

Hot Topic

RESEARCH BRIEF #4

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Cost Effectiveness of Chlamydia

The two most common sexually transmitted diseases (STDs) in the United States, chlamydia and gonorrhea, can lead to serious consequences in women, including pelvic inflammatory disease (PID) and its sequelae of chronic pelvic pain, infertility, and ectopic pregnancy.(1) Both entail significant health burden and substantial cost (2-4) .

Nationally, the reported chlamydia rate is 610.6 per 100,000 women and the gonorrhea rate is 106.5 per 100,000 women (5). Data from the National Health and Nutrition Examination Survey (NHANES) indicate the prevalence of chlamydia in women aged 14-25 years was 3.8% over the period of 2007-2008, and that it declined with increasing age (6).

Although chlamydia screening of young women is generally considered to be an effective preventive intervention, it is under-utilized in the US. Coverage rates have improved over the last 10 years, but remained under 50% for commercially-insured women in 2010; women in Medicaid managed care plans were screened at a higher rate: 62% (7). Increasing chlamydia screening coverage of women could be a cost-effective way to improve women's health and reduce the burden of chlamydia in the population.

Chlamydia Screening Recommendations

Because the prevalence of chlamydia is highest in young women (5;6), the Centers for Disease Control and Prevention (CDC), US Preventive Services Task Force (USPSTF), and other medical organizations recommend screening all sexually active young women for chlamydia and for other STDs for which they may be at risk (5;8;9). The USPSTF, which does not consider costs when making its recommendations, gives chlamydia screening for young women an A rating and gives a B rating to screening women age 25 and over with risk factors. Across states, gonorrhea rates tend to vary more than chlamydia rates. This, plus the lower overall rate for gonorrhea, suggests that the yield from routine screening for gonorrhea may be low in many settings. The USPSTF gives gonorrhea screening a B rating for women and pregnant

women at increased risk.

Cost-effectiveness of chlamydia screening

Some clinical preventive services, for example childhood immunizations, are considered *cost-saving*, meaning that the cost of the service is smaller than the discounted health care costs averted by the service (10). Interventions which are not cost-saving are in many cases considered to be cost-effective if they deliver health benefits at a reasonable cost. What constitutes reasonable is still something of an open question, but standards from the World Health Organization and less formal benchmarks used in the literature suggest that interventions costing less than \$50,000 per quality-adjusted life year (QALY) saved are cost-effective, based on the US per capita gross domestic product of \$47,000 (2010)(11-13).

Using this threshold, chlamydia screening in young women has generally been shown to be cost-effective, although many studies have used cases of chlamydia treated or cases of PID averted as outcomes, rather than QALYs or another health-adjusted life year (HALY) metric (14;15). Because “cost-effective” does not necessarily mean “cost-saving”, it should not be expected that a screening program will pay for itself in terms of current expenditures for screening being smaller than the discounted value of averted health care

costs in the future that are attributable to screening. Cost-effectiveness calculations are typically based on a societal or health care system perspective. In a societal perspective analysis, all costs and benefits accruing to society are included in the equation, while in a health care system perspective analysis, all costs and benefits accruing to the health care system over a given time horizon are included in calculations. Either perspective will include benefits such as averted future infertility treatments that may be attributable to current chlamydia screening, but such benefits may not be realized by a given health insurer. By the time a patient with untreated chlamydia seeks infertility treatment, she may have changed health insurers. Therefore, the cost-effectiveness of preventive services are often different when estimated from the perspective of a given health insurer. In a practical sense, this can mean that preventive services that are considered to be cost-effective by researchers are open to challenge by individual insurers or employers who are purchasing health plans on the basis that they do not deliver clearly-identified value to those who pay for the preventive services. However, this limited perspective can make many interventions that are cost-effective (or even cost-saving) from a societal perspective look relatively cost-ineffective, because many conditions develop long after the preventive interventions that reduce their incidence.

Factors that influence cost-effectiveness of chlamydia screening

Prevalence--Most studies have found the cost-effectiveness of chlamydia screening to be directly related to the prevalence in the population screened: a higher prevalence equals more cases of chlamydia detected and treated (15). This is true of most preventive services; if an intervention can be targeted to

those most at risk, it is more cost-effective than if provided to a larger population that includes low-risk individuals (16;17).

Estimates of rates of sequelae--The cost-effectiveness of chlamydia screening also depends on assumptions about the likelihood of long-term health complications due to chlamydia and the extent to which screening can reduce this likelihood. There is uncertainty surrounding both of these factors (2;18;19). Most cost-effectiveness analyses have assumed that PID occurs in 10%-20% of untreated chlamydial infections, although values as low as 1% and as high as 40% have been used. Analyses of the cost of PID and its sequelae suggest up to 80% of total discounted costs may be incurred within five years of the onset of PID (4;20). Because of this, individual health plans may find that chlamydia screening is cost-effective even when considering their own shorter time horizons.

Costs which are included in the analysis—As noted above, the analysis perspective determines which costs are included in the analysis. Some studies are conducted from the perspective of a single payer, such as a health department or insurer.

The manner in which the impact on partners is incorporated into the analysis also has an impact.

Cost-effectiveness studies of chlamydia screening often do not include the costs of medical care or societal costs for partners who may either be infected or avoid becoming infected when a woman is screened and treated. Modeling the transmission dynamics of chlamydia and other infectious diseases requires data regarding number of partners, duration of infection, transmissibility, and more (21). Incorporating or failing to incorporate the potential transmission effects can impact the results (22). The cost of care for PID and its sequelae may be changing, as well, which has implications for the cost-effectiveness of chlamydia screening regardless of the rate at which PID develops. For example, ectopic pregnancies are increasingly treated with methotrexate (rates tripled between 2002 and 2007, according to one study (23)), which may be less costly than alternative treatments.

Frequency of screening--The effectiveness of chlamydia screening as an intervention is impacted by its frequency; cost-effectiveness models have typically assumed annual screening, although some have examined more frequent intervals for all women or for those with prior chlamydial infections or risk factors (24;25). A study of insurance claims data in the US found that while 25.9% of women enrolled in insurance plans for 5 years received at least one chlamydia screen during that time period, only 0.1% were screened every year (26). A study in Sweden similarly found that most women who were screened for chlamydia at any time during a multi-year interval were screened only once (27).

Comparisons across studies

Direct comparisons between studies are difficult because of different assumptions about sequelae

and their costs, and because of different ways that other factors that impact the cost-effectiveness of chlamydia screening have been handled in various analyses. Some recent studies that have examined age-based screening of women are summarized in the adjacent table.

The cost per QALY saved through chlamydia screening varies among the studies, as does the modeled prevalence in the population screened. However, all are beneath the generally accepted cost per QALY benchmarks, and the cost per QALY saved from the study featuring the lowest prevalence (2.4%, close to the chlamydia prevalence in the U.S. of women aged 15-39 years) suggests that screening young women at a population-level prevalence can be cost-effective compared to potential alternative uses of the health care resources involved in screening. A cross-cutting review of clinical preventive interventions by the Partnership for Prevention ranked chlamydia screening of young women in the middle of a list of 25 clinical preventive interventions in terms of cost-effectiveness and preventable burden (10).

Most research on screening for chlamydia has focused on women, but a body of literature has examined the cost-effectiveness of screening at-risk men for chlamydia. The USPSTF and CDC do not recommend routine age-based screening of sexually active men (although the CDC does recommend routine chlamydia screening of men who have sex with men (1;8)). The prevalence of asymptomatic chlamydial infection can be high among men in some subpopulations and in some settings (particularly corrections), but most of the cost-effectiveness studies which have compared the cost-effectiveness of screening men for chlamydia compared to screening women for chlamydia have found that screening women is more cost-effective (28;29). Screening men in high-prevalence settings could be cost-effective compared to screening women with substantially lower prevalence (30).

Group screened	Chlamydia prevalence	Cost per QALY gained (2010 dollars)	Comparison intervention	Cost perspective	Reference
Women from the general population, aged 15-25*	6.0%+†	\$42,600	No screening	Health care system	(25;31)
Women from the general population, aged 15-24	5.0%	\$3600	No screening	Modified societal	(24)
Women from the general population, aged 15-39	2.4%	\$42,700	Screen women‡	Societal	(30)

Notes:

Costs adjusted to 2010 dollars

* UK data

† Prevalence shown is estimated, and is before screening program initializes; prevalence decreases after screening begins

‡ The cost per QALY shown was for an expansion of an already-existing program screening women in the general population

References

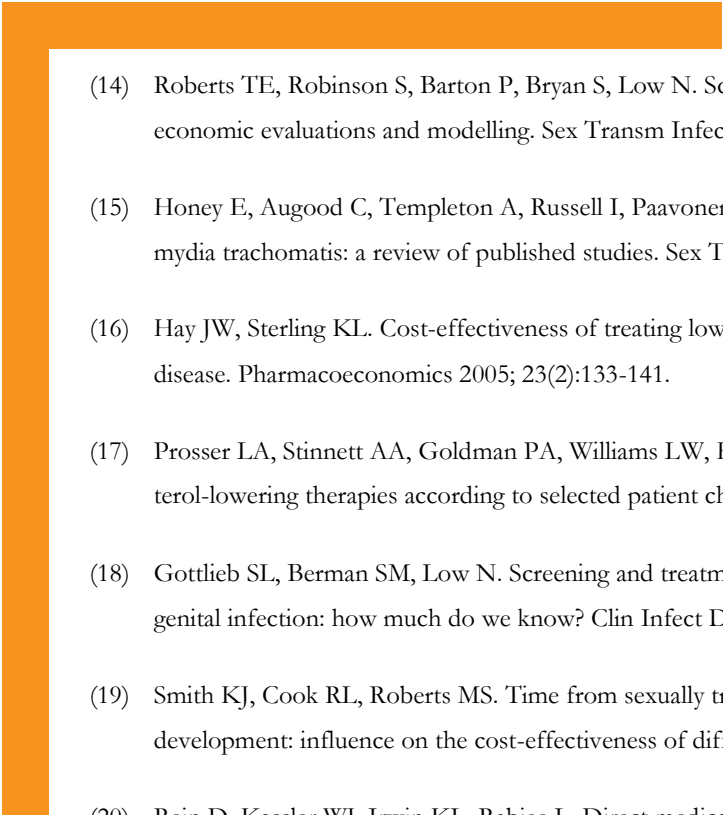
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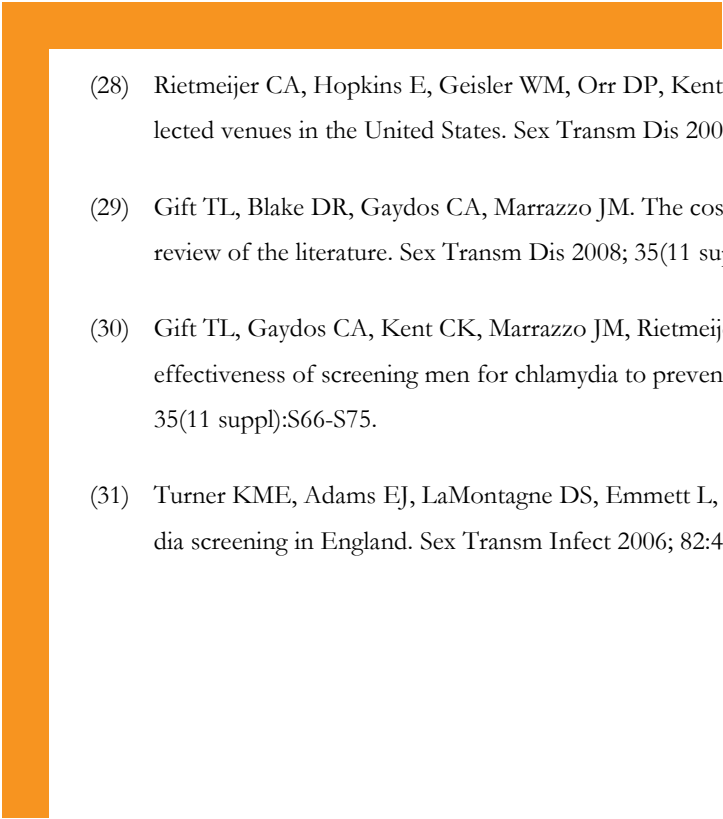
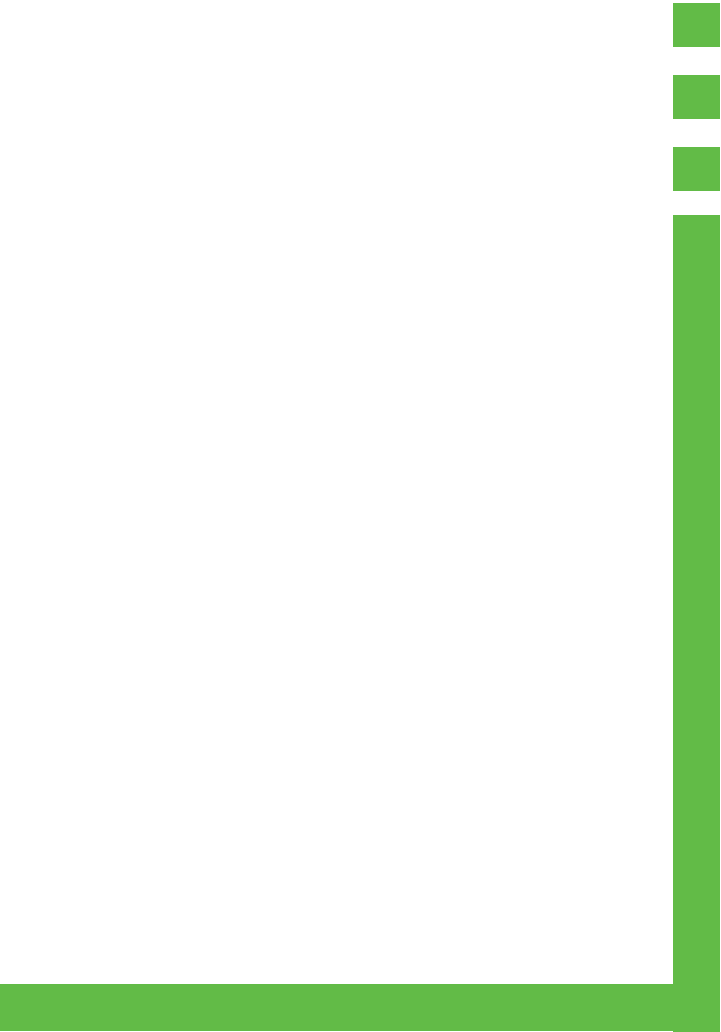
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