**Kansas Information for Communities
Mapping the Future**

Kansas Department of Health and Environment

2016 Governor's Public Health Conference
April 28, 2016
Greg Crawford, Director, Vital Statistics Data Analysis
Bureau of Epidemiology and Public Health Informatics

Our Mission: To protect and improve the health and environment of all Kansans.

This is a slide presentation used for the café presentation for KIC Query System Maps given at the Governor's Public Health Conference on April 28, 2016. These slides and notes are a public document and may be shared as long as the Kansas Department of Health and Environment is listed as the source.

Kansas Information for Communities (KIC) Map features were implemented in December 2015 for births and deaths. Maps will work for all data years for these two events. Each map created will include a table of the data used to create the map. The KIC map modules can display statistical data by "Frequencies Only", such as counts, and "Frequencies & Percent / Rate", such as population based mortality rates or percent of birth for a specific measure. All map results are displayed by county. KIC Maps cannot filter out counties nor can it map data for various regional groupings like peer group, geographic region, or health preparedness region. State data will display with the map as well.

KIC Maps will display counts or rates/percents in three different ways: "Higher / Lower than State", "Quartiles", and "Quintiles". The quartiles feature groups the states counties into four categories and assigns colors based on the range of values. There are multiple color choices that can be selected. The quintiles feature groups the state's counties into five groups. The groups in quartiles and quintiles are assigned an equal number of counties.

We have two examples today to display the features. The first, involving a birth outcome, will show how the map will display results for inadequate births by county. Most live birth outcomes involve reporting statistics by percent of all births. As is true with regular KIC, the denominator for maps will be the total number of births minus the number of events for which adequacy of prenatal care could not be calculated.

The second query, a cancer death query, has two parts. The first by all cancers and the second involving a sub-category of cancer. As you may know, Death KIC has 31 categories at tier 1 but that can be broken down into 115 sub categories. The map tool allows that drill down.

This is the screen that you enter information into for the map query. It looks different from a regular KIC query screen. That's on purpose. There are some new features and some features from the standard query that are unavailable because the data display is by default not tabular. In Step 1 the filter variables are set to All. Step 2 defaults to the current year, but you can select others or more than one. Step 3 has been selected for inadequate care, but normally you will need to select the birth outcome you want. Step 4 shows the default values for statistics to be mapped, count intervals, county labeling and map colors. You can change all of these as is shown in later slides.
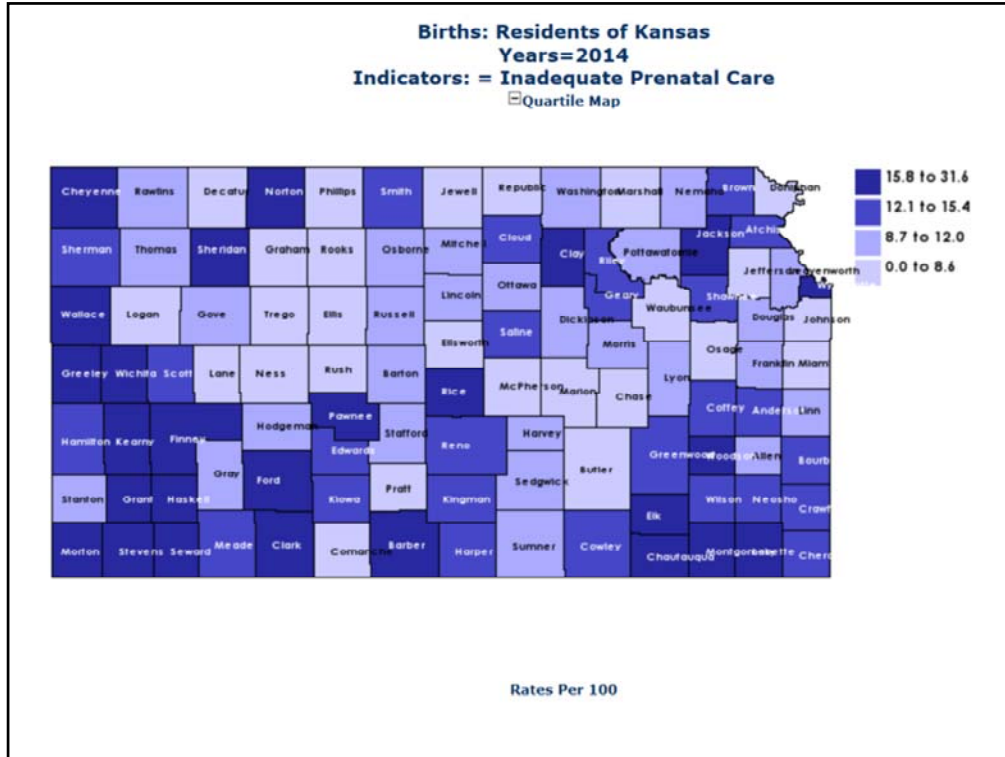
In this sample output we have selected quartiles for percent of births with inadequate care by county for 2014. based on the color one can see the variation in rates among Kansas counties. Here, the darker colors represent the highest rates. You'll notice that MAP KIC divided the state's rates into four groups and then created the legend using the highest and lowest value in each color grouping. You can't alter the grouping categories. In this particular output, you do not see whether the percent rates or statistically different.
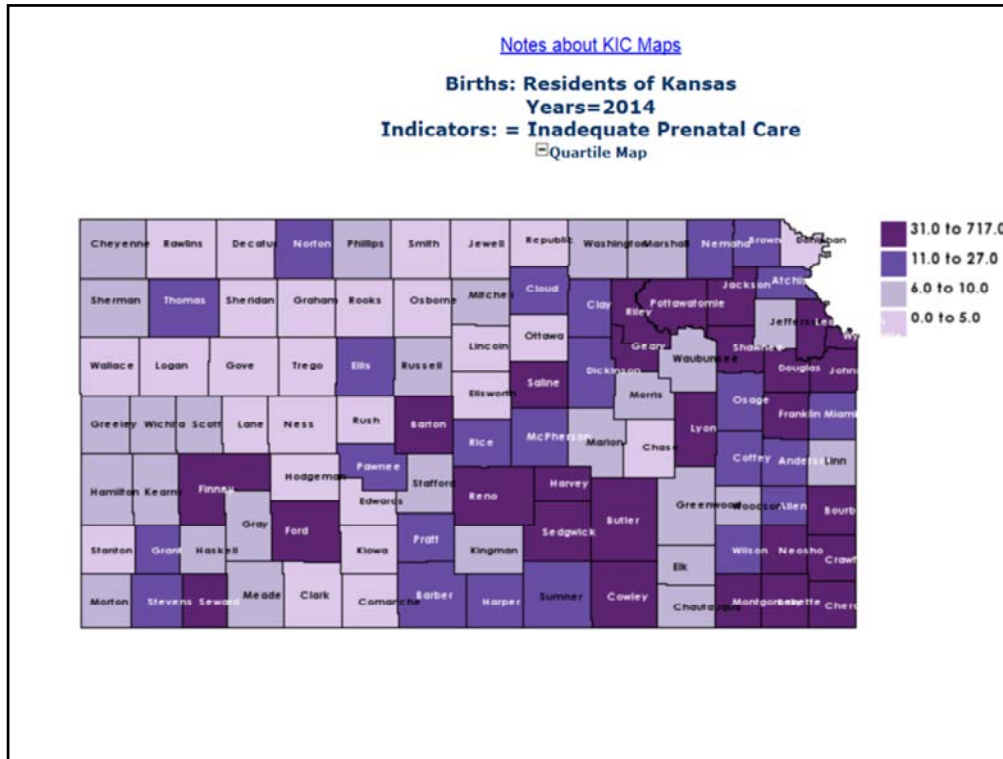
This is a sample that changes the output to display the counts instead of percents. We have also changed the map color. As you can see more populous counties have a larger number of inadequate care births. Thus they are the ones in the deeper purple There are not many instances where this kind of information will be helpful. But it is possible. You will notice there is no reference to a rate per 100 at the bottom, another indication you are mapping counts.

Notes about KIC Maps

Births: Residents of Kansas
Years=2014
Indicators: = Inadequate Prenatal Care
⊟Quintile Map

16.7 to 31.6
13.1 to 16.3
10.8 to 12.9
8.3 to 10.3
0.0 to 8.2

Rates Per 100
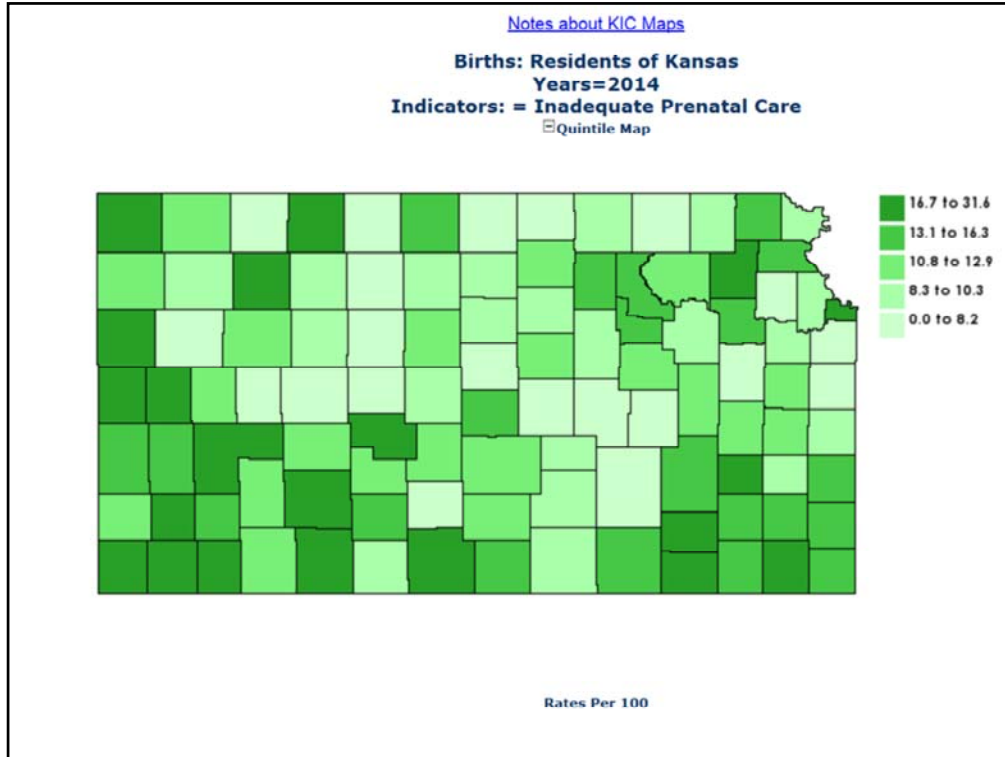
This example shows what the map looks like for the same data but with county names turned off and using quintiles. There may be times when you want to avoid displaying county names as it visually takes away from what you describing, such as a regional pattern
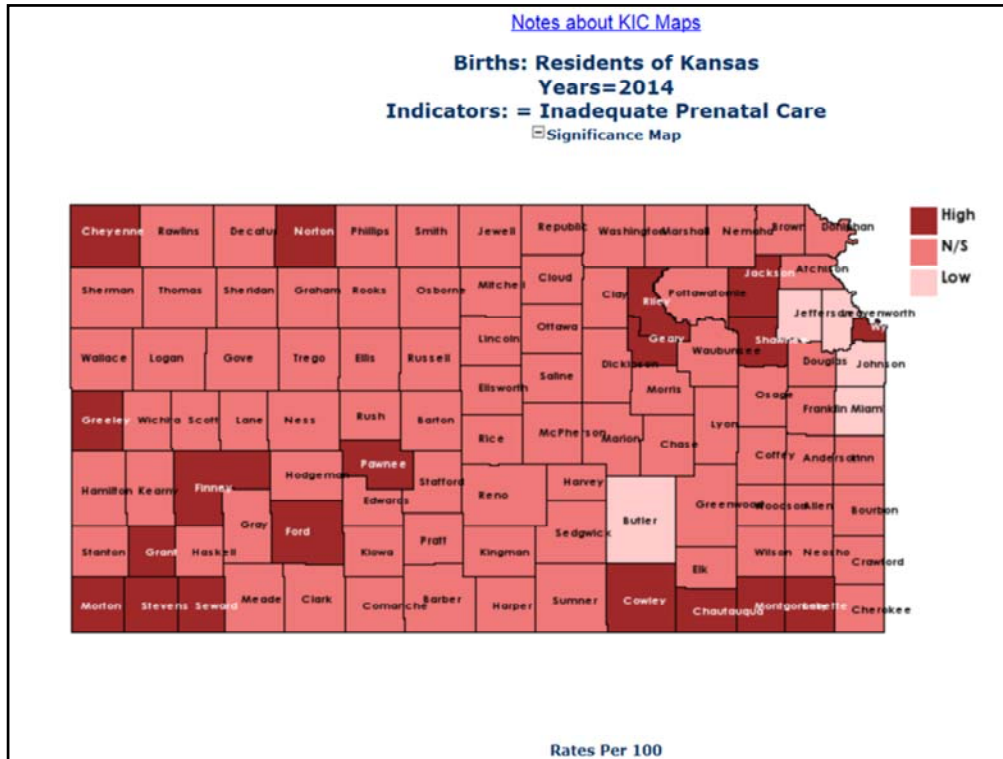
The third approach to displaying results, "Higher / Lower than State," is a map that compares county rates or percents to the state's rate and determines if the county values are statistically higher, statistically lower, or not statistically different from the state rate. Each county's rate is categorized as "High", "N/S" (Not Significant), or "Low" and category determination is based on a 95% Confidence Interval. KIC Maps calculates upper and lower confidence intervals for each county's rate. If those intervals overlap the state rate's confidence intervals, the category is set to N/S indicating there is no significant difference between the county rate and the state rate. This feature is valuable when comparing rates and percents. The feature is not recommended when you are mapping counts.
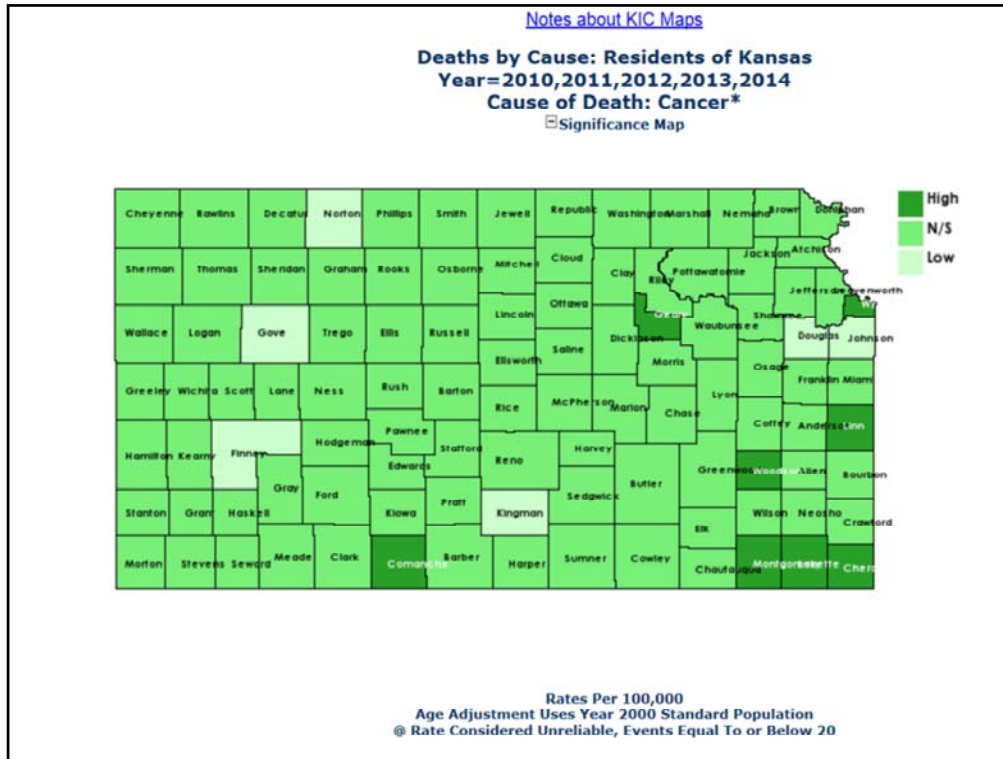
KIC Death Maps Example

- Cancer
- 2010 – 2014
- All sexes, all ages
- Age adjusted mortality rates
- Higher/lower than state
- Label counties

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Our second example is cancer deaths. These are the characteristics of this query.

Entry of that criteria produces these results when we map the data for comparison to the state's rate. As you can see displayed here, there are very few counties that either a) have enough deaths to calculate a reliable rate or b) have a rate with non-overlapping 95% confidence intervals. So for the 91 counties whose rates are N/S, the difference between the county rate and the state rate is not statistically significant. Since many counties have a small number of deaths and a small population, county mortality rates – even those calculated over a five year period – may not be statistically different from the state rate.

This type of map may be helpful when someone asked about why this rate or that percentage is so high in your county. In many cases it's a small number issue and your county is probably not unique.

Data Table

County	Number	Rate	County	Number	Rate	County	Number	Rate
Allen	179	195.7	Greenwood	87	156.5	Ottawa	65	156.4
Anderson	116	189.3	Hamilton	24	167.2	Pawnee	87	174.6
Atchison	186	181.0	Harper	85	175.1	Phillips	82	180.4
Barber	64	173.1	Harvey	402	164.7	Pottawatomie	197	169.7
Barton	339	182.0	Haskell	27	130.8	Pratt	130	180.5
Bourbon	179	176.4	Hodgeman	24	145.0	Rawlins	38	168.1
Brown	123	178.1	Jackson	147	168.5	Reno	757	170.6
Butler	626	169.7	Jefferson	217	177.3	Republic	80	161.3
Chase	47	211.2	Jewell	50	158.0	Rice	124	179.9
Chautauqua	66	197.4	Johnson	3,999	142.5	Riley	352	150.7
Cherokee	279	206.6	Kearny	41	182.0	Rooks	64	160.8
Cheyenne	40	142.0	Kingman	75	120.6	Rush	44	126.6
Clark	32	172.2	Kiowa	32	167.4	Russell	96	149.1
Clay	128	179.3	Labette	299	213.8	Saline	603	178.5
Cloud	123	167.0	Lane	20	129.2	Scott	52	148.1
Coffey	103	170.3	Leavenworth	652	168.7	Sedgwick	4,363	169.7
Comanche	41	252.7	Lincoln	42	160.3	Seward	141	160.5
Cowley	422	183.0	Linn	149	206.4	Shawnee	1,909	174.0
Crawford	408	181.2	Logan	43	189.8	Sheridan	31	142.6
Decatur	61	194.4	Lyon	321	181.1	Sherman	64	142.2
Dickinson	267	187.0	McPherson	366	166.2	Smith	67	173.5
Doniphan	82	161.0	Marion	162	157.4	Stafford	49	137.0
Douglas	699	150.9	Marshall	121	146.3	Stanton	20	141.6
Edwards	44	189.3	Meade	48	151.9	Stevens	53	165.2
Elk	54	207.7	Miami	300	158.7	Sumner	254	160.7

This is a partial display of the data table for the prior map. Since the counties displayed in this portion of the data table had >20 deaths, none of the rates are flagged as unreliable. All rates are per 100,000 population.

Here are the characteristics for our next example. We are still mapping cancer deaths but want to select a subcategory of cancer.

This is the top half of the map query screen. To map a subcategory only one change needs
to be made for the base query. Make a selection for a more specific cause.

This is a screen grab of the lower half of the map query screen. We have already selected setting for a more specific cause. We are changing the map color and selecting for quintiles. Map KIC will return a screen to select the specific cause after you click on the Submit button.

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Select
18. Malignant neoplasms of lip/ oral cavity/ pharynx
19. Malignant neoplasms of esphagus
20. Malignant neoplasms of stomach
21. Malignant neoplasms of colon/rectum/anus
22. Malignant neoplasms of liver and intrahepatic bile ducts
23. Malignant neoplasms of pancreas
24. Malignant neoplasms of larynx
25. Malignant neoplasms of trachea/bronchus/lung
26. Malignant melanoma of skin
27. Malignant neoplasms of breast
28. Malignant neoplasms of cervix uteri
29. Malignant neoplasms of uterus
30. Malignant neoplasms of ovary
31. Malignant neoplasms of prostate
32. Malignant neoplasms of kidney and renal pelvis
33. Malignant neoplasms of bladder
34. Malignant neoplasms of meninges/brain/other parts of central nervous system
35. Hodgkin's disease
36. Non-Hodgkin's lymphoma
37. Leukemia
38. Multiple myeloma and immunoproliferative neoplasms
39. Other malignant neoplasms of lymphoid/hematopoetic/related tissues
40. All other and unspecified malignant neoplasms

This list of cancer subcategories is displayed. Selecting one of those categories, represented as a hyperlink, will produce a map. In this example, we selected malignant neoplasms of the colon/rectum/anus.
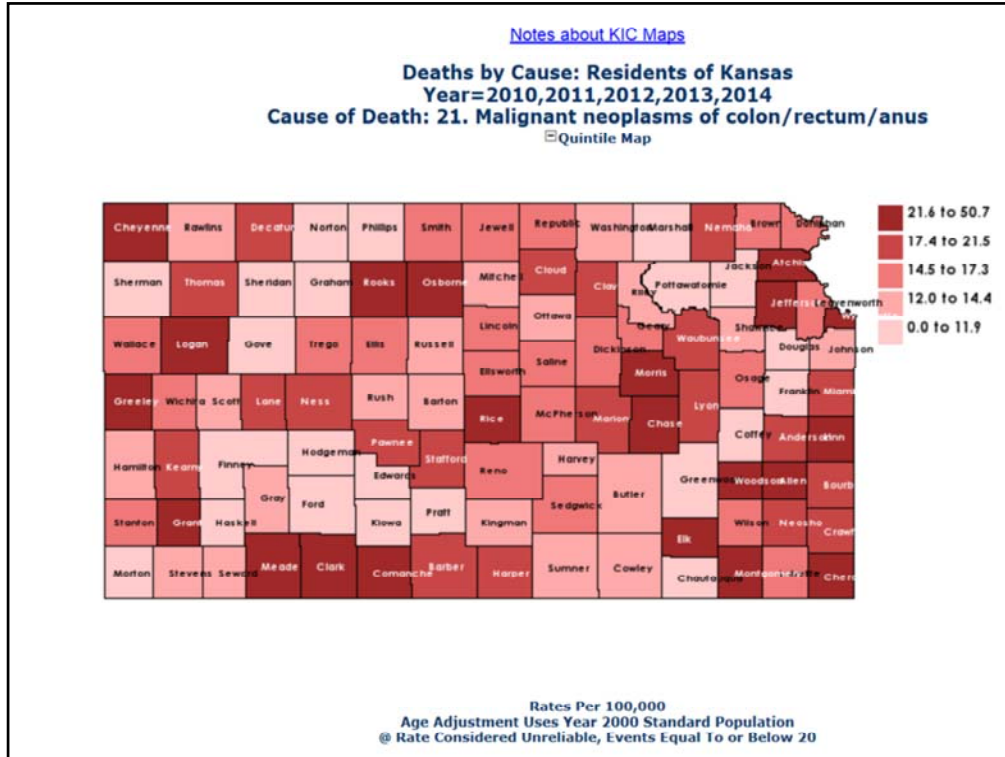
This is the map from the query and subcategory selection. The map is showing mortality rates grouped into quintiles.

Data Table

County	Number	Rate	County	Number	Rate	County	Number	Rate
Allen	22	21.9	Greenwood	4	8.2 @	Ottawa	6	14.0 @
Anderson	14	20.2 @	Hamilton	2	13.2 @	Pawnee	9	18.2 @
Atchison	28	26.9	Harper	10	21.2 @	Phillips	6	11.9 @
Barber	7	18.6 @	Harvey	31	12.1	Pottawatomie	7	6.4 @
Barton	25	12.9	Haskell	1	5.6 @	Pratt	10	11.9 @
Bourbon	19	18.4 @	Hodgeman	2	10.8 @	Rawlins	3	14.0 @
Brown	12	15.5 @	Jackson	9	10.6 @	Reno	70	16.2
Butler	48	13.4	Jefferson	32	26.0	Republic	8	15.4 @
Chase	7	39.4 @	Jewell	5	14.8 @	Rice	16	22.2 @
Chautauqua	3	7.9 @	Johnson	346	12.0	Riley	30	12.8
Cherokee	30	23.0	Kearny	4	19.5 @	Rooks	12	29.8 @
Cheyenne	5	23.9 @	Kingman	8	12.8 @	Rush	5	13.5 @
Clark	6	27.5 @	Kiowa	1	6.1 @	Russell	9	13.3 @
Clay	15	19.5 @	Labette	25	17.3	Saline	50	14.5
Cloud	14	19.3 @	Lane	3	18.7 @	Scott	5	14.4 @
Coffey	6	9.9 @	Leavenworth	61	16.1	Sedgwick	398	15.4
Comanche	8	50.7 @	Lincoln	3	14.5 @	Seward	13	14.2 @
Cowley	33	14.0	Linn	16	22.1 @	Shawnee	142	13.3
Crawford	46	19.7	Logan	5	22.9 @	Sheridan	1	4.0 @
Decatur	5	18.4 @	Lyon	38	21.5	Sherman	4	11.8 @
Dickinson	24	15.8	McPherson	34	16.6	Smith	8	17.2 @
Doniphan	8	15.4 @	Marion	23	21.4	Stafford	8	19.5 @
Douglas	55	11.8	Marshall	7	11.1 @	Stanton	2	15.1 @
Edwards	3	11.9 @	Meade	9	25.7 @	Stevens	5	14.4 @
Elk	6	21.6 @	Miami	35	18.2	Sumner	20	13.2
Ellis	26	15.7	Mitchell	7	13.5 @	Thomas	10	19.5 @
Ellsworth	8	15.6 @	Montgomery	60	26.2	Trego	5	16.8 @

This is the data table from the query and subcategory selection. In the rate column you can see that KIC has flagged selected rates as unreliable. The cutoff is 20 events.

Maps will be implemented for Cancer and Hospital Discharge data next. Features such as download and rotate, commonly available in KIC tabular outputs, are turned off in KIC Maps. However, users can perform a screen grab to capture the image and data.

KIC Maps has a suppression feature to address instances when individual county rates do not support an equal distribution of counties into quartiles or quintiles. When this suppression rule is implemented, the map graphic does not appear but the data table is visible. Absence of the map is due to the data distribution not being suitable for a map. You can also copy the contents of the statistical table in the KIC Maps output and paste that into a spreadsheet program. If you have the appropriate software,, you can also print out the page to a printer or PDF file.

KIC Maps uses the same source data as the corresponding tabular data modules. These modules will be updated as new data is added to the tabular modules.

Once again the materials are public documents. The slides and notes are available at
http://kic.kdheks.gov/share/gphc2016KIC.pdf. The opinions expressed are those of the
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kansas.health.statistics@kdheks.gov.

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