# Risk Factors for Cognitive Impairment and Dementia Differ Across Rural Classification Codes in a Rural Kentucky Appalachian Cohort

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## Introduction

Alzheimer's disease and related dementias continue to be on the rise, and it is estimated that nearly 14 million Americans will be living with the disease by 2060. However, rural residency imposes an increased risk for the disease compared to urban counterparts due to differences in socioeconomic, medical access, and lifestyle factors.

There are a multitude of classification schemes for rurality, often with drastically different results. These systems utilize data from federal agencies and are often used to designate federal funds. However, given the abundance and conflicting nature of these designation systems, it can be difficult to delineate which best characterize increased dementia risk.

## Purpose

The purpose of rural classification systems in medical rural research is to identify populations that may be at increased risk for the development of disease.

Therefore, we aim to better define differences between rural classification systems based on their ability to capture medical risk factors for the development of dementia.

We hypothesized that different classification systems would have different relative risks across multiple risk factors for dementia.

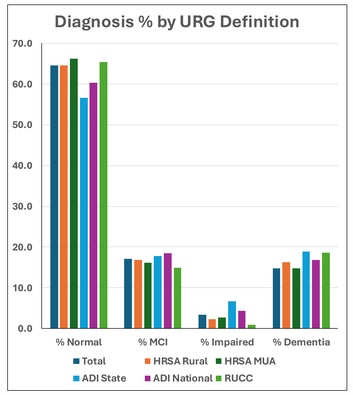
## Methods

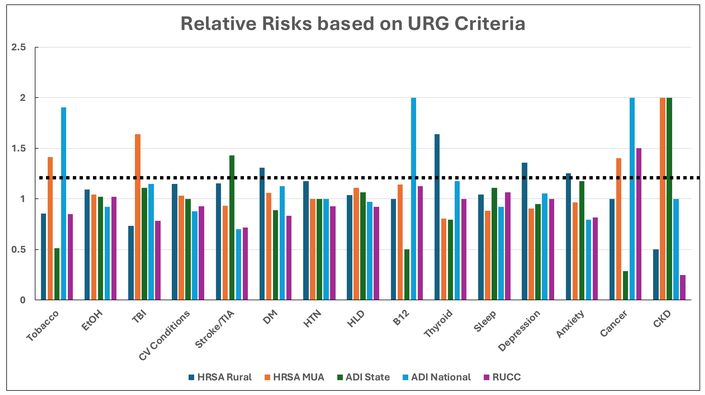
We performed a cross-sectional, descriptive analysis with the data from 790 active participants from UK's ADRC. These participants were initially recruited to the ADRC's longitudinal study with normal cognition.

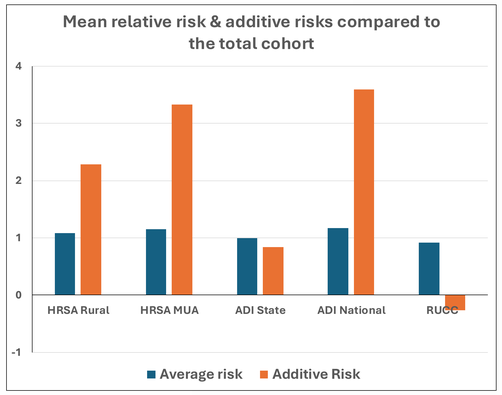
HRSA rural and MUA/HPSA designations, ADI state and national deciles, and RUCC scores were assigned to each participant.

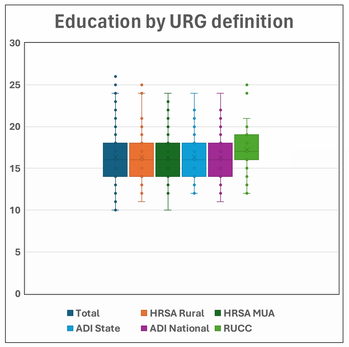
Standard descriptive analyses including relative risks were calculated for several demographic, genetic, & medical risk factors.

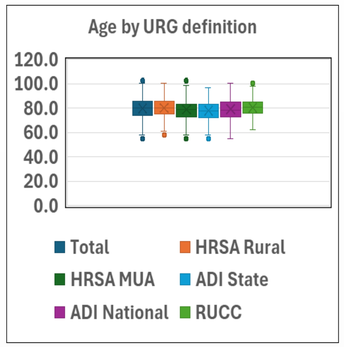
## Results

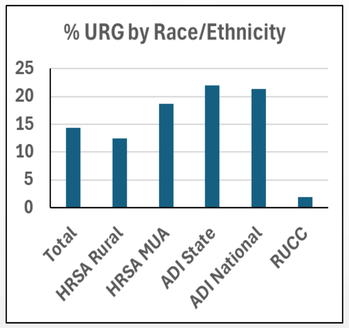


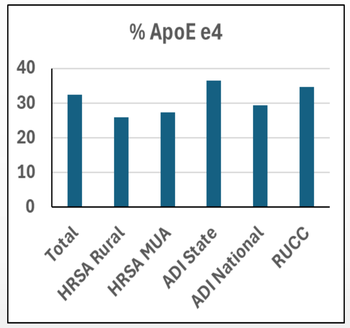



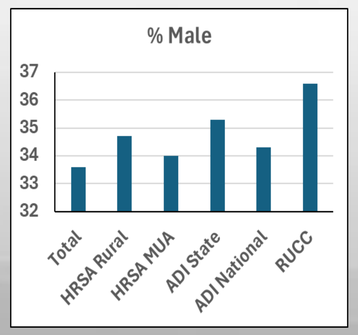




- Diagnostic classifications, mean age, and education did not differ across rural classifiers
- Race and ethnicity were enriched using the HRSA MUA/HPSA and ADI classifiers
- Relative risks for tobacco use, alcohol use, traumatic brain injury, cardiovascular risks, stroke or transient ischemic attack, diabetes, hypertension, hyperlipidemia, vitamin B12 deficiency, hypothyroidism, sleep disturbances, depression, anxiety, cancer and chronic kidney disease were variably distributed across classifiers
- HRSA Rural and MUA/HPSA, as well as ADI National percentiles were associated with higher mean relative risk (~1.2) and additive relative risk (2.3 to 3.6) profiles
- ADI State deciles and RUCC scores were not predictive of increased medical risks for cognitive impairment & dementia (RR<1.0)

## Conclusions

- Classifications based on population density and medical health care providers per capita, as well as those based on national deprivation indices were most able to identify high risk profiles for cognitive decline and dementia
- Classifications based on state normative values for deprivation failed to achieve this goal, suggesting that the national economy—rather than state-based economical factors—are most indicative of cognitive risk profiles
- Classifications based on travel distance performed most poorly, suggesting that actual mileage is less important than having access to transportation