

Understanding the Prevalence of Gestational Diabetes in Urban and Rural Communities in Kansas

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Introduction

Gestational diabetes mellitus (GDM) is the leading cause of maternal morbidity and mortality, perinatal and neonatal morbidity, and long-term consequences of both the mother and baby. The percentage of women with this condition has increased by 56% in the last ten years. Maternal obesity is a significant risk factor. In 2020, the obesity rate in KS was 30-35% which is expected to rise to more than 55% by 2030. Maternal and child health disparities are experienced in a greater extent in rural areas including obesity.

Purpose

Understand the trend of GDM and obesity by population density in rural and urban communities in KS

It is hypothesized that rural communities will have a higher prevalence of GDM and obesity

Methods

- A retrospective secondary analysis was performed on birth certificate data received from the Kansas Department of Health and Environment (KDHE) Vital Statistics. KDHE provided data on all mothers that gave birth in the state of Kansas from 2005 to 2019. The data included maternal demographics, maternal pre-pregnancy BMI, maternal education, and age.
- The data was categorized by peer groups defined by KDHE that group county data. Trend graphs were generated for prevalence of GDM, and pre-pregnancy BMI based from these peer groups.
- Statistical Analysis: Data was analyzed calculating percent of live births

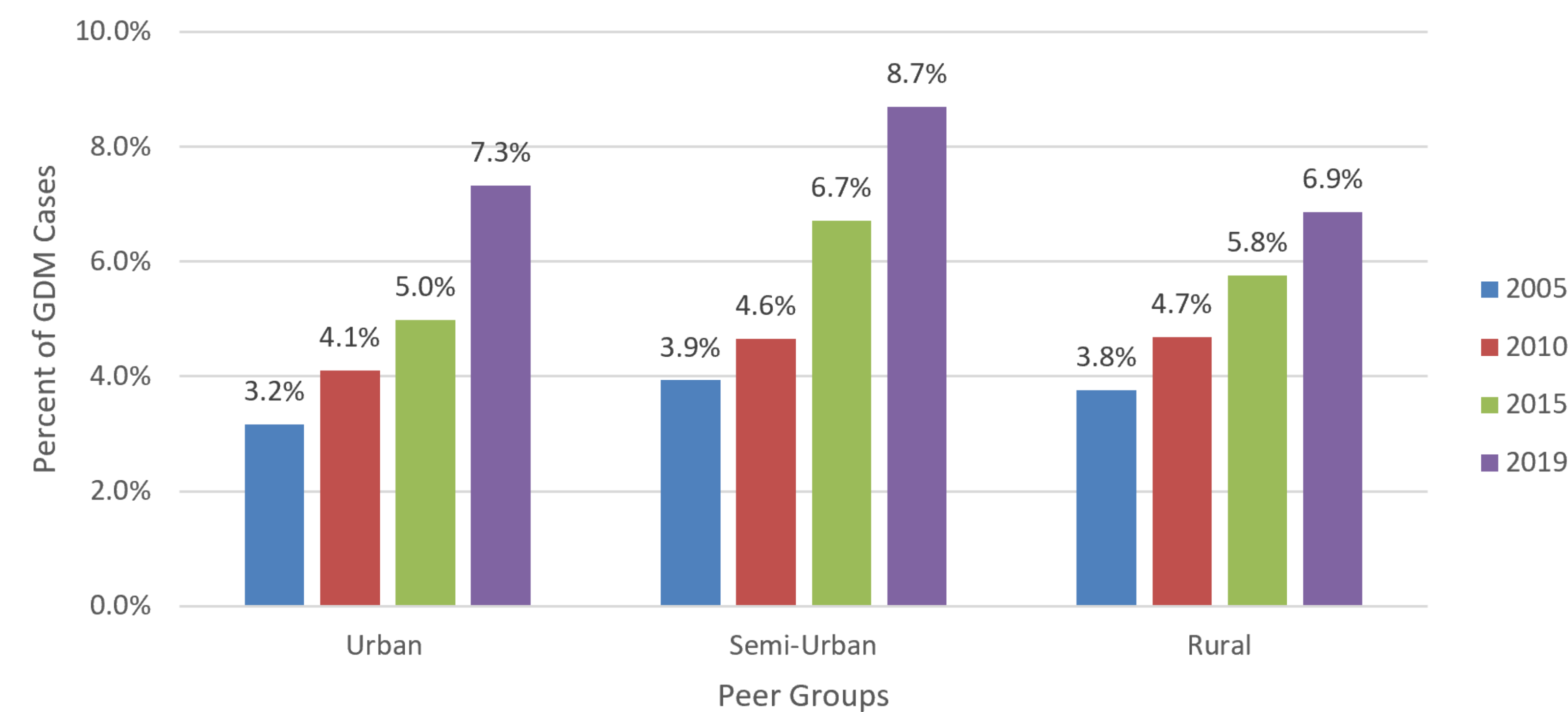
Results

Table 1. Demographics Data on Study Population

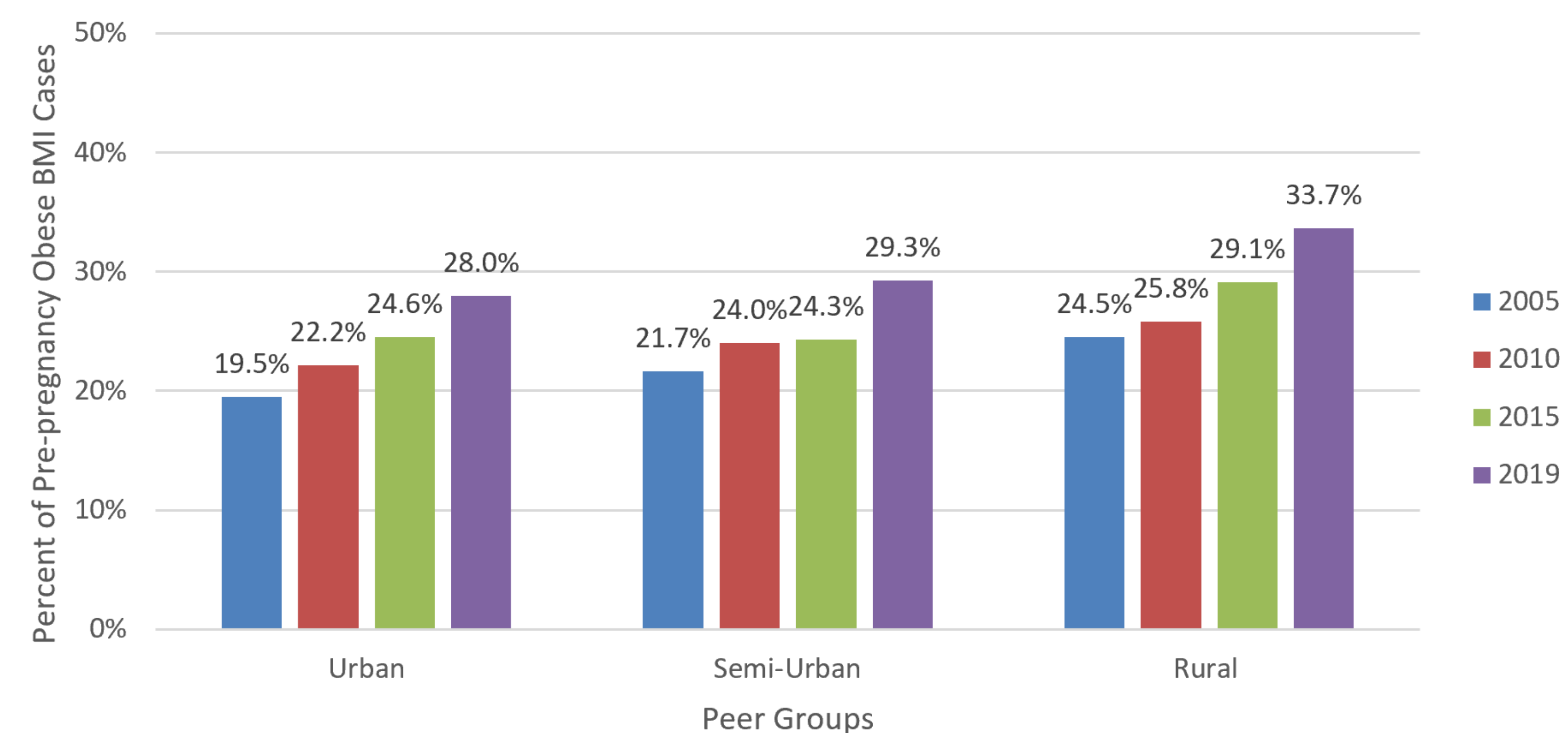
Characteristics	Number of Mothers	Percent of Mothers
Total	589605	
Age	27.40 +/- 5.7	
Marital Status		
Married	392457	66.60%
Ethnicity		
Hispanic	95742	16.20%
Non-Hispanic	493487	83.70%
Race		
Non-Hispanic White	493531	83.71%
Black/African American	46700	7.92%
Other	49374	8.37%
Mother's Birth Place		
United States	444179	85.90%
Kansas	303379	51.50%
Education		
Less than high school	89585	15.20%
High School/GED completed	138990	23.60%
Some College	129421	22%
College+	229900	39%

Peer Groups by persons per square mile (psm)	Examples:
Frontier: less than 6.0 psm	Chase, Elk, Kearny
Rural: 6.0-19.9 psm	Coffey, Kingman, Ottawa
Densely Rural: 20.0-39.9 psm	Atchison, Ellis, McPherson
Semi-Urban: 40.0-149.9 psm	Butler, Geary, Reno
Urban: 150 or more psm	Douglas, Johnson, Sedgwick

Gestational Diabetes Rates in Peer Groups



Pre-pregnancy Obese BMI Rates in Peer Groups



Results

Table 2. Live Births Per Peer Group from 2005-2019

Peer Group	% live births
Urban	51.3
Semi-Urban	13.9
Rural	34.7

Discussion & Conclusions

- Increases in the prevalence of gestational diabetes is reflective of increases in the prevalence of pre-pregnancy obesity cases.
- Rural counties have experienced an increase of gestational diabetes over the years with a higher prevalence from 2005-2015.
- Higher prevalence of pre-pregnancy obesity cases in rural group compared to urban groups across all years.
- Limitations: Missing data for certain rural counties such as Woodson and Rawlins, missing information on GDM and BMI information, the analysis did not control for race/ethnicity, age, education etc.
- Future work: Further sophisticated analysis will be done such as case study analysis on outlier counties, with an emphasis on rural counties
- This provides a foundation of understanding the trends of gestational diabetes in Kansas

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