

Gender Differences in Cardiometabolic Syndrome Among U.S. Rural and Non-rural Adults

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Abstract

Cardiometabolic syndrome (CMS) places an individual at a higher risk of stroke and heart failure. The 2013 Behavior Risk Factor Surveillance System survey, the largest national population-based survey, was used for logistic regression modeling. An effect-modifying relationship was found among women between rural residence and CMS.

Relevant Literature

- Rural living poses unique challenges by increasing opportunities for physical activity and healthy eating (food desert) can place a time and cost burden on families¹ as seen in Figure 1.



Figure 1: Distribution of Food Deserts in the United States

- Rural areas often have limited private and public health care opportunities that give access to obesity interventions as seen in Figure 2.

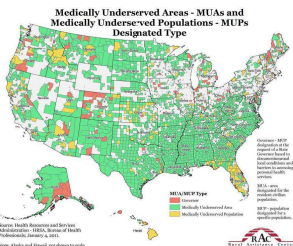


Figure 2: Health Care Shortage Areas²

Research Question

Does gender modify the effect of geographic locale of residence on CMS after controlling for modifiable (education level, emotional support, and smoking status) and non-modifiable (income level, age, lack of health insurance) risk factors?

Procedures/Data Analysis

- 2013 Behavior Risk Factor Surveillance System (BRFSS) survey—largest population-based survey conducted by the **Centers for Disease Control and Prevention**
- ≥18 years old Non-Hispanic White and Black individuals living in rural parts of the United States
- Metropolitan Statistical Area (MSA) variable-used to define place of residence and was recoded into rural and non-rural^{3,4}.
- Components of CMS included hypercholesterolemia, obesity, angina (as a substitute for decreased high-density lipoprotein), diabetes, and hypertension.

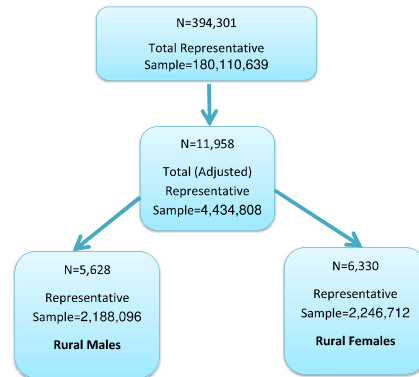


Figure 3: Sample size breakdown at each level.

- CMS was identified as the presence of ≥3 CMS components. Due to the complex sampling design, sample weights were utilized in order to analyze the data.
- Comparisons were analyzed using Pearson's Chi Square, simple, and **multivariable complex samples logistic regression** to determine the relationship of rural residence and CMS. All missing variables were excluded.

Findings

- Mean age (SE) = 54.3 (0.07)
- Urban Mean Age (SE) = 54.1 (0.08)
 - Rural Black Mean Age (SE) = 55.0 (0.12)

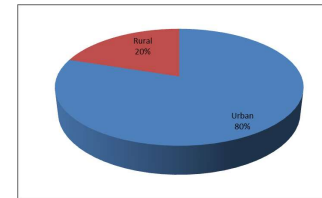


Figure 4: Distribution of geographic locale by residence

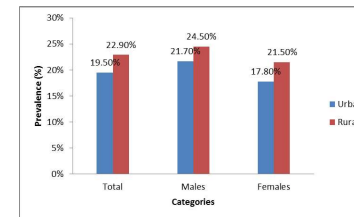


Figure 5: CMS occurrence versus locale of residence stratified by gender

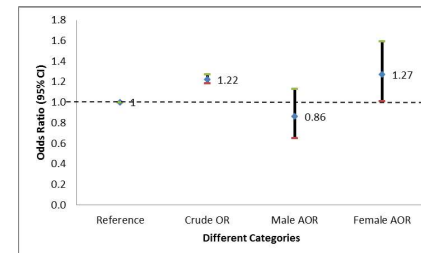


Figure 6: CMS occurrence versus locale of residence stratified by gender

Conclusions

- There is a significant relationship between rural residence and subjects with CMS,
- Rural dwellers had a **22% higher chance** of developing CMS than urban dwellers
- Rural women have a **27% higher chance** of developing CMS than their urban counterparts
- Rural women need more resources allotted to address CMS.

Limitations

- Since causation cannot be established through cross sectional studies, more longitudinal studies need to be done to understand the reasons that rural women experience higher prevalence rates of CMS.
- Self-reported data is always subject to recall bias and social desirability bias.

Social Change Implications

- Gender disparities must be taken into consideration when assessing public health outcomes and creating health policy surrounding chronic disease prevention.
- Health care professionals should be made aware of CMS gender gaps and advocate for reducing health disparities in rural women.