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# Assessing Health in Our Rural Communities

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Recent years have seen rising interest in the health of defined populations. This interest has been fueled, in part, by the growth of managed care organizations, which require health care professionals to provide high quality, comprehensive care to a specified population of individuals. Operating on the assumption that it is less costly in the long run to prevent disease or to treat it at an early stage rather than as an established condition, these organizations have encouraged proactive health assessment and implementation of preventive care. And the public health system, of course, has for many years been charged with identifying and improving the health and well-being of people in defined geographical areas. But because public health agencies operate under a variety of mandates—to collect vital statistics, monitor the environment, track transmittable diseases, encourage immunizations, etc.—it is difficult for them, with their limited resources, to mount comprehensive community health assessment and intervention programs.

Furthermore, communities themselves want to have a voice and a leading role in developing local health initiatives. Community citizens often have different health priorities, even a different definition of “health,” from health professionals or institutions who may not share their cultural context. Organized segments of the community—senior citizen groups, civic clubs, religious organizations, businesses—have opinions to offer about the health of their communities.

We<sup>1</sup> and others<sup>2-4</sup> have described the bringing together of disparate people and organizations into functioning partnerships that share responsibility and authority for the health improvement activities of defined populations. Each of these partnerships requires population-specific or community-

specific data on which to base their decisions about health priorities and the allocation of resources. The information must be valid and reliable, and must succinctly characterize the community, its resources, problems, and health-related concerns. To get the data, community organizations often collaborate with universities<sup>5-6</sup> or may hire private consulting companies to conduct community needs assessments.

In 1997, the Institute of Medicine provided a model for community health improvement.<sup>7</sup> The report describes two interacting processes: (1) problem identification and prioritization, and (2) analysis and implementation. Reece,<sup>8</sup> on the other hand, described a seven-step data gathering process for local communities, and there are other widely used processes (Planned Approach to Community Health [PATCH, CDC, 1990], Healthy Communities 2000 and Model Standards [APHA, 1991] and the Assessment Protocol for Excellence in Public Health [National Association of County Health Officials, 1991]). Most often, these assessments concentrate on a geographic region (such as a town or county) or a targeted subpopulation (defined by age, race, gender, culture, etc), use both primary sources (new data collected from respondents in the sampling frame) and secondary sources (existing national, state, or local data about people in the community of interest). Primary data can be obtained by survey, interviews, focus groups, and forums. Identifying needs and problems in the community is usually the goal of the assessment process, but resources or community assets should also be catalogued. A detailed process, known as asset mapping, has been described by McKnight and colleagues.<sup>9</sup>

In this paper we describe the community health assessment process undertaken by Healthy Carolinian task forces in four rural eastern North Carolina counties. We underscore the importance of both population-based methods and the role of local citizens. We believe that population-based methods, although labor intensive, insure that the information collected adequately reflects the geographic region or population of interest. Further, we believe that local citizens who represent the community, rather than an agency or institution, should be a major part of the community health

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improvement process. The views and values of citizens can shape the direction of the entire process. Ideally, community health improvement should begin with them.

## Methods

*The Setting.* The community health assessment process described here took place in four counties representative of the eastern coastal plain of North Carolina. The 29 counties that make up Eastern North Carolina have a population of approximately 1.2 million people, over one-third of which is non-white. It is a rural, poor, and medically under-served region whose elderly population is substantial and growing. Nearly 20% of the residents have incomes below the federal poverty level (compared to 14.5% nationally), and in a number of counties up to 20% of the population has no health insurance. Mortality rates for most chronic diseases are above state averages, and there are high rates of sexually transmitted diseases, substance abuse, and teenage pregnancy. East Carolina University, which assisted in the assessment process, is a state-supported university located centrally in the eastern coastal plain of North Carolina. Its mission includes the provision of service to the surrounding region and people.

*Identification of interest areas.* As described previously,<sup>1</sup> a community health partnership broadly representative of lay citizens, health and social service organizations, and community groups was established in each county. Each partnership first identified the 10 most compelling health concerns for its county, based primarily on the perceived level of concern by citizens. Other issues determining the choice of specific health concerns included the number of people affected, the severity of the problem, the costs involved, and the potential for preventing or improving the problem.<sup>10</sup> The resulting extensive list of concerns was organized into categories based on the Healthy Carolinians Objectives for the Year 2000. The partnership members in each county then chose the top 3-5 health concerns from the list. The key domains selected were health services delivery and access to care; nutrition and fitness; chronic disease; substance abuse/mental health; adolescent health; and maternal and child health.

*Gathering existing data.* The partnerships reviewed demographic and social indicators, and mortality and limited morbidity data, obtained from the US Census Bureau and a variety of state and local health data sources. This information, compiled into a written report for each county, was reviewed with local citizens on the partnership to insure common levels of understanding.

*Identifying gaps and developing survey objectives.* Existing data provide important information, but talking directly to county residents supplies critical information needed to

address the identified priority areas. Each county partnership identified gaps in existing health information, and then worked with faculty from the East Carolina University School of Medicine to develop a survey to assess those gaps. The surveys were tailored to each county, and therefore differed somewhat from county to county. Partnership members helped to develop and then reviewed the final survey instruments. A face-to-face survey was used because (1) up to 10% of households in the four counties have no telephone, (2) a significant proportion of the population is functionally illiterate, and (3) many questions were of a sensitive nature.

*Training interviewers and pilot testing.* Local county residents were hired and trained to conduct interviews. Because local citizens were familiar with the county and residents, using them increased community involvement and provided valuable feedback on the survey process. After one day of training on survey methods and the specifics of the survey instrument, interviewers practiced the interview in the homes of neighbors. At a subsequent half-day training session, interviewers provided feedback on wording and identified questions that were not workable or were not clear to respondents.

*Sampling/Enumeration.* The first goal of the interview process was the enumeration of 5,000 households across the four counties (2,000 in the most densely populated county; 1,000 in each of the three more rural counties). These 5,000 households represented approximately 10% of the total households in the four counties. Using 1990 US Census maps and data, a random sample was drawn from each census block group, the number of households in each block group being determined by the percentage of total county households located in that block group. A list of street names was generated for each block group and intersections of these streets were used as start points for selecting homes. To be sure households were representative, interviewers made up to three trips to a household at different times or on different days. If there was no response after the third attempt, interviewers moved to the next house on the street.

A household representative was asked to provide information about age, sex, race, education, and insurance status for each household member, and whether they had a regular doctor. Length of time living in the county, homeownership status, and occupation were recorded only for the household representative. Household representatives were asked whether they would agree to a second interview addressing health needs and concerns.

*Household interview.* A second interview consisted of a longer health survey completed at about half (n=2427) of the homes surveyed in the enumeration phase. To achieve sufficient numbers of uninsured and under-served respondents, the sample was stratified by insurance status and whether

**Table 1. Topics covered in household interview**

For all immediate family members living in the home:

- Demographics*
  - Date of birth
  - Sex
- Access to care*
  - Regular doctor
  - Use of specialists
  - Number of visits to the doctor in last year
  - Where care was sought, for sickness or physicals

For respondent only:

- Access to care*
  - Women's cancer screening
  - Ratings of medical care and services
  - Problems with payment for services
  - Problems with access
  - Use of emergency services
  - Insurance status
- Risk factors for chronic disease*
  - Personal and family health history
  - Smoking
  - Nutrition
  - Food frequency
  - Food security
  - Diet and exercise patterns
  - Self-reported height and weight
- Fitness*
  - Typical weekly physical activity
- Substance Abuse/Mental Health*
  - Neighborhood concern about alcohol and drugs
  - Use of mental health services

**Table 2. Content of Youth Risk Behavior Survey**

- Demographics*
  - Age
  - Grade
  - Sex
  - Race
  - Who lived with last year
  - Grades on most recent report card
- Safety and violence*
  - Seat belt use
  - Helmet use
  - Drink and drive
  - Carrying weapons
  - Physical fights
- Suicide*
  - Thoughts
  - Plans
  - Attempts
- Alcohol, tobacco, and other drugs*
  - Lifetime use
  - Current use
  - Age at first use
- AIDS education*
  - Home
  - School
- Body weight*
  - Description of body weight
  - Methods to lose weight
- Nutrition*
  - Foods ate yesterday
- Physical activity*
  - Exercise
  - PE class
  - Sports teams

those in the household had a regular physician. All 1153 households in which at least one person had no health insurance or regular doctor were chosen for a second interview; the remaining 1274 households were randomly selected from those in which all members had insurance and a regular doctor. Interviewers were given additional training on the specifics of the household interview. If possible, the interviewer who completed the enumeration interview returned to complete the household interview. Interviewers called to schedule the interviews and attempted to speak to the same persons who completed the enumeration interview, but sometimes another head of household completed the second interview. Respondents determined who was the most appropriate person in a family to answer questions about health (usually it was the female head of household). The interview contained questions about every member of the household, but some questions were limited to the respondent. Table 1 summarizes the content of the interview.

In two of the counties, additional sampling was neces-

sary to increase the number of households with uninsured members. A combination of targeted geographic and snowball sampling was used. Census blocks identified from the enumeration interviews as having a high percentage of uninsured were targeted for additional door-to-door interviews. Interviewers determined whether there was anyone in a household without health insurance and, with permission, completed an enumeration and household interview. During this process, respondents who did not have health insurance were asked if they knew anyone in the county who did not have health insurance that we could contact for an interview. Using these methods, both enumeration and household interviews were obtained from 219 households.

*Youth Risk Behavior Survey.* An identified area of community concern related to substance abuse and child and adolescent health. To address this, a Youth Risk Behavior

Survey (YRBS) was conducted in the middle schools of each county. The YRBS, originally designed by the Centers for Disease Control and Prevention (CDC) to assess and monitor health risk behaviors in high school students,<sup>11</sup> was modified in 1995 to produce a middle-school version (personal communication, CDC, 1997). The middle-school version of the YRBS includes questions about demographic variables; about safety and violence; tobacco, alcohol and other drug use; AIDS education and information; body weight; foods eaten; physical activity; and suicide potential (Table 2). The middle-school version of the YRBS has not been used as extensively as the high school version, so less is known about the targeted behaviors in middle-school students. Partnership members believed that any interventions that might follow an assessment would best be targeted at elementary and middle-school students. Statewide data are available for North Carolina, but county level data are not available; therefore, the partnerships chose to administer the YRBS locally. Middle-school teachers were trained to ad-

**Table 3. Number of completed interviews by county**

Survey	County 1	County 2	County 3	County 4
Enumeration	1830	1141	910	1089
Household	924	492	490	454
YRBS	3636	958	893	1577

minister the survey using a standard protocol of the North Carolina Department of Public Instruction. The survey was administered anonymously; individual responses were not linked to individual students. Completed survey response sheets were placed in sealed envelopes and collected from each school's principal.

## Results

Table 3 shows the number of interviews completed by county. As an example of the type of data obtained using this approach, we summarize selected results from the community health assessment in the larger, more population-dense county (County 1).

**Enumeration.** Respondents in 1,830 households completed enumeration interviews. Demographic data from the enumeration interviews closely matched data from the 1990 US census for the same county. Overall, 87% of household members had some form of health insurance, and 85% had a regular doctor; 80% of respondents agreed to participate in a subsequent household interview.

**Table 4. Comparison of insured and uninsured respondents in County 1**

Access to care concern	% of uninsured	% of insured
Paying for doctor's visits*	62	14
Paying for needed medicines*	40	11
Putting off going to doctor		
because can't afford*	47	12
No dental visits in last year*	67	43
No eye doctor visits in last year*	67	54
Use emergency room when sick*	47	26
No breast exam in last year*	64	44
No pap smear in last year*	51	36

\*All differences significant at  $p < .05$

**Household interview.** There were 924 respondents, 70% of whom were women; 41% were black, 57% white, and 2% from other races. Fifty-one percent of the respondents were married, 22% single, and 27% were widowed, divorced or separated.

One of the most important outcomes of this survey was a description of the uninsured population and of the problems associated with a lack of health insurance. More black (31%) than white (15%) respondents were uninsured, as were more single (36%) than married (16%) respondents. Some of the difficulties associated with being uninsured are shown in Table 4. Notably, county residents without health insurance had a hard time getting health care because they were unable to afford the costs of doctor visits and medications. Respondents without insurance made fewer visits for tooth and eye care than respondents with insurance.

The prevalence of diabetes among black respondents was nearly double that reported for the state of North Carolina (1997 Behavioral Risk Factor Surveillance System, North Carolina Department of Health and Human Services), while among white respondents it was 1.5 times higher than the state.

Many women had not undergone annual cancer screenings. Just over 50% of women over the age of 50 years reported having a mammogram in the last year. Of female respondents of all ages, 61% reported having a Pap smear and 52% a breast exam in the last year.

The diets of the respondents were high in fat and low in vegetables, fiber, and calcium. Patients with diabetes, heart disease and high blood pressure whose doctors recommended that they change their diets said that they did change their diets and lost weight.

One out of every four respondents perceived alcohol and drug use as problems in their neighborhoods. At least one person in half of the households interviewed smoked cigarettes, and 25% of the respondents were current smokers.

**Youth Risk Behavior Survey.** A total of 3,636 middle school students completed the survey; 50% were girls; 49% were white, 45% black, and 6% other races. The respondents were evenly distributed across the 6<sup>th</sup>, 7<sup>th</sup>, and 8<sup>th</sup> grades. Fifty percent lived with two parents, 17% with one parent and a step-parent, 27% with a single parent, and 6% with others.

Nearly half of middle-school students reported they had tried alcohol. The percentage of students who had tried drugs like cocaine or needle-injected drugs was higher than the percentage reported for the state of North Carolina (1997 Youth Risk Behavior Survey, North Carolina Department of Public Instruction).

**Action Plans.** The secondary data and results from the enumeration, household, and youth surveys were used by the partnerships to prioritize health problems for action. The process of prioritization was similar to that used to identify interest areas. The priority areas selected by the task forces were the following: limited access to health care; diabetes in blacks; insufficient nutrition education; tobacco use prevention; and prevention of risk behaviors in youth. Subcommittees were formed for each priority area. Action plans were developed based on the needs and the resources identified by the community health assessment. Additional community members were added to the partnership because of the action plans.

The access to care subcommittee is actively encouraging eligible persons to register for state Medicaid and Children's Health Insurance Programs (CHIP) and is developing free health services for the indigent and homeless. A mobile dental unit was purchased and is operating at county elementary schools.

Based on the survey findings, the diabetes subcommittee chose to work on identifying black individuals with undiagnosed diabetes or undiagnosed diabetic complications. Working with black churches, a comprehensive screening, education, and triage program has been established.

The nutrition subcommittee is working with schools, families, grocery stores, restaurants and local farmers to increase to five per day the number of fruits and vegetables eaten by a targeted group of children and families. It is training volunteer lay health advisors as nutrition advocates.

The tobacco use prevention subcommittee is working with the CDC-funded *Project Assist* to help people who want to quit and pregnant women to stop smoking, and to prevent tobacco use by school age children. The group has trained teen speakers who are presenting programs in elementary schools.

The youth risk behavior prevention subcommittee de-

veloped an informational brochure and has formed partnerships with several county organizations to focus on prevention of and intervention with risk behaviors in youth. They are developing a quarterly newsletter to increase communication among agencies and organizations.

## Discussion

We have described methods used for community health assessment in a four-county rural region of eastern North Carolina. We chose to use population-based data and emphasized the roles of local citizens because of the complex nature of health problems in the region and the differing experiences of local citizens regarding the health of their community, their personal health, and the existing health care delivery system. The comprehensive nature of our approach is founded upon our belief that health should not be defined as simply the absence of disease, but should include socioeconomic determinants, functional status, and quality of life. Evans and Stoddard<sup>12</sup> provide a theoretical foundation for this work. Adequately characterizing the health experience of an entire county required a comprehensive strategy to reach a representative sample of individuals with a diversity of health experiences. It was our intention that the entire assessment process be governed by a representative cross-section of the county—our partnership members.

We believe that the experiences of local citizens without institutional ties strongly influenced the overall assessment of health needs in each county. As described by Torres,<sup>13</sup> an understanding of the importance of involving local citizens developed in the 1980s and was applied in the 1990s. She noted that participants in a representative partnership often begin a project with differing perspectives that are subsequently negotiated in order to carry out their shared work. In our experience, local citizens helped to shape the thinking of a wide variety of health and social service employees about a series of health problems. We strongly recommend that community health assessments include adequate representation from lay members of the community because, ideally, recognition of the need for community health assessment and subsequent action will arise from these individuals. Their inclusion helps insure that the desired results will be achieved, resources will be used efficiently, and outcomes of particular interest to the community are not overlooked.<sup>14</sup> Henley describes trying to improve health in a community without involving the community as analogous to trying to improve a patient's health without involving the patient.

Our approach used traditional population-based methods to select a sample of individuals from which to collect survey data. We chose to define health needs of entire counties because these were rural counties with a distributed population and because this method was consistent with the

framework advocated by the State Department of Health and Human Services in its Healthy People 2000 programming. Advantages of this approach are that rural citizens have a natural identity with their county, and that many institutions and resources (hospital, health department, social services, and county government) focus their work at the county level. The primary disadvantage of focusing on whole counties is the distances that partnership members and surveyors had to travel to insure adequate representation from all corners of the county. In more urban areas, different approaches have been used.<sup>10</sup>

Much has been said about quantitative and qualitative methods of assessing community health needs.<sup>2,8,13</sup> Bushy<sup>2</sup> describes community health assessment as a data-driven process and provides a compilation of sources of data. She describes the need for combined quantitative and qualitative data to develop a complete picture of the community, and recommends four questions that will help partnerships determine the process of data collection:

- ◆ How will data collection methods create awareness, educate, and implement change in the community?
- ◆ What financial, volunteer, and time resources are available to collect, analyze, and communicate the data?
- ◆ To what degree do primary and secondary data complement each other?
- ◆ How accessible are the data?

In the present project, partnership members chose a combination of qualitative and quantitative methods and used both primary and secondary data sources. Qualitative methods were used by partnerships to characterize and prioritize areas of interest. Quantitative methods were extensively used in the household survey process. Secondary data from national, state, and local repositories were used to characterize health domains of interest to partnership members and to prioritize health problems. Primary data from a representative sample of households were used to determine health perceptions, health behaviors, disease prevalence, health system utilization, and their relationship to a variety of sociodemographic factors.

The survey process we used had the following advantages: (1) we were able, within limits, to generalize findings to the county's population; (2) we got input from a broadly representative sample rather than from only a vocal minority who might attend and speak at a town meeting or focus group; (3) we collected information from those without a telephone or those who could not respond to a written survey; (4) the partnership as a whole was represented by personal contact; and (5) we obtained a representative sample for subsequent assessments (for example, we can return to the households of those who self-reported having diabetes in order to better characterize the severity of the disease and

screen for complications). In addition, the large sample size and geographical approach allow partnership subcommittees to target specific segments of the county. For example, a local county diabetes subcommittee has targeted an area of the county with a significant number of older blacks.

The disadvantages of our survey process relate primarily to the cost and time involved. In addition, some survey findings only corroborated the findings obtained from other data sources and qualitative methods. Ideally, qualitative and quantitative findings should be complementary, building upon and extending the understanding of the problem for the partnership.

We believe that our methods resulted in beneficial outcomes for many project partners. There was no prior forum in these counties for the collective voice of either citizens or health and social service agencies. Both groups learned to work together and now have significant capacity to effect local change. The survey process, traditionally the domain of university faculties, became a shared project. Importantly, the results of the process were viewed as being of direct benefit to county residents. University faculty members now have relationships with key community leaders, as well as new perspectives on diseases, behaviors, and health process with which they can reshape health sciences curricula.

The findings of the survey are consistent with what might be expected, but they provide relevant information to inform a wide range of community health improvement initiatives, including non-traditional approaches such as educational and economic development programs. Because a significant portion of avoidable morbidity and mortality result from poor health behaviors over which the health system has only limited influence, health promotion and disease prevention activities need a broad family and community base. Assessments such as we have described can inform the development of such initiatives through collaborative community partnerships.

Medical doctors historically have had only limited time to promote health outside of traditional practice settings. However, we believe they can play an important role in managing the health of their communities through involvement in similar population-based approaches.

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