Kentucky
Epidemiologic Notes & Reports

Cabinet for Health Services
Department for Public Health
Division of Epidemiology & Health Planning

Volume 38 Number 7 July 2003

Smoking During Pregnancy— Placing Kentucky's Children At Risk

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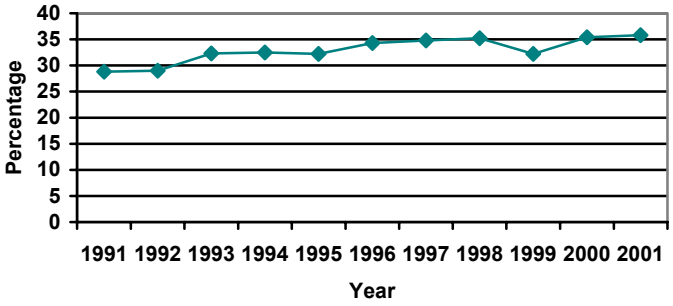
Smoking is a serious public health problem in Kentucky. In 2001, Kentucky led the 50 states in the percentage of current smokers, 30.9%[1]. A particular concern is the high percentage of smokers among pregnant women and women of childbearing age. Mothers who smoke increase the risk that their infants will suffer from low birth weight, intrauterine growth retardation, various respiratory diseases, and infant mortality[2,3]. This article examines birth and death data, as well as other data resources to determine the prevalence of maternal smoking and the relationship of maternal smoking to infant morbidity and mortality.

Smoking Among Women of Childbearing Age

An analysis of smoking among women of childbearing age provides valuable insight into the high prevalence of smoking among pregnant women. According to data from the 2001 Behavioral Risk Factor Surveillance System (BRFSS), Kentucky ranked second in the nation at 35.8% in the percentage of women age 18-44 who currently smoke. As shown in Figure 1, the prevalence of current smoking among women of childbearing age has increased over the past decade[1].

Figure 1.

Women Age 18-44 Who Are Current Smokers
Kentucky BRFSS, 1991 - 2001



Data Source: Kentucky BRFSS 1991-2001.

Smoking is also highly prevalent among females in high school. According to data from the 2001 Kentucky Youth Risk Behavior Survey (YRBS), 34.1% of the high school females surveyed had smoked cigarettes on one or more days in the past month and 18.3% had smoked cigarettes on 20 or more days in the past month[4].

The fact that over one-third of Kentucky women are current smokers is a serious concern. By smoking, women not only are increasing their own risk of developing cancer and other health problems, but also are increasing the chance of harming the fetus if they become pregnant. Even if women stop smoking when they realize that they are pregnant, harm to the fetus may have already occurred.

Smoking During Pregnancy

According to data from Kentucky birth certificates, smoking during pregnancy declined from 27% in 1991 to 23.4% in 2000. (See Figure 2.) However, the prevalence still remains high. The main decline occurred from 1991 to 1994[5]. Since that time, very little progress has been made in reducing the prevalence of smoking among pregnant women. In 1999, the most recent year in which a national comparison could be

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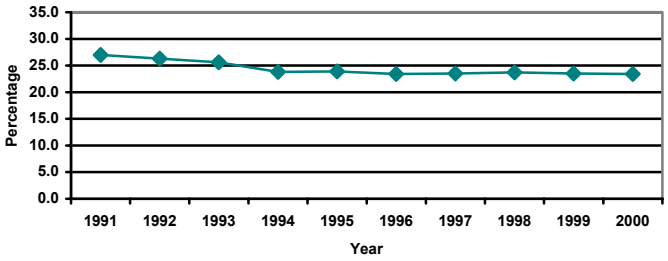
Figure 2.

Women Who Smoked During Pregancy
Kentucky, 1991 - 2000



Data Source: Kentucky Vital Statistics Files, Live Birth Certificate Files, 1991-2000.

July Notes & Reports.....

Smoking During Pregnancy

(Continued from Page 1)

made, Kentucky had the second highest percentage of maternal smoking in the nation[3].

Table 1 presents demographic characteristics of those women who smoked during pregnancy and gave birth in either 1999 or 2000. For both years, the age group with the highest percentage of smokers was 15-19. Approximately one third of women in this age group smoked while pregnant. A higher percentage of White women smoked compared to African American women and women of other races. The percentage of women who smoked decreased with higher education level. In 2000, 44.1% of pregnant women without a high school education smoked compared to only 2.9% of those pregnant women with a graduate degree. In 2000, 34.8% of women who began their prenatal care in the third trimester smoked during their pregnancy compared to only 21.7% of women who began prenatal care in their first trimester.

Table 1.

Percentage of Kentucky Resident Live Births to Women Who Smoked During Pregnancy by Selected Demographics
Kentucky Vital Statistics Files, Live Birth Certificate Files, 1999-2000

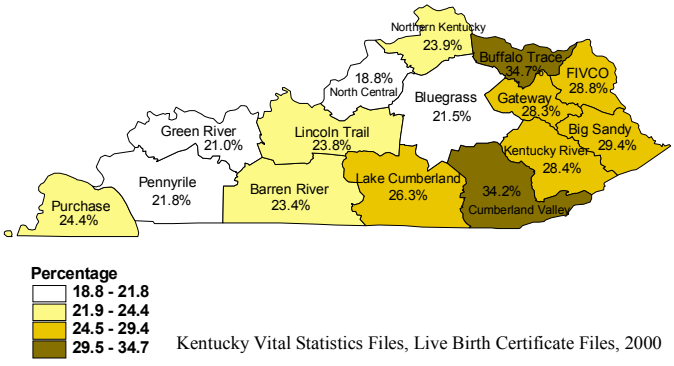
	1999	2000
Total	**23.5**	**23.4**
Age		
<15	24.6%	21.9%
15-19	33.7%	32.9%
20-24	28.8%	29.3%
25-29	19.4%	19.6%
30-34	15.0%	14.7%
35-39	18.1%	17.6%
40+	16.9%	18.7%
Race		
White	24.4%	24.4%
African American	16.3%	16.5%
Other	7.8%	6.8%
Education		
< High School	44.4%	44.1%
High School	27.2%	27.4%
Some College	14.6%	14.8%
College	4.1%	4.3%
Graduate/Professional	2.3%	2.9%
Trimester Prenatal Care*		
First	21.7%	21.7%
Second	34.4%	34.1%
Third	31.2%	34.8%

*Indicates the trimester of pregnancy in which prenatal care began.
Data Source: Kentucky Vital Statistics Files, Live Birth Certificate Files, 1999-2000

The geographic distribution of pregnant smokers varied widely throughout the state in 2000. (See Map 1.) The Area Development District (ADD) with the highest percentage of smokers was Buffalo Trace at 34.7%. The ADD with the lowest percentage was North Central at 18.8%.

Map 1.

Percentage of Kentucky Residents Who Smoked During Pregnancy by Area Development District, 2000



Kentucky Vital Statistics Files, Live Birth Certificate Files, 2000

Infant Morbidity and Maternal Smoking – Low Birth Weight

The negative association of smoking and poor pregnancy outcomes has been documented previously in numerous studies, particularly that of low birth weight[2]. Infants born to women who smoke during pregnancy have a lower average birth weight and are more likely to be small for gestational age than are infants born to women who do not smoke[6]. Birth certificate data for Kentucky residents who smoked during pregnancy indicate that the low birth weight rate increased from 118.8/1,000 live births in 1995 to 121.2/1,000 live births in 2000. (See Figure 3.) This represents a 2% increase over the six-year period. During the same time frame, the low birth weight rate among non-smoking women also increased but remained substantially lower than the rate for smoking women. Figure 3 also demonstrates that for year 2000 the low birth weight rate for smokers was nearly double that of non-smokers (121.2/1,000 live

(Continued on Page 3)

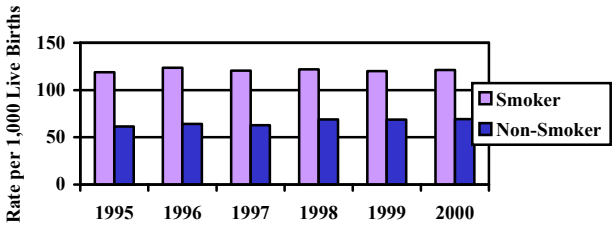
Smoking During Pregnancy

(Continued from Page 2)

births vs. 69.3/1,000 live births respectively) clearly demonstrating one of the negative impacts of smoking during pregnancy.

Figure 3.

Low Birth Weight* Rate Among Kentucky Residents by Smoking Status, 1995-2000**



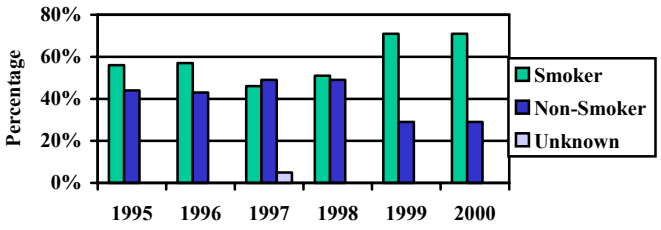
*Low Birth Weight is defined as any infant weighing <2500 grams at birth.
**Rates are per 1,000 live births.
Source: Kentucky Vital Statistics Files, Live Birth Certificate Files, 1995-2000.

Infant Mortality and Maternal Smoking - SIDS

The risk for perinatal mortality and for Sudden Infant Death Syndrome (SIDS) is increased among the offspring of women who smoke during pregnancy[6]. Linked Live Birth and Death Certificate data for Kentucky demonstrates this association[5]. From 1995 to 2000, the percentage of SIDS deaths to infants of women who smoked during pregnancy rose from 56% in 1995 to 71% in 2000, while SIDS deaths to non-smokers declined from 44% to 29% during the same time frame. (See Figure 4.)

Figure 4.

Percentage of Kentucky Resident SIDS* Deaths by Smoking Status of Mother During Pregnancy, 1995-2000

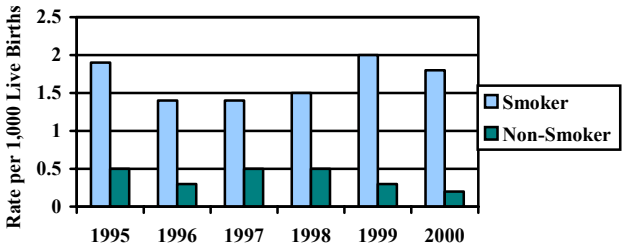


*SIDS deaths are based on ICD9 code 798.0 & ICD10 code R95.
Source: Kentucky Vital Statistics Files, Linked Live Birth and Death Certificate Files, 1995-2000.
Note: Death Certificates that could not be linked to a birth certificate were excluded from the analysis.

The infant mortality rate for SIDS among women who smoked ranged from three to nine times higher than the rate among non-smokers with the largest gap occurring in year 2000. (See Figure 5.) A steady decrease in the rate is currently exhibited among the non-smoking women while a slight increase is seen among the smoking women. Despite increased knowledge of the adverse health effects of smoking during pregnancy and cigarette smoking being the most preventable risk factor for SIDS, infant deaths due to SIDS among women who smoked during pregnancy continue to rise.

Figure 5.

Rate* of Kentucky Resident SIDS Deaths by Smoking Status of Mother During Pregnancy, 1995-2000**



*Rates are per 1,000 Live Births by Smoking Status.
**SIDS deaths are based on the ICD9 code 798.0 & ICD10 code R95
Source: Kentucky Vital Statistics Files, Linked Live Birth and Death Certificate Files, 1995-2000.
Note: Death Certificates that could not be linked to a birth certificate were excluded from the analysis.

Maternal Smoking-Attributable Mortality (SAM) and Years of Potential Life Lost (YPLL)

Smoking attributable infant deaths from certain conditions, such as low birth weight, SIDS, respiratory distress syndrome, and other respiratory conditions of the newborn, may be estimated by using a specific data program developed by the Centers for Disease Control and Prevention (CDC). According to data calculated by Smoking-Attributable, Mortality, Morbidity and Economic Costs (SAMMEC) software, an estimated 22 infant deaths were attributed to maternal smoking in Kentucky during 1999. Of these deaths, 12 were male and 10 were female. Maternal smoking caused approximately 17% of the infant deaths due to low birth weight, 24% of SIDS deaths, 7% of infant deaths due to respiratory distress syndrome, and 9% of the deaths classified as respiratory conditions of the newborn. Due to these deaths, there were an estimated 1,571 Years of Potential Life Lost (YPLL), 806 among males and 765 among females[7].

(Continued on Page 4)

Smoking During Pregnancy

(Continued from Page 3)

Conclusion

In Kentucky, approximately one out of every four pregnant women smokes. This behavior places their children at risk for low birth weight, SIDS, respiratory problems, and various other health conditions. Health care providers must place particular emphasis in counseling not only pregnant women, but also women of childbearing age on the benefits of smoking cessation. This counseling should continue even after the baby is born because second hand smoke can place the child at risk for respiratory illness, ear infection, asthma, and other illnesses[8]. "Make Yours a Fresh Start Family" is one of the many smoking cessation programs promoted by the Kentucky Department for Public Health. In this program, conducted by local health department clinics, pregnant women and mothers who smoke are made aware of how smoking can harm their children. They are instructed to set a stop day and given suggestions on how to deal with withdrawal symptoms and the temptation to smoke. For more information on this program and other smoking cessation programs, contact your local health department.

References

[1]Centers for Disease Control and Prevention (CDC) and Kentucky Department for Public Health. *Behavioral Risk Factor Surveillance System Survey Data,* 1991-2001. (The definition of current smoking is those Kentuckians who have smoked at least 100 cigarettes in their lifetime and now smoke everyday or some days.)

[2]Martin JA, Hamilton BE, Ventura SJ, Menacker F, Park MM. Births: Final data for 2000. National vital statistics reports; vol 50 no 5. Hyattsville, Maryland: National Center for Health Statistics. 2002.

[3]Matthews TJ. Smoking during pregnancy in the 1990's. National vital statistics reports: vol 49 no 7. Hyattsville, Maryland: National Center for Health Statistics, 2001.

[4]Centers for Disease Control and Prevention. *Surveillance Summaries*, June 28, 2002. MMWR 202; vol 51 (No.33-4).

[5]Kentucky Department for Public Health. Vital Statistics Branch. Vital Statistics, Live Birth and Death Certificate Files, 1991-2000. (Data from birth certificates are used to estimate the percentage of women who smoked during pregnancy. The certificate states whether or not the mother used tobacco during pregnancy and the average number of cigarettes smoked per day).

[6]Centers for Disease Control and Prevention. Women and smoking: a report of the Surgeon General (Executive Summary). *MMWR* 2002; vol 50 no RR-12.

[7]CDC. Smoking Attributable Mortality, Morbidity and Economic Costs. http://apps.nccd.cdc.gov/sammec/intro.asp

[8]American Academy of Pediatrics Committee on Environmental Health. Environmental tobacco smoke: a hazard to children. *Pediatrics* 1997 Apr;99 (4):639-42.

www.waterhealthconnection.org

On-Line Reference Guide to Waterborne Disease

Recognizing waterborne disease and the health effects of water pollution is the focus of a new physician on-line reference guide sponsored by the American College of Preventive Medicine (ACPM) and funded by the Environmental Protection Agency (EPA).

According to the ACPM, "Contamination of water reserves by either chemical agents or infectious pathogens may affect the health of millions of residents in the United States. Water consumers are frequently unaware of the potential health risks associated with exposure to waterborne contaminants and often consult practicing physicians who are unfamiliar with water pollution issues and their subsequent impact on human health. Misdiagnosis and under diagnosis of waterborne disease by the medical community may result in significant morbidity and mortality, particularly in vulnerable populations at increased risk of disease as a result of exposure to waterborne pathogens and chemical contaminants."

In addition, the organization says, "Events of September 11 emphasize the need for practicing healthcare providers to recognize unusual disease trends and early warning signs that may result from potential biological or chemical terrorism. Although the risk is extremely low, these covert attacks may include an assault on water safety. Primary care practitioners must be especially vigilant in light of the fact that they are likely to be the first to observe unusual illness patterns and must therefore understand their critical role in protecting water resources and their community's health."

The physician on-line reference guide provides a repository of educational information and preparedness resources for practicing physicians who must understand not only how to detect biological and chemical weapons exposure but also how to respond to this threat appropriately.

Access to the guide's web site is provided to health care practitioners at no cost. ACPM has been accredited by the American Council for Continuing Medical Education (ACCME) to provide CME credits for physicians participating in an online course on the reference guide. Visit the site at www. waterhealthconnection.org for more information.

Public Health Officials Urge Caution With Sick Prairie Dogs, Other Animals

With the introduction of monkeypox into the United States in June, Kentucky public health officials urged persons experiencing any signs of illness after contact with prairie dogs, Gambian giant rats, or other recently acquired exotic animals to seek medical attention if they developed symptoms such as fever, cough, rash and/or swollen lymph nodes. Physicians were asked to promptly report to the local health department any cases of illnesses consistent with these symptoms in patients who had had contact with these animals.

Health officials supported a Kentucky Department of Fish and Wildlife Resources (KDFWR) investigation into animals in the state that had originated with the Illinois distributor whose animals were believed to have transmitted monkeypox to people in three Midwestern states and New Jersey. At that time, KDFWR also banned the importation of all undomesticated rodents and rabbits, as well as all primates.

The Department for Public Health provided surveillance guidelines and other information about monkeypox to the state veterinary medical association, as well as local health departments and hospitals.

People who had acquired (since April 15, 2003) prairie dogs, Gambian rats, or other exotic animals that showed signs of illness were asked to contact their veterinarian's office. Pet owners taking sick animals to a veterinary clinic were advised to notify the veterinarian prior to transport so that appropriate infection control precautions could be taken in advance of arrival.

CDC Issues Interim Guidelines

On On June 11, the Centers for Disease Control and Prevention (CDC) issued interim guidance advising states that persons investigating monkeypox outbreaks and those involved in caring for infected individuals or animals receive a smallpox vaccination to protect against the possibility of contracting monkeypox.

The federal agency also recommended that persons who had had close contact with individuals or animals confirmed to have monkeypox be vaccinated. (Persons can be vaccinated up to 14 days post-exposure.) Since the smallpox vaccine is not an approved vaccine for monkeypox, the smallpox vaccine for this CDC-recommended use was distributed under FDA special procedures to allow such emergency use in association with individual patient informed consent and approval by an institutional review board (ethics committee). CDC did not recommend smallpox vaccination for veterinarians, veterinary staff, or animal control officers who had not been exposed. However, it did encourage such personnel to use standard infection control measures to prevent contact or airborne transmission of the virus if they were involved in investigation or treatment of ill animals.

According to the CDC, this is the first outbreak of human monkeypox infections to be documented in the Western Hemisphere. As of June 12, 54 possible cases had been reported in four states: Wisconsin, Illinois, Indiana, and New Jersey (transmitted in Indiana). In humans, infection with monkeypox virus results in a rash illness similar to, but less infectious than, smallpox. Monkeypox in humans is not usually fatal. The incubation period is about 12 days. Animal species susceptible to monkeypox may include nonhuman

For more information on monkeypox, visit the CDC web site at <http://www.cdc.gov/ncidod/monkeypox/index.htm>.

"SMAC!"
Learn More About Mosquitoes and West Nile Virus

A new, multi-agency web site to help Kentuckians learn more about West Nile virus recently became available. The site, http://www.westnile.ky.gov/, provides information from key state agencies involved in preventing the spread of the disease and protecting people from mosquitoes.

Named SMAC (Strategic Mosquito Attack Campaign), the web site provides links to the Department for Public Health, the Department of Agriculture, the Natural Resources and Environmental Protection Cabinet, and the Department of Fish and Wildlife. Each agency is playing a role in reducing mosquito numbers.

For example, the Department of Agriculture oversees a mosquito spraying program. Natural Resources' Waste Management Division provides a tire amnesty program to help reduce the number of discarded tires containing water—an ideal breeding place for the insects. Fish and Wildlife Resources offers information on how the disease affects wildlife and how persons can minimize their exposure to mosquitoes. The Department for Public Health and local health departments conduct mosquito surveillance and offer information about avoiding mosquitoes and West Nile virus.

KENTUCKY EPIDEMIOLOGIC NOTES & REPORTS
Printed With State Funds
by the
Commonwealth of Kentucky
Cabinet for Health Services
Department for Public Health
275 East Main Street
Frankfort, Kentucky 40621

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Suicide Rate Highest for Elderly

Depression is sometimes overlooked among senior citizens because it often occurs simultaneously with other serious illnesses such as heart disease, stroke, diabetes, cancer, and Parkinson's disease, according to the National Institute of Mental Health (NIMH). Because many older adults face these illnesses as well as various social and economic difficulties, depression may be mistaken as a normal consequence of these problems—an attitude often shared by seniors themselves.

Depression is one of the most common conditions associated with suicide. Bruce W. Scott, director of the state's Mental Health Division, says the greatest challenge is to better detect depression among older citizens and ensure that they receive proper treatment, which has been proven to reduce the risk of suicide. NIMH reports that many older adults who die by suicide (up to 75%) have visited a primary care physician within a month of their death. While comprising only 13% of the U.S. population, individuals age 65 and older accounted for 18% of all suicide deaths in 2000. According to data gathered by the Kentucky Department for Public Health for the same time period, there were 91 total deaths (18 per 100,000)—1.4 times higher than the rate among the entire population.

"Kentucky's 65+ population (almost 505,000 persons) is about 12.5% of the total population. Of these, an estimated 10% to 20% have mental health conditions—diagnosed or undiagnosed," said Jerry Whitley, executive director, Office of Aging Services, in the Cabinet for Health Services. In light of the current numbers in the aging population and the expected increases over the next 20 years, barriers to prevention and treatment of mental health conditions among the elderly must be elevated on the priority scale, he added.

The Kentucky Department of Mental Health and Mental Retardation Services and the Office of Aging Services formed a mental health and aging coalition in early 2000. Made up of consumer, provider, academic, legislative, and other groups, the coalition has dispersed seed money in the form of small grants to local communities to assist in devising better mental illness prevention and treatment programs for Kentucky's elderly.

According to the American Association for Geriatric Psychiatry, the direct and indirect costs of depression have been estimated at $43 billion each year. Late life depression is particularly costly, the Association says, because of the disability that it causes and the impact on the physical health of older persons.