SCREENING FOR CHLAMYDIA IN SPOKANE COUNTY: IMPLICATIONS FOR A LOCAL PUBLIC HEALTH DEPARTMENT

By

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To the Faculty of Washington State University:

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Abstract

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Objectives: The purpose of this study was to evaluate the extent to which providers in Spokane County are screening patients for chlamydia, to identify potential barriers to screening, and to recommend strategies for public health intervention.

Methods: A survey was mailed out to all (N = 663) Spokane County providers practicing in specialties that see the majority of STD cases. The final response rate was 47.8%. The association between provider and practice characteristics, and attitudes and beliefs to frequency of screening was determined using chi-square statistics.

Results: The majority (62.1%) reported screening females age 15 to 25 for chlamydia all or most of the time during a routine new or annual patient visit. Only 21.7% reported screening males all or most of the time. Providers were significantly ($p <$ .02) less likely to screen females for chlamydia if they specialized in emergency medicine. Providers were significantly ($p <$ .02) more likely to screen females if they reported regularly taking a sexual history from patients, following clinical practice guidelines for STD-related care, or using patient-administered support tools to elicit a sexual history. Attitudes significantly ($p <$ .02) associated with screening, included feeling responsible for ensuring that patients received STD prevention services,

believing that screening would prevent unnecessary health care costs, and believing that screening was a priority. Providers were significantly ($p < .02$) less likely to regularly screen females for chlamydia if they felt that their patients did not want STD prevention services, if they believed that most of their adolescent patients were not sexually active, if they felt that laboratory tests were to costly, or if they felt that chlamydia was too uncommon in their practice to justify the costs of screening.

Conclusion: Almost 40% of providers are not screening according to recommended clinical guidelines. Public health should provide information on STD risk and prevalence, and inform providers regarding the cost-effectiveness of screening for chlamydia. Additionally, all providers should be educated with regard to the role of males in the transmission of infection, specimen collection and diagnostic laboratory technologies, and effective sexual risk assessment. Further investigation and subsequent interventions aimed at providers practicing in emergency care settings are also warranted.

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Dedication

This thesis took a great deal of my time and energy, often at the expense of being with my loved ones. This thesis is dedicated to them; to my family, for loving me unconditionally, for understanding and supporting me in pursuit of my career aspirations, and for reminding me of what is truly important in life.
This thesis is also dedicated to my closest friends. They are an independent, colorful bunch of beautiful wine-drinking women, who provided me with several much-needed study breaks. And finally, this thesis is dedicated to my own personal kokopelli, who is a constant reminder to live life to the fullest.
I will hear his music forever.

CHAPTER 1

~ INTRODUCTION ~

Individual health care providers in Washington State have a statutory obligation to report certain communicable diseases to public health departments.[1] *Chlamydia trachomatis* is one of those reportable conditions. Public health departments have an obligation to analyze and disseminate reported case data to inform clinical practice regarding the incidence and prevalence of disease, and to assess the community for gaps in clinical services (Washington State Department of Health [WSDOH], 2005). Chlamydia infections are preventable, and when detected early, are easily treated. A provider's failure to screen for chlamydia and to report positive cases can impact the health of both the patient and the community. The purpose of this study was to evaluate the extent to which providers in Spokane County are screening patients for chlamydia, to identify potential barriers to screening, and to recommend strategies for public health intervention to increase screening rates in the community.

The Problem

Chlamydia is the most frequently reported communicable disease in the United States, in Washington, and in Spokane County (Centers for Disease Control and Prevention [CDC], Division of Sexually Transmitted Disease [STD] Prevention, 2000; WSDOH, 2003; WSDOH, 2004b). Most chlamydia infections are asymptomatic with estimates ranging from 70% to 95% of all cases (Kohl, Markowitz, & Koumans, 2003; Peipert, 2003; Shafer et al., 2002). Additionally, not all cases of chlamydia are reported to public health departments. It is therefore difficult to estimate true prevalence in a community, because many cases remain undiagnosed and unreported.

[1] WAC 246-101 describes notifiable condition reporting in Washington state.

Nationwide, the highest rates of chlamydia occur in young women less than age 19 years, the next highest in young women age less than 24 years (CDC, 2004). Within Spokane County, incidence rates are highest in young women age 20 to 24 years, with 2,062 reported cases per 100,000; and female adolescents age 15 to 19 years, with 1,851 reported cases per 100,000 (WSDOH, 2004a). Adolescents are generally at higher risk of acquiring an infection due to the greater likelihood of unsafe sexual practices, such as multiple partners and unprotected sex (CDC, 2004). In addition, adolescent females are more susceptible than older women to infection because of developmental differences in the cell structure of the cervix (Peipert, 2003).

Rates of chlamydia across the country, across the state, and within Spokane County are increasing. Advances in diagnostic testing mean that rates vary across years due to variations in sensitivity of testing. When adjusted for increased sensitivity of testing, positive rates in Region 10, comprised of Alaska, Washington, Oregon, and Idaho, have increased from 4.9 % in 1996 to 7.2% in 2003 (CDC, 2004). This represents the second largest increase observed across the nation except in Region 2, comprised of New York and New Jersey (CDC, 2004). The number of reported cases of chlamydia in Washington State has increased steadily, from 9,237 cases in 1996 to 17,635 cases in 2004 (WSDOH, 2004a). This represents a dramatic 91% increase, well above the rate of population growth, but unadjusted for variations due to differences in testing sensitivity (WSDOH, 2004a).

There are serious potential health consequences to undiagnosed infection. The clinical sequelae of chlamydia infection includes chronic pelvic pain, pelvic inflammatory disease (PID), ectopic pregnancy, spontaneous abortion, neonatal

conjunctivitis and pneumonia, preterm labor and low birth weights, and infertility (American Academy of Pediatrics, 2003; Hollblad-Fadiman & Goldman, 2003; Peipert, 2003). Untreated infections often result in long-term consequences to sexual and reproductive health and subsequently contribute to rising health care costs. It is estimated that untreated chlamydia infection and the associated sequelae of infection costs the United States more than $2 billion per year (Peipert, 2003).

According to the Centers for Disease Control and Prevention's *Sexually Transmitted Disease Surveillance Annual Report,* rates of chlamydia are increasing due to increases in risky sexual behavior; better screening rates of at-risk populations; less-invasive testing that is more acceptable to patients; increased sensitivity of testing technology; and better reporting of positive cases (2004). As a result, prevalence of chlamydia is increasing (CDC, 2004). As the prevalence of chlamydia continues to climb, so will the direct and indirect costs of both diagnosed and undiagnosed infections. Undiagnosed infections impose higher costs in the long-run. The burden of disease on patients, health care payers, and society is substantial and unnecessary.

Screening for Chlamydia

There are several essential clinical components to prevention and control of STDs (CDC, 2002). These include (1) screening and providing treatment as needed for symptomatic *and* asymptomatic sexually active patients, and (2) identification and subsequent screening and treatment of their sex partners. Clinic-based screening can reduce the prevalence of chlamydia within a population by up to 59% (CDC, Division of STD Prevention, 2000).

Wide-spread screening for chlamydia has also been shown to reduce the rates of pelvic inflammatory disease. Pelvic inflammatory disease (PID) is the most serious and costly consequence of untreated chlamydial infection, potentially leading to ectopic pregnancy, chronic pelvic pain, and infertility (Peipert, 2003). A pioneer randomized controlled trial investigated the impact of screening for chlamydia on incidence of PID (Scholes et al., 1996). Women in the study were enrolled in a staff-model HMO in Seattle, Washington and were identified as at increased risk for chlamydia infection through a self-administered questionnaire. Eligible women were assigned to one of two groups: screening or usual care. Results indicated that women assigned to the screening group were significantly less likely (44% less likely) to develop PID within one year.

Several population-based studies have also demonstrated an association between increased chlamydia screening rates and declining rates of ectopic pregnancies and PID. One of these studies evaluated the association between chlamydia screening and other strategies, including treatment of sex partners and implementation of an educational agenda, and rates of chlamydia infections and ectopic pregnancies in Uppsala County, Sweden (Egger, Low, Smith, Lindblom, & Herrmann, 1998). The study evaluated cases of chlamydia diagnosed between 1985 and 1995 for women age 20 to 39 years. The researchers found that the rates of both chlamydia infection and ectopic pregnancies declined over time as screening rates increased, with regression analysis demonstrating a significant correlation between the two ($p < .001$).

In another related study, researchers examined the association between rates of acute PID and incidence of gonorrhea and chlamydia over a 25-year period in urban hospitals of central Sweden (Kamwendo, Forslin, Bodin, & Danielsson, 1996). Hospital

records were examined for over 2,500 patients admitted for PID or related symptoms between 1970 and 1994. Results showed that the decline in rates of acute PID over time was significantly associated with decreases in the rates of both gonorrhea and chlamydia.

The results of these and other studies has led to the U.S. Preventive Services Task Force and other professional societies' general recommendation to screen all pregnant women, all sexually active women less than age 26 years, and all women age 26 years and older at increased risk of acquiring an infection due to risky sexual behavior(s) for chlamydia (Hollblad-Fadiman & Golden, 2003). Increased screening has the potential to reduce the burden of chlamydia within the United States. As a nation we spent $1.7 trillion on health care in 2003 and expenditures are increasing (Government Accountability Office, 2005). This nation cannot afford to adopt ineffective and costly health care and public health policy. Screening women for chlamydia prevents serious and costly clinical sequelae and has the potential to prevent unnecessary health care costs.

Cost-effectiveness Considerations

Generally, the cost-effectiveness of a screening strategy is dependent upon a number of factors, including gender, age, test type, and prevalence of chlamydia in the population screened. Men are unlikely to be screened, even in high-risk populations, for several reasons; the benefits of screening men have not been clearly determined, the historical method for specimen collection via urethral swab has not been well accepted, and there are currently no clear clinical recommendations for widespread screening of male populations (Boekeloo et al., 2002). Subsequently, men are usually screened only when they present with symptoms or have been identified as a partner of a laboratory confirmed case. Given these conditions, it has not been established that wide-spread

screening of male populations would be cost effective. However, some studies suggest that screening policies might be cost-effective for male populations with high prevalence (McConnell, Packel, Biggs, Chow, & Brindis, 2003).

In contrast, the cost-effectiveness of screening women for chlamydia has been well established, because most of the economic and health consequences of undiagnosed infection are experienced by women. Analyses vary widely regarding perspective (health system, laboratory, military), costs, savings, and outcomes. Upon review of the literature, some researchers have concluded that all screening strategies, regardless of whether strategies are based on age or on the prevalence of chlamydia within a population, have the potential to reduce pelvic inflammatory disease, and therefore have the potential to reduce costs (Kohl et al., 2003).

For instance, one study examined the cost-effectiveness of screening for chlamydia at point-of-entry for Army recruits (Howell, McKee, Gaydos, Quinn, & Gaydos, 2000). The objective of the study was to determine relative cost savings to both the military and to the civilian health sector by examining three screening strategies: (1) screening all recruits, (2) screening only those recruits less than or equal to age 25 years, and (3) not screening. According to the authors, more than 50% of military recruits return to the civilian sector within two years of initial recruitment at which time they no longer receive medical care directly from the military. The implications of this study are therefore relevant to the private sector, where enrollee attrition and the subsequent accrual of prevention efforts are also uncertain for any one payer. The military thus offers a modified payer perspective.

The results of the study indicated that over a five-year horizon, screening 10,000 women on the basis of age would provide cost savings to the civilian sector of $505,053, as well as provide a cost-saving to the military of $53,325. Sensitivity analysis demonstrated that either screening method was a cost-effective option for both military and civilian sectors.

In an earlier study of a similar population, researchers concluded that screening recruits on the basis of age prevented 222 cases of PID and saved the military $15 per case of PID prevented over a one-year period (Howell, Gaydos, McKee, Quinn, & Gaydos, 1999). The study assumed a prevalence of 9.2%. The prevalence of chlamydia in military recruits has been determined to be this high, but the same cannot be presumed of any given civilian patient population (Kohl et al., 2003). Wide-spread screening in populations with prevalence lower than 9.2% might not realize similar cost savings. However, few studies have taken into account the infectious nature of chlamydia and are likely to underestimate the potential cost-savings associated with the interruption of disease transmission within the population (Roberts et al., 2004).

Honey et al. (2002) conducted a review of screening for chlamydia. They included 10 published studies in their review, all of which were simulated models, and assessed them using criteria recommended by the Task Force on Principles for Economic Analysis of Health Care Technology. All studies found screening for chlamydia to be cost-effective over testing on the basis of symptoms. Six of the studies showed that age-based screening of women for chlamydia provided cost-savings over only screening women who had symptoms of chlamydia in populations with prevalence as low as 1.1%. The researchers pointed out that while economic modeling is a quick and relatively

inexpensive way to determine the cost-effectiveness of a clinical prevention effort, the model depends on accurate and robust evidence. They questioned the reliability of modeling, as the rates of PID used in a number of studies may have been artificially high.

Nonetheless, when assessed for value to the healthcare system by examining burden of disease prevented and the relative cost-effectiveness of prevention efforts, screening for chlamydia in females age 15 to 25 years is considered to be a recommended clinical priority for preventive services. The relative value provided by various clinical services recommended by the U.S. Preventive Services Task Force was assessed by examining two criteria (Coffield et al., 2001). The first criterion was "clinically preventable burden," defined as the proportion of disease or injury prevented within a population if the service were delivered to 100% of the population targeted. The second criterion was "cost-effectiveness," defined as net cost divided by quality-adjusted life years saved. The services were ranked according to the sum of the scores for the two criteria. Screening for chlamydia received a total score of seven, and was ranked 11 out of 30 for the clinical preventive services most recommended. Subsequently, screening for chlamydia was one of eight preventive services recommended for future priority-setting efforts.

In spite of formal recommendations and evidence of cost-effectiveness, screening rates are consistently found to be less than ideal. Physicians or other health care providers must ascertain their patients' sexual history to determine whether STD screening is indicated, but providers fail to consistently ask their patients about their sexual health. Results from a survey of providers in Colorado indicated that up to 29% of health care providers fail to consistently ask their patients about their sexual history (Torkko,

Gershman, Crane, Hammon, & Baron, 2000). Physicians who are unlikely to take a sexual history from patients are less likely to screen for STDs (Torkko et al., 2000).

Using a Monte Carlo model and public health surveillance data, researchers have estimated that only 60% of females age 15 to 19 years were screened in 2000 (Levine, Dicker, Devine, & Mosure, 2004). Other studies indicate that only 30% to 60% of physicians report that they routinely screen for chlamydia in accordance with recommended guidelines (Cook et al., 2001; Hogben et al., 2002; Torkko et al., 2000; St. Lawrence et al., 2002).

Understanding Barriers to Screening: A Quality Framework

The Institute of Medicine defines quality as: "…the degree to which health services for individuals and populations increase the likelihood of desired health outcomes and are consistent with current professional knowledge" (Institute of Medicine, 1990, pg. 20). This definition integrates both a clinical or individual perspective, and a public health or population perspective regarding the provision of care. In the context of this study, quality is defined as the degree to which screening for chlamydia for individuals and populations increases the likelihood of desired health outcomes and is consistent with current professional knowledge. The desired health outcome is low rates of chlamydia within Spokane County. Screening has been shown to reduce the prevalence of chlamydia in a population and can therefore be considered a health service, the quality of which is measured by adherence to screening guidelines.

The Donabedian framework is often used to assess quality in health care. Donabedian discussed that there is a fundamental relationship between the structure of a health system, the processes of health care within that system, and health outcomes

(Furrow et al., 2004). Incidence and prevalence of chlamydia are the outcomes measured by public health through notifiable condition reports. These outcomes are impacted directly by clinical and public health activities; including screening behaviors, treatment patterns, and partner management strategies used by practitioners and public health authorities. Together, these components comprise the processes of care.[2] These processes are, in turn, directly affected by characteristics of the health system, including characteristics of hospitals, providers, reimbursement levels, public health resources, and statutes specifying reporting requirements. Together, these components comprise the structure of the health system.

Another study developed a four-category framework for classifying barriers to STD-related screening: structure, organization, provider, and patient (Barnes, Anderson, Weisbord, Koumans, & Toomey, 2003). This framework clearly identified clinical barriers to screening and the relationships among them. However, unlike Donabedian's framework, the implications of Barnes' framework for public health are not expressly clear. Barne's model did not incorporate the role of public health in prevention and control of chlamydia.

Public health departments are uniquely able to educate patient populations and inform local clinical practice through public health assessment, including data collection, analysis, and dissemination. As mentioned previously, health care providers are required by law to report infectious disease to public health departments. Public health compiles, analyzes, and disseminates the outcome data that effectively complete the quality

[2] Chlamydia rates are impacted by a number of other factors, including the sexual behaviors and networks of those affected. These topics are beyond the scope of this paper, which is focused on describing and improving the integration of public health and clinical practice with regards to barriers to screening.

framework. These data can be used to inform policy, system, and individual interventions necessary to reduce the spread of disease within a community.

Applying the Framework: the Impact of Structure on Outcomes

Screening for chlamydia can be regarded as a health care value. Thus, adherence to screening guidelines can be used to assess the quality of care provided by providers, organizations, and health care payers. Barriers to screening are barriers to quality care. Analyzing the barriers to care within the context of Donabedian's framework will facilitate understanding how those barriers impact outcomes in this community.

The managed care sector offers an ideal platform from which to analyze structural barriers to screening. Chlamydia screening of all sexually active females age 15 to 25 years is a Health Plan Employer Data and Information Set (HEDIS) performance measure for managed care organizations. HEDIS measures are standards used to evaluate the performance of a health plan in regards to quality, access, finances, and customer satisfaction. Thomas Eng, VMD, MPH, a leader at the Institute of Medicine on the role of health plans in STD prevention, discussed the major barriers to STD related care within the managed care climate (1999).

The first barrier is that there is substantial turnover of both health care staff and enrollees. This makes it difficult to consistently implement and track an STD prevention program from one year to the next. Enrollee turnover is a disincentive for health plans to implement a sound STD prevention program; the benefits of most prevention efforts are realized through the prevention of long-term sequelae associated with undiagnosed STD infection. Thus, these benefits will not likely accrue to the individual health plan, but rather to the health care system in general.

The problems with enrollee turnover are closely associated with financial disincentives to the provision of preventive services. This is the second barrier discussed by Eng (1999). Health plans must be competitive in order to survive in the current health care market. Competition necessitates cost containment measures. Weak prevention efforts and lack of compliance with clinical practice guidelines are the subsequent results. In the current environment of managed care, health care providers are reimbursed under a variety of capitation arrangements, which may promote or impede the delivery of effective STD-related care. If prevention efforts are reimbursed under a set capitation amount, providers are financially discouraged from delivering STD prevention services. In contrast, if prevention efforts are reimbursed separately, providers may be more likely to adhere to prevention guidelines. Additionally, health plans might provide performance incentives around clinical prevention efforts. This might also increase compliance with prevention guidelines.

Interestingly, a recent survey of providers demonstrated no consistent association between physician compensation methods and delivery of sexual health services in accordance with current practice guidelines (Pourat, Rice, Tai-Seale, Bolan, & Nihalani, 2005). In spite of the results obtained by Pourat et al., evidence indicates that managed care organizations often fail to consistently screen their enrollees for chlamydia.

A recent study demonstrated that a large managed care organization was not consistently adhering to recommended screening guidelines (Burstein et al., 2001). The electronic medical records of 43,205 female adolescents enrolled in a large, nonprofit, vertically integrated managed care organization serving a three state geographical area in the eastern United States were examined. All encounters of females seeking care for pap

smears, pelvic exams, contraceptives, pregnancy, or STD testing were included. The analysis indicted that of 5,510 females identified as sexually active, only 62.7% were tested for chlamydia. Since approximately 95% of workers covered by employee health benefits are enrolled in managed care plans, including HMOs, PPOs, or POS ("Trends and Indicators," 2004), these results have important implications to public health policy.

Applying the Framework: The Impact of Process on Outcomes

Rates of chlamydia are also impacted by processes. Donabedian wrote that the impact of process on health outcomes is more direct than the impact that structure has on outcomes (Furrow et al., 2004). While structural barriers certainly impact adherence to screening, ultimately the health care providers provide care. Thus, the ultimate responsibility for screening falls upon the providers.[3] In order to affect policy or system changes to improve outcomes by reducing the prevalence of, and morbidity associated with chlamydia, it is important to understand provider screening behaviors and factors that might impede quality care processes.

Individual provider and practice characteristics, and attitudes regarding STD-related care, could potentially be barriers to screening for chlamydia. For example, STDs are often a low clinical priority (Eng, 1999). Health care providers have a finite amount of time to devote to patient care. STD preventive services compete with other clinical priorities. Eng discussed that lack of sufficient time and energy, inadequate training or experience, and low demand for STD services due to disinformation and potential social

[3] See Wickline v. State of California, 192 Cal. App.3d 1630. The courts ruled that while theoretically, a health care payer can be held liable for interfering with the implementation of a physician's medical judgment, a physician can not escape his or her ultimate responsibility to provide patient care within the standard of practice (Furrow et al., 2004).

stigma associated with STDs might all impede adherence to STD screening guidelines. These factors impede quality and represent process barriers.

A number of health care provider surveys have demonstrated an association between screening practices to these and other factors including physician attitudes towards STDs. A survey conducted of primary care physicians examined the relationship between physician attitudes toward STD-related issues and counseling practices (Ashton et al., 2002). The researchers developed nine items to address physician attitudes regarding their provision of STD-related services. The nine items were then used to create a summary attitude score. Physicians' practice regarding asking patients for information related to patients' sexual history was assessed. Physicians were asked how often they counseled patients age 15 to 25 years regarding STD/HIV prevention, and how often they asked patients about specific risk behaviors. Female physicians and the type of clinical practice in which physicians worked (e.g., solo vs. group) were significantly associated with a favorable attitude regarding STD-related services. A positive summary attitude score was also significantly associated with physicians' counseling and risk assessment performance.

Provider willingness to screen all sexually active adolescents and the relationship of willingness to screen to attitudes about the cost effectiveness of screening were recently examined (Boekeloo et al., 2002). A self-administered survey was given to all primary care salaried providers in a managed care organization. Questions included the following provider characteristics: sex, provider type, primary specialty, practice location, years since graduating medical school, and the number of adolescent patients seen per month. Provider beliefs regarding cost-effectiveness, training, ease of screening,

confidence in ability, and provider willingness to screen all adolescents for chlamydia were also assessed.

Fifty-six percent of all providers in the study believed that screening all sexually active adolescents for chlamydia was cost-effective care in their practice. In multivariate analysis, physicians' belief that screening was cost effective was found to be an independent predictor of willingness to screen both male and female adolescents. The researchers concluded that educating providers regarding the cost-effectiveness of screening may increase their willingness to do so.

There are several limitations to the study. First, it is uncertain whether the results can be generalized to providers practicing under other reimbursement scenarios, since the study was limited to providers affiliated with managed care practice. Providers' practices are potentially influenced by beliefs regarding the cost-effectiveness of screening *and* by reimbursement/contract concerns which may vary among different practice settings.

Second, willingness to screen does not necessarily equate to screening *as practiced,* because as with many preventive services, the benefits of STD prevention efforts are accrued over a period of time. Screening for chlamydia may not be cost-effective for an individual provider or health plan due to enrollee attrition, but may still be cost-effective to the health system in general.

Providers were asked if they believed that chlamydia screening was cost-effective care *in their practice.* Over half of the providers in the study believed that chlamydia screening was cost-effective within their practice at that point of time, presumably *regardless* of uncertainties regarding attrition of their patient population. Providers might

also believe screening for chlamydia to be cost-effective care in the health system, which might also influence screening practices. This point was not addressed in the study.

The results of Boekeloo et al. (2002) study suggest that cost considerations potentially influence providers' clinical practice, and that their beliefs regarding the cost-effectiveness of screening for chlamydia may influence their willingness to do so. Further investigation is needed to determine the association between providers' beliefs regarding the cost-effectiveness of screening for chlamydia on *actual* practice, and from a societal perspective.

Finally, the study assessed simply whether providers' views regarding the cost-effectiveness of screening were associated with their willingness to do so. The cost-effectiveness of screening may be influenced by numerous factors, including the type of laboratory test used and disease prevalence. Perceptions of laboratory tests were assessed, but were not included in the analysis, because the technology was relatively new at that time and few providers were likely to have been using it. The study did not address providers' perceptions of the prevalence of chlamydia in their patient populations.

Another survey conducted in Pennsylvania specifically addressed beliefs regarding prevalence (Cook et al., 2001). Physician attitudes and beliefs regarding STDs, prevention services, perceived barriers to providing STD services, and knowledge about chlamydia infection were assessed through physician responses to 16 items reported on a five-point Likert scale. Physicians' screening practices were assessed through answers to a clinical scenario. Multivariate analysis indicated that physicians were significantly more likely to screen for chlamydia if they were female and worked in a clinic or group-practice setting.

Regarding attitudes, physicians were significantly more likely to screen for chlamydia if they felt responsible for ensuring STD prevention for their patients, if they believed that a large proportion of their patients were sexually active, and if they believed that screening for chlamydia could prevent pelvic inflammatory disease. Results of the survey also demonstrated that attitudes regarding time pressures and financial difficulties associated with screening for chlamydia were *not* associated with screening behaviors of the providers surveyed.

The researchers found that physicians who believed the prevalence of chlamydia in their patient population was low were less likely to screen their patients for chlamydia. This finding has important implications because the cost-effectiveness of screening is largely dependent upon the prevalence of chlamydia within a population. Providers who believe the prevalence of chlamydia within their patient population is low may also believe that screening all sexually active patients less than 26 years of age (as recommended) might not warrant the costs.

Recent discussions with local providers in Spokane County shed additional light on the relationship between screening and cost considerations. A private family practice physician pointed out that payers often monitor physician performance related to the number of tests or procedures ordered during patient visits, thus providing a disincentive to screen for chlamydia. In contrast, however, physicians can bill more for intensive patient visits that are more complex or require extensive testing, thus providing an incentive for physicians to test for chlamydia. When asked about her specific screening behavior, one of the first concerns she expressed was regarding the cost effectiveness of screening within her patient population. Due to consistently negative test results, she

limits the number of chlamydia tests that she performs on her patients. She questions the cost-effectiveness of widespread screening in her practice, a particular concern when considering future contracts with payers.

A local pediatrician discussed the issue of screening from two perspectives. With regard to her own behavior, she decided that screening for chlamydia was not practical. She did not provide much STD care for women, and was therefore concerned that the quality of STD-related care she provided might suffer. As a result, she decided to refer patients for whom screening was indicated.

This pediatrician indicated that screening for chlamydia is encouraged at the HMO in which she works. The organization has established screening policies (which are an example of structural characteristics), and specifies that a percentage of at-risk patients be screened for chlamydia. Individual family practice physicians are monitored and provided feedback regarding their screening behaviors. Reimbursement is generally not a barrier to preventive care, since physicians can make more money with increases in some preventive screenings (e.g., mammograms). Additionally, the organization utilizes an electronic medical record that actually prompts physicians to provide STD screening. From her perspective, providers within her organization are encouraged rather than inhibited from screening. This is in contrast to other practice settings, where physicians face barriers of time constraints and heavy patient case loads.

Integrating Clinical and Public Health Policy and Practice

Chlamydia rates within Spokane County are rising. A thorough understanding of local providers' perceptions of barriers to screening is essential to future intervention efforts. Local data exist regarding rates of reported STDs, but the clinical practice of

physicians in Spokane County is uncertain, and public health assessment is therefore warranted. The purpose of this study was to gain a better understanding of providers' screening behaviors, and factors that potentially influence those behaviors, including providers' beliefs regarding the costs of screening, benefits of screening, and barriers to screening by administering a mailed survey to local physicians, nurse practitioners, and physician assistants.

Hypothesis

Building on the implications of Boekeloo et al. (2002) and considering the results obtained by Cook et al. (2001), I hypothesize that providers' beliefs about costs and effectiveness are significantly associated with the reported screening behaviors of participating providers. Specifically, I hypothesize that providers with the following beliefs are more likely to report that they routinely screen their patients for chlamydia: (1) laboratory tests are not too costly to screen all sexually active patients age 15 to 25 years; (2) screening all sexually active women age 15 to 25 years for chlamydia will prevent unnecessary health care costs; (3) chlamydia is not too uncommon in their patient population to justify the costs of screening all asymptomatic, sexually active patients age 15 to 25 years.

CHAPTER 2

~ RESEARCH DESIGN AND METHODOLOGY ~

Subjects

A survey was mailed out to all Spokane County physicians, physician assistants (PAs), and nurse practitioners (ARNPs) who practice in emergency medicine, internal medicine, family/general practice, obstetrics & gynecology, or pediatrics. These five specialties provide the majority of all STD-related care (Boekeloo et al., 2002; Cook et al., 2001). The final mailing list was obtained by cross-referencing a health care provider list utilized by the Spokane Regional Health District with the Spokane County Physician's Directory (2006). A total of 663 providers were initially mailed a survey in November of 2005.

Design

The non-experimental, retrospective survey of active health care providers in Spokane County was approved by the Institutional Review Board of Washington State University. The surveys were mailed with a cover letter, a self-addressed return envelope and a survey postcard. Providers were asked to fill out and mail the post card separately. The survey postcard was used to track respondents and ineligible providers while maintaining the confidentiality of survey responses. Providers were also asked to indicate on the postcard if they would be willing to sit on an STD Expert Panel.

The survey packets were sent out at week one, followed by a reminder post card at week three. Nonresponders were mailed a second packet and a subsequent reminder card at weeks six and eight respectively. Phone calls were attempted to each provider's office in between mailings in order to verify eligibility and encourage participation in the

study. Not all offices were successfully contacted due to time constraints. Messages were left at several offices but were not returned. Additional surveys were mailed or faxed upon request. Providers were ineligible if: (1) they were retired, (2) they had moved out of the county, (3) the survey was returned as undeliverable and current addresses could not be located, or (4) they did not see patients between age 15 and 25 years. A total of 115 providers were determined ineligible.

Measurement

The survey was developed utilizing existing questions from the literature and modified after receiving expert input from a practicing family physician. A draft of the survey was tested by four different providers (an internist, an ob-gyn, a family physician, and an ARNP) and was subsequently revised utilizing their input. The final instrument consisted of four pages, 62 total questions, and took approximately 12 to 15 minutes to complete (see Appendixes A and B for the final survey instrument and materials).

There were two primary outcome measures (dependent variables). These were the frequency that providers screened sexually active females and the frequency that providers screened sexually active males age 15 to 25 years for chlamydia. This was assessed by asking providers to indicate on a five-point Likert scale (all of the time to none of the time) their response to the statement, "I screen sexually active females (ages 15-25 years) for chlamydia." The frequency of screening males was asked separately, because screening practices are presumably different for males and females given differences in clinical guidelines. Survey responses to questions regarding screening for males were omitted in the analysis for obstetricians/gynecologists due to the fact that they are unlikely to see male patients. The providers were also asked how frequently they take

a sexual history from patients age 15 to 25 years during new or annual patient visits using the same Likert scale.

The independent variables consisted of questions that assessed the demographic and practice characteristics of providers and questions that assessed the beliefs and attitudes of providers with regard to STD-related care. The first page of the survey asked for the demographic characteristics of providers, including profession, gender, years since training, and specialty. Providers were also asked about the number of Hispanic and minority patients in their practice, practice setting, number of patient visits and STD specific visits per week, patients' insurance coverage, whether they follow clinical practice guidelines for STD-related care, and whether or not they were required to meet specific performance standards for chlamydia screening by any payer contracts. Respondents reported on whether they participate in the Infertility Prevention Project, a program that provides free laboratory testing and medication to high risk women.

The second page of the survey addressed provider screening practices and general attitudes and beliefs towards STD-related care in general and screening for chlamydia in particular. Providers were asked to indicate the diagnostic technology they most often used, as well as, the type of sample collected (cervical/urethral swab vs. urine), because laboratory tests can influence the ease and cost-effectiveness of screening. I assumed that providers who use amplified urine tests to screen for chlamydia would be more likely to report positive screening behaviors.

Attitudes and beliefs were addressed by asking the providers to indicate on a five-point Likert scale the level to which they agreed or disagreed with each of 16 attitude statements. Several attitude statements were pulled from other studies and used directly

or modified to address the particular objectives of this study based on the prior study's conclusions (Boekeloo et al., 2002; Cook et al., 2001). Several original statements were developed for purposes of this research after discussions with local providers.

Attitude statements assessed providers' beliefs regarding STD-related care in general, screening for chlamydia, and the costs or effectiveness of screening for chlamydia. For example, the statement, "I am well trained to address sexual risks with young patients," assessed general beliefs with regard to STD-related care and was pulled directly from Cook et al. (2001). The statement, "Compared to other clinical preventive services, screening for chlamydia is a priority in my practice" is an original attitude statement developed after a discussion with a local family practice physician. The statement, "Screening all sexually active women (ages 15-25 years) for chlamydia will prevent unnecessary health care costs," was developed based on results obtained from Boekeloo et al. (2002).

The third page of the survey addressed provider practices regarding partner management strategies and was followed by a series of questions to assess provider attitudes around patient delivered partner treatment. These findings will be analyzed and communicated in a separate report. The fourth page of the survey addressed STD reporting behaviors and other items that might be important to subsequent public health interventions. Specifically, providers were asked if they followed recommended instructions for specimen collection and whether or not they would be interested in receiving future training on specimen collection techniques. They were also asked whether or not they used patient-administered computer programs to obtain a patient's sexual history and clinical decision support tools to help them adhere to recommended

clinical practice guidelines, and who in their practice they relied on to provide STD education to patients. Finally, providers were asked to indicate the best ways for Spokane Regional Health District to reach them with public health information on STDs and other notifiable conditions.

Analysis

The surveys were scanned into Teleform® by Verity Incorporated and verified for accuracy. Teleform automatically prompts the reviewer to conduct a visual check for accuracy for any field that the system deems is unclear or for any field that is set up for automatic verification (e.g. open-ended questions).

Summary statistics were run on each of the demographic and practice characteristics. Several survey responses were recoded. Specifically, providers indicating their specialty as "other, women's health" were recoded as ob-gyn's. Respondents who indicated that the setting in which they provided the most STD-related care was the military, college or university based, prison, or Indian Health Services, were classified as practicing in a public/community clinic.

As done in similar surveys, the distribution of responses was reviewed and several variables were collapsed into fewer response categories (Ashton et al, 2002; Cook et al., 2001). Specifically, respondents who reported their profession as "other, CNM" were combined with ARNPs. Primary specialty was collapsed into five categories: emergency medicine/urgent care, internal medicine, pediatrics/other, family/general practice, and obstetrics & gynecology. All interval level data was also reviewed and subsequently dichotomized into two categories depending on where the natural break occurred; 0 to 10 or more than 10 years since training, 0 to 5 or more than 5 STD-related patient visits per

week, more or less than 5% Hispanic patient population, more or less than 20% minority populations, and more or less than 40% patient populations covered by Medicaid.

The two dependent variables and all attitude statements were also dichotomized (Ashton et al., 2002; Boekeloo et al., 2002; Cook et al., 2001; Torkko et al, 2000). Respondents who reported that they screen all of the time or most of the time were classified as "usually screens" and those that reported that they screened half, some, or none of the time were classified as "doesn't usually screen." Provider responses to the attitude statements were dichotomized as "agrees" or "disagrees" dependent upon the direction of the statement (positive or negative). Neutral or unsure responses were classified with "disagrees" for positively worded statements and with "agrees" for negatively worded statements. For example, in response to the question "I am comfortable discussing sex-related issues with my patients," providers who strongly or moderately agreed were classified as "agrees" and providers that were neutral/unsure, or in moderate or strong disagreement were classified as "disagrees."

Survey data were analyzed using Intercooled Stata for Windows®. The association between provider and practice characteristics and frequency of screening for chlamydia was assessed using chi-square statistics. Each of the 16 attitudes was also tested for association with each of the dependent variables using chi-square statistics. All associations were considered significant at a *p*-value of .05.

CHAPTER 3

~ RESULTS ~

Respondents vs. Nonrespondents

Of the 663 providers surveyed, 30 indicated that they were ineligible, 85 had moved, retired, or could not be located, and 38 refused to participate. A total of 264 providers returned surveys, four of which were excluded from the analysis because the provider indicated specialization in a field other than the five surveyed. The final response rate was 47.4%. The response rate was calculated as follows:

$$\frac{\text{[Number of returned and completed surveys – Exclusions]}}{\text{[Number of surveys initially mailed – Number of known ineligibles]}} \times 100$$

Characteristics of respondents vs. nonrespondents are reported in Table 1. Relative to nonresponders, responders were more likely to be female, ARNPs or PAs, and were less likely to specialize in emergency or internal medicine.

Characteristics of Providers and Their Practices

Characteristics of survey respondents are reported in Table 2. The greatest number of respondents reported that they provided the most STD-related care in private group practice (n = 118, 45.9%), the fewest provided care in a family planning clinics (n = 6, 2.3%). Almost 28% of providers (n = 62) indicated that they saw more than five females per week for screening or treatment of STDs and less than 2% of all providers (n = 3) reported that they see more than five males per week for screening or treatment of STDs.

There are seven Infertility Prevention Project (IPP) sites in Spokane County (WSDOH, 2004a). Only eight survey respondents reported that they participated in the

IPP. The remainder of respondents indicated that they either did not participate in the IPP or were unsure if they did.

A large number of respondents (n = 223) submitted information on the percentage of their patient population of Hispanic ethnicity. Of these, 18.4% of providers (n = 41) reported that more than 5% of their patient population is Hispanic. Fewer providers submitted information with regards to the race and insurance coverage of their patient population, presumably because this information is difficult to approximate. For these reasons, these variables were not analyzed for association with the dependent variables.

Summary of Provider Behaviors

A summary of provider behaviors is reported in Table 3. Provider agreement with all attitude statements is reported in Table 4. Most providers (n = 207, 79.9%) reported that they followed one of four clinical practice guidelines, the American Academy of Family Physicians, the U.S. Preventive Services Task Force, the American College of Obstetrics & Gynecology, or the Centers for Disease Control and Prevention, for STD-related care. However, only 5.1% (n = 13) indicated that they are required to meet performance standards for chlamydia screening by payer contracts.

Most respondents reported that they use either laboratory culture (n = 92, 39.0%) or an amplified test (n = 81, 34.3%) to screen patients for chlamydia. No respondent indicated that they used non-amplified tests and few respondents (n = 6, 2.5%) reported using a rapid or point-of-care test to screen for chlamydia. A greater number of providers reported using urine to test males for chlamydia (n = 85, 46.0%) than to test females for chlamydia (n = 33, 14.9%), and most providers (n = 200, 80.0%) follow the manufacturers' instructions for quality collection techniques.

Most providers reported usually taking a sexual history during new or annual patient visits (n = 209, 82.3%) and reported that they themselves usually provide STD education or counseling to their patients (n = 214, 84.9%), as opposed to relying on a nurse or medical assistant (n = 10, 4.0%) or written materials (n = 16, 6.3%). Additionally, 43.4% of respondents (n = 106) reported using some form of clinical decision support tool to help them adhere to clinical guidelines, and 20.2% of providers (n = 50) use patient-administered tools to help them elicit a sexual history from patients.

Summary of Associations

There were two dependent variables in this study: (1) the frequency that providers screen females age 15 to 25 for chlamydia, and (2) the frequency that providers screen males age 15 to 25 for chlamydia. The majority of respondents, 62.1% (n = 157) indicated that they screened females for chlamydia all or most of the time. In contrast, only 21.7% of respondents who provided care to males (n = 46) indicated that they always or usually screened males for chlamydia.

Results of the chi-square statistical tests for association indicated that a total of eighteen independent variables were statistically associated with regularly screening females for chlamydia; ten personal and practice characteristics reported in Table 5, and eight attitude statements reported in Table 6. ARNPs were more likely than either PAs or physicians to regularly screen female patients for chlamydia ($\chi^2 = 13.1$; $p < .02$). The number of years since training was completed was also significantly associated with positive screening behavior. Providers who had completed their formal training within ten years were more likely to screen females for chlamydia ($\chi^2 = 5.2$; $p < .05$). Female

respondents were also more likely to regularly screen females for chlamydia than were male respondents ($\chi^2 = 22.6$; $p < .001$).

Providers practicing in emergency or internal medicine were less likely to report regularly screening females for chlamydia, compared with providers practicing in obstetrics and gynecology, pediatrics, or family/general practice ($\chi^2 = 20.4$; $p < .001$). Providers who saw more than five patients per week for STD specific care were significantly more likely to screen females for chlamydia ($\chi^2 = 12.1$; $p < .001$), as were providers who reported following one of the four common clinical practice guidelines ($\chi^2 = 8.5$; $p < .02$), and whose patient population was composed of greater than 5% Hispanics ($\chi^2 = 10.2\%$; $p < .02$).

Providers who reported usually taking a sexual history from patients between age 15 to 25 years were significantly more likely to screen their patients for chlamydia ($\chi^2 = 35.8$; $p < .001$). While fewer providers reported using patient-administered support tools than reported using clinical decision support tools (n = 49, 77.6%, vs. n = 105, 65.7%), use of patient-administered tools was significantly associated with positive screening behavior ($\chi^2 = 6.5$; $p < .02$) whereas use of clinical decision support tools was not ($\chi^2 = 1.4$; $p > .05$).

Of the 16 attitude statements, eight were significantly associated with regularly screening females for chlamydia. The results of the analysis are shown in Table 6. Providers were significantly more likely to screen females for chlamydia if they felt comfortable discussing sex-related issues with patients, if they felt responsible for ensuring that patients in their practice received appropriate STD preventive services, if they believed that screening all sexually active women age 15 to 25 years for chlamydia

would prevent unnecessary health care costs, and if screening for chlamydia was a priority compared to other clinical preventive services.

Providers were significantly less likely to screen their patients all or most of the time if they thought that most of their patients did not want STD prevention services, if they thought that most of their patients were not sexually active, if they believed that laboratory tests were too costly to screen all sexually active patients age 15 to 25 years for chlamydia, or if they believed that chlamydia was too uncommon in their patient population to justify the costs of screening all patients for it.

In contrast to screening females for chlamydia, only three variables were significantly associated with usually screening males for chlamydia. As with females, providers were significantly more likely to screen males for chlamydia if they reported usually taking a sexual history during new or annual patient visits ($\chi^2 = 8.7$; $p < .02$). As with females, the diagnostic technology most frequently used was not associated with screening males for chlamydia. However, providers who reported using urine specimens to screen males for chlamydia were more likely to regularly screen males for chlamydia than providers who reported using urethral swab ($\chi^2 = 3.9$; $p < .05$). Finally, only one attitude was associated with screening males. Providers who reported feeling responsible for ensuring that young patients received STD preventive services were more likely to regularly screen males.

CHAPTER 4

~ CONCLUSION ~

Research Implications

This study assessed the frequency that health care providers in Spokane County screen patients for chlamydia. The results indicate significant gaps in screening sexually active young patients for chlamydia; almost 78% of primary care practitioners are not routinely screening males, and almost 38% of providers are not routinely screening females. Screening rates might be improved by informing health care providers regarding the cost-effectiveness of screening for chlamydia, the availability of urine-based testing, and by training them how to conduct effective sexual risk assessments of patients.

A recent study found that physicians' perceptions with regard to the prevalence of chlamydia in their patient population were significantly associated with screening behavior (Cook et al., 2001). Another study found that beliefs regarding the cost-effectiveness of screening for chlamydia were associated with providers' *willingness to screen* all sexually active adolescents for chlamydia (Boekeloo et al., 2002). I had hypothesized that cost considerations are associated with positive screening *behaviors.* Three attitude statements were designed to address these considerations and all three were found to be significantly associated with screening sexually active females age 15 to 25 years for chlamydia.

Specifically, providers who agreed that laboratory tests are too costly to screen all sexually active patients age 15 to 25 years, and providers that agreed that chlamydia is too uncommon in their patient population to justify the costs of screening all

asymptomatic, sexually active patients age 15 to 25 years, were significantly *less* likely to report that they usually screened females for chlamydia.

In contrast, providers that agreed that screening all sexually active women age 15 to 25 years for chlamydia will prevent unnecessary health care costs were significantly *more* likely to report that they routinely screen their female patients for chlamydia. The results of this study indicate that cost considerations and perceptions of prevalence may influence actual clinical practice.

Controlling the spread of disease is dependent upon the adoption of cost-effective practices. Cost-effectiveness considerations, out of necessity, will continue to guide the delivery of modern health care. Research suggests that screening for chlamydia is cost-effective when prevalence is greater than 1% (Honey et al., 2002). Informing providers regarding prevalence and the costs and benefits of screening for chlamydia has the potential to increase quality processes in compliance with screening guidelines. Increasing screening rates will improve outcomes by lowering the incidence and prevalence of chlamydia in a community.

The results of this study also indicated a large gap in the provision of STD services for males. Given the absence of clear clinical guidelines or evidence of clear benefits of screening males for chlamydia, the results of this study are not unexpected; similar results have been reported in other studies (Boekeloo et al., 2002). However, the fact that males are so infrequently screened may be one factor contributing to the spread of chlamydia. Providers should be minimally educated regarding the role of males in spreading infections, and that screening high-risk males may be necessary to avert cases of PID in female sexual partners. Specifically, screening rates for males might be

improved through interventions that (1) increase the use of urine-based testing, and (2) encourage providers to conduct effective sexual risk assessments during routine new or annual patient visits.

The results of this study indicate that providers who utilize urine-based screening were significantly more likely to report consistently screening males for chlamydia. A similar association between sample type and frequency of screening females was not observed. However, it is thought that females are socially conditioned to receive gynecological care; providers might be more comfortable screening women in general, making the sample type inconsequential (Boekeloo et al., 2002).

Additional efforts should focus on informing providers regarding the ease and effectiveness of urine-based testing. Urine-based testing is better tolerated by patients, particularly males, and might increase the rate that males are screened. Less than half of all providers (46.0%) reported usually using urine specimens to screen males for chlamydia. Even fewer providers are consistently using urine to screen females (14.9%). Urine-based screening is highly sensitive and specific, but is also more expensive than other tests (Holliblad-Fadiman & Golden, 2003). However, studies have indicated that urine-based screening might actually be more cost-effective than other screening tests, because it detects more cases of chlamydia, thereby preventing more cases of PID (Honey et al., 2002).

Another finding that may guide future intervention is with regard to sexual risk assessment. Regularly taking a sexual history was significantly associated with regularly screening both females ($p < .001$) and males ($p < .02$). Providing training to the provider community regarding effective sexual risk assessment might improve overall screening

rates. Additionally, providers who reported using patient-administered support tools (computer programs or other materials) to elicit a sexual history or provide counseling messages, were more likely to routinely screen females for chlamydia.

The reasons for this are not clear. Use of ready-made tools may save providers time, as the patient can fill out a questionnaire or review STD-related information while they are waiting to be seen. Since a provider can use the tool as opposed to direct discussion to ascertain whether or not the patient needs to be screened, use of such tools may also overcome patient or provider discomfort with the topic of sexuality.

Several other findings warrant discussion. It has been well established that female health care providers tend to report better adherence to STD-related guidelines (Ashton et al., 2002; Boekloo et al., 2002; Cook et al., 2001; Torkko et al., 2000; Wimberly & Hogben, 2004;). The results of this study indicate the same. The reasons for this are not well understood. It has been suggested that female providers might be more likely than males to provide appropriate STD-related care because of personal experiences with STD-related care, because of sympathies associated with the general belief that STDs are inherently female problems, or because of differences in attitudes or knowledge generated early on in training (Ashton et al., 2002; Cook et al., 2001; Torkko et al., 2000).

Additionally, most studies of this type have focused on the screening behaviors of physicians. However, PAs and ARNPs are a lower cost substitute to physicians and thus provide a great deal of primary care, including sexual health services (Grumbach & Coffman, 1998). This study offers new insight on differential attitudes and behaviors. In this study ARNPs were more likely than physicians or PAs to report screening females

for chlamydia all or most of the time. Similar results were reported by Torkko et al. (2000), who found that nurse practitioners were more likely than either physicians or PAs to both regularly take a sexual history and to regularly test patients for chlamydia.

A previous study reported no significant relationship between providers' years in practice and screening behaviors (Cook et al., 2001). Another study reported an unexpected finding that older provider age (greater than 40 years) was associated with regularly testing for chlamydia (Torkko et al., 2000). The findings from this study indicate a positive association between years since training was completed and screening females for chlamydia; providers who had completed training within the past ten years were significantly more likely to report usually screening females for chlamydia. Ashton et al. (2002) found that physicians 40 years of age or younger were more likely to report that STD specific training that they received in medical school was adequate. The findings presented here might reflect changes or updates in medical education curriculums with regard to STD related care (Ashton et al., 2002).

Finally, providers who reported having a patient population greater than 5% Hispanic were more likely to report regularly screening females for chlamydia. These findings should be interpreted with caution since it is presumed that providers were essentially reporting their "best guess" with regard to this variable. However, minority and Hispanic populations are at higher risk of chlamydia infections (Hollblad-Fadiman & Goldman, 2003). In Washington State, 14.7% of all cases were of Hispanic ethnicity, and 46% of all cases were in minority groups (WSDOH, 2004b). These results may indicate that providers are screening higher risk groups more frequently.

Areas for Further Research

Screening all women age 15 to 25 years for chlamydia was adopted by the National Committee for Quality Assurance as a Health Plan Employer Data and Information Set (HEDIS) performance measure in 2000 (Burstein et al., 2001; Shafer et al., 2002). While screening is not yet mandated, it is encouraged via HEDIS performance measures.

It was expected that providers would be influenced by their payer contracts, particularly if they were required to conduct a certain amount of preventive screenings. However, no association was detected between providers who reported that they were required to meet specific performance standards with regard to chlamydia screening, and reported screening behaviors. Only thirteen providers reported that they were required to meet performance standards for chlamydia screening by payer contracts. It is possible that the question was unclear, but like results obtained by Cook et al. (2001), there was also no association between providers' responses to the attitude statement, "Payer contract monitoring limits my ability to provide STD prevention services," and screening for chlamydia.

Providers are generally reluctant to provide services for which they will not get reimbursed. For instance, providers reimbursed under capitated arrangements may be discouraged from providing preventive services in spite of the HEDIS performance measure. The literature indicates that since implementation of the HEDIS measure, improvements in screening have been marginal. Average screening rates for chlamydia in managed care organizations increased only slightly between 1999 and 2001 (Henderson,

Tao, & Irwin, 2005). Providers often have conflicting incentives. The impact of performance measures on screening behaviors warrants further investigation.

Further investigation is also needed with regard to the cost-effectiveness of screening for chlamydia. To date, cost-effectiveness has been determined by computer models. Studies have indicated that screening can provide cost savings even within a one-year horizon in military populations. Such savings might also be realized in managed care populations in the civilian sector. Further studies using data gathered from controlled trials are needed to firmly establish the cost savings provided by expansive screening programs. Managed care populations are the ideal platform from which to conduct such a study.

The Institute of Medicine recommends that health plans be mandated to cover comprehensive STD preventive services, and if necessary, that they develop contractual relationships with public health departments for the provision of such services (Eng, 1999). Health plans experience turnover in the populations they cover, and this impedes the delivery of preventive services. Health payers are more likely to comply with a mandate if presented with firm evidence that doing so will be cost beneficial.

Implications for Local Public Health Practice

It has been suggested that behavioral change progresses in a continuous process and involves changing beliefs and knowledge, restructuring the environment in which the change is needed, and proving social support and/or a reward system in acknowledgement of change efforts (Cohen, Halvorson, & Gosselink, 1994). As a mechanism in this process, passive dissemination of information is not highly effective in

changing actual provider behavior, but might raise general awareness of the change desired (Grimshaw, Eccles, Walker, & Thomas, 2002).

Providers need to first understand that there is a gap in screening for chlamydia. As a first step, Spokane Regional Health District (SRHD) should raise awareness of the importance of screening patients for chlamydia, and of the current gaps or deficiencies previously discussed. The result of this survey should be actively disseminated to providers in Spokane County so that providers understand that change is needed. SRHD can use methods currently available to the organization, including the Epi-Gram newsletter, public health liaison outreach, and professional societies.

Other strategies are also needed. These may include feedback mechanisms that inform providers with regard to individual behaviors and patient populations, utilization of local opinion leaders or peer experts, and implementation of interventions that target both providers and the staff with whom they work. These strategies together are likely to be more effective at changing provider behavior than passive dissemination of information alone (Grimshaw et al., 2002).

The results of this study indicate that providers' screening behaviors are significantly associated with their attitudes and beliefs about chlamydia and STDs in general. At the very least, education should be targeted to address those beliefs and attitudes that were identified as barriers to screening. Specifically, all providers should be educated with regard to the prevalence of chlamydia, the role of males in the transmission of infection, specimen collection and diagnostic laboratory technologies.

According to the Washington State Department of Health, positive rates of chlamydia detected in females by private physicians in Washington State are greater than

7% (WSDOH, 2004b). In fact, prevalence of chlamydia in female populations screened was greater than 3% for all providers assessed in 2004 (WSDOH, 2004b). Providers in Spokane County should be minimally educated with regard to general prevalence rates in Spokane County. If able to obtain provider-specific prevalence and testing data, then SRHD could implement a direct feedback mechanism for providers to understand their specific patient population and their own screening practices. Feedback mechanisms have been found to improve provider performance around laboratory tests and prescribing practices (Cohen, Halvorson, & Gosselink, 1994). SRHD is currently pursuing a data sharing agreement with Pathology Associates Medical Lab to obtain provider-specific testing and testing results. If SRHD is able to obtain such data, then providers should be educated regarding the prevalence of chlamydia in their own practices.

The results of this study indicate that education around laboratory testing in general is also warranted. Greater than 24% of providers indicated that they didn't use laboratory testing, or that they were uncertain which test they used. Additionally, the majority of respondents indicated that they would be interested (27.8%, n = 71) or potentially interested (29.4%, n = 75) in receiving additional training with regard to quality specimen collection. SRHD should provide laboratory education to interested providers by collaborating with professional societies in order to ensure that continuing medical education credits are awarded to participants.

Additionally, over 47% of respondents believed that their patients do not want STD prevention services. Providers who believed this were significantly less likely to routinely screen for chlamydia. Educating patient populations regarding the need for screening may increase demand for prevention services, and in turn, influence physician

attitudes and increase rates of screening. Educating providers on the age-dependent risk factors may also increase screening in adolescent populations, as providers who agreed that most of their patients less than 18 years of age were not sexually active, were significantly less likely to screen for chlamydia. It is estimated that 65% of adolescent females are sexually active by the age of 18 (Cook et al., 2001).

Adherence to one of four clinical guidelines was significantly associated with screening females for chlamydia. Providers should be reminded of the importance of following clinical practice guidelines with regard to STD screening. One potential avenue for intervention to increase compliance with clinical guidelines is thru the Infertility Prevention Project (IPP). Providers who reported participating in the IPP were significantly more likely to regularly screen females for chlamydia. These results should be interpreted with caution because only eight respondents reported participating in the IPP. Nonetheless, all eight IPP providers reported usually screening females for chlamydia.

The IPP is a collaborative effort between public health laboratories and STD and family planning clinics throughout the country, and provides free or low cost testing and treatment for chlamydia to eligible patients. Participating providers are trained and instructed to screen all women age 24 and younger and any other woman with risk factors when undergoing a pelvic exam (CDC, Office of Population Affairs, 2000). Training is provided through CDC sponsored STD/HIV Prevention Training Centers.

The IPP training program is an ideal platform from which to address the knowledge and training gaps identified by this study. The training program is comprehensive and could be offered to local providers who are not currently participating

in the IPP program through the Seattle Training Center. Providers have access to intensive two or five day courses, teaching tools such as videos, case-based modules, and videos, and continuing education credits are available. Expanded access to CDC STD/HIV Prevention Training Centers was actually a recommendation made by the IOM (Eng, 1999).

Additionally, at-risk populations need greater access to IPP services. According to Katherine Gudgel, Special Projects Coordinator at the Washington State Department of Health, juvenile detentions are existing IPP sites, but chlamydia screening is currently inadequate in these settings (personal communication, March 8, 2005). Efforts should be made to increase screening rates of incarcerated adolescent females through the IPP program. Special efforts should also be made to increase screening of males in these high-risk populations. A recent study demonstrated that universal screening of males at entry into the juvenile detention systems was cost-effective over no screening or selective screening in populations with prevalence as low as 2.8% (Blake, Gaydos, & Quinn, 2004).

Further investigation is needed to assess community gaps in chlamydia screening in emergency care settings. Providers practicing in emergency medicine were less likely to report regularly screening females for chlamydia than providers practicing in obstetrics and gynecology or family practice. Ashton et al. (2002) reported that pediatricians had the least favorable attitudes regarding STD-related care, Cook et al. (2001) reported no significant association between specialty and screening for chlamydia, and Torkko et al. (2000) reported that internists were the least likely to regularly screen for chlamydia. None of these studies included providers practicing in emergency medicine.

Researchers have reported that emergency medicine physicians practicing in 13 of the southern states were the least likely to screen, and that they also diagnosed significantly more STDs than providers in other specialties (Wimberly & Hogben, 2004). Within Washington State, 395 cases of chlamydia were diagnosed in the hospital or other emergency care setting in 2004, and the positive rate was greater than 4% for all hospital-related testing (WSDOH, 2004a.). Within Spokane County, 11% of all reported cases of chlamydia in 2004 came from hospitals or emergency care settings (WSDOH, 2004b.). The emergency health care setting is a source of positive cases and one potential avenue for public health intervention.

Vic Ross, Washington State Department of Health's Region 9 Health Services Consultant (STDs), offered additional anecdotal evidence to justify a public health intervention in this setting (personal communication, February 2, 2006). According to Ross, who investigates reported cases of STDs in Spokane County, high-risk patients often provide misleading or false contact information upon admittance to the hospital in order to avoid reimbursement responsibilities for the care they receive. The results of this study indicate that few physicians are utilizing rapid or point-of-care chlamydia testing. Rapid tests provide results in 30 minutes. Most providers are using technologies that take at least 24 hours before results are reported. If patients are discharged before the results of their STD testing are reported, they may go untreated.

Recent studies have reported prevalence greater than 13.0% in patients visiting emergency departments (Embling, Monroe, Oh, & Hook, 2000; Mehta, Rothman, Kelen, Quinn, & Zenilman, 2001). Another study demonstrated that the combined use of point-of-care chlamydia testing with presumptive treatment guidelines in an STD clinic

increased the proportion of patients infected with chlamydia who receive same-day treatment (Swain et al., 2004). A similar protocol may be utilized in the emergency care setting to reduce the number of patients discharged with untreated infections.

Follow-up to this study should include a chart review at a local hospital to identify gaps in screening and treatment for chlamydia. If warranted by the chart review, subsequent public health intervention might target emergency medicine providers to increase screening for chlamydia generally, and to increase utilization of point-of-care diagnostic testing. Such efforts would ensure that those who are screened are appropriately treated when the opportunity is presented. However, hospital emergency departments are unlikely to implement an expanded screening program if they would have to bear the costs. Collaborations need to be formed between public health departments and hospitals for an intervention of this nature to be successful.

Expanding the IPP to nontraditional sites like emergency departments might be possible if funds could be conserved at existing sites. Currently, each IPP site is allocated a specific number of tests that can be performed. The test and subsequent treatment if needed is made available at reduced or no cost to eligible patients. However, payment should be requested from all patients able to pay. There is considerable debate whether this is in fact done at all sites and at all times (Katherine Gudgel, personal communication, March 8, 2005).

Implementation of standard procedures to encourage payment from those able to pay might increase the number of patients that can be served overall. The IPP could then potentially be expanded to nontraditional settings such as emergency departments at area hospitals. An alternative option is for public health departments to apply for grants to

support local pilot projects in collaboration with hospitals. If proven successful, local communities could then apply for or petition the CDC for long-term grant funding.

The results of this study also indicated that providers are more likely to screen patients for chlamydia if they first routinely take sexual histories from patients. Additionally, providers who utilized patient-administered tools to elicit that history or provide counseling messages were also more likely to screen for chlamydia. SRHD should minimally inform clinical practice regarding the importance of conducting routine sexual risk assessments.

SRHD should also consider providing risk assessment tools to the health care community and encouraging organizations to implement standard procedures for their use. Office-system interventions have been shown to be more effective than continuing medical education credits or interventions targeting physicians alone (Cohen, Halvorson, & Gosselink, 1994). SRHD could develop and distribute standardized written materials to the health care community, and/or place the materials on the SRHD website and concordantly encourage adolescents and other at-risk populations to access the information and conduct self-assessments. If patients meet their providers with risk assessments in hand, then providers will be more likely to follow thru with needed screening. One study demonstrated that physicians were more likely to check diabetic patients' feet if their assistants had the patient remove socks and shoes prior to the examination.

A risk assessment tool could be developed with the support of the medical community. Survey respondents were asked to indicate whether or not they would be willing to serve on a local STD expert panel. The response to this question was positive;

48 providers indicated that they would, or potentially would serve in such a capacity. A panel could be tasked with the development of a patient support tool, or at a minimum, tasked with reviewing or providing input for its development. This would lend credibility to any materials developed, and increase the likelihood that they would actually be used by the local medical community.

SRHD should additionally consider expanding their website to include a provider toolkit containing clinical practice guidelines, sexual risk assessment tools, prevalence data, and other information. The toolkit should also be endorsed by the medical community through the expert panel. Utilization of the toolkit could then be encouraged during health care provider visits routinely conducted by the public health liaisons.

In sum, the results of this study indicate that almost 38% of primary care practitioners are not routinely screening females for chlamydia in accordance with recommended clinical guidelines. This finding is consistent with those reported in other studies (Ashton et al., 2002; Boekeloo et al., 2002; Cook et al, 2001). As the public health authority in Spokane County, these results have important implications for SRHD; increasing provider compliance with clinical guidelines to improve screening processes may decrease the prevalence of chlamydia in Spokane County.

Limitations

There are several limitations to this study, including a modest response rate. However, the response rate was similar to those observed in other studies of similar populations (Ashton et al., 2001; Cook et al., 2001).

Providers were asked to self-report their screening behaviors. Self-reported behaviors may not necessarily reflect actual behaviors; screening behaviors may be over

reported (Ashton et al., 2001; Cook et al., 2001; Torkko et al., 2000). This may be particularly true of these results since there were significant differences between respondents and nonrespondents. ARNPs were more likely to respond to the survey, and were also more likely to screen patients for chlamydia. Providers practicing in emergency medicine were less likely to respond to the survey, and were also less likely to screen for chlamydia. Thus, screening rates might be over reported; actual screening behaviors and compliance with clinical practice guidelines in the community might be significantly lower than what was reported here.

Another limitation is that there were numerous study variables all of which were tested for association with the dependent variables using chi-square statistics. Subsequently, there is the possibility of Type I errors. However, all but three statistically significant associations were found to be significant at or beyond the 98% confidence level.

This study is also limited by the accuracy of the provider list utilized and by the fact that proxy responses cannot be ruled out. Even though the original mailing list was cross-referenced with another to ensure a complete and accurate census, it is possible that eligible providers were not included. It is also possible that physicians did not fill out the survey themselves, but had a medical assistant or another office staff fill it out for them.

This study was also restricted to providers in Spokane County. The results may not be generalized to provider practicing in other locales. Additionally, the focus of the study was on screening for chlamydia. Providers may have differential screening behaviors and attitudes for other STDs such as gonorrhea. The results of this study may not be generalized to provider attitudes and behaviors with regard to other STDs.

There might also be limitations attributed to the study design. The confidentiality of responses was ensured by having providers submit the survey and the survey post card separately. The post card was used to track survey respondents, but was not matched to the actual survey. There was no way to know which provider submitted which survey. Consequently, I was unable to match survey responses to the database to determine for instance, if a particular office submitted one survey for multiple providers.

Finally, providers were eligible for this study if they saw patients age 15 to 25 years. The broad eligibility requirement might also be a limitation of this study and might have contributed to the modest response rate. Not all practices or providers have a focus on STD-related care, or are even set up to provide STD-related services. It is assumed that a number of providers did not respond for these reasons.

Additionally, some providers may have responded in spite of the fact that they provide little care for STDs, or may not even have the opportunity to provide such care, and this may reflect differential attitudes and beliefs between providers who routinely screen for chlamydia and those who don't. Providers that felt responsible for ensuring that young patients receive STD-related care were more likely to routinely screen for chlamydia. Providers that reported that screening for chlamydia was a priority in their practice were also more likely to report positive screening behaviors. These findings may directly reflect the eligibility requirements of the survey.

Every routine or annual patient encounter is an opportunity to provide some level of STD-related care, even if that only involves a brief risk assessment and subsequent referral to a provider or office in a better position to provide screening or treatment for STDs. Almost 18% of providers indicated that they don't usually take a sexual history on

new or annual patient visits. Furthermore, the results presented here are similar to those presented from other surveys in which eligibility was additionally restricted to those who provide routine primary or gynecologic care (Cook et al., 2001; Torkko et al, 2000).

In spite of the limitations, this study indicates that screening rates in Spokane County are less than ideal. The effective control of chlamydia is of necessity a shared responsibility; of those individuals diagnosed, of health care providers and systems, and of public health departments. Public health departments are faced with limited resources. This study may offer general guidance to public health practitioners seeking intervention strategies. The results of this survey can specifically be used to inform and decrease prevalence in Spokane County through targeted interventions.

Table 1. Characteristics of respondent and nonrespondent health care providers in Spokane County who were mailed a survey to assess STD screening behaviors, beliefs, attitudes, and public health issues.

Characteristic	Respondents (n = 260)		Nonrespondents (n = 288)		
	n	(%)	n	(%)	χ^2
Profession					**45.1*** **
ARNP	61	23.5	19	6.6	
Physician Assistant	31	11.9	14	4.9	
Physician	168	64.6	255	88.5	
Gender					**36.1*** **
Female	136	52.7	80	27.6	
Male	122	47.3	210	72.4	
Primary Specialty					**12.4****
Emergency medicine	34	13.1	59	20.4	
Internal medicine	36	13.9	54	18.7	
Pediatrics/other	24	9.3	21	7.3	
Family/General Practice	129	49.8	133	46	
Obstetrics & gynecology	36	13.9	22	7.6	

Note. The original mailing list contained data with regards to sex, specialty, and gender. Nonrespondent data were calculated by subtracting respondent data from the data in the original list for eligible providers. Numbers may not add up to study total because variables with missing data were treated as nonrespondent data.

* $p < .05$. ** $p < .02$. *** $p < .001$

Table 2. Summary of Personal and Practice Characteristics of Survey Respondents

Characteristics	n	(%)
The number of years since completed training		
0 – 10	111	45.5
11 +	133	54.5
The setting that best describes where the most care for STDs is provided		
Private Solo Practice	27	10.5
Private Group Practice	118	45.9
Public/Community Clinic	39	15.2
Family Planning Clinic	6	2.3
HMO	17	6.6
Hospital	36	14.0
Other	14	5.5
The number of female visits per week involving screening or treatment for STDs		
0 – 5	160	72.1
6 +	62	27.9
The number of male visits per week involving screening or treatment for STDs		
0 – 5	247	98.8
6 +	3	1.2
Is a provider that participates in the Infertility Prevention Project (IPP)		
Yes	8	3.1
No / uncertain	249	96.9
Is required to meet performance standards for chlamydia screening by a payer contract		
Yes	13	5.1
No / uncertain	244	94.9
More than 5% of patients are Hispanic		
Yes	41	18.4
No	182	81.6
More than 20% of patients are of minority race		
Yes	23	24.5
No	71	75.5
More than 40% of patients covered by Medicaid		
Yes	73	36.3
No	128	63.7

Note. Numbers may not add up to study total because of missing data.

Table 3. Summary of Behaviors of Survey Respondents

Behaviors	n	(%)
Follows one of four clinical practice guidelines for STD-related care		
Yes	207	79.9
No / uncertain	52	20.1
Who/what the provider relied on to provide STD education/counseling to patients		
Myself	214	84.9
Nurse or Medical Assistant	10	4.0
Brochures/literature	16	6.3
None	5	2.0
Other	7	2.8
Uses patient-administered computer programs or other materials to elicit a sexual history and/or provide counseling messages tailored to an individual patient's risk		
Yes	50	20.2
No	198	79.8
Uses clinical decision support tools (other than recommended clinical guidelines) such as pocket guides, computer software, counseling checklists, or reminder systems to help provide sexual health services in accordance with recommended guidelines		
Yes	106	43.4
No	138	56.6
Takes a sexual history from patients (ages 15-25 years) during new or annual patient visits		
Yes	209	82.3
No	45	17.7
The diagnostic technology used most frequently to screen for chlamydia		
Laboratory culture	92	39.0
Amplified	81	34.3
Rapid	6	2.5
Uncertain/none	57	24.2
Follows manufacturer's instructions for specimen collection		
Yes	200	80.0
No	1	0.4
Uncertain	28	11.2
Not aware of specific instructions	21	8.4
The site from which the specimen is usually collected for females		
Cervical swab	189	85.1
Urine	33	14.9
The site from which the specimen is usually collected for males		
Urethral swab	100	54.0
Urine	85	46.0
Regularly screens sexually active females (ages 15-25 years) for chlamydia		
Yes	157	62.1
No	96	37.9
Regularly screens sexually active male patients (ages 15-25 years) for chlamydia		
Yes	46	21.7
No	166	78.3

Note. Numbers may not add up to study total because of missing data.

Table 4. Summary of Provider Attitudes

Attitude Statements	n	(%)
I am comfortable discussing sex-related issues with my patients.		
Agree	250	96.9
Disagree	8	3.10
I am well trained to address sexual risks with young patients.		
Agree	236	92.2
Disagree	20	7.8
Payer contract monitoring limits my ability to provide STD prevention services.		
Agree	119	46.5
Disagree	137	53.5
Most of my patients do not want STD prevention services.		
Agree	122	47.3
Disagree	136	52.7
It is more important to screen adults (ages 18-25 years) for chlamydia than it is to screen adolescents (ages less than 18 years) for chlamydia.		
Agree	80	31.3
Disagree	176	68.8
Most of my patients less than 18 years of age are not sexually active.		
Agree	68	27.2
Disagree	182	72.8
I am responsible for ensuring that young patients in my practice receive appropriate STD preventive services.		
Agree	190	74.5
Disagree	65	25.5
Time pressures limit my ability to provide effective STD preventive services and counseling.		
Agree	163	63.9
Disagree	92	36.1
Financial reimbursement difficulties limit my ability to provide effective STD preventive services and counseling.		
Agree	128	49.6
Disagree	130	50.4
Laboratory tests are too costly to screen all sexually active patients (18-25 years) for chlamydia.		
Agree	131	51.2
Disagree	125	48.8
I am concerned that lab tests are not as accurate as they need to be to screen all patients who might be at risk of infection.		
Agree	112	43.6
Disagree	145	56.4
It is not as important to screen asymptomatic sexually active males as it is to screen asymptomatic sexually active females.		
Agree	89	35.6
Disagree	161	64.4
Screening all sexually active women (ages 15-25 years) for chlamydia will prevent unnecessary health care costs.		
Agree	154	59.9
Disagree	103	40.1
Compared to other clinical preventive measures, screening for chlamydia is a priority in my practice.		
Agree	105	40.9
Disagree	152	59.1

Table 4 Continued. Summary of Provider Attitudes

Attitude Statements	n	(%)
Chlamydia is too uncommon in my patient population to justify the costs of screening all asymptomatic, sexually active patients (ages 15-25 years) for it.		
Agree	90	34.9
Disagree	168	65.1
Most chlamydia infections are asymptomatic.		
Agree	198	77.0
Disagree	59	23.0

Note. Numbers may not add up to study total because of missing data.

Table 5. Association of Personal and Practice Characteristics with Regularly Screening Females and Males for Chlamydia (CT) for Health Care Providers

Personal and Practice Characteristics	Screens Females				Screens Males			
	n	Yes (%)	No (%)	χ^2	n	Yes (%)	No (%)	χ^2
Profession				**13.1****				2.4
ARNP	60	81.7	18.3		43	30.2	69.8	
PA	31	51.6	48.4		28	21.4	78.6	
Physician	162	56.8	43.2		141	19.2	80.8	
The number of years since completed training.				**5.2***				0.2
0 – 10	109	70.6	29.4		99	22.2	77.8	
11 +	128	56.3	43.7		98	19.4	80.6	
Gender				**22.6*****				0.6
Male	117	47.0	53.0		102	19.6	80.4	
Female	134	76.1	23.9		108	24.1	75.9	
Primary specialty				**20.4*****				5.4
Emergency Medicine	32	34.4	65.6		32	9.4	90.6	
Internal Medicine	35	48.6	51.4		33	27.3	72.7	
Pediatrics/other	23	56.5	43.5		24	33.3	66.7	
Family/General Practice	127	68.5	31.5		123	21.1	78.9	
Obstetrics & Gynecology	35	80.0	20.0		---	---	---	
The number of visits per week involving screening or treatment for STDs				**12.1*****				0.9
0 – 5	155	52.9	47.1		206	22.3	77.7	
6 +	61	78.7	21.3		3	0.0	100.0	
Is a provider that participates in the Infertility Prevention Project				**5.0***				1.9
Yes	8	100.0	0.0		4	50.0	50.0	
No / Uncertain	242	61.2	38.8		207	21.3	78.7	
Follows guidelines for STD-related care				**8.5****				0.0
Yes	202	66.3	33.7		163	22.1	77.9	
No / Uncertain	50	44.0	56.0		48	20.8	79.2	
Required to meet performance standards for chlamydia screening				0.0				---
Yes	13	61.5	38.5		---	---	---	
No / Uncertain	237	61.6	38.4		---	---	---	
Greater than 5% of patients are Hispanic				**10.2****				1.4
Yes	40	85.0	15.0		29	27.6	72.4	
No	181	58.0	42.0		154	18.2	81.8	
Takes a sexual history during new or annual				**35.8*****				**8.7****
Yes	206	70.9	29.1		167	25.8	74.2	
No	44	22.7	77.3		42	4.8	95.2	

Table 5 Continued. Association of Personal and Practice Characteristics with Regularly Screening Females and Males for Chlamydia (CT)

Personal and Practice Characteristics	Screens Females				Screens Males			
	n	Yes	No (%)	χ^2	n	Yes	No (%)	χ^2
Diagnostic technology used most frequently				2.1				1.1
Laboratory culture	90	62.2	37.8		74	23.0	77.0	
Amplified	80	62.5	37.5		59	20.3	79.7	
Rapid	6	33.3	66.7		6	33.3	66.7	
Uncertain/None	54	59.3	40.7		51	17.7	82.3	
Specimen sample/site				0.0				**3.9***
Cervical swab/Urethral swab	185	64.9	35.1		94	18.1	81.9	
Urine	32	65.6	34.4		81	30.9	69.1	
Uses patient-administered support tools				**6.5****				1.7
Yes	49	77.6	22.4		34	29.4	70.6	
No	194	57.7	42.3		169	19.5	80.5	
Uses clinical decision support tools				1.4				0.1
Yes	105	65.7	34.3		89	20.2	79.8	
No	134	58.2	41.8		113	22.1	77.9	

Note. Numbers may not add up to study total because of missing data.

* $p < .05$. ** $p < .02$. *** $p < .001$

Table 6. Association of Attitudes with Regularly Screening Females and Males for Chlamydia (CT) for Health Care Providers in Spokane County

Attitude Statements	Screens Females				Screens Males			
	n*	Yes (%)	No (%)	χ^2	n*	Yes (%)	No (%)	χ^2
I am comfortable discussing sex-related issues with my patients.				**5.0***				0.2
Agree	243	63.8	36.2		203	22.2	77.8	
Disagree	8	25.0	75.0		7	14.3	85.7	
I am well trained to address sexual risks with young patients.				1.4				0.1
Agree	231	64.1	35.9		192	22.4	77.6	
Disagree	18	50.0	50.0		16	18.8	81.2	
Payer contract monitoring limits my ability to provide STD prevention services.				0.2				0.9
Agree	115	61.7	38.3		105	24.8	75.2	
Disagree	134	64.2	35.8		103	19.4	80.6	
Most of my patients do not want STD prevention services.				**26.2*****				0.7
Agree	116	45.7	54.3		107	19.6	80.4	
Disagree	135	77.0	23.0		103	24.3	75.7	
It is more important to screen adults (ages 18-25 years) for chlamydia than it is to screen adolescents (ages less than 18 years) for chlamydia.				1.2				0.0
Agree	79	58.2	41.8		66	22.7	77.3	
Disagree	170	65.3	34.7		142	21.8	78.2	
Most of my patients less than 18 years of age are not sexually active.				**12.2*****				0.2
Agree	65	44.6	55.4		64	20.3	79.7	
Disagree	178	69.1	30.9		140	22.9	77.1	
I am responsible for ensuring that young patients in my practice receive appropriate STD preventive services.				**27.0*****				**6.5****
Agree	189	71.4	28.6		150	26.7	73.3	
Disagree	59	33.9	66.1		58	10.3	89.7	
Time pressures limit my ability to provide effective STD preventive services and counseling.				2.7				0.0
Agree	158	58.9	41.1		141	22.0	78.0	
Disagree	91	69.2	30.8		68	22.1	77.9	
Financial reimbursement difficulties limit my ability to provide effective STD preventive services and counseling.				0.4				1.1
Agree	124	64.5	35.5		109	24.8	75.2	
Disagree	127	60.6	39.4		101	18.8	81.2	

Table 6 Continued. Association of Attitudes with Regularly Screening Females and Males for Chlamydia (CT) for Health Care Providers in Spokane County

Attitude Statements	Screens Females				Screens Males			
	n	Yes (%)	No (%)	χ^2	n	Yes (%)	No (%)	χ^2
Laboratory tests are too costly to screen all sexually active patients (18-25 years) for chlamydia.				**7.0****				0.9
Agree	126	54.8	45.2		113	19.5	80.5	
Disagree	124	71.0	29.0		96	25.0	75.0	
I am concerned that lab tests are not as accurate as they need to be to screen all patients who might be at risk of infection.				0.5				0.0
Agree	110	60.0	40.0		101	21.8	78.2	
Disagree	140	64.3	35.7		108	22.2	77.8	
It is not as important to screen asymptomatic sexually active males as it is to screen asymptomatic sexually active females.				0.5				1.1
Agree	84	59.5	40.5		78	18.0	82.0	
Disagree	159	64.1	35.9		132	24.2	75.8	
Screening all sexually active women (ages 15-25 years) for chlamydia will prevent unnecessary health care costs.				**25.8*****				---
Agree	153	75.2	24.8		---	---	---	
Disagree	97	43.3	56.7		---	---	---	
Compared to other clinical preventive measures, screening for chlamydia is a priority in my practice.				**39.5*****				2.5
Agree	104	85.6	14.4		79	27.8	72.2	
Disagree	146	46.6	53.4		130	18.5	81.5	
Chlamydia is too uncommon in my patient population to justify the costs of screening all asymptomatic, sexually active patients (ages 15-25 years) for it.				**48.5*****				3.1
Agree	87	33.3	66.7		78	15.4	84.6	
Disagree	164	78.0	22.0		132	25.8	74.2	
Most chlamydia infections are asymptomatic.				1.1				3.1
Agree	193	60.6	39.4		160	18.8	81.2	
Disagree	57	68.4	31.6		49	30.6	69.4	

Note. Numbers may not add up to study total because of missing data.

* $p < .05$. $p < .02$. $p < .001$

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~ APPENDIX A ~

SURVEY INSTRUMENT

63086

Screening for Chlamydia
Section 1: About You and Your Practice

This survey should take less than 15 minutes to fill out. Your answers are confidential. We will not be able to match survey responses with individual providers and the results will be reported in aggregate. Some of the questions may be uncomfortable to answer, however, these questions may help you understand how you might be better able to help your patients and prevent the spread of chlamydia in our community. If you see patients between 15 to 25 years of age, please complete and return the survey in the self-addressed stamped envelope provided, and mail the enclosed survey post card separately. If you do not see patients 15 to 25 years of age, then only fill out and return the survey post card. The post card will assist us with follow-up while enabling us to maintain the confidentiality of respondents. By completing this survey, you are consenting to participate in this research.

1. Are you a/an...?

○ ARNP ○ Physician
○ Physician's Assistant (PA) ○ Other _____

2. How many years ago did you complete training? ☐☐ *Years*

3. Your gender? ○ Male ○ Female

4. What is your primary specialty?

○ Emergency Medicine ○ Family/General Practice
○ Internal Medicine ○ Obstetrics & Gynecology
○ Pediatrics ○ Other _____

5. Which one of the following best describes the setting in which you provide the most care for STDs?

○ Private Solo Practice ○ Family Planning Clinic
○ Private Group Practice ○ HMO Practice
○ Public/Community Clinic ○ Hospital
○ Other _____

6. Approximately how many female patients aged 15-25 do you see per week in an outpatient setting?

○ 0 - 5 ○ 11 - 20 ○ 41 - 60
○ 6 - 10 ○ 21 - 40 ○ 60+

6a. Of these outpatient visits, approximately how many involve screening or treatment for STDs? _____ *Visits*

7. Approximately how many male patients aged 15-25 do you see per week in an outpatient setting?

○ 0 - 5 ○ 11 - 20 ○ 41 - 60
○ 6 - 10 ○ 21 - 40 ○ 60+

7a. Of these outpatient visits, approximately how many involve screening or treatment for STDs? _____ *Visits*

8. The Infertility Prevention Project (IPP) is a program that provides free laboratory testing and medication to high risk women. Are you an IPP participating provider?

○ Yes ○ No ○ Uncertain

9. Do you follow any of the guidelines listed below for STD-related care?

- American Academy of Family Physicians (AAFP)
- U.S. Preventive Services Task Force (USPSTF)
- American College of Obstetrics & Gynecology
- Centers for Disease Control and Prevention

○ Yes ○ No ○ Uncertain

10. Are you required to meet any specific performance standards for chlamydia screening by any of your payer contracts?

○ Yes ○ No ○ Uncertain

11. Approximately what percentage of your patients aged 15-25 are of Hispanic ethnicity? ☐☐☐ %

12. Approximately what percentage of your patients aged 15-25 are: (specify percentages)

White ☐☐☐ %
Black or African-American ☐☐☐ %
Asian/Pacific Islander ☐☐☐ %
American Indian or Alaskan Native ☐☐☐ %
Other ☐☐☐ %
TOTAL = 1 0 0 %

13. Approximately what percentage of your patients aged 15-25 are covered by: (specify percentages)

Private HMOs ☐☐☐ %
PPO or other private managed care ☐☐☐ %
Other private medical insurance ☐☐☐ %
Medicaid ☐☐☐ %
Self pay / no insurance ☐☐☐ %
TOTAL = 1 0 0 %

Page 1

Please continue on page two →

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Section 2: Screening for Chlamydia

Please indicate HOW OFTEN you do the following:	All of the Time	Most of the Time	Half of the Time	Some of the Time	None of the Time
1. I take a sexual history from patients (ages 15-25 years) during new or annual patient visits.	○	○	○	○	○
2. I screen sexually active females (ages 15-25 years) for chlamydia.	○	○	○	○	○
3. I screen sexually active males (ages 15-25 years) for chlamydia.	○	○	○	○	○

4. Which one of the following diagnostic technologies do you use most frequently to screen for chlamydia?
○ Laboratory Culture ○ Amplified ○ Rapid/Point-of-Care
○ Non-Amplified ○ Uncertain ○ None/I do not diagnose chlamydia

5. From which site do you usually collect the specimen?
a. For females ○ cervical swab ○ urine
b. For males ○ urethral swab ○ urine

Rate how much you AGREE or DISAGREE with the following statements:	Strongly Agree	Moderately Agree	Neutral or Unsure	Moderately Disagree	Strongly Disagree
1. I am comfortable discussing sex-related issues with my patients.	○	○	○	○	○
2. I am well trained to address sexual risks with young patients.	○	○	○	○	○
3. Payer contract monitoring limits my ability to provide STD prevention services.	○	○	○	○	○
4. Most of my patients do not want STD prevention services.	○	○	○	○	○
5. It is more important to screen adults (ages 18-25 years) for chlamydia than it is to screen adolescents (ages less than 18 years) for chlamydia.	○	○	○	○	○
6. Most of my patients less than 18 years of age are not sexually active.	○	○	○	○	○
7. I am responsible for ensuring that young patients in my practice receive appropriate STD preventive services.	○	○	○	○	○
8. Time pressures limit my ability to provide effective STD preventive services and counseling.	○	○	○	○	○
9. Financial reimbursement difficulties limit my ability to provide effective STD preventive services and counseling.	○	○	○	○	○
10. Laboratory tests are too costly to screen all sexually active patients (15-25 years) for chlamydia.	○	○	○	○	○
11. I am concerned that available chlamydia tests are not as accurate as they need to be to screen all patients who might be at risk of infection.	○	○	○	○	○
12. It is not as important to screen asymptomatic sexually active males as it is to screen asymptomatic sexually active females.	○	○	○	○	○
13. Screening all sexually active women (ages 15-25 years) for chlamydia will prevent unnecessary health care costs.	○	○	○	○	○
14. Compared to other clinical preventive services, screening for chlamydia is a priority in my practice.	○	○	○	○	○
15. Chlamydia is too uncommon in my patient population to justify the costs of screening all asymptomatic, sexually active patients (ages 15-25 years) for it.	○	○	○	○	○
16. Most chlamydia infections are asymptomatic.	○	○	○	○	○

Please continue on page three ——————>

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Section 3: Partner Management Strategies

Have you treated any patients with non-viral STDs in the past year?	○ Yes ○ No		***If you answered "No", please do not fill out this page, but continue on to page four. If you answered yes, please fill out this page and then continue to page four.***

Please indicate HOW OFTEN you practice the following partner management strategies after diagnosing a patient with chlamydia:	All of the Time	Most of the Time	Half of the Time	Some of the Time	None of the Time
1. Patient delivered partner treatment (PDPT): Give the patient medication or a prescription for medication for them to deliver to their partner(s).	○	○	○	○	○
2. Patient Referral: Instruct the patient to tell partner(s) to seek care for diagnosis and treatment.	○	○	○	○	○
3. Provider Referral: Collect partner information and have your office contact partners.	○	○	○	○	○
4. Health Department Referral: Refer patient to the health department for partner notification services.	○	○	○	○	○

STD treatment guidelines published by the Centers for Disease Control recommend clinical evaluation of sex partners as the first-choice strategy for partner treatment. However, if it is unlikely that the sex partners(s) will attend a clinic, providers may consider some alternative strategies. For example, patient delivered partner treatment (PDPT) is a strategy by which providers give antibiotics or prescriptions for antibiotics to their patient for them to give to their partner(s), along with an information sheet that includes instructions, contraindications, and advice to see a health care provider.

How strongly do you agree or disagree with the following statements as they relate to patient delivered partner treatment (PDPT)?	Strongly Agree	Moderately Agree	Neutral or Unsure	Moderately Disagree	Strongly Disagree
1. Compared to the other partner management strategies listed in the questions above, PDPT prevents unnecessary health care costs.	○	○	○	○	○
2. It is lawfully allowed in Washington State.	○	○	○	○	○
3. I don't feel well trained to provide PDPT.	○	○	○	○	○
4. It complies with the standard of care in my clinic.	○	○	○	○	○
5. It is something I don't feel comfortable with.	○	○	○	○	○
6. Financial reimbursement difficulties limit my ability to provide PDPT.	○	○	○	○	○
7. It is more effective than other partner management strategies.	○	○	○	○	○
8. It creates liability.	○	○	○	○	○
9. The partner(s) might not get the medication.	○	○	○	○	○
10. It would miss opportunity to counsel partner(s).	○	○	○	○	○
11. It protects patients from reinfection.	○	○	○	○	○
12. It reinforces to patient the need for partner treatment.	○	○	○	○	○
13. It misses opportunity for other clinical services.	○	○	○	○	○
14. It prevents the spread of STDs.	○	○	○	○	○
15. The patient or partner(s) might not understand adverse reactions and/or contraindications.	○	○	○	○	○

Please continue on page four →

63086

Section 4: Reporting and Other Issues

Public Health Reporting		All of the Time	Most of the Time	Half of the Time	Some of the Time	None of the Time
1. Please indicate HOW OFTEN you report positive test results for the following STDs to the Spokane Regional Health District.	*a. syphilis*	○	○	○	○	○
	b. gonorrhea	○	○	○	○	○
	c. chlamydia	○	○	○	○	○
	d. human papilloma virus	○	○	○	○	○

2. If able to, how might Spokane Regional Health District facilitate or support case reporting and partner notification services in your practice?

_____

_____

Other Issues

1. For whatever chlamydia test you use, do you follow the manufacturers' recommended instructions for specimen collection?

○ Yes ○ No ○ Uncertain ○ Not aware of specific instructions

2. Would you be interested in receiving training on quality collection techniques?

○ Yes ○ No ○ Maybe

3. Do you use patient-administered computer programs or other materials that elicit a sexual history and/or provide counseling messages tailored to an individual patient's STD risk?

Use of patient support tools

○ Yes ○ No

If yes, what do you use? _____

If no, why? _____

4. Do you currently use clinical decision support tools (other than recommended clinical guidelines) such as pocket guides, computer software, counseling checklists, or reminder systems to help you provide sexual health services to your patients in accordance with recommended guidelines?

Use of clinical support tools

○ Yes ○ No

If yes, what do you use? _____

If no, why? _____

5. Who do you rely on most within your practice to provide STD education and/or counseling to your patients? (Please check just one).

○ Myself ○ Brochures or other literature ○ Other _____

○ A nurse or medical assistant ○ None, I do not provide STD education/counseling

6. What are the best ways for Spokane Regional Health District to reach you directly with information on STDs, notifiable disease reporting and/or other public health information? (Please check all that apply).

○ SRHD web site ○ Fax ○ Professional Associations, and if so which ones?

○ Epi-Gram Newsletter ○ Public Health Liaisons _____

○ Conferences ○ Email ○ Other, please describe

○ Public Forums ○ Continuing Medical Education (CMEs) _____

Thank you for finishing this survey.
Please return it in the envelope

Remember to send the post card!

~ APPENDIX B ~

SURVEY MAILING AND FOLLOWUP MATERIALS

Please Respond!

Nonrespondents will receive follow-up phone calls. Please enter your name below and fill out the questions so that you or your office will not receive follow-up calls.

Your Name: _____

You are eligible for this survey if you see patients between 15 to 25 years of age.

Please check one:

___ I have completed and mailed the "Screening for Chlamydia" provider survey.

___ I am not eligible to complete the "Screening for Chlamydia" provider survey.

___ I will not complete the "Screening for Chlamydia" provider survey.

During **public health emergencies,** are you willing to volunteer your professional services?

___yes ___no

Would you be willing to sit on an (STD) Expert Panel?

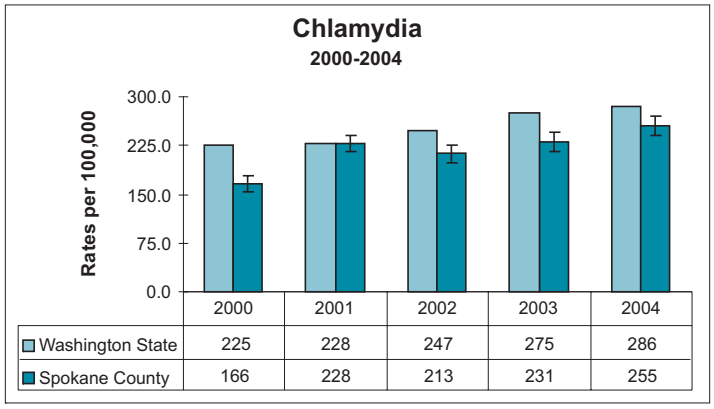
___yes ___no

Please mail this post card separate from the survey. Thank you.

January 12, 2006

Dear _____:

In Spokane County, the incidence of chlamydia has risen continually over time as demonstrated in the following graph. The recent increase may be attributed to a number of factors, including more screening of at-risk populations, less invasive testing (urine based), greater sensitivity of testing, risky sexual behavior, *and* a growing prevalence. Therefore, it is of substantial concern to us in public health.



	2000	2001	2002	2003	2004
Washington State	225	228	247	275	286
Spokane County	166	228	213	231	255

Prevention and effective control of sexually transmitted diseases (STDs) are responsibilities shared by patients, health care providers, and public health officials. The Spokane Regional Health District (SRHD) would like to obtain a thorough understanding of the services provided by health care providers to effectively integrate our interventions to improve STD control within our community. While local data exist on rates of reported STDs, the clinical practice of physicians within our community in regards to STD-related care is not clear.

The enclosed survey was first sent on December 2, 2005. It is being sent again to providers who have not yet responded. SRHD staff will use this information to guide public health policy and program interventions. It will help us direct our limited resources towards public health activities that will have the greatest impact on reducing the prevalence, associated morbidity, and economic costs of curable STDs within Spokane County.

You are eligible for this survey if you see patients between the ages of 15 to 25 years of age. If eligible, please take the time to fill out this survey and help us in this endeavor. We would appreciate receiving your completed survey by January 25, 2006. If you are interested in receiving the results from this survey, please call Stacy at (509) 324-1698 or email your request to sreisenauer@spokanecounty.org.

Sincerely,

Kim Marie Thorburn, MD, MPH
Health Officer

Stacy Reisenauer, BS
Epidemiologist

Enclosure

1/23/2006 [SRHD logo]

Dear (health care provider inserted from excel),

This is a friendly reminder to please fill out the survey, titled “Screening for Chlamydia”, that was sent to you by the Spokane Regional Health District. We have not yet received your response. This is important information to us - chlamydia is the most commonly reported infectious disease in Spokane County. The survey should take no longer than 15 minutes of your time.

The survey packet was mailed to you again on January 13 and contained a yellow survey, a self-addressed stamped envelope, and a return survey post card. You can request that another copy be sent to you again via email, fax, or a third postal mailing by contacting Stacy Reisenauer at sreisenauer@spokanecounty.org or by calling 324-1698.

Individual provider responses are confidential and results will be reported in aggregate. Please take this opportunity to help us better understand how we might effectively improve STD control within our community.

Sincerely,

[electronic signature]
Kim Marie Thorburn, MD, MPH
Health Officer
Spokane Regional Health District

[electronic signature]
Stacy Reisenauer
Epidemiologist
Spokane Regional Health District

Hello _____

This is Stacy Reisenauer. I am an Epidemiologist at Spokane Regional Health District. I am following up with Dr_____ regarding a health care provider survey we sent on December 1st that assesses STD-related care in our community. Chlamydia is the most common infectious disease in Spokane County and we are trying to understand how we might integrate public health practice with the medical community. I know that you/Dr. _____ is/are very busy, but it is really important that we obtain as many responses possible, including yours/Dr. _____. Please fill out the survey and return to us in the self-addressed stamped envelope by December 31, 2005. Please mail the survey post card separately. If you'd rather, you can fax back the survey to 324-3623, but you need to indicate your/Dr. _____ name on the cover sheet so that we know who the survey is from so that we don't call you again. Thank you very much for your assistance.