

Funding and Service Delivery in Rural and Urban Local US Health Departments in 2010 and 2016

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Objectives. To investigate differences in funding and service delivery between rural and urban local health departments (LHDs) in the United States.

Methods. In this repeated cross-sectional study, we examined rural–urban differences in funding and service provision among LHDs over time using 2010 and 2016 National Association of County and City Health Officials data.

Results. Local revenue among urban LHDs (41.2%) was higher than that in large rural (31.3%) and small rural LHDs (31.2%; $P < .05$). Small (20.9%) and large rural LHDs (19.8%) reported greater reliance on revenue from Center for Medicare and Medicaid Services than urban LHDs (11.5%; $P < .05$). All experienced decreases in clinical revenue between 2010 and 2016. Urban LHDs provided less primary care services in 2016; rural LHDs provided more mental health and substance abuse services ($P < .05$).

Conclusions. Urban LHDs generated more revenues from local sources, and rural LHDs generated more from the Center for Medicare and Medicaid Services and clinical services. Rural LHDs tended to provide more clinical services. Given rural LHDs' reliance on clinical revenue, decreases in clinical services could have disproportionate effects on them.

Public Health Implications. Differences in financing and service delivery by rurality have an impact on the communities. Rural LHDs rely more heavily on state and federal dollars, which are vulnerable to changes in state and national health policy. (*Am J Public Health*. 2020;110:1293–1299. doi:10.2105/AJPH.2020.305757)

 See also the *AJPH* Rural Health section, pp. 1274–1343.

Local health departments (LHDs) contribute to population health improvement through the core functions of public health: assessment, policy development, and assurance, which are operationalized into the 10 Essential Public Health Services (10EPHS).¹ Common activities conducted by LHDs include conducting community health assessments; communicable disease prevention, investigation, and control; population health promotion; emergency preparedness and response; management of vital records and statistics; and environmental health, among others.^{1–3}

Secure and stable funding is vital to the ability of LHDs to fulfill their missions. Funding appears to be correlated with the provision of key public health services, proportionally affecting the performance of public health systems across the 10EPHS.⁴ A combination of local, state, and federal

resources finance services provided by LHDs. Most of this funding comes from federal sources and is supplemented by state and local funds, often through competitive grant programs.² Most LHDs also provide at least some direct services and have increased their ability to bill public and private payers for this work.^{5,6}

Over the past 30 years, there has been a shift in the role of public health agencies. The release of 2 important Institute of Medicine (IOM) reports reflect a shift in focus toward

population-based public health services.^{7,8} Although engagement in the core public health functions and 10EPHS remains the standard for measuring LHD performance, their role as a provider of clinical services remains uncertain—particularly in rural and underserved communities.

People residing in rural communities face many challenges related to health and health care. They are generally older and poorer, and have more risky health behaviors leading to worse health outcomes.⁹ Rural residents have higher rates of tobacco use, obesity, and physical inactivity.¹⁰ They also have higher incidences of cancer and higher rates of poor cancer outcomes.¹⁰ Rural residents are disproportionately affected by the social determinants of health, including lower socioeconomic status and lower rates of insurance, and live in states that did not expand Medicaid as part of the Affordable Care Act (ACA).¹⁰

Many LHDs operating in rural and historically underserved communities remain an integral part of a fragile safety net that ensures access to health care services. With a limited primary care infrastructure, it is unlikely that the demand for clinical services provided by LHDs will subside. This is true not only in states that did not expand Medicaid but also in expansion states, as many rural communities continue to experience severe shortages of health professionals. In fact, in many of these Medicaid expansion states, expanded insurance coverage may actually exacerbate existing

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provider and service shortages as more individuals join the insured population.¹¹ Uncertainty around the ACA and volatility in insurance markets further complicates decisions on safety-net service provision among LHDs.

The purpose of this study is twofold. First, we describe the proportions of funding sources for LHDs and compare the differences in these proportions between rural and urban agencies over time. The results of this analysis are intended to inform policymakers on the effects of budget cuts to LHDs and justify the assurance of secure and stable funding for LHDs, especially in the rural localities.

Second, as the focus on population health and health care systems reform continues, there is a need to better understand the current balance of LHDs as clinical service providers with that of population-based services. While LHD service provision is likely influenced by multiple factors, the extent to which LHDs are engaged in clinical and population-based services and potential geographic variation in delivery of these services remains an important issue. In this analysis, we examined clinical and population-based services delivery among LHDs by level of rurality over time.

METHODS

We used a repeated cross-sectional study design to examine the outcomes of interest. We linked the 2010 and 2016 National Association of County and City Health Officials National Profile of Local Health Departments (Profile) data and used the data to examine rural-urban differences in funding sources and geographic distribution of clinical and population-based service provision among LHDs over time.^{2,12} Though there were older Profiles (1998–1990, 1992–1993, 1996–1997, 2005, and 2008) and 1 in 2013, the 2010 and 2016 Profiles used comparable categories for funding sources. We used zip codes of the LHDs to identify corresponding Rural Urban Commuting Area codes, which served as the measure of rurality. Rural Urban Commuting Area codes are defined by US Department of Agriculture Economic Research Service and classify US census tracts by using measures of population density, urbanization, and daily commuting.¹³ We limited the data set to only individual county

or city LHD jurisdictions. We excluded LHDs serving multicounty jurisdictions or those reporting as a regional health department from the analysis. These multi-jurisdiction LHDs report both revenue and services provision collectively for all sites as a single organizational entity. Furthermore, we were not able to accurately differentiate levels of rurality among the counties and cities comprising the jurisdiction. These departments report as a single entity with the organizational lead located within the most populous area of the jurisdiction. Including them in the analysis may systematically underestimate the experiences of rural LHDs.

We constructed a categorical variable reflecting the 3 levels of rurality by using Rural Urban Commuting Area codes. “Small rural” included census tracts with towns of fewer than 10 000 population. “Large rural” included census tracts with towns of between 10 000 and 49 999 population and census tracts tied to these towns through commuting. “Urban” included census tracts with towns with a population of 50 000 or more.

We calculated the proportion of each revenue source relative to the total revenue reported for each respective year and used it as a primary outcome of interest. Sources of revenue captured in these data included local, state, federal (direct and pass through), Medicare and Medicaid (Center for Medicare and Medicaid Services; CMS), private insurance, patient personal fees, nonclinical fees and fines, private foundations, and other revenue sources. The LHDs’ responses indicating the amount of revenues from various sources for each fiscal year were recorded. Local sources included revenue that originated from county, city, or town government, including allocations from taxing districts, property tax, and school boards. State sources included all revenues received from state agencies. Federal sources are those that originated from the federal government, excluding CMS reimbursements, provided to LHDs directly or passed through from the states. Medicare and Medicaid sources include all revenue received from CMS insurance plans for CMS patients. Private insurance revenue is dollars received from private health insurers and patient personal fees generated through the provision of health care services and paid directly by the patient. The final sources included nonclinical fees and fines,

grants from private foundations, and other revenue sources. Other sources included the sum of revenues from all sources except the ones already listed, such as donations and interest income.¹⁴

Select services provided in each respective year were also of primary interest. Profile response options for how these services were provided varied between the 2010 and 2016 survey. Response options for services performed directly by the LHD, however, were consistent between the 2 years examined. We created a dichotomous measure reflecting whether the LHD provided this service directly and used it in the analysis. Responses to these questions were not mutually exclusive, meaning that LHDs could indicate having provided a service directly but also indicate some other response option as well.

We described characteristics of the study population, the distribution of revenue sources, and select services by year and rurality. We used a regression-based differences-in-differences (DID) analysis approach to examine geographic differences in revenue sources and the extent changes in LHD sources of revenue over time were consistent between LHDs by rurality. We specified separate linear regression models with the percentage of revenue from each respective source as the outcomes variable. We created a dichotomous variable for time reflecting responses from 2010 and 2016 and included it in the models. The models included measures for time, level of rurality, and their subsequent interaction. We used Stata’s MARGINS command to derive the predicted value of revenue from each source by level of rurality in each time period. We used the Stata (DYDX) command with a contrast operator to examine the extent to which differences in the predicted values of revenue over time differed by level of rurality.¹⁵ We took a similar analysis approach to examine changes in direct services provision over time.

RESULTS

The 2010 Profile survey was distributed to 2565 LHDs, with responses from 2107 (82% response rate); in 2016, the survey was distributed to 2533 LHDs, with 1930 responding (76% response rate). Complete revenue and rurality information was

available for 1828 LHDs in 2010 and 1699 LHDs in 2016, with 1480 LHDs with observations in both years. We noted differences in the composition of LHDs by rurality and year. A higher proportion of small rural LHDs completed the profile survey in 2016 (39.6%) relative to what was observed in 2010 (30.8%). Conversely, a greater proportion of urban LHDs are represented in the 2010 profile survey (51.1%) compared with 2016 (40.1%). Higher proportions of small rural LHDs operated within centralized state systems in both years. Fewer small rural LHDs reported having a local board of health in 2016, relative to what was reported in 2010 (Table 1).

Funding Sources

We also observed significant differences between urban, large rural, and small rural LHDs and between the 2 time periods (Table 2). In both 2010 and 2016, urban LHDs reported higher proportions of revenue from local and direct federal sources than what was observed among large and small rural LHDs. Conversely, large and small rural LHDs reported greater proportions of revenue from CMS and private insurance than what was observed among urban LHDs.

Urban, large rural, and small rural LHDs all reported shifts in the distribution of revenue with increasing sources of revenue coming from local sources in 2016. Conversely, all LHDs experienced notable and consistent

decreases in revenue from CMS and patient fees between 2010 and 2016, regardless of geography (Table 2).

Changes in revenue from state, federal, and private insurance sources varied by rurality. While urban and small rural LHDs reported a smaller proportion of revenue coming from state sources, large rural LHDs reported a slight increase, creating a significant overall difference between the 2 time periods ($P < .05$). We noted similar findings with federal pass-through revenue, with urban and large rural LHDs reporting decreases in revenue from these sources, while small rural LHDs reported a slight increase ($P < .05$). Large rural LHDs also experienced a notable decrease in direct federal sources of revenue beyond what was observed among urban LHDs ($P < .05$). Although changes in revenue derived from private insurance billing were largely consistent between urban and small rural LHDs between the 2 time periods, revenue from this source increased among large rural LHDs ($P < .05$; Table 2).

Clinical and Prevention Services

A very high proportion of small and large rural LHDs continue to provide both adult and childhood immunizations (>90% in both time periods). We noted significant decreases in the proportion of urban LHDs providing immunizations with 88.9% of urban LHDs providing adult immunization directly in 2010 compared with 81.6% in 2016 ($P < .05$).

We noted a similar trend for childhood immunizations with 76.7% of urban LHDs providing this service directly in 2016 compared with 85.4% in 2010 ($P < .05$; Table 3).

With the exception of non-HIV/AIDS-related sexually transmitted infections (STIs), there has been a decrease in LHDs providing direct preventive screenings between the 2 time periods, regardless of level of rurality. A slightly higher proportion of small rural LHDs reported more direct screening for other STIs in 2016 (65.0%) than in 2010 (62.2%; $P < .05$). However, we found notable decreases in screening efforts related to diabetes and high blood pressure across all LHDs. Furthermore, lower proportions of urban LHDs reported engagement in direct cancer screening and blood lead level testing between the 2 time periods ($P < .05$). Both large and small rural LHDs reported less provision of screenings for cardiovascular disease ($P < .05$; Table 3).

The proportion of LHDs reporting increased direct provision of treatment services for HIV/AIDS has increased across levels, with notable increases occurring among small rural LHDs (16.2% in 2010 vs 34.5% in 2016; $P < .05$). Small rural LHDs also reported higher levels of engagement in the treatment of other STIs and tuberculosis-related illness in 2016 relative to 2010 ($P < .05$; Table 3).

We noted few significant changes in the direct provision of maternal and child health services between the 2 time periods. A lower proportion of urban LHDs reported the direct provision of Early and Periodic Screening, Diagnostic, and Treatment and well-child services in 2016, relative to what was observed in 2010 ($P < .05$); however, the provision of these services among small rural LHDs has remained largely unchanged (Table 3).

Fewer urban LHDs reported the direct provision of primary care services in 2016 (11.6%) relative to 2010 (15.2%; $P < .05$). Primary care provision among small rural LHDs has remained largely unchanged, with approximately 10% providing these services directly. Although the direct provision of home health services is higher among rural LHDs, decreases in the provision of these services were noted across all LHDs. More small rural LHDs reported the provision of direct oral health, behavioral and mental health, and substance abuse services in 2016 than did in 2010 ($P < .05$). In addition, a higher proportion of urban LHDs also reported the

TABLE 1—Characteristics of Local Health Department Clinics by Year and Rurality: United States, 2010 and 2016

	2010 (n = 1828)			2016 (n = 1699)		
	Urban (n = 934; 51.1%), No. (%)	Large Rural (n = 331; 18.1%), No. (%)	Small Rural (n = 563; 30.8%), No. (%)	Urban (n = 682; 40.1%), No. (%)	Large Rural (n = 344; 20.3%), No. (%)	Small Rural (n = 673; 39.6%), No. (%)
Governance category						
State	117 (12.5)	70 (21.2)	117 (20.8)	162 (23.8)	69 (20.1)	66 (9.8)
Local	733 (78.5)	232 (70.1)	413 (73.4)	464 (68.0)	244 (70.9)	549 (81.6)
Shared	84 (9.0)	29 (8.8)	33 (5.9)	56 (8.2)	31 (9.0)	58 (8.6)
Jurisdiction						
City	273 (29.2)	17 (5.1)	6 (1.1)	243 (36.1)	19 (5.5)	8 (1.2)
County	661 (79.8)	314 (94.9)	557 (98.9)	430 (63.9)	325 (94.5)	674 (98.8)
Local board of health						
Yes	658 (70.5)	267 (81.4)	446 (79.5)	466 (70.2)	247 (72.7)	421 (64.0)
No	275 (29.5)	61 (18.6)	114 (20.5)	198 (29.8)	93 (27.4)	237 (36.0)

TABLE 2—Differences in the Percentage of Local Health Department Revenue Source by Time and Rurality: United States, 2010 and 2016

LHD Revenue Source	2010 (n = 1828), %	2016 (n = 1699), %	Percentage Point Difference (2016–2010)	DID
Local				
Urban ^a	36.7	45.7	9.0	Ref
Large rural ^b	28.3 ^c	33.5 ^c	5.2	3.80
Small rural ^a	26.7 ^c	35.6 ^c	8.9	0.10
State				
Urban ^a	21.3	17.3	-4.0	Ref
Large rural	19.5	22.2 ^c	2.7	-6.70**
Small rural ^a	23.3	19.9 ^d	-3.4	-0.60
Federal pass through				
Urban ^b	21.3	18.6	-2.7	Ref
Large rural	21.9	21.4 ^d	-0.5	-2.20
Small rural	22.0	23.2 ^c	1.2	-3.90*
Federal direct				
Urban	4.4	3.7	-0.7	Ref
Large rural ^a	4.2	1.3 ^c	-2.9	2.20*
Small rural ^a	3.8	1.3 ^c	-2.5	1.80
CMS				
Urban ^a	14.6	7.9	-6.7	Ref
Large rural ^a	24.1 ^c	15.7 ^c	-8.4	1.70
Small rural ^a	24.5 ^c	17.6 ^c	-6.9	0.20
Private foundation				
Urban ^b	1.4	0.9	-0.5	Ref
Large rural	2.0	1.2	-0.8	0.30
Small rural	1.9	1.3	-0.6	0.10
Private insurance				
Urban	1.4	1.4	0.0	Ref
Large rural ^b	2.2 ^d	3.3 ^c	1.1	-1.10*
Small rural	4.7 ^c	4.5 ^c	-0.2	0.20
Patient fees				
Urban ^a	3.3	1.5	-1.8	Ref
Large rural	4.5 ^d	3.7 ^c	-0.8	-1.00
Small rural ^a	5.1 ^c	3.6 ^c	-1.5	-0.30
Nonclinical fees				
Urban	12.0	10.7	-1.3	Ref
Large rural	9.1 ^d	7.9 ^d	-1.2	-0.10
Small rural	4.1 ^c	3.9 ^c	-0.2	-1.10
Other				
Urban ^a	5.5	3.3	-2.2	Ref
Large rural ^a	6.2	2.2	-4.0	1.80
Small rural	5.7	4.2	-1.5	-0.70

Note. CMS = Center for Medicare and Medicaid Services; DID = differences in differences; LHD = local health department. Values derived from Stata MARGINS command following unadjusted regression model.

^aP < .01 change between 2010 and 2016.

^bP < .05 change between 2010 and 2016.

^cP < .01 compared with urban.

^dP < .05 compared with urban.

*P < .05 DID; **P < .01 DID.

direct provision of substance abuse services in 2016 relative to 2010 ($P < .05$; Table 3).

LHDs reported increased provision of prevention services related to physical activity, tobacco, substance abuse, and mental illness in 2016 relative to 2010 ($P < .05$). A higher proportion of LHDs reported the direct provision of chronic disease services in 2016 compared with what was observed in 2010. Furthermore, a higher proportion of small rural LHDs reported the direct provision of nutrition services in 2016 compared with 2010 ($P < .05$; Table 3).

DISCUSSION

In this study, we found key differences between rural and urban LHDs with respect to sources of revenue and the direct provision of services over time. Proportionally, urban LHDs generated more revenues from local sources than did rural LHDs. Conversely, while rural LHDs generated more revenue proportionally from CMS and clinical services, reflecting the ongoing importance of rural LHDs in providing clinical services directly to their communities, all 3 categories of LHDs experienced a decrease in the proportion of their revenues from CMS between the 2 time periods. It is possible that LHDs experienced a decreased demand for reimbursable services with expanding coverage of previously uninsured individuals through the ACA. However, these rural LHDs are often considered safety-net providers for many key direct services, helping to ensure access for their residents who may otherwise have limited access to providers.¹⁶ It is also possible that LHDs may experience an increased demand for clinical services as insurance coverage expands but provider capacity remains constrained. Given rural LHDs' reliance on these sources of revenue, continued decreases could have a disproportionate effect on rural LHDs—especially if they continue providing more direct clinical services as a matter of community need.^{11,17,18} This decrease could have a sizable negative impact on rural communities in Medicaid nonexpansion states where the need for these services may be greater.

In urban communities, some of these same direct services can be provided by other

TABLE 3—Differences in Percentage of Local Health Departments Providing Direct Services by Time and Rurality: United States, 2010 and 2016

	Urban (n = 1560; 44.3%)		Large Rural (n = 672; 19.1%)		Small Rural (n = 1293; 36.6%)	
	2010 (n = 861)	2016 (n = 699)	2010 (n = 315)	2016 (n = 357)	2010 (n = 584)	2016 (n = 708)
Immunizations						
Adult	88.9	81.6**	95.5	91.9	95.0	91.1
Child	85.4	76.7*	96.1	93.0	97.2	94.4
Screening						
HIV/AIDS	62.1	59.1	71.3	70.6	57.9	59.4
Other STIs	62.2	59.3	71.9	70.6	62.2	65.0*
Tuberculosis	80.1	76.7	92.5	89.5	87.7	85.9
Cancer	35.5	27.2**	41.1	34.0	33.8	28.7
Cardiovascular disease	28.5	24.2	36.9	21.2**	30.0	24.3*
Diabetes	36.8	30.5**	41.7	32.3**	47.1	34.6**
High blood pressure	58.0	48.9**	67.1	48.6**	74.4	58.1**
Blood lead	57.4	45.8**	63.4	61.9	64.4	65.7
Treatment						
HIV/AIDS	21.8	28.8**	26.0	41.0**	16.2	34.5**
Other STIs	59.7	58.4	65.3	70.4	57.4	63.6**
Tuberculosis	72.2	73.0	81.9	83.4	76.2	80.5**
Maternal and child health						
Family planning	48.5	42.5	62.2	59.3	58.6	57.5
Prenatal care	27.3	22.9	33.2	29.9	30.0	25.8
OB care	11.8	8.6	9.0	10.8	7.1	6.3
WIC	53.5	73.0	73.7	70.9	68.9	73.0
Home visits	53.4	48.3	66.2	60.8	68.4	58.8
EPSDT	34.2	25.3**	44.7	38.7	41.4	38.4
Well-child clinic	33.1	23.0**	39.9	29.9**	32.9	31.1
Other health services						
Comprehensive primary care	15.2	11.6*	14.8	16.0	8.9	10.0
Home health care	16.7	10.9**	28.4	22.1*	35.0	26.8**
Oral health	30.2	29.1	24.8	23.3	21.1	26.1*
Behavioral or mental health	13.3	12.8	10.3	9.6	5.3	8.5*
Substance abuse	10.6	14.6*	7.3	7.9	3.9	8.2**
Prevention services						
Injury	36.3	35.2	34.7	39.8*	38.1	40.0
Unintended pregnancy	47.6	41.3	52.3	52.3	51.9	49.0
Chronic diseases	52.8	56.2*	52.6	52.9	49.9	49.7
Nutrition	66.5	67.9	71.9	71.5	68.7	75.4**
Physical activity	51.2	56.2**	53.5	55.5	52.4	55.7*
Violence	23.2	20.4	19.9	21.2	21.0	18.3
Tobacco	66.8	69.0*	68.0	72.7	68.4	74.6**
Substance abuse	26.1	33.3**	24.5	29.1	24.5	31.8**
Mental illness	13.6	19.3**	13.6	15.4	11.4	15.1*

Note. BMI = body mass index; EPSDT = Early and Periodic Screening, Diagnostic, and Treatment; OB = obstetrical; STI = sexually transmitted infection; WIC = Special Supplemental Nutrition Program for Women, Infants, and Children.

*Difference between 2010 and 2016: $P < .05$; **difference between 2010 and 2016: $P < .01$.

providers, so that LHDs no longer need to assume this role.¹⁶ In addition, large rural LHDs and small rural LHDs, with their lower levels of local funds, depend heavily on state and federal sources of revenues, meaning state and federal budget cuts could significantly hamper the public health functions of LHDs nationally.^{4,19} LHDs receive most of their federal funds through state and federal pass through, which poses both a challenge and opportunity. More coordinated effort including specific funding for LHDs to address their community-level needs could lessen the gaps facing low-resourced localities. In addition, not all states distribute Centers for Disease Control and Prevention resources equitably, and rural LHDs, with small populations served, may end up with fewer funds. Requiring states to distribute resources in a way that is equitable to rural needs may also help to lessen disparities.

LHDs serving rural communities tend to provide more direct clinical services than do their urban counterparts, especially large rural LHDs. There appears to be a capacity difference between large rural LHDs and small rural LHDs, with large rural LHDs providing a broader array of services. Changes in services provided over time appear to mirror current health trends. Providing more STI-related services reflects increasing STI rates.²⁰ There were also increases in both treatment and prevention services around substance abuse and mental health, which might result in more funding for treatment and services in addition to LHDs being responsive to the needs of their community.²¹

We hypothesize that these differences in clinical service provision between rural and urban LHDs may be attributable to differences in availability of other providers within the community. As the number of insured individuals in many communities has increased as a result of ACA, LHDs in urban areas, where there are a large number of providers, do not need to serve as the safety-net provider and are able to focus on population-based services. In large rural areas, provider shortages may continue to exist, and there may be an opportunity for LHDs to expand their provision of direct clinical services and their billing capacity.²² In small rural areas, there may be a need for the provision of direct services; however, if there is not enough capacity, these needs may go unmet.

Limitations

Data used for this study were self-reported by LHDs participating in the 2010 and 2016 Profiles and were not independently verified for accuracy and may be incomplete, imperfect, or inconsistent. It should be noted that not all rural communities have LHDs or one that responded, and the information contained in this study may not fully capture the entire scope of rural public health. Furthermore, the survey inquired about specific program or service lines but did not probe the scale or scope of services. This study identified LHDs providing these services; it was not able to determine the extent to which these services were being provided within the overall context of LHD services. This study was descriptive in nature—not intended to predict why revenues and services are changing, but to demonstrate rural and urban differences. Future studies should investigate the factors that might lead to these changes. Finally, we did not examine the actual dollar amounts of funding sources for the 2 time periods, only the changes in proportions of funding sources. It is possible that the absolute amount of funding from any 1 source may have increased or decreased between 2010 and 2016, while the proportion of that specific funding source may have been in the opposite direction.

Public Health Implications

These findings describe key differences in financing and service delivery between LHDs serving urban and rural jurisdictions. Urban jurisdictions are served by LHDs with more local revenue, and their communities have more capacity to provide the clinical services vital to those who need access to care. This allows them to focus their resources, financial and human, on providing more population-based services that align with the 10EPHS. They can make strategic decisions to divest of clinical services if appropriate, knowing that there is a safety net of providers to care for their community. Conversely, many rural jurisdictions are served by LHDs lacking in local tax revenues, and their communities often experience shortages of health professionals. Rural LHDs often have had no choice but to retain direct care services because of community need and a lack of alternative support. Large rural LHDs and

small rural LHDs also rely more heavily on state and federal dollars, which are more vulnerable to changes in state and national health policy, giving them less control.

Among rural LHDs, large rural LHDs tend to have greater staffing and capacities as compared with small rural LHDs; they report more other providers of both clinical and population-based services.¹⁶ Some large rural LHDs have expanded their provision of clinical services and established billing systems to increase revenue.¹¹ For small rural LHDs, they often provide critical services and may be 1 of few providers of clinical services in their community. They are less able to provide population-based services beyond the basic foundational services of epidemiology and surveillance because in part of the scarcity of resources and the communities' basic needs around clinical services.

These findings are particularly relevant given the IOM recommendations that call on LHDs to develop outside capacity for clinical services delivery and shift focus to providing more population-based services.^{7,8} Although this may be feasible in urban communities, many LHDs operating in rural communities with historically deficient primary care systems may find this transition difficult.¹⁷ Rural LHDs rely more heavily on revenue from clinical services, which can sustain other health department activities. Importantly, both urban and rural LHDs strive to address the unique needs of their communities. Organizations that support local public health must consider how to support both urban and rural LHDs in pursuing their missions to improve health in their jurisdictions. **AJPH**

CONTRIBUTORS

K. Beatty and M. Meit developed the concept of the article. K. Beatty and N. Hale contributed to the analysis. All authors contributed to the writing and editing.

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CONFLICTS OF INTEREST

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This was not human participant research.

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