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Defining Comprehensive Public Health Delivery Systems

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DEFINING COMPREHENSIVE PUBLIC HEALTH DELIVERY SYSTEMS

The National Longitudinal Survey of Public Health Systems (NLSPHS) tracks changes in the organization and delivery of core public health activities in a nationally representative cohort of communities across the U.S. The NLSPHS uses a validated survey instrument administered to the local public health official in each sampled community to measure the following attributes:

- (1) **Availability of recommended activities:** Whether or not each of 20 recommended public health activities is performed in the community. These 20 activities are based on the Institute of Medicine's [Core Public Health Functions](#) definitions and reflect high-value practices recommended by a [series of expert panels](#) convened by the U.S. Centers for Disease Control and Prevention. These activities are closely aligned with the federal government's [Essential Public Health Services Framework](#) and a more recently developed set of [Foundational Public Health Capabilities](#) called for by the Institute of Medicine in its [2012 consensus report](#).
- (2) **Organizational contributions:** Which types of organizations in the community contribute to performing each of the 20 recommended public health activities. For each activity, a pre-defined check-list of 15 types of organizations is used, along with open-ended response options. For each type of organization, a contribution measure is constructed that indicates the proportion of the 20 recommended activities to which the organization contributes in each community. These measures are further grouped into one of four sectors based on organization type.
- (3) **Local agency effort:** What proportion of the total effort used to perform each activity is contributed by the local public health agency in the community. For each activity, a five-point Likert scale is used to measure effort.
- (4) **Perceived effectiveness:** How effectively is each activity carried out in the community, using a five-point Likert scale.

Comprehensive Public Health Systems are defined as those communities in which a broad array of the recommended public health activities are available in the community, AND in which a relatively broad range of organizations contribute to implementing these activities, AND/OR in which the local public health agency contributes relatively large share of the effort to implement these activities. The numeric thresholds used in defining comprehensive systems (i.e. thresholds for defining high **availability**, high **organizational contributions**, and high **agency effort**) were identified based on a cluster analysis performed with the original wave of survey data collected in 1998. The cluster analysis identified [seven distinct "clusters" or configurations](#) of public health delivery systems based on the first three system attributes described above (availability, organizational contributions, and local agency effort). Duncan and Wardian range tests and multinomial logistic regression models were used to identify threshold values of these attributes that accurately predict assignment of communities to one of the seven configurations identified in the cluster analysis. Three of the seven system configurations were defined as **comprehensive** systems because they exceed the threshold value for **availability** and they also exceed threshold values for **organizational contributions** and/or **agency effort**. The remaining four system configurations that did not meet criteria for comprehensive systems were subdivided into **conventional** systems and **limited** systems based on the availability measures. The estimated prevalence of comprehensive, conventional, and limited public health systems among U.S. metropolitan communities during 1998-2012 is shown in Table 1.

Table 1: Prevalence of Public Health Delivery Systems in Metropolitan U.S. Communities

<u>Type of System</u>	<u>1998</u>	<u>2006</u>	<u>2012</u>
Comprehensive systems			
Percent of communities	24.2%	36.9%	31.1%
Percent of population served	25.0%	50.8%	47.7%
Conventional systems			
Percent of communities	50.1%	33.9%	49.0%
Percent of population served	46.9%	25.8%	36.3%
Limited systems			
Percent of communities	25.6%	29.2%	19.9%
Percent of population served	28.1%	23.4%	16.0%

Note: Communities defined based on the service areas of U.S. local public health agencies. Sample limited to the 497 jurisdictions containing at least 100,000 residents as of 1998. Source: Mays GP et al. Understanding the organization of public health delivery systems: an empirical typology. *Milbank Quarterly* 2010;88(1):81-111

Table 2 below shows the threshold values for each attribute that is used in classifying communities into one of the three system configurations defined as a **comprehensive system**. These thresholds generally represent values that are at or above the median values measured for the entire U.S. sample of communities in 1998. Table 3 shows specifically how the threshold values are combined to define each of the three comprehensive system configurations.

Table 2: Threshold Values Used in Defining Comprehensive Public Health Systems

Attribute	Specific Measures	Threshold Value*
Availability of recommended activities	Activities that are performed in the community	>75%
Organizational contributions: Government agency sector	Activities with state agency contributions	>50%
	Activities with local agency contributions (other than public health agency)	>46%
	Activities with federal agency contributions	>11%
Organizational contributions: Health care provider sector	Activities with hospital contributions	>50%
	Activities with physician organization contributions	>31%
	Activities with FQHC/CHC contributions	>15%
Organizational contributions: Community institution sector	Activities with school contributions	>21%
	Activities with university contributions	>26%
	Activities with other nonprofit contributions	>46%
Organizational contributions: Private sector	Activities with health insurer contributions	>11%
	Activities with employer contributions	>15%
Local public health agency effort	Activities in which the local public health agency contributes most or all of the effort	>50%

*Proportion of the 20 recommended activities for which the attribute is reported.

Table 3: Definitions for Comprehensive Public Health System Configurations

Configuration	Definition
Concentrated Comprehensive	Exceeds availability threshold AND exceeds organizational contribution thresholds in at least two different organizational sectors AND exceeds local agency effort threshold
Distributed Comprehensive	Exceeds availability threshold AND exceeds organizational contribution thresholds in at least two different organizational sectors BUT does not exceed local agency effort threshold
Independent Comprehensive	Exceeds availability threshold AND exceeds local agency effort threshold BUT does not exceed organizational contribution thresholds in at least two organizational sectors

Are Comprehensive Public Health Systems Better? By definition, comprehensive systems deliver a broader scope of the public health activities that national expert consensus bodies have recommended to be available in every U.S. community. Moreover, communities with comprehensive public health systems consistently receive higher ratings from local health officials regarding the quality (perceived effectiveness) of the activities performed within their system. Longitudinal analyses indicate that communities that migrate from non-comprehensive to comprehensive systems experience larger reductions in premature mortality rates from potentially preventable conditions such as infant mortality, cardiovascular disease, diabetes, and cancer, compared to other communities. Additionally, local public health agencies operating in comprehensive systems use significantly fewer resources per capita than do their counterparts operating in non-comprehensive systems despite supporting a broader array of public health activities, indicating that comprehensive systems can do more with less.

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Resources

[Survey Instrument for the National Longitudinal Survey of Public Health Systems.](#)

[Overview of the National Longitudinal Survey of Public Health Systems.](#)

[Finding Order in Complexity: A Typology of Local Public Health Delivery Systems \(Research Brief\).](#)

[Comparative Report of Results from the National Longitudinal Survey of Public Health Systems.](#)