



Kansas Health Statistics Report

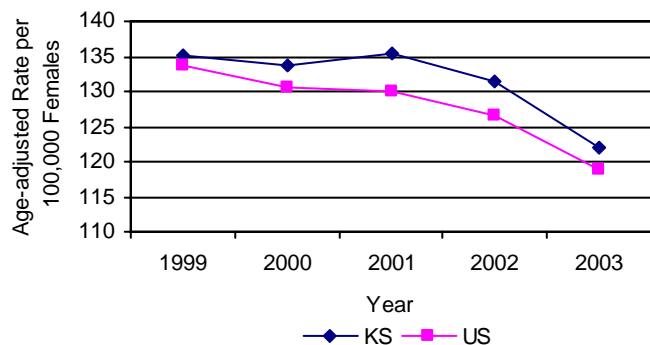
Kansas Department of Health and Environment – Division of Health
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Comparison of Kansas and National Breast Cancer Rates

The American Cancer Society predicts 178,480 new cases of breast cancer will be diagnosed in 2007 in the United States. In recent years, breast cancer was identified as one of the most common causes of cancer death among American women, second only to lung cancer [1].

However, nationally, death rates have been decreasing since 1990 due to improved detection, treatment, and understanding of the development of breast cancer [1]. This article compares Kansas and national breast cancer rates (per 100,000 females and age-adjusted to Year 2000 U.S. standard population) to determine whether trends are similar and to present important risk factors. Data were evaluated from the National Vital Statistics System (NVSS) [2], in combination with the Kansas Vital Statistics Mortality Data [3] and Cancer Registry Data [4] provided through the Kansas Information for Communities (KIC) system [5].

Figure 1. Breast Cancer Incidence Age-adjusted Rates in the U.S. and Kansas, 1999-2003



Kansas and U.S. breast cancer rates are comparable (Figure 1). Although Kansas incidence rates are slightly higher than those of the U.S., declining rates in the incidence of breast cancer reported in Kansas mirror those of the United States [4]. In 1999, the Kansas breast cancer rate was 135.2 per 100,000 females, while the rate was 133.8 in the U.S. By 2002, Kansas' rate fell to 131.5, while the U.S. rate was 126.7. The incidence rate fell both in Kansas and the U.S. in 2003 (122.0 and 119.0, respectively).

Figure 2. Percent Change in Age-adjusted Breast Cancer Incidence Rates in the U.S. and Kansas, 2000-2003

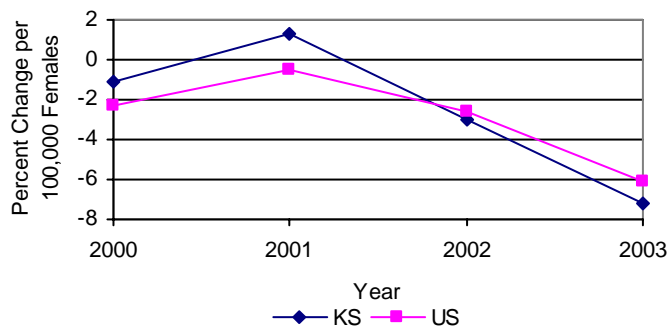


Figure 3. Breast Cancer Death Rates in the U.S. and Kansas, 1999-2005

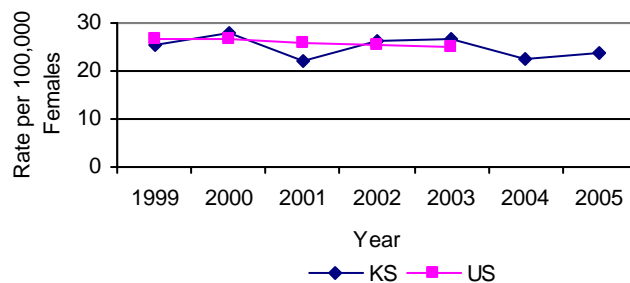
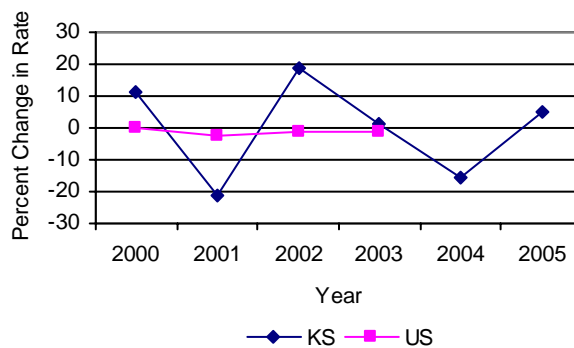


Figure 4. Percent Change in Age-adjusted Breast Cancer Death Rates, U.S. and Kansas, 2000-2005



In comparing the percent of difference in incidence between 1999 and 2003, both Kansas and the U.S. show larger declines in 2003 (7.22 percent and 6.08 percent, respectively). Although the declining trend appears to have begun in earlier years, the largest reduction appears in 2003. Nationally, breast cancer incidence rates were reported to have dropped unexpectedly by more than seven percent in 2003. Although it was acknowledged that other factors may have had an impact, this decrease was attributed mainly to a reduction in the use of hormone replacement therapy (HRT) in 2002 [6, 7]. Kansas trends appear to mirror national reports (Figure 2).

Kansas breast cancer death rates and percent of change rates between 1999 and 2005 have fluctuated over time. National breast cancer death rates and percents of change appear stable; however, national death data for 2004 and 2005 are not yet available (Figures 3 and 4).

Demographic Factors Impacting Breast Cancer

Some of the demographic

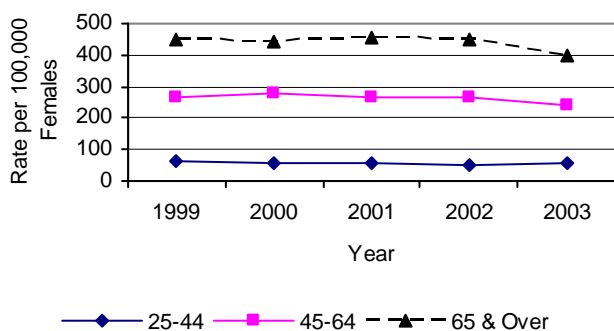
Inside

- Breast Cancer Rates in Kansas and U.S. Compared 1
- Smoking in Pregnancy 3
- Birth Certificate Impacts Calculation of Prenatal Care Start 4
- Kansas Unintentional Injury Deaths Compared 4
- Popular Baby Names Listed 5
- Vital Statistics Reports Out 6
- Uninsured in Kansas Studied 6
- Fall Trauma in Kansas 6
- P&I Mortality Down 7
- West Nile Virus Case Reported 7
- Norovirus Outbreak Studied 7

factors identified as impacting breast cancer rates include age, race, and ethnicity.

- Age – Generally speaking, the number of women who get breast cancer and who die with breast cancer increases progressively with age [8]. Most breast cancer occurs in women who are age 50 and older [1], with women age 60 and older at greatest risk [9]. Kansas breast cancer incidence rates for 1999 – 2003 by age group mirror national trends; women have progressively higher breast cancer rates as they age (Figure 5). Declines similar to those reported nationally for breast cancer rates in 2003 are evident among Kansas women age 45 and over.
- Race and Ethnicity – According to the Centers for Disease Control and Prevention (CDC), “the rate of women getting breast cancer or dying from breast cancer varies by race and ethnicity [8].” Nationally, aside from non-melanoma skin cancer [1], breast cancer is the most common form of cancer in women [6,8]. It is the number one cause of cancer death for Hispanic women, and it is the second most frequent primary form of cancer death for all other women [8]. However, the incidence rate in Hispanic women is about 40 percent lower than that of non-Hispanic white women [10]. On the other hand, in 2003, black women were more likely to die of breast cancer than any other group. White women had the highest incidence rate for breast cancer, while Black women had the second highest incidence rate followed by Asian/Pacific Islander, Hispanic, and American Indian/Alaska Native women [8].

Figure 5. Kansas Female Breast Cancer Incidence Age-adjusted Rates by Age Group, 1999-2003



Kansas breast cancer incidence by race/ethnicity for 1999-2003 [11] shows that women of Hispanic Origin have lower breast cancer incidence rates than Kansas women of Non-Hispanic origin for each of the years reported. Incidence rates for Kansas Hispanic women of all races (31.8 percent decrease between 2001 and 2002) and for Non-Hispanic White women (14.3 percent decrease between 2002 and 2003), are declining. Similar to national trends, Kansas rates for Non-Hispanic Black women increased between 2002 and 2003 (37.6 percent increase) [8].

Other Factors Impacting Breast Cancer

Some of the other factors identified as impacting breast cancer rates include monitoring and treatment, genetics, pregnancy, diet and exercise, and use of (HRT).

- Monitoring and Treatment – Monitoring and testing are cornerstones for detection of breast cancer. The use of X-ray mammograms decreased by four percent between 2000 and 2005 according to the National Center for Health Statistics. The most concerning rate decline was among women age 50 to 64, because this age group is at high risk for breast cancer [8,12]. It is important to have regular breast exams and mammograms and to evaluate any risk factors [9,13].

- Genetics – Women who inherit genes identified as BRCA 1 and BRCA 2 have been found to be more likely to develop breast cancer. Tests are available for identifying these genes for women with strong family history of breast or ovarian cancer [9]. Hispanic women with breast cancer, even with equivalent healthcare, tend to be younger and to have larger, more advanced tumors at diagnosis, suggesting possible biological or genetic factors that vary in effect for different ethnicities [10].
- Pregnancy – Factors increasing breast cancer risk include giving birth (temporarily slightly increases risk), having a first child after 35, ingestion during pregnancy of DES (diethylstilbestrol) [7], and never having given birth. Factors decreasing breast cancer risk include being a younger age at the birth of the first child, giving birth to more than one child at a younger age, having preeclampsia, and extended breastfeeding [14].
- Diet and Exercise – Diet and physical activity are broadly recommended as deterrents to breast cancer. A low-fat diet containing recommended servings of fruits, vegetables, and whole grains is suggested. Regular exercise and limiting alcohol consumption are important [15]. Studies indicate that postmenopausal alcohol exposure has a greater impact than that consumed at earlier ages [16].
- HRT – A study released in 2007 found that estrogen stimulates the expression of an inhibitor which hinders the ability of immune cells to kill tumor cells [17]. Another study found lower breast cancer rates among postmenopausal women not treated with HRT. It was reported that estrogen appeared to stimulate cancer receptor cells. Findings distributed from this study are reputed to have led to a major drop in the use of HRT [6].

The incidence of breast cancer appears to be declining both nationally and in Kansas. Medical experts attribute the decline in breast cancer deaths mainly to earlier detection and more effective treatments [1]. A number of factors like reproductive changes, mammography screening rates, environmental exposures, and dietary changes may be affecting breast cancer rates; however, HRT is the only risk factor to change substantially from 2002 to 2003 when there was a seven percent decline in breast cancer rates. Continued monitoring and public education about impacting risk factors are critical, and further study is warranted [1,7]. Professor Mike Richards quoted by BBC News stated, “Continued investment in staff and equipment combined with reforms to the way we work will mean that breast cancer services will improve even further in the future [13].”

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Smoking in Pregnancy and the Revised Birth Certificate - Implications for MCH Programs

The Bureau of Family Health's Needs Assessment (MCH2010) identified premature and low birth weight births as a priority health care need. Smoking during pregnancy was selected as a proxy to monitor progress:

The concern about smoking during pregnancy has been long-standing and is linked to adverse pregnancy outcomes, including low birthweight (LBW), intrauterine growth retardation, miscarriage, and infant mortality. . . Babies born to women who smoke are at substantially greater risk of LBW than babies born to nonsmokers [1].

Kansas resident birth data (2005) indicates 7.2 percent of all live births are low birth weight, 6.4 percent among non-smokers and 11.0 percent among smokers [1]. Before 2005, on the Kansas birth certificate (unrevised version), tobacco use was collected with a simple "yes/no" question on smoking tobacco during pregnancy. In contrast, the revised version asks for smoking tobacco use during each trimester of pregnancy (as well as the three-month period prior to pregnancy).

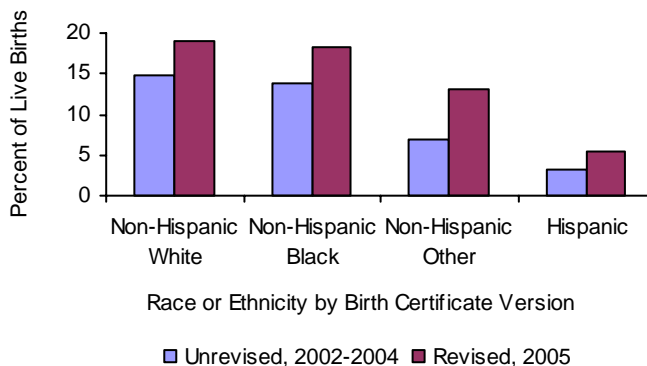
The National Center for Health Statistics has addressed this issue:

Studies based on the unrevised smoking question have suggested some underreporting of smoking on the birth certificate. Some of the underreporting no doubt reflected the lack of a specific time reference, that is, when during pregnancy the mother smoked. It is believed that the new question on prenatal smoking is providing higher quality, more reliable information in part because there is a specific time reference (each trimester) and women are afforded the chance to report that their smoking behavior has changed [1].

This change in data collection of smoking during pregnancy has significant implications for maternal and infant outcome measures. The year 2005 rates or percents are not comparable to before 2005. Also, because other states have not implemented

the revised birth certificate, information on Kansas residents who have given birth out of state is not available.

Figure 6. Percent of Live Births Where the Mother Reported Smoking during Pregnancy by Race or Ethnicity and Birth Certificate Version, Kansas, 2002-2004, 2005



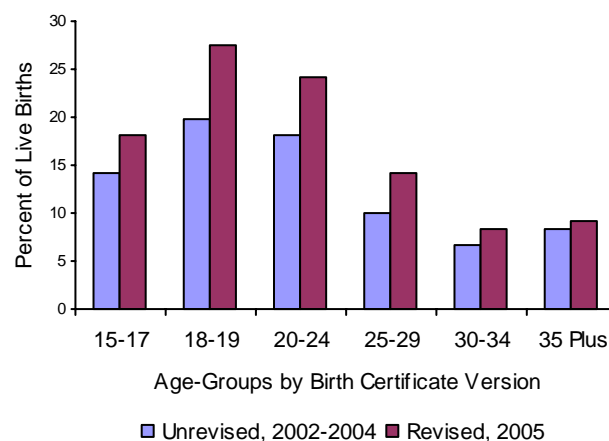
When comparing data from 2004 and 2005, the differences in data collection become apparent. In Kansas, 2004, with the unrevised version, in 12.4 percent of live births, the mother reported smoking during pregnancy [2]. This compares to 10.2 percent nationally (same time period) among states using this version of the birth certificate. For the same year, among the seven states using the revised birth certificate, 16.3 percent of mothers reported smoking at some time during pregnancy.

For resident live births in 2005, the percentage of mothers who reported smoking sometime during her pregnancy [2] was the same as the seven states that used the revised birth certificate in 2004. Nationally, despite the differences in smoking level between the two birth certificate versions, the variations among population subgroups by race and Hispanic origin persist. In Kansas, the variations by race or ethnicity are also comparable between the two versions of the birth certificate (Figure 6).

In Kansas overall, the age distribution is also comparable between the two versions of the birth certificate (Figure 7) with the greatest difference between the 18-19 year old mothers [2].

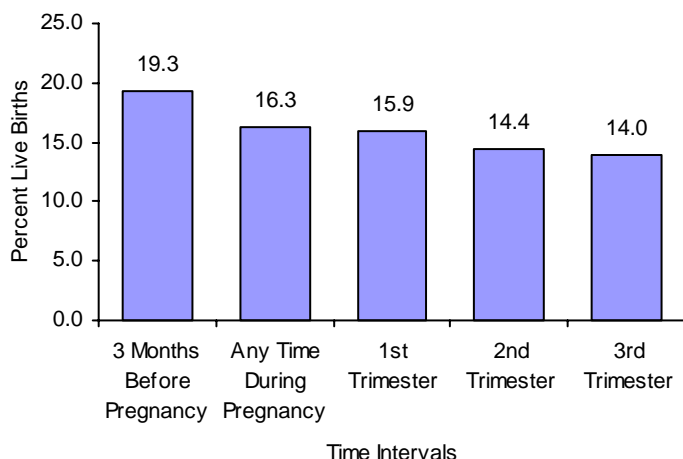
For Kansas, 2005, in 16.3 percent (n=6475) of live births (Figure 8), the mother reported smoking sometime during her pregnancy, in 19.3 percent of live births, the mother reported smoking

Figure 7. Percent of Live Births Where Mother Reported Smoking



in the 3 months before pregnancy. Of the mothers who reported smoking before pregnancy, 25.4 percent reported quitting by the second trimester and an additional 2.8 percent reporting quitting by the third trimester [2].

Figure 8. Percent of Mothers Who Reported Smoking before or During Pregnancy by Selected Time Intervals, Kansas, 2005



MCH Programs will continue to assess this indicator and others to gauge the impact of the new birth certificate data on critical MCH indicators – to monitor the health status of mothers and children in Kansas.

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New Birth Certificate Changes Calculation for Month Prenatal Care Began

The month prenatal care began and the adequacy of prenatal care utilization index (APNCU) are two important indicators in the evaluation of Kansas birth outcomes. Month care began indicates how early in the pregnancy a woman began seeing a physician. APNCU, which is based in part on month care began, gauges the quantity of prenatal care visits related to how soon in the pregnancy the woman began health care.

Prior to 2005 and the introduction of the revised Kansas birth certificate, month care began was based on a month value entered onto the unrevised certificate. Nationally, this value is computed by using the date of last menses and the date of the first prenatal care visit. Kansas adopted this method in order to prepare birth outcome data consistent with the National Center for Health Statistics.

These changes resulted in a higher percentage of inadequate APNCU values in 2005, 13.7 percent (Table 1). The inadequate APNCU rate was 8.7 percent in 2004. Comparison of the APNCU rates between 2004 and 2005 is inappropriate. APNCU rates for years prior to 2004 can be compared, but trends should not bridge 2004 – 2005.

Other reasons for the shift in rates include: the absence of accurate dates on Kansas or out-of-state birth certificates and the greater precision in the calculation of the month care began. The changes also reduce bias based on poor or inaccurate recall of the month care began. Both dates are collected by the physician providing prenatal care, who also forwards that record to the hospital for use in preparing the birth certificate.

Table 1. Adequacy of Prenatal Care Utilization Index, Kansas, 2004-2005

Indicator	2004	2005
Inadequate	8.7	13.7%
Intermediate	10.0	7.2%
Adequate	54.5	46.5%
Adequate Plus	26.8	32.6%

Kansas Residence Data

A review of APNCU values between final 2005 and preliminary 2006 residence births indicates similarly higher levels of inadequate APNCU.

Adequacy of Prenatal Care Utilization is just one of many changes resulting from the introduction of the 2003 Standard U.S. Certificates for birth and death. The certificates are reviewed and updated about every 10 years.

Other changes that were included in the new birth certificate were: more specific indications of tobacco use before and during pregnancy, whether the mother obtained WIC services during the pregnancy, primary source of payment for the delivery, primary language spoken, breastfeeding status and expanded race/ethnicity reporting.

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Kansas Unintentional Injury Deaths Parallel National Increase

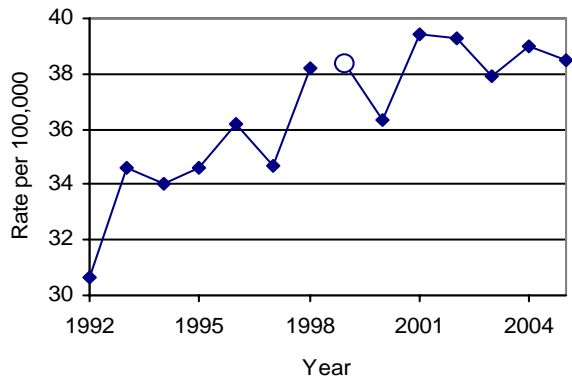
In a recent press release [1], the National Safety Council (NSC) reported that deaths in the United States due to unintentional injury rose by more than 20 percent during the decade ending in 2004. According to this report, motor vehicle crashes continue to be the leading cause of injury-related death, but deaths due to poisoning, especially from overdoses of legal and illegal drugs, are rising rapidly.

For the United States the crude death rate due to unintentional injury in 2004 was 37.8 deaths per 100,000 population. The median of the unintentional injury crude death rates for the 50 states and the District of Columbia was 41.8 deaths per 100,000 population. Kansas, at 40.3 unintentional injury deaths per 100,000 population, ranked 24th in the nation, with a lower unintentional injury death rate than a majority of the other states, but a higher rate than the nation as a whole.

The state with the lowest unintentional injury death rate was Massachusetts, at 19.9 deaths per 100,000 population; the state with the highest unintentional injury death rate was New Mexico, at 66.0 deaths per 100,000 population.

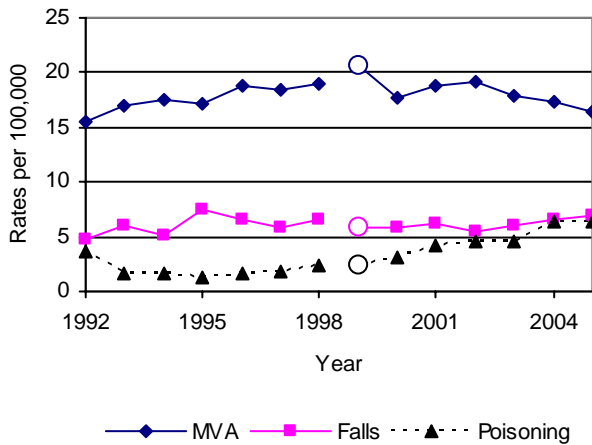
A multi-year analysis of Kansas' unintentional injury age-adjusted death rates showed an increase of 25.5 percent (from 30.66 per 100,000 population to 38.49) between 1992 and 2005 (Figure 9). The circle data point for 1999 indicates a break in the trend line due to implementation of ICD-10 mortality coding methods. ICD-9 was used for cause of death coding through 1998. Most of the increased unintentional injury mortality occurred from 1992 - 1998. No statistically reliable trend for 1999 – 2005 can be reported.

Figure 9. Age-Adjusted Unintentional Injury Death Rates, All Causes, Kansas Occurrence, 1992-2005



Motor vehicle accidents and falls have been the two leading causes of unintentional injury death in Kansas over the entire period of 1992 - 2005. Accidental motor vehicle deaths increased from 15.51 deaths per 100,000 population in 1992 to 19.03 deaths per 100,000 population in 1998 then declined from 20.61 deaths per 100,000 in 1999 to 16.42 deaths per 100,000 in 2005 (Figure 10). In each period, overlapping confidence intervals from year to year make it difficult to confirm these trends at intervals shorter than seven years.

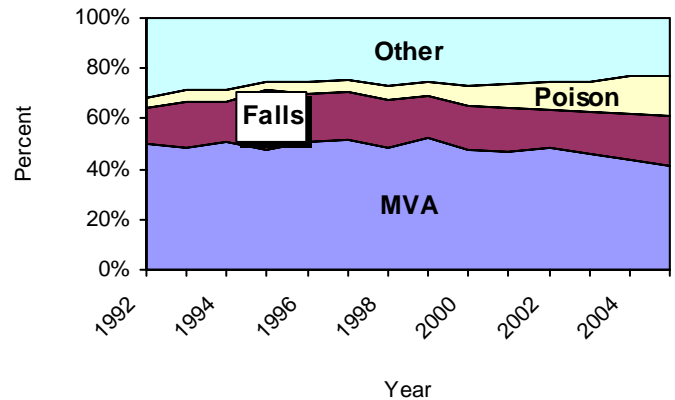
Figure 10. Age-Adjusted Unintentional Injury Death Rates, Motor Vehicle Accidents, Falls, and Poisoning, Kansas Occurrence, 1992-2005



Death rates due to unintentional falls increased 50.8 percent from 1992 to 2005 (from 4.65 per 100,000 population in 1992 to 7.01 per 100,000 population in 2005). The increase in the period when ICD-9 causes of death were used (1992-1998) can be accepted as a valid trend, since overlap of confidence intervals gradually disappears from 1992 to 1998. It is still too early to declare that the increase from 1999 to 2005 constitutes a valid trend, as confidence intervals of all years in the period overlap.

Kansas death rates due to unintentional poisoning have risen by 376.7 percent since 1995 (from 1.33 per 100,000 population in 1995 to 6.34 per 100,000 population in 2005), with most of the increase occurring since 1999. Unintentional poisoning deaths have also increased as a percentage of all unintentional injury deaths in Kansas, from 3.7 percent in 1992 to 15.5 percent in 2005 (Figure 11).

Figure 11. Major Contributions to Unintentional Injury Deaths, by Percent, Kansas Occurrence, 1992-2005



The National Safety Council attributes the national increase in unintentional poisoning to overdoses of legal and illegal drugs [1]. Increases in poisoning deaths were also noted in an earlier report [2] from the Center for Disease Control (CDC). That report stated that, for the years 1990-2001, "narcotics and psychodysleptics accounted for 51 percent of all poisoning deaths." However, the CDC report was based on data from only 11 states, not including Kansas. Further research is needed to determine the identity and legal status of the substances contributing to unintentional poisoning deaths in Kansas.

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2006 Most Popular Baby Names

Madison and Aiden were the most popular names given to newborns by Kansas parents in 2006. For the first time, since the state began compiling a list, the top name for both girls and boys is uni-gender.

After three years at the top, Emma has been unseated by Madison as the most popular girl name. Emily, Emma, Abigail and Kaitlyn join Madison in the top five. There are two new entries in the girls' top 10, Addison, which is new to the top 25, and Ava. Kaylee is the girl's name with the most spelling variations (38).

Aiden occupies the top spot on the boys list for the third year running. Jacob, the top spot for nine years until 2004, has slumped to number four, behind Caden and Brayden. Caden was the boys' name with the most spelling variation (30), and in 2006 parents preferred Caden spelled with a "C." The trend for Celtic and English boys names continues with names such as Aiden, Caden, Conner, Dylan and Logan included in the top 25. New boys' names in the top 10 are Landon, new to the top 25, Alexander, and Logan.

This information was prepared by the Division of Health's Center for Health and Environmental Statistics. The lists are derived from birth certificate information on file with the Center's Office of Vital Statistics. The list contains names with the same

pronunciation, but different spellings, to give a more accurate view of name popularity.

Popular baby names are one of the more regularly requested items produced by the Center's Office of Health Assessment. While the list reflects popular culture and names frequently used in the media, other information from birth certificates and other vital records stored with the Center's Office of Vital Statistics is used to gauge health trends in the state.

The popular baby names lists are available on the KDHE Web site at: <http://www.kdheks.gov/ches/index.html>.

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2005 Vital Statistics Reports Available

The Center for Health and Environmental Statistics has released 2005 reports on teenage pregnancies and adequacy of prenatal care.

The *Adolescent and Teenage Pregnancy Report, Kansas, 2005* summarizes data collected from vital records on fetal deaths, abortions, and live births. The report includes state and county level tables containing pregnancy totals and rates for various age groups from 10-19.

The *Adequacy of Prenatal Care Utilization Index, Kansas, 2005* utilizes information readily available on the Kansas birth certificate (number of prenatal care visits, date of first prenatal visit, data of last menses and gestational length of pregnancy). The index combines information on the adequacy of initiation of prenatal care and the adequacy of received services for the purpose of evaluating access and utilization of prenatal care. State and county level tables are included in the report.

Both reports are available on the KDHE Web site at: <http://www.kdheks.gov/ches/>.

Reports for earlier years can also be found at this location.

Center for Health and Environmental Statistics

Study on Uninsured Kansans Presented

Dr. Barbara Langner, consultant to the Kansas Health Policy Authority (KHPA), presented results from a survey of uninsured Kansans to Board members during its June 19, 2007 meeting. Results from the study indicate 10.5 percent of Kansas residents do not have health insurance. Regional differences in insurance coverage are apparent across the state with the highest percent uninsured living in southwest Kansas and the lowest percent uninsured in Johnson County.

Other characteristics of the uninsured found in the survey include:

Table 2. Selected Characteristics of Uninsured in Kansas

Percent of Kansans under 65 who were uninsured for more than 2 years	35%
Percent of Kansans under 65 who never had insurance	16%
Largest age-group of uninsured Kansans (19.8%)	19-24 year olds
Percent of Hispanics under 65 uninsured	26.0%
Percent of Uninsured Kansans at or below the Federal Poverty Level	39%

Source: Kansas Health Policy Authority

The full report can be found at: <http://www.khpa.ks.gov/AuthorityBoard/PreviousMeetingInformation/Handouts/6-19-07UninsuredProfilePrPtBL.ppt>.

Kansas Health Policy Authority

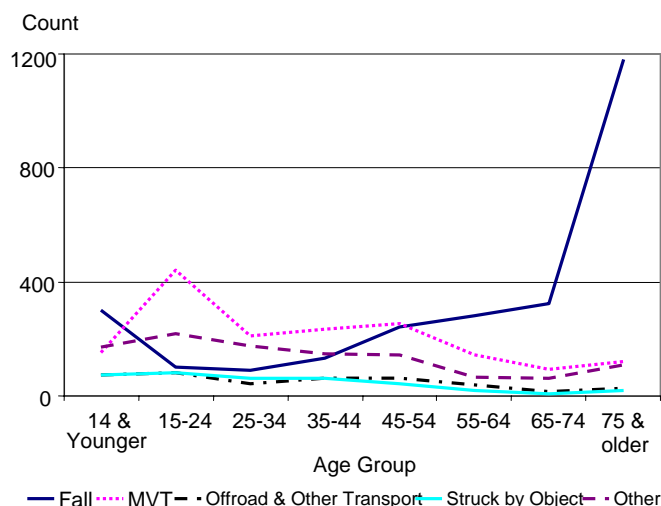
Fall Trauma in Kansas

In 2005, unintentional injury was the leading cause of death for Kansans aged 1-44 and the fifth leading cause of death overall. The three most common external causes of injury deaths in 2005 were motor vehicle crashes (494 deaths), falls (212 deaths) and poisonings (179 deaths) [1]. While falls are the second leading cause of fatal injury for Kansans, they are the leading cause of injury hospitalization.

The Kansas Trauma Registry (KTR) is a state-wide data repository for traumatic injuries in Kansas containing demographic, clinical, and other details on injuries requiring either acute transfer or a hospital length of stay two days or longer. In 2005, there were 2,656 fall injuries reported to the Kansas Trauma Registry, constituting nearly 43 percent of all cases submitted [2]. The majority of those falls (56.5%) occurred in persons age 65 and older. Of the 1,502 falls in that age group, 68 percent were women.

Based on trauma reports for the leading causes of injury submitted to the KTR in 2005, falls exceed motor vehicle traumas among children (14 and younger) and among adults in the oldest three age groups (Figure 12). There is a notable spike in the number of records reported to the KTR in the 75 and older group.

Figure 12. Leading Causes of Trauma (KTR 2005)



While falls account for the largest number of traumas in Kansas, they do not necessarily cause the most severe injuries. One measure of injury severity recorded in the KTR is the Injury Severity Score (ISS) which ranges from 0 (no injury) to 75 (un-survivable). The median ISS for falls in the KTR was five, compared to a median of 10 for motor vehicle traumas. While 30.2 percent of patients injured in motor vehicle crashes had severe injuries (ISS 16 and higher), only 14.4 percent of patients injured from falls had such severe injuries.

Therefore, while motor vehicle crashes constitute a large burden to Kansas in terms of both number and severity of injuries, the burden of falls should be understood as large numbers of less-severe injuries. Efforts to prevent fall injuries among the elderly could reduce the number of costly hospitalizations associated with these injuries, particularly as the elderly population continues to grow.

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- Records of patients transferred to higher level facilities excluded to avoid multiple counting of single trauma patients. Only records meeting inclusion criteria are counted.

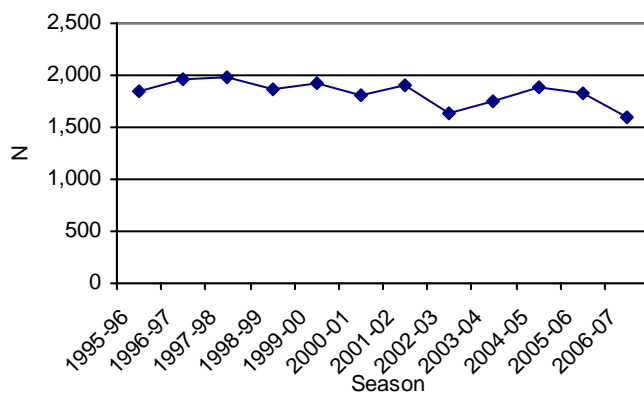
Pneumonia and Influenza Mortality Declines

One of the important indicators for public health is pneumonia and influenza (P&I) related mortality. Combined with information from sentinel physicians and laboratory testing, P&I mortality helps tell how bad the flu season is and helps epidemiologists refine outbreak recommendations.

P&I related mortality is any death in which either the underlying cause or a contributing cause of death was pneumonia or influenza. P&I is a factor in many deaths. Counts are typically higher in the winter.

The 2006 – 2007 flu season, measured in terms of P&I mortality, was the mildest in some time. The season, which runs from September through the end of May, recorded 1,597 resident deaths. This is the lowest number of deaths during the 12 years for which statistics can be calculated (Figure 13).

Figure 13. Kansas Resident Pneumonia and Influenza Mortal-



Mild flu seasons at the beginning and end of the same year have an impact on overall annual mortality rates. During the 12 seasons reviewed, P&I was not the underlying cause of death in two-thirds (66.1%) of the P&I associated deaths. Further research is needed to determine whether declines are associated with mild winters or fall vaccination campaigns.

*Greg Crawford
Office of Health Assessment*

West Nile Virus Reported

The Kansas Department of Health and Environment (KDHE) has received its first reported case of West Nile Virus in 2007. The patient is an adult from North Central Kansas.

West Nile Virus can be spread to people by mosquitoes that first bite an infected bird, but it is not contagious from person to person. Symptoms range from a slight headache and low-grade fever to swelling of the brain or brain tissue and in rare cases, death. People who have had West Nile Virus before are considered immune.

Cases are most common in the late summer and early fall months. In 2006, KDHE confirmed 25 West Nile cases that resulted in three deaths.

Birds are no longer tested for West Nile Virus in Kansas and KDHE will not be collecting information about dead birds. If you find a dead bird, KDHE recommends that you wear gloves, place the bird in a plastic bag, and dispose of it in the garbage.

So far this year, 11 states (including Colorado and Nebraska) have reported at least one human case of West Nile Virus to the

Centers for Disease Control and Prevention (CDC). Sixteen states (including Missouri and Oklahoma) have reported West Nile Virus activity in birds, animals or mosquitoes. KDHE asks physicians to report cases by calling (877) 427-7317.

Office of Surveillance and Epidemiology

Norovirus Gastroenteritis Outbreak

On June 21, 2007 a member of the staff associated with a group of campers notified the Kansas Department of Health and Environment (KDHE) of widespread illness among campers and staff at a summer camp in Geary County hosted by the American Diabetes Association (ADA). Approximately 56 (93%) of the campers and 26 (76%) of the staff were reported ill. Vomiting and diarrhea were reported among the ill.

KDHE staff initiated an outbreak investigation to determine the source of the illness and implement appropriate control and prevention measures.

The ADA hosted a camp for school age children with diabetes. The camp was held at Rock Springs Ranch camp located in Geary County. This group of campers included students in fourth through sixth grades. The ADA coordinated volunteers to staff each cabin with adults and medical staff. There were six cabins for the children, each of which housed 10 to 11 children and had five to six staff assigned to it. The group associated with the ADA was separate from the rest of the campers at Rock Springs Ranch; however, their meals were catered and served by Rock Springs Ranch staff.

Investigation

Contact information, a schedule of events and a list of campers and staff by cabin was obtained from ADA members. A survey was developed to collect information on time of arrival at camp, participation in activities and meals, onset time of illness and details of illness. The survey was administered to the ADA staff and parents of campers by e-mail for people with email addresses and by mail for the remaining people. The survey was web-based for people who received the email. People who received the survey via the postal service had the option of completing the paper survey or going to the Web site to complete the survey.

The investigators distributed a survey regarding work history, food history, and clinical information to all of the workers at the Rock Springs Ranch who were not from the ADA. Both people who had become ill and those who did not were asked to complete the survey. These workers stayed in a different location than the ADA campers and staff; however, they participated in activities with the ADA campers and helped serve meals.

Cases were defined as people who became ill with vomiting or diarrhea while at camp between June 16 and 21.

On June 22, inspectors from the Bureau of Consumer Health inspected the Rock Springs Ranch main kitchen, snack bar and satellite dining hall. Meals for the ADA campers were prepared at the main kitchen and brought out to the satellite dining hall.

The camp was attended by 65 children. In addition, there were 31 staff members from the ADA, including seven medical staff. The Rock Springs camp had a total of 51 staff not associated with the ADA.

Questionnaires were completed by 45.3 percent (n=29) of the 64 ADA campers (or by a parent or guardian), 66.6 percent (n=16) of the 24 ADA staff and 100 percent (n=7) of the seven ADA medical staff.

Questionnaires were completed by 65 percent (n=33) of the 51 Rock Springs camp workers. All Rock Springs staff involved in food preparation for the ADA camp completed the survey. Two Rock Springs staff reported becoming ill on June 20 and only having worked with the ADA group on June 19. These two workers were involved with some of the activities during the day and in

serving food to the campers and staff. No other Rock Springs staff reported becoming ill.

KDHE Investigators talked with Rock Springs Ranch staff about food preparation for the ADA campers. All food was prepared at the main kitchen at Rock Springs and brought to the ADA campers in a satellite dining hall. Staff from Rock Springs helped serve the ADA campers and staff. No violations were observed during the investigation of the satellite dining hall. During inspection of the main dining hall, three critical violations and three non-critical violations were observed. The critical violations had to do with when to wash hands after touching bare body parts, hot holding of foods, and cleanliness of food contact surfaces. The violations were corrected while the inspector was on site.

Conclusion

Two staff from Rock Springs also became ill. Among the ADA campers and staff who completed a survey, the attack rate was 62 percent (n=33). Both sexes became ill at the same rates. Cabin six appears to have had the highest percentage of ill among staff and cabin one appears to have had the highest percentage ill among campers. The outbreak appears to have been spread person to person rather than point-source (e.g. food-borne). The index case became ill on the evening of June 16, followed by an ADA staff on the evening of June 18. All the other cases became ill on June 20 and 21.

An outbreak of norovirus occurred among staff and campers at the ADA camp at Rock Springs Ranch. The KDHE laboratory confirmed that norovirus was the source among ADA campers and Rock Springs staff .

Noroviruses are the leading cause of gastroenteritis in the United States; an estimated 23 million people are infected with Norovirus every year [1-3]. Onset of diarrhea and vomiting are

common 12-48 hours after infection, and may last from 12 to 60 hours. Vomiting is more prevalent in children than adults. Transmitted primarily through the fecal-oral route, Norovirus particles may be spread through direct contact or through consuming fecally-contaminated food or water [1,2]. Results from outbreak investigations have also suggested that spread via aerosolized vomitus is possible. Because Noroviruses are highly contagious, requiring less than 100 organisms for infection, transmission may occur via hand-to-mouth activities following the handling of materials, fomites, and environmental surfaces contaminated with feces or vomitus [3].

Limitations of this study include small sample size and potential reporting bias. The investigators relied on the staff and parents of campers to complete the survey. Since 56 percent of people at the ADA camp completed the survey, the investigators cannot say what the overall attack rate was or if cabins one and six had the highest attack rates. The report was also limited by recall bias as information was gathered by surveys, which required staff and parents of campers to recall all activities while at camp.

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264-39
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