

Using Local Health Information To Promote Public Health

Issues, barriers, and proposed solutions to improve information flow.

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ABSTRACT: Local health information can be a powerful vehicle for improving the health of a community. It can highlight both the existence of problems and opportunities for improvement. It can also guide local action in support of policy changes and improve programs' effectiveness. However, efforts to expand the availability and use of local health information face major technical and institutional barriers, as well as health information privacy concerns. This paper provides an overview of current issues surrounding the availability and use of local health information, identifies barriers that hinder its use, and suggests potential solutions. [*Health Affairs* 25, no. 4 (2006): 979-991; 10.1377/hlthaff.25.4.979]

WITH THE SUPPORT OF Robert Wood Johnson Foundation (RWJF) Turning Point funds, the Virginia Center for Healthy Communities developed an online, publicly available statewide resource providing ZIP code-level data and maps for a variety of health indicators. In Wythe County, which has an age-adjusted diabetes mortality rate more than double that of the state, business leaders, the local health department, the local hospital, and non-profit organizations combined their visions and expertise to address this problem. Health department nurses began to screen for diabetes at health fairs, and the hospital provided classes for newly diagnosed diabetics. The Chamber of Commerce is leading a social marketing initiative complete with worksite screening, education about lowering diabetes risk, and materials for preventing and managing diabetes; the health department and the hospital are providing follow-up services.¹

The Fresno County, California, public health officer used county-level data from the 2001 California Health Interview Survey (CHIS) to identify obesity, diabetes, and asthma as the most important public health issues and obtained additional resources from the county's board of supervisors to address them. The Los Angeles County Children's Health Initiative, a coalition of public and private groups and foundations, used CHIS data to justify and plan a new health insur-

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ance expansion program for children. In Sacramento, the Community Services Planning Council, a National Neighborhood Indicators Project (NNIP) partner, maintains an online system containing more than 150 regional indicators and provides technical assistance to data users.

As these examples indicate, local-level information can be a powerful vehicle for improving health. It can highlight both the existence of problems and opportunities for improvement within a community. It can also guide local action in support of policy changes and improve programs' effectiveness.

As part of a planning effort to understand how foundations and other funders can best promote the availability and use of local health information, in April 2004 the RWJF convened a meeting of twenty-six experts in population data collection and analysis and the dissemination of local health information. Current and former officials of several state and local health departments and federal health agencies (including the Centers for Disease Control and Prevention, or CDC, the National Center for Health Statistics, or NCHS, and the Health Resources and Services Administration, or HRSA) and health advocacy and policy organizations, plus university-based researchers attended the meeting. A detailed conceptual framework based on the literature and the authors' experience was prepared for that meeting, revised per the meeting's recommendations, and supplemented by further expert input and literature review on relevant themes in health information privacy, community health assessment, and community indicators.

This paper provides an overview of current issues surrounding the availability and use of local health information, discusses the role that public health departments play in collecting and disseminating local health information, identifies barriers that hinder its use, and suggests potential solutions to overcome them.

■ **What is local health information?** Health is dependent on multiple factors, including individual characteristics, the community where one lives, the environment, and a host of social factors. This paper addresses "health" information regarding these multiple determinants of health, which help predict health status and behavior and support comprehensive policy and program development.²

Local health information describes the health status, resources, and challenges of a community. In the words of a 2002 Institute of Medicine (IOM) report, "Communities are both the physical and cultural settings for and—through their residents and community-based organizations—participants in action to promote the public's health."³ Communities are where the interests of government, business, faith-based organizations, nonprofits, health care delivery systems, and the media all converge. Therefore, health information is most useful when it is available at the community level. However, limitations in the underlying data sources, statistical considerations, and privacy protection requirements constrain the minimum population size for which data can be made publicly available—that is, how "local" the information can be.

■ **How is local health information used?** Local health information can be used

by a wide range of public and private organizations in a community. These organizations differ in size, sophistication in data use, and the goals they aim to achieve.

Government agencies—federal, state, and local—use local health information to develop policies and legislation and to allocate resources across departments, program areas, and contractors, as well as to plan and evaluate their activities. Community clinics and safety-net providers also use it to identify underserved groups or communities, estimate the types and magnitude of unmet needs, and seek funding. Health care payers and providers use it to understand their markets and design service offerings that meet the needs of their customers and patients.

Community-based organizations (CBOs) use local health information to design, target, and evaluate programs that meet specific community needs. Advocacy groups use it to quantify the need for policy change and convey their message effectively to policymakers, the media, and the public. Researchers also depend on it to understand patterns of health and disease as well as to evaluate policies and design new health improvement strategies. Employers and business associations can use it to assess conditions affecting the health of their workforce and estimate effects of their decisions on the community's health.⁴

Sources Of Data For Local Health Information

Since Baltimore formed the first local board of health in 1793, providing information about the community has been a critical component of public health practice.⁵ Public health agencies are both sources and users of local health information. The IOM recommended in 1988 that "every public health agency regularly and systematically collect, assemble, analyze and make available information on the needs of the community, including statistics on health status, community health needs and epidemiological and other studies of health problems."⁶ In 1994 the U.S. Public Health Service (PHS) identified ten essential public health services, starting with community health assessment ("Monitor health status to identify community health problems").⁷ Public health surveillance—the monitoring of information to identify problems and guide interventions—encompasses a broad range of health events, including infectious and chronic illnesses, injury and disability, mortality, personal behavior, and use of health care.

Many other sources also provide data that can be used to produce local health information (Exhibit 1). Some general caveats about the use of health data sets to make local inferences should be kept in mind. First, not all of them are available in all states or communities. Second, privacy restrictions imposed by provider organizations can vary across states and localities. Third, there may be instances of incomplete reporting or incorrect data items in any administrative data set.

Making Local Health Information Available To Local Users

■ **Technical barriers.** Despite the usefulness of local health information, several technical barriers limit its availability and use. Many arise because the underlying

EXHIBIT 1**Examples Of Data Sets From Which Local Health Information Can Be Developed**

Data type	Data set	Provider organization
Mortality by cause of death Natality (births)	Vital statistics	Local/state health departments
Health behavior and risk factors Health status and disability Access to care	Behavioral Risk Factor Surveillance System (BRFSS) and Youth BRFSS National Health Interview Survey (NHIS) State and local health surveys	Centers for Disease Control and Prevention; state health departments National Center for Health Statistics (NCHS) Examples: California, Hawaii, New York City
Disease prevalence	Cancer incidence and treatment Communicable disease (reported by physicians or laboratories) Chronic disease (self-reported)	State or regional cancer registries; National Cancer Institute Local/state health departments State and local health surveys; NHIS
Health insurance coverage	Current Population Survey State and local health surveys	Census Bureau Examples: California, Hawaii, New York City
Health care use	Hospital discharges, ER use Variation in use or services Medicare claims data Medicaid claims data Childhood immunization rates (National Immunization Survey) Use of services and access barriers	State health department or hospital association <i>Dartmouth Atlas</i> Centers for Medicare and Medicaid Services State health departments or Medicaid agencies NCHS State and local health surveys; NHIS
Health care spending	Medical Expenditure Panel Survey	Agency for Healthcare Research and Quality (AHRQ)
Health care quality	National Healthcare Quality Report Cardiac surgery outcomes	AHRQ State health departments (New York)
Public program participation	Childhood health screening results Child and maternal nutrition	State health departments State Women, Infants, and Children (WIC) agencies
Environmental health	Air quality Water quality, aquifer patterns	Environmental Protection Agency Local/state health departments
Neighborhood and local environment	Mortgage lending patterns (Home Mortgage Disclosure Act data) School enrollment, quality, prevalence of reduced-price lunches Reported crimes Neighborhood quality-of-life indicators Social Capital Community Benchmark Survey Housing quality	Fannie Mae School districts; state education departments; National Center for Education Statistics Local police departments, Department of Justice Community Indicators Consortium members Roper Center/Institute for Social Inquiry Local tax assessors/housing inspectors
Bioterrorism-related data	Syndromic surveillance data (ER patient symptoms, OTC drug sales)	Local health departments or regional health information organizations
Local economic conditions	Employment and labor force Income, economic activity	Bureau of Labor Statistics Bureau of Economic Analysis

EXHIBIT 1**Examples Of Data Sets From Which Local Health Information Can Be Developed (cont.)**

Data type	Data set	Provider organization
Demographics (population, age, race/ethnicity, employment, poverty, education)	Decennial census and American Community Survey	Census Bureau
	Survey of Income and Program Participation and other surveys	Census Bureau or other federal agencies (many available online via DataFerrett)
	Earned Income Tax Credit patterns	Internal Revenue Service
	Business and marketing databases	Private data providers (payment required)

SOURCE: Examples provided by participants at a meeting on local health information convened by the Robert Wood Johnson Foundation, Princeton, New Jersey, April 2004.

NOTES: ER is emergency room. OTC is over-the-counter.

data were not originally collected to provide local-level information, or because users desire a level of community detail that the data cannot provide. Every data set has a minimum population size for which it can be used to make direct estimates. For example, a state-level health survey may contain too few respondents to make direct estimates at a local level. Another barrier occurs when rare events, such as deaths from a specific cause, are tabulated for a small geographic area or population group, because the resulting rate can be highly unstable from one year to the next. Also, although most data have an associated geographic location, such as the respondent's ZIP code or census bloc, privacy restrictions limit the precision with which the location of individual data points can be identified. A survey may have too few respondents to provide truly representative spatial data for small geographic areas.⁸

The cost of information technology (IT) is a much lower barrier than it once was. Inexpensive and powerful computers, widespread access to the Internet, and Web-enabled data analysis and presentation software now make it feasible to develop flexible and inexpensive tools for local health information dissemination. Based on data from a local information system in Denver, the NNIP estimated that a basic system can be developed for about \$125,000 per year.⁹ In another example, the Illinois Project for Local Assessment of Needs (IPLAN) process includes community health needs assessment, prioritization of identified needs, and development and implementation of policies and plans to respond to priority needs. The IPLAN Data System, which provides 102 county-level indicators, is supported by an annual block grant of \$250,000.¹⁰

Some important data may be out of date or available only after a sizable lag. For example, the accuracy of population estimates based upon U.S. census data decreases with time from the last decennial census. Because data collected on an ongoing basis, such as vital statistics, must be cleaned and prepared for public use, they may be released only after a lag period of a year or more.

The demographic dimensions along which different data sets can be aggregated

or compared, including geographic identifiers, race/ethnicity, age groups, and year of collection, can differ greatly across data sets. For example, one set might use ZIP code, while another uses census tract. Similarly, different data providers might use different definitions and measures for particular health items.

Many types of data that would be highly useful for producing local health information are unavailable for the vast majority of communities. This includes data on access to care, health behavior, and health insurance coverage, which are collected by surveys that provide local-level detail in only a limited number of states. Environmental monitoring data are collected in few communities, but the small number of sensors in each community limits the data's spatial resolution. Other data types that would be useful for local health planning and policy development are rarely available because they require more extensive data collection efforts. Examples are chronic disease prevalence and prevention, morbidity for a wide range of diseases, functional status, and use of outpatient health care.

■ **Institutional barriers.** Other barriers arise from institutional factors among users and data providers. Many types of users, particularly CBOs, advocacy groups, and safety-net providers, lack the trained staff and data analysis infrastructure to use local health information most effectively. Many state and local health departments' staff experience, culture, organizational structure, and resource allocation are more strongly oriented to collecting data than to disseminating them.

Health departments or other government agencies might also be reluctant to encourage the broader use of local health information if they believe that it could lead to demands for expanded community health programs. Such demands can be difficult to meet in an era of severely constrained government funding.

The Council on Linkages between Academia and Public Health Practice has developed a list of core competencies representing skills, knowledge, and attitudes necessary for the practice of public health. Many of these domains are also necessary for the effective use of local information, including analytic and assessment skills and community dimensions of practice skills.¹¹ These competencies can be used in developing training materials for public health practitioners.

The National Public Health Performance Standards Program enables state and local public health systems and governing bodies to assess their performance against optimal standards of practice. The standards can also help these agencies improve their ability to make information available to communities.¹²

Population health data sets are usually collected in response to specific legislative mandates or to answer specific research questions. The structure, design, and methods of data collection might make it difficult to make inferences for other purposes. Disparate data sets can be linked or combined to extract additional meaning. However, no single, detailed, generally accepted conceptual framework or model clearly specifies how such data sets can most usefully be combined—that is, to identify the full range of the determinants of health that influence a community's health, how those factors interact with each other, and which are the

most influential in degrading or improving a community's health.¹³

■ **Privacy concerns.** Although local health information can benefit the health of the local population, its wider availability poses potential risks to individual privacy. Specifically, health information linked to detailed demographic data may be identifiable to a specific person in an area—even without a name, address, phone number, or other unique identifiers. For example, many state cancer registries will not release data on rare cancers that are specific to a ZIP code.

Americans have serious concerns about how personal health information is used, disclosed, or protected and the degree of awareness and control people have regarding their information.¹⁴ They are concerned about possible economic or social harm that may result from misuse of such information. In response, many state governments have enacted laws to protect the privacy of health information.¹⁵ The federal Health Insurance Portability and Accountability Act (HIPAA) of 1996 mandates that “covered entities” (health care providers, payers, and other organizations that receive personally identifiable health information from these sources) comply with broad privacy protection standards.

Public health agencies tend to be hybrid organizations to the extent that they provide primary care or fund clinical preventive services. However, they are not regulated as covered entities for their population-based public health activities. HIPAA specifically authorizes covered entities to disclose protected personally identifiable health information to “a public health authority that is authorized by law to collect or receive such information for the purpose of preventing or controlling disease, injury, or disability, including...the reporting of disease, injury, vital events such as birth or death, and the conduct of public health surveillance, public health investigations, and public health interventions.”¹⁶

HIPAA also notes ways that personally identifiable health information can be deidentified by stripping key identifiers, but this may render the data useless for producing local health information. Therefore, statistical techniques are used to prevent the disclosure of identifiable information when local health information is produced from underlying data sets containing personal information.¹⁷

How To Improve The Use Of Local Health Information

Local health information can help guide efforts to improve the health and health care of communities. It can identify local needs that may be obscured when data are aggregated to a regional, state, or national level. It also helps users prioritize needs, mobilize local resources, tap state and national resources, and act on opportunities to promote health. At the national and state levels, several steps can be taken to improve access to usable local health information. They include the following.

■ **Standardize the “toolbox” of flexible tools.** Flexible tools are Web-enabled information systems that allow users to get the local health information they need, for communities they define according to dimensions of geography, age, or race/eth-

nicity (Exhibit 2). These tools provide information in formats ranging from predefined to highly customized: preformatted tables, graphs, or maps; menu-driven systems that select from large amounts of presummarized data; or fully interactive systems that calculate customized results in real time.

However, many existing tools were developed to meet the needs of a particular state or community. Implementing them elsewhere may require substantial customization—but having other states or communities develop their own tools from scratch is also inefficient. A set of standard-based data collection and analysis tools that could be easily replicated could be cost-effective for the nation as a whole. A less comprehensive alternative would be a robust set of standard designs for flexible local health information tools, such as user interfaces, data-set structures, and confidentiality protection algorithms.¹⁸ Any development process

EXHIBIT 2

Examples Of Flexible Tools Providing Access To Local Health Information

Tool	Details/online availability
BRFSS results online	Interactive query system that provides state-level estimates, estimates for selected metropolitan areas, and user-defined maps based on data from the CDC Behavioral Risk Factor Surveillance System (BRFSS) surveys conducted in each state; http://www.cdc.gov/brfss/#interactive
CHIS results online	AskCHIS interactive query system provides comprehensive, real-time, user-customizable descriptive statistical results from the California Health Interview Survey (CHIS), at state and local levels; presummarized tables and reports and briefs from CHIS are also available; http://www.chis.ucla.edu
IPLAN	Illinois Project for Local Assessment of Needs (IPLAN) provides presummarized tables of health indicators for planning and assessment in Illinois communities; http://app.idph.state.il.us/IPLANDataSystem.asp?menu=1
MassCHIP	Massachusetts Community Health Information Profile (MassCHIP) provides presummarized tables and an interactive query system for health and health-related data in Massachusetts communities; http://masschip.state.ma.us
MICA	Missouri Information for Community Assessment (MICA) system provides access to a wide range of health data sets for Missouri counties and communities; http://www.dhss.mo.gov/MICA
New York City community health data	New York City Department of Health and Mental Hygiene offers presummarized tables of health data and neighborhood level health profile documents; is also conducting a community health examination survey; http://www.nyc.gov/html/doh/html/community/community.shtml
Primary Care Service Area data	Health Resources and Services Administration (HRSA) maintains a national geospatial database of primary care need measures at a subcounty level; downloadable data sets and user-defined maps are available; http://datawarehouse.hrsa.gov/pcca.htm
Virginia Atlas of Community Health	Virginia Center for Health Communities partnership provides presummarized tables, user-defined maps, and community profile documents; http://www.vahealthycommunities.com

SOURCE: Examples provided by participants at a meeting on local health information convened by the Robert Wood Johnson Foundation, Princeton, New Jersey, April 2004.

should involve data providers and users at national, state, and local levels to assure that the resulting tools have the broadest possible usefulness.

Communities beginning local health information initiatives would also benefit from a set of clearly specified best practices for selecting and implementing flexible tools that meet local needs, available data sets, and financial resources. Communities and local public health departments should work closely with state health departments, which can provide expertise and help spread the costs of tool development and implementation across several communities. Increased analytic capabilities should also be developed, to seamlessly produce local health information from multiple data sets for a fully user-defined population. For example, most existing tools limit users' ability to define a community by multiple demographic and geographic dimensions simultaneously. Information derived from surveys is often available only as presummarized results for predefined demographic groups or geographic areas. The complex statistical calculations underlying small-area estimation methods (which greatly increase the availability of local-level estimates for health data derived from surveys) have yet to be automated.

■ **Produce marketing materials and training curricula.** To be effective, flexible tools cannot simply be posted on the Internet in the hope that users will find them. Local health information initiatives could benefit from sample marketing plans and templates for marketing materials to help inform users that new tools and information are available. Flexible tools can help improve a community's health only if users have sufficient expertise in using local health information. Models and curricula for user training programs should be developed and evaluated so that they can be replicated across communities.¹⁹

■ **Foster creation and growth of intermediaries.** Community partnerships of users and data providers, working with universities and state and local health departments, can be effective vehicles for data sharing and local health information dissemination. Lessons from the NNIP partners in the United States, the Manitoba Centre for Health Policy in Canada, or Public Health Observatories in England, can be helpful in developing intermediaries in communities and substate regions.

Where they exist, regional health information organizations (RHIOs) may also be partners who can facilitate access to important data sets, such as outpatient utilization or chronic disease registries, that are otherwise difficult to obtain.²⁰

■ **Conduct needed research.** More research is needed to better understand how local health information can be used more widely and effectively. One area of research could examine how organizations obtain and use this information; what value users derive from the information; which types of flexible tools users would find most useful; and training and other capacity requirements needed to encourage the effective use of the information.

Also, as discussed above, improved models of population health would guide new data collection and the use of local health information. Research projects should identify factors to be included in a model and their relative influence, clari-

fyng which are determinants of health and which are health outcomes.

Anecdotal examples support the hypothesis that the benefits of local health information availability exceed the costs of production and dissemination. However, the "business case" for local health information should be examined through systematic description and analysis of the costs and benefits. For example, benefits could include user organizations' improved ability to better attract funds, reduced costs of poor health, and the (nonmonetary) benefits of improved health status. Costs include the investment required to implement flexible tools and train users adequately. Such research could help communities justify investments in local health information while they also face other compelling priorities.

■ **Develop and refine data standards.** Working groups of health statisticians and informaticians have been collaborating for years to develop public health data standards.²¹ These efforts are being accelerated by national efforts, including the CDC's Public Health Information Network; the National Health Information Network as envisioned by the Office of the National Coordinator of Health Information Technology (ONCHIT); and interoperable electronic health records (EHRs). Such efforts should help streamline the collection, aggregation, and analysis of data to produce local health information.

■ **Identify and fill unmet data needs.** Current knowledge and public health practice, as well as the population health model research described above, should make it feasible to identify a core set of health and health-related indicators that should be available for all communities.²² Additional indicators could be designated as useful, but not essential, and produced as a community's needs and resources allow. Ongoing review of research findings should identify when new factors—for example, noise levels—should be added to the core indicator set.

A local health information initiative could use the core indicators as the basis for an inventory of its available data sets, thereby identifying unmet data needs and prioritizing new data collection efforts. Recommended processes for identifying and filling unmet needs can also be codified as a guide to communities. For example, health survey instruments and sample design techniques, techniques for collecting new administrative data sets, and strategies for compiling population health data from local providers could all be shared across communities.

■ **Standardize policies and practices to protect privacy.** Statistical privacy protection techniques, security practices, and fair information practices can be developed on a national basis. Privacy protection policies, however, are governed by state-specific law and regulation. Creating standardized policies and practices would facilitate the start-up of local health information initiatives and help them enlist the participation of data providers while reassuring the population that its personal health information is adequately protected.

It is important to note that although collecting and disseminating local health information can facilitate community health improvement, change does not occur automatically. Improvements rely upon government agencies' having a culture

that promotes the use of data to measure and improve performance, partnerships between those agencies and community organizations, adequate staff and financial resources at both the public and private levels, and effective local leadership.

It is important for local public health agencies to collaborate with the general public, community-based organizations, and policy leaders to translate local information into policies and programs that can improve health. National and local philanthropies can also help fund the development of tools, training, and research to help local health information initiatives succeed.

Examples Of Local Health Information Tools And Resources

States, counties, and communities—often in collaboration with national organizations or federal agencies—have developed and implemented solutions aimed at surmounting the above-described barriers to local health information availability and use. These innovative efforts include Web-based flexible tools for local health information dissemination; structured processes for community health assessment; community health indicator sets; and national efforts that support communities working to disseminate and use local health information. State health departments, partnerships, and federal agencies have developed flexible tools that provide online access to individual data sets or to compendia of health and community indicators.²³ Several examples are described in Exhibit 2.

Community health assessment is an organized mechanism by which groups, including public health departments, community leaders, and community-based organizations, come together to identify local health problems and develop strategies to address them. Local-level information enables groups to identify each community's specific health priorities. A number of models and resources are available to guide these efforts, such as the IOM's Community Health Improvement Process or the Mobilizing for Action through Planning and Partnerships (MAPP) approach developed by the National Association of County and City Health Officials.²⁴

Health indicator sets—comprising measures such as demographic and socioeconomic characteristics, risk factors, health care use, health status, and health outcomes—are a central component of community health assessment. For example, ten high-priority health issues have been identified as major leading health indicators associated with the Healthy People 2010 objectives.²⁵ Broader sets of community indicators include measures of nonhealth characteristics, such as housing quality and public safety, as well as health-related measures. NNIP partners in cities such as Denver and Los Angeles have developed flexible tools to disseminate indicator-based information about neighborhood conditions, for the purpose of “democratizing information” to support community action.²⁶

Several national-level efforts facilitate the dissemination and use of local health information by supporting development of flexible tools, community health assessment, standards, indicators, and privacy protection methods. The CDC As-

assessment Initiative funds states to work with communities to improve: access to data, skills to interpret and understand data, and use of that data to drive programs and policy.²⁷ A collaboration of the National Association of Health Data Organizations, the National Association of Public Health Statistics and Information Systems, and the CDC is working to promote the uniformity of health data dissemination practices by state and local health agencies—for example, by developing detailed guidelines for dissemination practices such as statistical analyses, privacy protection, and data linkage.²⁸

LOCAL HEALTH INFORMATION CAN BE A POWERFUL TOOL in improving the health of communities. Initiatives where users partner with health departments, intermediaries, and other state and national organizations can foster the dissemination and use of local health information. However, such efforts face major technical and institutional barriers, as well as concerns about the privacy of health information. Solutions to overcome these challenges have been outlined. National, state, and local organizations should work together to refine and support implementation of those solutions, so that communities can benefit from the broader and more effective use of local health information.

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NOTES

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22. This is an important research undertaking in its own right. See, for example, M.A. Stoto, "Public Health Assessment in the 1990s," *Annual Review of Public Health* 13 (1992): 59-78.
23. For a review of existing Web-based data query systems in all fifty states, as well as a typology of the functionalities offered by these systems, see D.J. Friedman and R.G. Parrish, "Characteristics, Desired Functionalities, and Data Sets of State Web-based Data Query Systems," *Public Health Management and Practice* 12, no. 2 (2006): 119-129.
24. IOM, *Improving Health in the Community: A Role for Performance Monitoring* (Washington: National Academies Press, 1997); and MAPP, "A Strategic Approach to Community Health Improvement," http://mapp.naccho.org/MAPP_Home.asp (accessed 23 December 2005).
25. Healthy People 2010, "Leading Health Indicators," <http://www.healthypeople.gov/LHI> (accessed 17 April 2006).
26. Denver: Piton Foundation home page, <http://www.piton.org>. Los Angeles: Neighborhood Knowledge Los Angeles home page, <http://nkla.ucla.edu>.
27. See CDC, "Assessment Initiative," 13 January 2006, www.cdc.gov/epo/dphsi/assessment.htm (accessed 17 April 2006). "Assessment" here refers to one of the three core functions of government public health agencies as defined in IOM, *The Future of Public Health* (Washington: National Academies Press, 1988).
28. National Association of Health Data Organizations, "Web Data Dissemination Toolkit," 1 October 2005, <http://www.nahdo.org/hidsc2/hidschome.aspx> (accessed 17 April 2006).

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