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Telephone 971/673-1111
Emergencies 503/731-4030
Fax 971/673-1100

cd.summary@state.or.us
http://oregon.gov/DHS/ph/cdsummary/

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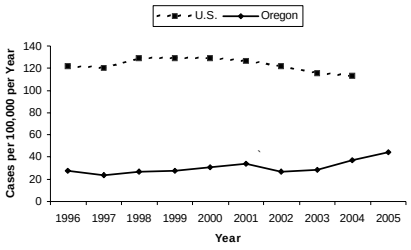
GONORRHEA RATES ARE UP — *NAAT*URALLY

AFTER HOLDING steady at approximately 30 cases per 100,000 per year since 1996, reported incidence of gonorrhea in Oregon increased to 40.5 during 2004–2005. In this installment of our venerable serial we explore the recent epidemiology of gonorrhea in Oregon and examine the role of the newest generation of laboratory tests for gonor- rhea, nucleic acid amplification tests (NAATs).

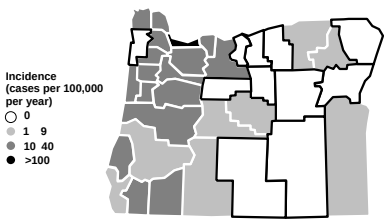
Despite the recent upsurge, Oregon's incidence remains approximately one-third that of the overall U.S.[1] (Figure 1) Why Oregon's rates are persistently lower than the rest of the U.S. is unclear, but a similar relationship of Northwestern region to overall U.S. rates has been observed for *Chlamydia* and attributed to earlier establishment of widespread screening in the region.[2] Most Oregon cases (approximately 70%) continue to be reported from Multnomah County, where the incidence has been approximately 3 times the rate in the next highest counties. (Figure 2) During 2004–2005, rates increased similarly between both sexes and across all age groups.

(Figure 1) Gonorrhea Incidence — Oregon and U.S., 1996–2005*



*Rates for 2005 projected from case reports through Nov. 18, 2005.

(Figure 2) Gonorrhea Incidence by County — Oregon, 2004.



One possible explanation for recent increases is increased detection. During the past 1–4 years, most major diagnostic laboratories in Oregon have switched to nucleic acid amplification tests (NAATs) from non-amplified nucleic acid tests or culture for diagnosis of gonorrhea. Many commercially available NAATs combine testing for *Chlamydia* with gonorrhea and permit urine to be used in lieu of urethral swab for men, or pelvic examination with cervical swab for women.[3] (Table 1) Consequently, it appears that more gonorrhea specimens are dripping into our laboratories. Although likely confounded by unmeasured changes in the makeup and number of submitters, the number of gonorrhea test submissions at one large Northwest-based regional laboratory that switched to NAATs from non-amplified tests in 2004 is informative. This lab has observed a 120 percent increase in specimens tested for gonorrhea in 2005 compared to its average number of annual submissions during 1999–2004. From 2003–2005 in this same lab, the annual proportion of all gonorrhea tests that were amplified nucleic acid tests increased from 0 to 100%.

Increased sensitivity may also have contributed modestly to the apparent increase. NAATs for gonorrhea are 5–10% more sensitive than their non-amplified counterparts or culture. (The comparable sensitivity increment for *Chlamydia* from culture or non-amplified test to NAAT is even more: 10%–30%.)[4] Even without invoking an increase in the number of tests, the transition to NAAT tests alone could have accounted for a small increase in reported gonorrhea. In the same lab described above, from 2004 to 2005 during transition to NAAT tests, proportion of gonorrhea tests positive increased by 15% from 0.31% to 0.36% of all tests submitted.

In addition to increased sensitivity of NAATs and evidence of increased numbers of specimen submissions to laboratories, trends from surveillance data also support the contribution of increased detection to recent increases. First, cases diagnosed in private offices — where providers and labs might have converted earlier and more completely to NAATs from their less costly predecessors and might use the tests less parsimoniously than their public counterparts — increased by 72% (from 527 to 925 per year) compared to public sites (e.g., sexually transmitted disease and family planning clinics, and jails), where new cases only increased by 26% (from 416 to 526 per year). In fact, approximately 80% of the overall increase during 2004-2005 can be attributed to additional cases diagnosed in private medical offices. Second, reported cases among asymptomatic patients in Oregon increased from 19% of all cases during 1996-2003 to 35% during 2004-2005, suggesting that more asymptomatic patients are being tested.

Improved sensitivity and accessibility of diagnostic tests is welcome, but clinicians should avoid

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indiscriminate testing of low-risk persons just because it is easy. Even with tests as accurate as most NAATs for gonorrhea, the likelihood that a positive test represents a real case of gonorrhea in a person with a one in 100 chance of gonorrhea is only 20%. That means that 80% of positive tests in such persons are false positives. (Table 2) Therefore, the United States Preventive Task Force does not recommend universal screening for gonorrhea but instead restricting testing in asymptomatic persons to those who fall into higher risk categories such as being aged <25 years with previous history of gonorrhea, other sexually transmitted infections, new or multiple sex partners, inconsistent condom use, sex work, drug use, or men who have sex with men.[5] If a low-risk person is tested and found unexpectedly to be positive, confirmatory testing with an alternate NAAT test or culture may be warranted.[4]

Expanding NAAT hegemony has also led to declining availability of culture. Sometimes, only a culture will do: NAAT tests have not been validated or approved for use with rectal or pharyngeal specimens.[3,4] However, in recent years, men who have sex with men represent over half of reported cases of gonorrhea among men. All but a few of these were diagnosed via urethral specimens, suggesting that substantial numbers of men with rectal or pharyngeal disease go undiagnosed.

When used discriminatingly, more accurate and convenient tests for gonorrhea are valuable tools. However, thorough sexual histories remain essential, screening of asymptomatic patients should be limited to those in established risk groups, and culture is still required to diagnose extragenital infection when suggested by history or exam.

Table 1. Common Amplified and non-Amplified Nucleic Acid Tests for Gonorrhea

Company/Test	Approved Specimen Source
(Non-amplified nucleic acid tests)	
Gen Probe/Pace 2 GC/Pace 2c	Endocervical (female); urethral (male); conjuctival
(Nucleic acid amplification tests)	
Roche/Amplicor	Endocervical (female); urethral (symptomatic males only); urine (males)
Becton-Dickinson/ BD Probe TecET	Endocervical (female); urethral (symptomatic males only); urine (males and females)
Gen-Probe/ APTIMA Combo 2	Endocervical (female); urethral (symptomatic males only); urine (males and females); vaginal swabs (pending)

Table 2. Predictive Value of Positive Test With Varying Pre-Test Probability for Typical Nucleic Acid Amplification Test for Gonorrhea*

Pre-test Probability (Likelihood that patient has gonorrhea before a test is done)	Predictive Value Positive (Probability that a positive test is a true positive)
1/1000	2.4%
1/100	19.5%
1/10	70.8%

*Sensitivity=97%; specificity=96%

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OREGON WILL begin using a new death certificate on January 1, 2006. Any death occurring in 2006 must be reported on the new form.

Additional medical information on pregnancy (current or within the year prior to death) is required to determine mortality among this population group and assist in maternal mortality review programs.

Additional information on the changes is available online at *http://oregon.gov/DHS/ph/chs/registration/index.shtml*.