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A Method for Identifying Positive Deviant Local Health Departments in Maternal and Child Health

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Background

- LHDs are responsible for many MCH services, but have limited resources.
- Some LHDs have managed to achieve better than expected MCH outcomes compared to peers.

Purpose

To use a positive deviance framework to identify LHDs that have consistently better MCH outcomes than their peers

Methods

- 2009-2010 Public Health Activities and Services Tracking (PHAST) data for FL (n=67) and WA (n=35)

- X = variables within LHD control including alternative providers in the community, clinician as an LHDs "top executive," and types of services the LHD provides
- Z = variables not under LHD control (Z) including population size, geography, and (arguably) the size of their budgets
- Y = outcomes (county-level rates of teen births, late or no prenatal care, infant mortality, % of low weight births)

Step 1: Regressed *Y=a+b1(Z)+e*
Step 2: Added in X variables *Y=a+b1(Z)+b2(X)+e*
Step 3: Likelihood ratio test to determine whether the internal control variables improved the explanatory power of the model.

- PDs = standardized residuals <-1

Results

Table 1: Descriptive Statistics for MCH Outcomes

	FL		WA	
Outcomes	Mean	Standard Deviation	Mean	Standard Deviation
Percent of all births with low birth weight	9.97	1.65	5.85	1.08
Infant Mortality Rate per 1,000	7.1	2.67	5.03	2.93
Percent of births that received no or late pre-natal care	4.46	1.86	4.49	1.97
Teen Birth Rate	46.57	15.75	36.5	20.83

Table 2: Range and Mean of per capita expenditures for maternal child health expenditure areas

State		LHDs	PDs (%)	Total Maternal Child Health Expenditures* non-PDs	Total Maternal Child Health Expenditures* PDs	WIC Expenditures non-PDs	WIC Expenditures PDs	Family Planning Expenditures non-PDs	Family Planning Expenditures PDs	Maternal, Infant, Child and Adolescent Health Expenditures non-PDs	Maternal, Infant, Child and Adolescent Health Expenditures PDs
FL	Rural	18	7 (39%)	$ 5.78-35.67 (19.68)	$ 7.64-33.26 (22.71)	$ 0-21.20 (1.91)	$ 0-0.89 (0.22)	$ 4.49-15.42 (9.36)	$ 2.38-16.03 (8.49)	$ 0.01-23.60 (8.42)	$ 4.48-22.41 (14.00)
	Micro	10	2 (2%)	$ 8.56-46.36 (20.80)	$ 28.05-36.26 (32.98)	$ 0.02-11.45 (4.80)	$ 0.02-11.05 (5.52)	$ 4.01-15.84 (6.27)	$ 9.12-20.72 (14.13)	$ 0.06-30.82 (9.73)	$ 10.57-16.09 (13.33)
	Metro	39	15 (38%)	$ 7.26-27.69 (15.49)	$ 7.49-56.38 (16.93)	$ 0-11.89 (5.40)	$ 0.02-15.01 (5.15)	$ 1.22-9.59 (4.06)	$ 1.97-10.87 (4.33)	$ 0.26-16.85 (6.02)	$ 0.32-32.04 (7.44)
WA	Rural	11	3 (27%)	$ 3.44-32.20 (15.16)	$ 17.17-25.95 (21.22)	$ 0-8.68 (3.96)	$ 4.98-8.97 (7.31)	$ 0-17.86 (3.84)	$ 0-10.27 (5.55)	$ 2.36-18.83 (7.37)	$ 3.14-11.81 (8.36)
	Micro	11	3 (27%)	$ 1.21-9.40 (5.77)	$ 2.36-6.21 (4.48)	$ 0-5.33 (2.90)	$ 0-3.43 (1.55)	$ 0 - 0.64 (0.08)	$ 0-0.01 (0)	$ 1.02-4.67 (2.79)	$ 1.09-5.11 (2.92)
	Metro	13	4 (31%)	$ 0.82-27.52 (9.30)	$ 0.73-11.71 (7.32)	$ 0-4.71 (1.78)	$ 0-4.98 (2.76)	$ 0-10.09 (2.15)	$ 0-2.87 (1.14)	$ 0.82-18.78 (5.36)	$ 0.73-5.36 (3.42)
Combined	Rural	29	10 (34%)	$ 3.45-35.67 (17.81)	$ 7.64-33.21 (22.27)	$ 0-21.20 (2.76)	$ 0-8.97 (2.30)	$ 0-17.86 (7.06)	$ 0-16.02 (7.63)	$ 0.01-23.60 (7.99)	$ 3.14-22.41 (12.34)
	Micro	21	5 (24%)	$ 1.21-46.36 (13.78)	$ 2.36-36.26 (15.88)	$ 0-11.45 (3.91)	$ 0-11.05 (3.14)	$ 0-15.83 (3.38)	$ 0-20.72 (5.65)	$ 0.06-30.82 (6.49)	$ 1.09-16.09 (7.08)
	Metro	52	19 (37%)	$ 0.82-27.67 (13.82)	$ 0.73-56.38 (14.85)	$ 0-11.87 (4.43)	$ 0-15.01 (4.63)	$ 0-10.09 (3.55)	$ 0-10.87 (3.64)	$ 0.26-18.78 (5.84)	$ 0.32-32.04 (6.57)

Results

- 34 PD LHDs [WA=10(29%); FL=24(29%)]
- 30 of 34 LHDs (WA=10; FL=20) had better than expected MCH outcomes over 2 years
- 22 LHDs (WA=5; FL=17) had 2 or more exceptional outcomes in a study year (Table 1)
- PD LHDs varied by context in proportion to all LHDs
  - (metropolitan=19; micropolitan=5; rural=10)
- Range of expenditures varied similarly in all LHDs and PD LHDs (Table 2)

Implications

- LHD factors other than financial resources have influenced these MCH outcomes
- Additional research is needed to

Source: Universalia Institutional and Organizational Assessment Model (IOA Model)

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