



Geospatial Information Systems

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The impact of nurse practitioner state regulations on population access to care.

- Nurse Practitioner (NP) state practice regulations that require NPs to be supervised by a physician impede optimal and independent practice and negatively affect access to care particularly in geographic areas of the country where physician providers are not present.

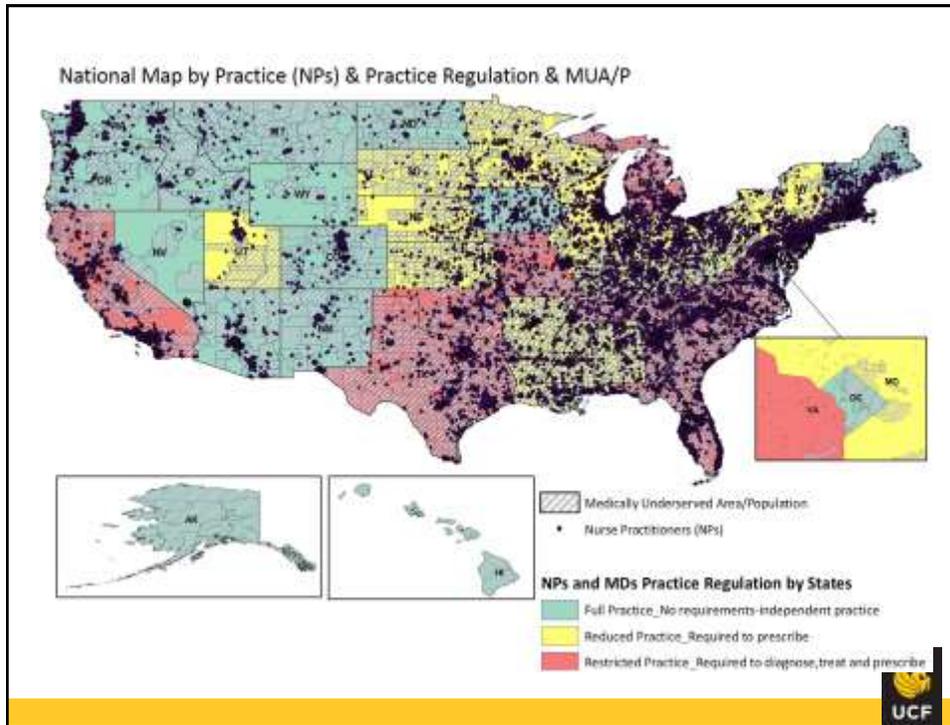


Approach

The **AIM of this study** was to geocode primary care physicians and NPs to examine the proportion of the population that had a greater than 30 minute drive to the closest PCP and/or NP by level of NP state practice restrictions.

- Sample:
 - Primary care physicians in the U.S. (N=241,618)
 - AANP members who gave permission to share contact information (N=21,211).
- Using GIS and providers' street address, the datasets were geocoded based on the GIS street network.





Approach – GIS Methods con't

- Models and measures were on *the Census Block Group Level* ($n=213,555$) where driving distance was assessed as the travel time by car to the closest MD or NP from the center point of a Census Block Group.

- **GIS origin-destination (O-D) cost matrix analysis**

- To identify the least cost paths along the street network. 'Cost' here refers to impedance factors used to calculate the travel time and includes:
 - road segment length, speed limit, road connectivity, and road hierarchy.



Logistic regression Model

Calculate the adjusted odds of having a greater than 30-minute drive time using the Census Block Group as the unit of observation (n=213,555)

- Independent Variable
 - NP practice regulation, Full Practice – (Independent), Minimally Restricted (reduced) and Restricted.
- Dependent Variable
 - proportion of populations with greater than a 30-minute drive time using the 2012 Census Block Group as the unit of observation.



• Logistic Regression Model con't:

- Covariate

- *States with full practice* that tend to be more rural than the restricted practice states.
- *geographic characteristics* - MD/NP supply as measured by the total number of MDs and NPs per capita,
- *built environment* - number of miles of road per square mile, proportion of space that is urban, population per square mile, and average drive time to the closest PCP or NP.



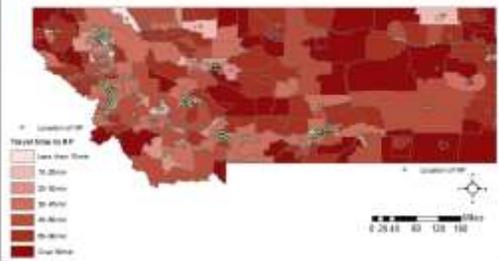
Findings:

- Compared to restricted states, people living in full practice states had 19.2% lower odds of having a greater than a 30 minute drive to the closest NP or MD (OR=0.808, $p=.001$). This result held when assessing by person or household.
- While reduced practice states had 7.1% lower odds of being greater than a 30 minute drive, it was not statistically significantly different from restricted practice (OR=0.929, $p=.237$).

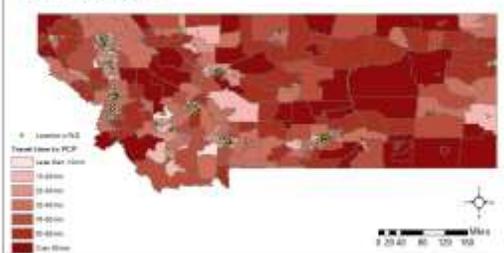


Montana- Independent Practice

Travel time to NPs



Travel time to PCPs

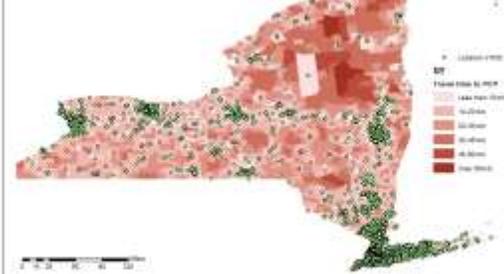


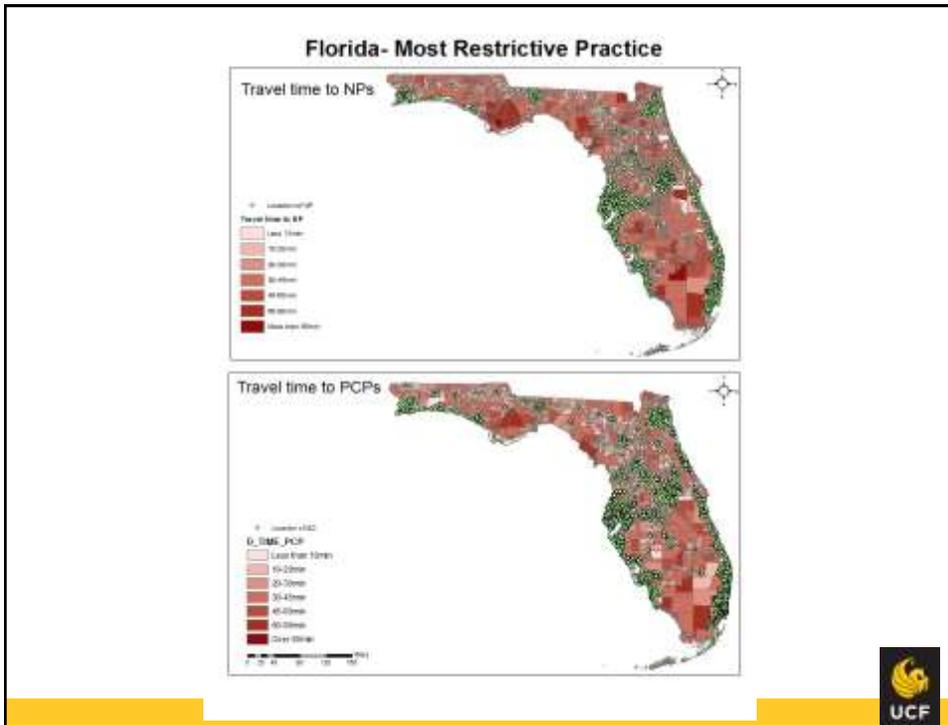
New York- Minimum Restrictive Practice

Travel time to NPs



Travel time to PCPs





What's known!

- Living in a rural area with increased travel burden is associated with poor access to needed health care due to increased burden
- Point estimates suggest that states with full NP scope of practice have a lower percentage of the population with a greater than 30 minute drive time to receive care when compared to states that restrict NP practice.
- Allowing NPs full autonomy to practice is a critical step for states to improve access to primary care.

- NPs who are practicing in states that require physician supervision, are in essence tethered to physician practices, limiting their geographic distribution.

