

## Status of Inadequate Sleep in Kansas and Association with Selected Health Indicators, 2012 Kansas Behavioral Risk Factor Surveillance System

### Background

Sleep disorders such as inadequate sleep are recognized as an important public health problem, with inadequate sleep linked to motor vehicle crashes, industrial disasters, and medical and other occupational errors. Evidence suggests that inadequate sleep is associated with a wide range of adverse health conditions and health risk behaviors, including an increased risk of hypertension, heart attack, stroke, diabetes, obesity and depression. It is estimated that sleep-related disorders, such as inadequate sleep, affect 50-70 million Americans [1]. The Kansas Department of Health and Environment (KDHE) identify the need to assess status of inadequate sleep among Kansans. Following this need, KDHE included Inadequate Sleep Module, comprised of five questions in 2012, in the Behavioral Risk Factor Surveillance Survey (BRFSS) and is collecting data related to sleep since 2008.

### Objective

To provide status of inadequate sleep and its association with selected health indicators in Kansas.

### Methods

The 2012 Kansas BRFSS data were used for this report. Kansas BRFSS is an ongoing, annual, population-based, random, digit-dial survey of non-institutionalized adults ages 18 years and older living in a private residence with landline and/or cell phone service in Kansas. Kansas BRFSS uses a split questionnaire design. The core section is asked of all respondents and the survey then splits into two “branches” (version A or version B) consisting of state-selected optional modules/state-added modules. Approximately half of the respondents that are asked core questions are randomly assigned to either questionnaire version A or questionnaire version B of the survey. The inadequate sleep module was part of questionnaire version B of the survey. The question to determine inadequate Sleep status was, “During

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the past 30 days, for about how many days have you felt you did not get enough rest or sleep?" Those who responded "all 30 days" were considered people with inadequate sleep. Other additional inadequate Sleep related questions were: "On average, how many hours of sleep do you get in a 24-hour period?"; " Do you snore?"; "During the past 30 days, for about how many days did you find yourself unintentionally falling asleep during the day?"; "During the past 30 days, have you ever nodded off or fallen asleep, even just for a brief moment, while driving?" Data from the 2012 Kansas BRFSS were analyzed to assess insufficient sleep in various population subgroups. The percentage of Kansans with unhealthy sleep behaviors, like unintentionally falling asleep during the day at least once in the past month and nodding off, or falling asleep while driving in the past month were examined. Further, adjusted logistic regression analyses were conducted to examine the odds of selected health indicators for people with insufficient sleep compared to people without insufficient sleep adjusting for age, gender, race, ethnicity, and education. Prevalence estimates and 95% confidence intervals (CI) were calculated. Data were weighted using the new raking method [2]. SAS 9.3 software was used for analysis.

## **Results**

In 2012, an estimated 330,657 (15.3%, 95% CI: 14.0 -16.6) adults reported having inadequate sleep.

An estimated 330,716 (15.3%) adults reported insufficient sleep during the past 30 days for all 30 days, 341,524 (15.8%) for 14-29 days, 440,055 (20.4%) for 5-13 days and 462,570 (21.4%) for 1-4 days. Higher prevalence of sleep insufficiency (insufficient sleep for all 30 days in the past month) was seen among younger adults, adults with more than one race, among those who were divorced or separated, have lower income, have lower education and among adults that were unable to work (Table 1).

Table 1. Percentage of Adults 18 Years and Older with Inadequate Sleep by Sociodemographic Characteristics in Kansas, 2012 BRFSS

Sociodemographic Characteristics and Selected Indicators	Percentage of Adults 18 Years and Older with inadequate sleep			
	Unweighted Frequency	Wt. %	Lower 95% CI	Upper 95% CI
Total	784	15.3%	14.0%	16.6%
Age groups				
18 - 24 years	36	12.5%	8.3%	16.7%
25 - 34 years	102	18.9%	15.1%	22.8%
35 - 44 years	122	19.6%	15.8%	23.4%
45 - 54 years	157	17.5%	14.7%	20.3%
55 - 64 years	175	13.7%	11.5%	16.0%
65 years and older	192	9.7%	8.1%	11.3%
Gender				
Male	282	14.4%	12.5%	16.3%
Female	502	16.2%	14.5%	17.9%
Race				
White Only	678	14.7%	13.5%	16.0%
Black or African American only	43	18.5%	11.1%	26.0%
Other Race Only	41	15.9%	10.1%	21.7%
More than one race	19	32.3%	18.2%	46.4%
Ethnicity				
Hispanic	32	14.0%	8.5%	19.5%
Non-Hispanic	748	15.4%	14.1%	16.7%
Annual Household Income				
Less than \$15,000	109	25.4%	19.6%	31.1%
\$15,000 - \$24,999	160	18.0%	14.7%	21.3%
\$25,000 - \$34,999	88	18.4%	13.7%	23.1%
\$35,000 - \$49,999	128	16.1%	13.0%	19.2%
\$50,000 or higher	226	12.7%	10.7%	14.7%
Education				
Less than high school	78	19.8%	14.6%	24.9%
High school graduate or G.E.D	256	17.6%	15.1%	20.1%
Some college	266	17.0%	14.7%	19.4%
College graduate	184	9.2%	7.5%	10.8%
Marital Status				
Married or member of an unmarried couple	436	14.8%	13.2%	16.3%
Divorced or separated	156	22.1%	18.1%	26.2%
Widowed	101	13.9%	10.8%	16.9%
Never married	86	13.3%	10.0%	16.5%
Employment Status				
Employed for wages or Self-employed	394	15.3%	13.5%	17.0%
Out of work	46	17.9%	12.0%	23.9%
Homemaker or Student	64	13.8%	9.9%	17.7%
Retired	164	9.2%	7.6%	10.8%
Unable to work	116	35.4%	28.5%	42.3%

Source: 2012 Kansas Behavioral Risk Factor Surveillance System, Bureau of Health Promotion, KDHE.

Sleep insufficiency was also high among adults with mental illness and its symptoms, among current cigarette smokers, among adults with current asthma, and diabetes, those who were obese, those who did not participate in any physical activity and those living with a disability (Table 2).

Table 2. Percentage of Adults 18 Years and Older with Inadequate Sleep by Co-morbid Conditions in Kansas, 2012 BRFSS

Co-morbid Conditions	Percentage of Adults 18 Years and Older with Inadequate Sleep			
	Unweighted Frequency	Wt. %	Lower 95% CI	Upper 95% CI
<b>Disability Status</b>				
Living with a disability	327	23.9%	21.0%	26.9%
Living without a disability	455	12.8%	11.4%	14.2%
<b>Smoking Status</b>				
Current Smoker	208	25.1%	21.5%	28.7%
Non-smoker	575	13.2%	11.8%	14.5%
<b>Current Asthma Status</b>				
Current Asthma	113	25.0%	19.8%	30.3%
No Current Asthma	667	14.5%	13.1%	15.8%
<b>Leisure Time Physical Activity</b>				
Participates in leisure time physical activity	515	13.4%	12.0%	14.8%
Does not participate in leisure time physical activity	268	21.8%	18.8%	24.9%
<b>Diabetes Status</b>				
Have Diabetes	134	20.3%	16.4%	24.2%
No Diabetes	650	14.8%	13.4%	16.1%
<b>Weight Category</b>				
Normal or Underweight (BMI<25)	208	13.2%	11.0%	15.4%
Overweight (25<=BMI<30)	243	13.5%	11.6%	15.5%
Obese (BMI>=30)	281	18.9%	16.3%	21.5%
<b>Mental Health Indicator</b>				
14+ days mental health not good	186	37.4%	31.9%	42.9%
<14 days mental health not good	584	12.9%	11.6%	14.2%
<b>Depression Status</b>				
Lifetime depression disorder	235	28.4%	24.6%	32.2%
No lifetime depression disorder	545	12.8%	11.5%	14.2%

Source: 2012 Kansas Behavioral Risk Factor Surveillance System, Bureau of Health Promotion, KDHE.

About 11 percent reported they had only 1 to 5 hours of sleep in a 24 hour period, 23 percent had only 6 hours of sleep and 28.5 percent had only seven hours of sleep. About one in three adults (33.9%) unintentionally fell asleep during day at least once in the past month. About half of the adults snored (52.6%). About 3.7 percent adults nodded off or fell asleep while driving in the past month (Table 3).

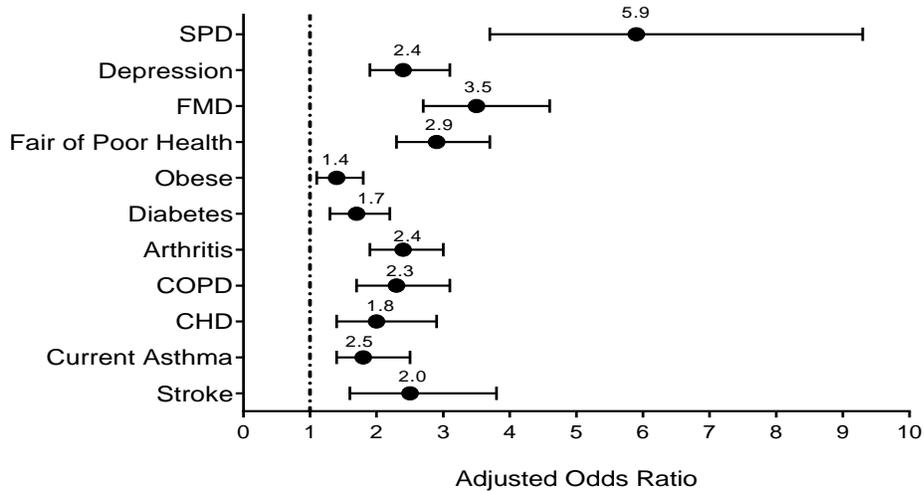
Table 3. Percentage of Adults 18 Years and Older with Selected Inadequate Sleep Related Behaviors

Selected Inadequate Sleep Related Behaviors	Unweighted Frequency	Wt. %	Lower 95% CI	Upper 95% CI
<b>Sleeping on average hours in 24-hr period</b>				
One to Five hours	522	11.1%	9.9%	12.3%
Six hours	1178	22.9%	21.4%	24.4%
Seven hours	1707	28.5%	26.9%	30.0%
Eight hours	1665	27.7%	26.2%	29.2%
Nine to Ten hours	517	9.1%	8.1%	10.1%
More than Ten hours	57	0.8%	0.5%	1.0%
<b>Snoring</b>				
Yes	2829	52.6%	50.8%	54.4%
No	2274	47.4%	45.6%	49.2%
<b>Unintentionally fell asleep during the day at least 1 day in the preceding 30 days</b>				
Yes	3645	66.1%	64.5%	67.8%
No	1996	33.9%	32.2%	35.5%
<b>Nodded off or fell asleep while driving in the preceding 30 days</b>				
Yes	163	3.7%	2.9%	4.4%
No	5589	96.3%	95.6%	97.1%

Source: 2012 Kansas Behavioral Risk Factor Surveillance System, Bureau of Health Promotion, KDHE.

Adjusted odds ratios indicated that frequent mental distress, serious mental illness, symptoms of mental illness, self-perceived poor or fair general health, heart-attack, stroke, asthma are associated with sleep insufficiency (Figure 1).

Figure 1: Adjusted Odds Ratio for Chronic Diseases among Adults with Inadequate Sleep



## Conclusions

Inadequate sleep is a prevalent health issue in Kansas. Disparities are seen with respect to various socio-demographic sub groups and among those with mental illness, obesity, other chronic diseases and risk factors. This population based information indicates the need for public health strategies to address issues related to sleep insufficiency and unhealthy sleep behaviors among Kansas adults.

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## References

1. CDC. Insufficient Sleep Is a Public Health Epidemic. Available at: <http://www.cdc.gov/features/dssleep/>. Accessed on June 3, 2014.
2. CDC. Methodologic changes in the Behavioral Risk Factor Surveillance System in 2011 and potential effects on prevalence estimates. *MMWR* 2012;61:410–3.

## The Reach of Clinical Tobacco Cessation Interventions and Their Contribution to Quitline Registration Volume

### Introduction

Throughout the U.S. health care system, physicians and organizations regularly evaluate the quality of care they provide and engage in quality improvement processes to improve that care. One area in which physicians may engage in quality improvement is tobacco cessation. As the leading cause of preventable death in the U.S.[1], tobacco use warrants intervention by physicians. The U.S. Department of Health and Human Services *Treating Tobacco Use and Dependence: 2008 Update* is an authoritative clinical guide for health care providers who wish to systematically and effectively address tobacco use. The guide makes a variety of recommendations, among which are:

1. All patients should be asked if they use tobacco and should have their tobacco use status documented on a regular basis.
2. All physicians should strongly advise every patient who smokes to quit because evidence shows that physician advice to quit smoking increases abstinence rates.
3. Once a tobacco user is identified and advised to quit, the clinician should assess the patient's willingness to quit at this time.
4. All clinicians and clinicians-in-training should be trained in effective strategies to assist tobacco users willing to make a quit attempt and to motivate those unwilling to quit.
5. All patients who receive a tobacco dependence intervention should be assessed for abstinence at the completion of treatment and during subsequent contacts.

These are known as the five A's Intervention (Ask, Advise, Assess, Assist and Arrange).[2] Five A's and the systematic referral of tobacco users to the Kansas Tobacco Quitline has been disseminated to and encouraged for health care providers across Kansas by the Kansas Department of Health and Environment (KDHE) and its partners.

## Background

In 2012, KDHE partnered with the Kansas Health Foundation to assess tobacco-related measures in Kansas adults. The resulting household survey provided unique, population-based estimates which can be used to assess the extent to which Kansas adult smokers are being reached with five A's. As the coordinator of Kansas Tobacco Quitline services, KDHE also has access to monthly Quitline usage information. Here we present both to support program planning and evaluation and to build awareness of clinical tobacco cessation strategies.

## Methods

The 2012/2013 Kansas Adult Tobacco Survey (ATS) is a point-in-time population-based random digit dial survey of non-institutionalized adults ages 18 years and older living in a private residence with landline and/or cell phone service in Kansas. In total, 9,656 Kansas adults participated in the ATS survey, of which 1,341 identified as cigarette smokers. Statistical procedures to account for complex survey design and weighted data were used to generate prevalence and sub-population prevalence estimates of exposure to clinical cessation steps. All statistical analyses were conducted using SAS 9.3 software.

To use Kansas Tobacco Quitline services, a user must first register. Although there is some duplication of unique people in the number of Quitline registrations if a person registers for services with the Quitline more than once, presenting a count of registrations is the most straightforward method for estimating the number of unique callers to the Quitline. Counting registrations also best describes the level of activity the Quitline experiences during a given period of time. This makes registrations a better metric for evaluating Quitline promotional activities than counting unique participants, which would exclude any tobacco user who failed to quit previously or relapsed. During registration, participants are asked how they heard about the Quitline and the response is categorized into over 20 different groups, one of which is "Health Professional." If "Health Professional" is selected, a secondary how-heard-about category is included to describe the type of health professional. Registrants are also asked if they have any of the following conditions: asthma, heart disease (coronary artery disease), chronic obstructive pulmonary disease (COPD) or diabetes.

## Results

In Kansas, smokers have a lower prevalence of having health insurance (68.5%, 95% CI: 65.3%-71.7%) than non-current smokers (87.5%, 95% CI: 86.4%-88.5%). Among smokers with health insurance, 35.4 percent have coverage which includes cessation counseling or

medication, 15.6 percent do not and 49 percent do not know if cessation counseling or medication is covered by their health insurance.

In 2012 and 2013, 83.5 percent of Kansas adults had seen a doctor, dentist, nurse or other health professional in the past year. Of these, 63.8 percent had their tobacco use status assessed, including 89.7 percent of current smokers. Among adult tobacco users who had seen a health care professional in the past year, 51.4 percent were advised to stop using tobacco. Of these, 63.4 percent were asked if they wanted to try to quit and 58.6 percent were offered assistance, information or additional advice. Of those offered assistance, information or additional advice, 49.1 percent were referred to a Quitline, cessation class or 1-on-1 counseling; 54.3 percent were recommended or prescribed nicotine replacement therapy (NRT) or medication and 35.1 percent committed to start a quit attempt.

Figure 1. Past-year prevalence of clinical tobacco cessation strategies among Kansas adults, ATS, 2013

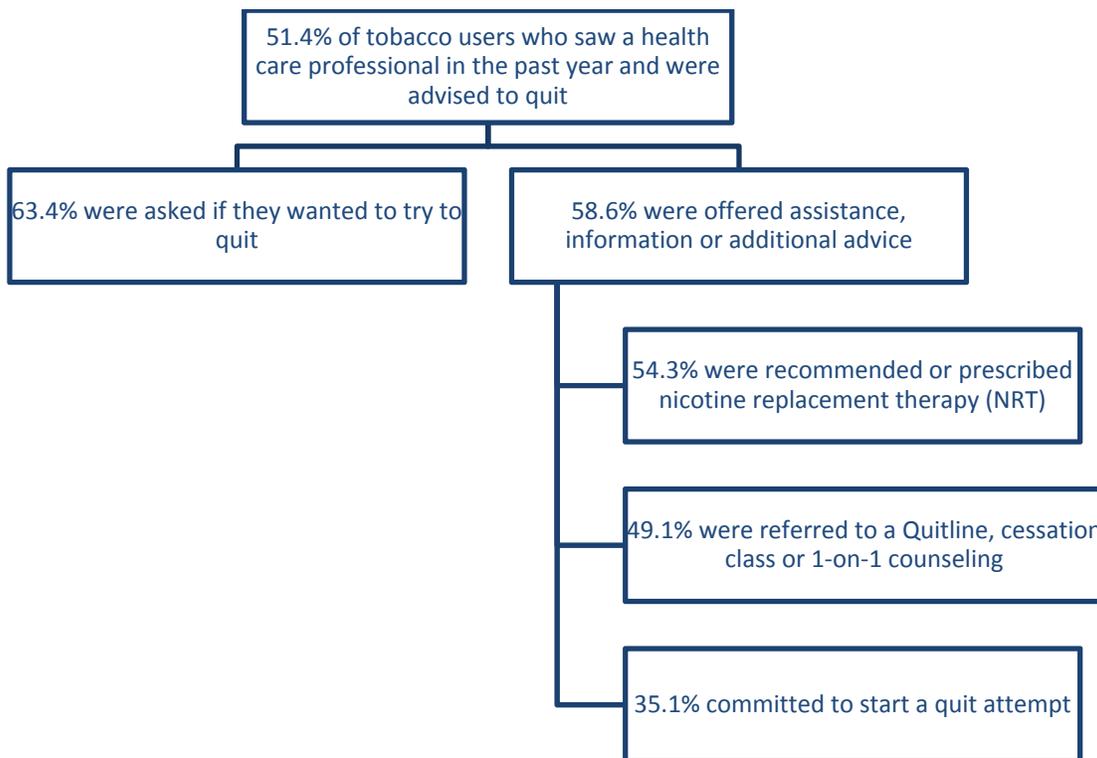
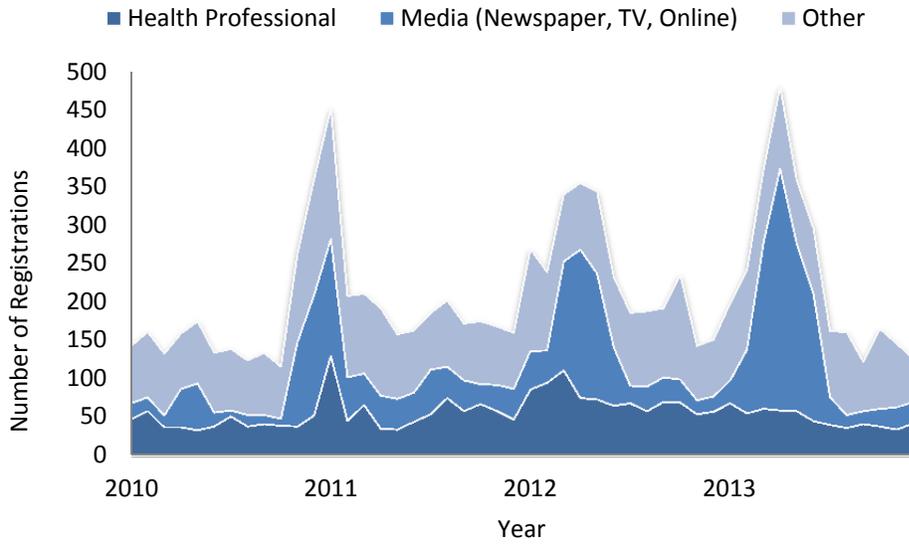


Figure 2 demonstrates the contribution of health care professionals to Kansas Tobacco Quitline registration volume. The three peaks apparent in figure 2 coincide with promotional campaigns. In late 2010 and early 2011 KDHE provided free NRT to qualifying Quitline registrants. In Spring 2012 and 2013 the Centers for Disease Control and Prevention implemented nationwide media smoking cessation campaigns known as “TIPS from Former Smokers” which also drove large increases in Quitline call volume. Unlike the “Media” and “Other” categories, health care professional referrals were relatively constant

from 2010-2013. Excluding unknowns and refusals, referrals from health care professionals have accounted for nearly 26 percent of Kansas Tobacco Quitline registrations since 2010. During months when the Quitline is not being actively promoted, health care professional referrals can account for nearly 40 percent of total Quitline registration volume.

Figure 2. Kansas Tobacco Quitline registrations by tobacco users by how they heard about the Quitline, 2010-2013



During 2010-2013, 19.4 percent of Quitline registrants reported having asthma, 10 percent reported coronary arterial disease, 17.9 percent reported COPD and 13.2 percent reported some form of diabetes. In contrast, the 2012 Kansas Behavioral Risk Factor Surveillance System found that 9.4 percent of Kansas adults have diabetes, 8.4 percent have asthma and 6 percent have COPD, emphysema or bronchitis.

## Discussion

Health care professionals play an important role in preventing tobacco-attributable disease. While Kansas health care professionals seem to be doing a good job of regularly assessing tobacco use status, there is room for improvement on the remaining four A's. In 2012/2013, only half of tobacco users were advised to quit using tobacco by a health care professional and only about three-in-five (58.6%) of these were offered additional assistance, information or advice. Furthermore, of those smokers who do have health insurance, half do not know if cessation counseling or medication is covered.

Despite the relatively low percentages of tobacco users being advised to quit and receiving assistance to do so, health care professional referral continues to be a leading contributor to Quitline registration volume. As demonstrated by the relatively high percent of Quitline registrants with COPD and asthma, the Quitline already serves a less healthy portion of the population. Health care providers interested in treating and preventing these

conditions and others caused or exacerbated by tobacco use should ensure they are systematically identifying, advising and treating tobacco use.

Technical assistance is available to health care providers interested in improving their tobacco cessation processes and outcomes. Please direct questions and requests to (785) 296-8127, or e-mail the KDHE Tobacco Use Prevention Program at [TUPP@KDHEKS.GOV](mailto:TUPP@KDHEKS.GOV). Free help to quit using tobacco is available from the Kansas Tobacco Quitline, 1-800-QUIT-NOW (784-8669) or [www.KSquit.org](http://www.KSquit.org).

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## References

1. U.S. Department of Health and Human Services. The Health Consequences of Smoking—50 Years of Progress. A Report of the Surgeon General. Atlanta: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, 2014.
2. Fiore MC, Bailey WC, Cohen SJ, et. al. Treating Tobacco Use and Dependence. Quick Reference Guide for Clinicians. Rockville, MD: U.S. Department of Health and Human Services. Public Health Service. October 2000.

## Notice to Readers

### Preliminary Vital Statistics Counts Released

The Kansas Department of Health and Environment Bureau of Epidemiology has published preliminary counts for births, death, marriages, and marriage dissolutions by county for 2013 (Table 1). The bureau has also made available selected annual statistical tables of vital events. These 25 tables, available in PDF and Excel, can be located at <http://kic.kdhe.state.ks.us/kic/OHA/anntable13.html>. Marriages and marriage dissolutions are reported by county of occurrence. Births and deaths are reported by county of residence. A complete analysis of vital events, including rates, will be available later this year when the bureau publishes the *Annual Summary of Kansas Vital Statistics, 2013*.

## Kansas Health Statistics Report

Table 1. 2013 Kansas Vital Statistics\*

County of Residence	Live Births	Deaths	Marriages	Marriage Dissolutions	County of Residence	Live Births	Deaths	Marriages	Marriage Dissolutions
Kansas	38,805	25,347	17,328	9,085					
Allen	143	199	67	30	Lyon	419	295	190	53
Anderson	94	93	36	25	McPherson	320	380	175	84
Atchison	191	170	96	56	Marion	109	166	67	21
Barber	60	61	30	18	Marshall	125	121	71	26
Barton	350	261	168	60	Meade	69	55	21	10
Bourbon	218	196	88	60	Miami	297	253	227	107
Brown	139	136	66	22	Mitchell	72	96	42	21
Butler	751	634	415	143	Montgomery	427	400	189	146
Chase	26	34	23	3	Morris	59	68	34	14
Chautauqua	34	60	28	9	Morton	37	42	17	10
Cherokee	219	247	104	68	Nemaha	154	134	61	20
Cheyenne	27	31	18	10	Neosho	204	197	99	41
Clark	20	29	12	5	Ness	33	48	14	7
Clay	113	115	53	25	Norton	51	61	36	31
Cloud	103	121	45	32	Osage	150	189	78	62
Coffey	94	109	61	85	Osborne	50	65	18	9
Comanche	21	34	12	4	Ottawa	58	70	25	15
Cowley	456	440	232	160	Pawnee	63	72	29	27
Crawford	489	383	182	109	Phillips	65	74	28	17
Decatur	33	39	20	5	Pottawatomie	353	176	91	64
Dickinson	218	224	123	79	Pratt	122	135	55	37
Doniphan	81	77	44	16	Rawlins	22	50	18	7
Douglas	1,219	650	728	235	Reno	743	772	416	231
Edwards	32	30	17	14	Republic	49	88	28	17
Elk	27	45	12	6	Rice	128	129	38	17
Ellis	360	246	216	66	Riley	999	313	740	309
Ellsworth	52	89	42	33	Rooks	60	62	32	11
Finney	656	217	229	78	Rush	30	45	8	9
Ford	681	244	253	128	Russell	94	84	35	24
Franklin	332	256	136	114	Saline	772	544	333	246
Geary	1,029	199	603	367	Scott	61	47	29	14
Gove	30	50	15	4	Sedgwick	7,487	4,111	3,176	2,222
Graham	24	20	12	8	Seward	441	121	193	97
Grant	123	40	58	20	Shawnee	2,352	1,714	1,037	417
Gray	103	44	32	14	Sheridan	31	23	6	1
Greeley	25	16	6	5	Sherman	80	88	42	20
Greenwood	62	97	56	6	Smith	28	68	22	5
Hamilton	37	26	17	9	Stafford	49	54	22	9
Harper	83	76	26	14	Stanton	38	12	15	6
Harvey	445	399	212	90	Stevens	99	45	35	19
Haskell	52	31	20	4	Sumner	272	257	168	71
Hodgeman	21	20	3	8	Thomas	98	81	51	31
Jackson	156	125	77	26	Trego	33	40	15	9
Jefferson	195	169	110	38	Wabaunsee	98	73	35	19
Jewell	27	43	18	20	Wallace	23	19	18	2
Johnson	7,320	3,714	2,430	1,317	Washington	79	73	43	13
Kearny	63	50	23	11	Wichita	25	29	12	7
Kingman	90	99	41	35	Wilson	109	131	58	31
Kiowa	39	30	15	1	Woodson	29	65	21	8
Labette	270	260	115	52	Wyandotte	2,678	1,367	1,130	295
Lane	23	17	7	7	Unknown	1	0	1	0
Leavenworth	955	564	455	277					
Lincoln	25	31	13	11					
Linn	91	114	39	37					
Logan	33	41	25	17					

\*Residence data are presented for births and deaths  
Occurrence data are presented for marriages and marriage dissolutions

Source: Kansas Department of Health & Environment

## Kansas Health Statistics Report

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