An Access Deprivation Index
& Health Landscape

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The Robert Graham Center
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- Health Policy Research sponsored by the American Academy of family Physicians, dedicated to bringing a family practice and primary care perspective to health policy deliberations
- Operates with editorial independence
- Intersections between geography and health & the power of analytic maps to convey complex information
Create a neighborhood-level measure of risk for experiencing barriers to accessing healthcare drawing on commonly held individual and ecological data.
Many efforts in literature - use either:

► **Personal characteristics**
  - to explain barriers or delays in accessing healthcare
    (Aday, 1993; Batlzman et al, 2002; Weinick and Krauss, 2000).

**OR**

► **Ecological measures of poverty**
  - as a near-proxy for health access problems
    (Krieger et al, 2003).
The Premise

Person-level: socio-demographic variables

Geography-level: ecologic (census tract) variables

LINK

Difficulty or risk of delaying/not getting health care

Useful for mapping

Explain
Data requirements

1. **Person-level**: 2002-2005 NHIS data
   - self-reported deprivation variables, and
   - personal characteristics that explain deprivation.

2. **Geography-level**: 2000 Census data
   - (N=65,344 census tracks) with:
     - ecologic variables that explain deprivation
Methods

(1) Selected key NHIS variables based on:
- Review of relevant literature.
- Exploratory statistical analysis including checks for multicollinearity

(2) Identified two dependent variables:
- Delayed getting care for at least one of five reasons.
- (a) Either 1 above, or (b) needed mental health or prescription medicines, but did not get them because could not afford.
Selected variables based on: (1) literature review; (2) exploratory analysis

Estimated logistic model (NHIS data) to explain dependent variable (deprivation)

PCA to identify weights for explanatory variables

Weights used to create: (1) Deprivation Index (2) Gini inequality index

Prepared census data for analysis (census track-level)
Analysis (next steps)

Check survey sample for sufficiency of N at census track level

Merge census with NHIS data and create analysis file for multi-level (HLM) modeling

Estimate multi-level logistic model:
- Level 1 - individual person (NHIS)
- Level 2 - census tract (census)
  - pairwise substitution of census for NHIS variables - (using F-value)

PCA to identify weights for Final model variables.

Weights used to create:
- (1) Deprivation Index
- (2) Gini inequality index

Validate the results with State detail survey data

Geocodes for NHIS data
Findings: Logistic Regression (NHI S data)

The predictors of the highest risk of a person delaying getting care were:

► Aged less than 65 years old
► With no insurance
► With a functional limitation
► With fair or poor health (self-assessed)
Findings: Logistic Regression (NHI S data)

Other predictor characteristics of highest risk of a person delaying getting care were:

- Female person
- Not own home
- Living with no children in household
- At less than 400% of poverty level
- Smoker
- On Medicare
- Health not excellent (self-assessed)
### Geographical Hierarchical Linear Modeling

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<th>County resources</th>
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Preliminary Ecologic Model

- Census-tract level variables that best predict access problems are:
  - percent **Black**
  - percent **Hispanic**
  - percent **65 years or older**
  - percent **disabled**
  - percent **with only 1 adult in household**

- access deprivation indices for 66,997 U.S. census tracts ranged from 6.3% to 40.9%
Mock ADI Map