

Sexually Transmitted Diseases: Will This Problem Ever Go Away?

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One of the oldest professions in the world may also be related to one of the oldest public health problems in the world—sexually transmitted diseases. In 2005, more than 18 million new cases of STDs (sexually transmitted diseases) were reported in the United States, with 54,500 cases in North Carolina alone. While these diseases are of epidemic proportion, we actually see surprising little about them in the media and we talk about them even less. A 1997 national Institute of Medicine report stated that “sexually transmitted diseases (STDs) are hidden epidemics of tremendous health and economic consequence in the United States. They are hidden from public view because many Americans are reluctant to address sexual issues in an open way and because of the biological and social factors associated with these diseases.”¹ According to this report, in 1995 the United States had the highest rates of curable STDs in the developed world, with approximately 12 million new cases of STDs annually, three million of them occurring among teenagers. Little public outcry has been heard since then and little progress has been made in the last ten years.

Historically, it is easy to accept that STDs were a problem before we even understood the germ theory of how infections are spread. Similarly, in 1918, at the time of the Spanish flu epidemic, infections such as influenza and STDs were common, but not commonly understood. However, now the United States has the most advanced healthcare system in the world, a wide variety of powerful antibiotics, modern infection control practices, and a multitude of tried and true methods individuals can use to prevent STDs. Most sexually transmitted diseases and conditions are entirely preventable and many curable. Obviously, this is not just a problem of healthcare. As a practicing public health professional in North Carolina and a parent to four teenagers who are soon to enter the “at risk” population, I consider this to be unacceptable.

Why can't we make this problem go away?

*“Why can't
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The Problems Presented by STDs

STDs are transmitted through unprotected sex with someone who has the disease. Since many STDs are asymptomatic, STDs are frequently transmitted by persons who unknowingly are infected. Any person who is sexually active or who becomes sexually active is at risk.

In North Carolina, there are nine sexually transmitted diseases or conditions that are reportable to state and local public health agencies. They include: chlamydia, gonorrhea, syphilis (all stages and types), chancroid, granuloma inguinale, hepatitis B, HIV/AIDS, lymphogranuloma venereum (LGV), and nongonococcal urethritis (NGU). Historically, North Carolina has experienced consistently high rates of syphilis, gonorrhea, chlamydia, and HIV/AIDS when compared to other states.² There are also a number of sexually transmitted illnesses such as human papillomavirus (HPV) that are not reportable in North Carolina. The “Running the Numbers” department of this issue of the *North Carolina Medical Journal* includes a discussion authored by Lynne Sampson describing the problems of drawing inferences about the prevalence of STDs from available reportable data.³

There are 30 known strains of HPV, some strains causing no symptoms, others causing genital warts, and still others that cause cervical cancer. HPV is a leading cause of cervical cancer in the United States. It is believed to be implicated in an average of 300 cases of cervical cancer reported in North Carolina each year. The Centers for Disease Control and Prevention (CDC) estimates that over 50 % of sexually active adults will acquire HPV at some point in their lives.⁴ Genital herpes is also common, but not reportable. An estimated 45 million cases of genital herpes, primarily caused by type 2 herpes simplex virus (HSV-2), occur each year in the United States,⁵ but few states require reporting of these cases. Other STDs not reportable in North Carolina include trichomoniasis and bacterial vaginosis.

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Table 1.
North Carolina Reportable Sexually Transmitted Diseases, 2005

	Sex			Total
	Male	Female	Unknown	
Chlamydia (lab-confirmed)	5,481	25,702	0	31,183
Gonorrhea	7,529	7,546	0	15,075
Syphilis				
Primary Syphilis	81	15	0	96
Secondary Syphilis	135	43	0	178
Early Latent Syphilis	127	88	0	215
Late Syphilis	80	71	0	151
Late Latent Syphilis	34	25	0	59
Late Syphilis w/symptoms	0	0	0	0
Neurosyphilis	0	2	0	2
Congenital Syphilis	5	5	1	11
Syndromic Diagnoses				
Nongonococcal Urethritis (NGU)	5,318	n/a	0	5,318
Mucopurulent Cervicitis (MPC)	n/a	24	0	24
Pelvic Inflammatory Disease (PID)	n/a	382	0	382
Other STDs				
Chancroid	5	0	0	5
Granuloma Inguinale	1	3	0	4
Lymphogranuloma Venereum (LGV)	3	0	0	3
Ophthalmia Neonatorum (gonorrhea)	0	0	0	0

Undiagnosed and/or untreated STDs contribute to the higher than average rates of infant mortality and preterm births in North Carolina and are a leading cause of infertility across the country. Other common, yet serious, medical implications of STDs include such things as syphilitic meningitis, neurosyphilis, chronic hepatitis, cirrhosis, liver cancer, endometritis, and even death. Despite advances in healthcare, HIV infection remains a fatal disease. We're not just talking about a curable STD rash, but serious infections with serious potential consequences for individual and community health.

According to data collected by the HIV/STD Prevention and Care Branch of the Division of Public Health, over 54,500 new STDs were reported in North Carolina in 2005. These included 11 cases of congenital syphilis and 1,806 new cases of HIV disease. Specific disease trends vary by disease and from year-to-year. Some STDs, such as gonorrhea, have actually declined over the last ten years while the number of reported chlamydia cases has increased among 20 to 29 year olds. It is important to note that screening for chlamydia has increased in publicly-funded clinics over the past several years, and in May of 2004 the State Laboratory of Public Health began using a more sensitive screening test. This likely accounts for the increase in detected cases. Hepatitis A, B and C, often not appreciated as STDs, accounted for an additional 1,100 STD case reports in 2005. STD screening and reporting varies from provider-to-provider, therefore performing a statewide STD trend analysis can be challenging.

The high rates of STDs affecting North Carolina are typical

across the predominantly rural South. For the past decade, southern states consistently led the nation in reported cases of syphilis, chlamydia, gonorrhea, and new AIDS cases.⁶ In 2002, the CDC reported that seven of the states with the highest AIDS case rates in the nation were located in the South. Similarly, in 2000, all of the states with the highest rates of gonorrhea and nine of the top ten states with regard to infectious syphilis were in the South.⁷ These trends are still true today. The direct and indirect human and economic costs associated with these diseases in the rural South have been well documented by state and national organizations, public health experts, and healthcare researchers. Higher rates in the South are influenced by differences in the racial and ethnic distribution of the population. These differences are linked to higher rates of poverty and the availability and quality of healthcare services.⁷ STDs, including HIV/AIDS, disproportionately and unacceptably affect persons of color, particularly across the South. Poverty, access to quality healthcare (including prevention services and education), cultural factors such as the lack of trust for the healthcare system, and social stigma are all strongly linked to high rates of STDs and HIV/AIDS among persons of color.

CHALLENGES: Why Is This So Difficult?

Missed Opportunities

There are two myths that are prevalent in North Carolina. The first is the belief that STDs, including HIV, only happen to people who do bad things or make bad choices. The second is that only the people who have these conditions are directly affected by them. These beliefs, whether openly expressed or quietly implied, keep individuals from seeking rapid treatment for themselves and their sexual partners. The fear of being stigmatized, and the lack of awareness about the true risks of acquiring an STD, keep the epidemic alive in our communities.

The false assumptions about who is at risk for HIV/STD infections affect screening and counseling practices of public and private healthcare providers. While STD and HIV screening and counseling are a regular part of the standard of care in local public health departments and community health centers, it is normally not a part of routine screening in many private practices.

For example, one North Carolina study found that among primary care providers in Wake County in 1997 less than 25% offered routine screening for chlamydia, despite the fact that this disease is the most frequently reported bacterial STD and one that is easily treated.⁷ Preventing and treating STDs is also critical because of the strong evidence that a person with a STD is more likely to acquire HIV infection, and if an individual is co-infected, they are more likely to transmit their HIV infection to others.⁸ Early diagnosis and treatment of STDs is a critical public health strategy to reduce the spread of new HIV/AIDS in both the public and private healthcare sectors. CDC just released new guidelines to strongly encourage that HIV screening become a regular and routine part of all healthcare settings in this country.

Access to Care and Cultural Competency

Access to care and the ability to provide culturally-appropriate health services are inextricably tied together. Traditional barriers to care, such as being un- or under-insured, lack of transportation, lack of providers in many rural areas, and inconvenient hours of operation are common for most health services, and certainly impact STD care as well. But, even if patients are able to seek care in their communities, the issues of stigmatization, confidentiality, and cultural differences make STD care particularly challenging for providers and patients.

Adolescent Sexual Health

Nearly half of all the new sexually transmitted diseases and HIV infections occur in youth between the ages of 15 and 24. Adolescents are at increased risk because of their risk-taking behaviors and lack of awareness about HIV/STDs. In 2005, North Carolina high school students participated in the 2005 Youth Risk Behavior Survey (YRBS) that assessed the behaviors that put them at risk for various health problems. These behaviors included diet, exercise, tobacco use, and sexual behavior.⁹ The results revealed that 50.8% of all high school students and 63% of high school seniors self-reported that they had experienced sexual intercourse. Eight percent of students reported having sex before the age of 13. In four of the five risk-taking categories examined, the percentage of North Carolina adolescents engaging in risky sexual behaviors was greater than the national average.⁹

The debate about how North Carolina should address these alarming statistics is strongly mixed. While most people believe that parents/guardians and schools should play a strong role in educating our young people about HIV/STD and teen pregnancy prevention, there is conflict about what the prevention messages should be, how often they should be taught, and at what ages. The role of public education in meeting the challenges of the STD epidemic is the focus of the commentary in this issue of the *North Carolina Medical Journal* by Sherry Lehman.^b

The North Carolina General Assembly enacted the Abstinence Until Marriage Law in 1995 which instructs the State Board of Education about what to include in the health curriculum taught in North Carolina public schools. The Healthful Living Standard Course of Study sets the goals and objectives by grade for human sexuality education for North

Carolina in accordance with the Abstinence Until Marriage Law. This law promotes “abstinence only” education in grades 7 through 12. Many people are concerned that sexually active adolescents are not being provided with all the information they need to reduce their risks of getting a STD or HIV infection. Still others argue that the only message North Carolina teens should get in school is that abstinence is the only absolute way to prevent getting these diseases. They believe that talking about other risk reduction methods (i.e., condom use) is not appropriate. This is a critical conversation for North Carolina. We need to seriously examine this question in light of the fact that many adolescents are having unprotected, high-risk sex and experiencing high rates of STDs, including HIV, not to mention unplanned adolescent pregnancies. In early 2002, North Carolina uncovered a previously unrecognized HIV outbreak among young adults attending college or linked to students attending college. This outbreak received national attention and it supports the notion that North Carolina’s young adults are not hearing (or paying attention to) our HIV/STD prevention messages.

Racial and Ethnic Disparities

Syphilis—Syphilis disproportionately affects minority communities in North Carolina. Rates for African Americans, American Indians/Alaska natives, and Hispanics are many times higher than for corresponding white groups. A complex combination of healthcare access, poverty, racism, and the composition of sexual networks produces this disparity in syphilis rates. In 2005 rates among African American males were four times higher than among whites. Hispanic rates were two times higher than for whites. Racial disparities in male syphilis rates have improved slightly over the past five years due in part to decreasing syphilis rates in minorities generally, and increasing rates among white men. Syphilis rates among all women regardless of color have declined dramatically over the past five years from 10.5 cases/100,000 in 2001 to 3.4 cases/100,000 in 2005. There has been a modest improvement in the disparity between white and black female rates as well. In 2005, the early syphilis rate for African American women was approximately 10.5 times the rate for white women. By 2005, African American female rates had declined to approximately 8.5 times the rate for white females.²

Unfortunately, North Carolina continues to suffer from cases of congenital syphilis. In both 2004 and 2005, eleven infants were born to mothers who had active or inadequately treated cases of syphilis, the majority of whom were African American. This is down from previous years (21 infants in 2003, 15 in 2002, and 19 in 2001), but remains unacceptably high. Six of the eleven women in 2004 did not have any prenatal care (PNC) prior to delivery and an additional three had less than five total PNC visits. Women who do not receive adequate PNC services often miss opportunities for screening. According to the North Carolina Pregnancy Risk Assessment Monitoring System (PRAMS) survey for 2003, 18.4% of North Carolina mothers reported a barrier to receiving prenatal care services.¹¹ Younger mothers and those of African American or Hispanic race/ethnicity were most likely to report barriers to prenatal care.

Gonorrhea—There is some good news in that severe racial disparities in gonorrhea incidence rates are on the decline among males. In 2001, rates among African American males were 32 times the rates for white males. The disparity decreased to 22 times higher in 2005. Disparities among females have remained relatively steady, with African American female gonorrhea rates 10 to 14 times higher than rates for white females over the five-year period.

Chlamydia—Racial disparities in female chlamydia reports have remained stable over the past five years (2001-2005), with seven-to-eight times more cases reported among African American females and three-to-five times more cases among American Indian/Alaska Native and Hispanic females.

HIV/AIDS—An estimated 29,500 persons were living with HIV or AIDS in North Carolina (including persons who may be unaware of their infection) as of December 31, 2005. In 2005, the rate of HIV infection for non-Hispanic blacks (61.4 per 100,000) was more than seven times greater than for non-Hispanic whites (8.6 per 100,000). The rate of infection for Hispanics (24.1 per 100,000) was almost three times greater than for whites, and the rate of infection for American Indians (20.6 per 100,000) was over twice the rate for whites. The highest rate of HIV infection in 2005 was among African American non-Hispanic males, at 88.6 per 100,000. This was more than six times more than white non-Hispanic males (14.4/100,000). The greatest disparity observed in 2005 was for African American non-Hispanic females, with a rate of HIV infection (37.3 per 100,000) that was over 12 times higher than for white non-Hispanic females (3.0 per 100,000).

NOTEWORTHY SUCCESSES: What is Working?

Despite the challenges, North Carolina has made progress on several important fronts. The following section describes several efforts that are showing positive results in reducing the rates of these diseases.

STD Services in Local Health Departments

In North Carolina, all 100 local health departments offer free and confidential STD and HIV/AIDS services. Many community, academic, and faith-based organizations also offer STD and HIV/AIDS screening and counseling. Faith-based organizations have been very successful in some communities in linking persons into care and prevention services, or in offering some HIV/STD screening. North Carolina academic and research partners have continued to play enormous roles in developing best practice models and keeping STD and HIV/AIDS on the radar screen nationally. North Carolina was the first state to implement an acute HIV screening program, which allows for the detection of HIV in individuals even before they have had a chance to mount an antibody response.¹² Peter Leone describes these efforts in a commentary in this issue of the *North Carolina Medical Journal*.¹³ Successful North Carolina interventions are the subject of a subsequent article by Evelyn Foust in this issue of the *North Carolina Medical Journal*.¹⁴

Syphilis Elimination

In 1998 CDC reported that over 50% of all the United States primary and secondary syphilis cases were reported from just 28 counties. Five of those counties were in North Carolina, a number greater than for any other state. The counties were Forsyth, Guilford, Mecklenburg, Robeson, and Wake. Many of these cases occur among sex workers in these communities. To assist in addressing the evident need, CDC awarded the North Carolina Division of Public Health additional funding to participate in the National Plan to Eliminate Syphilis.¹⁵ Due to the efforts of NC's local county health departments, community-based organizations, and state disease intervention staff, early syphilis now has been reduced by 69%. North Carolina has been able to demonstrate that community-based interventions, combined with traditional approaches, are effective in reducing STDs.

Commentaries by Merle Green and Jonathan Lucas of Guilford County and by Melissa Packer, April Oxedine, and Karen Woodell of Robeson County in this issue of the *North Carolina Medical Journal* describe the extensive, community-based efforts required to address the epidemic of syphilis among NC sex workers.^{16,17}

Vaccines Against STDs

In May of 2001, the Food and Drug Administration (FDA) licensed a combined hepatitis A and B vaccine (Twinrix[®]) for use in persons over the age of 18. Currently, the vaccine is available at almost all (96%) of the local health department STD clinics across the state. The vaccine is administered as a three-dose series. This project was started in 2003 by HIV/STD Prevention and Care Branch staff in collaboration with the State Immunization Branch. Healthcare providers were educated about the importance of this new combination vaccine and strongly encouraged to offer the vaccine to everyone over 18 years of age who is seen for an STD visit. Targeted risk factors include HIV positive status, Hepatitis C virus positive status, injecting drug use, men who have sex with other men, anyone having a male sex partner, and incarceration. Based on utilization from January through June of this year, it is estimated that approximately 5,600 persons will be vaccinated. Frederick Sparling, a distinguished infectious disease scientist from the University of North Carolina at Chapel Hill, addresses the prospect for vaccines to prevent STDs in this issue of the *North Carolina Medical Journal*.¹⁸

In June of 2006, the first vaccine for human papillomavirus (HPV) was recommended by the Advisory Committee on Immunization Practices for use in the prevention of cervical cancer caused by four of the HPV types. The HPV types included in the vaccine (Gardasil[®]) are responsible for approximately 70% of the cervical cancers and 90% of genital warts. Currently the vaccine is recommended for 11-to-12 year-old girls, but it can be used in girls as young as 9 years old and up to age 26 at the provider's discretion. It is recommended for girls/women who have not been immunized against HPV. Ideally, immunization would be provided before sexual activity begins, since it will be ineffective if the individual has already been exposed to an HPV

type covered by the vaccine. The vaccine is not effective as a treatment for existing HPV, genital warts, cervical cancers or precancers.

The Center for HIV-AIDS Vaccine Immunology (CHAVI) is a major component to the Global HIV Vaccine Enterprise. In July 2005, the National Institute of Allergy and Infectious Diseases (NIAID) awarded the CHAVI grant to a consortium of investigators from Duke University, Beth Israel Deaconess Medical Center, the Dana-Farber Cancer Institute, the University of Alabama-Birmingham, and Oxford University. Dr. Barton Haynes at Duke University is the CHAVI principal investigator and the consortium consists of a group of investigators who are well known as having made significant scientific contributions to HIV vaccine design and to the current basis of knowledge of HIV transmission and infection. The initial research focus will be on understanding the host immune response in the acute stages of infection. Other lead investigators in North Carolina include David Goldstein of Duke University and Myron Cohen of the University of North Carolina at Chapel Hill.

Screening Pregnant Women for HIV

Since 1994, there has been a requirement that pregnant women be offered testing for HIV as a part of regular prenatal care. The North Carolina Administrative Code was modified in 2003 so that all pregnant women would be tested unless they specifically declined such testing. This "opt out" approach to prenatal testing is very effective at promoting testing for women who have prenatal care; however, it does not improve testing for women who do not receive routine prenatal care. The benefit of prenatal testing, especially when combined with the program for acute HIV screening, is undeniable. In the North Carolina State Laboratory of Public Health (SLPH), in addition to the typical HIV antibody testing, patient lab samples are screened for the presence of genetic material (RNA) that would indicate possible HIV infection prior to the development of antibodies. This is innovative new testing technology that is discussed in greater detail in a subsequent article by Arlene Sena and Marcia Hobbs in this issue of the *North Carolina Medical Journal*.¹⁹ Since the implementation of the acute HIV screening program through the SLPH, five pregnant women have been identified with acute HIV infection. These women were tested as the rule requires, and under the previous testing algorithm would have been told they were negative. They would likely have progressed through pregnancy and delivered HIV-exposed infants. Given the likely 25-30% vertical transmission for mothers who are not provided prenatal antiretroviral therapy, it is probable that at least one of the babies would have been infected. However, since the woman's HIV infection was determined and all were provided appropriate prenatal antiretroviral medication, all five babies have been determined not to be infected.

Jail Screening

As part of the Syphilis Elimination Project (SEP), syphilis screening was initiated in the seven county jails in the six SEP counties (Durham, Forsyth, Guilford, Mecklenburg, Robeson, and Wake). Inmates are given counseling on syphilis and other STDs and blood is collected for screening by a nurse or trained phlebotomist. Data collection began in 2002 and analysis shows that the screening is highly effective in identifying new cases. From 2002 to 2004 the program screened 20,552 inmates (17.5% female). There were 742 seropositives, which yielded 121 new cases of syphilis. Screening female inmates seems to be of particular value because they are more likely to be seropositive (8.11% compared to 2.65% for males) and more likely to be new cases (0.97% compared to 0.51% for males). The effort to address the STD epidemic among incarcerated populations is described by Lynne A. Sampson in this issue of the *North Carolina Medical Journal*.²⁰

Conclusions

Despite the undisputed impact of STDs, and how much we have learned about how to treat and prevent them, North Carolina public health authorities still struggle to ensure that STD/HIV prevention and control strategies remain high priorities in both private and public healthcare clinics. Most sexually transmitted diseases and conditions are preventable and many curable. However, the establishment of routine screening, and successful prevention and education programs are challenged by lack of resources and public awareness.

Sexually transmitted diseases are a serious problem in North Carolina that won't go away. This is the case of a traditional public health problem that the traditional way of thinking will not solve. Societal attitudes, false beliefs, fears, and our inability to talk honestly and openly about sexual behaviors are getting in the way. STDs are not reserved for a small subset of our society. STDs are equal opportunity infections. The bottom line is that infection with either HIV or another STD is a risk for any sexually active individual. Early education and risk reduction counseling for all sexually active individuals is a must, regardless of age. Routine screening and counseling for these diseases should be the standard of care for all patients in all healthcare settings.

STD and HIV/AIDS programs at the state and local levels remain highly controversial, lack strong public approval, are significantly underfunded, and are frequently fractured at service delivery points. With a father who is a public health professional, my own children have heard this sad story all too often. The risks they face are real and the consequences of ignoring them can be fatal. We can, and we MUST, do better. **NCMedJ**

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