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Local Health Department Activities to Ensure Access to Care

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Abstract

Background—Local health departments (LHDs) can play an important role in linking people to personal health services and ensuring the provision of health care when it is otherwise unavailable. However, the extent to which LHDs are involved in ensuring access to health care in its jurisdictions is not well known.

Purpose—To provide nationally representative estimates of LHD involvement in specific activities to ensure access to healthcare services and to assess their association with macro-environment/community and LHD capacity and process characteristics.

Methods—Data used were from the 2010 National Profile of Local Health Departments Study, Area Resource Files, and the Association of State and Territorial Health Officials' 2010 Profile of State Public Health Agencies Survey. Data were analyzed in 2012.

Results—Approximately 66.0% of LHDs conducted activities to ensure access to medical care, 45.9% to dental care, and 32.0% to behavioral health care. About 28% of LHDs had not conducted activities to ensure access to health care in their jurisdictions in 2010. LHDs with higher per capita expenditures and larger jurisdiction population sizes were more likely to provide access to care services ($p < 0.05$).

Conclusions—There is substantial variation in LHD engagement in activities to ensure access to care. Differences in LHD capacity and the needs of the communities in which they are located may account for this variation. Further research is needed to determine whether this variation is associated with adverse population health outcomes.

Introduction

The landmark 1988 IOM report indicated that an important responsibility of local health departments (LHDs) is to "assure" that those who need care receive it, either by directly providing services or by brokering with other community providers.[1] One of the ten essential public health services (EPHS) is to "link people to needed personal health services and assure the provision of health care when otherwise unavailable."[2]

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Recent data indicate that more than 23,000 LHD jobs were lost in 2008–2009 alone, and 53% of LHDs had experienced funding cuts by early 2010.[3] Simultaneously, healthcare demand is increasing because of economic slowdown, rising unemployment, and loss of employer-provided insurance.[4] Although a recent IOM report[5] proposed gradual withdrawal by LHDs from provision of personal healthcare services,[5] ensuring healthcare access will remain an important function of the public health mission. Failure of a community healthcare system to accommodate the primary healthcare needs of under-served people is known to exacerbate health conditions, resulting in preventable hospitalizations and financial burdens to society.[6,7]

Access to health services through safety net providers has been examined.[6–10] The availability and quality of public health services vary widely across communities.[11–15] However, evidence is limited on LHD involvement in ensuring healthcare access, and on factors that influence this involvement. Such information could be useful in guiding public health theory and practice.

The current study is timely as the Patient Protection and Affordable Care Act (PPACA) will increase availability of health insurance coverage through Medicaid expansion, new health insurance exchanges, and health insurance mandates. Implementation of PPACA will create opportunity for the public health system and may result in adjustment of clinical service provision by public health departments as they reevaluate their roles.[16] However, LHDs will continue to be important in linking people to services and reducing disparities in access. Additionally, LHDs can facilitate outreach and enrollment in health insurance, partner with organizations such as community health centers, and influence providers to ensure access to health care.[17] With increased integration of public health and clinical service,[18] LHDs may pursue greater involvement in assuring access to care.

Conceptual Framework

Healthcare management theory suggests that provision of services in not-for-profit organizations such as LHDs is determined by community needs and LHD capacity to deliver them.[19] The current study applied a framework developed for performance assessment of public health systems,[20] with five inter-related components: macro-environment, structural capacity, processes, outcomes, and mission (Figure 1). *Macro-environment* refers to factors, such as community characteristics, that are not under LHD control but affect their existence and functioning. *Structural capacity* includes human and fiscal resources that LHDs use to accomplish their mission. *Processes* are the ten EPHS, and activities that LHDs execute in order to implement these, such as community health assessment and improvement planning. *Outcomes* are changes in community health status. The *mission* of an LHD is to carry out the three core functions of assessment, policy development, and assurance.[20]

Relationships between some framework components (e.g., structural capacity and processes) have been studied.[13,14,21] The current study hypothesized that LHDs serving disadvantaged communities (e.g., more people without health insurance), and those that have greater financial and human resources and well-functioning processes (e.g., a completed health assessment and community health plan) would be more likely to conduct activities to ensure healthcare access in their jurisdictions.

Methods

Data

The primary data source is the 2010 National Profile of Local Health Departments Study (Profile Study), conducted by the National Association of County and City Health Officials (NACCHO). The Profile Study provides a comprehensive account of U.S. LHD infrastructure and practice.[22] In 2010, in addition to the core questionnaire sent to all 2565 U.S. LHDs, a module questionnaire regarding assurance of care access was administered to a stratified random sample of 625 LHDs. The Profile Study data from 516 LHDs responding to the module questions were merged with the Health Resources and Services Administration's Area Resource File (ARF, 2009–2010 edition) to obtain county-level health resource information, and the Association of State and Territorial Health Officials' (ASTHO) 2010 Profile of State Public Health Agencies Survey,[23] for information on ensuring care access at the state level.

Dependent Variable Measures

In the Profile Study, LHD administrators were asked whether their LHD conducted specific activities to ensure access in their jurisdictions to medical care, dental care, and behavioral health services. The specific activities were (1) assessing gaps in access to services; (2) addressing gaps through direct provision of clinical services; (3) implementing strategies (e.g., referrals) to increase accessibility of existing services; and (4) implementing strategies to target healthcare needs of the underserved. The current study focused on Activities 2, 3, and 4. LHDs that conduct at least one activity type were coded as 1 separately for each type of care; otherwise they were coded as 0.

Independent Variable Measures

Following the conceptual model introduced above and prior research on LHD performance,[13,24] the following independent variables were selected:

Macro-environment/community factors—The jurisdiction characteristics were: (1) proportion of people without health insurance; (2) number of primary care physicians per 10,000 people; (3) number of hospital beds per 10,000 people; (4) presence of a federally qualified health center (FQHC; yes/no); (5) state public health agency's involvement level in ensuring healthcare access; (6) population size (<25,000, 25,000–49,999, 50,000–99,999, 100,000–499,999, ≥500,000); (7) jurisdiction type (county, city/township, and combined county–city/multicounty); (8) LHD governance characteristics (decentralized [local] and others [state and mixed]); and (9) presence of a local board of health (yes/no).

The first four community variables came from ARF and were measured at the county level. For LHDs with multi-county jurisdictions, the population-weighted average was calculated for the three ratio variables (1–3). For city/multicity LHDs, which do not match a specific county's federal information processing standards (FIPS) code, ARF data were merged with Profile Study data by ZIP code. FQHC was coded as 1 if there was at least one in the county, and 0 otherwise.

The fifth environmental factor variable came from the 2010 ASTHO survey,[23] which asked state agencies about their direct involvement in ten activities and programs for ensuring care access, including emergency services and health disparity initiatives. Involvement level ranged from 0 (none) to 9 (maximum) in 2010. The other variables (7–9) were taken from the Profile Study. To account for unobservable time-invariant regional effects, a geographic region variable (South, Northeast, Midwest, West) was included.

Structural capacity/resources—Measures of LHD structural capacity/resources were (1) annual LHD expenditure per capita; (2) number of full-time equivalent employees (FTEs) per 10,000 people; (3) budget cut in 2010 (yes/no; i.e., operating budget was lower in 2010 than in 2009); (4) characteristics of director, including full-time employment (yes/no); tenure as LHD director (in years); possessing an MD degree (yes/no); and (5) separate health officer position (yes/no, i.e., separate from agency director). Expenditure and FTE variables were classified into quintiles.

Process activities—Process activity variables were (yes/no): (1) completion of a community health assessment in the past 3 years; (2) development of a community health improvement plan in the past 3 years; and (3) LHD fundraising activities (e.g., preparing issue briefs for policymakers, providing testimony, communicating with legislators).

Data Analysis

Bivariate relationships were assessed, and then three separate multiple logistic regression models were run to assess associations between the probability of conducting activities to ensure access to healthcare services, and community factors, LHD capacity, and process activities. Analyses were conducted using Stata 11 SVY to account for the complex sampling design of the Profile Study and ensure that estimates are nationally representative. Significance level was $p<0.05$. Data were analyzed in 2012.

Results

Descriptive Statistics Results

Approximately 66.01% (95% CI=61.61%, 70.41%) of LHDs reported conducting at least one of three activities to ensure access to medical care; 45.90% (95% CI=41.38%, 50.42%) to dental care; and 32.01% (95% CI=27.83%, 36.18%) to behavioral health services (Figure 2). In 2010, 72% of LHDs reported conducting one or more of the three activities to ensure access to one or more of the three types of health services; the rest (28%) did not. Table 1 shows a bivariate relationship between independent variables and the three dependent variables.

Logistic Regression Results

Medical care model (Model I)—Those LHDs in states with more involved state public health agencies (AOR=0.85) were less likely to conduct activities to ensure access to medical care (Table 2). LHDs with larger jurisdiction population sizes (e.g., 50,000–99,999 and ≥500,000) (AOR=2.68; AOR=6.82) were more likely to conduct activities to ensure access to medical care than those with populations of <25,000. LHDs involved in

fundraising activities (AOR=2.93) were more likely to ensure access to medical care. In addition, LHDs with the per capita expenditure within the 2nd quintile ($21–$34 per capita) were more likely (marginally significant [AOR=3.05, p=0.062]) to conduct activities to ensure access to medical care than LHDs with per capita expenditure within the 1st quintile (<$21 per capita).

Dental care model (Model II)—Significant predictors of ensuring access to dental care were large jurisdiction population sizes, especially 50,000–99,999 (AOR=2.46) and 100,000–499,999 (AOR=2.44), and conducting fundraising activities (AOR=2.35). The 2nd quintile of per capita expenditure borders on significance (AOR=2.50, p=0.089; Table 2).

Behavioral health services model (Model III)—Factors significantly associated with ensuring access to behavioral health services included geographic location in the West (AOR=9.42); larger jurisdiction population size (e.g., ≥500,000) (AOR=3.55); having a full-time agency director (AOR=5.60); and conducting fundraising activities (AOR=2.34; Table 2).

Discussion

The results did not support the hypothesis that LHDs located in disadvantaged communities were more likely to conduct activities to ensure healthcare access. However, LHDs in states that had greater state agency involvement in ensuring access to health care were found to be significantly less likely to conduct such activities. This finding suggests that LHD decisions regarding ensuring access to medical care are conditioned on the extent of state agency involvement in providing this service.

In 2010, more than one in four LHDs reported not engaging in any of the three activities to ensure access to care: addressing gaps in access to care, increasing accessibility of care, and targeting the needs of the underserved. This finding might indicate a substantial gap in LHD provision of EPHS #7: “Link people to needed personal health services and ensure the provision of health care when otherwise unavailable.” Although debate remains as to whether LHDs should be involved in direct delivery of personal health care,[25–28] and some LHDs have outsourced or discontinued its provision,[26,29,30] LHDs’ role in ensuring access to needed health care has been well defined by IOM.[31]

Evidence is limited on the impact of environmental factors on LHDs’ strategic behaviors. Mays and colleagues[13] found that the community poverty rate was associated with better provision of EPHS #7, whereas physicians-to-population ratio had no association with EPHS #7. The current results do not suggest an association between community doctor availability or presence of an FQHC and LHD involvement in ensuring health-care access. Thus, medical doctors, FQHCs, and LHDs may not be competing for patients; that is, they serve their own, well-defined population segments.

Overall, LHDs with a jurisdiction population of more than 50,000 were more likely to conduct activities to ensure access to medical care and dental care. LHDs with a jurisdiction population of more than 500,000 were more likely to conduct activities to ensure access to

behavioral health services. These findings are consistent with previous studies that jurisdiction population size is an important correlate of public health service provision.[11,12,15,32] Turnock and colleagues found that health departments serving populations greater than 50,000 reported better performance of the ten public health practices,[15] and optimal LHD population size was found to be 50,000–500,000.[13,33]

In the West ($p<0.001$) and Midwest ($p=0.060$), LHDs were more likely to conduct activities to ensure access to behavioral services than those in the South. No regional effects were found for medical or dental care services. From a strategic management perspective, LHDs' decision to provide services is based on capacity to deliver services and on community needs.[19] Thus, the findings may reflect variation in the latter. It is beyond the scope of this study to ascertain access to care activities by other safety net providers (e.g., community health centers).[34,35] Future research is needed to assess the extent to which public health services complement clinical services, especially in medically underserved areas.

The relationship between per capita public health expenditure and ensuring access to health services was not linear. LHDs within the 2nd-quintile expenditure range ($21–$34) were more likely to conduct activities to ensure access to medical and dental care ($p<0.1$) than those within the 1st quintile. Other categories of the expenditure variable were not significant.

Those LHDs with a full-time director were more likely to conduct activities to ensure access to behavioral health services. The bivariate analyses show that LHDs with more FTEs were more likely to be engaged in ensuring access to care. Overall, the findings of this study are consistent with previous findings on associations between LHD resources and better performance in provision of all ten EPHS.[12,13,36]

The results also indicate that LHDs that conducted fundraising activities for access to health care were about three times more likely to conduct activities to ensure care access than those that did not, for all types of care. Thus, effective engagement and communication with local policymakers would help raise necessary funds.

Limitations

The study has several limitations. First, survey responses were self-reported and were not independently verified. Second, the validity of the four questions in assessing LHDs' assurance of healthcare access was not formally established. Third, outcome measures were binary; thus, the intensity of involvement in these activities could not be modeled. Fourth, there are other public health service providers in the community,[34] but information on these was not available for this analysis.

Conclusion

Substantial evidence indicates that access to appropriate health care can mitigate health status disparities and improve quality of care.[37,38] This study found that 28% of LHDs did not report conducting any of the activities to ensure access to care, which may be due to differences in LHD capacity and may be appropriate for community needs. LHD capacity to ensure access to care needs to be strengthened, especially for those LHDs with fewer

resources. Additional research is needed to assess the quality and optimal scope of LHD activities aimed at ensuring healthcare access, and to determine the added benefits of preventing adverse outcomes (e.g., unnecessary hospitalizations, emergency department visits) in communities where LHDs conducted such activities. Finally, a recent IOM report[5] recommended that a minimum package of public health services provided by LHDs be identified and fully funded. It may be helpful if this process addresses the extent to which this package should include activities that foster healthcare access.

References

1. IOM. The future of public health. Washington DC: IOM; 1988.
2. Public Health Functions Steering Committee. Public health in America. www.health.gov/phfunctions/public.htm
3. Willard R, Shah GH, Leep C, Ku L. Impact of the 2008–2010 economic recession on local health departments. J Public Health Manag Pract. 2012; 18(2):106–14. [PubMed: 22217535]
4. Holahan J. The 2007–09 recession and health insurance coverage. Health Aff (Millwood). 2011; 30(1):145–52. [PubMed: 21134911]
5. IOM. For the public's health: investing in a healthier future. www.iom.edu/Reports/2012/For-the-Publics-Health-Investing-in-a-Healthier-Future.aspx
6. Bindman AB, Chattopadhyay A, Auerback GM. Interruptions in Medicaid coverage and risk for hospitalization for ambulatory care-sensitive conditions. Ann Intern Med. 2008; 149(12):854–60. [PubMed: 19075204]
7. Felland LE, Ginsburg PB, Kishbauch GM. Improving health care access for low-income people: lessons from ascension health's community collaboratives. Health Aff (Millwood). 2011; 30(7): 1290–8. [PubMed: 21734203]
8. Forrest CB, Whelan EM. Primary care safety-net delivery sites in the U.S. : a comparison of community health centers, hospital outpatient departments, and physicians' offices. JAMA. 2000; 284(16):2077–83. [PubMed: 11042756]
9. Hadley J, Cunningham P. Availability of safety net providers and access to care of uninsured persons. Health Serv Res. 2004; 39(5):1527–46. [PubMed: 15333121]
10. Mobley L, Kuo TM, Bazzoli GJ. Erosion in the healthcare safety net: impacts on different population groups. Open Health Serv Policy J. 2011; 4:1–14. [PubMed: 21892377]
11. Kennedy VC. A study of local public health system performance in Texas. J Public Health Manag Pract. 2003; 9(3):183–7. [PubMed: 12747314]
12. Mays GP, Halverson PK, Baker EL, Stevens R, Vann JJ. Availability and perceived effectiveness of public health activities in the nation's most populous communities. Am J Public Health. 2004; 94(6):1019–26. [PubMed: 15249309]
13. Mays GP, McHugh MC, Shim K, et al. Institutional and economic determinants of public health system performance. Am J Public Health. 2006; 96(3):523–31. [PubMed: 16449584]
14. Scutchfield FD, Knight EA, Kelly AV, Bhandari MW, Vasilescu IP. Local public health agency capacity and its relationship to public health system performance. J Public Health Manag Pract. 2004; 10(3):204–15. [PubMed: 15253516]
15. Turnock BJ, Handler A, Hall W, Potsic S, Nalluri R, Vaughn EH. Local health department effectiveness in addressing the core functions of public health. Public Health Rep. 1994; 109(5): 653–8. [PubMed: 7938386]
16. IOM. Transforming the public health system: what are we learning?. iom.edu/Global/Perspectives/2012/TransformingPublicHealth.aspx
17. Derose KP, Gresenz CR, Ringel JS. Understanding disparities in health care access—and reducing them—through a focus on public health. Health Aff (Millwood). 2011; 30(10):1844–51. [PubMed: 21976325]

18. Scutchfield FD, Howard AF. Moving on upstream: the role of health departments in addressing socioecologic determinants of disease. Am J Prev Med. 2011; 40(1S1):S80–S83. [PubMed: 21146784]
19. Swayne, L.; Duncan, WJ.; Ginter, PM. Strategic management of health care organizations. 6. Hoboken NJ: Wiley; 2008.
20. Handler A, Issel M, Turnock B. A conceptual framework to measure performance of the public health system. Am J Public Health. 2001; 91(8):1235–9. [PubMed: 11499110]
21. Zhang X, Luo H, Gregg EW, et al. Obesity prevention and diabetes screening at local health departments. Am J Public Health. 2010; 100(8):1434–41. [PubMed: 20558810]
22. Leep CJ, Shah GH. NACCHO's National Profile of Local Health Departments study: the premier source of data on local health departments for surveillance, research, and policymaking. J Public Health Manag Pract. 2012; 18(2):186–9. [PubMed: 22286289]
23. Association of State and Territorial Health Officials' (ASTHO). ASTHO profile of state public health. 2 www.astho.org/uploadedFiles/_Publications/Files/Survey_Research.
24. Mays GP, Smith SA. Evidence links increases in public health spending to declines in preventable deaths. Health Aff (Millwood). 2011; 30(8):1585–93. [PubMed: 21778174]
25. American Public Health Association. The Local Health Department—services and responsibilities: an official statement of the American Public Health Association Adopted November 1, 1950. Am J Public Health Nations Health. 1951; 41(3):302–7. [PubMed: 18017280]
26. Keane C, Marx J, Ricci E. Privatization and the scope of public health: a national survey of local health department directors. Am J Public Health. 2001; 91(4):611–7. [PubMed: 11291374]
27. Metzler DF. Public health in a troubled world. Am J Public Health Nations Health. 1966; 56(2): 161–8. [PubMed: 5948211]
28. Terris M, Kramer NA. Medical care activities of full-time health departments. Am J Public Health Nations Health. 1949; 39(9):1129–35. [PubMed: 18140147]
29. Keane C. The effects of managerial beliefs on service: privatization and discontinuation in local health departments. Health Care Manage Rev. 2005; 30(1):52–61. [PubMed: 15773254]
30. Keane C, Marx J, Ricci E. Local health departments' mission to the uninsured. J Public Health Policy. 2003; 24(2):130–49. [PubMed: 14601535]
31. IOM. The future of public health. Washington DC: National Academies Press; 1988.
32. Freund CG, Liu Z. Local health department capacity and performance in New Jersey. J Public Health Manag Pract. 2000; 6(5):42–50. [PubMed: 11067660]
33. Suen J, Magruder C. National profile: overview of capabilities and core functions of local public health jurisdictions in 47 states, the District of Columbia, and 3 U.S. territories, 2000–2002. J Public Health Manag Pract. 2004; 10(1):2–12. [PubMed: 15018334]
34. Halverson PK, Miller CA, Kaluzny AD, Fried BJ, Schenck SE, Richards TB. Performing public health functions: the perceived contribution of public health and other community agencies. J Health Hum Serv Adm. 1996; 18(3):288–303. [PubMed: 10158617]
35. Mays GP, Halverson PK, Stevens R. The contributions of managed care plans to public health practice: evidence from the nation's largest local health departments. Public Health Rep. 2001; 116(S1):50–67. [PubMed: 11889275]
36. Handler AS, Turnock BJ. Local health department effectiveness in addressing the core functions of public health: essential ingredients. J Public Health Policy. 1996; 17(4):460–83. [PubMed: 9009540]
37. Shi L, Starfield B, Politzer R, Regan J. Primary care, self-rated health, and reductions in social disparities in health. Health Serv Res. 2002; 37(3):529–50. [PubMed: 12132594]
38. Politzer RM, Yoon J, Shi L, Hughes RG, Regan J, Gaston MH. Inequality in America: the contribution of health centers in reducing and eliminating disparities in access to care. Med Care Res Rev. 2001; 58(2):234–48. [PubMed: 11398647]

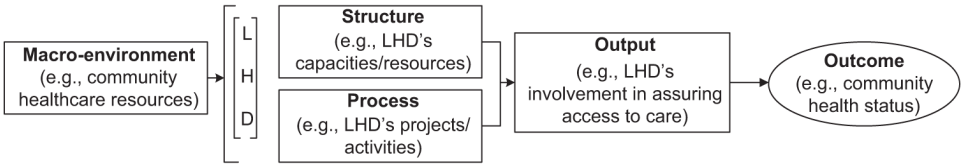

Figure 1.

A conceptual model of LHD involvement in ensuring access to care

LHD, local health department

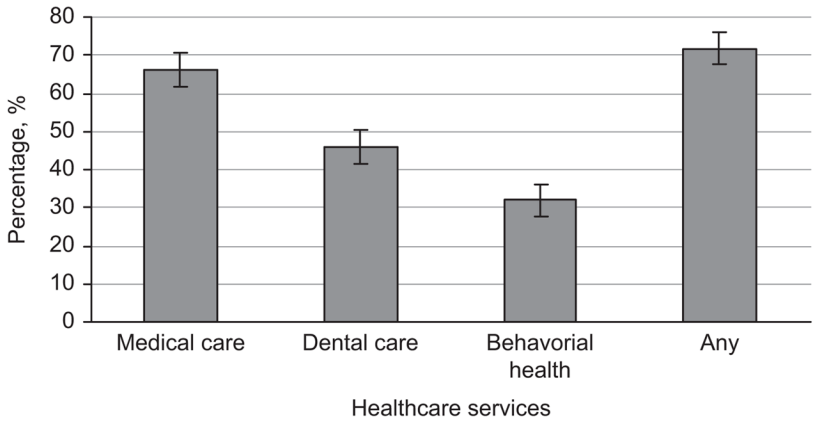

Figure 2.

Percentage of LHD involvement in ensuring access to medical, dental, and behavioral health care in 2010

LHD, local health department

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Table 1

Characteristics of LHDs that ensure access to medical, dental, and behavioral health care, % unless otherwise indicated

	Medical care		Dental care		Behavioral health services	
Variables	**Yes**	**No**	**Yes**	**No**	**Yes**	**No**
MACRO-ENVIRONMENT/COMMUNITY FACTORS						
Uninsured rate	13.46	12.77	13.41	13.07	13.19	13.24
Doctors per 10,000 population, *n*	0.30	0.26	0.29	0.28	0.25	0.30
Hospital beds per 10,000 population, *n*	34.21	29.10	32.19	32.70	33.23	32.11
Presence of FQHC	65.54	33.46	43.51	56.49	34.00	66.00
State agency involvement level in ensuring access to care	4.25	4.46	4.21	4.42	4.20	4.38
Geographic region						
South	**69.04** *	30.96	**43.17** **	56.83	**24.01** ***	75.99
Northeast	53.11	46.89	32.52	67.48	25.28	74.72
Midwest	66.65	33.35	49.41	50.59	34.89	65.11
West	74.05	25.95	59.99	40.01	52.43	47.57
LHD jurisdiction characteristics						
Jurisdiction population size (%)						
<25,000	**54.49** ***	45.51	**33.97** ***	66.03	**24.36** ***	75.64
25,000–49,999	70.21	29.79	47.87	52.13	29.79	70.21
50,000–99,999	71.60	28.40	50.62	49.38	34.57	65.43
100,000–499,999	77.37	22.63	62.68	37.32	44.20	55.80
≥500,000	87.27	12.73	63.54	36.46	53.91	46.09

Variables	Medical care		Dental care		Behavioral health services	
	Yes	No	Yes	No	Yes	No
Jurisdiction type						
County	68.31	31.69	**48.74** **	51.26	31.80	68.20
City/multi-city	56.44	43.56	29.99	70.01	26.66	73.34
Combined/multicounty	65.82	34.18	51.48	48.52	40.88	59.12
LHD governance characteristics						
Decentralized	67.00	33.00	47.58	52.42	**34.49** *	65.51
LHD with local board of health	66.28	33.72	46.29	53.71	32.04	67.96
LHD CAPACITIES/RESOURCES						
Per capita public health expenditure ($), by quintile						
1st (<21)	**48.53** **	51.47	**27.90** ***	72.10	**19.26** *	80.74
2nd (21–34)	76.73	23.27	54.48	45.52	36.52	63.48
3rd (35–50)	70.64	29.36	48.81	51.19	35.03	64.97
4th (51–80)	74.42	25.58	62.86	37.14	45.09	54.91
5th (≥81)	72.82	27.18	50.92	49.08	37.56	62.44
FTEs per 10,000 population, by quintile						
1st (<2.4)	**48.65** **	51.35	**28.66** **	71.34	**20.97** *	79.03
2nd (2.4–3.8)	63.93	36.07	47.74	52.26	32.18	67.82
3rd (3.9–6.1)	67.66	32.34	43.76	56.24	28.40	71.60
4th (6.2–9.2)	65.63	34.37	48.58	51.42	42.57	57.43
5th (≥9.3)	78.72	21.28	58.57	41.43	40.39	59.61

Variables	Medical care		Dental care		Behavioral health services	
	Yes	No	Yes	No	Yes	No
Budget-cut in 2010	66.57	33.43	48.40	51.60	37.12	62.88
LHD director characteristics						
Full-time	**67.40** *	32.60	48.07	51.93	**66.14** **	33.86
Tenure (M)	8.55	9.10	7.89	9.47	8.31	8.94
Director with MD degree	**78.53** *	21.47	**58.59** *	41.41	33.98	66.02
Health officer position	**70.62** **	29.38	49.61	50.39	35.35	64.65
LHD PROCESS ACTIVITIES						
Community assessment	**73.38** **	26.62	**57.18** ***	42.82	**63.01** *	36.99
Improvement program	**74.92** **	25.08	**59.26** ***	40.74	**61.17** *	38.83
Fundraising activities	**80.89** **	19.11	**63.76** ***	36.24	**52.29** **	47.71

Note: Boldface indicates significance. Estimates are weighted; 95% CIs are not presented in this table to simplify presentation.

* $p<0.05$,

** $p<0.01$,

*** $p<0.001$, according to χ^2 test or t-test where appropriate.

FQHC, federally qualified health center; LHD, local health department

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Table 2

Factors associated with LHDs' activities to ensure access to medical, dental, and behavioral health care

	Model I[a]		Model II[a]		Model III[a]	
Variables	**AOR (95% CI)**	***p*- value**	**AOR (95% CI)**	***p*- value**	**AOR (95% CI)**	***p*- value**
MACRO-ENVIRONMENT/COMMUNITY FACTORS						
Uninsured rate	1.01 (0.93, 1.11)	0.755	0.98 (0.91, 1.07)	0.678	0.93 (0.85, 1.02)	0.130
Doctors per 10,000 population	1.02 (0.45, 2.33)	0.960	1.05 (0.47, 2.38)	0.902	0.65 (0.23, 1.83)	0.411
Hospital beds per 10,000 population	1.01 (0.99, 1.02)	0.229	0.99 (0.99, 1.01)	0.965	1.00 (0.99, 1.01)	0.899
Presence of FQHC	1.21 (0.61, 2.38)	0.582	0.65 (0.35, 1.18)	0.153	1.07 (0.56, 2.06)	0.833
State agency involvement level in ensuring access to care	**0.85 (0.73, 0.98)**	0.025	0.94 (0.82, 1.08)	0.385	1.06 (0.92, 1.21)	0.420
Geographic region						
South	ref		ref		ref	
Northeast	0.44 (0.12, 1.66)	0.226	0.93 (0.26, 3.37)	0.916	1.32 (0.35, 4.98)	0.677
Midwest	0.84 (0.28, 2.59)	0.766	1.27 (0.47, 3.39)	0.638	2.69 (0.96, 7.52)	0.060
West	1.70 (0.50, 5.72)	0.393	2.65 (0.94, 7.47)	0.066	**9.42 (3.18, 27.90)**	0.000
LHD jurisdiction characteristics						
Jurisdiction population size						
<25,000	ref		ref		ref	
25,000–49,999	1.66 (0.75, 3.65)	0.212	1.63 (0.73, 3.63)	0.234	1.40 (0.62, 3.14)	0.418
50,000–99,999	**2.68 (1.07, 6.73)**	0.035	**2.46 (1.07, 5.62)**	0.033	1.35 (0.54, 3.40)	0.520
100,000–499,999	2.50 (0.93, 6.66)	0.068	**2.44 (1.00, 5.96)**	0.051	1.74 (0.69, 4.35)	0.239
≥500,000	**6.82 (1.80, 25.79)**	0.005	2.55 (0.83, 7.83)	0.101	**3.55 (1.15, 10.93)**	0.027

Variables	Model I[a] AOR (95% CI)	*p*- value	Model II[a] AOR (95% CI)	*p*- value	Model III[a] AOR (95% CI)	*p*- value
Jurisdiction type						
County	ref		ref		ref	
City/multi-city	2.35 (0.66, 8.40)	0.187	0.83 (0.33, 2.12)	0.703	2.06 (0.74, 5.71)	0.165
Combined/multicounty	0.84 (0.33, 2.13)	0.705	0.93 (0.40, 2.16)	0.863	1.48 (0.64, 3.38)	0.356
LHD governance characteristics						
Decentralized	1.69 (0.60, 4.79)	0.321	1.45 (0.56, 3.73)	0.444	0.90 (0.32, 2.49)	0.835
LHD with local board of health	0.57 (0.26, 1.23)	0.152	0.52 (0.26, 1.06)	0.071	0.54 (0.24, 1.19)	0.127
LHD CAPACITIES/RESOURCES						
Per capita public health expenditure ($), by quintile						
1st (<21)	ref		ref		ref	
2nd (21–34)	3.05 (0.95, 9.85)	0.062	2.50 (0.87, 7.16)	0.089	1.40 (0.47, 4.16)	0.543
3rd (35–50)	1.62 (0.49, 5.37)	0.426	1.64 (0.51, 5.26)	0.406	0.84 (0.24, 2.98)	0.784
4th (51–80)	1.68 (0.45, 6.33)	0.439	2.28 (0.63, 8.24)	0.206	2.30 (0.58, 9.07)	0.233
5th (≥81)	1.42 (0.31, 6.48)	0.649	1.45 (0.35, 6.01)	0.604	1.48 (0.34, 6.41)	0.599
FTEs per 10,000 population, by quintile						
1st (<2.4)	ref		ref		ref	
2nd (2.4–3.8)	1.08 (0.34, 3.46)	0.894	1.14 (0.36, 3.60)	0.827	1.00 (0.36, 2.78)	0.996
3rd (3.9–6.1)	2.04 (0.54, 7.77)	0.295	0.89 (0.28, 2.80)	0.841	1.16 (0.32, 4.14)	0.819
4th (6.2–9.2)	1.35 (0.34, 5.43)	0.668	1.28 (0.36, 4.61)	0.702	1.94 (0.50, 7.51)	0.334
5th (≥9.3)	3.47 (0.64, 18.79)	0.149	2.22 (0.48, 0.25)	0.305	1.79 (0.36, 8.88)	0.475

Variables	Model I[a] AOR (95% CI)	*p*- value	Model II[a] AOR (95% CI)	*p*- value	Model III[a] AOR (95% CI)	*p*- value
Budget-cut in 2010	0.59 (0.31, 1.12)	0.106	0.80 (0.45, 1.41)	0.439	1.38 (0.77, 2.48)	0.285
LHD director characteristics						
Full-time	1.16 (0.37, 3.64)	0.798	1.47 (0.43, 5.04)	0.539	**5.60 (1.13, 27.90)**	0.035
Tenure	1.00 (0.96, 1.04)	0.928	0.97 (0.94, 1.01)	0.107	1.00 (0.97, 1.04)	0.861
Director with MD degree	1.97 (0.69, 5.62)	0.207	1.65 (0.64, 4.24)	0.300	1.30 (0.55, 3.03)	0.550
Health officer position	1.30 (0.64, 2.63)	0.461	1.18 (0.62, 2.24)	0.613	1.01 (0.55, 1.87)	0.972
LHD PROCESS ACTIVITIES						
Community assessment	1.02 (0.50, 2.12)	0.950	1.19 (0.60, 2.36)	0.616	0.78 (0.40, 1.49)	0.445
Improvement program	1.42 (0.65, 3.11)	0.384	1.69 (0.85, 3.33)	0.133	1.68 (0.85, 3.31)	0.136
Fundraising activities	**2.93 (1.57, 5.47)**	0.001	**2.35 (1.39, 3.97)**	0.001	**2.34 (1.39, 3.92)**	0.001

[a]Model I: medical care model; Model II: dental care model; Model III: behavioral health service model

FQHC, federally qualified health center; LHD, local health department