	0	19	9	10	0	15	5	4	0	6
2005	8	25	0	16	14	21	0	17	6	8	0	10
2006	7	27	0	14	9	18	1	6	8	9	1	12
2007	7	15	0	22	12	14	0	12	5	8	0	11
<b>Total</b>	<b>130</b>	<b>202</b>	<b>4</b>	<b>168</b>	<b>103</b>	<b>173</b>	<b>2</b>	<b>118</b>	<b>56</b>	<b>77</b>	<b>2</b>	<b>66</b>

*Note.* Reports missing race/ethnicity data have been apportioned according to the distribution among reports with race/ethnicity data. Reports missing age data have been excluded from analysis. Numbers may differ from those in Tables 4 and 6 due to rounding.

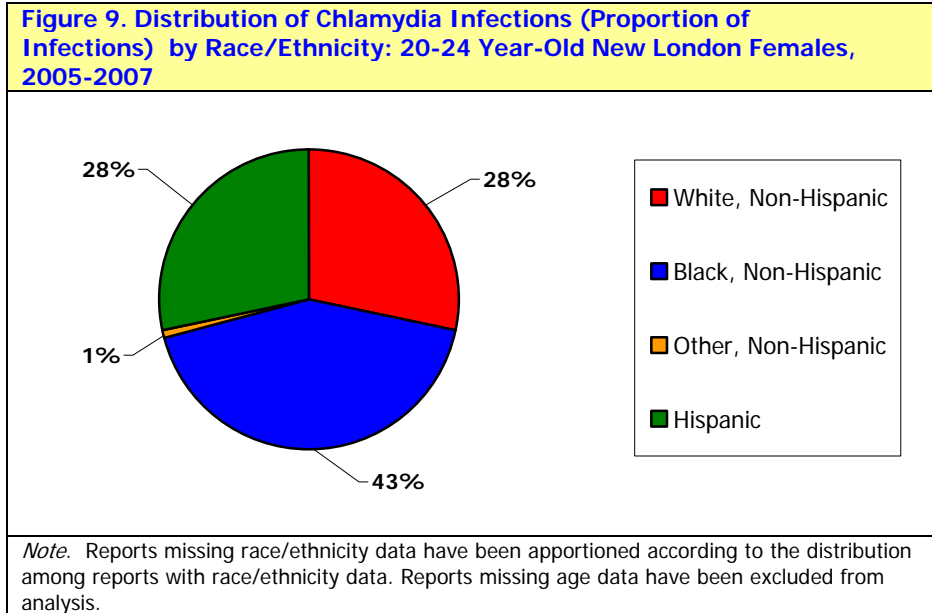
Because the number of chlamydia infections among White, Black, Other and Hispanic females in the 15-19, 20-24 and 25-29 year-old age groups is small and varies from year to year, it is useful to add together three years of data (2005-2007) to obtain a sufficient number of infections to calculate a reliable estimate of the distribution of chlamydia infections in each race/ethnicity group.

Among 15-19 year-old New London females, Blacks accounted for almost half (47%) of chlamydia infections during 2005-2007 (Figure 8).

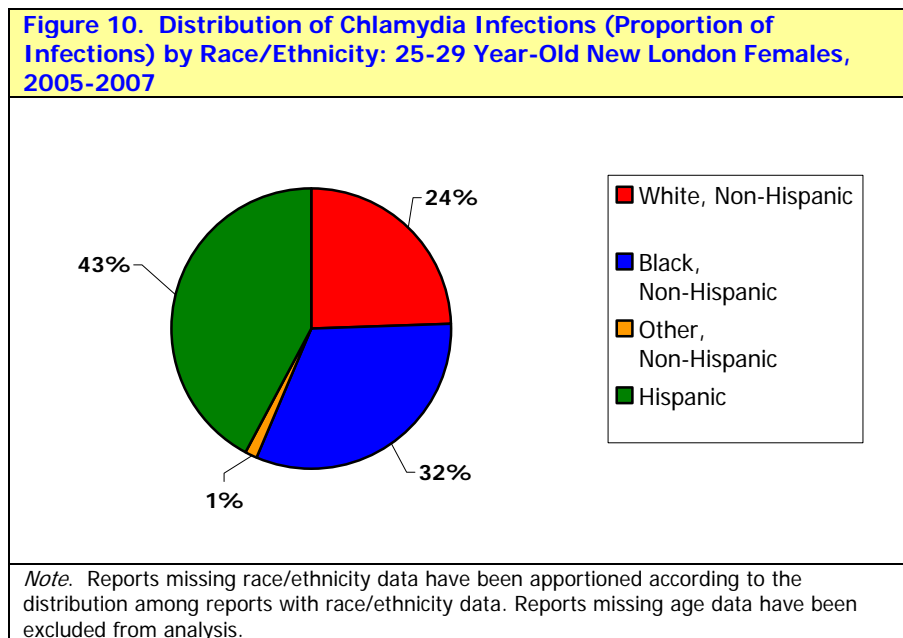
**Figure 8. Distribution of Chlamydia Infections (Proportion of Infections) by Race/Ethnicity: 15-19 Year-Old New London Females, 2005-2007**



The proportion of chlamydia infections increases to 28% among 20-24 year-old New London White females with a corresponding drop in the proportion of infections among 20-24 year-old Black and Hispanic females (Figure 9).



Among 25-29 year-old New London females, the proportion of infections among Hispanics increases to 43% and the proportion of infections among Blacks decreases to 32% (Figure 10).



## Comparison of New London and U.S. Chlamydia Infection Rates by Female Gender, Age and Race/Ethnicity

Table 10 presents New London chlamydia infection rates among 15-29 year-old females by race/ethnicity and age group; rates for Other race were not calculated for statistical considerations (see *Notes, Rates and Numbers*, page 50).

Year	15-19			20-24			25-29		
	White, Non-Hispanic	Black, Non-Hispanic	Hispanic	White, Non-Hispanic	Black, Non-Hispanic	Hispanic	White, Non-Hispanic	Black, Non-Hispanic	Hispanic
1997	1,529.1	8,938.5	5,394.2	616.6	12,069.0	434.8	1,041.7	2,994.0	823.0
1998	3,363.9	11,173.2	4,564.3	1,438.8	5,172.4	6,521.7	0.0	4,790.4	1,234.6
1999	2,293.6	11,731.8	5,394.2	822.2	8,620.7	7,391.3	416.7	6,586.8	2,057.6
2000	1,682.0	7,262.6	4,149.4	1,027.7	5,747.1	3,043.5	1,041.7	4,790.4	2,057.6
2001	3,058.1	12,849.2	2,904.6	411.1	9,195.4	4,782.6	1,041.7	2,994.0	2,057.6
2002	1,529.1	8,938.5	7,053.9	616.6	12,069.0	5,652.2	1,250.0	5,988.0	2,057.6
2003	1,834.9	4,469.3	10,788.4	1,130.5	10,344.8	1,739.1	1,875.0	598.8	823.0
2004	1,223.2	10,055.9	7,883.8	925.0	5,747.1	6,521.7	1,041.7	2,395.2	2,469.1
2005	1,223.2	13,966.5	6,639.0	1,438.8	12,069.0	7,391.3	1,250.0	4,790.4	4,115.2
2006	1,070.3	15,083.8	5,809.1	925.0	10,344.8	2,608.7	1,666.7	5,389.2	4,938.3
2007	1,070.3	8,379.9	9,128.6	1,233.3	8,046.0	5,217.4	1,041.7	4,790.4	4,526.7

*Note.* Reports missing race/ethnicity data have been apportioned according to the distribution among reports with race/ethnicity data. Reports missing age data have been excluded from analysis. \*Rates excluded for Other race (see *Notes, Understanding Public Health Data: Rates and Numbers*, page 50).

Table 2 (page 12) and Figure 11 show that the 2006 chlamydia infection rate among 15-19 year-old females was:

- 22% lower among New London Whites than U.S. Whites;
- 66% higher among New London Blacks than U.S. Blacks;
- 95% higher among New London Hispanics than U.S. Hispanics;

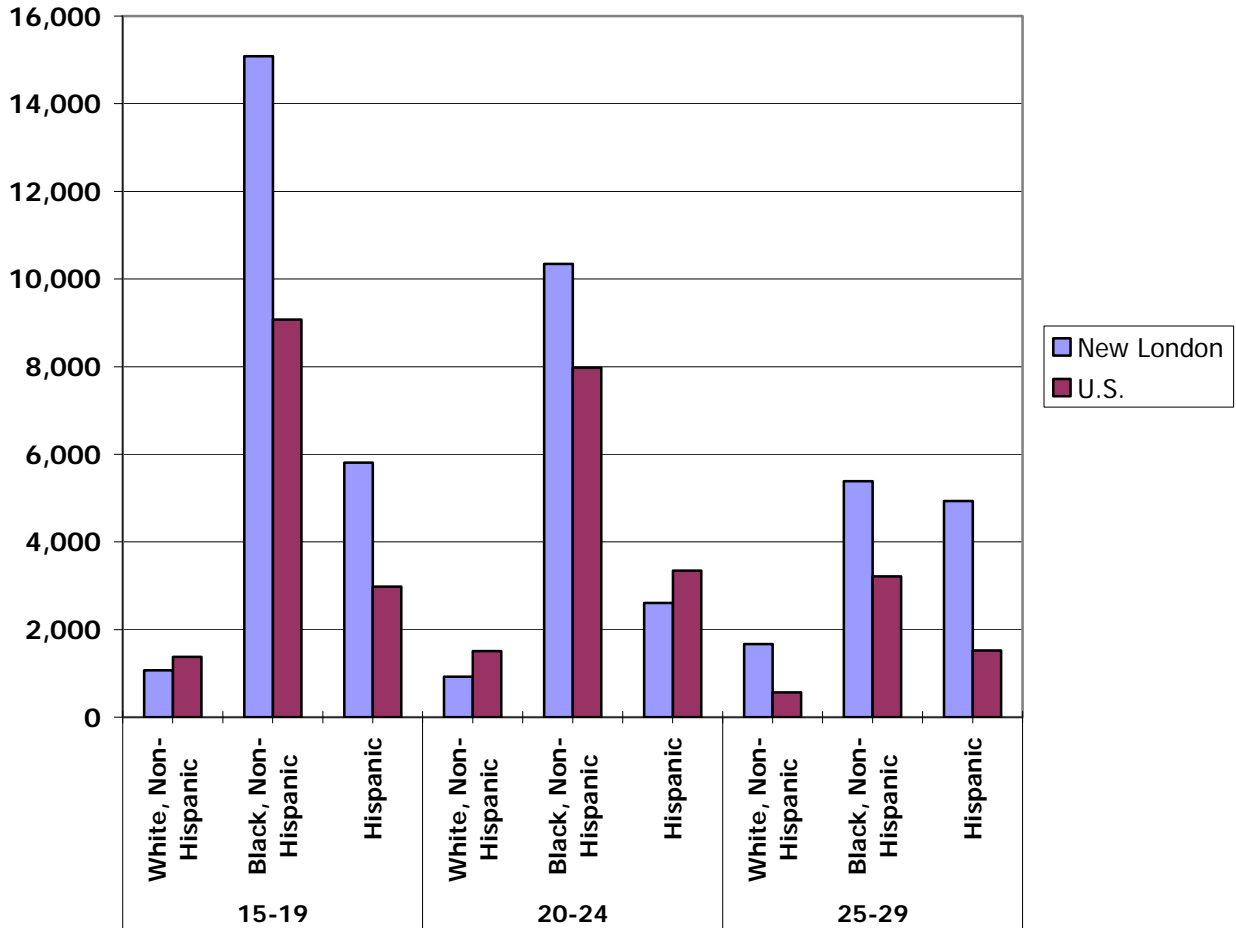
20-24 year-old females was:

- 39% lower among New London Whites than U.S. Whites;
- 30% higher among New London Blacks than U.S. Blacks;
- 22% lower among New London Hispanics than U.S. Hispanics;

25-29 year-old females was:

- 193% higher among New London Whites than U.S. Whites;
- 68% higher among New London Blacks than U.S. Blacks;
- 224% higher among New London Hispanics than U.S. Hispanics.

**Figure 11. Chlamydia Infection Rates (per 100,000) by Age Group and Race/Ethnicity\*: 15-29 Year-Old New London and U.S. Females, 2006**



*Note.* Reports missing race/ethnicity data have been apportioned according to the distribution among reports with race/ethnicity data. Reports missing age data have been excluded from analysis. \*Rates excluded for Other race (see *Notes, Understanding Public Health Data: Rates and Numbers*, page 50).

### Using Rates to Assess Age/Race/Ethnicity Disparities among New London Females Age 15-29

Looking at New London data only, the 2006 chlamydia infection rate (Table 2, page 12 and Figure 11) among female:

15-19 year-olds was:

- 1,309% higher among Blacks than Whites;

- 443% higher among Hispanics than Whites;

20-24 year-olds was:

- 1,018% higher among Blacks than Whites;
- 182% higher among Hispanics than Whites;

25-29 year-olds was:

- 223% higher among Blacks than Whites;
- 196% higher among Hispanics than Whites.

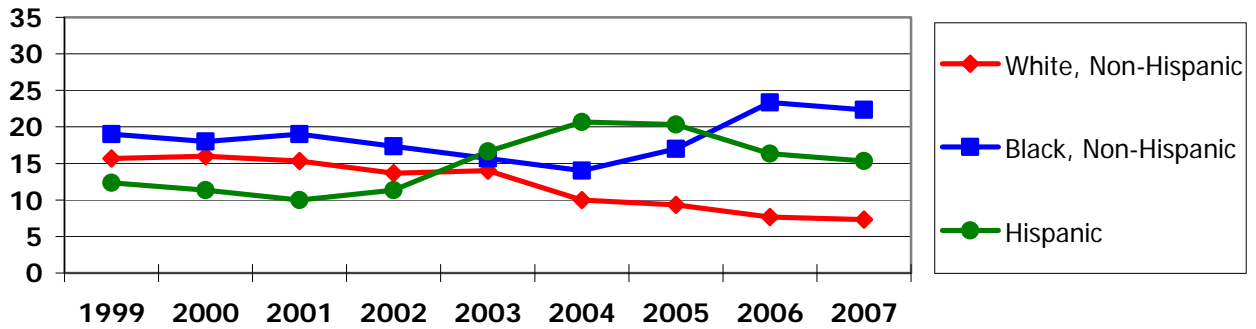
## Introduction to Rolling Averages

Annual variations in the number of chlamydia infections may reflect actual changes in the number of infections, random changes, and also over- and under-counting. The three-year rolling average number of chlamydia infections (Table 11, and Figures 12-14) smoothes the variations in data and makes trends more apparent (see *Notes, Three-Year Rolling Averages*, page 52, for further information on rolling averages).

Year	15-19			20-24			25-29		
	White, Non-Hispanic	Black, Non-Hispanic	Hispanic	White, Non-Hispanic	Black, Non-Hispanic	Hispanic	White, Non-Hispanic	Black, Non-Hispanic	Hispanic
1999	16	19	12	9	15	11	2	8	3
2000	16	18	11	11	11	13	2	9	4
2001	15	19	10	7	14	12	4	8	5
2002	14	17	11	7	16	10	5	7	5
2003	14	16	17	7	18	9	7	5	4
2004	10	14	21	9	16	11	7	5	5
2005	9	17	20	11	16	12	7	4	6
2006	8	23	16	11	16	13	6	7	10
2007	7	22	15	12	18	12	6	9	11

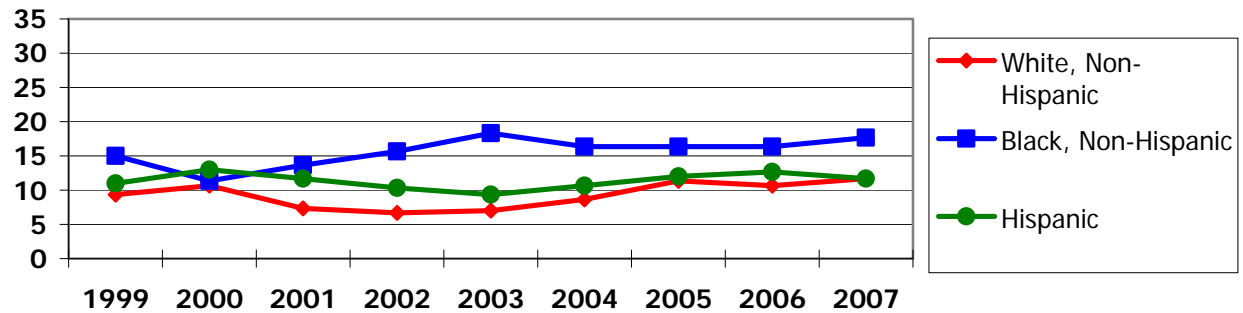
*Note.* Reports missing race/ethnicity data have been apportioned according to the distribution among reports with race/ethnicity data. Reports missing age data have been excluded from analysis. \*Rates excluded for Other race (see *Notes, Understanding Public Health Data: Rates and Numbers*, page 50).

**Figure 12. Three-Year Rolling Average Number of Chlamydia Infections by Race/Ethnicity\*: 15-19 Year-Old New London Females, 1999-2007**



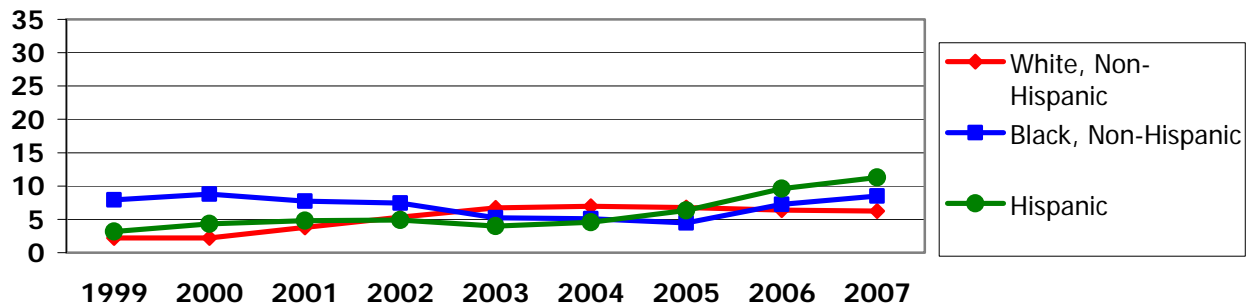
*Note.* Reports missing race/ethnicity data have been apportioned according to the distribution among reports with race/ethnicity data. Reports missing age data have been excluded from analysis. \*Rates excluded for Other race (see *Notes, Understanding Public Health Data: Rates and Numbers*, page 50).

**Figure 13. Three-Year Rolling Average Number of Chlamydia Infections by Race/Ethnicity\*: 20-24 Year-Old New London Females, 1999-2007**



*Note.* Reports missing race/ethnicity data have been apportioned according to the distribution among reports with race/ethnicity data. Reports missing age data have been excluded from analysis. \*Rates excluded for Other race (see *Notes, Understanding Public Health Data: Rates and Numbers*, page 50).

**Figure 14. Three-Year Rolling Average Number of Chlamydia Infections by Race/Ethnicity\*: 25-29 Year-Old New London Females, 1999-2007**



*Note.* Reports missing race/ethnicity data have been apportioned according to the distribution among reports with race/ethnicity data. Reports missing age data have been excluded from analysis. \*Rates excluded for Other race (see *Notes, Understanding Public Health Data: Rates and Numbers*, page 50).

The three-year rolling average number of chlamydia infections in New London among:

- 15-19 year-old females (Figure 12) decreased slightly among Whites and Hispanics, and recently began to decrease among Blacks;
- 20-24 year-old females (Figure 13) has been stable for over three years among Whites, Blacks and Hispanics;
- 25-29 year-old (Figure 14) Black and Hispanic females has been increasing slightly for over three years while remaining stable among White females.

### **Multiple Chlamydia Infections among Females and Males**

The data on New London residents infected multiple times were examined to determine if a history of one chlamydia infection increases the likelihood of a subsequent infection. If individuals who are infected once are likely to become re-infected, those individuals are appropriate targets for heightened prevention efforts. The number of chlamydia infections is not equal to the number of individuals who have been infected because individuals may be infected more than once. Record matching based on common name, address, and/or date of birth was used to classify all infections on an ordinal basis (*i.e.*, first, second or third infection). These matching criteria would lead to an under-estimation of individuals who experienced more than one infection if subsequent infections could not be matched to an individual (this would happen, for example, if one report had some but not all of the data required to match records). For this analysis, a chlamydia infection was defined as a subsequent infection if that infection occurred at least one month after the previous infection. This time frame was established based on the recognition that chlamydia infections respond to treatment and would not result in a positive laboratory test at 30 days past initiation of treatment (personal conversation, Otilio Alvarides, CT DPH). This classification system is subject to error; if an infected individual were not treated and tested positive 30 days after the first test, that person would be counted erroneously as having had a subsequent infection. This error would only be of importance if there were a great number of individuals diagnosed with chlamydia but not treated. The risk of subsequent infections was assessed separately

for females and males to examine gender-based differences. Age-associated risk was also assessed; the percentages of infections among individuals less than age 28 and those less than age 19 were calculated to refine the definition of individuals at high risk for a chlamydia infection. The results of this analysis follow.

### **Females with Multiple Chlamydia Infections**

In New London between 1997 and 2007:

- 934 females were diagnosed with a sexually transmitted chlamydia infection;
- 310 females (33% of those ever infected) had two or more chlamydia infections
  - 278 (90%) of females with two or more infections were below age 28, and 68 (22%) were below age 19;
- 98 females (32% of those infected twice) had three or more infections
  - 87 (89%) of females with three or more infections were below age 28, and 24 (24%) were below age 19;
- 28 females (29% of those infected three times) had four or more infections
  - 25 (89%) of females with four or more infections were below age 28, and four (14%) were below age 19;
- 11 females (39% of those infected four times) had five or more infections
  - 100% of females with five or more infections were below age 28, and none were below age 19.

### **Males with Multiple Chlamydia Infections**

In New London between 1997 and 2007:

- 288 males were diagnosed with a sexually transmitted chlamydia infection;
- 37 males (13% of males ever infected) had two or more chlamydia infections
  - 37 (100%) were below age 28, and two (5%) were below age 19;
- eight males (22% of males infected twice) had three or more infections
  - all were between the ages of 19-24;
- three males (38% of males infected three times) had four or more infections
  - all were between the ages of 22-24.

## **Multiple Chlamydia Infection Analysis Conclusions**

These findings suggest that a history of chlamydia is a predictor of subsequent infection; 33% of females and 13% of males who were diagnosed once went on to be diagnosed two or more times. Further, the data suggest females below age 28 are at highest risk of experiencing multiple chlamydia infections. Males are less likely than females to experience one or more chlamydia infections. Males below the age of 28 are at highest risk of experiencing multiple chlamydia infections.

## **Gonorrhea**

### **Background**

Gonorrhea is the second-most commonly reported infectious disease in the U.S., and it is estimated that only 50% of gonorrhea infections are reported (Weinstock, 2004). Left untreated, gonorrhea can lead to serious health problems including pelvic inflammatory disease in women and epididymitis in men. Gonorrhea infections increase the risk of HIV infections (if exposed to HIV). Drug resistance is an important issue; currently there is only one class of antibiotic recommended to treat gonorrhea (CDC, 2007).

## **Assessing Gender as a Risk Factor for Gonorrhea Infection**

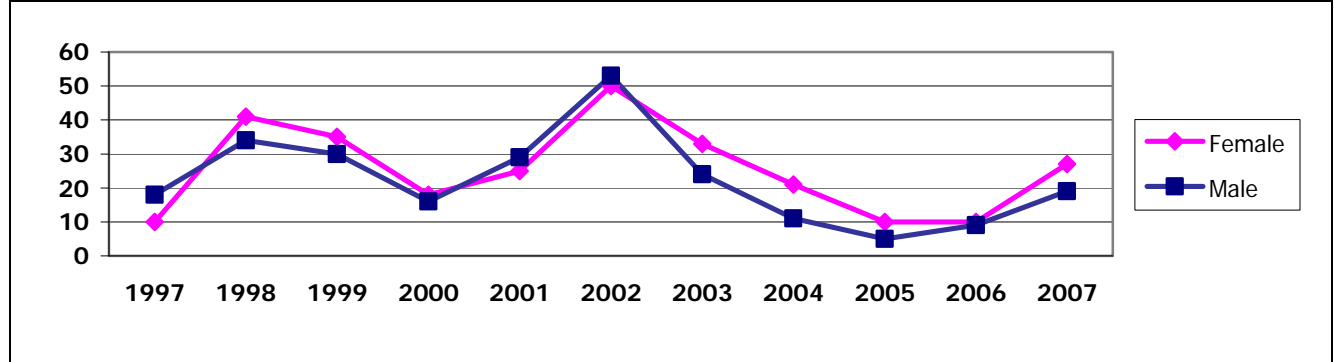
### **Number of Gonorrhea Infections in New London by Gender**

Over the past 11 years, the annual number of gonorrhea infections in New London has ranged from 15 to 103 (Table 12, Figure 15); infections decreased from 2002 until 2005, but have been increasing since then among both females and males. Gender is not a strong risk factor for gonorrhea; in

Year	Females		Males		Total
	Number	Percent	Number	Percent	Number
1997	10	35.7	18	64.3	28
1998	41	54.7	34	45.3	75
1999	35	53.8	30	46.2	65
2000	18	52.9	16	47.1	34
2001	25	46.3	29	53.7	54
2002	50	48.5	53	51.5	103
2003	33	57.9	24	42.1	57
2004	21	65.6	11	34.4	32
2005	10	66.7	5	33.3	15
2006	10	52.6	9	47.4	19
2007	27	58.7	19	41.3	46
<b>Total (Average)</b>	<b>280</b>	<b>(53.0)</b>	<b>248</b>	<b>(47.0)</b>	<b>528</b>

2006, females accounted for approximately 53% of the gonorrhea infections in New London and 52% of U.S. gonorrhea infections (U.S. data not shown).

**Figure 15. Number of Gonorrhea Infections: New London Females and Males, 1997-2007**



***Moving from Number of Infections to Infection Rates***

Table 13 depicts the number of gonorrhea infections in New London in 2006, the corresponding gonorrhea infection rate and the comparable U.S. rate (2006 was the latest year for which

U.S. data were available). Rates are also calculated for females and males.

	New London		U.S.	NL %
	Number	Rate	Rate	Lower than U.S.
<b>Total Population</b>	19	74.0	120.9	39
<b>Female</b>	10	76.2	124.3	39
<b>Male</b>	9	71.7	116.8	39

**Comparison of New London and U.S. Gonorrhea Infection Rates by Gender**

Table 13 shows that the 2006 New London gonorrhea infection rate was 39% lower than the U.S. rate among the total population, females and males.

**Using Rates to Assess Gender Disparities in New London**

In New London, the 2006 gonorrhea rate was 6% higher among females than males.

## Assessing Race/Ethnicity as a Risk Factor for Gonorrhea Infection

### Number of Gonorrhea Infections in New London by Race/Ethnicity

Table 14 depicts the number of gonorrhea infections in New London by race/ethnicity over the past 11

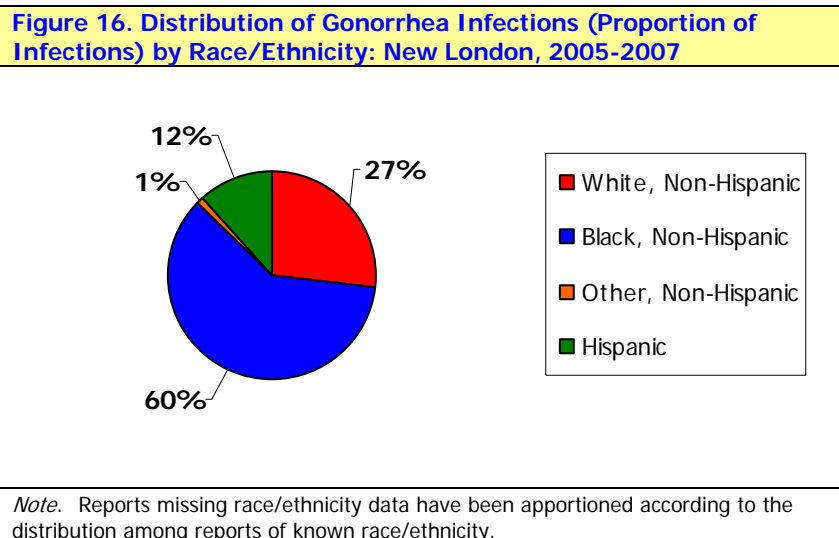
years. The racial/ethnic distribution of the gonorrhea infections in New London during 2005-2007 is displayed in Figure 16.

Table 14. Number of Gonorrhea Infections by Race/Ethnicity: New London, 1997-2007				
Year	White, Non-Hispanic	Black, Non-Hispanic	Other, Non-Hispanic	Hispanic
1997	7	15	2	4
1998	26	39	0	10
1999	21	34	0	10
2000	7	20	0	8
2001	7	38	0	9
2002	28	56	1	18
2003	19	33	0	5
2004	5	22	0	5
2005	5	6	0	3
2006	1	15	1	2
2007	15	26	0	4
<b>Total</b>	<b>141</b>	<b>304</b>	<b>4</b>	<b>78</b>

*Note.* Reports missing race/ethnicity data have been apportioned according to the distribution among reports with race/ethnicity data. Numbers may differ from those in Table 12 due to rounding.

Because the annual number of gonorrhea infections is small and varies from year to year, it is useful to add together three years of data to obtain a sufficient number of infections to calculate a reliable estimate of the distributions of gonorrhea infections in each race/ethnicity group.

In New London, during 2005 through 2007, Whites accounted for 56% of the population and 27% of gonorrhea infections, Blacks accounted for 17% of the population and 60% of gonorrhea infections, Others accounted for 7% of the population and 1% of the infections, Hispanics accounted for 20% of the population and 12% of the gonorrhea infections.



There were insufficient data to calculate New London gonorrhea infection rates by race or age group. This was due to the small number of infections reported each year and the high proportion of reports that did not have race/ethnicity data (see *Notes, Understanding Public Health Data: Rates and Numbers*, page 50).

## **Assessing Gender and Race/Ethnicity as Risk Factors for**

### **Gonorrhea Infection**

#### **Number of Gonorrhea Infections in New London by Gender *and* Race/Ethnicity**

Having assessed gender and race/ethnicity as separate risk factors for gonorrhea infection, we now look at the combination of gender and race/ethnicity. The number of gonorrhea infections among New London females and males by race/ethnicity are displayed in Table 15.

Year	White, Non-Hispanic		Black, Non-Hispanic		Other, Non-Hispanic		Hispanic	
	Females	Males	Females	Males	Females	Males	Females	Males
1997	5	2	4	11	0	2	1	3
1998	22	4	13	26	0	0	6	4
1999	15	6	16	18	0	0	4	6
2000	7	0	5	15	0	0	7	1
2001	6	1	13	25	0	0	6	3
2002	16	12	22	34	0	1	12	6
2003	13	6	17	16	0	0	3	2
2004	5	0	14	8	0	0	2	3
2005	4	1	3	3	0	0	2	1
2006	1	0	8	7	0	1	1	1
2007	14	1	10	16	0	0	3	1
<b>Total</b>	<b>108</b>	<b>33</b>	<b>125</b>	<b>179</b>	<b>0</b>	<b>4</b>	<b>47</b>	<b>31</b>

*Note.* Reports missing race/ethnicity data have been apportioned according to the distribution among reports with race/ethnicity data. Numbers may differ from those in Table 12 due to rounding.

Because the number of gonorrhea infections is small and varies from year to year, it is useful to add together three years of data (2005-2007) to obtain a sufficient number of infections to make reliable comparisons between groups.

Among females in New London, from 2005 through 2007:

- Whites accounted for 56% of the population and 41% of gonorrhea infections;
- Blacks accounted for 17% of the population and 46% of gonorrhea infections;
- Other race accounted for 7% of the population and 0% of gonorrhea infections;
- Hispanics accounted for 20% of the population and 13% of gonorrhea infections.

Among males in New London, from 2005 through 2007:

- Whites accounted for 57% of the population and 6% of gonorrhea infections;
- Blacks accounted for 17% of the population and 81% of gonorrhea infections;
- Other race accounted for 7% of the population and 3% of gonorrhea infections;
- Hispanics accounted for 19% of the population and 10% of gonorrhea infections.

## **Assessing Gender and Age as Risk Factors for Gonorrhea Infection**

### **Number of Gonorrhea Infections by Gender and Age Group**

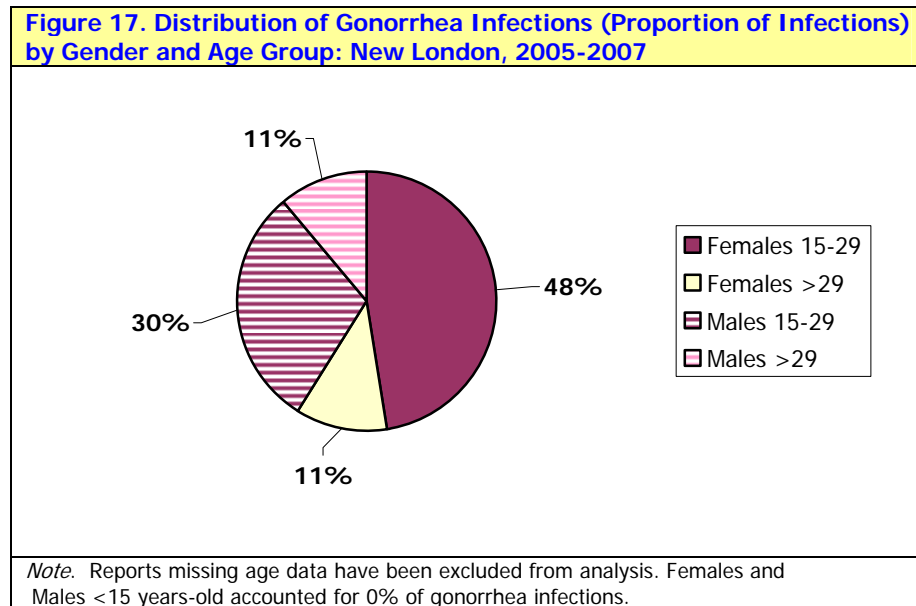
In New London, gonorrhea infections are rare until after age 14 (Tables 16-17). There are more gonorrhea infections among 20-24 year-old than 15-19 year-old males. In New London, gonorrhea infections decrease somewhat among both genders after age 29 and decrease further among females after age 39 and among males after age 44.

<b>Table 16. Number of Gonorrhea Infections by Age Group: New London Females, 1997-2007</b>												
<b>YEAR</b>	<b>&lt;10</b>	<b>10-14</b>	<b>15-19</b>	<b>20-24</b>	<b>25-29</b>	<b>30-34</b>	<b>35-39</b>	<b>40-44</b>	<b>45-54</b>	<b>55+</b>	<b>unknown</b>	<b>TOTAL</b>
1997	0	0	5	3	1	1	0	0	0	0	0	10
1998	2	0	17	15	1	2	2	1	1	0	0	41
1999	0	0	15	12	3	2	3	0	0	0	0	35
2000	0	0	5	9	1	1	2	0	0	0	0	18
2001	0	2	10	7	2	3	0	0	0	0	1	25
2002	0	1	15	13	10	5	2	2	0	0	1	50
2003	0	0	12	8	9	1	3	0	0	0	0	33
2004	0	0	6	6	7	1	1	0	0	0	0	21
2005	0	0	2	4	3	1	0	0	0	0	0	10
2006	0	0	1	5	2	2	0	0	0	0	0	10
2007	0	0	3	9	9	5	1	0	0	0	0	27
<b>TOTAL</b>	<b>2</b>	<b>3</b>	<b>91</b>	<b>91</b>	<b>48</b>	<b>24</b>	<b>14</b>	<b>3</b>	<b>1</b>	<b>0</b>	<b>2</b>	<b>280</b>

<b>Table 17. Number of Gonorrhea Infections by Age Group: New London Males, 1997-2007</b>												
<b>YEAR</b>	<b>&lt;10</b>	<b>10-14</b>	<b>15-19</b>	<b>20-24</b>	<b>25-29</b>	<b>30-34</b>	<b>35-39</b>	<b>40-44</b>	<b>45-54</b>	<b>55+</b>	<b>Unknown</b>	<b>TOTAL</b>
1997	0	0	3	6	4	3	1	1	0	0	0	18
1998	0	0	7	14	3	3	2	4	1	0	0	34
1999	0	0	7	10	5	4	3	1	0	0	0	30
2000	0	0	0	10	3	0	0	3	0	0	0	16
2001	0	0	5	9	9	4	0	1	1	0	0	29
2002	0	1	9	17	7	9	3	4	2	1	0	53
2003	0	0	4	7	6	5	2	0	0	0	0	24
2004	0	0	1	3	4	1	1	1	0	0	0	11
2005	0	0	2	2	0	0	1	0	0	0	0	5
2006	0	0	2	0	3	0	1	3	0	0	0	9
2007	0	0	1	6	8	2	1	1	0	0	0	19
<b>TOTAL</b>	<b>0</b>	<b>1</b>	<b>41</b>	<b>84</b>	<b>52</b>	<b>31</b>	<b>15</b>	<b>19</b>	<b>4</b>	<b>1</b>	<b>0</b>	<b>248</b>

In New London and across the U.S., 15-29 year-olds are most likely to become infected with gonorrhea.

In the U.S. in 2006, 75% of infections were among 15-29 year-olds, 24% among individuals over age 29, and 1% among individuals below age 15 (data not shown). In New



London, from 2005 through 2007, 78% of infections were among 15-29 year-olds (48% among females and 30% among males) and 22% among individuals over age 29 (Tables 16-17, Figure 17). There have been only six gonorrhea infections in New London among individuals below the age of 15 over the past 11 years (two were congenitally transmitted) and no gonorrhea infections among individuals below age 15 over the past five years.

## **Syphilis**

Syphilis is a genital ulcerative disease that, if untreated, progresses from a chancre (sore), to a rash and eventually to internal organ damage. Syphilis rates in the U.S. reached a 59-year low in 2000 but have been increasing since then among males more so than among females (CDC, 2007). According to CT DPH, there has been only one reported case of syphilis in New London during the past five years (2003-2007).

## **STDs Not Reportable**

STDs that are not reportable can be more common and as, if not more, dangerous than those that are reportable. Human papilloma virus (HPV), the main cause of cervical cancer and genital warts, is not reportable. Also unreported are trichomoniasis, an STD associated with premature birth and low birth weight, and herpes simplex virus (HSV). A recent study from the CDC reported that 26% of a nationally representative sample of 14-19 year-old girls tested positive for an STD (CDC, 2008); HPV was the most common STD with a prevalence of 18%, followed by chlamydia which affected 3.9%; trichomoniasis was found in 2.5% and HSV in 2.0% of the sample. Because the girls were not tested for gonorrhea (the second-most commonly reported disease in the country) nor for syphilis, it is likely that more than 26% of girls aged 14-19 were infected with a potentially dangerous STD. (This CDC study measured STD prevalence. Prevalence is a measure of the number of individuals infected with a disease at a certain point in time. Prevalence data are not available for New London because we do not know the number of individuals who were tested for STDs.) The 2008 CDC findings reinforce the message that reported STDs reflect the "tip of the iceberg." A disturbing implication of this study is that dangerous STDs such as HPV or trichomoniasis may be quite common, but infection rates cannot be determined because these diseases are not reportable.

## **STD Discussion**

Chlamydia and gonorrhea infections have been increasing in New London and across the nation. Reports of disease have increased over time among both men and women for many reasons. Over the past 25 years screening tests have improved and are now better at detecting disease. More men and women are being tested and more physicians and labs are reporting disease (CDC, 2007). The increased number of reported infections may also reflect a true increase in the number of infections. It is important to remember that the actual number of STDs far exceeds the reported number of cases because not all infections are detected and not all detected diseases are reported.

The 2006 New London chlamydia infection rates were higher than U.S. rates among females (91%), males (66%), Whites (36%), Blacks (43%), and Hispanics (103%). In New London and across the U.S., STD infection rates are highest among 15-29 year-olds. New London chlamydia infection rates were lower than U.S. rates among 15-24 year-old White females and 20-24 year-old Hispanics females. Chlamydia infection rates by age/race/ethnicity are not available for males, but rates are lower among 15-19 year-old New London males and higher among 20-34 year-old New London males compared to U.S. males of the same age groups.

STD disparities are evident in New London; the 2006 chlamydia infection rate among females was over eight times higher among Blacks compared to Whites and, among males, rates were 11 times higher among Blacks than Whites. Disparities were even more extreme among the young; in 2006 among 15-24 year-old females, chlamydia infection rates among Blacks were over 11 times higher than rates among Whites and, among 15-19 year-old females, the Hispanics rate was over five times higher than the White rate. In New London, gonorrhea infections have been increasing since 2005, but remain 39% lower than U.S. rates among both females and males. New London data reveal gonorrhea infection disparities; Blacks represent 17% of the population but accounted for 60% of the 2005-2007 gonorrhea infections.

A history of chlamydia infection has been identified as a risk factor for subsequent chlamydia infections among females; 33% percent of New London females infected with a chlamydia infection experienced a subsequent infection and most females who experience a subsequent infection are below age 28. Chlamydia and gonorrhea are not the only STDs that affect New London residents. There has been one reported case of syphilis over the past five years, and, according to national data, other dangerous STDs that are not reportable are common among sexually active young women.

## **Section 2. Teen Births**

### **Background**

Teen pregnancy has a tremendous impact on teens, their families, and, ultimately, all taxpayers. Pregnant teens are less likely than older females to receive timely prenatal care and more likely to experience complications of delivery and maternal death.

Children born to teens are more likely to be born prematurely or at low birth weight, increasing the risk of infant death, blindness, chronic respiratory problems, mental retardation, cerebral palsy, dyslexia, and hyperactivity (Child Trends Databank).

According to the National Campaign to Prevent Teen and Unplanned Pregnancy, children born to teens inhabit a less stimulating home environment and experience poorer academic and behavioral outcomes than children born to older females. These children score lower on standardized tests, are more likely to repeat a grade, and are less likely to complete high school. Compared to children born to older mothers, children born to teens suffer more abuse and neglect. Sons born to teen mothers are more likely to end up in prison, and daughters of teens are more likely to end up teen mothers themselves (National Campaign to Prevent Teen Pregnancy, 2008).

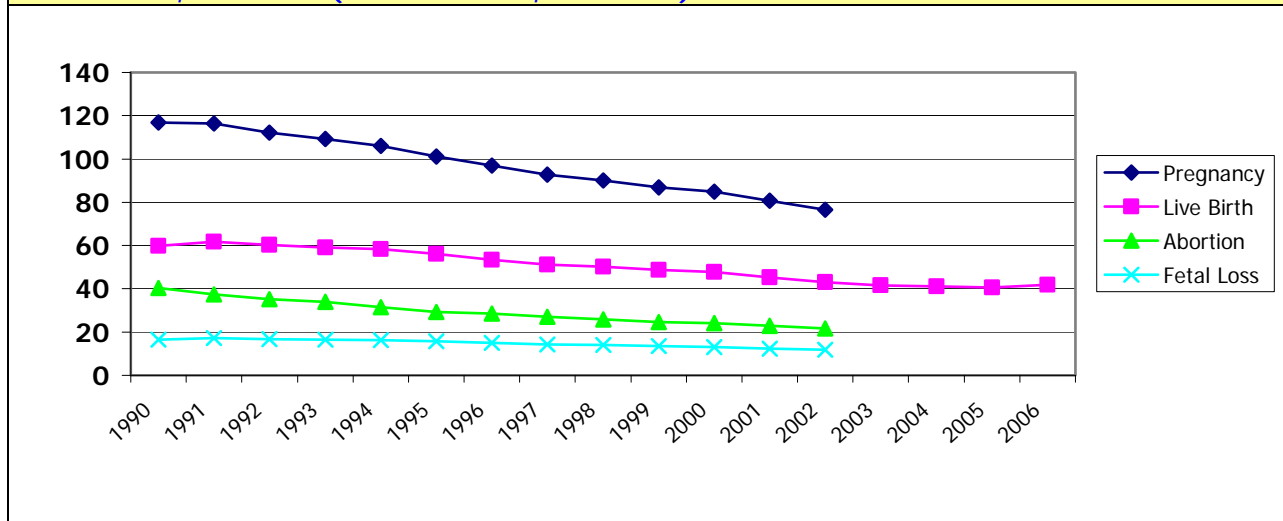
### **U.S .Teen Pregnancy and Pregnancy Outcome Trends**

Pregnancy among teens is a troubling public health issue; unfortunately, the only data related to teen pregnancy among New London teens are the teen birth statistics available from CT DPH. No data exist on New London teen pregnancies, abortions, or fetal losses. The most recent data on pregnancy and pregnancy outcomes among U.S. females age 15-19 are depicted in Table 18 and Figure 18. On average, over the three most recent years for which complete (*i.e.*, pregnancy, birth, abortion and fetal loss) U.S. birth outcome data were available (2000-2002), birth rates among 15-19 year-olds have been about 44% lower than pregnancy rates and abortion rates have been about 50% lower than birth rates (Figure 18).

**Table 18. Pregnancy, Live Birth, Induced Abortion, and Fetal Loss Rates (per 1,000) by Age Group: 15-19 Year-Old U.S. Females, 1990-2002**

Year	Pregnancy		Live Birth		Abortion		Fetal Loss	
	15-17	18-19	15-17	18-19	15-17	18-19	15-17	18-19
1990	77.1	167.7	23.3	88.6	21.1	24.3	8.1	21.2
1991	76.1	172.1	23.6	94.0	18.3	24.2	8.2	22.5
1992	73.5	169.3	22.7	93.6	16.0	26.8	7.9	22.4
1993	72.7	164.1	22.7	91.1	15.4	25.5	7.9	21.8
1994	71.1	159.6	22.7	90.2	14.1	26.1	7.9	21.6
1995	67.4	153.4	22.0	87.7	13.4	23.5	77.6	21.0
1996	63.4	149.0	20.6	84.7	12.6	22.9	7.2	20.3
1997	59.5	144.3	19.3	82.1	11.8	20.3	6.7	19.6
1998	56.7	140.3	18.3	80.9	10.7	21.5	6.4	19.4
1999	53.1	136.6	17.1	79.1	9.4	20.2	5.9	18.9
2000	50.8	134.5	15.8	78.1	8.5	18.4	5.5	18.7
2001	46.9	130.9	14.0	76.1	8.0	17.1	4.9	18.2
2002	44.4	125.0	13.1	72.8	7.4	16.8	4.6	17.4

**Figure 18. Pregnancy, Live Birth, Induced Abortion, and Fetal Loss Rates (per 1,000): 15-19 Year-Old U.S. Females, 1990-2002 (Live Birth Rates, 1990-2006)**



*Note.* Live birth data is the only pregnancy outcome data that is available for 2003-2006; pregnancy, induced abortion and fetal loss data for 2003-2006 have not been published.

## New London Teen Births

### Numbers of Births to New London Teens

There have been six births to New London teens below age 15 in the past five years (2002-2006); one Black, three Hispanic and two of unknown race/ethnicity. The numbers of New London births to 15-19 year-olds are depicted in Table 19. In general, in New London and across the U.S., there are more births to 18-19 year-olds than 15-17 year-olds in each race/ethnicity group. For that reason, numbers of births and birth rates are analyzed separately for 15-17 and 18-19 year-olds.

**Table 19. Number of Births by Race/Ethnicity and Age Group: 15-19 Year-Old New London Females, 1998-2006**

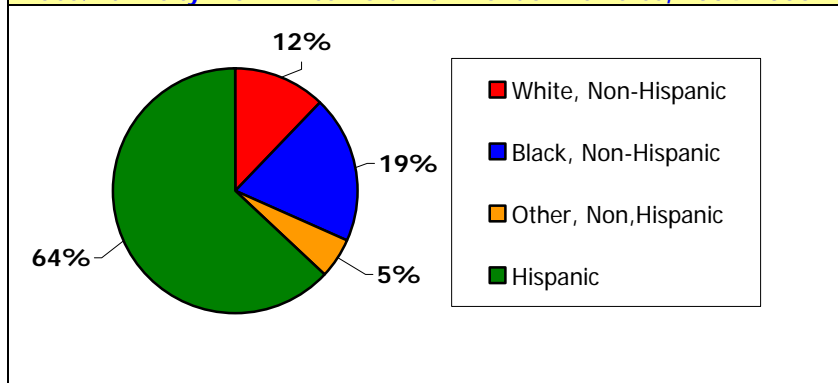
	15-17 Year-Olds						18-19 Year-Olds						Total Teen Births
	White NH	Black NH	Other NH	Hisp	Unknw	Total 15-17	White NH	Black NH	Other NH	Hisp	Unknw	Total 18-19	
1998	2	8	0	11	0	21	8	12	0	12	0	32	53
1999	6	6	2	6	0	20	22	9	1	9	1	42	62
2000	4	0	0	8	2	14	11	6	1	9	2	29	43
2001	8	2	0	9	0	19	11	8	2	8	1	30	49
2002	8	4	0	6	1	19	10	12	2	9	0	33	52
2003	2	7	3	12	0	24	10	9	3	16	0	38	62
2004	3	1	2	16	0	22	8	5	4	14	1	32	54
2005	1	3	1	10	0	15	7	5	1	23	0	36	51
2006	3	7	0	10	0	20	11	5	0	15	0	31	51
<b>Total</b>	<b>37</b>	<b>38</b>	<b>8</b>	<b>88</b>	<b>3</b>	<b>174</b>	<b>98</b>	<b>71</b>	<b>14</b>	<b>115</b>	<b>5</b>	<b>303</b>	<b>477</b>

Note. NH=Non-Hispanics; Hisp=Hispanic; Unknw=Unknown race/ethnicity

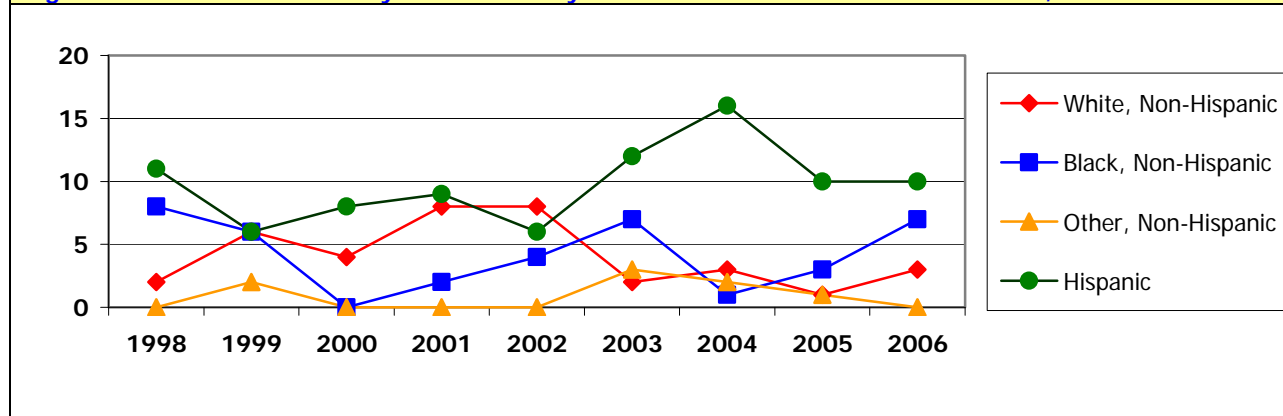
### Births to 15-17 Year-Olds

From 1998 to 2006 there were between 14 and 24 births to 15-17 year-olds per year (Table 19). From 2004-2006, most births to 15-17 year-old New London females were to Hispanics (Figures 19-20).

**Figure 19. Distribution of Births (Proportion of Births) by Race/Ethnicity: 15-17 Year-Old New London Females, 2004-2006**



**Figure 20. Number of Births by Race/Ethnicity: 15-17 Year-Old New London Females, 1998-2006**

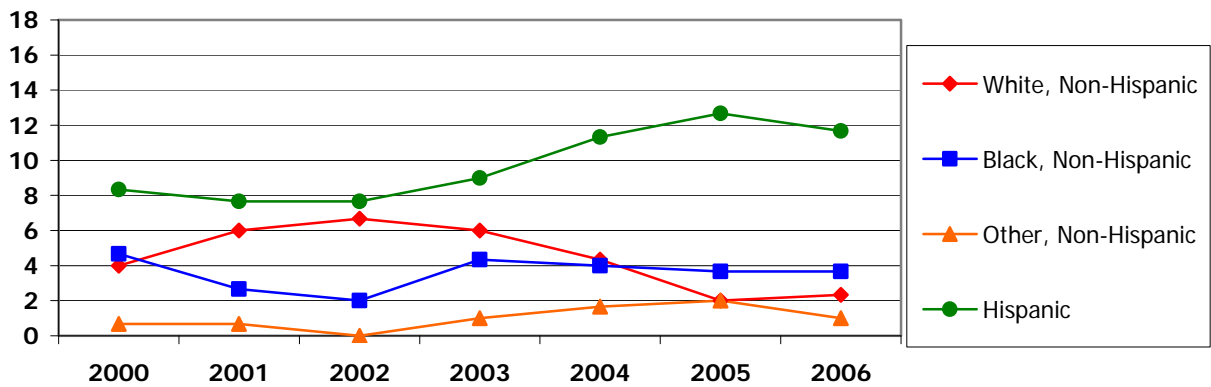


Note. Births to teens of unknown race/ethnicity have been excluded from analysis.

## Rolling Average Number of Births to New London 15-17 Year-Olds

The three-year rolling average numbers of births to 15-17 year-old females (Figure 21) smoothes out the year to year variations in the number of births and makes trends more apparent; births appear to be stable among Blacks and Others, decreasing among Whites and, recently, beginning to decrease among Hispanics.

**Figure 21. Three-Year Rolling Average Number of Births by Race/Ethnicity: 15-17 Year-Old New London Females, 2000-2006**



*Note.* Births to teens of unknown race/ethnicity have been excluded from analysis.

## Moving from Birth Numbers to Birth Rates among 15-17 Year-Olds

### Using Rates to Assess New London Birth Trends among 15-17 Year-Olds

Births are more common among 15-17 year-old Black, Other and Hispanic teens than among White teens (*i.e.*,

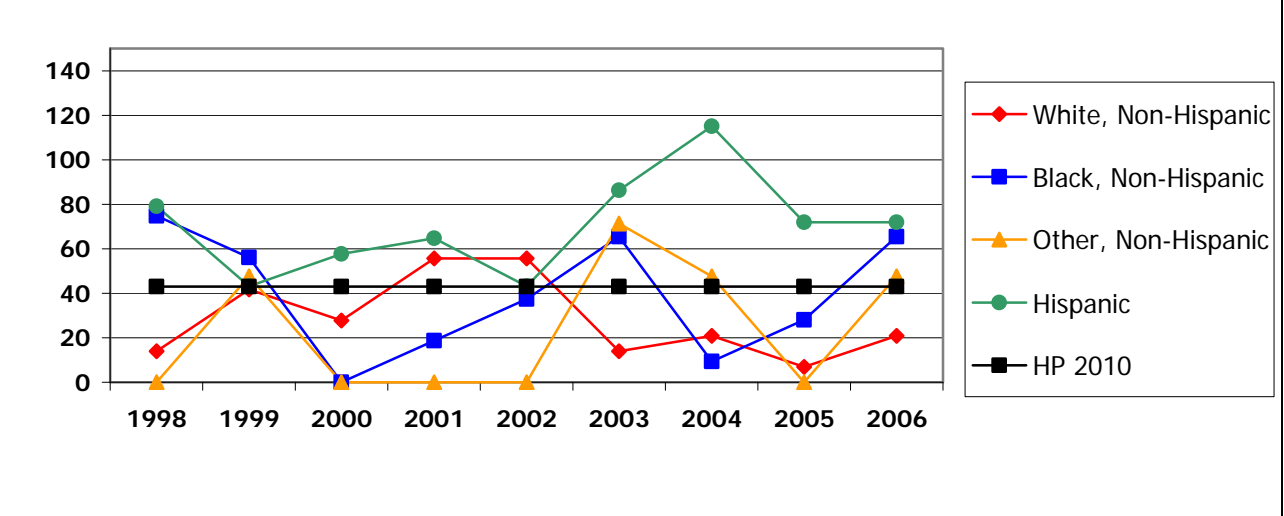
rates are higher among Blacks, Others and Hispanics than Whites [Table 20, Figure 22]).

**Table 20. Birth Rates (per 1,000) by Race/Ethnicity: 15-17 Year-Old New London Females, 1998-2006**

Year	White, Non-Hispanic	Black, Non-Hispanic	Other, Non-Hispanic	Hispanic
1998	13.9	74.8	0.0	79.1
1999	41.7	56.1	47.6	43.2
2000	27.8	0.0	0.0	57.6
2001	55.6	18.7	0.0	64.7
2002	55.6	37.4	0.0	43.2
2003	13.9	65.4	71.4	86.3
2004	20.8	9.3	47.6	115.1
2005	6.9	28.0	0.0	71.9
2006	20.8	65.4	47.6	71.9

*Note.* Births to teens of unknown race/ethnicity have been excluded from analysis.

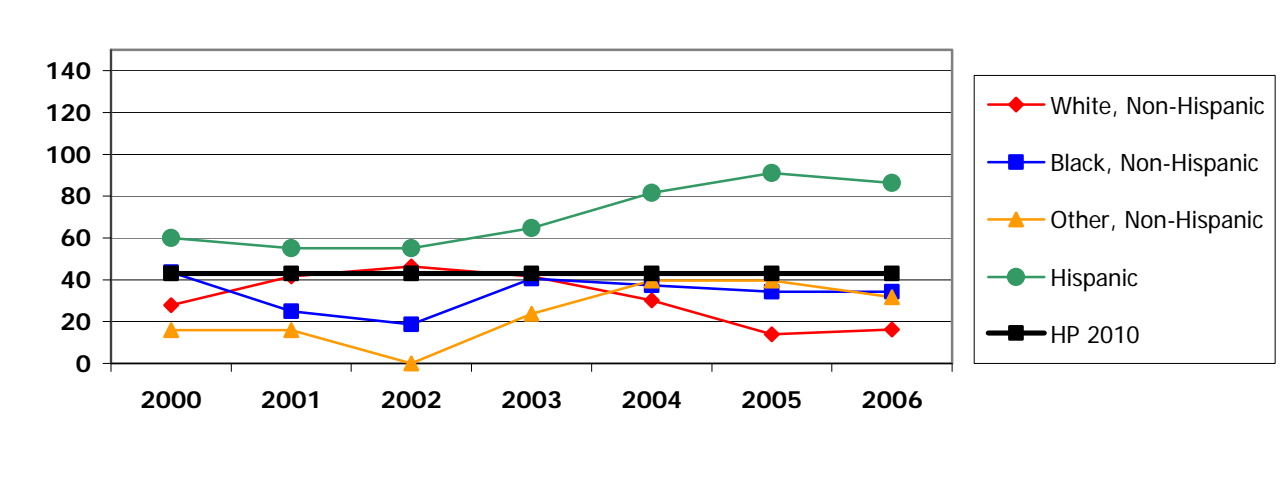
**Figure 22. Birth Rates (per 1,000): 15-17 Year-Old New London Females by Race/Ethnicity, 1998-2006 Compared to Healthy People 2010 Target Rate**



*Note.* Births to teens of unknown race/ethnicity have been excluded from analysis.

The three-year rolling average birth rates for 15-17 year-old New London teens (Figure 23) suggests that birth rates have stabilized among Blacks, Whites (after years of decreasing) and Others (after years of increasing), and may have begun to decrease among Hispanics.

**Figure 23. Three-Year Rolling Average Birth Rates (per 1,000): 15-17 Year-Old New London Females by Race/Ethnicity, 2000-2006 Compared to Healthy People 2010 Target**



*Note.* Births to teens of unknown race/ethnicity have been excluded from analysis.

## Introducing the Healthy People 2010 Target Birth Rate for 15-17 Year-Olds

The national target for reduction in teen pregnancy as specified in Healthy People 2010 is 43 births per 1,000 females aged 15-17 years (DHHS, 2000). As seen in Figure 23, on average, over the three most recent years, New London birth rates among 15-17 year-olds were below the national target rate for Whites, Blacks and Others, and above the target rate among Hispanics.

## Comparison of New London and U.S. Birth Rates among 15-17 Year-Olds

In 2006, the birth rate among 15-17 year-olds in New London (Table 21) was 76% higher than the

	White, Non-Hispanic	Black, Non-Hispanic	Hispanic
New London	20.8	65.4	64.7
U.S.	11.8	36.1	47.9

U.S. rate among 15-17 year-old Whites, 81% higher among New London Blacks, and 35% higher than the U.S. rate among 15-17 year-old Hispanics.

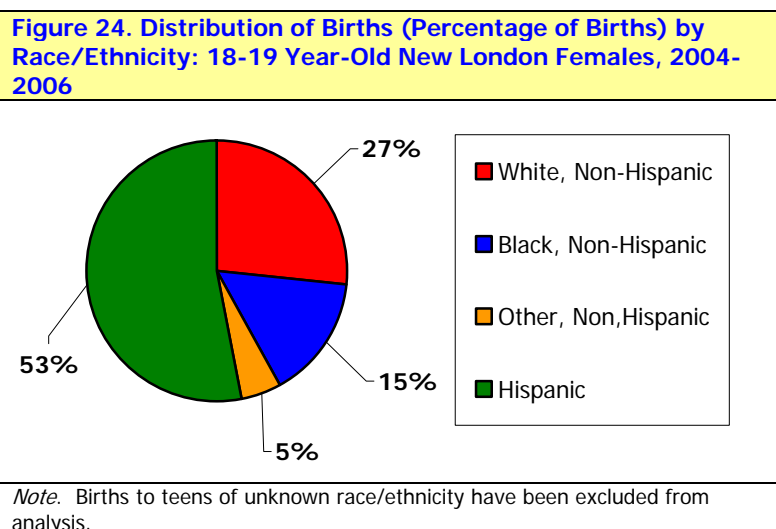
## Using Rates to Assess Racial/Ethnic Disparities in New London

In New London, the 2006 New London birth rate (Table 21) among 15-17 year-olds was 214% higher among Blacks and 211% higher among Hispanics, compared to Whites.

## Births to 18-19 Year-Olds

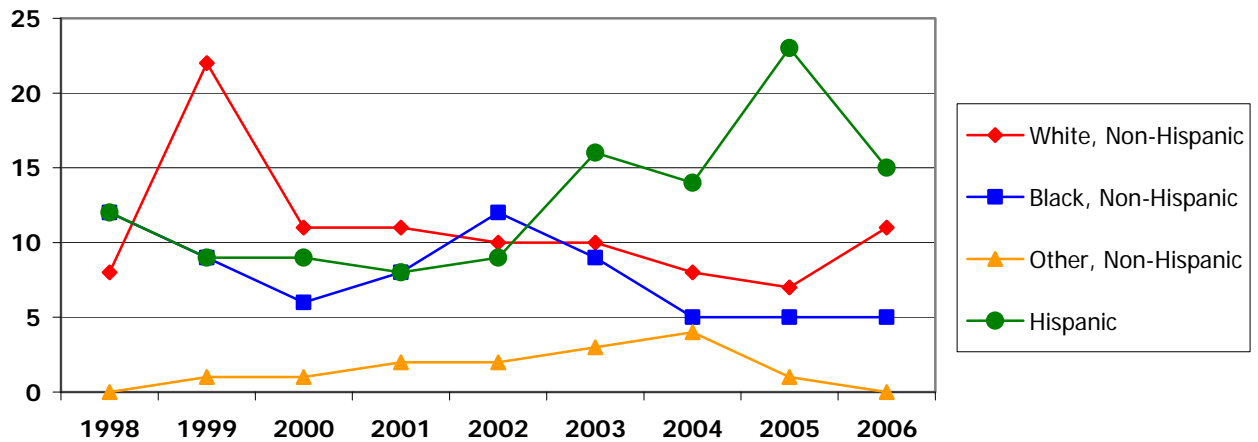
### Number of Births to New London 18-19 Year-Olds

From 1998 to 2006, there were between 29 and 42 births per year to 18-19 year-olds (Table 19, page 40). From 2004-2006, most New London births to 18-19 year-olds were to Hispanics (Figure 24); during that time there were five or fewer births a year to Blacks and Others, 11



or fewer births a year to Whites, and between 14 and 23 births a year to Hispanics (Table 19, Figure 25).

**Figure 25. Number of Births by Race/Ethnicity: 18-19 Year-Old New London Females, 1998-2006**

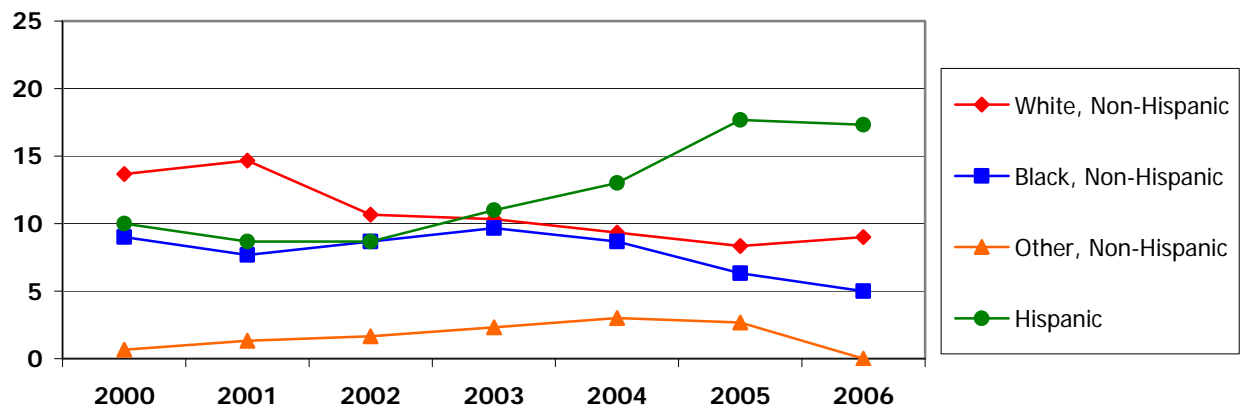


*Note.* Births to teens of unknown race/ethnicity have been excluded from analysis.

### Rolling Average Number of Births to New London 18-19 Year-Olds

The three-year rolling average numbers of births to 18-19 year-old New London females (Figure 26) suggests that births are rare among Others, increasing among Whites, decreasing among Blacks, and stabilizing among Hispanics.

**Figure 26. Three-Year Rolling Average Number of Births by Race/Ethnicity: 18-19 Year-Old New London Females, 2000-2006**



*Note.* Births to teens of unknown race/ethnicity have been excluded from analysis.

## Moving from Birth Numbers to Birth Rates among 18-19 Year-Olds

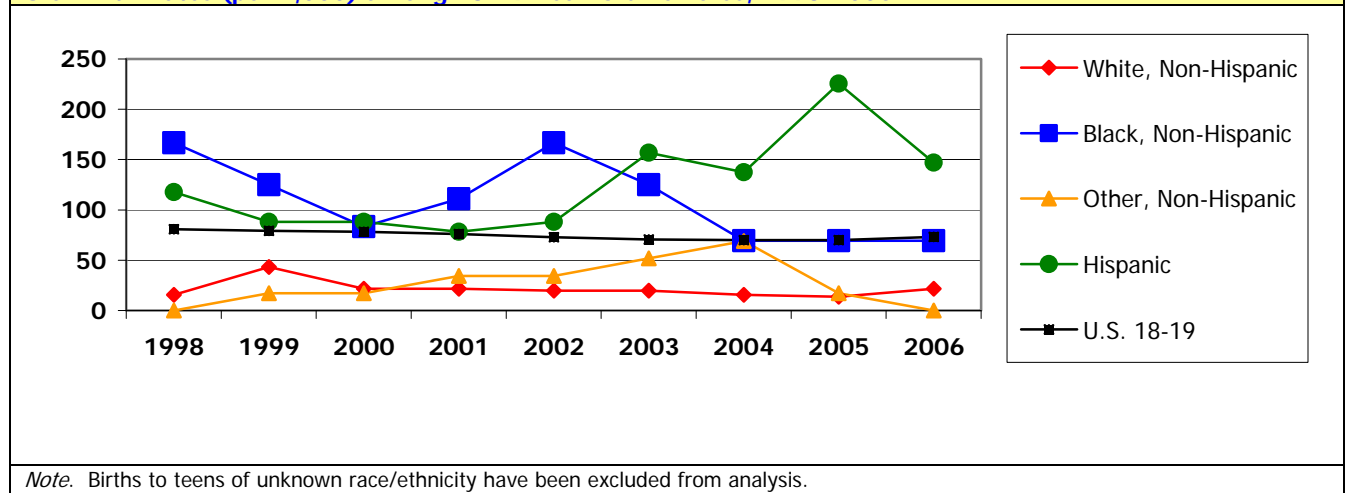
### Using Rates to Assess New London Birth Trends among 18-19 Year-Olds

Birth rates among 18-19 year-old New London teens (Table 22) are depicted and compared to U.S. birth rates among 18-19 year-olds in Figure 27.

Table 22. Birth Rates (per 1,000) by Race/Ethnicity: 18-19 Year-Old New London Females, 1998-2006				
Year	White, Non-Hispanic	Black, Non-Hispanic	Other, Non-Hispanic	Hispanic
1998	15.7	166.7	0.0	117.6
1999	43.1	125.0	17.2	88.2
2000	21.6	83.3	17.2	88.2
2001	21.6	111.1	34.5	78.4
2002	19.6	166.7	34.5	88.2
2003	19.6	125.0	51.7	156.9
2004	15.7	69.4	69.0	137.3
2005	13.7	69.4	17.2	225.5
2006	21.6	69.4	0.0	147.1

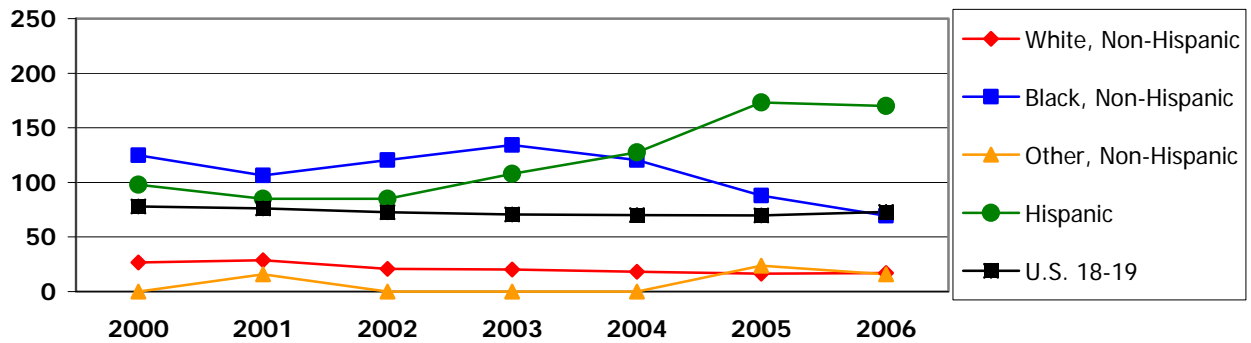
*Note.* Births to teens of unknown race/ethnicity have been excluded from analysis.

Figure 27. Birth Rates (per 1,000): 18-19 Year-Old New London Females by Race/Ethnicity Compared to U.S. Birth Rates (per 1,000) among 18-19 Year-Old Females, 1998-2006



New London birth rates among 18-19 year-olds have been somewhat stable except among Hispanics and Other race (Figure 27). The three-year rolling average birth rates (Figure 28) suggest that birth rates are stable among Whites and Others, decreasing among Blacks, and possibly stabilizing after years of increase among Hispanics.

**Figure 28. Three-Year Rolling Average Birth Rates (per 1,000): 18-19 Year-Old New London Females by Race/Ethnicity Compared to U.S. Birth Rates among 18-19 Year-Old Females, 2000-2006**



*Note.* Births to teens of unknown race/ethnicity have been excluded from analysis.

### Comparison of New London and U.S. Birth Rates among 18-19 Year-Olds

New London birth rates among 18-19 year-olds are compared to U.S. birth rates in Figure 27. (Healthy People 2010 national target birth rate goals have not been established for 18-19 year-old teens.) The three-year rolling average birth rates among

18-19 year-old White and Other New London females have been consistently lower than the national average (Figure 28). As of 2006, (Table

**Table 23. Birth Rates (per 1,000): 18-19 Year-Old White, Black, and Hispanic New London and U.S. Females, 2006**

	White, Non-Hispanic	Black, Non-Hispanic	Hispanic
<b>New London</b>	21.6	69.4	147.1
<b>U.S.</b>	49.3	108.4	139.7

23) New London birth rates were lower than U.S. birth rates among 18-19 year old Whites (56%) and Blacks (36%), but slightly higher than U.S. rates among Hispanics (5%).

### Using Rates to Assess Racial/Ethnic Disparities in New London

In New London in 2006 (Table 23), among 18-19 year-olds, the birth rate among Blacks was 221% higher than the rate among Whites, and the rate among Hispanics was 581% higher than the rate among Whites.

## **Teen Birth Discussion**

Births to New London teens appear to be decreasing or stable. Birth rates among 15-17 year-old White, Black and Other New London teens were below the U.S. Healthy People 2010 target rate, but birthrates among 15-17 year-old Hispanics were higher than U.S. rates. Among 18-19 year-olds, New London birth rates were lower than U.S. birth rates among Whites and Others, comparable to U.S. rates among Blacks, but higher than U.S. birth rates among Hispanics. Teen birth disparities are evident; birth rates among Blacks and Hispanics are higher than rates among Whites. Most New London teen births are to Hispanics.

## **STD and Teen Birth Conclusions**

Gender, age, and race/ethnicity are associated with STD risk. In New London and the U.S., females are much more likely to be diagnosed with chlamydia than males, but the lower number of reported infections among males is likely because fewer males present for routine testing (DHHS, 2000). Fewer males tested suggest that infected males are not being diagnosed, treated or reported (Steele, 2007). New London residents, both males and females age 15-34 are considered to be at high risk for STDs because their infection rates are higher than the rates for their U.S. counterparts and because infections have increased dramatically over the past 11 years. STD infections among men increase after age 19 (compared to age 14 among females) and do not decrease among males or females until after age 34.

Many factors impact New London teens' reproductive health and sexuality decisions and behaviors including:

- availability of reproductive health, family planning, and STD testing services;
- recent STD and teen pregnancy prevention programs, in particular the programs that may have contributed to the observed reductions in pregnancies among 18-19 year-old Black teens;

- local policies and practices that impact STDs such as condom distribution in schools or community settings, STD counseling, provision of medication for infected individuals and their partners, and re-testing after STD infection.

These findings suggest the need to create:

- STD prevention and control programs starting before age 15 and continuing until beyond age 29;
- culturally relevant STD prevention strategies targeting all audiences – Whites, Blacks, Hispanics and Others. Prevention can help reduce the total number of infections and decrease racial/ethnic health disparities;
- teen pregnancy prevention programs that effectively target at-risk youth:
  - teens approaching age 15 are at risk; STD and teen pregnancy prevention programs must start at an early age;
  - teens age 18-19 are at risk, although they may be considered adults.

# Notes

## Important Terms

### **Sexually Transmitted Disease (STD) and Sexually Transmitted Infection (STI):**

These are terms that refer to any of over 25 disease-causing organisms that can be transmitted through sexual contact.

**Reportable Diseases:** These are diseases considered to be of great public health importance. Local, state, and national agencies require that such diseases be reported by doctors or laboratories. Reporting allows for the collection of statistics that show where, when, and how often the disease occurs, which in turn helps researchers identify disease trends and track disease outbreaks. This information can help control future outbreaks (Medline Plus, 2007).

**Reportable STDs:** Health care providers and laboratories are required by CT General Statute to report all cases of chlamydia, gonorrhea, syphilis, and chancroid to the CT Department of Public Health (DPH) and the local health department serving the infected individual.

**Confirmed STDs:** STD statistics are based on laboratory confirmed infections. Provider reports of STDs that are not laboratory confirmed are not used to calculate STD statistics.

**Health Disparities:** "...include differences (in the incidence, prevalence, morbidity, mortality, and burden of disease) that occur by gender, race or ethnicity, education, or income, disability, geographic location, or sexual orientation" (DHHS, 2000). The STD and teen birth surveillance systems available to Ledge Light Health District collect data on age, gender, race/ethnicity, and geography (address).

## Understanding Public Health Data: Rates and Numbers

This report provides information that can be used to measure the extent of the STD and teen pregnancy problem in New London, CT. The simplest measures of the problem are the count of the number of infections and trends showing whether numbers are increasing or decreasing over time. This report includes several graphics that depict the number of infections each year between 1997 and 2007. It is necessary to know the number of infections to assess the burden of disease and to estimate prevention and control resource requirements. Pie charts are used to portray the proportion of infections among population subgroup. Where the annual number of infections is small (statistically unreliable), three years of data are added together to improve statistical reliability and create pie charts that more accurately summarize data. The magnitude of disease burden can be evaluated by comparing New London numbers to national disease numbers. Because there are many more people in the entire U.S. than in New London and, accordingly, many more infections, rates are calculated to compare these two groups of different size.

A rate is a measure of the frequency of an event per population unit. Rates include a numerator and a denominator. The numerator is the number of events in a specified population. The denominator is the number of people in the specified population. New London rates are based on Census 2000 population estimates (Census, 2000). Using simple math, the number of people in a denominator can be set to a specified number, usually 100,000 for STDs and 1,000 for teen births.

**RATE per 100,000** = (Number of events in a population over a specified period of time ÷ Average number of people in the population over the specified period of time) × 100,000.

New London rates are not as reliable as U.S. rates because the numbers of infections in New London are relatively small and vary widely from year to year. Rates are not statistically reliable when the number of events is small (five or less). Rates are not

calculated for populations less than 100 to protect the confidentiality of the members of that small group. (Washington State DPH, 2001).

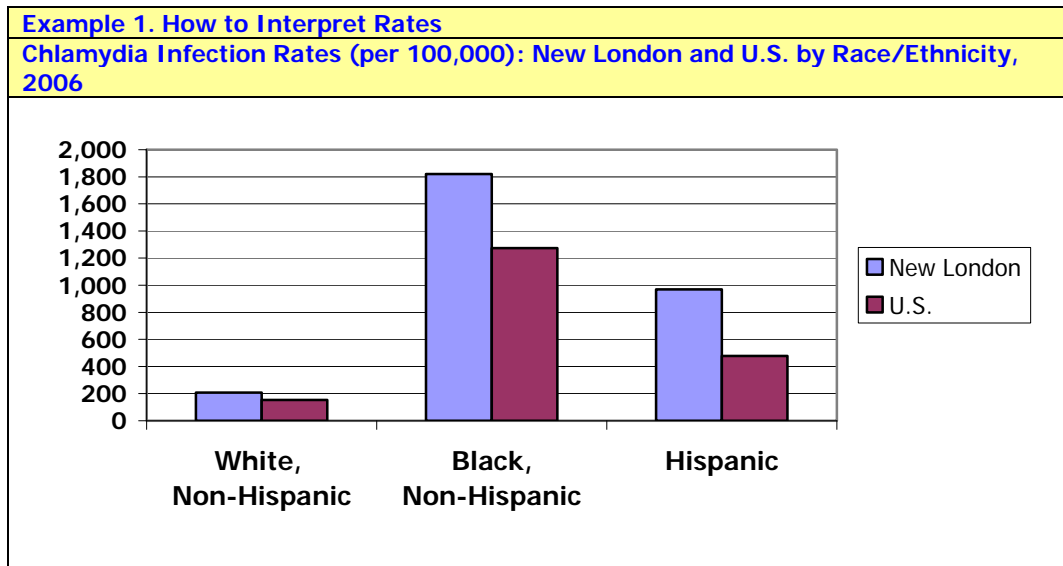
### Example of How to Interpret Rates

Example 1 depicts the 2006 New London and U.S. chlamydia infection rates for White, Black, and Hispanic females; rates are plotted against the vertical (Y) axis and population sub-groups along the horizontal (X) axis.

In this particular graph, the rates are capped at 2,000 because that number is high enough to include rates observed for all population sub-groups. In this report, some graphs have much lower maximum rate values because rates were much lower in the groups being assessed. If all graphs had the same maximum value, the graphs depicting data for groups with low rates would be hard to visualize — all of the columns would be very short and differences between the columns would be hard to distinguish.

It can be seen that, in 2006, rates among Whites from New London are comparable to

U.S. rates, while rates among New London Blacks and Hispanics are higher than U.S. rates. Keep in mind that,



because of the mathematical manipulation, rates do not reflect the actual number of infections that occurred. This graph depicts the number of events that would have occurred in each group if there were 100,000 people in both the U.S. and in New London.

High STD or teen pregnancy rates suggest a public health problem. When rates differ between groups (for example between races, genders or age-groups) there is said to be a health disparity. When a health disparity is recognized, it is useful to assess the actual number of people being affected. Public health officials assess the actual number of events in order to make decisions about prevention, intervention, and resource allocation.

### **Three-Year Rolling Averages**

Annual variations in the number of STDs or teen births may reflect actual changes in the number of infections, random changes, and, in the case of STDs, over- and under-counting. Three-year rolling averages smooth variations in data and makes trends more apparent. A three-year rolling average is calculated by adding the number of events (*i.e.*, STDs or teen births) in the specified year to the number of events in the previous two years, then dividing by three and repeating for a series of years (*e.g.*, the 2007 three-year rolling average number of chlamydia infections is equal to the sum of the number of chlamydia infections in 2005, 2006 and 2007 divided by three).

## **Data Sources**

### **STD Data Sources**

In the fall of 2007, the Ledge Light Health District Communicable Disease Prevention Division's Epidemiology Program established a secure electronic database to track reportable infectious disease, vital statistics, and other health data. Data from January 1997-August 2007 were provided to Ledge Light by the CT DPH Sexually Transmitted Disease Division. Since September 2007, Ledge Light has entered data from reportable disease reports into the electronic disease database. Eleven years of New London STD data were analyzed to create this report. National STD data were abstracted from the Centers for Disease Control and Prevention 2006 STD Surveillance Report (CDC, 2007).

## **Births to Teens Data Sources**

The CT DPH Office of Vital Records maintains a registry of births, marriages, civil unions, deaths and fetal deaths which have occurred in CT or to CT residents. CT Vital Records databases are analyzed annually to create statistical reports, known as Registration Reports, for births, deaths, fetal deaths, marriages, and divorces. New London data were abstracted from the 1998-2006 Registration Reports (CT DPH). National data on births and birth outcomes were abstracted from National Vital Statistics Reports (Ventura, 2008 and Hamilton, 2007).

## **Data Validity**

### **STD Data Validity**

The following is a list of threats to STD data validity and the probable impact on STD statistics.

- The greatest limitation to STD statistics is that they severely underestimate the true number of infections. It is estimated that less than 50% of chlamydia and gonorrhea cases are reported (CDC, 2007, Weinstock, 2004). There are two important reasons why:
  1. Individuals may not experience symptoms of infection and so may not seek medical care and be diagnosed. Chlamydia and, to a lesser extent, gonorrhea are often asymptomatic and, as a result, infected individuals do not seek treatment.
  2. Health care providers are required by CT General Statute to report certain STDs (and other diseases) to State and local health departments. Compliance with this law is limited:
    - Not all infections are reported; this results in an underestimation of the true incidence of STDs.
    - Reports are sometimes sent to one but not both (state and local) health departments, resulting in discrepancies between state and local health department statistics. STD statistics on the CT DPH website may not be the same as the statistics in this report.

- Providers do not always report diseases in a timely fashion; reports may not be received for weeks or months after the diagnosis. The year that an STD report is received by Ledge Light is the year of record (the year that the STD is counted). Consequently, the year of record may not be the year in which the disease occurred.
- New London rates are based on Census 2000 population estimates. No other reliable population estimates are available. Rates based on Census 2000 estimates will be in error to the extent that the population of New London changed since 2000 (*i.e.*, rates will be overestimated if the population increased and underestimated if the population decreased since 2000).
- Data on race and ethnicity are often missing. Reports that do not include data on age, race, or ethnicity lead to an undercount of the true number of infections in those groups. (See *Racial and Ethnic Disparities; Actual and Apportioned Number of Chlamydia Infections*, page 56, for a discussion of this problem.) Information on race or ethnicity was missing from 30% of all STD reports over the past 11 years. The proportion of reports missing data on race or ethnicity varied from year to year. Information on age was missing from 0.1% of laboratory or physician reports of disease.
- The validity of STD data on race and ethnicity is unknown. It is recognized that the recommended practice of having individuals self-report their races and Hispanic ethnicity is not routinely practiced; therefore the validity of data on race and ethnicity is suspect.
- The validity of STD data may also be impacted by the accuracy of the tests used to diagnose disease, the astuteness of the health care provider in recognizing and diagnosing disease, and the accuracy of both the person completing the reports and the person entering data into the disease registry. These influences are assumed to be negligible and, more importantly, equal for Ledge Light and comparison data. Consequently, Ledge Light data can be compared to national data with one exception; Ledge Light data has been analyzed to assess the extent to which individuals experience multiple episodes of chlamydia or

gonorrhoea. This enhanced scrutiny of Ledge Light data led to the identification and elimination of duplicate entries for the same disease. U.S. data might have duplicate entries and overestimate actual numbers.

### **Births to Teens Data Validity**

CT DPH Office of Vital Records has been responsible for maintaining records of all births to CT residents since 1915. CT Vital Records includes data for Connecticut residents that occur in other states and Canada. CT reciprocates with every other state in the U.S. and the provinces of Canada in exchanging copies of complete birth and death records for non-residents. Consequently, records of births to CT residents are essentially 100% complete.

### **Race and Ethnicity Notes**

The forms that most providers and laboratories use to report STDs have check-off boxes to select from among the following races: African American, American Indian or Alaskan Native, Asian, Hawaiian or Pacific Islander, White, Other, or Unknown. In addition, there are check-off boxes to classify Hispanic/Latino ethnicity as either Yes, No, or Unknown.

In this report, race and ethnicity are treated as five mutually exclusive groups: Non-Hispanic White (referred to as "White" in this report), Non-Hispanic Black (referred to as "Black" in this report), Hispanics (who may be of any race), Non-Hispanic of some other race (referred to as "Other" in this report), and Unknown. The number of individuals from New London who are reported to be American Indian or Alaskan Native, Asian, Hawaiian or Pacific Islander is very small. Reporting cases among such small groups may make it possible for an individual in a community to be identified. To avoid this problem, these groups have been combined with the "Other" group. This classification system results in a comprehensive set; that is, the total of the groups sums to the total population. Comparative data (U.S. STDs and teen births) are likewise classified.

### **Racial and Ethnic Disparities: Actual and Apportioned Number of Infections**

Assessment of racial disparities in STDs is hampered by inadequate reporting by providers and laboratories. Reports that do not include data on age, race, or ethnicity lead to an undercount of the true number of infections in those groups. Between 1997 and 2006, about 30% of reports did not include race or ethnicity data. In 2007, that number rose to 44%. Reports on adolescents were most frequently missing data.

The CDC and CT DPH compensate for this problem of missing data by apportioning reports of disease among individuals of unknown age, race, or ethnicity according to the distribution of infections among the population of known age, race, or ethnicity (CDC, 2007). This method was used to determine New London rates by gender and race, where possible. This method could not be used to produce New London STD rates by gender *and* age *and* race/ethnicity because of a combination of the low number of infections and the high number of reports that did not include race or ethnicity—with one exception: there was a sufficiently high number of chlamydia infections among New London females aged 15-29. Analysis of racial/ethnic disparities among females and males of other ages has been assessed by determining the proportion of disease contributed by the various age/race/ethnicity/gender groups.

### **Timeliness of Data**

#### **STD Data**

Reports of STDs among Ledge Light residents may not be received for weeks or even months after they have been documented by a provider or laboratory. There is generally a two-year lag period before U.S. data on STDs are released for publication by the National Center for Health Statistics (NCHS). The most recent U.S. STD statistics available at the time data were analyzed for this report were from the year 2006.

## **Births to Teens Data**

2006 is the latest year for which data on teen births has been made available by the CT DPH Office of Vital Statistics.

## **Disclaimer**

Information in this report was accurate at the time of publication. However, CT DPH and the National Center for Health Statistics (NCHS) may make corrections or update the data in their reports. Ledge Light does not track such changes. Any changes made by CT DPH or NCHS subsequent to April 2008 have not and will not be reflected in this document.

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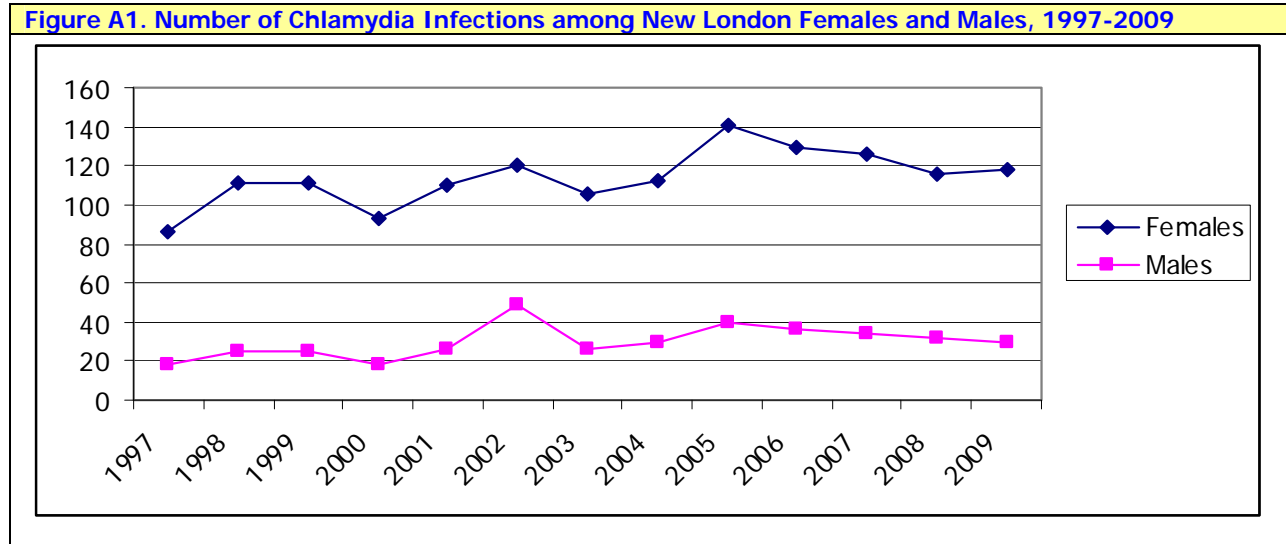
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Appendix A

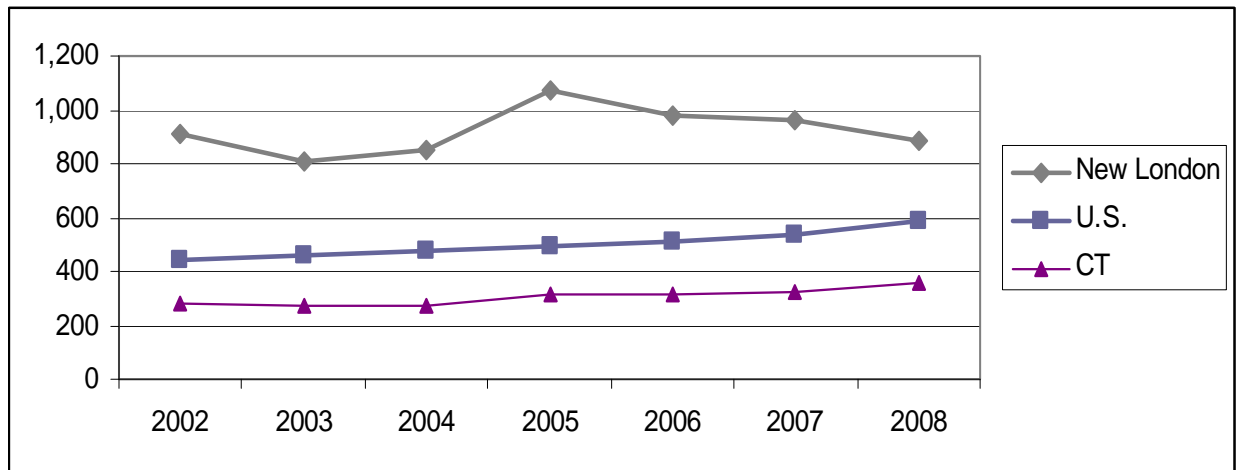
SUPPLEMENTAL STD DATA, 2008-2009

Table A1. Chlamydia Infections (Number and Rate): New London and U.S.; Females, Males, and Total, 1997-2009									
Year	NL Females		U.S. Females Rate	NL Males		U.S. Males Rate	NL Total		U.S. Total Rate
	Number	Rate		Number	Rate		Number	Rate	
1997	86	655.1		18	143.5		104	405.1	
1998	111	845.5		25	199.3		136	529.8	
1999	111	845.5		25	199.3		136	529.8	
2000	93	708.4		18	143.5		111	432.4	
2001	110	837.9		26	207.3		136	529.8	
2002	120	914.1	445.0	49	390.7	126.8	169	658.3	289.4
2003	106	807.4	463.6	26	207.3	133.0	132	514.2	301.7
2004	112	853.1	480.6	30	239.2	145.6	142	553.2	316.5
2005	141	1,074.0	492.2	40	318.9	159.4	181	705.1	329.4
2006	129	982.6	510.8	36	287.0	171.3	165	642.7	347.8
2007	126	959.8	539.8	34	271.1	188.6	160	623.3	367.5
2008	116	883.6	583.8	32	255.1	211.1	148	576.5	401.3
2009	118	898.8		29	231.2		147	572.6	

U.S. rates are only available for 2002-2008.



**Figure A2. Chlamydia Infection Rates (per 100,000): New London, CT and U.S., 2002-2008**



**Table A2. Number of Chlamydia Infections: New London Females by Race/Ethnicity, 1997-2009**

Year	White-NH	Black-NH	Other-NH	Hispanic	Unknown	TOTAL
1997	19	28	0	18	21	86
1998	21	32	0	17	39	109
1999	22	35	1	30	23	111
2000	16	22	1	19	34	92
2001	22	32	1	20	32	107
2002	34	37	2	27	20	120
2003	23	26	1	28	27	105
2004	22	36	1	31	20	110
2005	29	45	0	37	30	141
2006	23	40	4	28	35	130
2007	24	27	0	31	41	123
2008	27	15	0	13	61	116
2009	5	14	2	9	88	118

**Table A3. Number of Chlamydia Infections: New London Males by Race/Ethnicity, 1997-2009**

Year	White-NH	Black-NH	Other-NH	Hispanic	Unknown	TOTAL
1997	5	7	0	2	4	18
1998	4	14	1	4	4	27
1999	5	14	1	2	3	25
2000	3	5	1	4	6	19
2001	5	12	4	3	5	29
2002	7	22	2	8	11	50
2003	4	10	0	4	8	26
2004	9	11	0	7	5	32
2005	5	22	0	4	9	40
2006	6	11	1	5	11	34
2007	4	11	0	4	15	34
2008	2	8	0	1	21	32
2009	0	2	0	2	25	29

<b>Table A4. Distribution (Proportion) of Chlamydia Infections: New London Females by Race/Ethnicity, 1997-2009</b>					
<b>Year</b>	<b>White-NH</b>	<b>Black-NH</b>	<b>Other-NH</b>	<b>Hispanic</b>	<b>Unknown</b>
1997	22.1	32.6	0	20.9	24.4
1998	19.3	29.4	0	15.6	35.8
1999	19.8	31.5	0.9	27.0	20.7
2000	17.4	23.9	1.1	20.7	37.0
2001	20.6	29.9	0.9	18.7	29.9
2002	28.3	30.8	1.7	22.5	16.7
2003	21.9	24.8	1.0	26.7	25.7
2004	20.0	32.7	0.9	28.2	18.2
2005	20.6	31.9	0	26.2	21.3
2006	17.7	30.8	3.1	21.5	26.9
2007	19.5	22.0	0	25.2	33.3
2008	23.3	12.9	0	11.2	52.6
2009	4.2	11.9	1.7	7.6	74.6

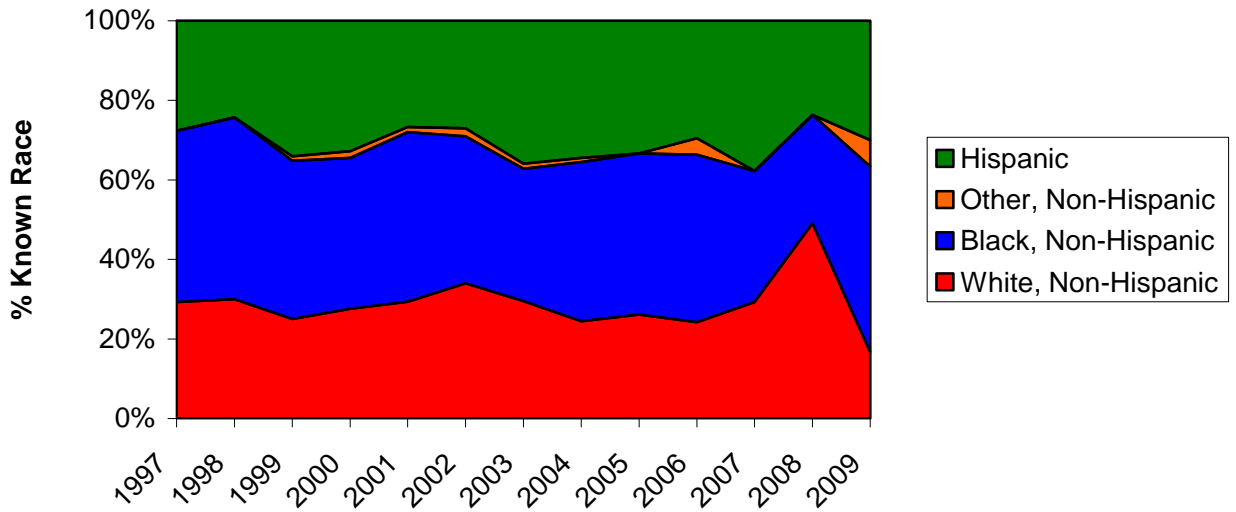
NH: non-Hispanic

<b>Table A5. Distribution (Proportion) of Chlamydia Infections: New London Males by Race/Ethnicity, 1997-2009</b>					
<b>Year</b>	<b>White-NH</b>	<b>Black-NH</b>	<b>Other-NH</b>	<b>Hispanic</b>	<b>Unknown</b>
1997	27.8	38.9	0	11.1	22.2
1998	14.8	51.9	3.7	14.8	14.8
1999	20.0	56.0	4.0	8.0	12.0
2000	15.8	26.3	5.3	21.1	31.6
2001	17.2	41.4	13.8	10.3	17.2
2002	14.0	44.0	4.0	16.0	22.0
2003	15.4	38.5	0	15.4	30.8
2004	28.1	34.4	0	21.9	15.6
2005	12.5	55.0	0	10.0	22.5
2006	17.6	32.4	2.9	14.7	32.4
2007	11.8	32.4	0	11.8	44.1
2008	6.3	25.0	0	3.1	65.6
2009	0	6.9	0	6.9	86.2

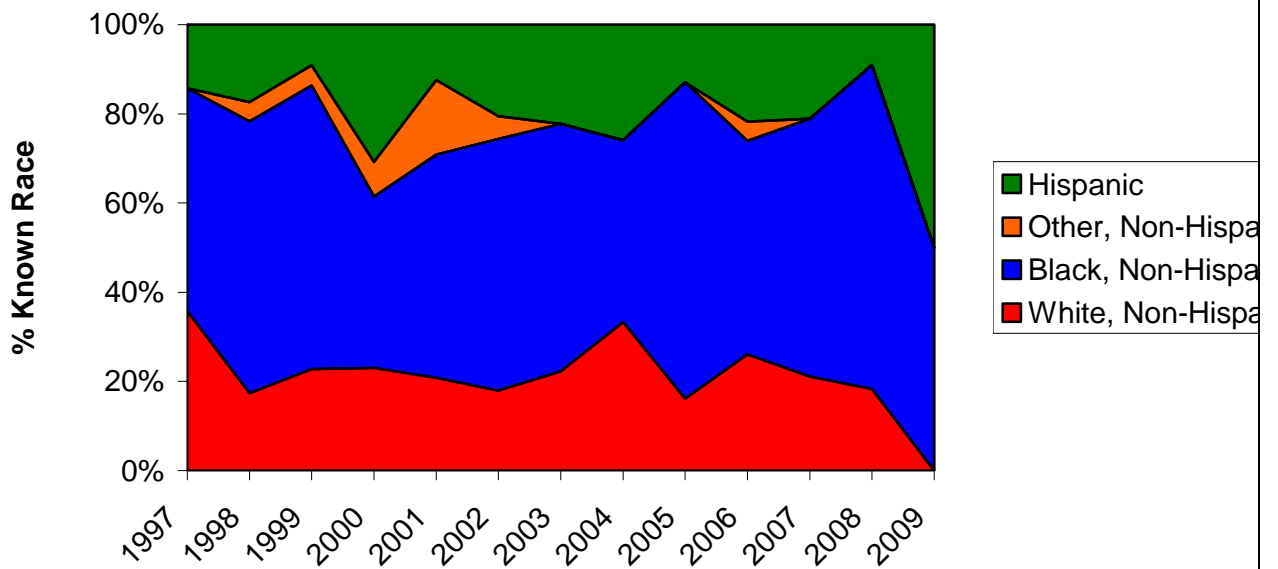
NH: non-Hispanic

The number of infections in each race/ethnicity group is not estimated in this supplement because, in 2008 and 2009, the high percentage of unknown race/ethnicity precludes using the accepted method of attributing unknown race/ethnicity according to the distribution of known race/ethnicity.

**Figure A3. Distribution of Chlamydia Infections among New London Females of Known Race/Ethnicity, 1997-2009**



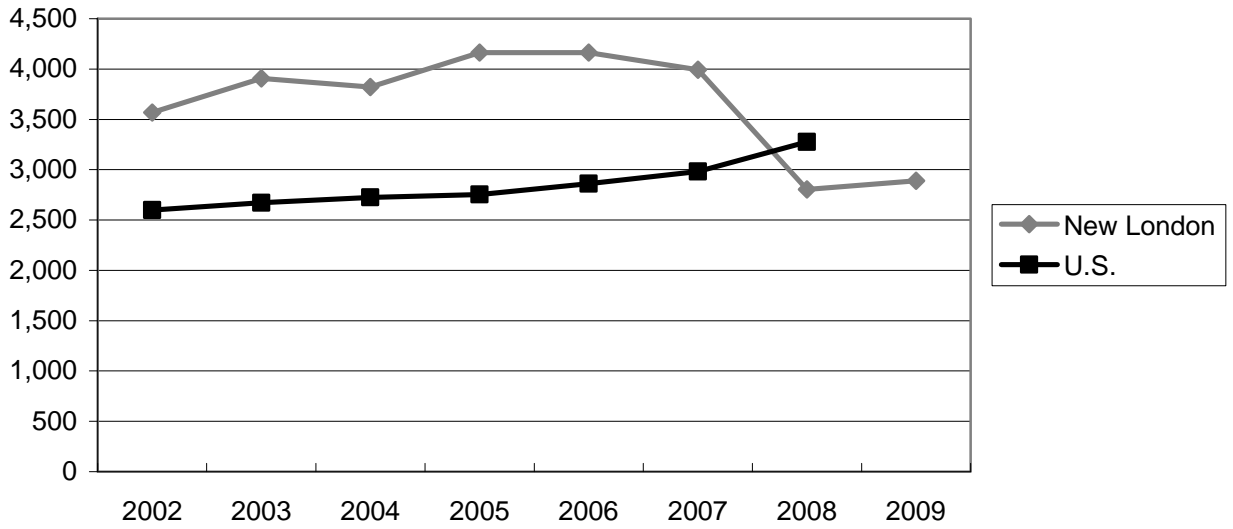
**Figure A4. Distribution of Chlamydia Infections among New London Males of Known Race/Ethnicity, 1997-2009**



<b>Table A6. Number of Chlamydia Infections by Age Group: New London Females, 1997-2009</b>											
Year	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-54	55-70	Unknown	Total
1997	4	39	28	12	2	0	1	0	0	0	86
1998	2	54	38	11	2	0	2	0	0	0	111
1999	0	50	40	17	3	1	0	0	0	0	111
2000	4	36	26	18	4	3	1	1	0	0	93
2001	3	50	32	14	7	3	1	0	0	0	110
2002	3	42	40	21	9	1	1	0	2	1	120
2003	0	46	33	14	8	2	0	2	0	1	106
2004	1	45	34	17	7	5	2	1	0	0	112
2005	0	49	52	24	11	1	1	1	0	2	141
2006	1	49	34	31	9	2	1	1	1	0	129
2007	0	47	37	26	13	2	0	1	0	0	126
2008	0	33	47	21	4	3	2	3	0	2	115
2009	2	34	49	12	10	4	3	2	0	2	118

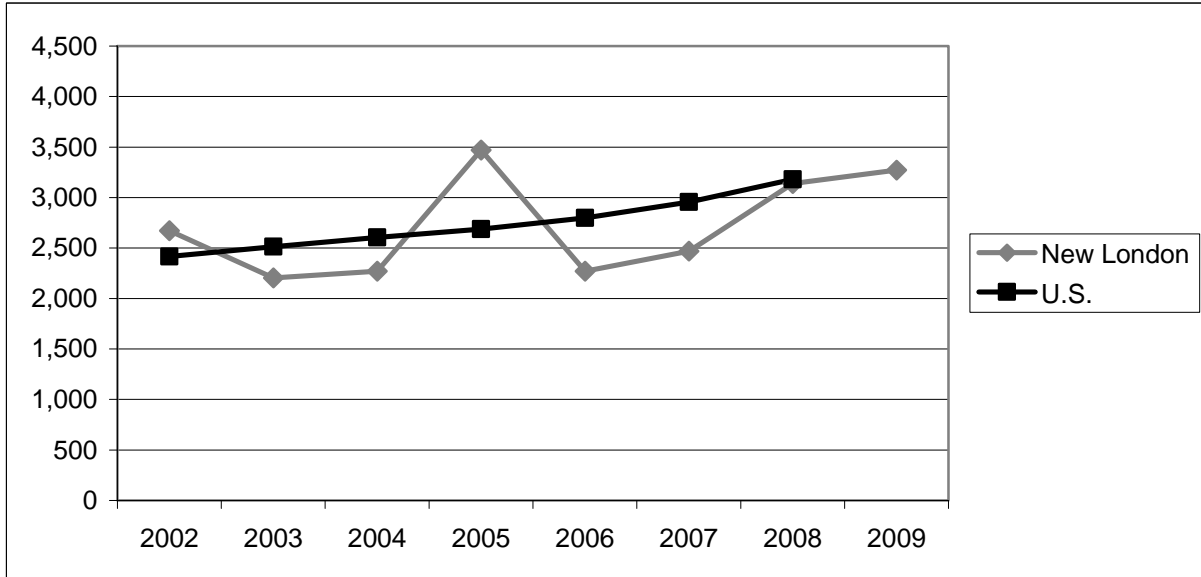
<b>Table A7. Number of Chlamydia Infections by Age Group: New London Males, 1997-2009</b>											
Year	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-54	55-70	Unknown	Total
1997	0	6	8	3	0	0	1	0	0	0	18
1998	0	5	11	6	2	0	1	0	0	0	25
1999	0	8	4	5	5	1	0	2	0	0	25
2000	0	3	9	2	3	1	0	0	0	0	18
2001	0	9	8	3	3	2	0	0	0	0	26
2002	0	6	28	6	6	0	1	0	2	0	49
2003	0	4	7	8	4	1	1	1	0	0	26
2004	0	3	11	10	3	2	0	0	0	0	30
2005	0	9	23	4	2	1	1	0	0	0	40
2006	0	4	16	6	6	3	0	1	0	0	36
2007	0	6	14	4	6	2	1	0	0	1	34
2008	0	4	13	7	4	4	0	0	0	0	32
2009	0	8	13	5	3	0	0	0	0	0	29

**Figure A5. Chlamydia Infection Rates (per 100,000): 15-19 Year-Old New London and U.S. Females, 2002-2008/2009\***



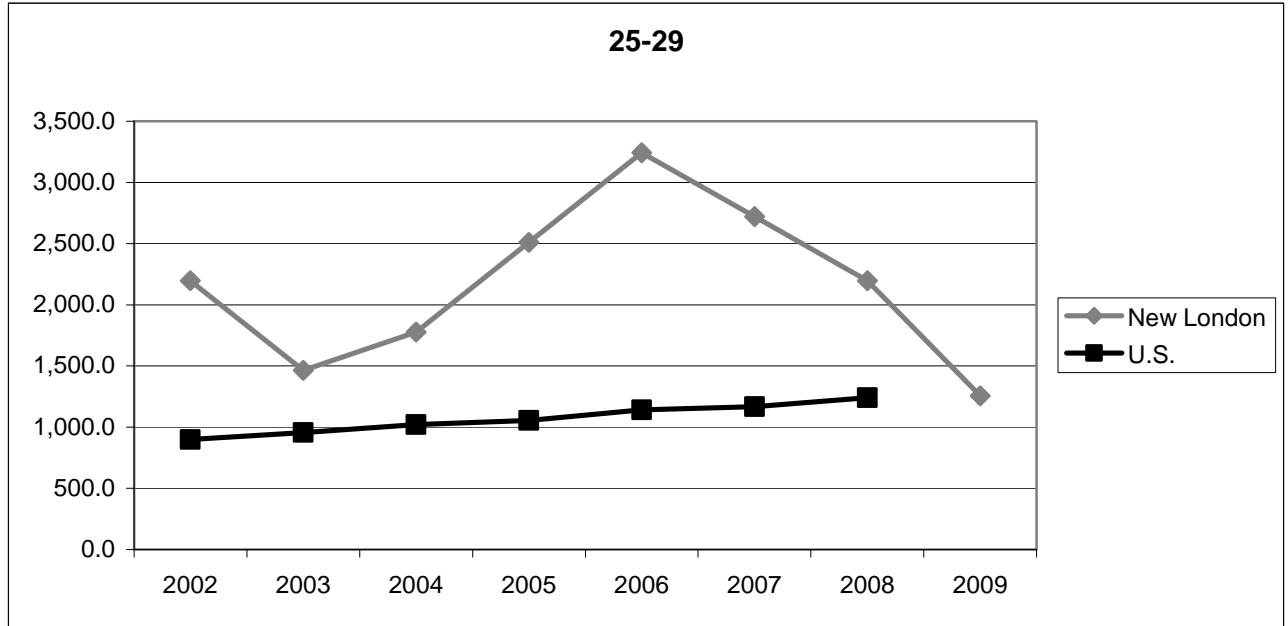
U.S. rates are not available for 2009.

**Figure A6. Chlamydia Infection Rates (per 100,000): 20-24 Year-Old New London and U.S. Females, 2002-2008/2009\***



U.S. rates are not available for 2009.

**Figure A7. Chlamydia Infection Rates (per 100,000): 25-29 Year-Old New London and U.S. Females, 2002-2008/2009\***



U.S. rates are not available for 2009.