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Identifying Positive Deviant Local Health Departments in Maternal and Child Health

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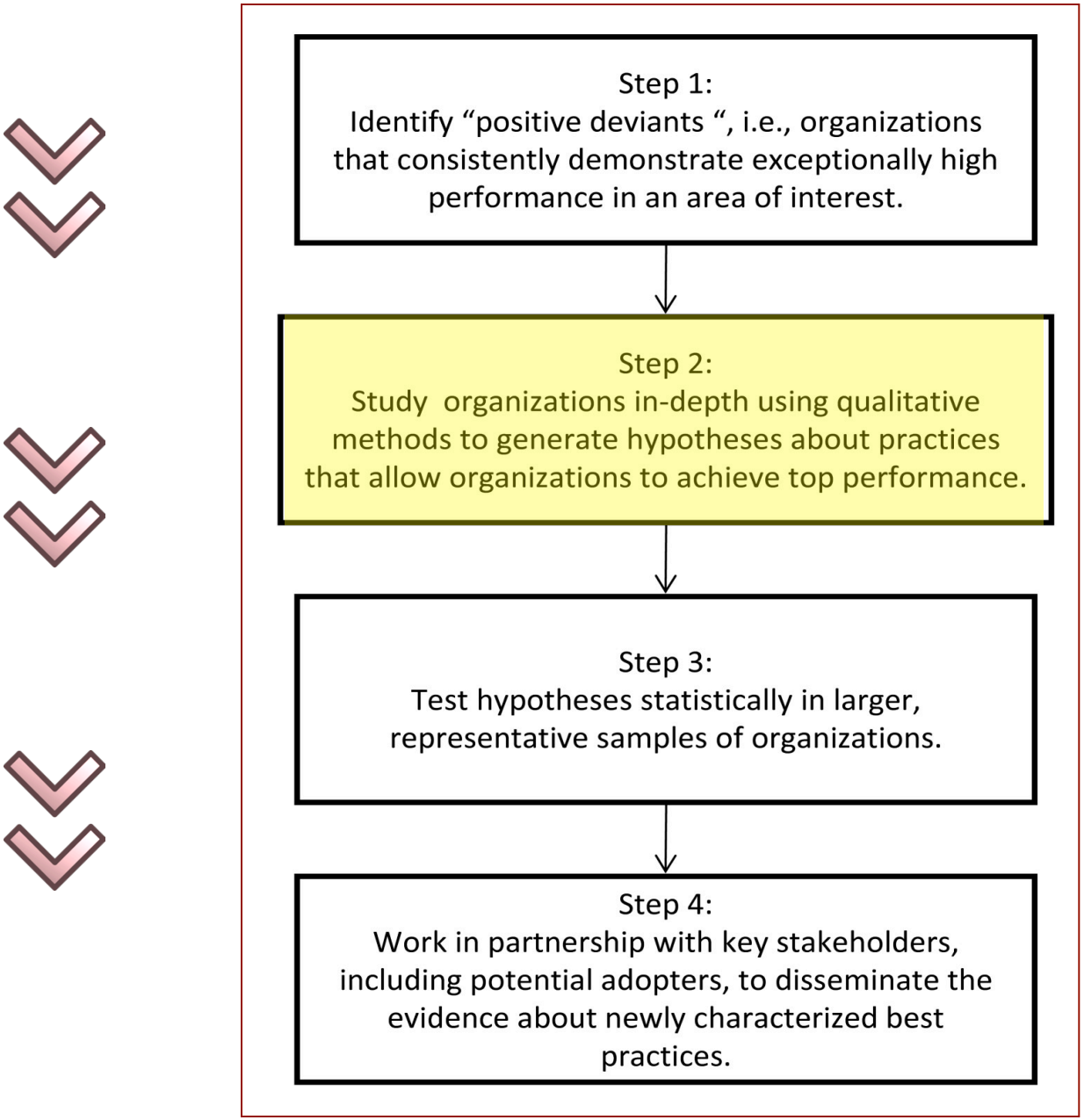
Research Objective

To identify and learn from LHD jurisdictions that perform better than expected in MCH outcomes compared to peers

Framework: Positive Deviance

- Used to identify and learn from units that perform beyond expectations
- Defined by context
- Performance Improvement

Framework: Positive Deviance Method



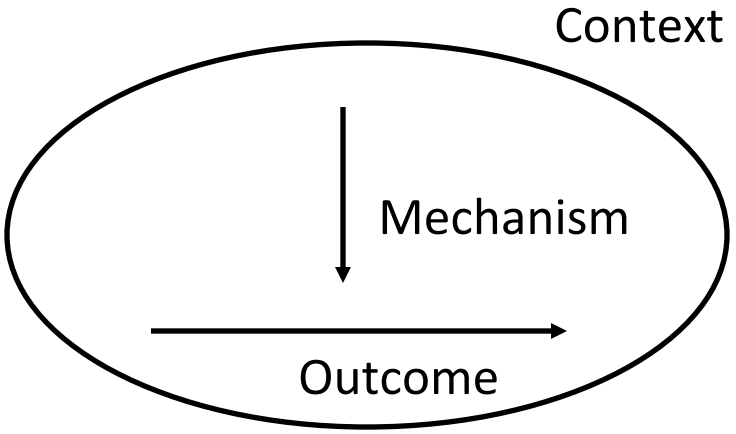
Framework: Realist Evaluation (Pawson and Tilley)

Context: LHD environment (budget, population, geography)

Mechanisms: leadership, partnerships, service provisions

Outcomes:

- Teen pregnancy rates
- Low birth weight
- Pre-natal care
- Infant mortality rate



C + M = O

Methods

- 2009-2010 Public Health Activities and Services Tracking (PHAST) data
  - WA (n=35), FL (n=67), NY [n=48 (excluded NYC and 9 additional LHDs)] uniquely detailed and matched annual MCH-related county-level expenditure data

C+M=O Variables

Context (Z) = those over which LHDs have no control

- population size
- geography
- budgets

Mechanisms (X) = Variables over which LHD leaders and boards have some internal control (X)

- assuring service through alternative providers in the community
- having a clinician as an LHDs “top executive”
- the types of services the LHD provides

Outcomes (Y)

- county-level rates of teen births
- late or no prenatal care
- infant mortality
- percent of low weight births

Methods: Quantitative

- **Step 1:** We regressed $y=\alpha + \beta_1 (Z) + e$ to identify high performers in each outcome taking into account local contextual factors.
- **Step 2:** We added in X variables $Y=a+b1(Z) +b2(X)+e$ to assess how well the model fit when including LHD-controlled variables.
- **Step 3:** Likelihood ratio test to evaluate whether the inclusion of mechanism additional variables improved model fit.

See: Klaiman, T.; Pantazis, A.; Bekemeier, B. (2014). "A Method for Identifying Positive Deviant Local Health Departments in Maternal and Child Health." *Frontiers in Public Health Systems and Services Research*. 3(2): Article 5. Available at http://uknowledge.uky.edu/frontiersinphssr/vol3/iss2/5/

Positive Deviant Identification Regression Results

State	Model Outcomes	R^2		Likeilhood Ratio Test
		Step 1	Step 2	*p-value*
Florida	Teen pregnancy rate	0.65	0.69	**0.001**
	Infant Mortality rate	0.23	0.27	**0.03**
	Late or no prenatal care rate	0.10	0.20	**0.002**
	Low birth weight rate	0.45	0.52	**< 0.001**
New York	Teen pregnancy rate	0.50	0.51	0.17
	Infant Mortality rate	0.32	0.33	0.12
	Late or no prenatal care rate	0.55	0.65	**< 0.001**
	Low birth weight rate	0.28	0.39	**0.001**
Washington	Teen pregnancy rate	0.82	0.84	**0.005**
	Infant Mortality rate	0.22	0.33	**0.005**
	Late or no prenatal care rate	0.33	0.53	**< 0.001**
	Low birth weight rate	0.30	0.50	**< 0.001**

Results

- 50 positive deviant LHDs across 3 states:
  - WA= 10 (29%)
  - FL= 24 (36%)
  - NY = 16 (33%)
- 45 of 50 LHDs (90%) had better than expected MCH outcomes over 2 years,
- 25 LHDs (50%) had 2 or more exceptional outcomes in a single study year

Results: MCH Expenditures – PDs and non-PDs

State		LHDs	PDs (%)	Total Maternal Child Health Expenditures*		WIC Expenditures		Family Planning Expenditures		Maternal, Infant, Child and Adolescent Health Expenditures	
				non-PDs	*PDs*	*non-PDs*	*PDs*	*non-PDs*	*PDs*	*non-PDs*	*PDs*
FL	*Rural*	18 (27%)	7 (29%)	$ 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 (9.35)	$ 2.38-16.03 (8.49)	$ 0.01-23.60 (8.42)	$ 4.48-22.41 (14.00)
	Micro	10 (15%)	2 (8%)	$ 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 (58%)	15 (63%)	$ 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)
NY	*Rural*	9 (19%)	4 (25%)	$ 0.25-14.06 (5.77)	$ 1.18-16.61 (7.94)	$ 0-8.70 (1.76)	$ 0.26-7.48 (2.42)	$ 0-13.87 (2.54)	$ 0.03-8.77 (4.46)	$0.10-6.13 (1.47)	$ 0.04-3.03 (1.06)
	Micro	13 (27%)	5 (31%)	$ 0.30-12.90 (2.56)	$ 1.38-20.55 (9.92)	$ 0.01-8.05 (1.40)	$ 0.12-10.12 (3.28)	$ 0-6.52 (0.43)	$0.04-17.37 (4.75)	$ 0.08-2.41 (0.72)	$ 0.24-3.62 (1.89)
	Metro	26 (54%)	7 (44%)	$ 0.02-13.70 (4.81)	$ 1.07-20.39 (7.50)	$ 0-7.77 (2.28)	$ 0-6.54 (3.71)	$ 0-3.11 (0.30)	$ 0-3.18 (0.62)	$ 0-8.31 (2.22)	$ 0.86-11.14 (3.17)
WA	*Rural*	11 (31%)	3 (30%)	$ 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 (31%)	3 (30%)	$ 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 (37%)	4 (40%)	$ 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*	38 (25%)	14 (28%)	$0.25-35.67 (15.44)	$1.18 - 33.21 (17.68)	$ 0-21.20 (2.56)	$ 0-8.97 (2.34)	$ 0-17.86 (6.18)	$ 0-16.03 (6.61)	$ 0.01-23.60 (6.71)	$ 0.04-22.41 (8.73)
	Micro	34 (23%)	10 (20%)	$0.30-46.36 (9.72)	$ 1.38 - 35.26 (13.05)	$ 0-11.45 (3.00)	$ 0-11.05 (3.21)	$ 0-15.84 (2.31)	$ 0-20.72 (5.23)	$ 0.06-30.82 (4.40)	$ 0.23-16.09 (4.62)
	Metro	78 (52%)	26 (52%)	$ 0.17-27.69 (10.50)	$0.73 - 56.37 (13.00)	$ 0-11.87 (3.64)	$ 0-15.01 (4.40)	$ 0-10.09 (2.36)	$ 0-10.87 (2.86)	$ 0.01-18.78 (4.50)	$ 0.32 - 32.04 (5.75)

Next Steps

- Positive deviance can be used to ID high performers
- Mechanisms matter, but it is not clear how
- Conducting in-depth analysis to identify the *mechanisms* that lead to exceptional outcomes

Thank you!

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  - JoAnne Fischer
  - Carol Brady

Questions??