Some Funding Lessons for Local Public Health Services

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Lesson #1: The Minimum Efficient Size of a Local Public Health Department (LHD) is roughly 100,000 people

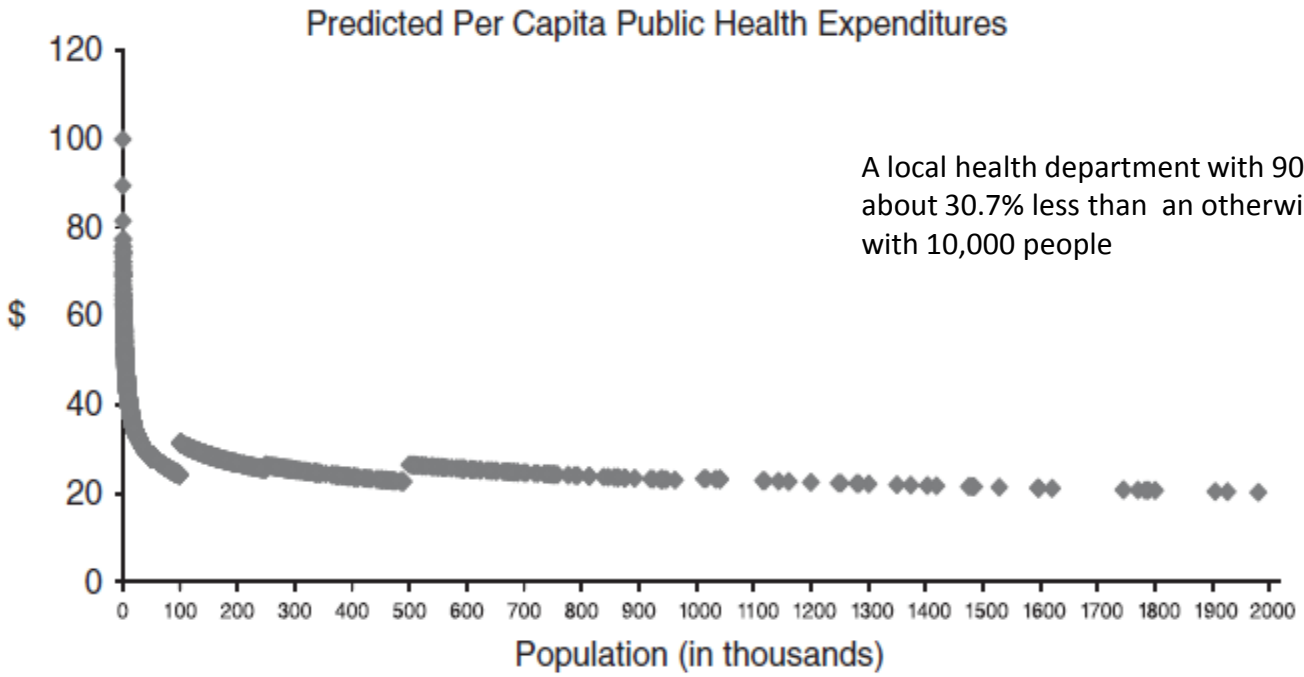
- "Jurisdiction Size and Local Public Health Spending", *Health Services Research,* Dec. 2009

- Multiple regression analysis:
  - **C = f(population; X)**

- X includes number of different services offered, %services contracted out and produced by others, %clinical services, %different funding sources, racial composition, political unit (city, county, etc.) and urban/rural designation

- Cross-sectional study of 2,018 LHDs in the U.S. as of 2005 ranging from 313 to nearly 10 million people (average population of 130,099)—NACCHO data.

Findings



A local health department with 90,000 people spends about 30.7% less than an otherwise comparable one with 10,000 people

Principal Findings. The MES of a local public health department is approximately 100,000 people. After that size, additional population has little impact on public health spending per capita.

Conclusions. Seventy-seven percent of LHDs in the sample fall below the 100,000 MES. Higher levels of government may want to provide financial inducements so that smaller LHDs consolidate or enter into agreements with larger public health organizations to provide services.

Lesson #2: Expectations of scale economies encourage whereas differences among communities inhibit the formation of regional LPH districts

- "An Empirical study of the Consolidation of Local Public Health Services in Connecticut", *Public Choice* (with Laurie Bates and Becky Lafrancois), April 2011.

- Multiple regression analysis (Probit model):
  - Participation in a regional public health district (yes/no= 1/0) = f(community characteristics, anticipated district size, differences among communities)
    - **trade-off is involved between potential scale economies and jurisdictional heterogeneity**

- Cross-sectional study of 169 towns and cities in Connecticut as of 2004 where 92 communities voluntarily participated in 18 regional health districts. 878 matches with 25 percent reflecting two communities in the same health district.

Findings and Implications

- Joining or forming a health district is perceived as an “inferior good”.

- An inverted U relationship is found between combined population and probability of forming a regional district.
  - Perceived diseconomies set in at a combined population of about 47,000 people.

- Differences in income, population and land area reduce the probability of consolidation.
  - Given the relatively low perceived diseconomies and jurisdictional heterogeneity, higher levels of government may want to use financial incentives to induce more local governments to form regional public health districts.

Lesson #3: The demand for local public health is inelastic with respect to tax-price and unaffected by income

- Work in Progress (with Laurie Bates)
- Panel data set of the 169 towns and cities in Connecticut over the years from 2001-2008.
- Multiple regression analysis:
  - **Public health expenditures = f(population, tax-price, income, intergovernmental aid, community characteristics)**
- Based on a public choice model of the median voter

Findings

	Local Public Education	Municipal Services	Local Public Health Services (all)	Local Public Health Services (districts)
Tax-price elasticity	-0.21	-0.09	-0.42	-0.12
Income Elasticity	0.05	0.12	0	0

Implications: (1) matching grants will not stimulate much additional spending on local public health. (2) A rising tide won't raise the good ship public health.

Lesson #4: Public health spending is sensitive to intergovernmental aid

- Same work in progress.

	Local public education	Local Municipal Services	Local Public Health (all)	Local Public Health (districts)
Change in spending per capita per $1 of aid	$0.24	$0.05	$2.24	$1.76

Flypaper Effect +

-Bernet (JPHMP-2007) reaches a similar conclusion from his cross-sectional study of Missouri LHDs.

In Connecticut, districts receive $2.43 per capita for towns with less than 5,000 pop and $2.08 with more than 5,000. Independent districts receive $1.18 if full-time and $0.49 if part-time. LHDs must spend at least $1 per capita.

Lesson #5: Decentralized public health departments that rely on internal funding are more efficient

- "Explaining the efficiency of local health departments in the U.S.: An Exploratory Analysis" (with Kankana Mukherjee and Ning Zhang), *Health Care Management Science*, 2010.

- Fairly representative cross-sectional sample of 771 local health departments in U.S. as of 2005 (NACCHO data).

- Used data envelopment analysis, a linear programming technique, to measure the **technical** efficiency of LHDs.
  - Three outputs: (1) population, (2) number of different clinical services, and (3) number of different environmental services.
  - Seven inputs: FTE (1) managers, (2) nurses, (3) sanitarians, (4) clerical, (5) other employees, (6) percent with PCs, and (7) percent with access to internet.

Findings

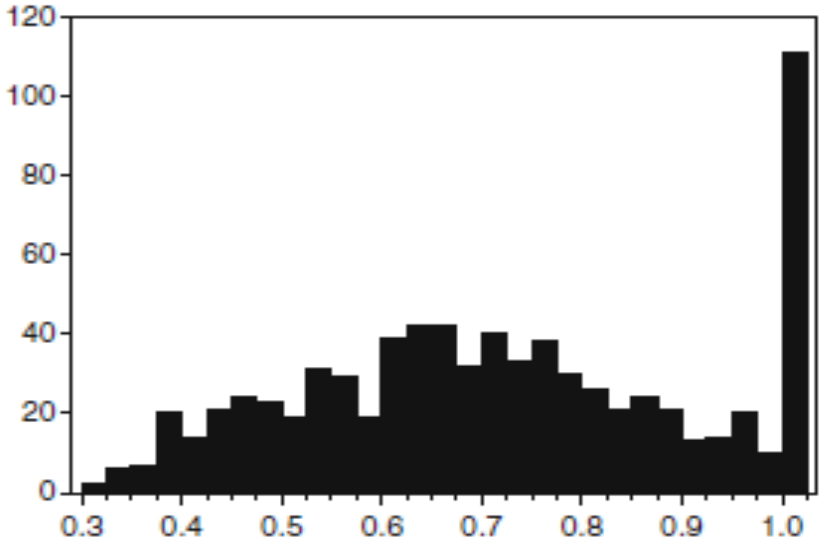


Fig. 4 Relative efficiency of 771 LHDs with nonzero inputs and outputs

Typical LHD operates with 28% inefficiency although inefficiency ranges as high as 69%. Inefficiency averages around 15% for hospitals.

Lesson #5: Some Other Findings

- Multiple regression analysis:
  - **Efficiency Score = f(racial/ethnic composition, urban vs. rural, %service provided externally, %external funds, type of jurisdiction)**

- Efficiency found to be inversely related to a greater percent of external funding but effect is small (0.02 elasticity).
  - Varela et al. (HCMS-2010) finds that the efficiency of publicly-provided primary care services in Brazil is inversely correlated with the level of municipal dependence on intergovernmental grants.
    - Soft-budget or moral hazard effect

- More centralized LHDs operate with, at least, 0.11 percentage points less efficiency than an otherwise comparable independent city or town jurisdiction.
  - However, this finding and the one above may reflect association rather than causation

Lesson #6: A community in a voluntarily-established regional LHD spends more than an otherwise comparable independent LHD but both types of communities are equally efficient with respect to resource allocation

- Bates and Santerre (R&R at *RSUE*)

- Estimate the median-voter's demands for education, municipal and public health spending using a panel data set of Connecticut communities over the period 2001 to 2008 separately for consolidated and independent LHDs.

- Use the means-replacement technique to establish how much a switch from an independent to consolidated LHD (and vice-versa) would impact different types of local public spending.

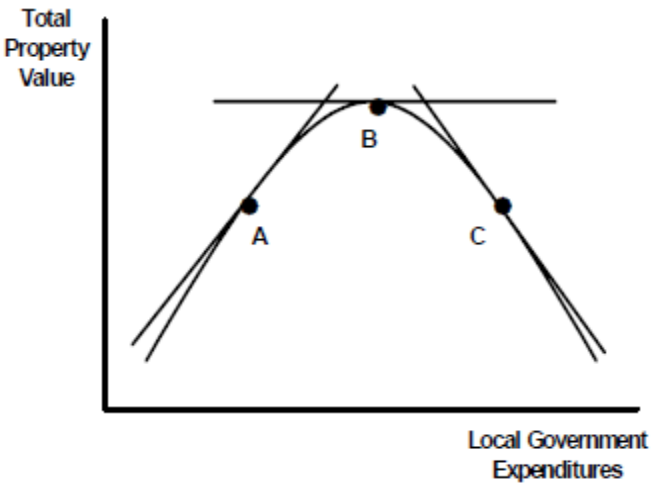
- Find that switch to consolidated (and to independent)leads to more (less) spending on local public health spending and less (more) on other type of public spending.

Lesson #6: continued

- Apply Brueckner's test for allocative efficiency in the local public sector, which is based on people voting with their feet in response to taxes and the relative provision of various types of local public goods. Both are capitalized into property values. Allocative efficiency occurs when the marginal social benefit of a good (MSB) equals marginal social cost (MSC)
- Total property value

equals the discounted stream of property rents less public sector costs, or present value of fiscal surpluses

Figure 1: Property Value Hypersurface



It can be shown that MSB = MSC at point B in Figure 1

Lesson #6: continued

- The estimated coefficient on public health spending in an equation predicting aggregate property values indicates if communities operate at point B (efficiency so statistically insignificant), A(underprovision so positive), or C (overprovision so negative).

- Using same panel-data sample of Connecticut communities, a fixed effects model finds that both consolidated and independent LHDs operate at point B.

- Without fixed effects both types of LHDs operate at point A which indicates underprovision. (**No test reveals overprovision!**)

- Note: Tests for communities in other areas of the country that are forced to form consolidated LHDs may provide different results.

What Lessons Have We Learned?

- We (I) seem to know that:
  1. LHDs are optimally sized at 100,000 people or so
  2. Perceived economies encourage (up to a point) but jurisdictional differences impede the formation of LHDs (a trade-off)
  3. Spending on LPH is not very sensitive to relative tax contributions or income (the community's own money)
  4. Spending on LPH relatively is sensitive to outside aid (other peoples' money)
  5. Outside aid may negatively influence degree of efficiency (why always the trade-offs?) but minimally
  6. No sign that local public health departments overproduce local public health services

Lessons learned (continued)

- But, as the saying goes, “If you’ve seen one local health department, you’ve seen one local health department” (i.e., so varied in nature)

- As a result, we truly need much more consistent and complete data over time to revisit these average patterns in the data for LHDs and to ask other relevant policy questions.