Kansas Health Statistics Report

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Influenza Vaccination Rates Among Kansas Children — BRFSS Data

Every year, an average of 20,000 children aged 0-4 years are hospitalized because of laboratory-confirmed influenza [1]. Among children aged 0-4 years with high-risk medical conditions, the rate of hospitalization because of laboratory-confirmed influenza is 250-500 cases/100,000 children [2].

Although influenza-associated deaths are uncommon among children aged 0-4 years, during the 2007-08 influenza season, 86 children died from influenza-related complications [2]. Although annual influenza vaccination can reduce the chances of experiencing severe complications or dying from influenza infection, national vaccination rates remain low among all population groups. Although not intended to be nationally representative, vaccination coverage rates among children aged 6-23 months and 24-59 months in eight Immunization Information Sentinel (IIS) sites during the 2007-08 influenza season were 40.8 percent and 22.2 percent, respectively [3]. In 2006, the Advisory Committee on Immunization Practices (ACIP) recommended that children aged 6-59 months be vaccinated annually against influenza because rates of hospitalization are highest among that age group. In addition, children of any age with asthma or other chronic medical conditions were also included in the recommendations [4]. In 2008, influenza vaccination recommendations were revised to include all children aged 6 months -18 years [2].

Interventions targeted at improving vaccination coverage include physician counseling. Studies have reported that physician counseling improves targeted vaccination rates among groups at high risk [5].

This study was conducted to determine influenza vaccination coverage among Kansas children during 2007, before the universal influenza vaccination recommendations were made, and to examine the association between physician counseling and influenza vaccination rates among these groups by using the Kansas Behavioral Risk Factor Surveillance System (BRFSS).

Methods

BRFSS is a state-based survey that collects information on health-risk behaviors, health conditions, preventive health practices and healthcare access. The 2007 BRFSS survey design was conducted by using disproportionate stratified sampling of nonmobile telephone numbers [6]. Data were weighted to account for the complex sample design and differential response rates among age and sex groups.

In Questionnaire Version 2 of the 2007 BRFSS survey, a child under age 18 was randomly selected within the household. The respondent was asked if this child had been vaccinated against influenza, if influenza vaccination had been recommended by a physician and if the child had physician-diagnosed asthma. SAS® 9.1 software (SAS Institute, Inc., Cary, North Carolina) was used to analyze the data generated from parent respondents to this version of the questionnaire, using data weighting to allow for generalization of results to the whole population and analytic procedures to account for the complex sampling design. Researchers examined the association between influenza vaccination rates and other factors (e.g., presence of asthma or another high-risk condition) and other demographic factors (e.g., parent's education level and residence [urban: population greater than or equal to 40 persons/sq. mile versus rural: population less than 40 persons/sq. mile]). Also assessed was whether physician counseling for influenza vaccination was associated with vaccine uptake.

Results

A total of 1,173 children were included in the BRFSS Version 2 sample. Of those, 12.6 percent were identified as having physician-diagnosed asthma, and 28.0 percent were aged 6-59 months (Table 1).

Table 1. Selected Population Characteristics among Kansas Children in 2007[a]

Characteristic	Unweighted frequency	Weighted (%)	95% CI*
Child population			
Ages 6–59 months	240	28.0	24.7–31.4
All ages with asthma	139	12.6	10.3–14.8
Sex			
Male	615	51.4	49.1–53.7
Female	558	48.6	46.3–50.9
Ethnicity			
Hispanic	123	12.0	10.4–13.6
Non-Hispanic	960	88.0	86.4–89.6
Parent's education level			
≤High school	307	28.8	25.7–32.1
>High school	778	71.2	68.0–74.3
Residence			
Urban	737	65.3	62.1–68.52
Rural	382	35.1	32.8–37.3

* CI = confidence interval.

[a] Unweighted frequencies <50 may be unreliable. Caution should be used when interpreting such results.

Table 2 illustrates that influenza vaccination rates were less than 40 percent among children with asthma and among children residing in Kansas overall.

Table 2. Kansas 2007 Child Influenza Vaccination Coverage Rates[a]*

Factor	Unweighted frequency	Weighted (%)	95% CI†
Children of all ages	269	26.4	24.8–31.4
Children ages 6–59 months	115	47.4	40.2–54.6
Children with physician-diagnosed asthma (all ages)	54	39.9	30.0–49.9

*Percentage of children who had received an influenza vaccination during the previous 12 months.

†CI = confidence interval.

[a] Unweighted frequencies <50 may be unreliable. Caution should be used when interpreting such results.

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Table 3 indicates that children aged 6-59 months and children with physician-diagnosed asthma are less likely to be counseled if they lived in rural areas or the parent had high school or less than a high school education.

Table 3. Physician Counseling among Children Ages 6-59 Months and Children with Physician-diagnosed Asthma during 2007[a]

Factor	Unweighted frequency	Counseled (Weighted %)	95% CI*
Children ages 6–59 months	120	52.7	45.3–60.2
Rural residence	22	29.6	17.4–41.8
Urban residence	98	62.0	53.3–70.8
Parents with ≤high school education	18	37.1	19.8–54.5
Parents with >high school education	102	57.3	49.2–65.4
All children with physician-diagnosed asthma	50	43.7	33.0–54.4
Rural residence	11	31.4	14.3–48.5
Urban residence	39	48.3	35.5–61.0
Parents with ≤high school education	11	33.7	14.4–52.9
Parents with >high school education	39	48.2	35.1–61.2

[a] Unweighted frequencies <50 may be unreliable. Caution should be used when interpreting such results.

Table 4 indicates that rates were higher among children whose parents were counseled by the child's physician regarding influenza vaccination.

Table 4. Percentage of Vaccinated Kansas Children, by Parental Receipt of Physician Counseling[a]

Factor	Unweighted frequency	Counseled (Weighted %)	95% CI*
Children ages 6–59 months	94	85.3	78.3–98.3
Children with physician-diagnosed asthma (all ages)	41	84.2	73.7–94.7

*CI = confidence interval.

[a] Unweighted frequencies <50 may be unreliable. Caution should be used when interpreting such results.

Discussion

Although vaccination coverage among children aged 6-59 months approaches 50 percent, with coverage rates of 40 percent among children with asthma, results demonstrate that Kansas influenza vaccination coverage remains low. Vaccination levels are higher among those whose parents had received physician counseling regarding influenza vaccination (Table 3), which is consistent with findings of earlier studies that indicate physician counseling improves vaccination coverage [5]. Physician counseling was lowest among children living in rural areas (Table 4), indicating that vaccination rates might be improved by targeted physician counseling among this group at high risk.

There are several study limitations. First, a cross-sectional survey, assessing the temporal association between counseling and vaccination receipt is not possible; second, this survey is based on responses from households that have land telephone lines. Thus, the study might be limited by response rates and lack of input from mobile telephone–only households. In addition, full compliance with ACIP guidelines was not assessed in this study; researchers did not determine if children had, or required one or two vaccinations. Finally, the only chronic medical condition with a high risk for influenza complications addressed in this study was children with physician-diagnosed asthma. Therefore, it cannot be determined if influenza vaccination coverage is higher when other conditions are also present (e.g., the overall vaccination coverage for groups at high risk who have chronic medical conditions other than asthma).

The 2008 ACIP recommendations for influenza vaccination have been expanded to include all children aged 6 months -18 years. Kansas rates among children at high risk are low, and challenges continue to elevate influenza incidence among all children. One method of improving vaccination coverage is to increase physician counseling for all children age 6 months or older.

Editorial Note

Results featured here may differ from those displayed on the official Kansas BRFSS website (for the following reasons)

- Researchers limited analysis to responses from parent respondents and excluded all non-parental responses.
- Researchers also limited analysis to data from Version 2 of the 2007 Kansas BRFSS Questionnaire.
- Analysis included all children in Version 2 who had ever been diagnosed with asthma, and not just those who currently had the condition.

For further information about the Kansas BRFSS 2007, please see the following websites http://www.kdheks.gov/brfss/index.html; http://www.kdheks.gov/brfss/Survey2007/dr2007_casthdx2.html

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3. Centers for Disease Control and Prevention (CDC). Influenza vaccination coverage among children aged 6–59 months—eight immunization information system sentinel sites, United States, 2007–08 influenza season. MMWR Morb Mortal Wkly Rep 2008; 57:1043–6.
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5. Centers for Disease Control and Prevention (CDC). Improving influenza, pneumococcal polysaccharide, and hepatitis B vaccination coverage among adults aged <65 years at risk. MMWR Recommend Rep 2005; 54(No. RR-5).
6. Centers for Disease Control and Prevention (CDC). BRFSS operational and user's guide. Atlanta, GA: U.S. Department of Health and Human Services, CDC; 2006. Available at: http://ftp.cdc.gov/pub/Data/Brfss/userguide.pdf. Accessed October 24, 2008.

Flu Vaccination Rates Change

The Centers for Disease Control and Prevention reported increases in Kansas' estimated self-reported influenza vaccination coverage from the 2005-2006 influenza season to the 2006-2007 season for most age and risk groups. The findings are based on Behavioral Risk Factor Surveillance System (BRFSS) results.

Changes in the estimated self-reported influenza vaccination coverage were significant for three age groups. Notable was the increased self-reported influenza vaccination coverage for persons at high risk aged 18-49 years (Table 5). Findings are subject to several limitations, including recall bias. The full report is available at http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5738a1.htm.

Table 5. Percentage-point Change in Estimated Self-reported Influenza Vaccination Coverage from 2005-06 Influenza Season to 2006-07 Influenza Season by Selected Age and Risk Groups, Kansas

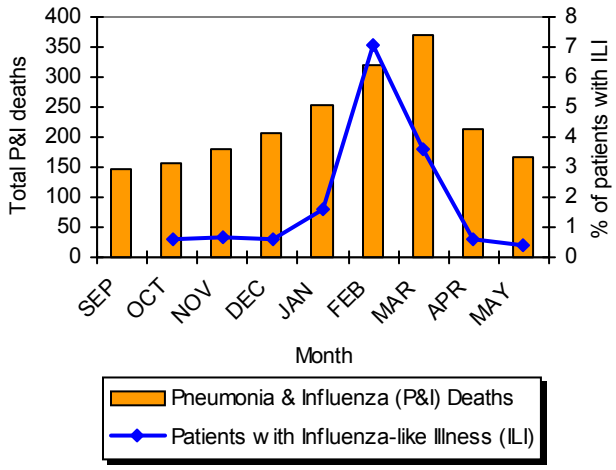
Category	Percent Change	
Persons aged 18-49 years at high risk	8.9	§
Other persons aged 18-49	3.3	§
Persons aged 50-64 years at high risk	1.0	
Other persons aged 50-64 years	1.3	
All persons aged 65 years and older	-0.5	§
All persons aged 18 and older	2.9	

§ p<0.05. Percentage point difference between seasons is statistically significant.
Source: BRFSS

Mortality from Influenza Compared

The Kansas Department of Health and Environment (KDHE) monitors both influenza morbidity and mortality. Influenza morbidity is tracked through sentinel influenza surveillance. Every week, sentinel health care providers report the total number of patients seen, and those patients that meet the case definition for Influenza-like Illness (ILI) — fever ≧100°F, with cough and/or sore throat, in the absence of a known cause other than influenza. The number of deaths caused by pneumonia or influenza (P&I) is collected on the Kansas death certificate. Mortality is divided among three categories: pneumonia or influenza as a contributing factor of death, influenza as the direct cause of death, and pneumonia as the direct cause of death. Mortality data is collected from September through May, while morbidity data is collected from October through May.

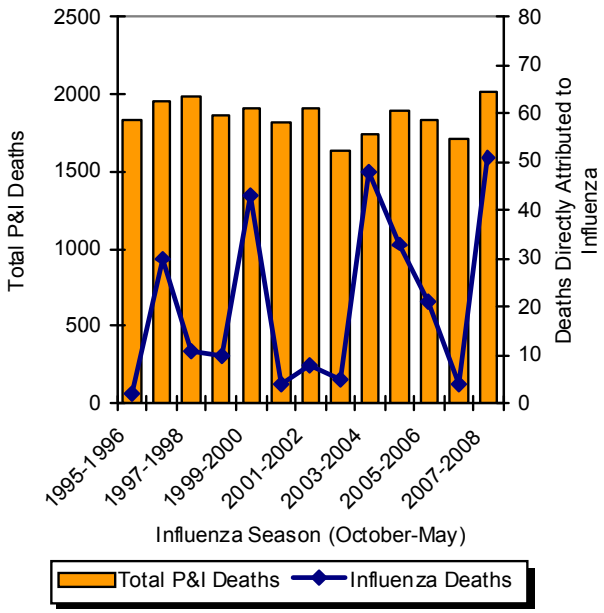
Figure 1. Deaths attributed to pneumonia or influenza (P&I)* and sentinel provider patient visits attributed to Influenza-like Illness (ILI) by month, Kansas, 2007-2008 influenza season



*Death certificate lists pneumonia or influenza as a contributing factor or direct cause of death. 2007-2008 data are provisional and subject to change.
Source data: KDHE Center for Health and Environmental Statistics

After three mild influenza seasons, the number of patients seeking care for ILI increased markedly during the 2007-2008 season [1]. A strong period of peak activity stretched from February through early March. Mortality followed a similar pattern (Figure 1).

Figure 2. Deaths attributed to pneumonia or influenza (P&I)* and deaths directly attributed to influenza, Kansas



*Death certificate lists pneumonia or influenza as a contributing factor or direct cause of death. 2007-2008 data are provisional and subject to change.
Source data: KDHE Center for Health and Environmental Statistics

Pneumonia or influenza was listed as a contributing factor in 1,297 (64.4%) deaths. Another 667 (33.1%) deaths were directly attributed to pneumonia, while 51 (2.5%) deaths were directly attributed to influenza. The total (n=2,015) represents the highest number of P&I deaths ever recorded in Kansas — data are available for every season since 1995-1996. Previously, the greatest number of total P&I deaths was recorded in 1997-1998 (n=1,952). The number of deaths directly attributed to influenza was also the highest on record, surpassing 48 deaths reported in 2003-2004 (Figure 2).

Nationally, the rate of P&I deaths was significantly higher than expected, surpassing the epidemic threshold for eight consecutive weeks, from early January to mid-May.

Laboratory data from KDHE and the Centers for Disease Control and Prevention (CDC) demonstrated that influenza vaccine component strains differed from circulating virus strains. However, because the vaccination status of affected individuals is not tracked, it is not known if vaccine inefficacy, virus virulence, or other factors accounted for the high levels of flu activity and mortality seen during the 2007-2008 season.

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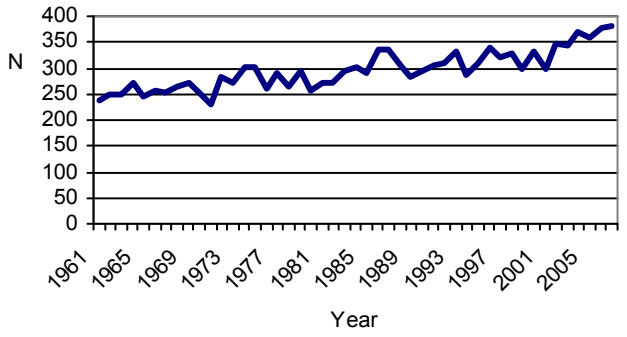
References

1. A detailed report regarding ILI surveillance, "Influenza Surveillance, Kansas, 2007-2008", is available online at http://www.kdheks.gov/epi/download/disease_summary/2007/Section_II/Kansas_Influenza_Surveillance07_08.pdf

Suicides in Kansas

Suicide was 10th leading cause of death to Kansas residents in 2007. The 380 reported suicide deaths represent the highest total ever recorded in the state (Figure 3). By comparison, only 236 resident suicide deaths were reported in 1960.

Figure 3. Resident Suicide Deaths, Kansas, 1960-2007

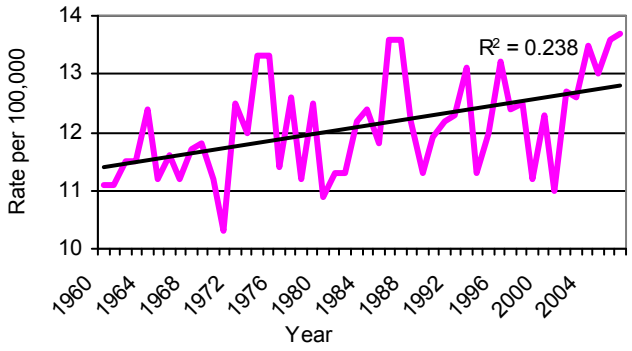


Source: Kansas Vital Statistics

The crude mortality rate trend for suicide is more challenging to discern. This is the result of widely fluctuating annual counts. During the same 48-year period the state crude mortality rate has been increasing, but linear trend as indicated by the R^2 value is not very strong (Figure 4). The R^2 value, or coefficient of determination, is an indicator from 0 to 1 that reveals how closely the estimated values for the trendline correspond to actual data. A trendline is most reliable when its R^2 value is at or near 1.

Age-adjusted suicide mortality rates are subject to some volatility because of the relatively small statistical values. The age-adjusted mortality rate for 2007, was 13.6 per 100,000 population. Between 1990 and 2007 the rate ranged from 11.1 in 2001 to 13.7 in 2006. Age-adjusted suicide mortality rates are available through Kansas Information for Communities (KIC), the agency's health information portal.

Figure 4. Resident Suicide Crude Death Rates, Kansas, 1960-2007



Source: Kansas Vital Statistics

Kansas resident age adjusted suicide mortality rates tend to be higher than national rates. The National Center for Health Statistics reported a national age adjusted suicide mortality rate for 2005 – the most current year available – of 10.9 per 100,000 population. That compared with Kansas' age adjusted suicide mortality rate of 13.0 in 2005.

The age-group with the highest suicide mortality rate in 2007 was 45-64 with 20.5 deaths per 100,000 population (Table 6). This was followed by the 25-44 age group.

Table 6. Kansas Resident Age group Specific Mortality Rates, 2007

Age group	N	Rate
Under 15	4	< 1.0
15 to 24	59	14.4
25 to 44	120	16.5
45 to 64	144	20.5
65 and over	53	14.7
Total Crude Rate	380	13.7

Source: Kansas Vital Statistics, U.S. Census Bureau

Only 20 of the suicides in 2007 occurred to persons of Hispanic origin, slightly over five percent (5.3%). Slightly more than nine out of 10 suicides occurred to persons of white race (93.7%) with blacks accounting for only 7 suicide deaths (1.8%). More than four out of five suicides occurred to males (81.3%).

Guns were used in suicides in 56.1 percent (213) of Kansas resident suicides in 2007. Drugs (16.6%) were the method in 63 suicides. Hanging (16.3%) and gases and vapors (5.0%) were the next most frequent methods.

Because of the Iraq war there has been growing interest in the number of military-related suicides that occur in a state. A box on the death certificate asks if the decedent was ever in the U.S. Armed Forces. The certificate does not ask whether the military service was in the Iraq war and thus may not be able to establish an association between the death and this war.

During the period from 2002-2006 there were 1,790 Kansas occurrence suicides in which the military status of the decedent was not unknown. For all age-groups, 442 suicides or 24.7 percent involved persons who had served in the military. The *Military Times* reports that persons 18-34 years of age comprise 75 percent of the active duty armed forces. Within the population of persons 18-24 years of age, there were 216 Kansas occurrence suicides in 2002-2006. Of that number only 14 or 6.5 percent had served in the military.

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Immunization Rates for Kansas Children Increase

Kansas' immunization rates increased in 2007, according to a national report released today by the Centers for Disease Control and Prevention (CDC). The annual National Immunization Survey (NIS) provides state-level estimates of immunization coverage among 19 to 35-month-old children.

Increasing immunization rates is the focus of the Immunize Kansas Kids project, funded by the Kansas Health Foundation and jointly managed by KDHE and the Kansas Health Institute. More than 20 organizations, ranging from the Kansas Association of Local Health Departments to the Kansas Chapter of the American Academy of Pediatrics, also are active participants in the project, which has the long-term goal of increasing Kansas immunization rates to 90 percent and sustaining them at that level.

Kansas children have been immunized at increasing rates for five out the last six years. The rate for the 4:3:1:3:3 series has increased 14.9 percentage points since 2002 to 81.7 percent, putting Kansas above the national average in 2007. The rate for the 4:3:1:3:3:1 series increased 20.9 percentage points for the same period.

Rates for the 4:3:1:3:3 series (four doses of DTaP vaccine, three doses of polio vaccine, one dose of measles-mumps-rubella vaccine, three doses of hepatitis B vaccine, and three doses of haemophilus influenzae type b vaccine) increased to 81.7 percent. This marks a 2.7 percentage point increase from 2006.

Rates for the 4:3:1:3:3:1 series (four doses of DTaP vaccine, three doses of polio vaccine, one dose of measles-mumps-rubella

vaccine three doses of haemophilus influenzae type b vaccine, three doses of hepatitis B vaccine, and one dose of varicella vaccine) increased 6.1 percentage points to 76.0 percent for 2007.

Rates for several individual immunizations increased, according to the survey. Pneumococcal vaccination rates increased 11.0 percentage points and 0.7 percentage points for the series of four and three doses respectively in 2007. The rate for the hepatitis B series increased 1.5 percentage points, while the varicella vaccination rate rose by 6.0 percentage points.

Since 2003, KDHE, in collaboration with its partners, has made many changes to the Kansas immunization system, including incorporating recommendations established by the Governor's Blue Ribbon Task Force. The following actions have been implemented to increase the state's immunization rates:

- Implemented a statewide immunization registry (a centralized database of immunization records) to ensure parents and health care providers know a child's immunization schedule so that he or she can be fully immunized. The registry now contains records for more than 1.2 million Kansans, documenting more than eight million immunizations. Those who have access to the registry include 70 of the 100 local health departments in Kansas and 110 private providers.
- Recommended an accelerated immunization schedule for DTaP (diphtheria, tetanus, and pertussis) vaccine to ensure more children complete the series by allowing them to receive the fourth DTaP dose at 12 months, rather than 15-18 months.
- Required hepatitis B and varicella (chickenpox) vaccine for school entry beginning in 2004.
- Partnered with Kansas Health Institute and Kansas Health Foundation to implement the Immunize Kansas Kids project, which produced research to determine barriers to childhood immunizations in Kansas.
- Expanded the Immunize and Win a Prize program statewide, to provide an incentive for parents to ensure their child is fully immunized, and to assist those families struggling with financial issues surrounding immunizations.
- Partnered with the Kansas WIC program regarding immunization status of children in the program.

Project officials are optimistic that the goal of 90 percent immunization coverage for Kansas children can be achieved. They also caution that, given the unstable nature of immunization rates, too much significance should not be attached to the numbers from a single year. However, the trend in Kansas is one of improvement.

Kansas Department of Health and Environment

Maternal and Child Health Trends Reported

The KDHE Bureau of Family Health has published the second edition of the Kansas Maternal and Child Health (MCH) Biennial Summary, 2008. The report presents summaries of 26 important health issues in women of reproductive age, infants, children, adolescents, and children with special health care needs, and presents MCH health systems indicators in Kansas.

Women of Reproductive Age and Infants

For Kansans; 2006, low birth weight (LBW) and very low birth weight (VLBW) infants contributed heavily to the total infant mortality rate. Almost two thirds (61.5%) of infant deaths occurred among the 7.2 percent of infants who were born at LBW. Similarly, 45.1 percent of infant deaths occurred among the 1.3 percent of infants born at VLBW.

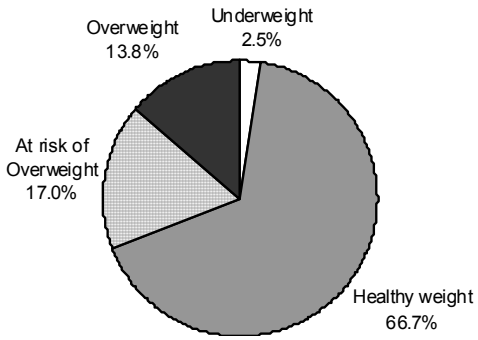
For Kansans, 2006, the risk of delivering a LBW infant was greater among black mothers (all ethnicities) and differed by maternal age, with the highest risk for the youngest and oldest mothers regardless of race.

In Kansas, 1999-2006, there was an increasing trend in the percent of women 18-44 who lacked health insurance, with about 19.7 percent of women lacking health insurance in 2006. In that same year women at greatest risk of being uninsured were Hispanic, had less than a high school education, earned less than $24,000 and resided in a densely-settled rural county, and were widowed, divorced or separated. The proportion of Hispanic women ages 18-44 with no health insurance increased to about 52.0 percent in 2006.

Children and Adolescents

The percentage of Kansas WIC infants (Special Supplemental Nutrition Program for Women, Infants, and Children) ever breastfed increased by 13.8 percent from 58.0 percent in 1997 to 66.0 percent in 2006. The percentage of infant's breastfed for at least 6 months increased to 42.2%. However, the percentage breastfed at least 12 months decreased to 16.9%.

Figure 5. Percent Weight Distribution of WIC Children (24-59 months) Kansas, 2006, n=22,404



Source: Pediatric Nutrition Surveillance System

The percentage of Kansas WIC children who were overweight increased by 70.4 percent from 8.1 percent in 1995 to 13.8 percent in 2006 (Figure 5). For 2006, 17.4 percent of Hispanic children participating in WIC were overweight.

In Kansas, for adolescents/young adults ages 15-24 (2005-2006), 75.5 percent of unintentional injury deaths were caused by motor vehicle crashes, 8.8 percent were caused by poisonings, and 3.1 percent were caused by drowning. In white (non-Hispanic and Hispanic) youth, unintentional injury caused the highest percent of injury deaths. However, in black (non-Hispanic) youth, homicides caused more deaths than unintentional injuries.

Children with Special Health Care Needs

Overall, Kansas children with special health care needs (CSHCN) did better than U.S. CSHCN. The 2005-2006 National CSHCN Survey estimates that 28.6 percent of Kansas CSHCN ages 0-11 served by care systems met all five core outcomes compared to 20.4 percent of the U.S., and Kansas ranked first in the nation. For CSHCN ages 12-17, 20.2 percent met all six core outcomes compared to 13.7 percent of the U.S., and Kansas ranked second in the nation. The sixth, transition to adulthood, was asked only for CSHCN ages 12-17.

In Kansas, 50.3 percent of youth with special health care needs receive services necessary to transition to all aspects of adult life compared to the national average of 41.2 percent. Generally, the vocational/education transition is more comprehensive than transition to adult medical services.

In Kansas, an estimated 62.9 percent of CSHCN have adequate health insurance coverage compared to the national average of 62.0 percent. "Adequate" private and/or public insurance is defined as access to health services including preventive care, primary care and tertiary care. Many Kansas families have policies that cover only well visits or catastrophic care.

To view the report, please visit http://www.kdheks.gov/bcyf. For more information, please contact Jamie Kim at jkim@kdhe.state.ks.us.

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Diabetes Risk Assessment Through the Behavioral Risk Factor Surveillance System Using Diabetes Risk Test Questions

In Kansas, an estimated 152,712 adults (7.3% prevalence rate) were living with doctor-diagnosed diabetes in 2007. Diabetes is a leading cause of end-stage renal disease, cardiovascular disease, blindness and lower extremity amputations and represents a significant economic burden with total direct and indirect costs estimated to exceed $174 billion nationally in 2007 [1]. However, there is evidence that diabetes can be prevented through lifestyle intervention in individuals at high risk for developing the disease [2].

The American Diabetes Association (ADA) recommends interventions to promote weight loss and physical activity for individuals at high risk for developing diabetes, based on tests for impaired glucose tolerance or impaired fasting glucose [3]. However, because it would not be cost effective to use such clinical tests in a community setting, efforts have been made to find other ways to detect individuals at high risk for developing diabetes. The paper-and-pencil Diabetes Risk Test (DRT) questionnaire developed by the ADA [4] is a tool for identifying individuals at risk for developing diabetes based on the following risk factors: age, sex, history of delivery of a macrosomic infant, obesity, sedentary lifestyle and family history of diabetes [5].

Although the DRT was not originally intended for use as a population-based survey, four of the six risk factor questions are routinely included in the annual Kansas Behavioral Risk Factor Surveillance System (BRFSS) survey. The addition of two questions would make it possible to use the BRFSS to assess diabetes risk at a population level. The objective of this study was to assess diabetes risk based on the DRT questions using a population-based telephone-administered survey system.

Methods

The Kansas Behavioral Risk Factor Surveillance System (BRFSS) Survey is an ongoing population-based telephone survey of non-institutionalized adults age 18 and older residing in Kansas. Information on all questions from the DRT was collected through the 2006-2007 Kansas BRFSS. In the DRT scoring system, points are assigned for each reported risk factor. A cumulative point total of 10 or above is categorized as "High Risk." A total between 3 and 9 points is categorized as "Low Risk."

Table 7. Diabetes Risk Test (DRT) Scoring System

Item	Points
Woman who delivered a macrosomic (≥9 pounds) infant	1
At least one sibling with diabetes	1
At least one parent with diabetes	1
BMI 27 or higher	5
Younger than 65 and little or no exercise in the past month	5
Age 45-65	5
Age 65 and older	9

Based on the DRT scoring system shown in Table 7, scores were calculated for 2006-2007 Kansas BRFSS respondents who reported that they did not have doctor-diagnosed diabetes.

Results

About 28 percent of adults were identified as high risk for developing diabetes based on the point scoring system in Table 7. About 36 percent of those having a high school education or less were at high risk of developing diabetes as compared to 25 percent of those with at least some technical or college education (Table 8). About 34 percent of those having an annual household income below $50,000 were at high risk of developing diabetes as compared to 24 percent of those with household income of $50,000 or more.

Hispanic ethnicity was not strongly associated with being at high risk for developing diabetes in this study. About 31 percent of Hispanics were at high risk of developing diabetes as compared to 28 percent of non-Hispanics. The number of Black/African-American respondents at high risk was not large enough to enable comparisons among race groups in this sample.

Table 8. Percentage of high risk for developing diabetes among adults 18 and older without doctor-diagnosed diabetes by selected characteristics, Kansas BRFSS 2006-2007

Characteristic	% High Risk	95% Confidence Interval
Education*		
High School Grad or lower	35.6	32.9-38.4
At least some college or technical	24.7	23.1-26.3
Household income*		
Less than $50,000	33.8	31.5-36.1
$50,000 or more	24.0	22.2-25.9
Ethnicity		
Hispanic	30.6	22.9-38.2
Non-Hispanic	28.3	26.9-29.7

*Indicates a statistically significant difference based on non-overlapping 95% confidence intervals.

Discussion

The risk factor classification employed by the DRT questionnaire is based on a classification tree developed by Herman and colleagues [5] using data from the Second National Health and Nutrition Examination Survey (NHANES II, 1976-1980). They reported that if these questions were used to screen for undiagnosed diabetes, about 31 percent of adults would be flagged for further testing to diagnose diabetes. To our knowledge, the DRT questionnaire has not been evaluated in more recent population-based surveys. The estimate for the proportion of adults at high risk for developing diabetes based on the 2006-2007 Kansas BRFSS, is similar to the estimate derived from a nationally representative sample of NHANES II. The BRFSS results also show that adults with lower education and household income are more likely to be at high risk of developing diabetes based on DRT score.

Conclusion

In summary, information on all DRT questions collected through BRFSS can be used to compute a diabetes risk score based on the ADA's DRT questionnaire. It is estimated that about 28 percent of Kansas adults 18 and over are at high risk for developing diabetes. Disparities in certain population subgroups are also observed. This information is valuable in understanding risk of developing diabetes in the total Kansas population and in subgroups. This information could be used for planning strategies directed towards primary prevention of diabetes in Kansas.

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Health Professional Shortage Areas Report

The KDHE Office of Local and Rural Health has published the 2008 Primary Care Health Professional Underserved Areas Report.

During the past 40 years, governmental programs have been designed to address health care provider supply problems, including state and federal scholarships, loan repayment or forgiveness programs, federal agency sponsorship of international medical graduates, payment enhancements for Rural Health Clinics (RHC) and Medicare bonus payments to make practices financially viable in rural communities.

Consistent in all of these programs is the eligibility requirement that a service area (usually a county or city) meet criteria to be designated as a Medically Underserved Area (MUA) or a Health Professional Shortage Area (HPSA).

The annual report provides data on the status of the state in regard to various types of health care provider shortage designations. The report:

- Defines various federal and state underserved designations.
- Summarizes the benefits to counties or individuals available with each designation.
- Identifies counties qualified for each designation as of May 2008.
- Provides contact information for each program.
- Describes the proposed new federal method for designating HPSAs and MUAs.

The report is at http://www.kdheks.gov/olrh/download/PCUARpt.pdf.

Office of Local and Rural Health

Demographic Profile of Uninsured Working Adults Aged 18-64 Years in Kansas

One of the Healthy People 2010 [1] and its corollary Healthy Kansans 2010 [2] objectives is to increase the proportion of persons who have health insurance. To have health insurance is one of the strong predictors of access to quality healthcare [3, 4]. Research shows that uninsured persons are at increased risk for adverse health outcomes [3, 4]. Persons who are uninsured for an extended period of time are at significantly higher risk of premature death [5]. Lack of health insurance also puts a burden on the health care system, as it provides uncompensated care to individuals who are uninsured, resulting in escalating cost of care and treatment [6, 7]. In the United States, the number of uninsured persons has increased over the past ten to fifteen years [6, 7]. This increase has mostly occurred in adults who are between 18-64 years of age [6, 7]. Currently, there are an estimated 35 million working-age adult Americans who are uninsured. The national estimates have also shown that there is variation in lack of insurance by age, race/ethnicity, education and income and other demographic variables. This is an important consideration when addressing health disparities in the nation [6, 7].

State-based data is needed to provide information on the current status of working-age adults who are uninsured. This information can be used by policymakers to guide their efforts toward developing polices that increase health insurance coverage among working-age adults. State data can also be used to develop public health programs and interventions that address the issues related to lack of health insurance among working-age adults.

The Kansas Behavioral Risk Factor Surveillance System (BRFSS) [8] provides ongoing and consistent data on health insurance coverage. The purpose of this study is to present the current status of estimates on lack of health insurance coverage among adults ages 18-64 years using 2006-2007 Kansas BRFSS data. In addition to overall estimates of lack of health insurance, the study also presents the estimates of state-specific data on lack of health insurance coverage by age, gender, race/ethnicity, education, employment, and income.

Method

Kansas BRFSS is an annual, population-based random digit dial telephone survey of non-institutionalized adults ages 18 years and older. All adults 18 years and older residing in private residences with landline telephones are eligible for BRFSS sampling. The Kansas BRFSS currently uses a disproportionate stratified random digit dial sampling method that considers the entire state as one geographic stratum. Primary subjects are randomly selected from sampled households. Survey data are statistically weighted to represent the Kansas population.

Table 9. Prevalence of lack of insurance among working-age adults aged 18-64 years by selected demographic characteristics, Kansas 2006-2007

Characteristics	Weighted percentage	Lower 95% CI	Upper 95% CI
Overall	15.0	14.0	15.9
Age-group			
18-29 years	24.5	21.6	27.4
30-49 years	13.0	11.9	14.0
50-64 years	9.4	8.6	10.4
Gender			
Male	15.0	13.5	16.5
Female	15.0	13.8	16.1
Race			
White	11.8	10.9	12.7
African American	21.6	16.2	26.9
Other race*	40.3	35.6	45.0
Ethnicity			
Hispanic	47.8	42.8	52.8
Non-Hispanic	12.2	11.3	13.0
Employment status			
Employed for wages	12.1	11	13.2
Self-employed	19.4	16.6	22.2
Unemployed	50.3	43.1	57.6
Other**	18.2	15.7	20.6
Educational status			
Less than high school	44.8	39.7	49.9
High school graduate or GED	21.3	19.1	23.4
Some College	14.1	12.5	15.8
College graduate	5.1	4.2	6.1
Annual household income			
< $ 25,000	40.2	37.2	43.3
$25,000-$49,999	14.3	12.6	15.9
$50,000 +	4.0	3.2	4.9

*Other race includes Asian, American Indian/Alaska Native, Native Hawaiian or Pacific Islander, or other race.
** Other employment status includes homemaker, student, or those unable to work.

For this study, Kansas BRFSS data from 2006 and 2007 were combined to provide adequate sample size to decrease the variance and improve estimate precision. The study included 11,959 respondents aged 18-64 years. Respondents were categorized as uninsured or lacking health insurance if they answer “No” to the question, “Do you have any kind of healthcare coverage including health insurance, prepaid plans such as HMOs, or government plans such as Medicare?” Missing or unknown responses and refusals were excluded from the analysis.

The demographic factors considered for this analysis included age, gender, race/ethnicity, employment status, educational

status and annual household income. Respondents were categorized into three age groups: 18-29, 30-49 and 50-64 years. Race was classified as white, African American, other (Asian, Native American, Hawaiian or Pacific Islander). Ethnicity was classified as Hispanic or non-Hispanic.

Employment status was classified as employed for wages, self employed, unemployed or other. Educational status was classified as less than high school graduate, high school graduate, some college and college graduate. Annual household income was classified as < $25,000, 25,000 through $49,999 and $50,000 or more per year.

SAS procedure survey means was used to analyze these data because of complex survey design. Prevalence estimates for lack of health insurance with 95 percent confidence intervals were prepared.

Results

According to 2007 census estimates, there were 1.72 million working-age adults aged 18-64 years in Kansas. The results showed (Table 9) that about 258,000 (15.0%) working-age adults in Kansas were without health insurance. Lack of insurance was most frequently reported in the 18-29 year age-group as compared to 30-49 and 50-64 year age groups. Racial and ethnic disparities were seen in terms of lack of insurance. One in five African Americans (21.6%), and four out of ten (40.3%) individuals in the "other" race group reported lack of insurance, as compared to one in eight (11.8%) whites. About half (47.8%) of the Hispanics reported lack of health insurance as compared to one in eight non-Hispanics (12.2%).

Half (50.3%) of the unemployed adults reported lack of health insurance as compared to one in eight (12.1%) adults who were employed for wages. About half (44.8%) of the adults who had less than high school education reported lack of health insurance as compared to one in twenty (5.1%) adults with a college degree. One in five (21.3%) adults with high school or GED diploma reported lack of health insurance. Four out of ten (40.2%) adults with an annual household income of less than $25,000 reported lack of insurance as compared to one in twenty-five (4.0%) adults with an annual household income of $50,000 or more.

Discussion and Conclusion

The findings of this study related to age group are consistent with other published estimates [6, 7], which have shown higher prevalence of lack of insurance among working-age adults in the younger age group (18-29 years). As reported in other published estimates [6, 7], disparities were seen in the prevalence of lack of health insurance among working-age adults in Kansas with respect to other demographic factors. The prevalence of lack of health insurance among working-age adults in Kansas was higher among African Americans, Hispanics, those who did not graduate from high school, those with annual household income less than $25,000 and those who were not employed.

The results of this study provided current population-based estimates of working-age adults who are uninsured in Kansas. The results also identified disparities with regards to lack of insurance among working adults in different subpopulation groups. This information can be used to develop public health programs and interventions that address the issues related to lack of health insurance among these demographic groups of working-age adults.

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Trends in Breast Cancer Hospitalizations and Associated Costs

Breast cancer is the most commonly diagnosed cancer among females in the U.S. [1] and Kansas [2]. However, national and Kansas trends both show that incidence rates for breast cancer have decreased since 1999 [3]. On the other hand, while the number of hospitalizations declined 21 percent between 2001 and 2003, the average hospital bill per admission increased 20 percent for patients without complications and 13 percent for those with adverse effects from chemotherapy. Nationally, hospital expenses for breast cancer treatments totaled more than $1.6 billion in 2003 alone [4].

The purpose of the current study is to review Kansas trends in breast cancer incidence, hospital discharge and death rates, the distribution of most frequently used breast cancer treatments by payer and costs associated with breast cancer hospitalizations for major payers. Since medical expenses for breast cancer are increasing nationally, a similar trend is expected in Kansas.

Methods

Data were analyzed from the Kansas Cancer Registry 2000-2005 [2], Kansas discharge data from the Kansas Hospital Association 2000-2006 [5] and Kansas Vital Statistics mortality data 2000-2006 [6]. These data were accessed through the Kansas Information for Communities (KIC) system [7]. The breast cancer record case definition is those records with a primary diagnosis code using the International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM) = 174 – 174.9. Medicare 2004-2006 cost estimates were based on national Medicare payment averages supplied by Ingenix for Medicare [8]. Medicaid 2004-2006 reimbursement estimates were derived from data provided by the Centers for Medicare and Medicaid Services via permission of the Kansas Health Policy Authority [9]. Medicaid data, for purposes of this analysis, were identified as records benefit plans for the HCBS Frail Elderly, Medically Needy, Title XIX, Title XIX Presumptive Eligibility, Qualified Medicare Beneficiary and Sixth Omnibus Bill Reconciliation Act (SOBRA) containing a primary diagnosis of breast cancer. Private insurance cost estimates for 2004 and 2005 were derived from the Kansas Health Insurance Information System (KHIIS) data provided by the Kansas Insurance Department [10]. Calculation of mean payments for private insurance excludes data for health maintenance organizations (HMOs) due to bundling issues with cost data. The italicized 2006 private insurance estimates are projections based on the Consumer Price Index (CPI) increases from 2005 [11]. Statistical significance when stated is determined with

95 percent confidence intervals. All statistics are reported for women only.

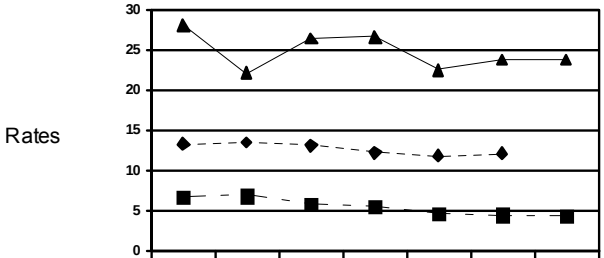
U.S. and Kansas Breast Cancer Trends and Costs

Trend data from 1999 – 2003 indicated that breast cancer incidence for female age-adjusted rates per 100,000 using the year 2000 U.S. standard population both nationally, and in Kansas, showed a decline, although Kansas rates were higher than the national rates for all years [3]. Incidence rates have declined for breast cancer in Kansas from 2000 through 2005 (Figure 6).

In the U.S., women experienced more than 90,000 hospital stays for breast cancer in 2004, representing a 28 percent decrease from 1997, according to data from the Healthcare Cost and Utilization Project (HCUP) (using hospital discharge as the unit of analysis). The reduction in hospitalization rate per 100,000 women showed a 34 percent decrease [12].

A similar downward trend is seen in Kansas hospital discharge rates per 10,000 from 2000 to 2006 (Figure 6). While national breast cancer death rates have been stable from 1999-2003 [3], Figure 6 shows a slight decline in Kansas breast cancer death rates per 100,000, although the rates are significantly lower in years 2001 and 2004 only from the year 2000 rate, p <.05 [7].

Figure 6. Breast Cancer Age-adjusted Trends
Kansas, 2000-2006



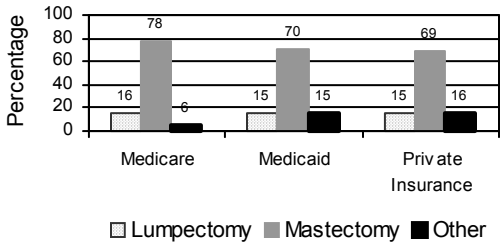
	2000	2001	2002	2003	2004	2005	2006
Incidence Rate per 1,000,000	13.4	13.6	13.2	12.3	11.9	12.2	n.a.
Hospitalization Rate per 10,000	6.8	7	5.9	5.7	4.7	4.6	4.4
Death Rate per 100,000	28.2	22.2	26.5	26.7	22.6	23.9	23.9

Research has shown that approximately 2 out of 3 women hospitalized with breast cancer undergo a mastectomy, which is the most common procedure performed on women hospitalized for the disease. Medicare and Medicaid are billed for half of these hospitalizations.

However, many women with breast cancer undergo a lumpectomy or a partial or complete mastectomy as part of their treatment. Advances in breast cancer surgery, including the use of more breast conserving procedures, have resulted in fewer surgeries that require hospitalization [4]. The decreasing numbers of breast cancer hospitalizations are likely due to the use of outpatient treatments. Additional analysis is needed to explore outpatient costs and treatments.

Nationally, as the hospitalization rates for breast cancer decreased, the use of the two most frequent principal procedures i.e., mastectomies and lumpectomies, performed in the inpatient hospital setting decreased by 32 percent and 45 percent, respectively. The majority of lumpectomies and an increasing number of mastectomies are now performed in outpatient settings, primarily because of advances in early diagnosis of breast cancer and surgical technologies [12]. Figure 7 shows the two procedures performed in Kansas hospitals by payer source. Among the major payers, Medicare recipients had the highest percentage of mastectomies followed by Medicaid recipients and individuals with private insurance. There were no significant differences in percentage of lumpectomies across major payer sources.

Figure 7. Breast Cancer Principal Procedure Percentages by Payer for Hospitalizations
Kansas, 2004-2006



The number of Kansas hospitalizations with a primary diagnosis of breast cancer are shown in Table 10. The estimated total costs for Medicare, Medicaid and private insurance hospitalizations are increasing even though the hospitalization rate is stable or declining.

Table 10: Estimated Hospitalization Reimbursements for Breast Cancer by Payer Source, Kansas, 2004-2006

Total Number *	2004	2005	2006
Medicare	369	357	356
Medicaid	27	33	28
Private Insurance	342	350	330
Total	738	740	714
Total Allowed Dollars			
Medicare **	$1,445,071	$1,442,653	$1,624,212
Medicaid ***	$125,769	$137,402	$105,646
Private Insurance ****	$2,273,308	$2,332,135	$2,400,471
Total	$3,844,148	$3,912,190	$4,130,329
Average Allowed Dollars			
Medicare **	$3,916	$4,041	$4,562
Medicaid ***	$4,658	$4,164	$3,773
Private Insurance ****	$6,647	$6,663	$7,274
Average	$5,209	$5,287	$5,785

Sources:

*The total number of hospital discharges by payer source and years are derived from Kansas Hospital Discharge Data provided by the Kansas Hospital Association.

** Based on national Medicare payment averages.

*** Reimbursement Estimates are derived from Medicaid data provided by the Centers for Medicare and Medicaid Services via permission of the Kansas Health Policy Authority.

**** Reimbursement estimates for 2004 and 2005 are derived from Kansas Health Insurance Information System (KHIIS) data provided by the Kansas Insurance Department. Reimbursement estimates for 2006 are projections derived from KHIIS data and based on the Consumer Price Index (CPI).

The number of Medicare hospitalizations declined slightly from 2004 to 2006, while the total and average costs increased slightly in 2006. Conversely, the number of hospitalizations reimbursed by Medicaid is relatively constant from 2004 to 2006, while the average cost declined annually. For private insurance, the number of hospitalizations has been relatively stable, with a slight decline in 2006 from the previous two years. However, the total and average cost to private insurance has increased between 2004 and 2005 and is estimated to increase in 2006. Nationally, the average cost for breast cancer hospitalizations was $6,900 in 2004 [12]. Kansas breast cancer mean costs appear somewhat lower than the national average. Further research is needed to assess differences.

Data limitations

Costs, for purposes of this report, are based on the number of hospitalizations as reported in the Kansas hospital discharge data only, i.e., federal, private and other hospitalizations are not avail-

able. Estimates are conservative since there are many other costs associated with breast cancer treatment and care. For example, professional and pharmaceutical costs connected with hospitalization are not included here. Additionally, payments and reimbursements made for Workers Compensation, privately paid patient costs and a number of other payer sources are not included.

Kansas community hospital discharge data does not contain cost data within the dataset. Cost estimates are derived based on averages from other healthcare reimbursement datasets like KHIIS, Medicaid and Medicare average cost reports. These datasets cannot be merged due to the lack of a unique record identifier, thus impacting ability to conduct statistical analysis. Also, the absence of a unique identifier is problematic in the community hospital discharge dataset because individuals admitted multiple times in a single year may be counted as unique patients, producing inflated counts that can affect statistical reliability. KHIIS data consists of the experience of the top 20 Kansas private health insurers only, thus not all private insurance experience is represented in the data. Further analysis is needed for a more comprehensive view of trends in this arena.

Summary and conclusion

On one hand, current research appears to show the incidence of breast cancer declining both nationally and in Kansas. Kansas trends in breast cancer incidence, hospital discharge and death rates are declining, while average costs for hospitalizations have increased. Furthermore, private insurers consistently pay more than Medicare and Medicaid for breast cancer hospitalizations with similar primary diagnoses and principal procedures.

On the other hand, while hospitalization rates are declining and expenses are increasing, hospitals do not charge every patient the same price for medical care. Uninsured patients and those who pay with their own funds are charged 2.5 times more for hospital care than those covered by health insurance and more than three times the allowable amount paid by Medicare. Patients who self-pay for hospital care, such as the uninsured and foreign visitors, do not benefit from discounted rates negotiated on the patient's behalf by insurance companies and Medicare. Furthermore, the gap between the amount self-pay patients are charged and what Medicare pays has more than doubled in the past 20 years [13]. Future research should address cost burdens for the uninsured.

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2007 Kansas Vital Statistics Summary Released

The 2007 Annual Summary of Kansas Vital Statistics is the latest edition of a report released by the Kansas Department of Health and Environment. The report serves as the baseline document used to assess the health of Kansans. It is used by the department's program managers, epidemiologists, and other researchers for targeted studies and more specialized evaluations by the public, policymakers, and by federal, state, and local governments.

The tables and charts contained in this report represent a portion of the insight that can be gained from the data reported on births, stillbirths, deaths, marriages, marriage dissolutions (divorce and annulment), and abortions recorded. Analysis of trend data, county data, and a comparison of Kansas to the nation are included in this report. Some of the highlights from the report include:

- In 2007, a total of 41,951 births were registered to Kansas residents, 1,055 more than in 2006. The number of births in 2007 is the highest reported since 1981 (41,202).
- "Addison" and "Aiden" were the most popular names given to newborns by Kansas parents in 2007. For the second consecutive year, the top name for both girls and boys is unigender.
- The percent of Kansas mothers receiving inadequate prenatal care increased 11.6 percent between 2006 and 2007.
- Out-of-wedlock births followed national trends, increasing to a record high (15,252 or 36.4 percent).
- The teen pregnancy rate for Hispanic teens (10-19) has increased by nearly 10 percent (9.5 per 1,000 female age-group population) between 2003 (52.2) and 2007 (57.2). Hispanic teens have the highest pregnancy rates in the state.
- Almost half of the abortions performed in Kansas occurred to non-Kansans. The abortion ratio, since reaching a peak of 186.3 per 1,000 live births in 1996, has generally declined by 27.3 percent to 135.4 in 2007.
- In 2007, a total of 333 infant deaths occurred - 40 more deaths than in 2006 (293). This is the highest number reported in the past twenty years.
- The disparity in the infant, neonatal and post neonatal death rates between white non-Hispanics and black non-Hispanics continues to be a public health concern. The black non-Hispanic infant death rate (19.6) is 2.9 times higher than the rate for whites (6.8).
- Between 1999 and 2007, the age-adjusted death rate for heart disease, the leading cause of death for Kansans, decreased nearly 25 percent (24.8).
- Marriage and marriage dissolution rates have dropped by a quarter and nearly a third, respectively, since 1988.

The 2007 Annual Summary is available in a PDF format at http://www.kdheks.gov/ches/index.html. Requests for single, printed copies of the Annual Summary of Vital Statistics should be

made to the KDHE, Center for Health and Environmental Statistics, Office of Health Assessment at 785-296-8627 or for an alternative form because of a disability at 1-800-332-6262 (TDD/TT).

Selected Vital Event Rates & Ratios, Kansas, 2006-2007

Vital Event	2006	2007
Live Births		
Number	40,896	41,951
Rate[1]	14.8	15.1
Out-of-Wedlock Births		
Number	14,376	15,252
Ratio[2]	35.2	36.4
Stillbirths (S.B.)		
Number	192	186
Rate[3]	4.7	4.4
Hebdomadal Deaths (Under 7 days)		
Number	137	163
Rate[4]	3.3	3.9
Perinatal Period III Deaths (S.B. & Hebdomadal)		
Number	329	349
Rate[3]	8.0	8.3
Neonatal Deaths		
Number	176	211
Rate[4]	4.3	5.0

Vital Event	2006	2007
Infant Deaths		
Number	293	333
Rate4	7.2	7.9
Maternal Deaths		
Number	7	6
Rate5	1.7	1.4
Deaths		
Number	24,489	24,413
Rate1	8.9	8.8
Marriages		
Number	18,836	18,910
Rate1	6.8	6.8
Marriage Dissolutions		
Number	9,145	9,347
Rate1	3.3	3.4
Abortions		
Total Reported	11,271	10,841
Kansas Residents.	5,886	5,679
Out of State Residents	5,385	5,162

1 Rate per 1,000 population
2 Ratio per 100 live births
3 Rate per 1,000 live births + stillbirths
4 Rate per 1,000 live births
5 Rate per 10,000 live births

Residence data presented for births and deaths. Occurrence data presented for marriages, and marriage dissolutions.

News Notes

Uninsured Kansans Increase

U.S. Census Bureau (USCB) data show about 340,000 Kansans lacked health insurance in 2006-2007. According to a Kansas Health Institute Fact Sheet this represents an increase of about 34,000 people since 2005-2006. Kansas was one of only 10 states in which the uninsured rate increased. The data are from the USCB Current Population Survey. For further details and other findings, go to: http://www.khi.org/resources/Other/1213-UninsuredKHI08-10.pdf.

Kansas Health Institute

The Office of Assessment (OHA) of the Kansas Department of Health and Environment's Center for Health and Environmental Statistics produces *Kansas Health Statistics Report* to inform the public about availability and uses of health data. Material in this publication may be reproduced without permission; citation as to source, however, is appreciated. Send comments, questions, address changes and articles on health data intended for publication to: OHA, 1000 SW Jackson, Suite 130 Topeka, KS, 66612-1354, Kansas.Health.Statistics@kdhe.state.ks.us, or 785-296-8627. Roderick L. Bremby, Secretary KDHE; Richard J. Morrissey, Interim Director, Division of Health; Elizabeth W. Saadi, PhD, Interim State Registrar and Interim Director CHES;, Elizabeth W. Saadi, PhD, Director, OHA; Greg Crawford, Editor.

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