Overview of Urban-Rural Classification Schemes Including the 2013 NCHS Urban-Rural Classification Scheme for Counties

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Objectives

- Review major urban-rural classification schemes.
- Describe features of the NCHS Urban-Rural Classification Scheme that make it particularly suitable for use in studying health differences.
- Show examples of health differences using urban-rural schemes, with a focus on the NCHS scheme.
Terminology

- **Common usage:**
  - “Metropolitan” and “urban” -- densely populated areas
  - “Nonmetropolitan” and “rural” -- small towns, sparsely populated areas, farm land

- **Technical usage:**
  - OMB metropolitan-nonmetropolitan classification of counties
  - Census Bureau urban and rural classification of census tracts
For this talk:

- “Metropolitan” and “nonmetropolitan” – will refer to the OMB classification.
- “Urban” - colloquial meaning, will refer to metropolitan areas.
- “Rural” – colloquial meaning, will refer to nonmetropolitan areas.
Current Urban-Rural Health Differences

For many health measures:

- Rural residents fare worse than urban residents.
- Residents of centers of large cities fare worse than residents of the suburbs and smaller cities.
- Residents of suburbs fare better than residents of other urban-rural levels.
Reasons for using county:

- Primary political unit of local government (in most parts of U.S.), has programmatic importance at federal and state levels.
- Stable boundaries.
- County-level health, economic, demographic, and environmental measures are widely available.
Classifies counties as:

- Metropolitan or nonmetropolitan
- Nonmetropolitan counties further differentiated as micropolitan or noncore.

Classification based on published standards, revised prior to decennial census.
OMB Metro-Nonmetro Classification Continued

- **Metropolitan counties:**
  - In metropolitan statistical areas (MSA)
    - MSA has a densely settled urban core $\geq 50,000$ population and surrounding less densely settled counties (suburban) linked to core by commuting.
    - Usually multi-county.

- **Nonmetropolitan counties:**
  - In micropolitan statistical areas
    - Smaller version of MSA with urban core of 10,000-49,999.
    - Sometimes multi-county.
  - Noncore $\rightarrow$ not micropolitan
    - Urban population <10,000
    - Single counties
Disadvantages of OMB Classification

- The single category for metro territory is too broad - important health differences can be missed.
Alternative Urban-rural Schemes

- Three schemes further differentiate the OMB metro-nonmetro classification:
  - NCHS Urban-Rural Classification Scheme for Counties (1990, 2006, 2013)
  - Department of Agriculture Economic Research Service schemes:
    - Rural Urban Continuum Codes (RUCC)
    - Urban Influence Codes (UIC).
2013 NCHS Urban-Rural Scheme

- 6 levels: 4 metro, 2 nonmetro
  - Distinguishing feature – Separate categories for central and suburban counties of large MSAs.

- Derived using:
  - 2010 census-based MSAs and micropolitan statistical areas (February 2013)
  - 2010 census-based populations and variables used for confirmatory analyses
2013 NCHS Urban-Rural Scheme Continued

U.S. counties and county-equivalents

- Metropolitan
  - Large metro (MSA population ≥ 1 million)
    - Large central metro
    - Large fringe metro
  - Medium (MSA population 250,000-999,999)
  - Small (MSA population < 250,000)
- Nonmetropolitan
  - Micropolitan (Urban cluster population 10,000-49,999)
  - Noncore (No urban cluster)
## Classifying Large Metro Counties

<table>
<thead>
<tr>
<th>Urbanization category</th>
<th>Classification rule</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Large central metro</strong> (akin to center city)</td>
<td>Counties in MSA $\geq$ 1 million population that:</td>
</tr>
<tr>
<td></td>
<td>1) Contain the largest principal city of the MSA, <em>or</em></td>
</tr>
<tr>
<td></td>
<td>2) Are completely contained within the largest principal city of the MSA, <em>or</em></td>
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<tr>
<td></td>
<td>3) Contain at least 250,000 residents of any principal city of the MSA.</td>
</tr>
<tr>
<td><strong>Large fringe metro</strong> (akin to suburbs)</td>
<td>Counties in MSA $\geq$ 1 million population that are not central.</td>
</tr>
<tr>
<td>Urbanization category</td>
<td>Number of counties</td>
</tr>
<tr>
<td>---------------------------</td>
<td>--------------------</td>
</tr>
<tr>
<td></td>
<td>N</td>
</tr>
<tr>
<td>Metropolitan counties</td>
<td>1,167</td>
</tr>
<tr>
<td>Large central metro</td>
<td>68</td>
</tr>
<tr>
<td>Large fringe metro</td>
<td>368</td>
</tr>
<tr>
<td>Medium metro</td>
<td>373</td>
</tr>
<tr>
<td>Small metro</td>
<td>358</td>
</tr>
<tr>
<td>Nonmetropolitan counties</td>
<td>1,976</td>
</tr>
<tr>
<td>Micropolitan</td>
<td>641</td>
</tr>
<tr>
<td>Noncore</td>
<td>1,335</td>
</tr>
</tbody>
</table>
2013 NCHS Urban-Rural Scheme
USDA ERS Urban-Rural Schemes

- Rural Urban Continuum Codes (RUCC) and Urban Influence Codes (UIC)

- Metro counties categorized based on MSA population:
  
  **RUCC:**
  - L: ≥ 1 million
  - M: 250,000-999,999
  - S: <250,000
  
  **UIC:**
  - L: ≥ 1 million
  - M-S: < 1 million

- Nonmetro counties categorized based on urban population and proximity to metro and/or micropolitan counties.

  **RUCC:** 6 categories
  - (20,000+, 2,500-19,999,<2,500)
  
  **UIC:** 10 categories
  - (10,000+, 2,500-9,999,<2,500)
Disadvantages of ERS Schemes

- Too few metro categories given size of metro population.
- Suburban counties of large MSAs not differentiated into central and fringe --> important health differences missed.
- Too many nonmetro categories --> many health databases cannot support them.
For the NCHS, RUCC, and UIC schemes, the number of counties for which data are available in the vital statistics system (VS) and in the combined 2012-2014 NHIS for each urban-rural category.
Vital Statistics System has data for all U.S. counties, and therefore, may be able to support the detailed nonmetro categories of the RUCC and UIC schemes.

NHIS sample includes only a very small number of nonmetro counties -- insufficient to support use of the RUCC and UIC nonmetro categories.
Mortality Data Examples

  - Infant mortality
  - Homicide, males all ages
  - Stroke, 45+ years

- Rates plotted for NCHS, RUCC, and UIC urban-rural schemes
Infant mortality average annual, 2011-2013, NCHS
Infant mortality average annual, 2011-2013, RUCC

Deaths per 1,000 live births

Large Medium Small 4 5 6 7 8 9

Metropolitan Nonmetropolitan
Infant mortality average annual, 2011-2013, UIC
Homicide, males, all ages average annual, 2011-2013, NCHS
Homicide, males, all ages average annual, 2011-2013, RUCC
Homicide, males, all ages
average annual, 2011-2013, UIC
Stroke mortality, 45+ years average annual, 2011-2013, NCHS
Stroke mortality, 45+ years, average annual, 2011-2013, RUCC

The graph shows the number of deaths per 1,000 live births for stroke mortality in different categories: Large, Medium, Small Metropolitan, and 4, 5, 6, 7, 8, 9 Nonmetropolitan areas. The bars indicate the mortality rates, with error bars showing the variability. The rates appear to be consistently higher in Nonmetropolitan areas compared to Metropolitan areas.
Stroke mortality, 45+ years, average annual, 2011-2013, UIC
More Mortality Data Examples

- NCHS scheme captures important mortality differences across urban areas and between large fringe metro areas and other areas.
  - RUCC and UIC schemes do not identify important differences between large central and large fringe metro areas.
  - UIC scheme cannot identify differences between medium and small metro areas.
  - RUC and UIC do not capture differences between large fringe metro and other areas.

- Confidence intervals around RUCC and UIC nonmetro category estimates are so large that most differences are not significantly different.
When Using Vital statistics Data

- Because the vital statistics system has data for all U.S. counties, more detailed categories for nonmetro counties can be supported.

- Nonmetro categories derived from the RUCC or UIC could be substituted for the two nonmetro categories of the NCHS scheme when greater detail is desired.
NHIS Data Examples

- National Health Interview Survey – 2012-2014
  - Health status
  - Current smoking
  - Edentulism
  - Health insurance
  - Delayed or did not get medical care

- Percentages plotted for 2013 NCHS urban-rural schemes
Fair/poor respondent-assessed health status, 18-64 years, NHIS 2012-2014
Current smokers
18-64 years, NHIS 2012-2014

![Bar chart showing the percentage of current smokers by metropolitan area type. The chart compares large central, large fringe, medium, small, micropolitan, and noncore areas. The data indicates higher percentages of current smokers in nonmetropolitan areas compared to metropolitan areas.]
Edentulous 65+ years, NHIS 2012-2014
No health insurance coverage 18-64 years, NHIS 2012-2014
Did not get/delayed medical care in past year due to cost 18-64 years, NHIS 2012-2014
Advantages of NCHS Scheme

- NCHS Urban-Rural Classification Scheme for Counties developed for use with health data.
  - Four metro categories differentiate metro territory.
  - Separate levels for large central and large fringe metro counties. Schemes which do not differentiate these counties cannot accurately represent important health disparities.
  - Only two nonmetro levels reflecting small nonmetro counts in health data files.
Description of scheme development:
- 2013 NCHS scheme, VHS Series 2 No. 166
- 2006 NCHS scheme, VHS Series 2 No. 154

Data file with 1990-based, 2006, and 2013 scheme codes available for download.

NCHS urban-rural Website:
http://www.cdc.gov/nchs/data_access/urban_rural.htm

CDC WONDER mortality files