

Community-Level Data

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Health-related data are used at many geographic and political levels by individuals and groups for a multitude of purposes. The focus of this paper is on what and how data are used at the local level, for what purposes and by whom, as well as some of the unique challenges and methodological manipulations involved. Examples of common and unique uses of data and the analytic challenges involved are included.

Health-related data are typically used at the local level to describe populations in terms of demographics, economics, social and environmental conditions, disease prevalence, births, causes of deaths, health behaviors, and available health care resources. They may also be used to characterize access to health services and the use and cost of such services. The data are generally secondary, ie, obtained from another agency that specified form and content without local user input. The data may come from the US Census (eg, income, housing, education), the state and federal vital statistics system (eg, births, deaths, communicable disease incidence), disease registries (eg, cancer incidence, prevalence), or national or state surveys (eg, Behavioral Risk Factor Surveillance System). Other sources may be agencies responsible for Medicaid, Medicare, licensing and regulation, environmental protection, education, commerce, agriculture, transportation, highway safety, or law enforcement. With increasing technology and governmental investments in data collection, there is a wealth of data available, but they may not be readily useful to or easily analyzed by the local user.

Local Users and Uses

The users of health-related data at the community level in North Carolina might be local chapters of voluntary health organizations (eg, American Heart Association, American Lung Association), Healthy Carolinians groups, hospitals, health departments, health care providers, professional associations, academic institutions, news media, governmental agencies,

elected officials, and individual citizens interested in their own health or the health of their family and community. Typical purposes for data use include community diagnosis, program planning, policymaking, advocacy, justification of requests for resources, and program evaluation. The purposes may be categorized within the 3 core functions of public health (ie, assessment, policy development, and assurance)¹ and within the 10 Essential Public Health Services.^{2,3} The core functions and essential services are related and provide a useful typology of the various uses. (See Table 1.)

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These core functions and resource allocation decisions should be guided by empiricism and rational analysis, ideally leading to the greatest good for the greatest number. Good decisions depend on good information. Data, however, are not the information. They are the raw material of information. Data must be refined to become information, and information must then be turned into knowledge that is then diffused and understood before it can lead to action. Data are useful only if transformed into information about problems that can and should be solved and put in the hands of people able and willing to solve them. Because problems identified and prioritized at

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Table 1.
Uses of Data at the Local Level in Relation to 3
Core Functions of Public Health and the 10
Essential Public Health Services

Assessment

1. Monitor health status to identify community health problems
2. Diagnose and investigate health problems and health hazards in the community

Policy Development

3. Inform, educate, and empower people about health issues
4. Mobilize community partnerships to identify and solve health problems
5. Develop policies and plans that support individual and community health efforts

Assurance

6. Enforce laws and regulations that protect health and ensure safety
7. Link people to needed personal health services and assure the provision of health care when otherwise unavailable
8. Assure a competent public health and personal health care workforce
9. Evaluate effectiveness, accessibility, and quality of personal and population-based health services
10. Conduct research for new insights and innovative solutions to health problems

the community level are often the ones most likely to be solved, data may be most useful when applied at the local level.

There is a history of community action for health improvement in North Carolina from the Comprehensive Health Planning Councils of the late 1960s, through the Health Systems Agencies from the mid-1970s to mid-1980s, to a public health community diagnosis and planning process that began in the mid-1970s and continues today. In the mid-1990s, the North Carolina Department of Health and Human Services began to require local health departments to submit legislative priorities for funding requests and encouraged the local departments to base their priorities on a community diagnosis process to be conducted every 4 years. Local planning was bolstered in the late 1990s by the establishment of the Governor's Task Force for Healthy Carolinians and the Office of Healthy Carolinians which developed the state's health plan called *Healthy Carolinians 2010*.⁴ It was aligned with the federal *Healthy People 2010*⁵ blueprint and contained goals and objectives with quantified benchmarks and targets. The Healthy Carolinians initiative embodied the first 5 of the 10 Essential Services under the functions of *assessment* and *policy development* listed in Table 1 above. It encourages local health planning with small grants and "certification to communities who have broad-based community partnerships which represent the needs of the

disadvantaged and whose mission is prevention based."⁶ As certification requires a community assessment, the communities and staffs of the local public health departments, who are principal partners, are some of the most active users of health-related data. They are guided by a Community Health Assessment Guide Book⁷ and an online County Health Data Book,⁸ the contents of which are described in the commentary by Paul Buescher. As local communities *monitor health status to identify community health problems*, they typically examine data on mortality, communicable disease prevalence, pregnancy rates, and birth weight. However, the Healthy Carolinians approach goes beyond typical health statistics. They may also look at population demographics, education and socioeconomic conditions, and behaviors that contribute to health. The Centers for Disease Control and Prevention's Behavioral Risk Factor Surveillance System (BRFSS), a statewide telephone survey conducted annually in North Carolina, is an excellent source of data on risk factors, but there are only 22 counties with samples large enough for statistical generalization, and the complex sampling strategies require special statistical procedures for valid description.⁹ Local groups frequently conduct their own behavior and opinion surveys but often do so with small convenience samples from which valid generalizations cannot be made. The community assessment and planning process also includes an evaluation of community resources (ie, asset mapping). Healthy Carolinians partnerships are now certified in 78 of the state's 100 counties.¹⁰

Health workforce data are particularly useful. Historically, inventories of physicians and other providers have been used to define Health Professional Shortage Areas (HPSAs) which bring federal and state resources to build and staff community health centers. These data, combined with information on local and regional health disparities, are constantly used to *inform, educate, and empower* policy makers, *mobilize partnerships to identify and solve health problems*, and *develop policies and plans*. They have been effectively employed to justify the need for medical and dental schools at East Carolina University, the Area Health Education Centers Program, and expansion of curricula and enrollments in the state's medical, nursing, and allied health schools. Other frequent users of health workforce data at the local level are hospitals, community health centers, Area Agencies on Aging, and voluntary health organizations. They *develop policies and plans that support individual and community health efforts* and use data on health resources for *linking people to personal health services*. Physician directories and community service inventories are very valuable data assets. Local public health departments, hospitals, and academic institutions are interested in local data for their roles in *assuring a competent workforce* and in *evaluating the effectiveness, accessibility, and quality of personal and population-based health services*. Academic institutions use local data to *conduct research for new insights and innovative solutions to health problems*. While there is a rich array of secondary data, they may not be appropriately defined or available in a form for valid and ready application at the local level.

Focusing the Data on Specific Regions and Communities

Professional policy analysts and knowledgeable policy makers at the state or federal level may be able to refine or transform data easily into information and to act on it. Users at the local level may be challenged. Technical expertise notwithstanding, a number of problems may exist at the local level. The variables in data collected by a state or state-level agency may not have been chosen or measured to answer local questions. The geographic level of observation and measurement may not be appropriate. The county is a common level of aggregation for most health and health resource data but health problems and community planning efforts do not always follow county boundaries. Local users may need to lump or split the data for multi-county or partial-county analyses. Census data are obtainable down to the census block but analysis may require that they be lumped together. When data are from statewide samples, sample sizes at the county level may not be large enough to draw statistically significant conclusions, particularly when describing smaller population subgroups (eg, Hispanics or American Indians) by gender and age group. When county level data are large enough to split, more specific locations within a county may not have been collected or available. Another problem is that the time frames of data in standard reports may not be useful. Single-year data may not have enough observations; multiple-year data (particularly rates) may occlude trends. The needs of community-level data users, contexts, and relevant issues vary widely, as do their analytic capacities. The challenge for local users is to get simple patterns to emerge without torturing the data, the analysts, or the end users. The data must be clean, of sufficient size, and amenable to simple analysis for information to emerge and be seen, not through statistical smoke, but in clear graphic displays and then stated in simple sentences. A few examples of unique uses and challenges are useful.

Variable Must Be Redefined

A planner at a local health department wants to look at leading causes of death for people under age 75 in her county, but available reports do not provide mortality rates for that specific age group. She suspects that for those under age 75 cancer rather than heart disease is the leading cause of death. She asks colleagues at the local university to analyze recent death file data. They aggregate death certificate data (available from the Odum Institute¹¹) into a 0 through 74 age group and recalculate mortality rates by race and gender. Her hypothesis is confirmed and community attention will be focused on cancer prevention and treatment.

Longer Exposure in Taking the Data Snapshot

A Healthy Carolinians group wants to develop programs to address obesity in the county. BRFSS data are available, but sample sizes in single years are too small to show any statistically significant differences between the county and the state. A custom analysis reassembling the raw data into a 5-year period to provide a larger sample shows there is in fact a higher body-mass index

for the county population than the rest of the state. They will use the information in a grant application.

Produce a Moving Picture Instead of a Snapshot

Elimination of health disparities is a goal of *Healthy Carolinians 2010*. Halfway through the decade, how are individual counties doing in relation to this goal? By analysis of single-year data as a 25-year time series, trends may become apparent at the county level.

Gerrymandered Health Statistics

Data geocoded at the county level are not adequate to define phenomena that do not respect county boundaries. Local communities would certainly be interested in the health impacts of a flood, tornado, or toxic discharge—events likely to cross governmental boundaries. So also might we be interested in the relative health of one political jurisdiction to another. How, for instance, does North Carolina's Third Congressional District differ from the First Congressional District in terms of mortality? By political design, the First Congressional District contains 17 whole counties and 6 partial ones. The Third District contains 9 whole counties in addition to 6 partials, split from the First District. Demographically, the First District is 54% nonwhite versus 22% nonwhite for the Third. Mortality data are coded in public files only at the county level so important health statistics are not available at the congressional district level, which is an unfortunate disconnect between democracy and public health. Mortality rates for congressional districts can be estimated, however, by applying race- and/or age-specific rates to populations in census blocks weighted by race and age proportions and then aggregated up to the district. The race and age proportions are known accurately at the census-block level. Indeed, that information was used to create the politically gerrymandered districts. For example, the estimated mortality rate (2000–2004, age-adjusted) for the total population of the First District is 1039 deaths per 100 000 population versus 966 for the Third District. The estimated rates could have considerable political significance and lead to advocacy for resources to address health disparities. This kind of analysis is not difficult, but it does require powerful computing. The same methods can be used to calculate mortality rates for state legislative districts. Similarly, we can lump together data about populations affected by natural and manmade disasters. This could be very useful in disaster planning, management, and recovery.

The fundamental purpose of using data at the local level is to inform and empower citizens, health providers, and policy makers to take actions to improve community health. There are methodological challenges in refining, redefining, repackaging, and analyzing the data, but with available technology, programs to train local users, and community-campus partnerships for technical assistance, these challenges can be overcome. State agencies and academic institutions can provide training and expertise in survey design and sampling, statistical analysis, interpretation of data, and cartographic presentation of information. We can and should improve how we collect and disseminate data for local users. Death and health-related data

should be geocoded and available for analysis—with privacy safeguards—at the smallest community level whenever possible. One of the objectives of *Healthy People 2010* (23.3) is the “development of data systems that use geocoding to promote use of geographic information systems (GIS) at all levels.”⁵ Realization of this objective would allow local users flexibility to define neighborhoods and communities in more appropriate

ways and to show their elected representatives the problems, needs, and resources of their “designer districts.” We should develop dynamic, electronic public health data systems that allow users to define queries in terms of units of analysis, levels of aggregation, and combinations of variables of interest at the community level. The systems should be customizable, current, convenient, and collaborative. **NCMJ**

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