Rural-Urban disparities in time to stage 3 HIV (AIDS) diagnoses in Tennessee

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Disclosures

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TN CFAR
TENNESSEE CENTER FOR AIDS RESEARCH

The Southeastern U.S.A is Disproportionately Affected by HIV

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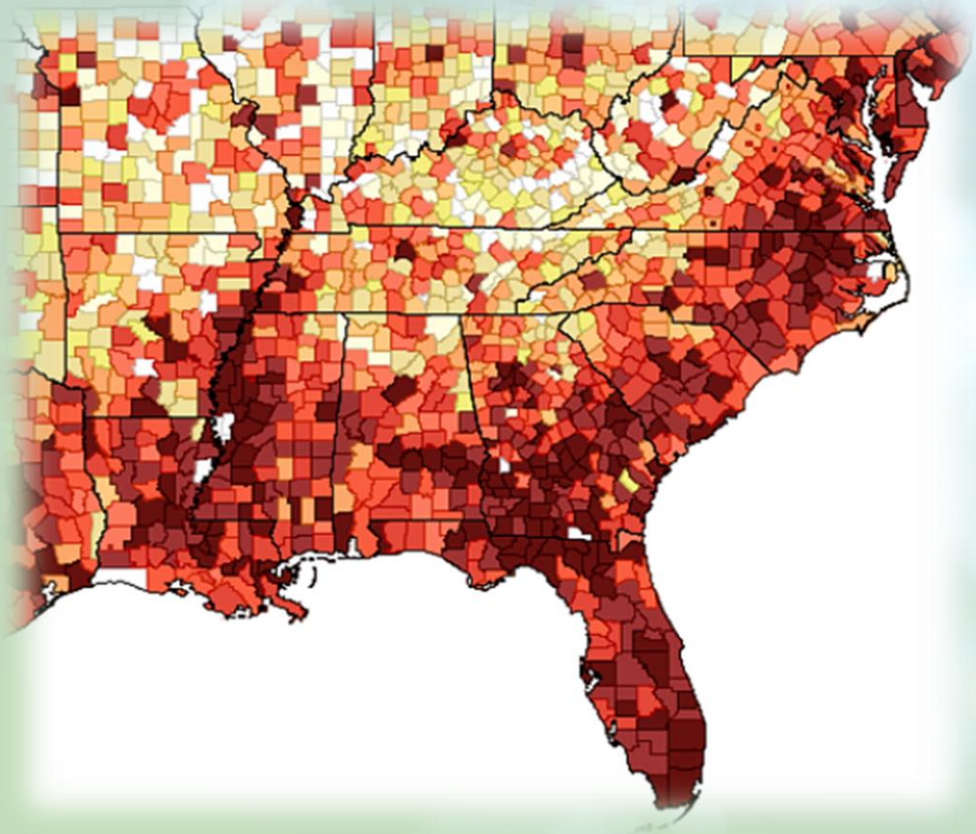
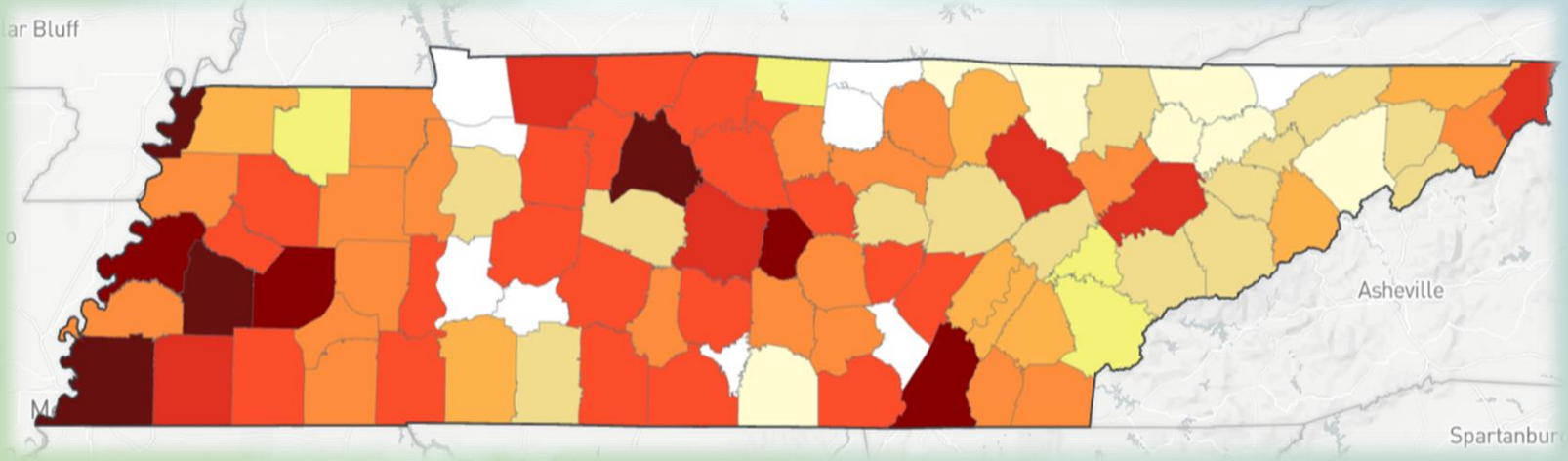


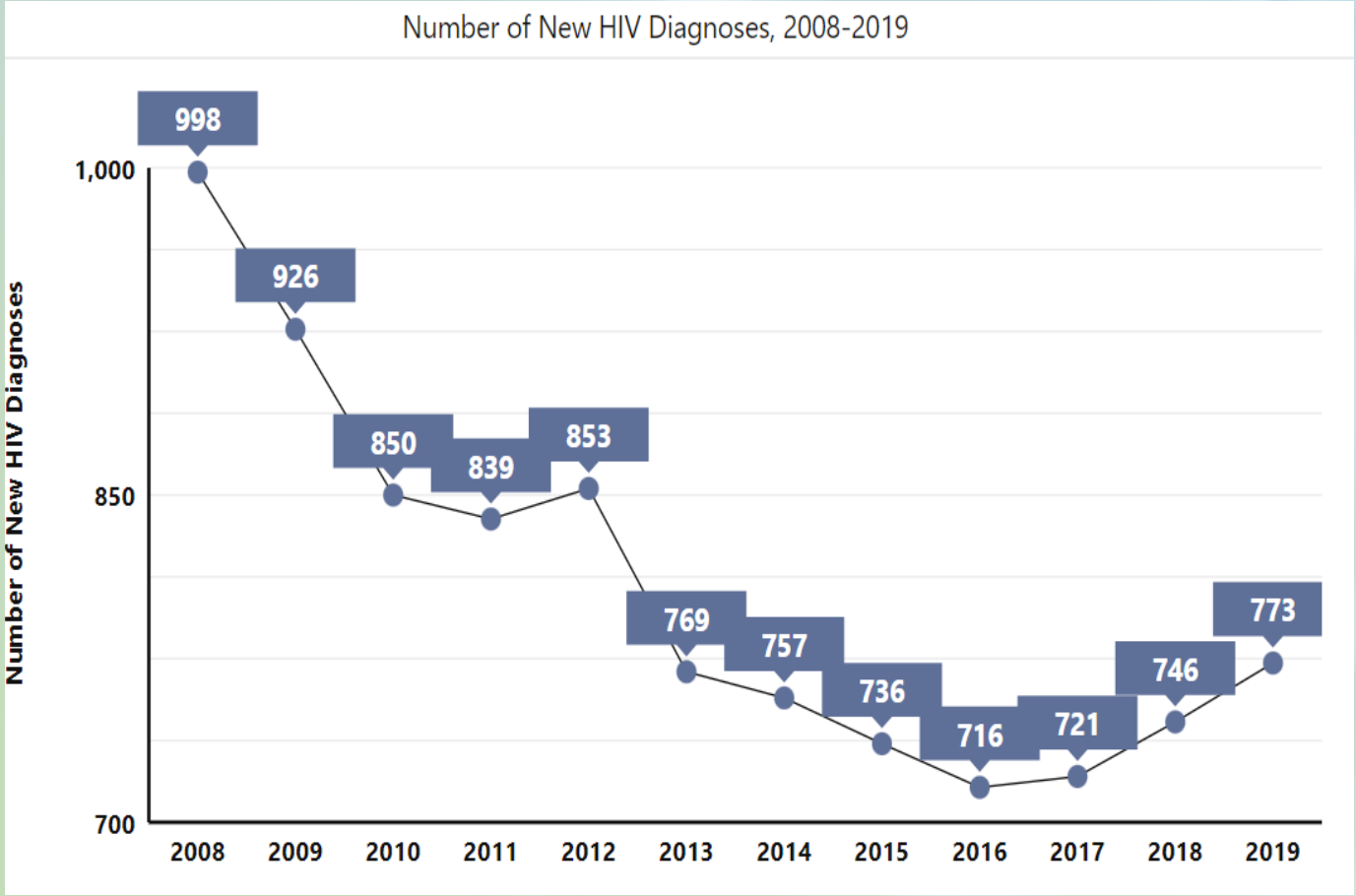
The Southeast accounts for 38% of the U.S. population, but…

- **51%** of new HIV cases
- **47%** of HIV-related deaths
- **24%** of HIV diagnoses that are non-urban **(highest in the U.S.)**
- **20.4%** of HIV diagnoses in the Southeast are classified as **"late"**

Tennessee Data (2019)

- **17,667** PWH in TN (307/100,000)
  - 54.7% Black, 5.9% Hispanic/Latinx, 34.7% White
  - 75.2% Male, 24.8% Female
- **773** new HIV diagnoses in 2019 (average over last 5 years has been ~750/year)→ **~17.3%** were diagnosed late
- **307** PWH died in 2019





Tennessee: *New Diagnoses*

Knowledge Gaps

Limited studies suggest the following risk for presenting with advanced disease at the time of HIV diagnosis:

- Older age at diagnosis
- Racial minority status (particularly Hispanic MSM)
- Non-metropolitan residence
- Uninsured status
- Female sex/gender identification

Very few studies have examined predictors of late HIV in the southeast

- Most data comes from Northeast/West

No studies have utilized statewide surveillance data in the Southeast to comprehensively examine geographic factors that impact delays in HIV diagnoses!

Addressing Knowledge Gaps

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Study Premise:

- Incident HIV remains an important public health problem, especially in the Southeast
- Late/delayed HIV diagnoses are an important driver of incident HIV
- Identifying factors associated with accelerated progression to Stage 3 HIV (AIDS) is vital to improving HIV-related health outcomes through intensified testing and prevention programs.

Study Goal:

- Evaluate factors associated with time to Stage 3 HIV diagnoses in TN
- Specific focus on **rural vs. urban disparities**

End Outcome:

- Results will inform TDH HIV testing and prevention programming

Specific Study Goals & Aims

- ***Goal/Aim:*** To identify disparities associated with accelerated time to stage 3 HIV (AIDS) diagnosis with a specific focus on differences on disparities based on urban vs. rural residence in Tennessee utilizing TDH HIV surveillance data and U.S. Census Bureau data from January 1, 2015 to December 31, 2019.

- ***Definitions:***
  - ***Stage 3 HIV (AIDS):*** *documentation of an opportunistic illness, CD4 count <200 cells/μL, or CD4% <14.*
  - ***Majority-rural status:*** *defined using U.S. census bureau definition:*
    - *County with ≥50% of housing clusters in areas w/ <2,500 individuals or sub-urban population density of <1,000 people/sq mile*
    - *Census provides "proportion rural" and "proportion urban" data for every county: "Majority rural"= county w/ "proportion rural" of >/= 0.5*

Study Design & Methods

- **Retrospective cohort study utilizing:**
  - Individual-level surveillance data from the Tennessee Department of Health (TDH) enhanced HIV/AIDS Reporting System (eHARS) to capture demographics and HIV outcomes
  - US Census Bureau data to measure majority-rural ("rural") vs. majority-urban ("urban") county of residence

- **Individuals were followed from HIV diagnosis until Stage 3 diagnosis, death, or administrative censoring on March 31, 2020.**

- **Cox models were used to estimate adjusted hazard ratios (aHR) and 95% confidence intervals (CI) for Stage 3 diagnosis.**

Study Population

Study Population: Adults ≥18 years old newly diagnosed with HIV-infection from January 1, 2015 to December 31, 2019 identified via the TDH electronic HIV/AIDS Reporting System.

Inclusion Criteria:

- Age ≥18 (no upper age limit for subject inclusion)
- Newly positive HIV test in eHARS between 1/1/2015 & 12/31/2019

Exclusion Criteria:

- Age <18 years old
- Concurrent or previous positive HIV test result
- No evidence of HIV diagnosis or no HIV testing documented in eHARS

Results

- **3,652 newly HIV-diagnosed individuals were included:**
  - Median age at diagnosis: 30 years (IQR: 25, 42)
  - 56.3% were non-Hispanic Black
  - 25.1% received a stage 3 HIV (AIDS) diagnosis during follow-up.
  - Median time from HIV diagnosis to Stage 3 diagnosis was 23 days (IQR: 11, 263)

- **Adjusted survival analyses showed:**
  - Increased hazard of receiving a stage 3 diagnosis for those residing in **high proportion-rural counties** at HIV diagnosis (**aHR=1.51**, 95% CI 1.1-2.1)
  - Increased hazard of receiving a stage 3 diagnosis for **Hispanic individuals** diagnosed with HIV (**aHR=1.6**, 95% CI 1.2-2.1)

Figure 1: Kaplan-Meier Estimates:
Time to Stage 3 Diagnosis by Majority Rural vs. Majority Urban County of Residence at HIV Diagnosis [1]

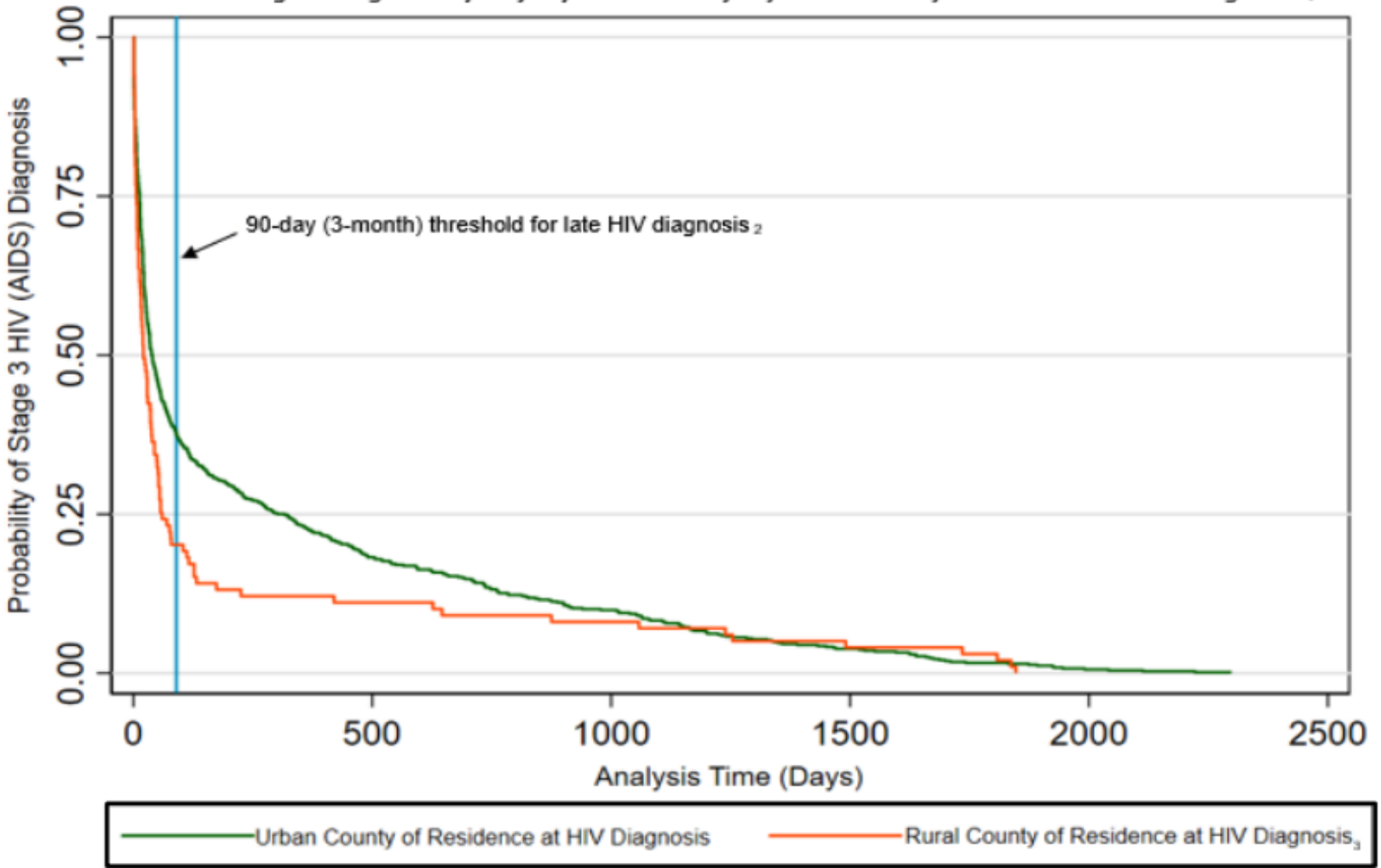
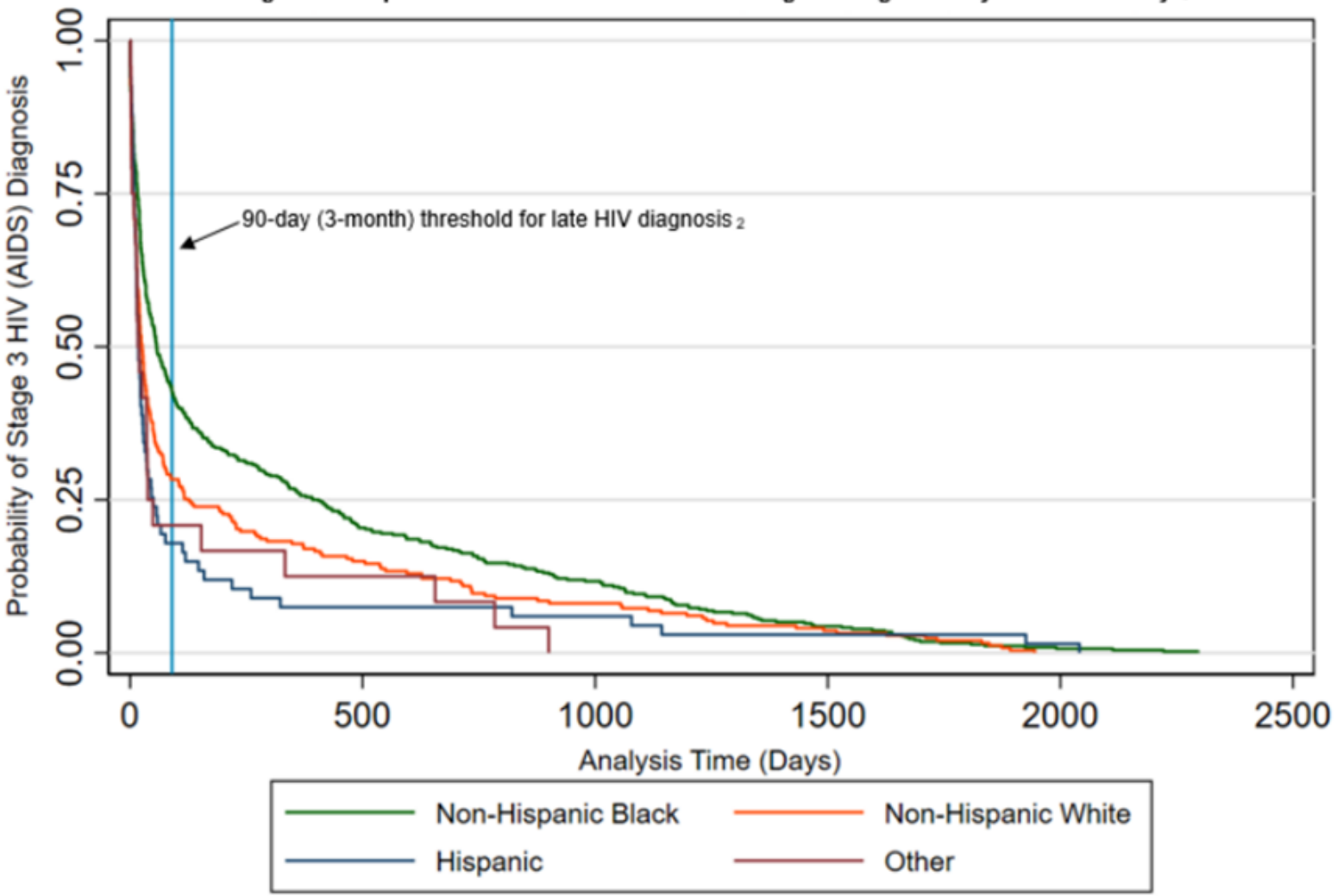


Figure 2: Kaplan-Meier Estimates: Time to Stage 3 Diagnosis by Race/Ethnicity [1]



Main Points & Discussion

- In Tennessee, **rural residence** and **Hispanic race/ethnicity** were associated with a **shorter time to Stage 3 HIV diagnosis**
- This indicates these populations are being **diagnosed late** in the disease process.
- Efforts to increase uptake of early HIV testing should be focused on the needs of these vulnerable populations.
- These results are important for identifying factors contributing late/delayed HIV diagnoses despite existing resources and will help in designing effective new HIV testing, treatment, prevention, and care retention programs

Limitations

- Definitions & cut-offs used for "rural" and "urban": there are limited data & no consensus definition for "rural"/"urban" classifications in HIV research
- Heterogeneity within counties contributing to misclassification
- Lack of insurance and income data at the time of HIV diagnosis as both may have effects on HIV-related health outcomes & testing/prevention practices
- Selection & survivorship bias

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