Sexually Transmitted Infections Among California Youth: Estimated Incidence and Direct Medical Cost, 2005

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Abstract

Purpose: The purpose of this study was to estimate the incidence and the direct medical cost of sexually transmitted infections (STIs) among young persons in California and each of its 58 counties, and to better inform discussions about statewide policies and local resources needed for STI prevention and control efforts. Methods: On the basis of the methods developed at the Centers for Disease Control and Prevention we estimated the statewide number of new cases of eight major STIs among young persons aged 15 to 24 years in California in 2005: chlamydia, gonorrhea, syphilis, genital herpes, human papillomavirus (HPV), hepatitis B, trichomoniasis, and HIV. We also calculated the direct medical cost of these STIs using national cost-per-case estimates. To inform local policy discussions about STI control efforts, the statewide estimates were allocated by county. Results: An estimated 1.1 million new cases of STIs occurred among young persons in California in 2005, with a direct medical cost of $1.1 billion. The estimated number of new cases within counties ranged from a low of 82 in Alpine and Sierra counties, at a cost of $38,000, to a high of about 360,000 in Los Angeles County, at a cost of $390 million. Conclusions: These estimates illustrate the widespread and frequently underreported incidence and costs of youth STIs in California and its counties, and provide the foundation for a comprehensive assessment of youth STI prevention needs.

Keywords: Youth, sexually transmitted infections, incidence, direct medical cost

Sexually transmitted infections (STIs) can have considerable and long-lasting impact on the health and quality of life of individuals, in the form of infertility, ectopic pregnancies, dyspareunia, cancer, and increased susceptibility to HIV. Young persons aged 15 to 24 years acquire more than half of all new STIs every year (Weinstock, Berman, & Cates, 2004). National estimates show that 9.1 million new STIs occurred among 15-24-year-olds in the year 2000, the majority of which were due to human papillomavirus (HPV), trichomoniasis, and chlamydia (Weinstock, Berman, Cates, 2004).

Despite the progress over the last decade in screening and detecting STIs, especially among young persons, major obstacles remain to accurately monitoring the incidence and prevalence of STIs. Many STIs are asymptomatic and detected only through screening, not all STIs are reportable (e.g., HPV and trichomoniasis), and screening and reporting are not always complete for reportable STIs, which means that the true incidence of STI is likely to be substantially higher than the number of reported cases each year (California Department of Health Services, 2006c; Chesson, Blandford, Gift, Tao, & Irwin, 2004).

In addition to the morbidity caused by STIs, the burden of STIs also is reflected in the economic costs associated with these infections. These costs comprise direct, indirect, and intangible costs (Chesson et al., 2004). Direct costs are further divided into medical and non medical components. Direct medical costs refer to the expenses of treating acute infections (e.g., diagnostic testing, drug treatments, and doctor visits) and the sequelae of untreated or

inadequately treated acute infections, such as pelvic inflammatory disease. Direct non medical costs are those associated with receiving medical treatment, such as transportation to a medical appointment. Indirect costs refer to productivity losses, or lost wages, attributable to STIs. Finally, intangible costs are related to the pain and suffering associated with STIs.

The national direct medical cost of the estimated 9.1 million cases of STIs among young persons aged 15 to 24 years was estimated at $6.5 billion for the year 2000 (Chesson et al., 2004). The bulk of this cost was associated with HIV and HPV infection. Estimates of direct nonmedical, indirect, and intangible costs either do not exist or have not been calculated for all STIs or age-specific groups.

National estimates of incidence and costs of STIs among young persons are important for national policy development and funding decisions on efforts to prevent STIs (Weinstock et al., 2004). National estimates, however, have limited value for states' and counties' policy, program, and budgetary decisions, as different states have different population profiles for STI risk. The purpose of this study was to estimate the incidence and direct medical cost of STIs among young persons for California and each of its 58 counties, extending the national estimates and the methodology developed by Weinstock et al. (2004) and Chesson et al. (2004). The estimated incidence and direct medical cost can be used to inform discussions about statewide policies and local resources needed for STI prevention and control efforts.

Methods

Incidence

Basing our methods on those developed by Weinstock et al. (2004) for their national study, we estimated the incidence of eight major STI among young persons aged 15 to 24 years in California in 2005: chlamydia, gonorrhea, syphilis, genital herpes, HPV, hepatitis B, trichomoniasis, and HIV.

Because county-specific numbers of STIs are not available for most STIs, we extrapolated the California estimates for chlamydia, gonorrhea, syphilis, genital herpes, HPV, hepatitis B, and trichomoniasis to the county level using the number of gonorrhea and chlamydia cases reported in 2005 in California (California Department of Health Services, 2006d), which are available at the county level. For both chlamydia and gonorrhea among 15-24-year-olds, we calculated the proportion of each county's cases from the statewide total. We then averaged the chlamydia and the gonorrhea proportion to obtain an overall proportion for each county. This was then multiplied by the statewide estimate for each STI to obtain county-level estimates for each STI. Given the limited data available on other proxies for risk at the county level, we assumed that the distributions of other STIs are associated with the distribution of gonorrhea and chlamydia. Because the distribution of chlamydia and gonorrhea differs slightly, and because it is unknown which of the two the other diseases follow most closely, we weighted equally the gonorrhea and chlamydia distributions.

County-specific numbers of HIV infection also are not available, and thus, we used a similar method to extrapolate the statewide estimate for HIV to the county level. HIV infection is unlikely to follow the distribution of gonorrhea and chlamydia, however, so we instead used the number of reported sexually transmitted AIDS cases in each county during 2001-2005 (California Department of Health Services, 2006b). We assumed a minimum of one case of AIDS in counties for which data were withheld due to the small number of cases reported. We then calculated the proportion of each county's sexually transmitted AIDS cases from the statewide total of sexually transmitted AIDS cases. The proportion for each county was multiplied by the statewide estimated number of HIV cases to obtain county-level estimates.

Chlamydia

To estimate the true incidence of chlamydia among young persons aged 15 to 24 years, we followed the method of Groseclose, Zaidi, DeLisle, Levine, and Louis (1996) and Weinstock et al. (2004). We first used data from the 2002 National Survey of Family Growth (NSFG; Centers for Disease Control and

Prevention, 2006a) to estimate the percentage of sexually active U.S. women aged 15 to 24 years in ethnic or racial groups (i.e., Black, White, Hispanic, and other). We estimated the percentages separately for each year of age to account for age differences in sexual activity. We then applied these percentages to the California Department of Finance's (2007) 2005 population estimates for females aged 15 to 24 years, thus obtaining the number of 15-24-year-old women who are sexually active and thus at risk for STIs.

We then used California-specific chlamydia prevalence-monitoring data for 2005 from the Region IX Infertility Prevention Project (California Department of Health Services, 2006e) to determine the percentage of women who screened positive for a chlamydial infection in family planning clinics. Using the number of sexually active women and the percentage of women who were positive for a chlamydial infection we calculated the number of prevalent infections for Black, White, Hispanic, and other women. Assuming that the duration of chlamydial infection in women is 0.96 years and that incidence of infection is its prevalence divided by duration (Chesson et al., 2004; Groseclose et al., 1999), we calculated the number of incident infections among women. To calculate the number of incident cases among men we assumed that the incidence among men equals that among women (Chesson et al., 2004; Groseclose et al., 1999).

Gonorrhea

To estimate the true incidence of gonorrhea among young persons aged 15 to 24 years in California we assumed that the cases reported to the California Department of Health Services (2006d) for this group in 2005 were underreported and under diagnosed by 50% (Weinstock et al., 2004). We estimated the number of incident cases separately for males and females.

Syphilis

We assumed that the cases of primary, secondary, and early latent syphilis reported to the California Department of Health Services (2005c) for young persons aged 15 to 24 years in 2005 were underreported and underdiagnosed by 20% (Weinstock et al., 2004). We estimated the number of incident cases separately for males and females.

Genital Herpes

Genital herpes is not a reportable STI in California, and no reliable state or local estimates of incidence exist. The herpes simplex virus type 2 (HSV-2) is the cause of most genital herpes. Weinstock et al. (2004) estimated that 640,000 new HSV-2 infections occurred among young persons in the United States in the 2000. This estimate was based on the assumption that the rate of genital herpes in 2000 had remained the same as the rate in 1985 (Weinstock et al., 2004). A recent study on the trends of herpes simplex virus type 1 and type 2 seroprevalence in the United States has shown, however, that the overall age-adjusted HSV-2 seroprevalence decreased by 19% between 1988–1994 and 1999–2004 (Xu et al., 2006).

Taking this decrease into consideration, we estimated 520,000 new HSV-2 infections among persons aged 15 to 24 years in the United States. (Gender-specific estimates were not available.) We then extrapolated the national estimate to California using a multiplier of 12.91%, which represents California's proportional share of youth aged 15 to 24 years in the United States population. The multiplier was calculated using U.S. population estimates from the U.S. Census Bureau (2006) and California population estimates from the California Department of Finance (2007). This multiplier was chosen as a straightforward way to estimate how many of the national cases of genital herpes would occur in California based on the percentage of the U.S. population of young persons who live in California.

Human Papillomavirus (HPV)

HPV is not a reportable STI in California, and no reliable state or local incidence estimates exist. The national incidence estimate for HPV (4.6 million) calculated by Weinstock et al. (2004) was therefore extrapolated to California using the multiplier of 12.91%. In estimating the incidence of HPV among 15–24-year-olds, Weinstock et al. (2004) assumed that incidence

among females reflects the incidence among males.

Hepatitis B

To estimate the true incidence of hepatitis B among young persons aged 15 to 24 years, we followed the calculation method of Weinstock et al. (2004). The Centers for Disease Control and Prevention has estimated that 8,000 new infections with the hepatitis B virus occurred in the United States in 2004 among 15–24-year-olds (A. Wasley, Centers for Disease Control and Prevention, Division of Viral Hepatitis, personal communication, August 1, 2006). We assumed that approximately half of these infections occurred among individuals who reported high-risk sexual activity (Weinstock et al., 2004). (Gender-specific estimates were not available.) We extrapolated the national estimates to California using the multiplier of 12.91%.

Trichomoniasis

For trichomoniasis, we extrapolated the national estimate (1.9 million) calculated by Weinstock et al. (2004) to California using the multiplier of 12.91%. Weinstock et al. (2004) assumed that 7.4 million new cases of trichomoniasis occurred in the United States in the year 2000. We assumed that the incidence remained the same in 2005. Furthermore, as did Weinstock et al. (2004), we assumed that 25% of new infections occurred in 15–24-year-olds. (Gender-specific estimates were not available.)

Human Immunodeficiency Virus (HIV)

The Office of AIDS at the California Department of Health Services has estimated there are between 6,788 and 8,988 incident cases of HIV in California each year (Facer, Ritieni, Marino, Grasso, & Social Light Consulting Group, 2001). Taking the midpoint of this range (7,888) and assuming that 75% of infections are acquired sexually and that 50% of sexually acquired HIV infections are contracted by individuals younger than 25 years (Weinstock et al., 2004), we estimated the number of new HIV infections among 15-24-year-olds in California. (Gender-specific estimates were not available.)

Cost

Using the cost-per-case estimates developed by Chesson et al. (2004) we calculated the direct medical cost of chlamydia, gonorrhea, syphilis, genital herpes, HPV, hepatitis B, and trichomoniasis for young persons aged 15 to 24 years in California. When gender-specific data were available and when costs differed considerably between genders, Chesson et al. (2004) calculated gender-specific cost-per-case estimates, resulting in gender-specific estimates for chlamydia, gonorrhea, genital herpes, and HPV. Furthermore, using gender-neutral cost-per-case estimates developed by Hutchinson et al. (2006), we also calculated the direct medical cost of HIV for young persons aged 15 to 24 years in California.

All estimated costs are the lifetime costs of new cases of STIs occurring among young persons aged 15 to 24 years during the year 2005 (i.e., incidence costs), rather than the total cost in 2005 of existing cases of STIs and their sequelae among individuals who were 15 to 24 years old at the time of infection (i.e., prevalence costs; Chesson et al., 2004). Both Chesson et al. (2004) and Hutchinson et al. (2006) used a 3% annual discount rate in their calculation of all lifetime costs. We adjusted all costs for inflation to year 2005 dollars using the medical care component of the consumer price index (Economic Report of the President, 2006).

To calculate the total direct medical cost for each STI, we multiplied the inflation-adjusted cost per case by the estimated total number of incident cases of each STI estimated to have occurred in 2005 among young persons aged 15 to 24 years. For the STIs for which a gender-specific cost per case was available, we multiplied the gender-specific cost per case by the gender-specific incidence estimate or we assumed a male-to-female ratio in a gender-neutral estimate.

Results

Statewide

Table 1 shows that young persons aged 15 to 24 years in California acquired 1.1 million new cases of eight major STIs in the year 2005. Estimates for individual STIs range from more

than a half million new HPV cases and a quarter million new trichomoniasis cases, down to 380 new syphilis cases and 520 new hepatitis B cases. For contrast, the table also includes the number of newly reported cases in California in 2005, for those five STIs for which data are collected (C. Woodfil , California Department of Health Services, Immunization Branch, personal communication, January 13, 2007; California Department of Health Services, 2006a, 2006d). As can be observed, the estimated number of cases is higher than is the reported number of cases for all five reportable STIs.

Table 1 also shows the average lifetime cost per case of each STIs, in year 2005 dollars. Employing the methods and assumptions detailed in the Methods section, we estimated the total statewide direct medical cost for STIs acquired by young persons in 2005 to be $1.1 billion.

Table 1
Reported and Estimated Number of New Cases Among 15–24-Year-Olds, Average Lifetime Cost per Case, and Total Direct Medical Cost of Eight Main STIs, California, 2005

STI	Reported no. of New Cases in 2005	Estimated no. of New Cases in 2005[a]	Average Lifetime Cost Per Case ($)		Total Direct Medical Cost ($)[a]
Chlamydia	84,186	180,000	302	(females)	29 million
			25	(males)	
Gonorrhea	16,788	33,000	330	(females)	7.5 million
			66	(males)	
Syphilis	313	380	550		0.2 million
HIV	516	2,900	190,797		560 million
Hepatitis B	41	520	965		0.5 million
Genital herpes	–	67,000	517	(females)	38 million
			633	(males)	
HPV	–	590,000	1,522	(females)	460 million
			33	(males)	
Trichomoniasis	–	250,000	22		5.3 million
Total	**–**	**1.1 million**	**NA**		**1.1 billion**

Note. Dashes indicate non reportable STI. NA indicates not applicable. [a]Rounded to two significant digits. In calculating total direct medical costs, we assumed that males accounted for 43% of new cases of genital herpes and 50% of new HPV infections among 15-24-year-olds. Furthermore, gender-specific incidence estimates indicated that males accounted for 50% of new cases of Chlamydia and 40% of new cases of gonorrhea.

Counties

Appendix A shows the estimated number of new cases of STIs in 2005 and the total direct medical cost for each California county. The estimated number of new cases within counties ranged from a low of 82 in Alpine and Sierra, at a cost of $38,000, to a high of about 360,000 in Los Angeles county, at a cost of $390 million. To illustrate regional variability, the data were organized into five social-geographic regions consisting of contiguous groups of counties organized by geographic and demographic proximity (North/Mountains, Central Valley, Bay Area/Central Coast, Los Angeles County, and South). The direct medical cost ranged from a low $22 million in the North/Mountains region to $150 million and over in all other regions. The Los Angeles County region had the highest cost, at $390 million.

Discussion

The most commonly used marker for the impact of STIs is the number of cases reported to local health departments. As was reinforced by our analysis, however, the reported number of cases of newly acquired STIs considerably underestimates their true incidence. This undercounting is most likely due to incomplete screening coverage of at-risk populations, underreporting of infections by medical and laboratory providers, and presumptively treated infections that are not confirmed by testing (California Department of Health Services, 2006c).

Furthermore, as was shown by our analysis, the cost of treating acute infections and their sequelae can be considerable, whether due to the high cost per case of some STIs, such as HIV, or due to the high incidence of other STIs, such as HPV. The high lifetime cost of HIV infection is well-known; however, the lifetime cost of other STIs is less well documented. The cost estimates from this analysis represent only a portion of the total economic burden of STIs among young people in California, as not all STIs were considered and direct non medical, indirect, and intangible costs were not estimated. Nevertheless, the estimates derived from this analysis suggest that the economic burden of newly acquired STIs in 2005 among young people in California exceeded $1 billion in direct medical cost.

The wide range of incidence and cost estimates across counties results from county variations in STI incidence rates, together with county variations in the size of the 15-24-year-old age cohorts. Some of the major factors contributing to differences in STI incidence rates include variations in poverty levels; differences in sexual practices and social-sexual networks between urban, rural, and suburban populations; variations in the proportion of racial or ethnic populations in different counties; and differing levels of access to care (Aral & Holmes, 1999; California Department of Health Services, 2006c; Centers for Disease Control and Prevention, 2006b, 2007; Sapolsky, 2005).

Although non reportable infections account for a majority of the cost of STIs other than HIV, the incidence and cost of these non reportable infections have been largely absent from discussions about policy and funding at the state and local level in California. Here, and in most other states, STI prevention and control efforts have focused on reportable bacterial infections (Chlamydia, gonorrhea, and syphilis) that can be easily diagnosed and treated. Yet, our estimates show that these three STIs account for less than 20% of the calculated incidence for all STIs among 15-24-year-olds in 2005 and less than 7% of the direct medical cost for all STIs (other than HIV) for this age group. Given the substantial incidence and costs associated with non reportable STIs, greater emphasis is needed on primary prevention, as well as monitoring, of these “hidden” STIs among youth, as well as all other age groups. Nevertheless, obstacles exists to preventing and monitoring non reportable STIs such as genital herpes, as no proven programs exist for preventing it, and vaccine trials are incomplete. In addition, mass screenings and using antiviral medications for everyone who is infected would be expensive.

It is well-known that several STIs, such as non reportable trichomoniasis and genital herpes, increase the risks of transmitting and acquiring HIV (Centers for Disease Control and Prevention, 1998; McClelland et al., 2007; Serwadda et al., 2003; Wald & Link, 2002; Wasserheit, 1992). Historically, little emphasis has been placed on prevention and control of non-reportable STIs in HIV prevention efforts. Our incidence estimates show that genital herpes and trichomoniasis account for 50% more infections than do Chlamydia, gonorrhea, and syphilis combined. Thus, these two non reportable STIs should be included in cost-savings calculations and in policy and program dialogue about STI/HIV prevention and control efforts in California.

We relied on various assumptions in our calculations of incidence and cost estimates. Therefore, the estimates we have derived should be considered approximations. Our analyses are subject to the same limitations as were the methods and cost-per-case estimates on which

we relied in our calculations. For example, the assumptions included rates of underreporting, proportion of STIs among young people, treatment guidelines, previous cost estimates, non exhaustive direct medical costs, and others. In addition, although estimates of the cost burden of HPV-related health outcomes can vary substantially (Insinga, Dasbach, & Elbasha, 2005), it is important to note that many possible adverse health outcomes attributable to HPV, such as anal, vaginal, and vulvar cancers, were not included in the HPV cost estimated by Chesson et al. (2004). Further discussion of these limitations can be found in the studies cited in the Methods section.

In our calculation of the incidence of Chlamydia we used the 2002 NSFG (Centers for Disease Control and Prevention, 2006a) to estimate the number of sexually active women who are at risk for acquiring STIs. The 2002 NSFG does not include anal sex in its question about sexual activity and number of partners; therefore, any females who reported only anal sex in the past year would not be counted, but are still at risk for STI transmission. We relied on NSFG data in our calculations because California lacks reliable data on adolescent sexual behaviors at the county level and at the local school-district level. A coordinated, representative, statewide system for collecting local-level data on adolescent sexual behavior via standardized questions compatible with those used in national surveys of adolescents would facilitate future estimates.

California has a robust surveillance system for reportable STIs, including prevalence-monitoring projects in family planning clinics. These data were used in our calculation of the incidence of chlamydia and gonorrhea and in our distribution of state-level estimates to the county level. Nevertheless, sentinel family planning sites, the source of the chlamydia prevalence-monitoring data, are not a random sample of all family planning providers across California, clinics that participate in the prevalence monitoring project might not collect data on every person being tested, and some young women might not access care at family planning clinics, all of which could lead to either underestimation or overestimation of the true prevalence of Chlamydia in the population of young women in California.

The methodology used to distribute the statewide estimated number of incident STIs among the counties also has limitations. Because the true geographic distribution of non reportable STIs is unknown, we used the distribution of reported gonorrhea and Chlamydia cases to approximate the distribution of the other STIs, except HIV. The distribution of reported gonorrhea and Chlamydia cases is largely determined by the population size of each county, the age and race/ethnic distribution, and the distribution of risk factors. Because population size is the main determinant of the STI distribution, and because the risk and demographic factors associated with gonorrhea and Chlamydia are correlated with other STIs, this approach is not unreasonable. Nevertheless, because the risk factors for different STIs are not perfectly correlated, and the distributions of different STIs are known to differ geographically (California Department of Health Services, 2006c; Centers for Disease Control and Prevention, 2006b), some error in the distribution of the estimated STIs between counties is introduced by this approach.

Although all incidence and cost estimates reported here are approximate, these estimates provide a useful starting point for the first comprehensive appraisal of the costs of STIs among young persons in California, and for the allocation of this economic burden among counties and regions of the state. With this new information state and county policymakers will be better able to assess the sufficiency of current state and local resources and investments to prevent STIs among young persons.

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Appendix A

Estimated Number of New Cases and Total Direct Medical Cost of Eight Main STIs Among 15–24-Year-Olds, California Counties, 2005

Region	County	Population of 15–24-year-olds	Estimated no. of new cases in 2005	Total direct medical cost($)
North/Mountains		327,702	32,270	$21,601,000
	Alpine	204	82	$38,000
	Amador	5,525	451	$210,000
	Butte	41,963	5,109	$3,600,000
	Calaveras	6,102	448	$230,000
	Colusa	3,858	184	$90,000
	Del Norte	4,555	228	$110,000
	El Dorado	25,745	1,323	$1,200,000
	Glenn	4,860	540	$270,000
	Humboldt	23,076	2,017	$1,800,000
	Inyo	2,805	194	$93,000
	Lake	8,621	1,070	$1,000,000
	Lassen	6,578	544	$260,000
	Mendocino	13,972	1,206	$1,100,000
	Modoc	1,524	173	$83,000
	Mono	1,818	114	$55,000
	Nevada	15,584	879	$520,000
	Placer	41,268	3,708	$2,600,000
	Plumas	3,126	179	$87,000
	Shasta	28,914	3,199	$1,900,000
	Sierra	545	82	$38,000
	Siskiyou	6,966	559	$280,000
	Sutter	14,129	2,294	$1,200,000
	Tehama	9,794	1,055	$580,000
	Trinity	2,020	121	$57,000
	Yolo	43,483	3,911	$2,800,000
	Yuba	10,667	2,600	$1,400,000

Appendix A (continued)

Estimated Number of New Cases and Total Direct Medical Cost of Eight Main STIs Among 15–24-Year-Olds, California Counties, 2005

Region	County	Population of 15–24-year-olds	Estimated no. of new cases in 2005	Direct medical cost ($)[a]
Central Valley		867,131	247,867	$163,950,000
	Fresno	158,091	45,768	$29,000,000
	Kern	125,000	40,830	$29,000,000
	Kings	23,716	5,884	$4,000,000
	Madera	22,375	4,159	$2,600,000
	Mariposa	2,488	231	$110,000
	Merced	46,240	9,144	$5,400,000
	Sacramento	208,771	77,013	$52,000,000
	San Joaquin	114,198	27,407	$19,000,000
	Stanislaus	86,106	20,758	$13,000,000
	Tulare	72,211	16,147	$9,500,000
	Tuolumne	7,935	526	$340,000
Central Coast		1,247,436	224,304	$268,540,000
	Alameda	205,764	62,417	$58,000,000
	Contra Costa	142,057	28,519	$24,000,000
	Marin	27,978	2,712	$5,000,000
	Monterey	66,691	8,494	$7,000,000
	Napa	18,450	1,755	$1,400,000
	San Benito	9,310	1,188	$640,000
	San Francisco	64,300	30,116	$83,000,000
	San Luis Obispo	47,791	3,507	$3,800,000
	San Mateo	85,965	8,642	$11,000,000
	Santa Barbara	71,405	7,295	$7,700,000
	Santa Clara	219,405	34,090	$29,000,000
	Santa Cruz	40,380	4,240	$4,100,000
	Solano	64,920	15,440	$13,000,000
	Sonoma	69,483	5,619	$11,000,000
	Ventura	113,537	10,270	$9,900,000
Los Angeles Co.	Los Angeles	1,414,241	361,876	$390,000,000

Appendix A (continued)

Estimated Number of New Cases and Total Direct Medical Cost of Eight Main STIs Among 15–24-Year-Olds, California Counties, 2005

Region	County	Population of 15-24-year-olds	Estimated no. of new cases in 2005	Direct medical cost ($)[a]
South		1,577,704	254,794	$268,500,000
	Imperial	28,580	2,924	$2,500,000
	Orange	430,735	53,566	$57,000,000
	Riverside	292,719	37,175	$49,000,000
	San Bernardino	338,796	75,606	$50,000,000
	San Diego	486,874	85,523	$110,000,000
CALIFORNIA		5,434,214	1,121,111	$1,112,591,000

Note. [a]County costs are rounded to two significant digits. To obtain the estimated number of new cases for a county, we summed the estimated number of new cases of each STI in that county.