**Children's Mercy-Weighing In**

**Childhood Obesity Reduction Project**
**Executive Summary**

**Purpose**: Children's Mercy Hospital and Clinics (Children's Mercy) contracted with the health care consulting group of the Department of Health Management and Informatics, University of Missouri School of Medicine (Consultants) to:
1) Compile a childhood obesity profile and report for six counties in the Kansas City area (Johnson and Wyandotte in the state of Kansas; and Cass, Clay, Jackson, and Platte in the state of Missouri); and
2) Provide recommendations to create an online profile and establish a comprehensive set of indicator measures.

The Consultants' aim was to identify and compile indicators to track progress in childhood obesity prevention strategies that were readily available on the Internet. This strategy complemented Children's Mercy's Community Health Needs Assessment to assess the status of childhood obesity and its determinants in a six-county Kansas City area while reducing costs often associated with generating additional public health assessments, such as: 1) design, testing, implementation, analysis or reporting of a new survey; and 2) design, testing, implementation, analysis or reporting of other monitoring and surveillance systems based on vital records, hospital-based data, U.S. Census data and other sources of health-related information.

**Background:** Obesity is the condition of excess body fat to the extent that health is impaired. Health experts commonly employ a height-to-weight ratio ($kg/m^2$) called body mass index (BMI) to identify overweight and obese adults. The World Health Organization (WHO) classifies adults with a BMI greater than or equal to 25 as overweight, while adults with a BMI greater than or equal to 30 are classified as obese, (WHO, 2013). While a single, standardized method for classifying overweight and obese children has proved elusive, health experts have commonly employed sex- and age-specific percentile rankings of BMI to make these determinations. More specifically, children with a BMI between the 85th and 94th percentile for their age and sex are considered overweight, while children with a BMI at or above the 95th percentile for their age and sex are classified as obese (Barlow, 2007).

**Methods:** The methodology deployed to search, identify and analyze priority indicators for childhood obesity prevention was designed in six stages.
- First, Consultants used prior experience and an updated literature review to develop a causal pathway for obesity, obesity related outcomes and possible strategies to prevent or mitigate childhood obesity. Consultants adopted the Obesity Determinants and Solution Pathways, (Egger, Swinburn, & Rossner, 2003).
- Second, Consultants used this causal pathway to search and identify potential priority indicators. The search strategy involved creation of a search list for potential indictors and identification of websites that contained query able information about indicators.
- Third, Consultants designed an analytical plan to query identified websites and estimate indicator measures.
- Fourth, Consultants guided data query and generation of indicator measures to identify technical characteristics of the indicator and queries related to its utility for monitoring progress of preventive actions.
- Fifth, Consultants convened a workshop for coalition participants to discuss utility of indicators and prioritize preferred indicators for monitoring purposes.

- Finally, Consultants used a web-based survey to ascertain preferences regarding indicators from coalition members who participated in the workshop, as well as those unable to participate in the workshop.

**Recommendations:** The Consultants recommend that Children's Mercy adopt 14 indicators identified by both expert consultant and survey respondents as priority to track annual progress on childhood obesity prevention initiatives. The indicators are feasible to use, inexpensive to measure and have demonstrated utility.

**Domain 1.a:** *Socioeconomic Status and Demographic Factors of Mothers*
- Educational attainment of pregnant women (less than high school, high school, some college, college graduate), (Figure 1).
- Percent of households in poverty among those that have a female householder, no husband present, and the householder's own minor children, (Figure 2).

**Domain 1.b**: *Socioeconomic Status and Demographic Factors of Children*
- Prevalence of children in poverty by age, (Figure 3).

**Domain 2:** *Environmental Factors*
- Percent of population with a low accessibility to healthy food among the children, low-income and total populations, (Figure 4).
- Prevalence of children living with a parent who is overweight/obese, (Figure 5).
- Prevalence of children living with a parent who is inactive during leisure time, (Figure 6).

**Domain 3.a:** *Overweight/Obesity and Related Behaviors of Adults Ages 18 and Older and Mothers*
- Prevalence of overweight/obesity among adults 18 and older, (Figure 7).
- Prevalence of obesity among adults, (Figure 8).

**Domain 3.b**: **Overweight/Obesity and Related Behaviors of Children**
- Prevalence of neonates with high birth weight (> 4,499g), (Figures 9, 9a, 9b, 9c, 9d).

**Domain 4.a**: *Overweight/Obesity-related Disease or Health Condition of Adults Ages 18 and Older and Mothers*
- Prevalence of pregnant women told by a health professional that they have diabetes, excluding gestational diabetes, (Figure 10).
- Prevalence of adults 18 or older who were told by health professional that they have diabetes, (Figure 11).
- Rate of hospitalization due to diabetes, (Adults), (Figure 12).

**Domain 4.b**. **Overweight/Obesity-related Disease or Health Condition of Children**
- Prevalence of children by age (0—17, 5+) whose parent(s) was/were told by a health professional that their child has type (Type 1 or)-2 diabetes,[1] (Figure 13).
- Rate of hospitalization due to diabetes among children, (Figure 14).

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[1] At the time the childhood obesity profile and report was compiled, data for this indicator were gathered in the Community Health Needs Assessment conducted by Children's Mercy for Clay, Jackson, Johnson, and Wyandotte counties. However, figures and tables were not available. Since release of the childhood obesity profile and report, the Children's Mercy Community Health Assessment was posted online and the figure showed Parents in total service area who have been told by a doctor or other health care provider that their child (age 0 – 17) has diabetes (Type 1 and Type 2 diabetes), (Children's Mercy, 2013).

Alternatively, Children's Mercy should consider adding to this list of 14 indicators a set of six out of the 16 additional indicators identified by the expert consultant. These six additional indicators measure different domains of the children's obesity causal pathway from the 14 matched indicators. The six additional indicators recommended are:

- Percent of households that received Food Stamps/SNAP in the past 12 months among all households that have a female householder with no husband present and children under 18 years, (Figure 15).
- Percent of parents who describe (perceive) their child as "very overweight" (among overweight but not obese children and among obese children),[2] (Figure 16).
- Prevalence of low-income postpartum women who were overweight/obese prior to pregnancy, (Figures 17a, 17b).
- Prevalence of children aged 5 - 17 with a BMI between the 85th and 95th percentiles (and above the 95th percentile),[3] (Figure 18).
- Rate of deaths attributed to diabetes (Adults), (Figure 19).
- Rate of deaths attributed to diabetes among children, (Figure 20).

The Consultants also recommend that Children's Mercy and its partners adopt a participatory approach for continuing to build a robust collaborative initiative to design and sustain strategies to prevent and mitigate childhood obesity in the six-county area of Kansas City (Johnson, et al., 2009).

For more information about the full childhood obesity profile and report, you may contact Weighing In, Children's Mercy staff at weighingin@cmh.edu.

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[2] At the time the childhood obesity profile and report was compiled, data for this indicator were gathered in the Community Health Needs Assessment conducted by Children's Mercy for Clay, Jackson, Johnson, and Wyandotte counties. However, figures and tables were not available. Since release of the childhood obesity profile and report, the Children's Mercy Community Health Assessment was posted on-line and the figures showed Children's Actual vs. Perceived Weight Status (Among Children 5 – 17 Who are Overweight/Obese Based on BMI: Total Service Area, 2013), (Children's Mercy, 2013).

[3] At the time the childhood obesity profile and report was compiled, data for this indicator were gathered in the Community Health Needs Assessment conducted by Children's Mercy for Clay, Jackson, Johnson, and Wyandotte counties. However, figures and tables were not available. Since release of the childhood obesity profile and report, the Children's Mercy Community Health Assessment was posted online and the figure showed Percent of Children Who are Overweight or Obese (Percent of Children Ages 5 – 17 Who Are Overweight or Obese, With a Body Mass Index in the 85th Percentile or Higher), (Children's Mercy, 2013).

## I.    Figures

**Domain 1.a: Socioeconomic Status and Demographic Factors of Mothers**

**Figure 1**:  Educational attainment of pregnant women, by educational attainment
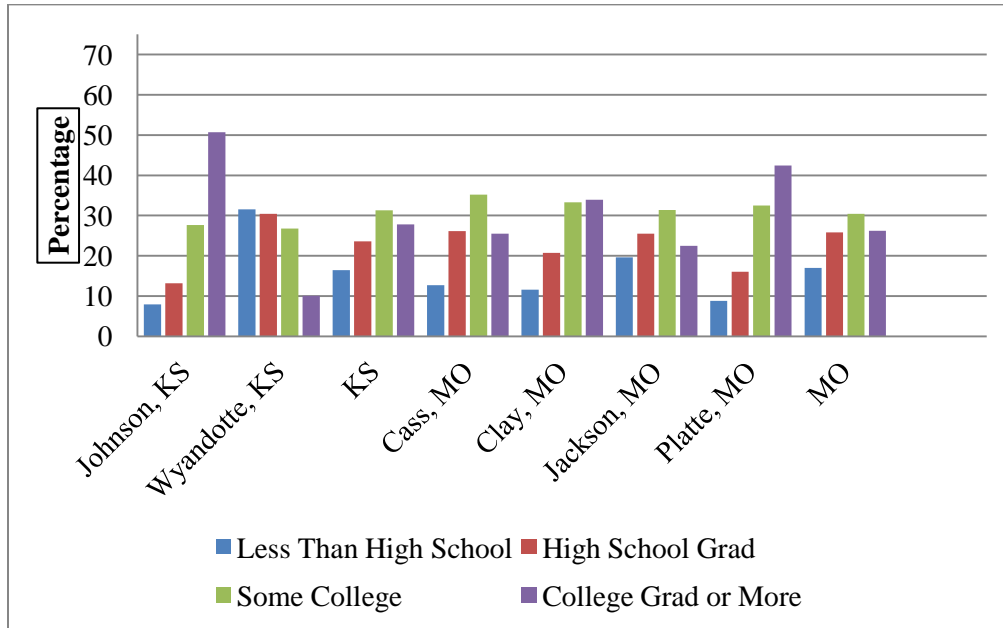


Source:  American Community Survey (ACS) Economic Characteristics
Advantages:  Collected from state Vital Records birth certificate data; this indicator is a census of all pregnant women and is available at the county level by year.

**Figure 2**:  Percent of households in poverty among those that have a female householder, no husband present, and the householder's own minor children
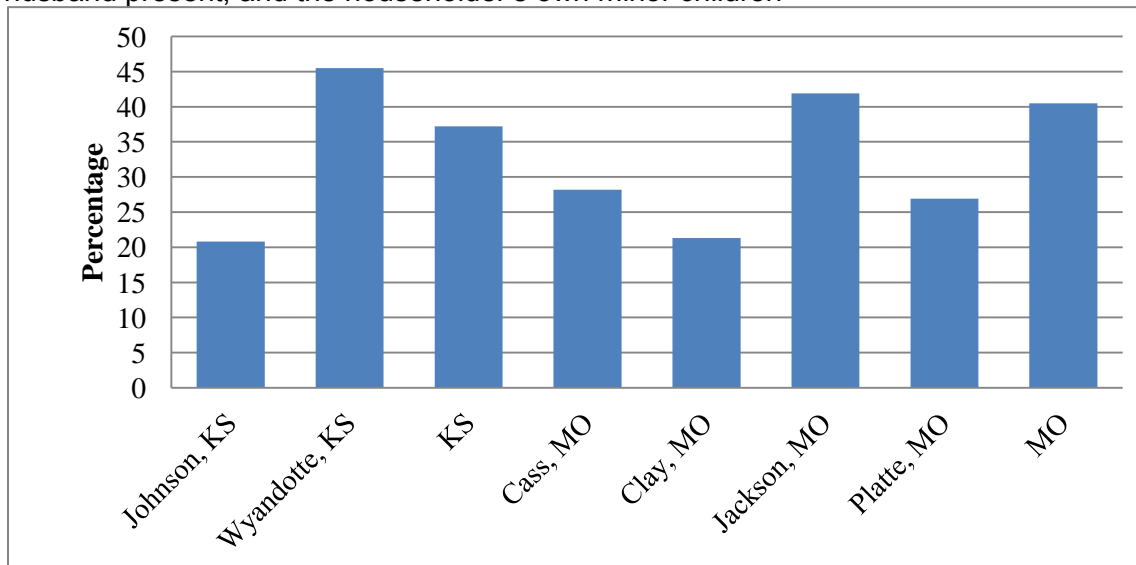


Source: ACS Economic Characteristics
Advantages:  Data available at the county level annually from the ACS and the Census tract level (but in multi-year aggregates).
Disadvantages:  Not available as crosstabs by other factors.

**Domain 1.b: Socioeconomic Status and Demographic Factors of Children**

**Figure 3:** Prevalence of children in poverty, by age
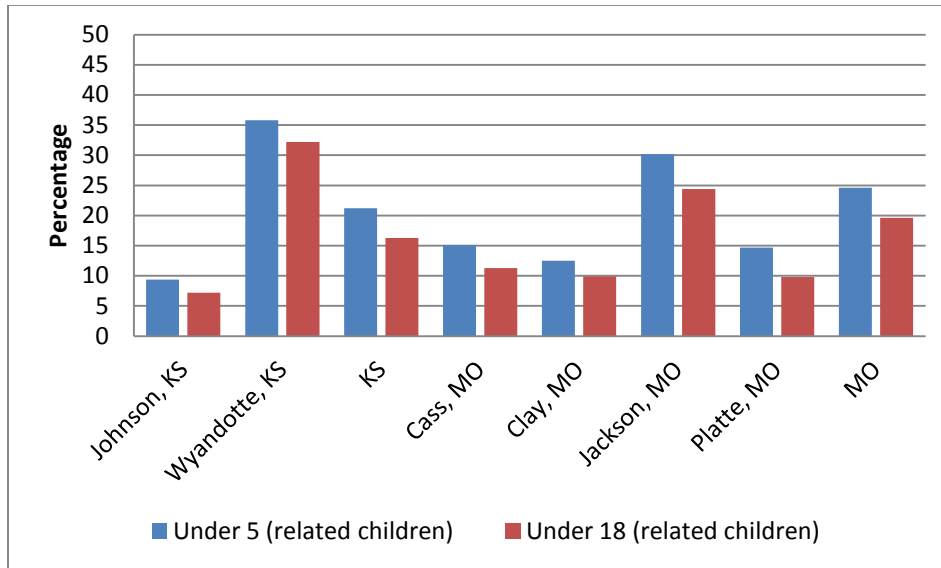


Source:  ACS Economic Characteristics
Advantages:  Data available at the county level (annually from the ACS) and the Census tract level (but in multi-year aggregates).
Disadvantages:  Not available by crosstabs by other factors

**Domain 2: Environmental Factors**

**Figure 4:** Percent of low accessibility to food among children, low-income, and all people
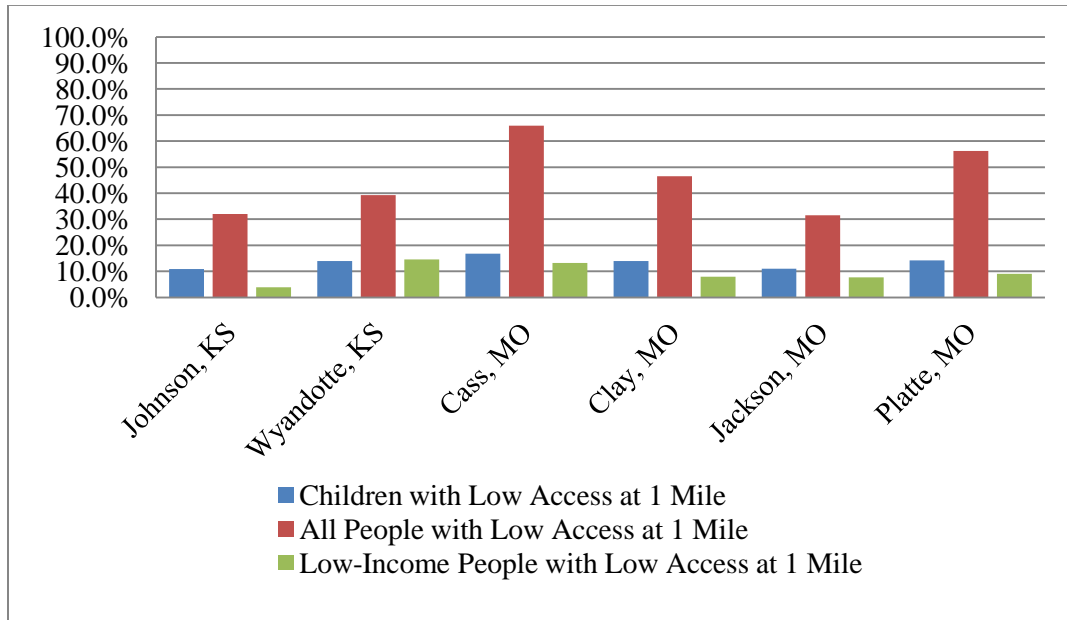


Source:  United States Department of Agriculture (USDA) (Data released in 2006 & 2010, 2010 release used)
Advantages:  Data are available at the Census tract level (from the USDA)
Disadvantages:  Not available as crosstabs by other factors and not available for trends (only two data releases from the USDA in 2006 and 2010).  Somewhat labor intensive; only available at the Census tract level, so county-level rates must be calculated manually.

**Figure 5:** Prevalence of children living with a parent who is overweight/obese
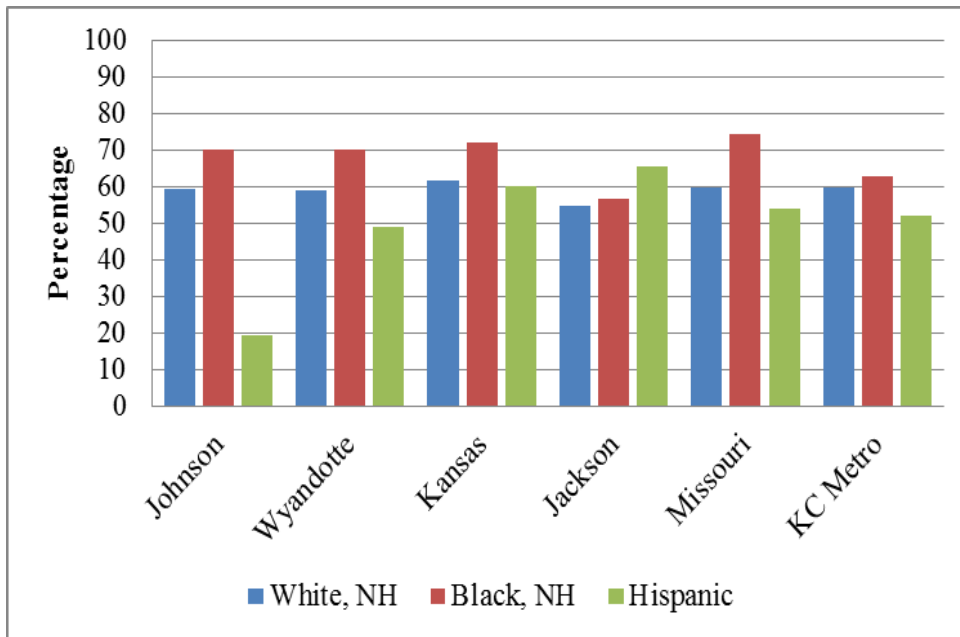


Source: Behavioral Risk Factor Surveillance System (BRFSS)/Selected Metropolitan/Micropolitan Area Risk Trends (SMART) record level data
Advantages: The underlying data used to create this indicator are collected annually through the BRFSS/SMART and are available publicly at the county level for select counties.
Disadvantages: Labor intensive; this indicator is created from the record-level BRFSS/SMART datasets, not available for all counties in the area of interest.

**Figure 6**: Prevalence of children living with a parent who is inactive during leisure-time
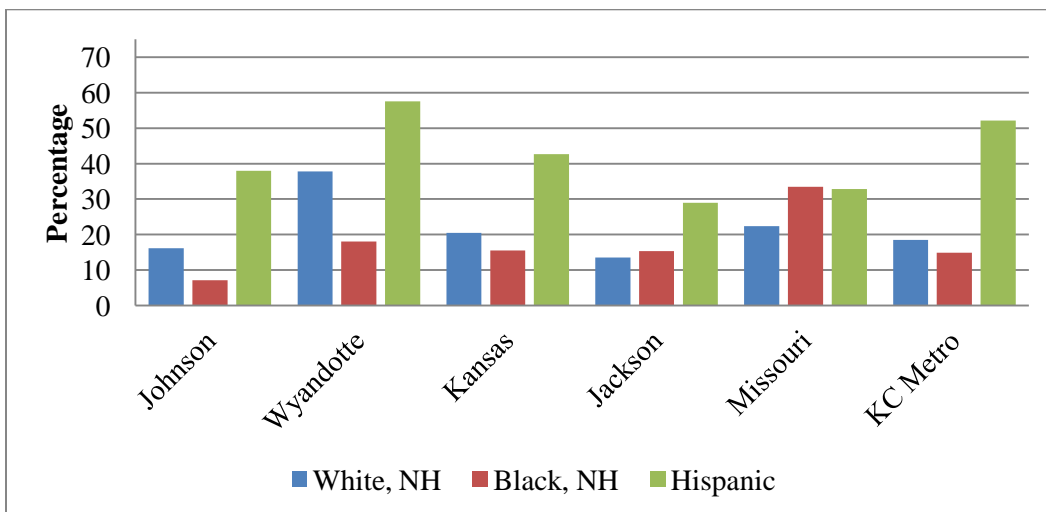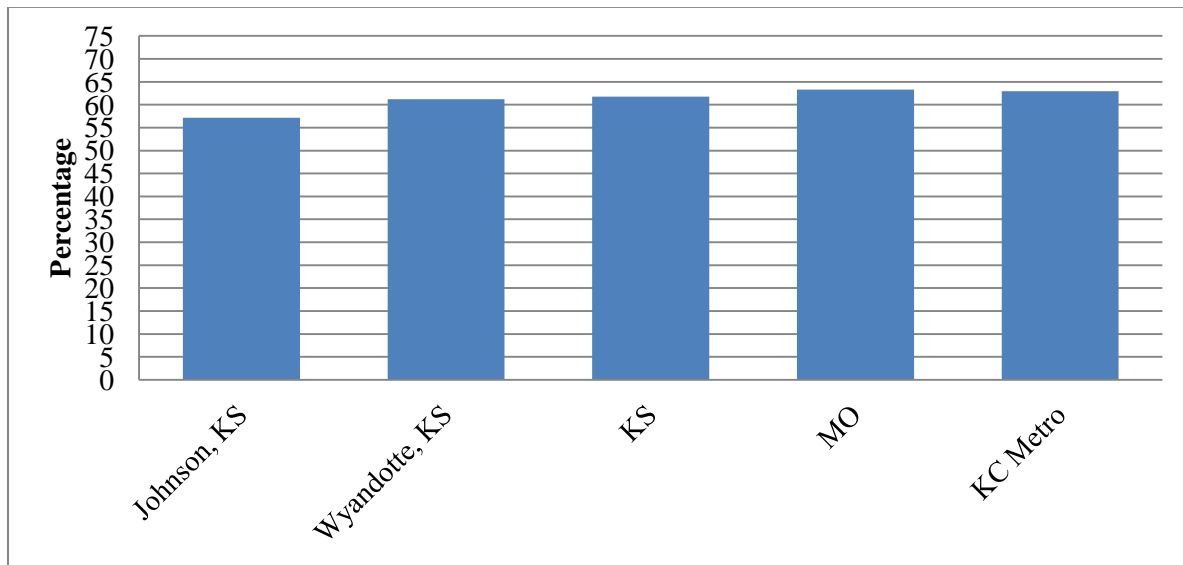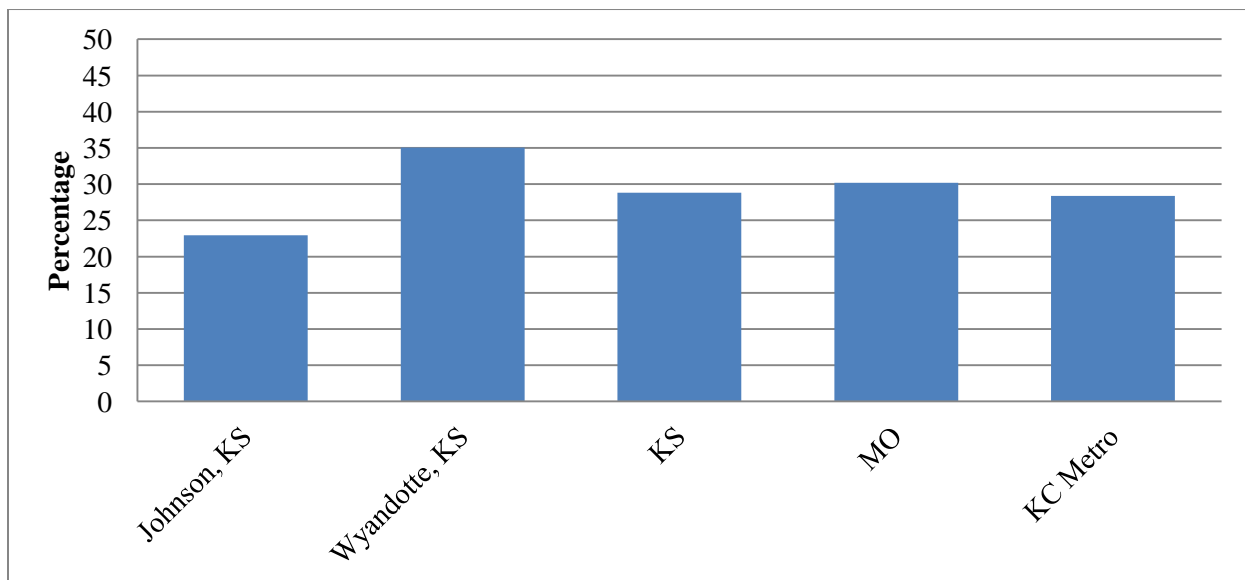


Source: BRFSS/SMART record-level data
Advantages: The underlying data used to create this indicator are collected annually through the BRFSS/SMART and are available publicly at the county level for select counties.
Disadvantages: Labor intensive; this indicator is created from the record-level BRFSS/SMART datasets, not available for all counties in the area of interest.

**Domain 3a: Overweight/Obesity and Related Behavior of Adults**

**Figure 7:** Prevalence of overweight/obesity among adults 18 and older



Source:  BRFSS/SMART record-level data
Advantages:  The underlying data used to create this indicator are collected annually through the BRFSS/SMART and are available publicly at the county level for select counties.
Disadvantages; Labor intensive; this indicator is created from the record-level BRFSS/SMART datasets, not available for all counties in the area of interest.

**Figure 8:** Prevalence of obesity among adults



Source:  BRFSS/SMART (summaries compiled for trends and record level data for cross tables)
Advantages:  The underlying data used to create this indicator are collected annually through the BRFSS/SMART and are available publicly at the county level for select counties.
Disadvantages:  Labor intensive; this indicator is created from the record-level BRFSS/SMART datasets, not available for all counties in the area of interest.

**Domain 3.b.: Overweight/Obesity and Related Behaviors of Children**
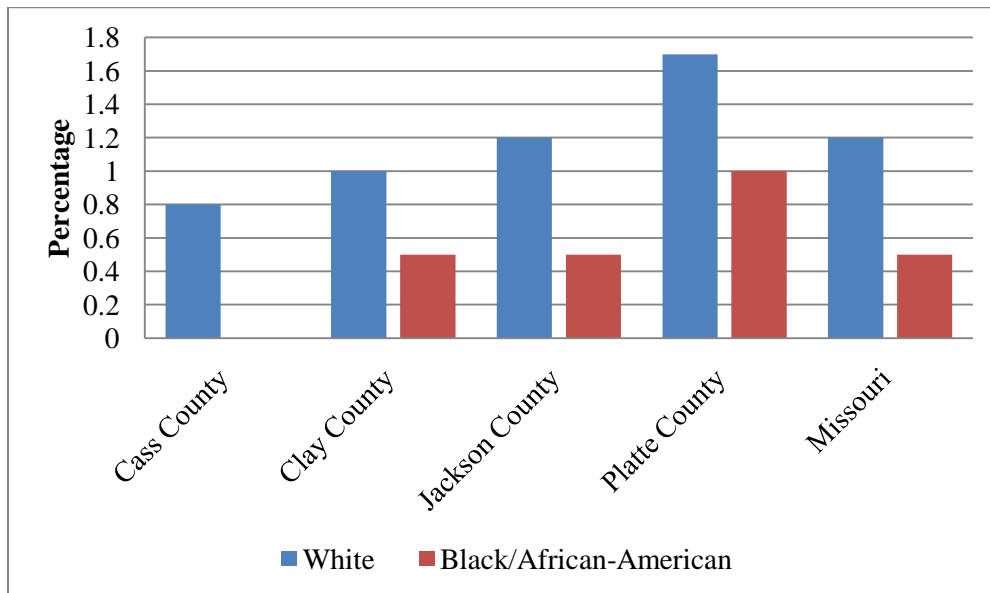
**Figure 9a:** Prevalence of neonates with high birth weight (> 4,499g)
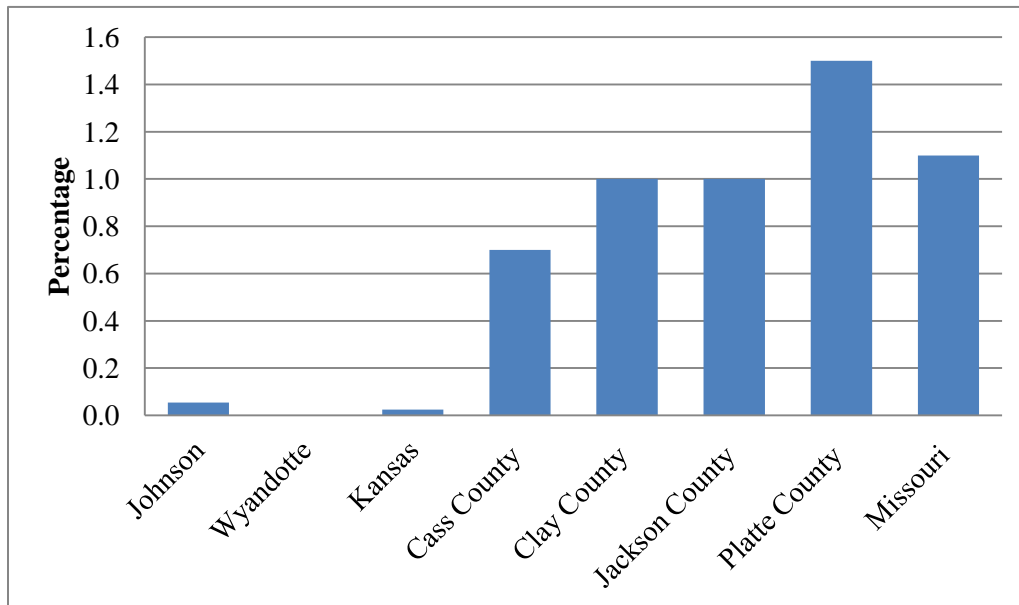


Source: Birth Missouri Information for Community Assessment (MICA)/Birth Kansas Information for Communities (KIC)

Advantages: Collected from state Vital Records birth certificate data; this indicator is a census of all neonates and is available at the county level by year.
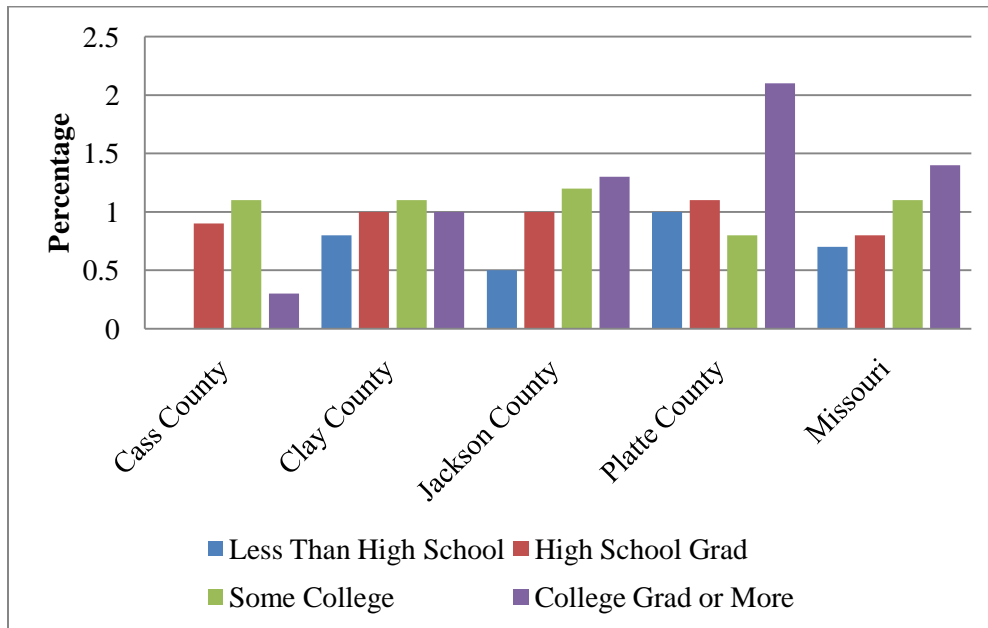
**Figure 9b:** Prevalence of neonates with high birth weight (> 4,499g), by race



Source: Birth MICA/Birth KIC

Advantages: Collected from state Vital Records birth certificate data; this indicator is a census of all neonates and is available at the county level by year.

**Figure 9c:** Prevalence of neonates with high birth weight (> 4,499g), by educational attainment



Source:  Birth MICA/Birth KIC
Advantages:  Collected from state Vital Records birth certificate data; this indicator is a census of all neonates and is available at the county level by year.
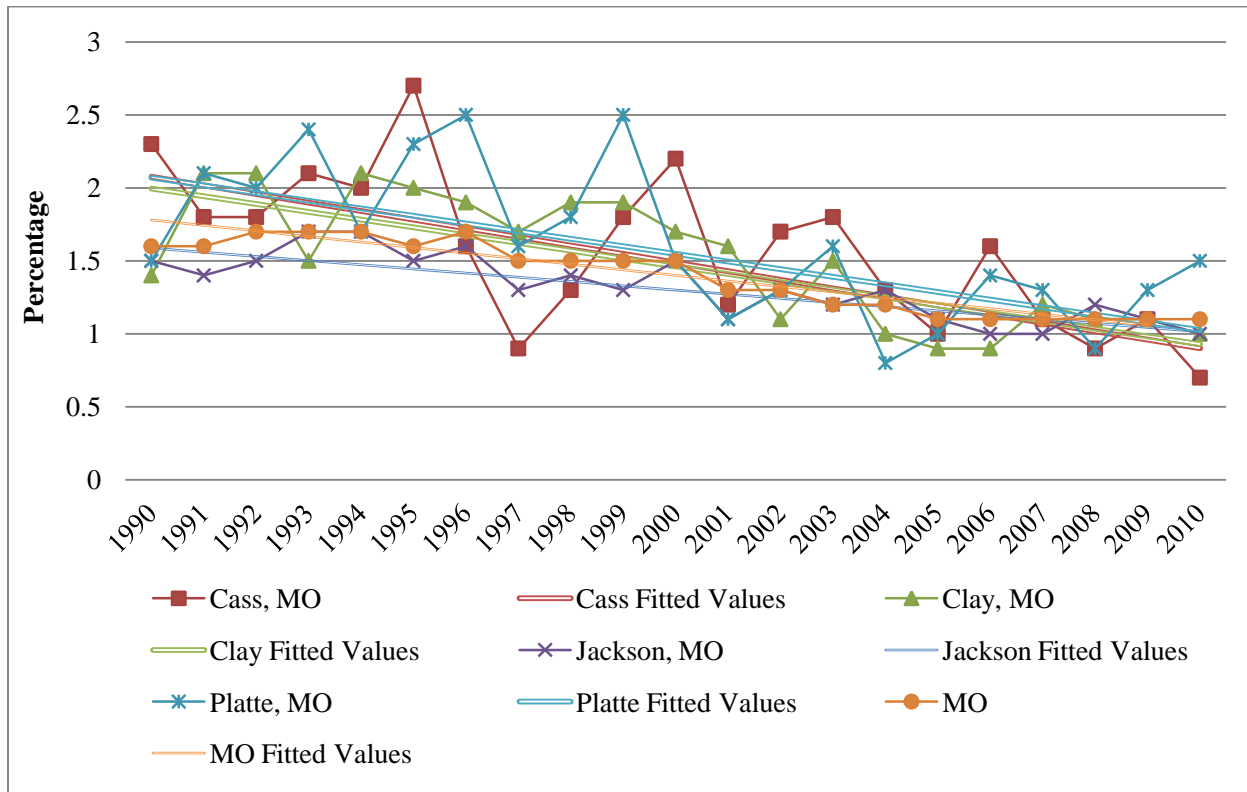
**Figure 9d:** Prevalence of neonates with high birth weight (> 4,499g), by year
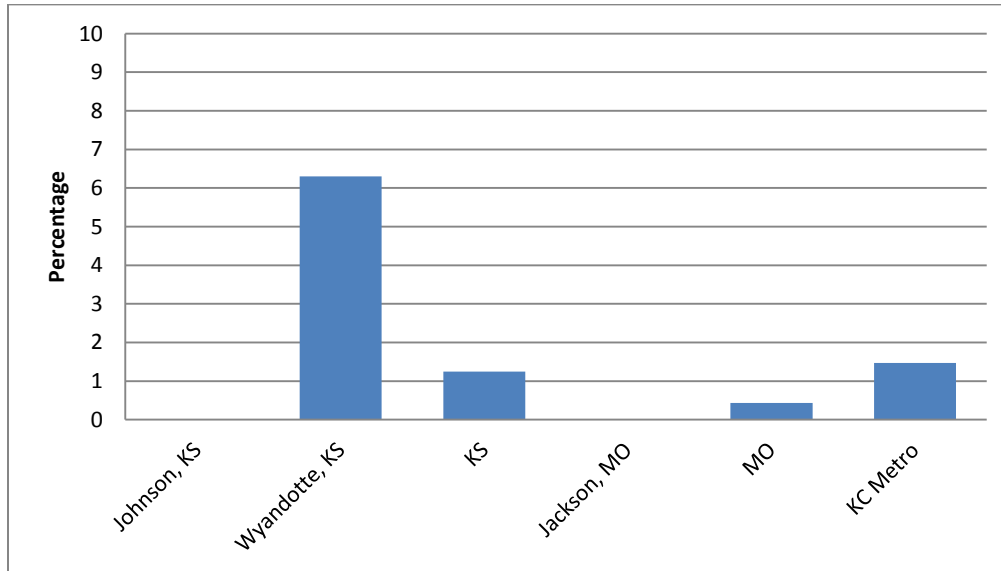


Source:  Birth MICA/Birth KIC
Advantages:  Collected from state Vital Records birth certificate data; this indicator is a census of all neonates and is available at the county level by year.

**Domain 4a: Overweight/Obesity Related Disease or Health Condition of Adults Ages 18 and Older and Mothers**

**Figure 10:** Prevalence of pregnant women told by a health professional that they have diabetes, excluding gestational diabetes
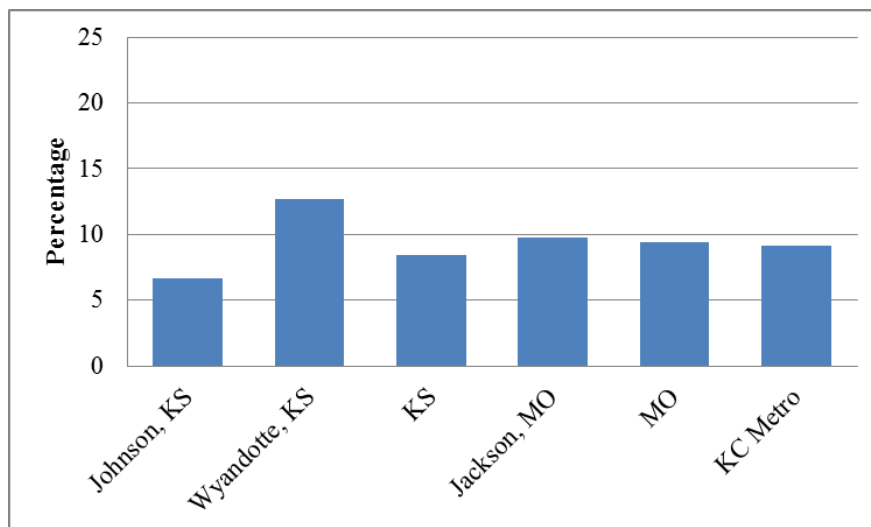


Source:  BRFSS/SMART record-level data
Advantages:  The underlying data used to create this indicator are collected annually through the BRFSS/SMART and are available publicly at the county level for select counties
Disadvantages:  Labor intensive; this indicator is created from the record-level BRFSS/SMART datasets, not available for all counties in the area of interest.

**Figure 11:** Prevalence of adults 18 and older who were told by a health professional that they have diabetes



Source:  BRFSS/SMART (summaries compiled for trends and record level data for cross tables)
Advantages:  The underlying data used to create this indicator are collected annually through the BRFSS/SMART and are available at the county level, with yearly trends, and it can be drilled down by other factors.
Disadvantages:  Labor intensive; this indicator is created from the record-level BRFSS/SMART datasets, not available for all counties in the area of interest.

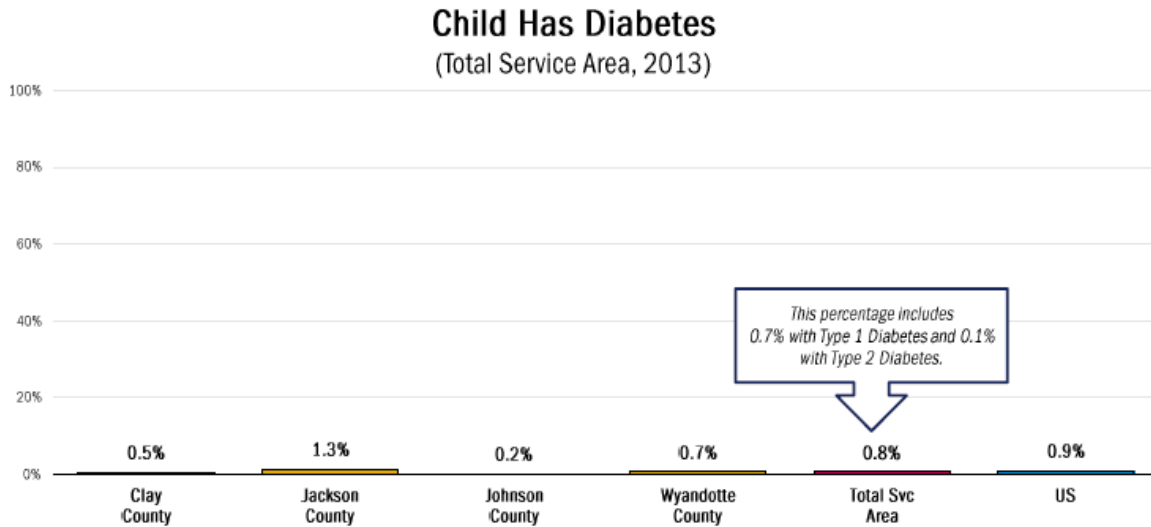**Figure 12:** Rate of hospitalization due to diabetes (adults)
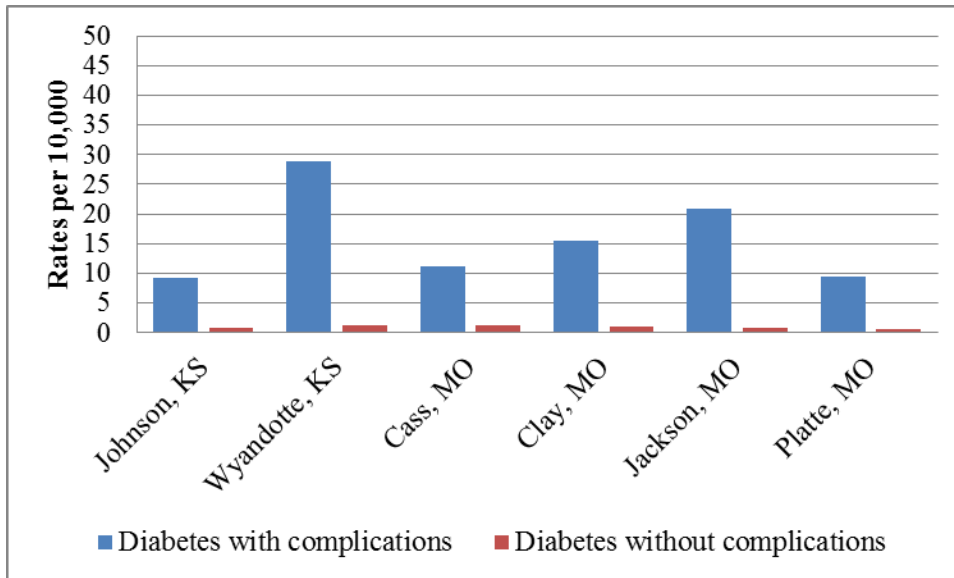


Source: Discharge MICA/Discharge KIC
Advantages: The data are available at the county level, with yearly trends, and can be drilled down by other factors. Collected from state's hospital discharge data; this indicator is a census of all hospitalizations and is available at the county level by year.
Disadvantages:  A major drawback for this indicator is that the data sources do not distinguish between type 1 and type 2 diabetes.  The information about the type of diabetes is stored in the raw discharge data, which is not available publicly.

**Domain 4.b. Overweight/Obesity-related Disease or Health Condition of Children**

**Figure 13:** Parents in total service area who have been told by a doctor or other health care provider that their child (age 0 – 17) has diabetes (Type 1 and Type 2 diabetes)

## Child Has Diabetes
### (Total Service Area, 2013)

*This percentage includes 0.7% with Type 1 Diabetes and 0.1% with Type 2 Diabetes.*

| Clay County | Jackson County | Johnson County | Wyandotte County | Total Svc Area | US |
|---|---|---|---|---|---|
| 0.5% | 1.3% | 0.2% | 0.7% | 0.8% | 0.9% |

Source: 2013 PRC Child & Adolescent Health Survey. Professional Research Consultants, Inc. [Items 71, 73].
         2012 PRC National Child & Adolescent Survey, Professional Research Consultants, Inc.

**Figure 14:** Rate of hospitalization due to diabetes among children



Legend: Cass, MO; Clay, MO; Jackson, MO; Jackson Fitted Values; Platte, MO; MO; MO Fitted Values

Source: Discharge MICA/Discharge KIC

Advantages: The data are available at the county level, with yearly trends, and can be drilled down by race, Hispanic ethnicity and age brackets. Collected from state's hospital discharge data; this indicator is a census of all hospitalizations and is available at the county level by year.

Disadvantages: A major drawback for this indicator is that the data sources do not distinguish between type 1 and type 2 diabetes. The information about the type of diabetes is stored in the raw discharge data, which is not available publicly.
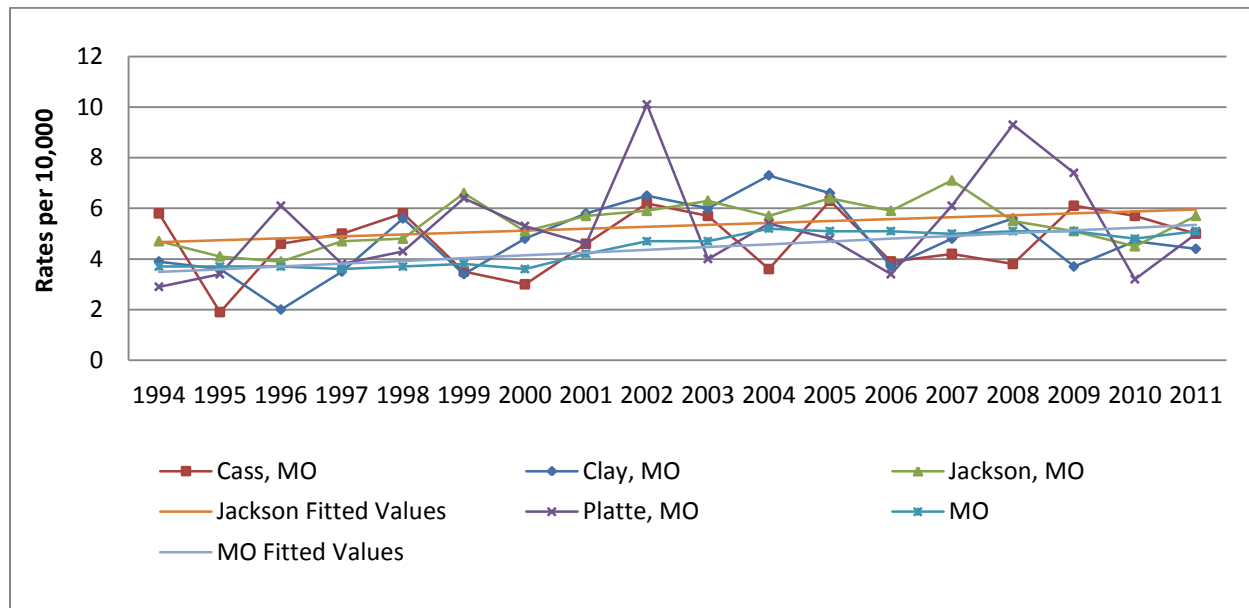
**Six out of the 16 additional indicators identified by the expert consultant (Note: Indicators measure different domains of the children's obesity causal pathway from the 14 matched indicators.)**

**Figure 15:** Percent of households that received Food Stamps/SNAP in the past 12 months among all households that have a female householder with no husband present and children under 18 years
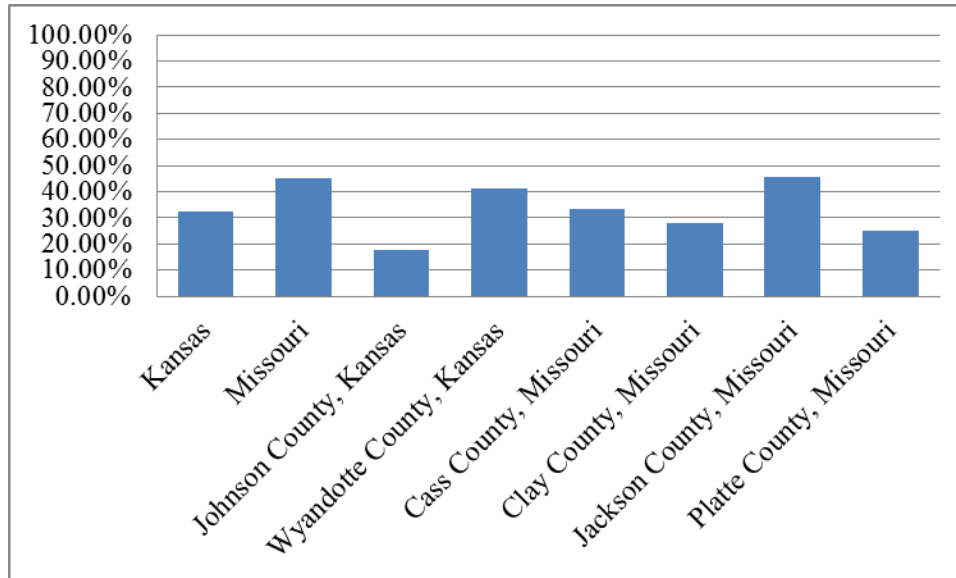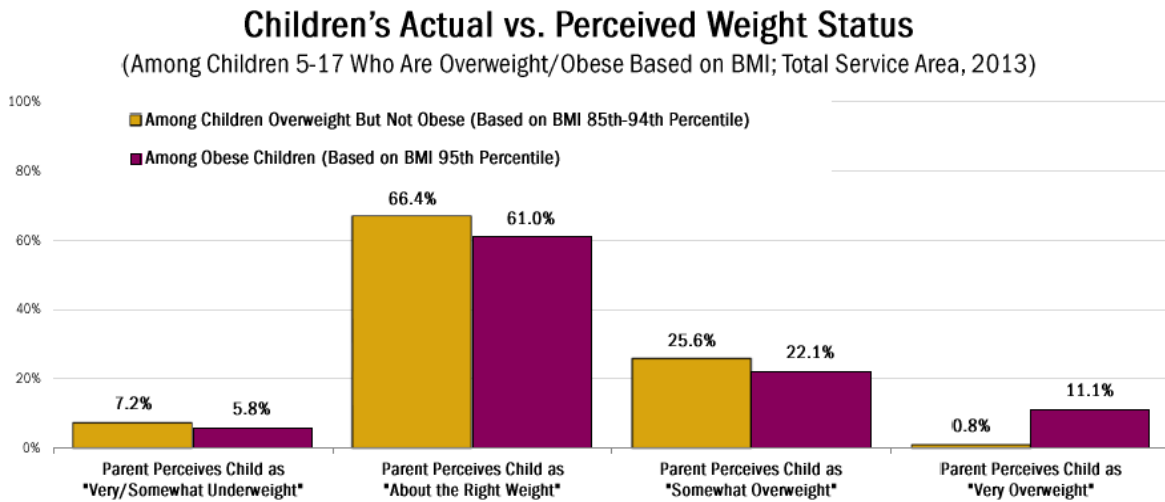


Source: American Community Survey (ACS) Food Stamps/Supplemental Nutrition Assistance Program (SNAP) by Household Type
Advantages: Data available at the county level (annually, from the ACS) and the Census tract level (but in multi-year aggregates).
Disadvantages: Not available as crosstabs by other factors.

**Figure 16:** Percent of parents who perceive their child as "Very Overweight" (among overweight but not obese children and among obese children)

### Children's Actual vs. Perceived Weight Status
(Among Children 5-17 Who Are Overweight/Obese Based on BMI; Total Service Area, 2013)

- ■ Among Children Overweight But Not Obese (Based on BMI 85th-94th Percentile)
- ■ Among Obese Children (Based on BMI 95th Percentile)

| | Parent Perceives Child as "Very/Somewhat Underweight" | Parent Perceives Child as "About the Right Weight" | Parent Perceives Child as "Somewhat Overweight" | Parent Perceives Child as "Very Overweight" |
|---|---|---|---|---|
| Overweight But Not Obese | 7.2% | 66.4% | 25.6% | 0.8% |
| Obese | 5.8% | 61.0% | 22.1% | 11.1% |

Note: Total Service Area includes Johnson and Wyandotte in the state of Kansas; and Clay and Jackson in the state of Missouri.
Source: 2013 PRC Child & Adolescent Health Survey. Professional Research Consultants, Inc. [Item 123]
Disadvantages: Data collected through the Community Health Needs Assessment (CHNA), which is not a regularly recurring survey.

**Figure 17a:** Prevalence of low-income postpartum women who were overweight/obese prior to pregnancy (Missouri)
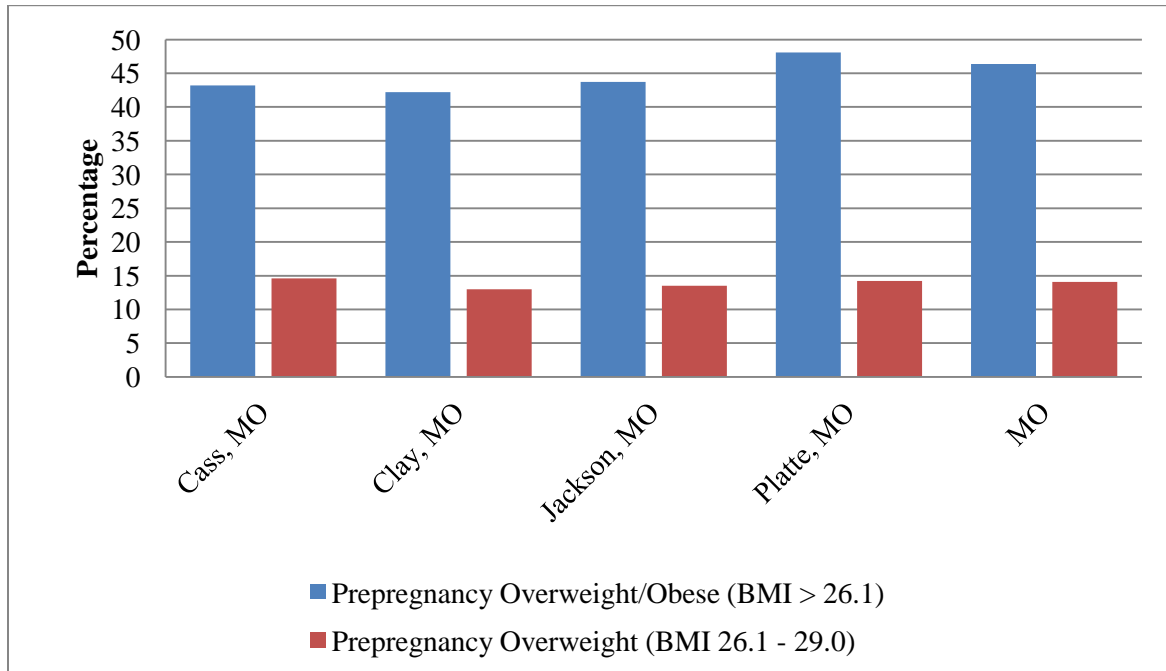


Source: Prenatal/Postpartum Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) MICA
Advantages: Collected from state administrative files; this indicator is a census of all pregnant women in the targeted program (MO: Prenatal/Postpartum WIC MICA) and is available at the county level by year.
Disadvantages: The source for the Kansas data (PNSS) was discontinued by the CDC in 2012. Data for Kansas is pre-summarized into tables that do not break out the data by factors such as education level or marital status. The data for Missouri and Kansas are shown on different graphs due to the data being incomparable; the source for the Missouri data defines overweight as BMI of at least 26, whereas the source for the Kansas data uses the more typical definition of BMI of at least 25. Note: The indicator does not cover the entire low-income population, just the segment enrolled in the target programs.

**Figure 17b**: Prevalence of low-income postpartum women who were overweight/obese prior to pregnancy (Kansas)
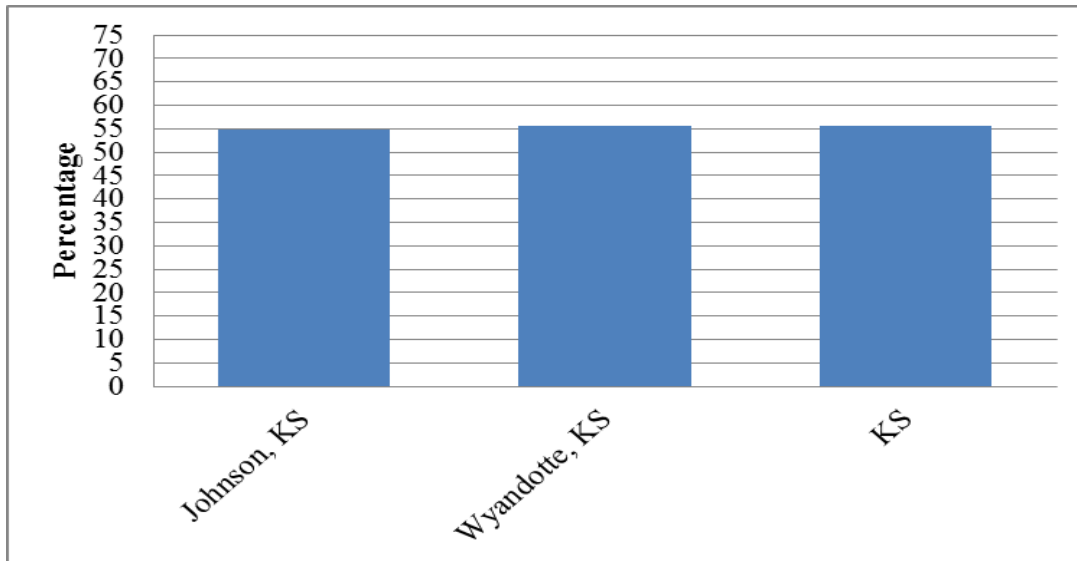


Source:  Pediatric Nutrition Surveillance System (PedNSS) Kansas (KS)
Advantages: Collected from state administrative files; this indicator is a census of all pregnant women in the targeted program (KS: PedNSS) and is available at the county level by year.
Disadvantages:  The source for the Kansas data (PNSS) was discontinued by the CDC in 2012. Data for Kansas is pre-summarized into tables that do not break out the data by factors such as education level or marital status. The data for Missouri and Kansas are shown on different graphs due to the data being incomparable; the source for the Missouri data defines overweight as BMI of at least 26, whereas the source for the Kansas data uses the more typical definition of BMI of at least 25.  Note: The indicator does not cover the entire low-income population, just the segment enrolled in the target programs.

**Figure 18:**  Prevalence of children aged 5 – 17 with a BMI in the 85th Percentile or Higher



## Percent of Children Who Are Overweight or Obese
### (Percent of Children Ages 5-17 Who Are Overweight or Obese, With a Body Mass Index in the 85th Percentile or Higher)
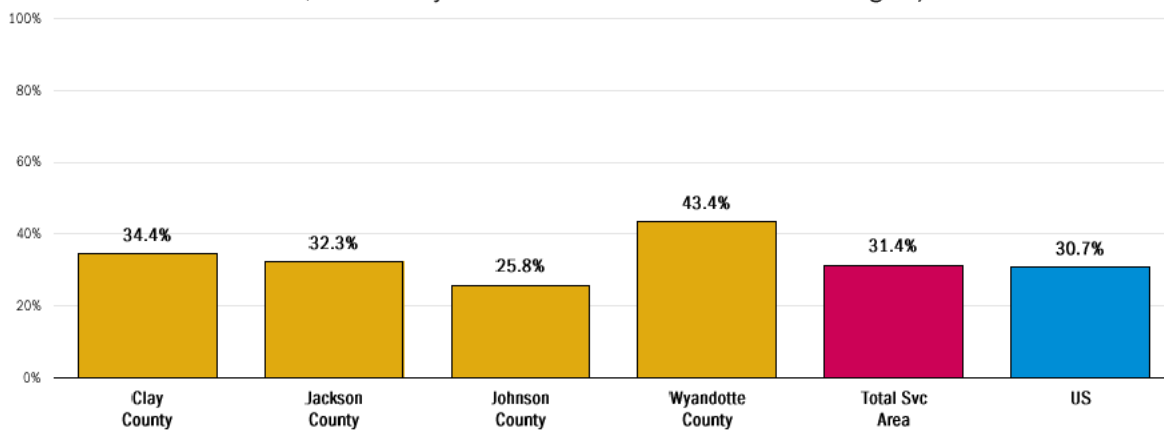
Source:  2013 PRC Child & Adolescent Health Survey. Professional Research Consultants, Inc. [Item 159]
          2012 PRC National Child and Adolescent Health Survey. Professional Research Consultants, Inc.
Disadvantages:  Data collected through the Community Health Needs Assessment (CHNA), which is not a regularly recurring survey.
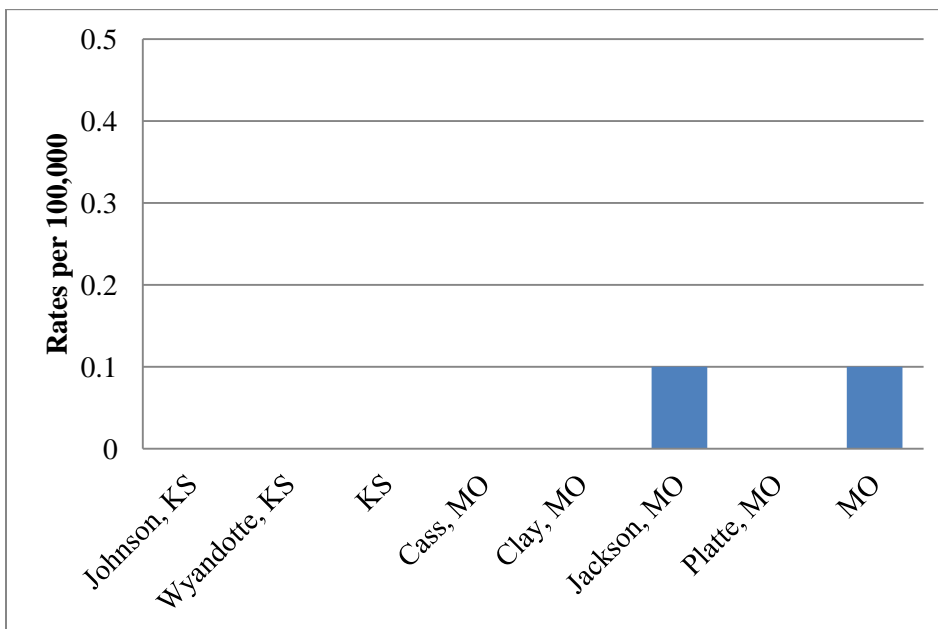
**Figure 19:** Rate of deaths attributed to diabetes (Adults)
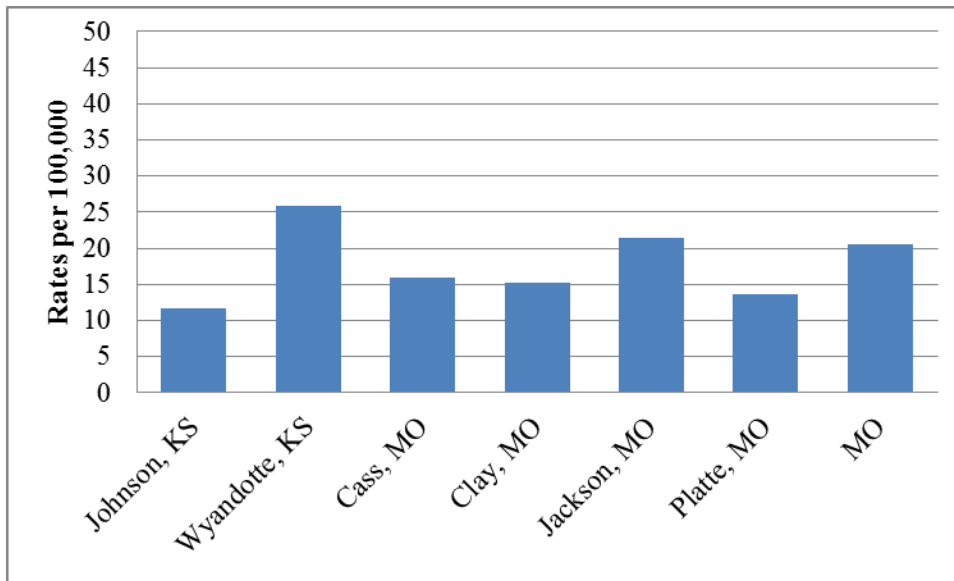


Source: Death MICA/Death KIC
Advantages: The data are available at the county level, with yearly trends, and can be drilled down by other factors. Collected from the state Vital Records death certificate data; this indicator is available at the county level by year.

**Figure 20:** Rate of deaths attributed to diabetes among children



Source: Death MICA/Death KIC
Advantages: The data are available at the county level, with yearly trends, and can be drilled down by other factors. Collected from state Vital Records death certificate data; this indicator is available at the county level by year.

## II.    Works Cited

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