Regional Disparities in Opioid Use Disorder and Treatment Access During Pregnancy Among Kentucky Medicaid Beneficiaries

HSD33

Mohadese Alizadeh, Sepideh Poursafargholi, Hamid Zarei, Venetia Aranha, Eliana Lopez Baron, Jovita Murillo, Seyed M. Karimi

School of Public Health and Information Sciences, University of Louisville

Introduction

- **The Clinical Burden**: Opioid Use Disorder (OUD) during pregnancy is linked to severe maternal and neonatal complications.[7,14] Medications for Opioid Use Disorder (MOUD) significantly mitigate these risks, yet access remains highly inequitable.[9,12,17]
- **The Geographic Context**: Kentucky reports some of the highest OUD rates in the United States, compounded by complex spatial disparities in healthcare infrastructure.[3,4]
- **Study Objective**: To estimate the prevalence of OUD and MOUD utilization among pregnant Medicaid beneficiaries across Kentucky, and to visualize the spatial determinants (poverty and rurality) driving treatment disparities.

Methods

Detailed methods are provided in the QR code appendix.

- **Clinical Cohort**: Analyzed Kentucky Medicaid Claims Data (2016–2022) using Chronic Conditions Data Warehouse (CCW) algorithms to identify pregnancies complicated by OUD. MOUD utilization was stratified by any use (≥1 claim) and sustained treatment (≥2 claims).[6]
- **Spatial Vulnerability Data**: Extracted tract-level metrics for poverty (CDC Social Vulnerability Index) and rurality (USDA RUCA codes) and linked them to the 8 Kentucky Medicaid regional using raw population sums to prevent ecological fallacy.
- **Geospatial Modeling**: Utilized ArcGIS Pro 3.5 Network Analyst to generate 45-minute drive-time service catchments around active MOUD dispensing facilities. Areas falling outside these catchments were classified as "treatment deserts."

Results

Regional Observations in OUD Burden and MOUD Access

Statewide, OUD complicated 7.01% of pregnancies, with 46.69% receiving sustained MOUD (≥2 claims) (Figure 2). However, geospatial integration revealed complex variations in regional care delivery (Figure 1):

- **Region 8 (Appalachia - High Need, High Access): D**emonstrated the highest OUD prevalence (13.02%) and severe baseline vulnerabilities, including 98.6% rural, 38.6% poverty (Figure 3). This region recorded the state's highest sustained MOUD rate at 56.83% (Figure 2), which visually coincides with a high concentration of overlapping 45-minute service catchments (Figure 1).
- **Region 2 (Rural West - The Utilization Gap):** Despite a lower OUD prevalence (4.0%), the region recorded the state's lowest sustained MOUD utilization rate (27.28%). However, the 45-minute drive-time map (Figure 1) shows this region is largely covered by facility catchments, indicating a disconnect between physical proximity and actual treatment engagement.
- **Regions 3 and 6 (The Urban Anomalies):** Region 3 encompassing the City of Louisville (14.3% rural) and Region 6 (0.0% rural, 15.57% poverty) (Figure 3) demonstrated unexpectedly low sustained MOUD retention (e.g., 33.0% in Region 3). Despite dense urban infrastructure, these depressed rates suggest that physical proximity to facilities does not inherently guarantee treatment engagement..
- **Regions 1 and 4 (Geographic Gaps):** While these regions exhibit relatively high initial MOUD rates, visual analysis of the full-state 45-minute service areas (Figure 1) reveals distinct geographic treatment gaps. These visible gaps align with areas of lower population density, highlighting localized physical access barriers.

Figure 1: Spatial Disparities in OUD Burden and 45-Minute MOUD Drive-Time Catchments Across Kentucky

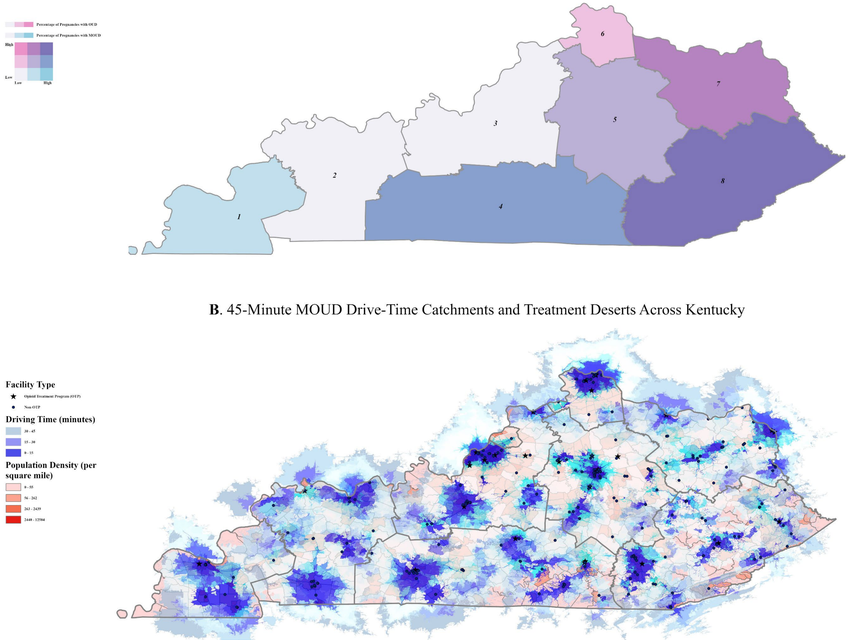


Figure 2: Comparison of OUD and MOUD Across Kentucky Medicaid Regions

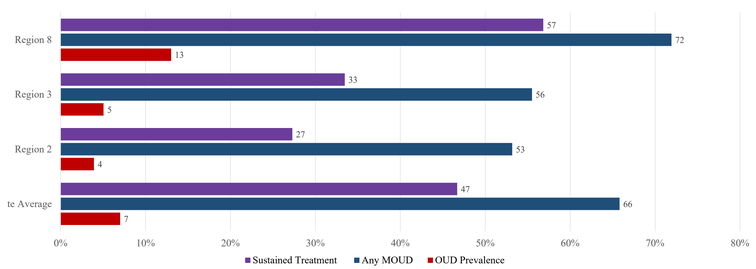
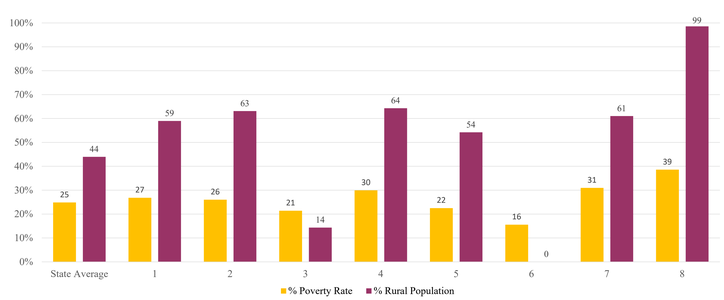


Figure 3: Kentucky Medicaid Region Vulnerability Metrics



Discussion

- **Distribution of Care Infrastructure**: Regions experiencing the highest OUD disease burdens, such as Appalachia, exhibit the greatest treatment coverage. This pattern indicates that previous public health interventions and resource allocations have effectively targeted areas with historically acute needs.
- **Multifactorial Barriers to Care:** Data from urban centers (Regions 3 and 6) and well-covered rural areas (Region 2) demonstrate that geographic proximity does not guarantee service utilization. Reduced MOUD engagement is likely due to systemic barriers beyond travel distance, such as limited provider availability, transportation challenges, and stigma.
- **Policy Implications**: Future public health strategies should employ a dual approach. Spatial network modeling can address physical access gaps in underserved rural areas, such as Regions 1 and 4. In contrast, care coordination and anti-stigma interventions are required to overcome non-spatial barriers in underperforming but well-covered regions.

Funding

This work was funded by a State-University Partnership (SUP) grant that included the State of Kentucky's Cabinet for Health and Family Services (CHFS) and the University of Louisville (Contract Number: PON2 746 2400004958).

References