

Translating research into practice: A tool for public health performance improvement

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Presenter Disclosures

Michelyn Wilson Bhandari

(1) The following personal financial relationships with commercial interests relevant to this presentation existed during the past 12 months:

No relationships to disclose

Background

- The public health system has struggled to translate performance measures into quality improvement initiatives.
- Public Health Systems & Services Research and the National Public Health Performance Standards Program (NPHPSP) share the goal of increasing “the science base of public health which will result in the improvement of public health practice.”
- The goal of performance improvement research is to provide scientific evidence that allows communities to develop more efficient and effective public health systems through targeted use of limited resources.

<http://www.cdc.gov/od/ocphp/nphpsp>

Objectives

1. To define the characteristics of high-performing local public health systems; and
2. To determine the relationship between local public health system performance and public health agency structure, organization, finance, and management

Study Population

- 529 local public health systems/jurisdictions from within 30 states that completed Version 1 of the NPHPSP local instrument between 2002 and 2007
- 78 repeat observations were removed
- 98 systems were excluded because they could not be matched by jurisdiction type or had not completed one or more secondary data sets
- Study sample: 353 systems within 23 states

Data: Dependent Variables

- Measures of system performance on the 10 Essential Public Health Services (EPHS) were obtained from Version 1 of the NPHPSP local public health system performance assessment instrument
- EPHS score is the average of all indicators of the model standards that fall under an EPHS
- 11 variables (1 for each EPHS & Overall)

Data: Independent Variables

- Characteristics of public health agency structure, finance, organization and management were obtained from the 2005 NACCHO Profile
- County-level information on area demographic, socioeconomic, and health resource characteristics were obtained from the 2005 ARF
- Federal public health spending was obtained from the Census Bureau's 2005 Consolidated Federal Funds Report (CFFR)

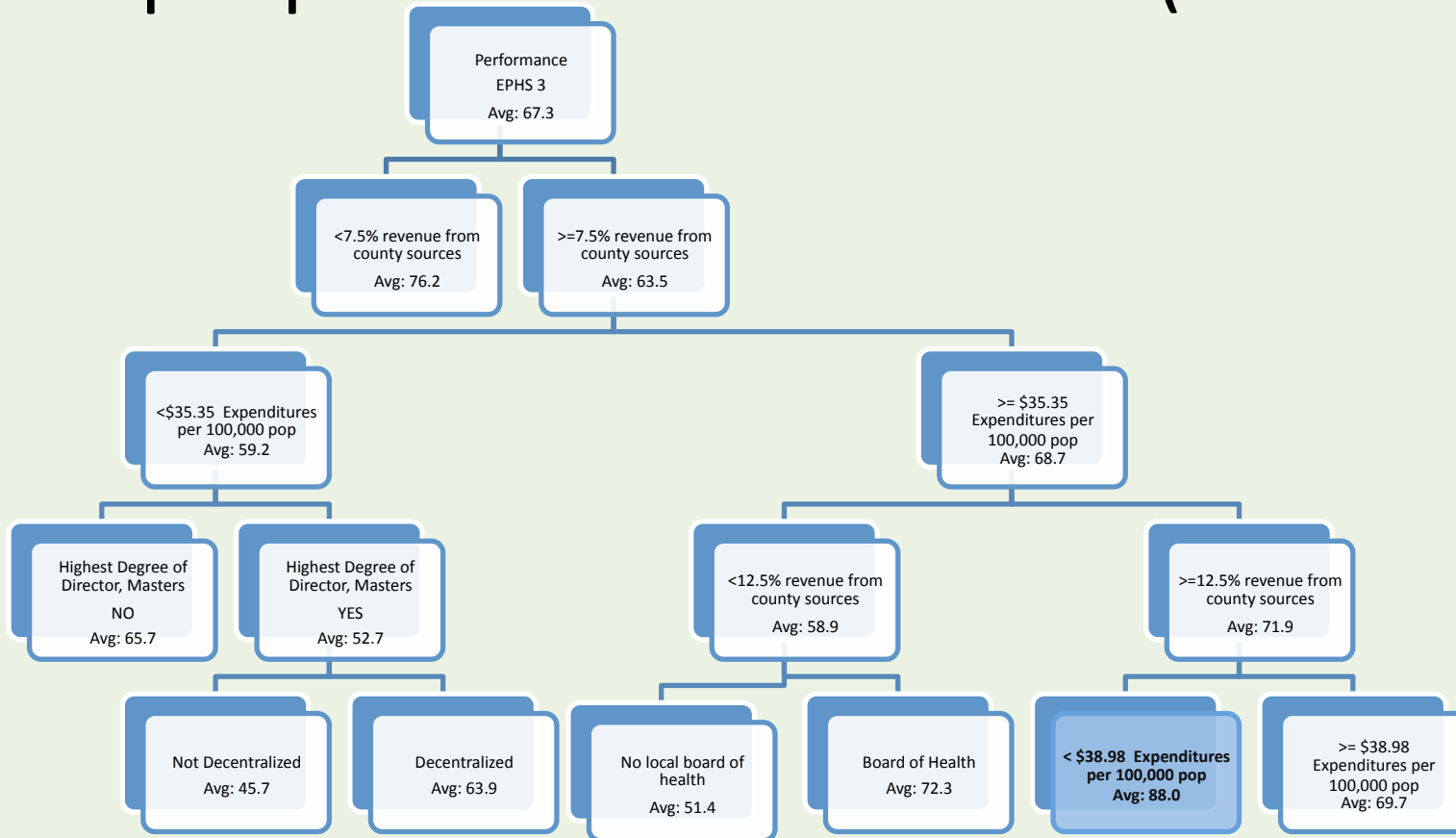
Data

- Data sets were linked by jurisdiction to create one large data set that includes over 1,800 variables.
- Only jurisdictions with data from all sources were included in this project.
- Number of variables used in the study was reduced based on previous research.
- The reduced dataset used in this study includes 82 variables from 353 local jurisdictions.

Analysis

- Adjusted some independent variables by converting continuous to dichotomous and log transforming variables with skewed distributions
- Regression trees were used to explore relationships between measures of public health system performance on the 10 essential public health services (EPHS) and measures of community characteristics and agency infrastructure
- Regression trees were created for total performance and each of the 10 EPHS

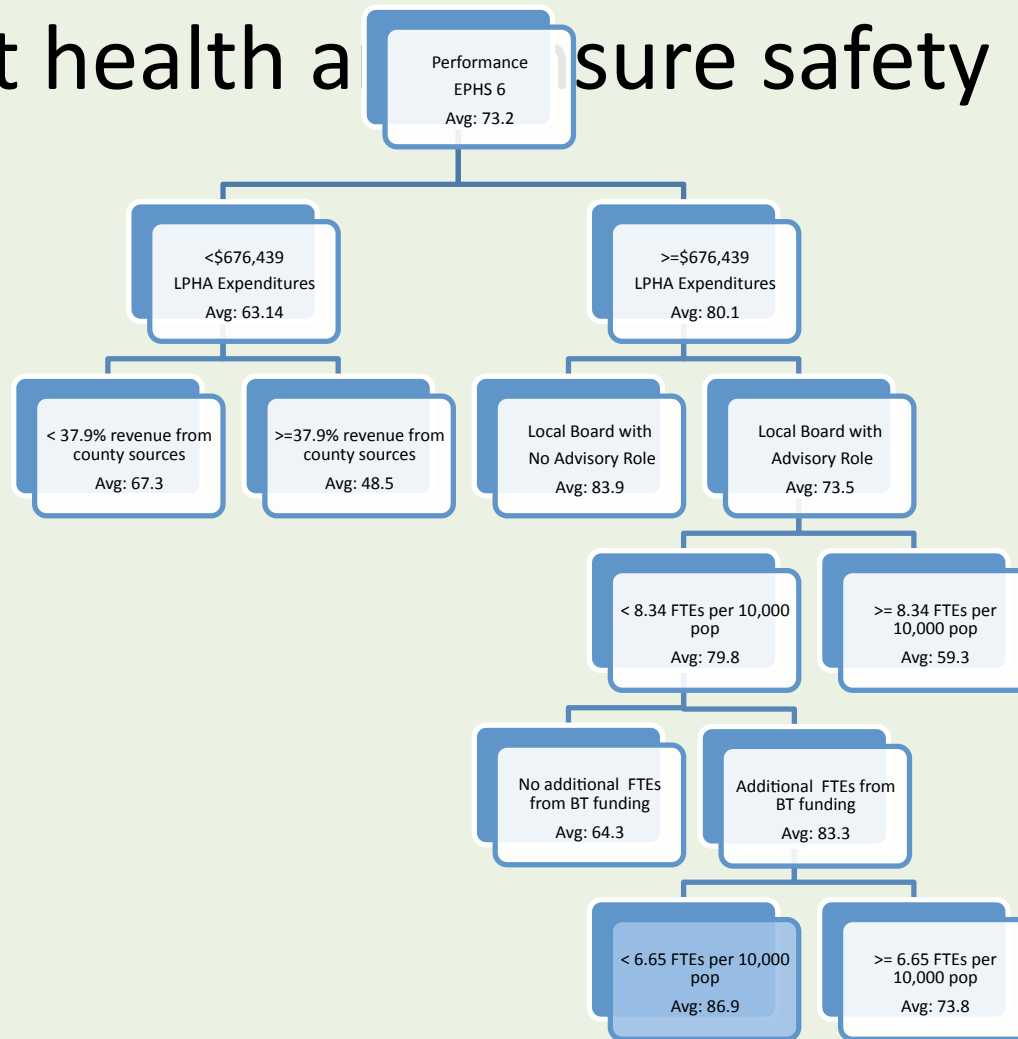
EPHS 3 - Inform, educate, and empower people about health issues ($R^2=0.25$)



Conclusions

- EHPS 3:
 - Systems with a low % of revenue from county sources, lower per capita expenditures, and a board of health yield highest possible performance
 - Systems with low per capita total LPHA expenditures, a director with a Masters degree, and in a centralized/mixed relationship with state yield poorer performance

EPHS 6 - Enforce laws and regulations that protect health and ensure safety ($R^2=0.36$)



Conclusions

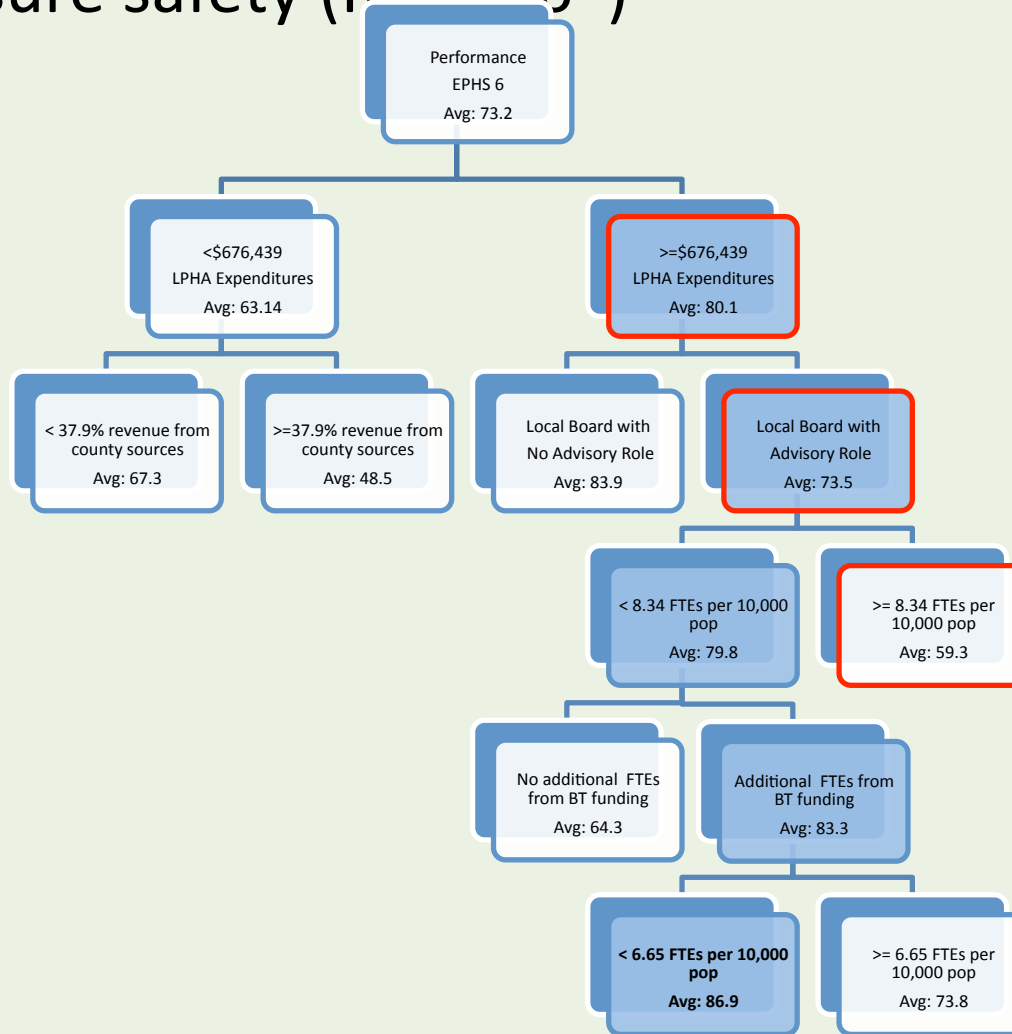
- EHPS 6:
 - Systems with higher LPHA total expenditures, a BOH that advises, fewer FTEs per capita, and additional FTES from BT yield highest possible performance
 - Systems with low LPHA total expenditures and a higher % from county resources yield poorer performance

How to use a regression tree

- Compare actual vs. predicted performance
- Example using The Plain County Public Health Department with an actual performance of 56% on EPHS 6 vs. predicted of
 - \$5 million in total expenditures
 - Function of the local board of health--advisory
 - 10 FTEs per 10,000
 - No additional FTEs from BT funding

How to use a regression tree

EPHS 6 - Enforce laws and regulations that protect health and ensure safety ($R^2=0.36$)



•Blue boxes are predicted path

•Red outlined boxes are actual performance

•Compare predicted vs. actual and make improvements where possible

Discussion

- Regression trees can be useful tools in performance improvement and in benchmarking or setting performance goals
 - Plain County Actual vs. Predicted Performance
 - Compared to similar agencies, performance on EPHS 6 is lacking and could be improved
 - Make improvements based on the pathway suggested by the “branches” or nodes of the tree

Discussion

- Regression trees can be used as complements to other methods such as linear regression in predicting performance
 - Trees are easier to interpret but may be considered to have weak predictability
 - Although, the R-squares were similar to those found with linear regression

Discussion

- Several variables had to be transformed leading to loss of information
- Need to improve the quality of explanatory variables to provide more meaning
- Data harmonization of primary data sets could improve quality of variables
- Analysis limited by use of self-reported data

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QUESTIONS??