

Running the Numbers

*A Periodic Feature to Inform North Carolina Healthcare Professionals
about Current Topics in Health Statistics*

*From the State Center for Health Statistics, NC Department of Health and Human Services
<http://www.schs.state.nc.us/SCHS>*

Interpretation of Sexually Transmitted Disease Surveillance Data

By law, all cases of chlamydia, gonorrhea, syphilis, and HIV infection in North Carolina must be reported to the appropriate county health department. The information is then forwarded to the HIV/STD Prevention and Care Branch in the North Carolina Division of Public Health in Raleigh for compilation and aggregate reporting to the Centers for Disease Control and Prevention (CDC). The Branch publishes the data in the form of summary counts and rates. Correct interpretation of these published rates requires some knowledge of how the cases are detected and reported.

Chlamydia

The most prevalent reportable sexually transmitted disease (STD) in North Carolina is chlamydia. It is also the disease with the least reliable surveillance data. Cases of laboratory-confirmed chlamydia must be reported to the local health department within seven days. The surveillance problem lies in the fact that chlamydia is most often asymptomatic in both males and females. It is also a major cause of pelvic inflammatory disease (PID) and infertility in females. For this reason, there are a number of programs targeting asymptomatic young women for screening. There are virtually no comparable state programs for screening young men. Most male cases are detected and reported when infected females encourage their male partners to seek care. As a result, chlamydia case reports are highly biased towards screened populations, i.e. young women attending public clinics. In 2005 there were 31,183 cases reported in North Carolina, and more than 80 percent were female.

So how do we interpret the published data? Surveillance data are a very poor indicator of trends in chlamydia incidence. In fact, the growing number of case reports over the last five years is primarily due to the expansion of screening programs, an indication of positive public health activity. However, the surveillance data can provide some useful information. Recognizing that a great many chlamydia cases remain undetected and therefore unreported, the reported cases represent a lower boundary of the estimated prevalence of the disease in North Carolina.

Gonorrhea

Gonorrhea is the second most frequently reported STD in North Carolina, with 15,075 laboratory-confirmed cases reported in 2005. In contrast to chlamydia, nearly all gonorrhea cases among males are symptomatic and females are only slightly less likely to have symptoms. This means that many infected people will present for care and, if gonorrhea testing is ordered, their disease will be detected and reported. Additionally, many asymptomatic young women are screened for gonorrhea during chlamydia screening.

As a result, gonorrhea reporting is quite reliable and has no apparent gender bias (in 2005 50% of North Carolina cases were male and 50% were female). It is possible that public STD clinics may be more inclined than private healthcare providers to order gonorrhea tests (as opposed to presumptive treatment without testing). This tendency, and the female screening programs in public clinics, may lead to some reporting bias towards patients who attend public clinics, but this is difficult to assess. Gonorrhea reports have declined steadily for the last eight years and this is most likely due to a real decline in incidence of the disease.

Syphilis

All reactive syphilis tests must be reported to the local health department within 24 hours. Each individual reported will be investigated thoroughly to determine whether or not the person is infected at all and, if so, whether the infection is a new one or a failed treatment of a previous one. If the infection is new, the appropriate stage must be diagnosed as well. This investigation is conducted by local or regional health department personnel and can take days or weeks. Patients are interviewed to help determine their stage of infection and to identify sexual partners who have been exposed. These partners are then interviewed and tested for syphilis.

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The early stages of syphilis have very distinct symptoms which makes diagnosis errors unlikely. In the later, asymptomatic stages, interviews are needed to establish the time of the infection and therefore the current stage. In general, reporting of early syphilis (primary, secondary, and early latent) in North Carolina is likely to be quite accurate.

Syphilis is much less common than chlamydia or gonorrhea (only 489 cases of early syphilis were reported in 2005). It is also viewed by providers and public health officials as being a much more serious disease. These factors make it much more likely that suspected syphilis cases will be tested and reported. Good initial reporting and thorough contact tracing of related cases make syphilis surveillance data the most reliable and complete STD data available in North Carolina. A small number of cases will always be missed by surveillance, but trends in early syphilis incidence mirror the true incidence in the population more closely than is the case for any other STD. The rate of early syphilis in North Carolina declined by approximately 50% from 2001 to 2005, due in large part to comprehensive public health control efforts.

HIV and AIDS

AIDS, the syndrome resulting from HIV infection, has been reportable in North Carolina since 1984, while HIV infection itself has only been reportable since 1990. Physician diagnoses must be reported to the local health department, which then forwards them to the state. In addition, laboratories must report HIV-positive results directly to the state. As previously described for syphilis, North Carolina has thorough contact tracing and partner notification programs for all cases of HIV infection and AIDS. Many cases are detected when the partners of HIV-infected index cases are interviewed and tested.

Because HIV infection is largely asymptomatic for many years, early detection is very dependent upon whether or not infected people are screened for the disease. This can lead to many of the same problems described previously for chlamydia — the surveillance data reflect the population that receives screening. In the early years of the epidemic, such screening was closely targeted to groups known to be at very high risk of infection. e.g., men who have sex with men and injection drug users. In recent years, HIV testing has been more widespread and public health messages have stressed that “knowing one’s HIV status is part of good sexual health.” However, the CDC estimates that currently one-fourth to one-third of all people infected with HIV have not been tested and therefore have not been reported with HIV infection.

When an HIV-infected person meets certain criteria (lowered CD4 cell counts, acquisition of certain infectious diseases, etc.) they meet a case definition for AIDS.

Because AIDS is generally symptomatic, it is likely that AIDS reporting is more complete than HIV reporting. However, some providers may be unaware that a patient previously reported with HIV must be reported again when AIDS case status is met. Also, approximately 30% of new HIV infection reports are among people who have already met the case definition for AIDS.

Because the stage of AIDS occurs very late in the course of HIV infection, AIDS surveillance data are not useful in evaluating the current epidemic trends. These data are most useful in assessing the prevalence of AIDS cases and the need for resources for treatment. Surveillance data for HIV disease (the first report of HIV infection, regardless of stage) are a better indicator of which groups are currently at highest risk. In 2005, there were 1,806 new HIV disease cases reported in North Carolina.

Finally, it should be noted that changes in case detection methods will have an impact on how many STD cases are reported. In May of 2004 the State Laboratory of Public Health changed to a more sensitive test for chlamydia. This immediately caused a slight increase in case reports as more tests were found positive. Likewise, the HIV/STD Prevention and Care Branch instituted some new policies surrounding laboratory reporting of HIV in 2003. This caused a number of “old” HIV cases to be first reported in 2003. The surveillance data reflect this with a noticeable increase in reports for 2003, which leveled off in 2004.

To view copies of published reports from the HIV/STD Prevention and Care Branch, please see our webpage: <http://www.epi.state.nc.us/epi/hiv/>.

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