Development of a Comprehensive Method for Identifying Facilities with Nursing Shortages

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Objectives

- Briefly summarize research
- Show rationale for recommendations
- Explain preferred method

Guiding Principles

- Context: facility within community
- Demand over need
- Identify standards for data
- Low burden on facilities and HRSA
- Applicable to all facility types
- Data easy to access and available over time
- Commonly accepted data elements/indicators
- Easy to update to reflect changing environment

Data Sets and Compilations

- Facility-level data
  - Survey of Nurse Employers in North Carolina
  - North Dakota Nursing Needs Study Facility Survey
- Community-level data
  - Area Resource File (ARF)
  - U.S. Census Bureau
- National data
  - National Sample Survey of Registered Nurses (NSSRN)
  - *Health, United States, 2005*

Analyses Using Facility Data

- Methods: OLS Regression and Ordered Probit Models
- Dependent variables: # of adverse consequences, vacancy rates, and self-reported difficulty recruiting RNs
- Performed an external validation of NC data
- Applied models derived from North Carolina data to North Dakota

Conclusions about Facility-Level Models

- Subjective dependent variables are not ideal
- Findings from one state don’t care over to other states
- Predictive value of models differs across types of settings
- Facility-level predictors not available in most states

Geography-Based Models

- Rationales:
  - Can be estimated using only nationally available data that is frequently updated
  - Inability of a facility in a county with sufficient overall supply to recruit/retain RNs may be an indication of organizational culture issues, which NELRP not meant to address

Geography-Based Models

- Limitations:
  - Patterns of RN employment and/or health service utilization often transcend county (and state) lines
  - Use of county-level data can mask large differences within counties
  - Does not allow for special circumstances specific to facilities

Counting RNs in Counties

- Source: 2000 U.S. Census
  - Based on Census long-form data; a 1-in-7 sample of the population
  - Less accurate when actual number of RNs in the county is low
  - Estimates RNs by county of residence, not employment
  - BUT... Probably best source currently available

Counting RNs in Counties, cont.

- Future: American Community Survey (ACS) data will become available every year
  - Currently only provides estimates for counties with population >65,000
  - Will eventually (2008) provide estimates for smaller areas using 3-year moving averages
  - Smaller sample than decennial census; therefore less precise

Adjusting for Commuting

- U.S. Bureau of the Census provides data (2000) on commuting flows between every pair of counties in the U.S.
- Commuting in-flow was based % of persons employed in county living in a different county
- Commuting out-flow was based on % of employed residents of the county working in a different county
- Rates of county in-flow/out-flow were applied to RNs
  - Assumes RN commuting patterns are not different from commuting patterns overall (preliminary analyses do not seem to indicate differences)

Early Techniques

- Ratio of RNs to Population
- Ratio of RNs to Adjusted Population
- Ratio of RNs to Physicians
- Factor Analysis of Nursing Shortage Indicators
  - RNs relative to infrastructure (demand)
  - RNs relative to population (need)
  - Economic conditions

Preferred Method

- Applying simplified logic of Nurse Demand Model (NDM) to:

  1) Measure health care utilization by setting for counties (*e.g.*, *inpatient days*)

  2) Estimate current national RN staffing by setting (*e.g.*, *RNs working in inpatient units*)

Preferred Method

3) Calculate national RN staffing intensity for each setting (*e.g.*, *RNs per inpatient day*)

4) Apply national RN staffing intensity ratios to measures of utilization for each county

5) Sum estimated demand for each setting

6) Use supply of RNs to estimate RN shortages

(Raw shortage numbers are standardized as a percent of demand)

Advantages

- Uses nationally available data
- Uses actual patterns of utilization by county
- Accounts for multiple types of care (incl. non-clinical care)
- Accounts for differences in RN staffing intensity across settings

Limitations

- Does not account for county or state variation in health systems (e.g., HMO penetration; use of LPNs)
- Does not account for patient acuity within types of care
- Assumes current RN staffing intensity iadequate at the national level

Conclusions

- Preferred method is not ideal, but has more advantages than other methods
- Prioritization by facility type, as discussed earlier
- Supplementation with other processes is advised:
  - Special rules
  - Application process
  - Adjustments for shortcomings (see below)