Project Introduction

Fairfax County and Inova Health System would like to identify where obesity risk factors for vulnerable populations are high, offering health officials and policymakers an actionable resource to inform policy.

Objective: Create an obesogenic index to measure obesity risk quantitatively in Fairfax County and establish a baseline for measuring change.

Data Sources

OpenStreetMap (OSM): Geospatial locations of physical features
Fairfax County Housing Stock: Domicile Locations, Housing Conditions

Methods

Variable Construction
1. ACS & Fairfax variable exploration → selection
2. Distance-time mutation from OSM data and travel-time isochrones

Factor Analysis
1. Standardize features
2. Factor loading weights
3. Proportions variance weights
4. Weighted sum score
5. Normalize score scale (0, 1)

Index Construction
1. Composite Index Explaining unobservable factors with measurable variables

Obesogenic Environments

Supervisor Districts
Obesogenic Environment Index by Supervisor District

High School Districts
Obesogenic Environment Index by High School Attendance Area

Census Tracts
Obesogenic Environment Index by Census Tract

Limitations
1. Quality of OSM data
2. Quality of TravelTime application programming interface (API)
3. Index weights and validation

Conclusions
1. Interdisciplinary method for index construction provides new measurement for health inequities
2. Low-income racial and ethnic minority groups have high risk, especially Hispanics
3. Policy intervention and resource allocation requires analysis at multiple geographic units

Next Steps
1. Overlaying findings with Inova health data to better understand patient population
2. Conduct sensitivity analysis (robustness of index)
3. Compare current policy initiatives with maps to enhance existing measures and to create evidence-based policy

Resources