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# A State-Level Analysis of Maternal and Child Health Partnerships among Indiana Local Health Departments

## Abstract

**Background:** As one of many organizations within a system of networks, numerous U.S. local health departments (LHDs) use partnerships as a structural intervention to address physical, mental, social concerns of women and infants.

**Purpose:** This state level study examines current levels of maternal and child partnerships among Indiana LHDs and sectors in the public health system. Geography and organizational readiness (infant mortality listed as a goal in the strategic plan) were used as proxy measures to examine how likely LHDs work with these sectors.

**Methods:** An eighteen-item online survey was administered to 93 LHDs collected between March and June 2014. Descriptive and Pearson Chi-Square analyses were conducted using SPSS 23.0.

**Results:** LHDs reported having more formal (coordinating, cooperating, collaborating) partnerships with hospitals, the state health department, and physician practices/medical groups. LHDs less frequently reported partnerships with transportation, midwives, and parks and recreation. Furthermore, LHDs in non-metropolitan LHDs were more likely to have both informal and formal partnerships with non-public health sectors than LHDs in metropolitan jurisdictions. LHDs that did not have infant mortality as a goal in their strategic plan were more likely to have informal partnerships with health care, health insurance, and quasi-governmental organizations.

**Implications:** This study presents opportunities to further explore the influence of contextual and functional characteristics in existing LHD partnerships that focus on women and infants.

## Keywords

public health partnerships, maternal and child health, contextual characteristics

## Cover Page Footnote

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## INTRODUCTION

**M**ulti-sectoral partnerships have been documented in enhancing connectivity.<sup>1</sup> Some of these sectors include, but are not limited to healthcare providers, health and human services, education, public safety and environmental health, and recreation. As one of many organizations within a system of networks, numerous U.S. local health departments (LHDs) use partnerships as a structural intervention to address physical, mental, social concerns of women and infants.<sup>2</sup> Different types of relationships exist between sectors in local public health systems depending on the purpose of the partnership. Partnerships can be informal and based on exchange of information (networking) while formal relationships involve altering activities (coordination), resource sharing (cooperation), or joint planning (collaboration). Contextual and functional characteristics can also influence the presence of LHD partnerships. The location of LHDs (e.g., metropolitan versus nonmetropolitan) and the identification of public health goals (organizational readiness) aimed to decrease the infant mortality rate can influence whether these partnerships are able to create community and system change.

National partnership studies have been conducted, but can be quite limiting if all states are not represented. State level analyses provide an additional lens in exploring dynamics to cross-sectoral collaboration; in this case, examining the presence and predictors of maternal and infant health partnerships can be a strategy to improve health care access for women and children. In many states, infant mortality, deaths per 1000 live births, continues to be a major public health.<sup>3</sup> Historically, Indiana's infant mortality has been greater than the nation's average for over 100 years.<sup>4</sup> In 2013, the state ranked 39th of 50 states with a rate of 7.2 per 1000 births; a rate much higher than the nation's average at 6.0 per 1000 births.<sup>3</sup> In an effort to address this public health issue, infant mortality was identified as a top priority in the Indiana State Department of Health's strategic plan. As the state works to achieve goals related to this priority, it is important to assess the type and context in which LHD maternal and infant health partnerships operate. Thus, the purpose of this paper is to identify different types of partnerships that exist among Indiana LHDs that address health needs of women and infants. In addition, contextual and functional characteristics such as geography and organizational readiness are examined to determine the level in which these partnerships occur in a decentralized governed state.

## METHODS

An 18-item online survey was used to collect demographic information (e.g., size of county), programs and goals focused on infant mortality and maternal and child health partnerships that LHDs may have with different sectors in their jurisdiction. Partnership concepts were derived using Himmelman's Framework.<sup>5</sup> A list of sectors within public health system was obtained from the partnership and collaboration section of the 2008 National Association of County and City Health Officials (NACCHO).<sup>6</sup> All sectors that directly or indirectly contribute to the delivery of the Ten Essential Public Health Services were listed as partners that LHDs could

work with in addressing infant mortality. Face validity of the survey was tested with county health administrators participating in the Indiana Public Health Association Public Health Infrastructure Committee. The committee, in addition to, key informants ( $n=5$ ) working in local health departments provided input on survey administration. From these informational meetings, it was perceived that most Indiana LHDs had at least one public health nurse who may be directly or indirectly involved in maternal and child health partnerships. If not, it was believed that public health nurses know ‘who’ in the department could best response to the survey. Protocol was obtained through the Indiana University’s Institutional Review Board.

The survey was sent through a listserv to public health nurses working at LHDs ( $n=93$ ) in the state yielding 58% ( $n=54$ ) response rate. Data were collected from March to June 2014. At least 51% of public health nurses and 49% coordinators and administrators completed the survey. For the purposes of analysis, we categorized partnerships into two relational characteristics that LHDs described with sectors in their jurisdictions. The first type, informal partnership, primarily focuses on networking or exchanging ideas through print, electronic, or in personal media channels. The second type, formal partnership, involved altering activities, sharing resources, and building capacity to enhance population activities. These functions may be described as coordinating, cooperating, or collaborating. LHDs were also given the option to indicate no partnership activity if it was not present. Two characteristics were identified from the survey, which were used to determine the influence of informal and formal partnerships between LHDs and sector entities in their jurisdiction. The first characteristic, geography, was defined using a methodology created by Shah et al. based on the National Center of Health Statistics definition for urban–rural counties.<sup>7</sup> Two categories were created: metropolitan and nonmetropolitan. The second characteristic, organizational readiness to address infant mortality, was defined as the presence of a strategic plan mentioning decreasing infant mortality as a goal for the agency. Respondents selected *yes*, *no*, *do not know/not sure*, or *do not have a plan*. For the purposes of analysis, responses were dichotomized to *yes* and *no/do not know/no plan*. Data were analyzed in SPSS 23.0 employing descriptive and bivariate analyses.

## RESULTS

Local health departments reported having more formal (coordinating, cooperating, collaborating) partnerships with hospitals (64.1%), the state health department (62.5%), and physician practices/medical groups (50.0%). LHDs less frequently reported partnerships with transportation (84.6%), midwives (75.6%), and parks and recreation (70.7%); Table 1.

Local health departments in nonmetropolitan jurisdictions were more likely to partner with middle schools ( $p=0.018$ ) and libraries than LHDs in metropolitan jurisdictions ( $p=0.007$ ). Moreover, LHDs in nonmetropolitan counties were more likely to have formal partnerships with middle schools and libraries than LHDs in metropolitan counties. In addition, nonmetropolitan LHDs are more likely to have informal (networking) partnerships with libraries than

metropolitan LHDs ( $p=0.018$ ). LHDs that do not have infant mortality as a goal in their strategic plan were more likely to have informal partnerships with physician practices ( $p=0.008$ ), health insurers ( $p=0.039$ ), community health centers ( $p=0.009$ ), and cooperative extensions ( $p=0.033$ ); Table 2.

**Table 1. Types of maternal and child health inter-organizational partnerships reported by local health departments (LHD,  $n=54$ ) in Indiana, 2014**

|   | None*<br><i>n</i> (%) | Networking <sup>†</sup><br><i>n</i> (%) | C-C-C <sup>§</sup><br><i>n</i> (%) |
|---|-----------------------|---|------------------------------------|
| State Health Department ( $n=40$ ) <sup>¶</sup>                           | 4 (10.0)              | 11 (27.5)                               | 25 (62.5)                          |
| Hospitals ( $n=39$ )  | 5 (12.8)              | 9 (23.1)                                | 25 (64.1)                          |
| Physician Practices/Medical Groups ( $n=40$ )                             | 7 (17.5)              | 13 (32.5)                               | 20 (50.0)                          |
| Midwives ( $n=41$ )   | 31 (75.6)             | 4 (9.8)                                 | 6 (14.6)                           |
| Community Health Centers ( $n=37$ )                                       | 10 (27.0)             | 11 (29.7)                               | 16 (43.2)                          |
| Health Insurers ( $n=37$ )  | 19 (51.4)             | 9 (24.3)                                | 9 (24.3)                           |
| Cooperative Extensions ( $n=41$ )   | 19 (46.3)             | 10 (24.4)                               | 12 (29.3)                          |
| Middle Schools ( $n=41$ )   | 7 (17.1)              | 14 (34.1)                               | 20 (48.8)                          |
| High Schools ( $n=41$ )   | 6 (14.6)              | 13 (31.7)                               | 22 (53.7)                          |
| Parks and Recreation ( $n=41$ )   | 29 (70.7)             | 5 (12.2)                                | 7 (17.1)                           |
| Transportation ( $n=39$ )   | 33 (84.6)             | 2 (5.1)                                 | 4 (7.4)                            |
| Faith Communities ( $n=42$ )  | 18 (42.9)             | 11 (26.2)                               | 13 (31.0)                          |
| Community-based Nonprofits with Programs for Mothers & Infants ( $n=40$ ) | 12 (30.0)             | 10 (25.0)                               | 18 (45.0)                          |
| Libraries ( $n=40$ )  | 27 (67.5)             | 6 (15.0)                                | 7 (17.5)                           |
| Colleges and Universities ( $n=40$ )                                      | 24 (60.0)             | 5 (12.5)                                | 11 (27.5)                          |
| Business ( $n=40$ )   | 21 (52.5)             | 8 (20.0)                                | 11 (27.5)                          |
| Media (TV/Radio) ( $n=39$ )   | 14 (35.9)             | 10 (25.6)                               | 15 (38.5)                          |

\* This category includes responses of no partnership, not sure, or “this is our organization”.

<sup>†</sup> Networking includes the exchange of ideas and information for mutual benefit, often via newsletter, conferences, meetings, and electronic information sharing. It is the least formal form of partnership and requires little time or trust between partners.

<sup>§</sup> C-C-C (Coordinating, cooperating, or collaborating): “Coordinating involves the exchange of information and the altering of activities for a common purpose. Cooperating involves the exchange of information, altering activities and sharing resources. It requires a significant amount of time, high level of trust and sharing of turf. Collaborating includes enhancing the capacity of the other partner for mutual benefit and a common purpose, in addition to the above activities – the exchange of information, altering activities, and sharing of resources.”

<sup>¶</sup> The different sample sizes ( $n$ ) for each organization depends on missing data (set as system missing) or a response of “contracting” (set as system missing and excluded from analysis).

## IMPLICATIONS

This state level analysis of maternal and child partnerships in Indiana presents opportunities to strategically align organizations to address factors contributing to infant mortality for women from preconception to the first year of the infant’s life. In this study, formal partnerships with the state health department and health care institutions are most prominent, which is consistent with a recent study conducted by Issel et al. that showed LHDs most commonly reported maternal and child health collaboration with the healthcare sector.<sup>8</sup> The means in which these partnerships

**Table 2. Bivariate analysis of maternal and child health informal vs. formal inter-organizational partnerships reported by local health departments (LHD, n=54) in Indiana by classification of urban–rural counties and readiness, 2014**

| Contextual Factors   | Classification of Urban-Rural* Counties |           |              | Readiness†: Infant Mortality in Strategic Plan |          |              |
|--|---|-----------|--------------|--|----------|--------------|
|  | Metro                                   | Non-Metro | p-value§     | Yes  | No       | p-value§     |
| <b>Partnering agencies</b>   | 27                                      | 27        |              | 16   | 34       |              |
| <b>State health department (n=40)</b>  |   |           | 0.262        |  |          | 0.935        |
| None   | 3 (75)                                  | 1 (25)    |              | 1 (25)   | 3 (75)   |              |
| Networking   | 6 (55)                                  | 5 (45)    |              | 3 (27)   | 8 (73)   |              |
| Coordinating/Cooperating/Collaborating   | 9 (36)                                  | 16 (64)   |              | 8 (32)   | 17 (68)  |              |
| <b>Hospitals (n=39)</b>  |   |           | 0.972        |  |          | 0.330        |
| None   | 2 (40)                                  | 3 (60)    |              | 1 (20)   | 4 (80)   |              |
| Networking   | 4 (44)                                  | 5 (56)    |              | 1 (11)   | 8 (89)   |              |
| Coordinating/Cooperating/Collaborating   | 10 (40)                                 | 15 (60)   |              | 9 (36)   | 16 (64)  |              |
| <b>Physician practices/Medical groups (n=40)</b>                                 |   |           | 0.941        |  |          | <b>0.008</b> |
| None   | 3 (43)                                  | 4 (57)    |              | 4 (57)   | 3 (43)   |              |
| Networking   | 6 (46)                                  | 7 (54)    |              | 0 (0)  | 13 (100) |              |
| Coordinating/Cooperating/Collaborating   | 8 (40)                                  | 12 (60)   |              | 9 (45)   | 11 (55)  |              |
| <b>Midwives (n=41)</b>   |   |           | 0.905        |  |          | 0.248        |
| None   | 13 (42)                                 | 18 (58)   |              | 10 (32)  | 21 (68)  |              |
| Networking   | 2 (50)                                  | 2 (50)    |              | 0 (0)  | 4 (100)  |              |
| Coordinating/Cooperating/Collaborating   | 3 (50)                                  | 3 (50)    |              | 3 (50)   | 3 (50)   |              |
| <b>Community health centers (n=37)</b>   |   |           | 0.883        |  |          | <b>0.009</b> |
| None   | 4 (40)                                  | 6 (60)    |              | 1 (10)   | 9 (90)   |              |
| Networking   | 5 (45)                                  | 6 (55)    |              | 1 (9)  | 10 (91)  |              |
| Coordinating/Cooperating/Collaborating   | 8 (50)                                  | 8 (50)    |              | 9 (56)   | 7 (44)   |              |
| <b>Health insurers (n=37)</b>  |   |           | 0.459        |  |          | <b>0.039</b> |
| None   | 11 (58)                                 | 8 (42)    |              | 9 (47)   | 10 (53)  |              |
| Networking   | 3 (33)                                  | 6 (67)    |              | 0 (0)  | 9 (100)  |              |
| Coordinating/Cooperating/Collaborating   | 4 (44)                                  | 5 (56)    |              | 4 (44)   | 5 (56)   |              |
| <b>Cooperative extensions (n=41)</b>   |   |           | 0.674        |  |          | <b>0.033</b> |
| None   | 9 (47)                                  | 10 (53)   |              | 9 (47)   | 10 (53)  |              |
| Networking   | 5 (50)                                  | 5 (50)    |              | 0 (0)  | 10 (100) |              |
| Coordinating/Cooperating/Collaborating   | 4 (33)                                  | 8 (67)    |              | 4 (33)   | 8 (67)   |              |
| <b>Middle schools (n=41)</b>   |   |           | <b>0.018</b> |  |          | 0.051        |
| None   | 6 (86)                                  | 1 (14)    |              | 3 (43)   | 4 (57)   |              |
| Networking   | 7 (50)                                  | 7 (50)    |              | 1 (7)  | 13 (93)  |              |
| Coordinating/Cooperating/Collaborating   | 5 (25)                                  | 15 (75)   |              | 9 (45)   | 11 (55)  |              |
| <b>High schools (n=41)</b>   |   |           | 0.077        |  |          | 0.068        |
| None   | 5 (83)                                  | 1 (17)    |              | 2 (33)   | 4 (67)   |              |
| Networking   | 6 (46)                                  | 7 (54)    |              | 1 (8)  | 12 (92)  |              |
| Coordinating/Cooperating/Collaborating   | 7 (32)                                  | 15 (68)   |              | 10 (45)  | 12 (55)  |              |
| <b>Parks &amp; recreation (n=41)</b>   |   |           | 0.197        |  |          | 0.110        |
| None   | 15 (52)                                 | 14 (48)   |              | 9 (31)   | 20 (69)  |              |
| Networking   | 2 (40)                                  | 3 (60)    |              | 0 (0)  | 5 (100)  |              |
| Coordinating/Cooperating/Collaborating   | 1 (14)                                  | 6 (86)    |              | 4 (43)   | 3 (43)   |              |
| <b>Transportation (n=39)</b>   |   |           | 0.436        |  |          | 0.591        |
| None   | 15 (45)                                 | 18 (55)   |              | 11 (33)  | 22 (67)  |              |
| Networking   | 0 (0)                                   | 2 (100)   |              | 0 (0)  | 2 (100)  |              |
| Coordinating/Cooperating/Collaborating   | 2 (50)                                  | 2 (50)    |              | 1 (25)   | 3 (75)   |              |
| <b>Faith communities (n=42)</b>  |   |           | 0.716        |  |          | 0.312        |
| None   | 9 (50)                                  | 9 (50)    |              | 5 (28)   | 13 (72)  |              |
| Networking   | 4 (36)                                  | 7 (64)    |              | 2 (18)   | 9 (82)   |              |
| Coordinating/Cooperating/Collaborating   | 5 (38)                                  | 8 (62)    |              | 6 (46)   | 7 (54)   |              |
| <b>Community-based nonprofits with programs for mothers &amp; infants (n=40)</b> |   |           | 0.845        |  |          | 0.591        |
| None   | 5 (42)                                  | 7 (58)    |              | 4 (33)   | 8 (67)   |              |
| Networking   | 4 (40)                                  | 6 (60)    |              | 2 (20)   | 8 (80)   |              |
| Coordinating/Cooperating/Collaborating   | 9 (50)                                  | 9 (50)    |              | 7 (39)   | 11 (61)  |              |
| <b>Libraries (n=40)</b>  |   |           | <b>0.007</b> |  |          | 0.596        |

|   |         |         |       |        |         |       |
|---|---------|---------|-------|--------|---------|-------|
| None                                      | 16 (59) | 11 (41) |       | 9 (33) | 18 (67) |       |
| Networking                                | 0 (0)   | 6 (100) |       | 1 (17) | 5 (83)  |       |
| Coordinating/Cooperating/Collaborating    | 1 (14)  | 6 (86)  |       | 3 (43) | 4 (57)  |       |
| <b>Colleges &amp; universities (n=40)</b> |         |         | 0.971 |        |         | 0.252 |
| None                                      | 11 (46) | 13 (54) |       | 9 (37) | 15 (63) |       |
| Networking                                | 2 (40)  | 3 (60)  |       | 0 (0)  | 5 (100) |       |
| Coordinating/Cooperating/Collaborating    | 5 (45)  | 6 (55)  |       | 4 (36) | 7 (64)  |       |
| <b>Business (n=40)</b>                    |         |         | 0.143 |        |         | 0.082 |
| None                                      | 12 (57) | 9 (43)  |       | 8 (38) | 13 (62) |       |
| Networking                                | 2 (33)  | 6 (67)  |       | 0 (0)  | 8 (100) |       |
| Coordinating/Cooperating/Collaborating    | 3 (27)  | 8 (73)  |       | 5 (45) | 6 (55)  |       |
| <b>Media (TV/radio) (n=39)</b>            |         |         | 0.831 |        |         | 0.107 |
| None                                      | 7 (50)  | 7 (50)  |       | 3 (21) | 11 (79) |       |
| Networking                                | 5 (50)  | 5 (50)  |       | 1 (10) | 9 (90)  |       |
| Coordinating/Cooperating/Collaborating    | 6 (40)  | 9 (60)  |       | 7 (47) | 8 (53)  |       |

\* The classification of urban-rural counties is divided into metropolitan (large central, large fringe, medium, or small metro) and nonmetropolitan (micropolitan or noncore).

† Readiness of local health departments is measured by whether or not they have identified infant mortality in their strategic plan. Only 50 of the 54 local health departments responded to readiness. The “no” category includes responses of “no”, “don’t know”, or “we do not have a strategic plan”.

§ *p* values in bold-face indicate statistical significance at  $p < 0.05$

exist may vary due to contextual factors. Previous evidence suggest that metropolitan areas have different types of community partners with different levels of motivations for formation of collaborative networks. In this study, nonmetropolitan LHDs appear to form both informal and formal partnerships with sectors that do not have a primary mission to improve health. These sectors may serve as a ‘gateway or bridge’ to accessing populations that are most affected by infant mortality. LHDs’ readiness, as indicated by having infant mortality listed as a priority in the strategic plan, may serve as a “proxy” measure to consider in further examining activities related to partnership formation and sustainability. Informal partnerships with physician practices, community health centers, cooperative extension, and insurance companies were preferred because LHDs may deliver similar public health services to women, infants, and children. It may be more beneficial for LHDs to refer clients to these sectors, thus strengthening the overall system’s ability to assure the provision of health care services. In the next phase of this study, we will survey nonmetropolitan and metropolitan Indiana LHDs and their connections with partners in communities that denote infant mortality as a major priority and LHDs that simply listed as one of many priorities. On a national level, findings from this case study can be used to compare the 27 state health departments that have a decentralized/mainly decentralized governance structure and comprise single counties, which according to the NACCHO Profile represents over 60 percent of LHDs. One limitation to this study was the small sample size, which does not allow for multi-variable analysis. Due to small and zero cell problems, scale building was not possible for certain items; therefore, we had to use the individual items for analysis. Future studies will also explore how these partnerships form and sustain these connections, using mixed methods.

## SUMMARY BOX

**What is already known about this topic?** Past research reveals the types of partnerships that exist between local health departments and organizations in the public health system at a national level. Certain characteristics, such as geography and organizational structure, have been found to affect the presence of partnerships.

**What is added by this report?** This study provides a state level analysis focused on maternal and child health partnerships. Data were collected from LHD staff such as public health nurses, coordinators, and administrators to further examine differences in partnership activity by sector. This study also presents two new characteristics to measure partnership activity: geography as defined as metropolitan and nonmetropolitan and organizational readiness to address infant mortality.

**What are the implications for public health practice, policy, and research?** It is important for both state and local health departments to value both informal and formal partnerships as a means of building relational capacity that extend outside of the walls of their agency. Recognizing the influence of community and organizational context on infant mortality may help practitioners and policymakers identify inter-organizational strategies to further promote the reduction of infant mortality.

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