

## **Public Health Shortage Areas in Pennsylvania: A Barrier to Health Information**

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### **Abstract**

One of the essential functions of public health services is to “inform, educate, and empower people about health issues” (CDC 1994). Throughout the United States, the tendency is to have decentralized public health systems that leave the decision-making and a significant part of the financing to local county and municipal governments. This strong reliance on local government financing and control translates into extreme variations in per capita expenditures and access. This paper examines whether or not individuals residing in areas without a centralized public health infrastructure have more difficulty accessing health information to help them make informed decisions about healthy living and lifestyle choices. The paper compares the ease and accuracy of accessing basic public health information in counties and municipalities without a Local Health Department<sup>1</sup> (LHD) as compared to counties and municipalities served by a LHD. The study examines the case of Pennsylvania, because the state has the lowest ratio of public health workers per person in the country (Gebbie 2000), and it has only 10 LHDs covering six counties and four municipalities.

The study found that in areas without a LHD, residents had to make 20% more calls and received useful information in only 64% of the inquiries. This is compared with locales served by LHDs which required

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<sup>1</sup>An agency of local government, a local health department (LHD) develops and administers programs and services that are aimed at maintaining a healthy community. To ensure that these efforts address a community's most important health problems and concerns, the LHD encourages residents to participate in assessing public health needs and in formulating a community health plan. It also works with other community organizations to assure that needed services and programs are available.

fewer calls in order to receive useful information, and in which useful information was attained 100% of the time. This assessment shows that the potential for callers to receive useful public health information in areas without a LHD was impacted by both the higher number of calls that were required and in the diversity of places to which callers were referred. In locales without LHDs, the caller was much more likely to be referred to a non-public health entity, and was statistically less likely to get to speak to a public health professional early on in their inquiry.

### **Introduction**

Today most states in the United States organize their public health systems around county health departments (Mays et al. 2004). Of the currently identified 2,865 local public health agencies in the United States, 73% cover a county, or a county and city, and 18% cover smaller geographic areas such as towns and townships (NACCHO 2005) (Beitsch et al. 2006). Sixty-two percent of LHDs in the United States serve populations of less than 50,000 persons while 40% of LHDs serve even less populated rural areas (NACCHO 2005). On the average, the majority of the funding, 65%, for these LHDs, comes from local government sources, the state, or are pass-through funds from the federal government.

This decentralized approach to funding and control has meant that no one entity has comprehensive authority and responsibility for creation, maintenance, and oversight of the nation's public health infrastructure which in turn has allowed the distribution of services in public health to be "fragmented and uneven" (Baker et al. 2005).

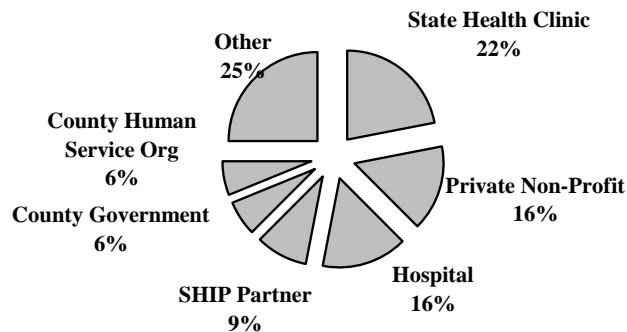
Of the 67 counties in the Commonwealth of Pennsylvania, only six have a county health department and an additional four municipalities have local health bureaus.<sup>2</sup> None of the 42 rural counties in Pennsylvania has a LHD. Counties without LHDs have services provided by various different governmental agencies and non-governmental organizations. The state Department of Environmental Protection provides environmental services (water supply testing), the Department of

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<sup>2</sup>Counties with health departments are Montgomery, Bucks, Chester, Erie, Philadelphia and Allegheny; municipal bureaus include York, Allentown, Bethlehem and Wilkes-Barre.

Agriculture provides restaurant inspections, and the state Department of Health provides the remaining public health services. The counties, which lack LHDs, have a state health center with a staff of one to four nurses that provide communicable disease clinical services including sexually transmitted disease and tuberculosis diagnosis and treatment, immunization, and HIV testing, counseling and education (PADOH 2007). The health centers operate under the direction of district offices, whose staff provide coordination, consultative and administrative support to the health centers in communicable disease reporting and investigation, epidemiology, informational and referral, chronic disease prevention and intervention programs, and environmental health services (PADOH 2007). In addition, the state Department of Health contracts with local non-profit agencies for the provision of other public health services throughout counties without LHDs.

**Figure 1: Organizations Providing Public Health Services in Areas without LHDs**

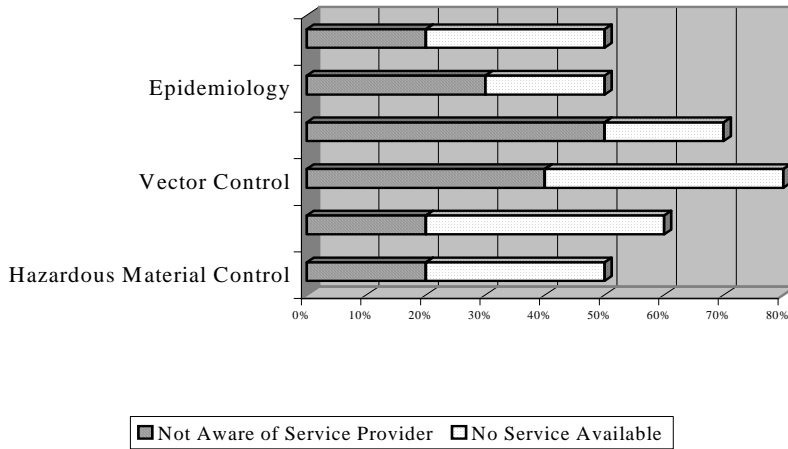


In 2004, an assessment of the existing public health infrastructure in areas of Pennsylvania without a LHD was completed using a survey of agencies and organizations (identified through reputational sampling) carrying out public health functions in 10 Pennsylvania counties without a LHD (Cardelle 2004).

The data shows that in counties without a LHD, public health services are offered by a varied set of institutions (Cardelle 2004) (Figure 1, above). In counties without LHDs, state health centers report offering less than a quarter of the public health services in the area. Private sector

entities such as nonprofits and hospitals offer more public health services than the state health centers. As Figure 2 (below) shows, when asked to identify what other institutions in the county offered public health services, the majority of the organizations delivering public health services were either not aware of who delivered essential public health services or indicated that the services were not offered in their area (Cardelle 2004). Fifty percent of the respondents could not identify who inspected recreational facilities and an additional 20% reported that those services were not offered in their area. Close to 80% of the respondents were not aware of a provider who provided vector control and 50% could not identify providers in their area that offered HIV testing, hazardous material control or carried out epidemiologic surveillance (Figure 2). These are all services that existing LHDs deliver or coordinate in areas with LHDs.

Figure 2



The data from this previous assessment (Cardelle 2004) shows evidence that even though essential public health services may be being offered in the areas of Pennsylvania not covered by a LHD, they are being offered through a decentralized structure that is influencing their visibility. Without a LHD to serve a coordinating role, the residents of the locale have greater obstacles to knowing what services are offered

and where they are being offered. Therefore, since one of the essential public health functions is to “inform, educate, and empower people about health issues” (Public Health Functions Steering Committee 1994), this paper postulates that the decentralized structure present in locales without a LHD would be a barrier to individuals gaining health information that help them make informed decisions about healthy living and lifestyle choices.

### **Methodology**

This assessment compared the ease of accessing basic public health information, and the accuracy of that information in counties and municipalities without LHDs<sup>3</sup> as compared to counties and municipalities served by a LHD. A sample of 10 counties and 18 municipalities that were similar in population and income to the counties and municipalities with LHD were selected. The non-LHD locales falling within a two standard deviation range of the mean population size and per capita income of the nine LHD locales (Philadelphia was not included) were sampled.

Trained college students (health education majors) adhering to the following protocol collected the data:

1. The beginning of an inquiry was a call to the main municipality or county telephone number.<sup>4</sup>
2. The students introduced themselves as a college student and asked if there was someone or some office in the municipality or county that could answer one of the following six questions (there was only one question asked per phone call):
  - a. Does this municipality/county have high incidence levels of Lyme disease? If I found a tick on me, what should I do?

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<sup>3</sup>For the purpose of this study, LHDs are defined as health departments established and managed by local governments (county or municipal).

<sup>4</sup>There are many examples in the literature of using mystery patients or clients to measure performance of health care institutions (Van den Borne 2006; Borfritz 2001). More recently, a similar methodology was used to measure performance of disease reporting systems (Dausey et al. 2008).

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- b. Do I need to get a meningitis vaccine at my age?
  - c. Where can someone get checked for Chlamydia?
  - d. Who is at risk for West Nile Virus?
  - e. Why should I get my house tested for radon? How do I get my house tested for radon?
  - f. Who is at risk for lead poisoning? What are the signs of lead poisoning?
3. The response from this initial call was intended to result in a referral; however, if the response was a negative (no, do not know, I am not sure, etc.) the student then asked if there was a local health department or a public health director. If the answer was no, then they asked if the person could suggest somewhere else that the caller could call to get the information.
  4. If referred to call somewhere else, the student collected information and called the next destination, then repeated the process.
  5. The student kept calling referrals until receiving useful information (defined as information that they as health educators would determine allow a prudent layperson to make an informed decision),<sup>5</sup> no longer referred, or referred five times.
  6. All questions were kept consistent and calls were made within approximately the same time of the day (afternoon).

For each locale, written records of the dates, times, responses, and referrals for each call were maintained.

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<sup>5</sup>The responses to what the callers indicated was useful were compared when the protocol and the methodology was tested on three counties (not part of the study) using Cohen's Kapa measure, which measures the degree of agreement between raters on categorical assessments (Is this information useful?). The Kappa score for inter-rater reliability on whether an answer was useful was 0.69, which the literature defines as signifying substantial agreement (Landis and Kich 1977).

## Results

A total of 181 calls were made to 15 counties and 22 municipalities. There were 43 calls made to the counties and 138 to municipalities. Of 181 calls, 142 were made to locales without LHDs and 39 were made to locales with LHDs. An average of 30 calls were made per question.

In order to receive useful information, an average of 2.43 calls were required. Eighty percent of the inquiries required three or fewer telephone calls. Sixty-four percent of the inquiries resulted in the caller receiving useful information.

**Table 1**

	Mean number of calls <sup>1</sup>	Percent of the inquiries receiving useful information <sup>2</sup>	Percent of inquiries that required two or fewer calls <sup>2</sup>
Locale with LHD	2.15	100%	84%
Locale without LHD	2.71	55%	46%

<sup>1</sup>Difference in means sig <.05.

<sup>2</sup>Difference is sig <.05. The percentage of calls not receiving useful information means that the either the caller was referred five times without getting useful information or they failed to get the last caller to refer them to another number.

Inquiries made to locales served by LHDs required fewer calls in order to receive useful information, and useful information was attained 100% of the time (Table 1, above). The difference between the numbers of calls between the two groups is statistically significant at the .05 level (sig < .05)<sup>6</sup>. Locales with LHDs were significantly more likely to provide useful information in fewer calls across all themes (Table 2, following page). Locales without LHDs required almost three calls for the questions on Lyme disease and STD testing and over 2.5 calls on the question about immunizations, radon and lead poisoning. In addition, non-LHDs had a lower percentage of inquiries resulting in useful information. While 80% of the inquiries made about STDs resulted in

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<sup>6</sup>Statistically significant at .05 (p < .05) means that the probability of that relationship occurring by chance is less than 5%.

useful information, only 26% of the inquiries on radon resulted in useful information and only 32% of the inquiries on West Nile Virus resulted in useful information.

**Table 2**

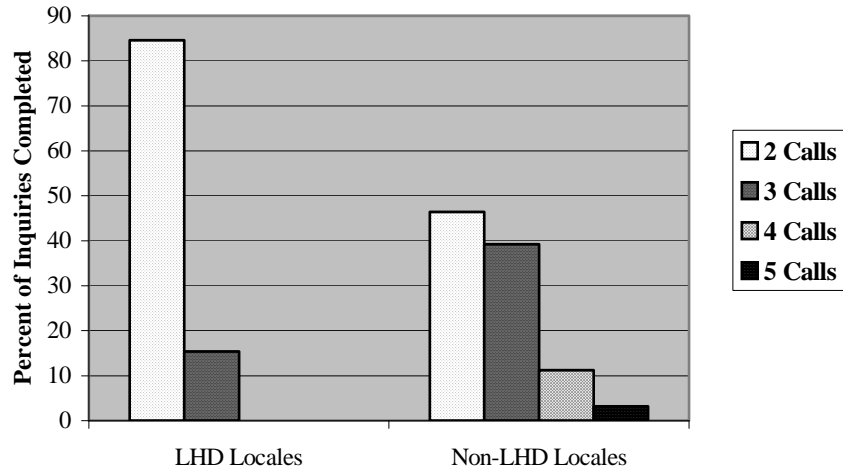
	Mean number of calls		Percent of the inquiries receiving useful information	
	LHD	Non-LHD	LHD	Non-LHD
Lyme Disease	2.14	2.96	100%	60%
Immunization	2.14	2.57	100%	50%
STD Testing	2.14	2.96	100%	80%
West Nile Virus	2.17	2.38	100%	32%
Radon	2.17	2.71	100%	26.3%
Lead Poisoning	2.17	2.64	100%	75%

The locales with no LHD required more phone calls to complete the inquiry. One hundred percent of the inquiries made to locales with a LHD were completed with three phone calls. Only 85% of the inquiries made to locales without a LHD were completed with three or fewer calls (Figure 3, page 15) (sig < .05).

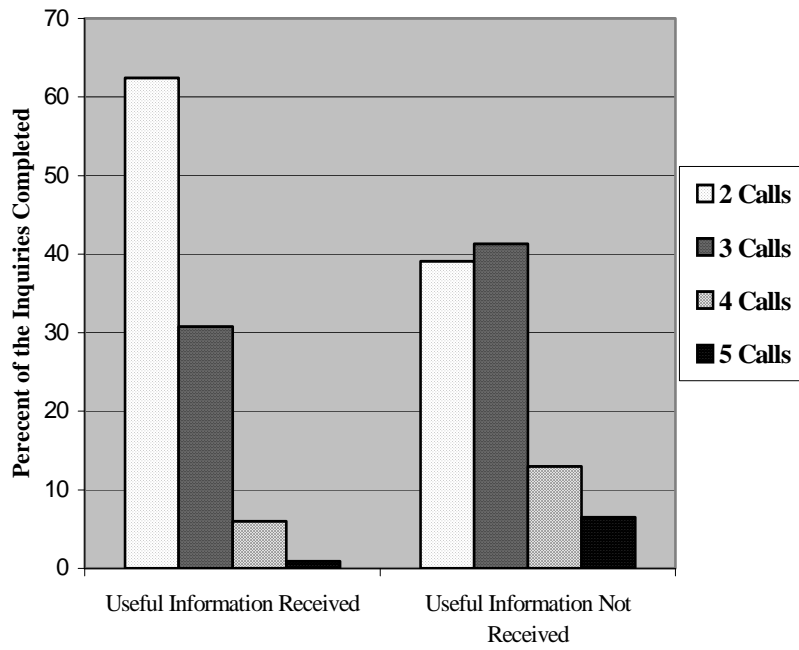
Analysis of the relationship between the number of calls and receipt of useful information showed a statistically significant relationship between the two variables. Inquiries that resulted in useful information had a mean number of calls of 2.45, while inquiries not resulting in useful information had a mean number of calls of 2.87. Figure 4 (next page) demonstrates that 92% of the inquiries which resulted in useful information were responded with fewer than three calls, while the inquiries not resulting in useful information required more calls.



**Figure 3**



**Figure 4**



A third major issue identified in the difference between locales is the dispersed types of referrals made during the inquiry. While locales with LHDs referred the caller to the LHD sometime during the first three calls 100% of the time, inquiries made to locales without LHDs were referred to other government agencies 55% of the time, after the initial call. In these locales, other government agencies were the most common referral after the first and second referrals; only during the third referral are non-LHD locales likely to refer the inquiries to the Pennsylvania Department of Health (either state level or county level). These delayed referrals could exhaust callers and keep them from continuing their inquiries. The callers in this study had a protocol that required them to continue to call, but members of the public requesting information would likely not be so persistent (see Table 3, below).

**Table 3**

	Referral 1		Referral 2		Referral 3	
	LHD	Non-LHD	LHD	Non-LHD	LHD	Non-LHD
PA DOH (state or county)	0%	9.9%	0%	24.8%	0%	40%
Private Provider <sup>1</sup>	0%	11.3%	0%	15.8%	0%	14.5%
State Health Center	0%	8.5%	0%	22.8%	0%	18.5%
Other Government Health Agency <sup>2</sup>	0%	2.1%	0%	2%	0%	1.8%
Other Government Office <sup>3</sup>	11%	55.6%	0%	28.7%	0%	18.2%
Penn State Extension Office	0%	2.8%	0%	1%	0%	3.6%
LHD	89%	0%	100%	0%	0%	0%
Other <sup>4</sup>		9.8%		4.9%		3.4%

<sup>1</sup>Includes hospitals, private physicians, non-profit agencies

<sup>2</sup>Local Health Board, Department of Environmental Protection, Department of Agriculture, Vector Control

<sup>3</sup>Housing Authority, Assistance Office, hotline, commissioner's office

<sup>4</sup>Library, courthouse, college professor

Overall, as compared to callers in locales with LHDs, callers within locales without LHDs tend to run a 93% greater risk of being referred to non-public health entity during the first referral and 60% greater risk during the second referral. In addition, callers in locales without a LHD have a 50% greater risk of not receiving useful information (Table 4). As Table 5 demonstrates, the individuals responding to the calls are trying to provide some type of useful information, but lack the adequate information. The callers did not report an unwillingness to provide service, but instead a genuine unawareness of the information. The referrals are also problematic because some, such as having the caller search the web or go to the library, may result in erroneous information.

**Table 4**

	Relative Risk	Confidence Intervals	
Inquiries to non-LHD locales not resulting in useful information	1.51	1.32	1.70
Referrals made to non-public health entities in non-LHD locales after first call.	1.93	1.56	2.37
Referrals made to non-public health entities in non-LHD locales after second call.	1.60	1.37	1.85

**Table 5**

Sample Responses		
Q	LHD Locale	Non-LHD Locale
1	“Try the Health Department, hold and I will transfer you.”	“There is no one in the city that can help you with that. ... Go into a search engine like Yahoo and type in the words Lyme disease...”
2	“I’ll transfer you to the Health Bureau.”	“I have no idea; maybe you could try your personal physician.”
3	“We have a walk-in clinic.”	“Since there is not a LHD, we (the city) have contracted with Family Health Counseling.”

4	"I will transfer you to a nurse at the Health Department."	"I would try the library for that information. I do not know if we have a local health department - that is a good question. Sorry I can't help you."
5	"You need to do what everybody else does and go to Home Depot and buy a test kit."	"I will transfer you to our building inspector."
6	"Call our Lead Program."	"We don't have a local health department but we have a board of health." Transferred to a physician's office ... The receptionist told me to "call the state Health Department."

### Discussion

This assessment shows that the potential for callers to receive useful public health information in LHDs and non-LHDs was impacted by both the higher number of calls that were required and in the diversity of places to which callers were referred.

In locales without LHDs, the caller was much more likely to be referred to a non-public health entity, and was statistically less likely to get to speak to a public health professional early on in their inquiry. This delay or diversion increases the chance of getting information that is not useful. It is important to highlight that over 85% of the calls that are eventually referred to public health entities such as state department of health centers, county vector control programs, and county West Nile control programs resulted in useful information. Therefore, it was not that the personnel in the network of organizations that provide public health services to non-LHD locales could not provide useful and timely information, it was that it took the caller a longer time to get to that organization. In both types of locales, once the caller was forwarded to a public health entity, the chances of receiving useful information improved dramatically. The difference is that in locales without LHDs, the caller had to demonstrate a greater determination in following-up on the referrals.

In general, there is an overall uncoordinated response in locales without a LHD. In locales with LHDs, over 90% of the initial calls were sent to the LHD by government personnel with the job of answering phone calls (administrative assistant or receptionist). This shows that in

LHD locales, frontline government workers were aware of the portal of entry into the public health infrastructure. In non-LHD locales, there was not a common entity that government employees could consistently identify as being in charge of public health. There was no pattern in non-LHD locales as to where the call was referred; it was sometimes a hospital, sometimes another government agency, and sometimes the Department of Health. Even in situations in which the caller was told there was a local public health entity in non-LHD locales, the caller had a greater likelihood of getting messages such as:

*“There is a Health Officer but she is part time, you would have more luck calling the state Health Department.”*

*“...the health officer is working part time now, but leave a message and I will get back to you as soon as possible.”*

*“The city health line was closed about two years ago, so you need to call the state Health Department or go on the web to [www.state.pa.us](http://www.state.pa.us).”*

The danger in these situations, as well as in situations in which it took callers four to five calls to get an answer, is that callers would give up. It is fair to ask how many calls a college student, who is mildly concerned about being tested for an STD, would make before giving up.

This study did have inherent limitations. The sample of the counties and municipalities called are not representative of the rural counties in Pennsylvania. The sampled counties have higher per capita incomes and are more densely populated. In addition, the determination of what constitutes “useful” information is a subjective assessment.

In addition, since the study was not blind, unconscious subjective bias may have been introduced. Although the calls were made at different times of the day, there is a possibility that the study did not capture a representative sample of persons who answer the calls in county offices.

## **Conclusion**

The results of these different studies indicate that areas without LHDs are lacking the infrastructure with which to provide all the

essential public health functions. In areas across the country that lack a LHD, a proposed solution to this problem has been the creation of a network of coordinated entities that could provide the 10 essential functions of public health. However, a lesson of this assessment is that these networks are not recognized as being an entity that is perceived as having the charge of providing public health services. This study highlights that while private-public partnership may adequately serve the public health needs of a population, there is a clear need for public sector stewardship of the partnership. Without at least one central entity that has the established reputation of being the steward of the public's health, residents in need of information and services will have difficulty in solving their public health related problems. The disjointed services offered or the paucity of useful information provided may not be a reflection of the competence of the personnel in these network-based infrastructures, but rather a reflection of the lack of a centralized portal of entry into the infrastructure. While it may be possible to provide public health services through a decentralized network, it is difficult for this network's structure to establish a clear portal of entry for residents. Unlike a fire, a traffic accident, or even a water-main break where what is required of local services is clearly evident; responses to a strange rash, the identification of a vector, or environmental hazards are less clear and linear. As a result, residents of locales without LHDs are more likely to be without the essential service of public health needed to make informed decisions regarding their health. These differences create a public health disparity, a disparity that given the increasing threats to the public's health, SARS, West Nile Virus and bioterrorism, stands to negatively affect the long-term health status of the population. Since the public entrusts the public sector with its protection, it follows that the portal of entry into a public health infrastructure be the responsibility of the public sector.

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