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Chlamydia— Top Sexually Transmitted Disease

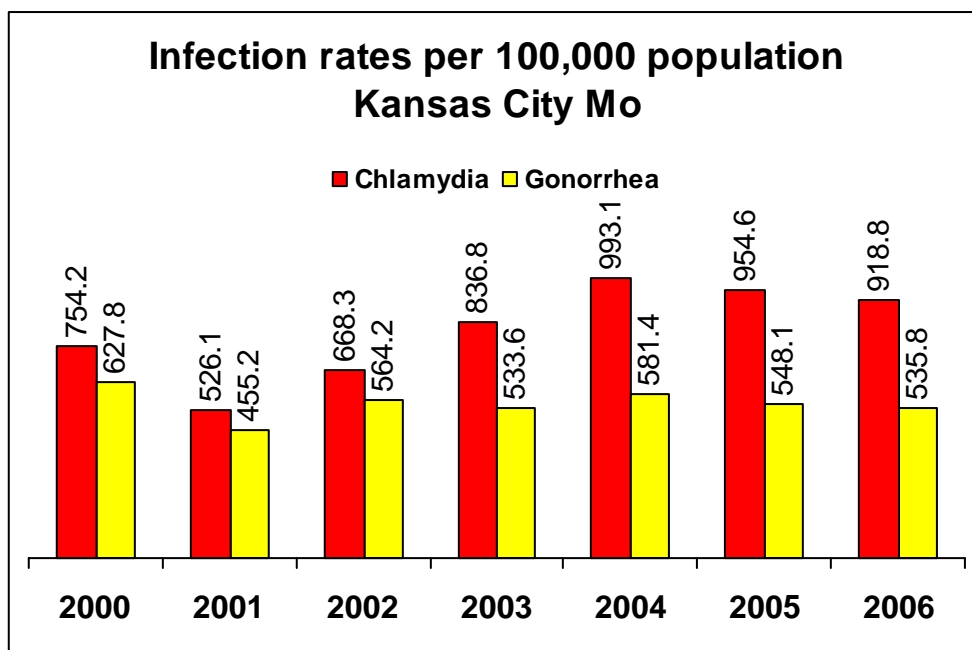
Chlamydia trachomatis is the most commonly reported bacterial sexually transmitted infection (STI) in Kansas City. The bacteria can be transmitted through vaginal, anal, and oral sex, and from an infected mother to her baby during vaginal birth. Any sexually active person can be infected with chlamydia. The greater the number of sex partners, the greater the risk of infection. *Chlamydia* infections are widely diffused in the general population and – unlike gonorrhea and syphilis – appear not to be restricted to a particular risk group, mainly affecting young people, especially young women. The highest incidence is usually reported in the age group 15–24 years, accounting for more than 60% of all cases.

Nationally, in 2005 (the last year data for which data is available), 976,445 *Chlamydia* infections were reported and the reported number of cases of *Chlamydia* infection was nearly three times greater than the reported cases of gonorrhea (339,593 gonorrhea cases). The rate of *Chlamydia* among blacks was over eight times higher than that of whites (1247.0 and 152.1 cases per 100,000, respectively). In Kansas City, the infection rate among women 15-24 y of age attending the sexually transmitted disease clinic was 3.1 times higher than that for like women attending family planning clinics.

During 2006, the Kansas City Health Department reported 3,916 *Chlamydia* infections among City residents, compared to 2,308 gonorrheal infections and 144 syphilis infections. The reported number of infections among women was 2.2 times higher than reported among men. Five zip codes ac-

counted for 42% the reported *Chlamydia* infections and four of those also were included among the five zip codes that accounted for 52% of the gonorrheal infections. The reported number of infections in Kansas City has been increasing over the years, largely due to expanded testing, and to a lesser degree, partner contact follow-up.

Chlamydia is known as a "silent" disease because about three quarters of infected women and about half of infected men have no symptoms. If symptoms do occur, they usually appear within 1 to 3 weeks after exposure. If left untreated, this STI can progress to cause complications with serious consequences on women's reproductive health, including pelvic inflammatory disease that may lead to ectopic pregnancy and tubal infertility. *Chlamydia* infection is easily treated with a single dose of antibiotics and is a preventable disease (safe sex, condom use). An important aspect of prevention involves the evaluation of sexual partners to prevent re-infection and further spread



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of disease.

Genital *Chlamydia* infection causes cervicitis and salpingitis in women and urethritis and conjunctivitis in both men and women. Because the cervix of teenage girls and young women is not fully matured, they are at particularly high risk for infection if sexually active. Since *Chlamydia* can be transmitted by oral or anal sex, men-who-have-sex-with-men are also at risk for chlamydial infection.

In women, the bacteria initially infect the cervix and the urethra. Women who have symptoms might have an abnormal vaginal discharge or a burning sensation when urinating. When the infection spreads from the cervix to the fallopian tubes, some women still have no signs or symptoms; others have lower abdominal pain, low back pain, nausea, fever, pain during intercourse, or bleeding between menstrual periods. *Chlamydia* infection of the cervix can spread to the rectum.

Men with signs or symptoms might have a discharge from their penis or a burning sensation when urinating. Men might also have burning and itching around the opening of the penis. Pain and swelling in the testicles are uncommon.

Men or women who have receptive anal intercourse may acquire chlamydial infection in the rectum, which can cause rectal pain, discharge, or bleeding.

As with any STI, epidemiologists must be cognizant of what is going on in other parts of the world since sexually active international travelers can easily introduce new or genetically altered pathogens into this country. The cornerstone for this surveillance remains laboratory testing and national notification of the results. However, in much of the developed and developing world, *Chlamydia* infections are not required to be reported. And, that deficiency poses a threat to Kansas City residents.

Infection with *Chlamydia* was detected for the first time in 1907 by Giemsa staining and, ever since, detection has been improved with respect to sensitivity, specificity,

time per assay and the laboratory standardization. However, in 2006, a new variant of *C trachomatis* was reported in Sweden, designated either as Swedish CT variant (swCT variant) or new variant *C trachomatis* (nvCT) (*Sex Trans Infect* 2007;83:253-254). Due to a genetic deletion, this variant is not detectable by many nucleic acid amplification tests. This has led to increased spread of the disease in countries such as Sweden as many infected individuals were given false negative reports (www.eurosurveillance.org/em/v12n10.1210-221.asp), although diagnostics may not have been the only factor that contributed to the recently observed increase.

This new variant has been detected in Ireland, Norway, and Denmark, although the number of infections has remained low. In contrast, in Sweden, the variant accounts for 10-65% of reported *Chlamydia* infections. A possible reason why the variant does not appear to have spread outside Sweden may be found in a study carried out in one county which reported that 79% of all sexual partners of *Chlamydia* cases lived within 100 km of each other (*Sex Trans Dis.* 2007;34:255-256). Therefore, sex abroad may not be a significant risk factor for the acquisition and hence spread of *Chlamydia* infection unlike in the case of other STIs such as syphilis where it is well documented. In Sweden, it has been hypothesized that a number of factors are present that may have resulted in selection of the variant, for example the high number of diagnostic tests carried out almost exclusively by the nucleic acid assay, the lack of contact tracing performed for false negative persons and the treatment of symptomatic patients only (www.eurosurveillance.org/em/v12n04.1204-223.asp).

From what has been published, this new variant of *C trachomatis* appears to be restricted to a few countries of northern Europe. However, since it is not detectable by the predominant tests used in this country its introduction may go unnoticed. And given the fact that most infected persons are asymptomatic, this variant could establish itself before anyone noticed.

The Kansas City Health Department received the Missouri Public Health Association 2007 Publication Award for:

Griffin R, Wilkinson T, Hoff GL. Hepatitis vaccination of men-who-have-sex-with-men by taking the vaccine to the community. J Men's Health Gender 2007;4:39-43.

Fetal Mortality

In the US, fetal deaths at 20 or more weeks gestation account for 49% of all fetal and infant deaths that occur between the 20th week of gestation and the 1st year of life (*MMWR Morb Mort Wkly Rep* 2004;53:529-532). Nationally in 2004 (the most recent year for which data is available), there were 25,655 reported fetal deaths in the US (*Nat Vital Stat Rep* 2007;56(3) www.cdc.gov/nchs). The fetal mortality rate was 6.20 per 1,000 live births and fetal deaths. Between 1990 and 2004, fetal mortality rates for ≥ 28 weeks of gestation have declined substantially whereas those for 20-27 weeks of gestation have not declined.

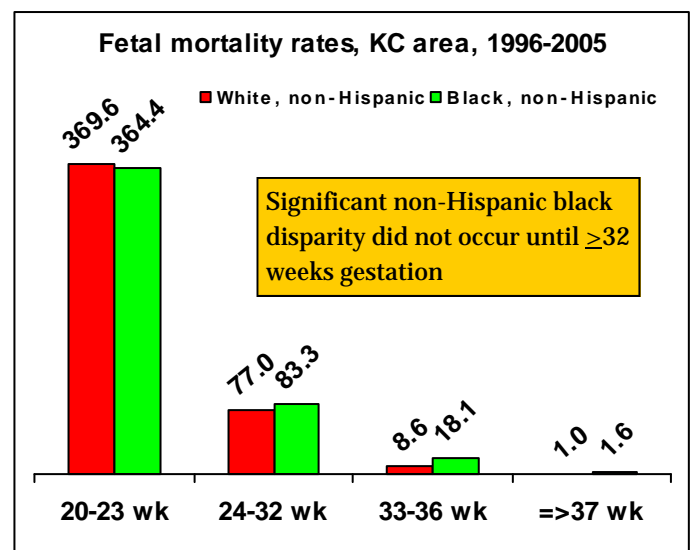
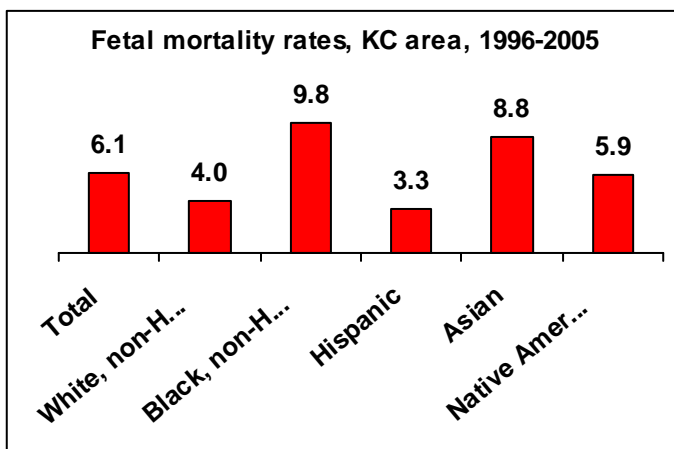
In 2005, pregnant women in Kansas City experienced 43 fetal deaths (stillbirths) which was slightly above the average of 41 fetal deaths annually for the period 2001-2005. In 2005, the fetal mortality rate was 5.7. Mothers <20 y old accounted for 16.3% of stillbirths, those mothers 20-34 y old for 65.1% while women ≥ 35 y old accounted for 18.6%. Women 40 y of age and older had the lowest ratio of live births to stillbirths at 50.7:1, followed by teenagers 15-17 y old with 73.3:1. More males were stillborn than females and the ratios varied by race/ethnicity.

One of the Yr 2010 national health objectives is to reduce deaths among fetuses ≥ 20 weeks gestation to 4.1 deaths per 1,000 live births plus fetal deaths for all racial/ethnic populations. However, there are disparities in the risk for fetal death (see graph below). Compared to non-Hispanic whites, non-Hispanic blacks are 2.5 times more likely to experience a fetal death and Asians are 2.2 more likely. Hispanics, on the other hand had a lower risk of fetal death.

The recognition of the racial/ethnic disparities in fetal deaths is well documented. However, what is unclear is whether these disparities occur throughout the gestational period. According to the National Center for Health Statistics (NCHS), the disparity is constant with non-Hispanic blacks having at a rate at least double that for non-Hispanic whites. The NCHS calculates the fetal death rates by dividing the number of fetal deaths that occur during a specific gestational period by the total number of fetal deaths and live births for that gestational period and subsequent gestational periods, and multiplying the result by 1,000.

Despite the prestige of the NCHS, an examination of fetal deaths in South Carolina found no racial/ethnic disparity when gestational age was controlled for (*Am J Perinatol* 2005;22:245-248), while an analysis of fetal deaths by birthweight specific rates found no significant disparity between whites and blacks until birthweights were $\geq 2,500$ g or ≥ 5 lb 8 oz (*Ann Epidemiol* 2006;16:485-491).

Consequently, the Kansas City Health Department, in conjunction with the health departments of the City of Independence, Jackson, Clay and Platte counties, examined racial/ethnic disparities in fetal deaths by birthweight specific and gestational age specific rates using data from 1996-2005 (see graph below). That analysis demonstrated statistically significant disparities for non-Hispanic whites when fetal deaths occurred <28 weeks gestation and at weights <1,000 g or 2 lb 3 oz. Statistically significant disparities for non-Hispanic blacks were



not evident until gestation was ≥ 32 weeks or weights were $\geq 2,500$ g. As the results of the Kansas City area data were consistent with each other, this suggests that the non-Hispanic black disparity in fetal mortality is a late gestational issue (*J Nat Med Ass* 2007;99(11), in press).

The lack of disparity for non-Hispanic blacks and the disparity for non-Hispanic whites during earlier gestation or with low birthweights were associated with disparate rates for very preterm live births.

Maternal Mortality

On the 12th of October, the World Health Organization released an assessment of maternal mortality worldwide for the year 2005. That report concluded that the world's maternal mortality ratio (the number of maternal deaths per 100,000 live births) is declining too slowly to meet Millennium Development Goal 5, which aims to reduce the number of women who die from pregnancy/childbirth related causes by 75% by 2015.

To achieve the goal's target, an annual decline of 5.5% in maternal mortality ratios is required over the period 1990 to 2015, yet the annual rate of decline has only been 0.4%. The decline has taken place almost entirely in countries with relatively low levels of maternal mortality. Countries with the highest initial levels of mortality have made virtually no progress over the past 15 years.

In 2005, there were 536,000 maternal deaths. The life-time risk of death from pregnancy-related causes is lowest for women in Ireland (1 in 47,600) and highest in Niger (1 in 7). The US ranks 41st out of 171 countries with a life-time risk of 1 in 4,800.

In the US, the maternal mortality ratio declined from 21.5 in 1970 to 7.5 in 1982. However, in recent years the maternal mortality rate has been increasing (*Vital Health Stat* 2007;3(33) www.cdc.gov/nchs). In 2004, the rate was 13.1 with non-Hispanic black women having a substantially higher risk of maternal death than non-Hispanic white women (rates of 43.7 and 9.3, respectively) (*Nat Vital Stat Rep* 2007;55(19) www.cdc.gov/nchs). Hispanics had a rate of 8.5 deaths per 100,000 live births.

Women who have multifetal pregnancies are at a greater risk of dying than women who have only a single fetus irrespective of age, race, marital status, and educational level (*Obstet Gynecol* 2006;107:563-568). It is estimated that approximately 40% of deaths (due to hemorrhage and complications of chronic diseases) are preventable (*Obstet Gynecol* 2005;106:1228-1234). The higher risk of maternal death among non-Hispanic blacks has been attributed to them being more socioeconomically disadvantaged, less frequent and later access to care, and more severe disease and comorbidities (*Ann Epidemiol* 2007;17:180-185; *Am J Public Health* 2007;97:247-251). According to the Preeclampsia Foundation, preeclampsia accounts for 18% of maternal deaths in the US, and 15% worldwide.

The US national Yr 2010 objective for pregnancy-related mortality is no more than 3.3 maternal deaths per 100,000 live births. Pregnancy-related deaths are uncommon in Kansas City, yet the maternal mortality rate is 4.9 times the Yr 2010 objective. There were 6 deaths and 37,106 total live births between 2001 and 2005, for a maternal mortality rate of 16.2 per 100,000 births. This rate is probably an underestimate, however, based on a report from Maryland that found 38% of pregnancy-related deaths were not indicated as a maternal death on the death certificates (*Am J Public Health* 2005;95:478-482). At least half of the unreported deaths were among women who were undelivered at the time of death, experienced a fetal death or therapeutic abortion, died more than a week after delivery, or died as the result of a cardiovascular disorder.

Healthy People, Healthy Communities

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