The "Community Need Index"

A New Tool Pinpoints Health Care Disparities in Communities throughout the Nation

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Accurate measurement of community health need is the first step in addressing the barriers to health care access that many people face. As one of the largest safety-net providers in the nation, Catholic Healthcare West (CHW) has a responsibility to improve the quality of life in the communities we serve, and that requires understanding the barriers to health care access those communities are facing.

CHW has long measured community need through needs assessments of the communities we serve at our 40 hospitals in California, Arizona, and Nevada. These appraisals measure such factors as the type of health problems community members experience, which members are in the most serious need, and whether adequate resources are available to address demands at the local level.

Although routine assessments continue to be an important means of identifying specific health care concerns in specific communities, they tend to utilize a diverse collection of qualitative and quantitative indicators with varying, often subjective, interpretations of the indicators. Because they are not standardized, the findings in such studies do not permit effective comparison with those of other studies. As a result, they do not lend themselves to the measurement of community need from a regional, state, or even national perspective.

An interdisciplinary team at CHW theorized that a standardized community need assessment tool that demonstrated the link between community need and access to care could be used systemwide to help improve patient care. Such a tool, which would apply the same analytical rigor used in studying medical treatments or hospital operations, would elevate community benefit assessment to the level of a science. Our team developed the tool—which we named the Community Need Index (CNI)—in 2004. Since then, we have provided the tool to all of our hospitals and community partners.

SOCIAL AND ECONOMIC HEALTH INDICATORS

Rather than relying solely on public health data, our team decided that the CNI would need to

account for the underlying economic, structural, and personal barriers that affect overall health. Personal barriers alone represent a broad range of factors, including literacy, general education, differences in beliefs about health, and the presence or absence of a strong, stable home environment.[1] Poverty, life expectancy, and health insurance status are also factors to be considered in making projections about health and chronic illness.[2] Working with literature and experiential evidence, our team identified five barrier issues that enable quantification of access to health care: income, culture, education, insurance, and housing.

Income Decades of research have established a strong relationship between socioeconomic status and health. Simply put, people without much money have a reduced ability to pay for health services. Beyond that, people who live in impoverished neighborhoods and encounter social and economic barriers to accessing health care are likely to suffer a disadvantage with respect to disease prevention, management of illnesses, and long-term survival. Factors include not only inability to purchase health care services but also a shortage of providers, poor health literacy, and lack of access to healthy lifestyle activities.[3] Low-income wage earners are also less likely to be covered by an employer's health insurance program or to be able to pay their share of health care services even if they are covered.[4]

Culture/Language Cultural or ethnic barriers can contribute to a number of health disparities, ranging from increased prevalence of disease to reduced access to government health programs.[5] Cultural differences may adversely impact health because of language issues and variations in approach or delivery, all of which can preclude some people from taking full advantage of the systems and services available. Recent immigrants

Barriers to Health Care

The CNI was formulated using answers to the following nine questions:

Income Barriers
- What percentage of the population is elderly and in poverty?
- What percentage of the population is composed of children in poverty?
- What percentage of the population is composed of single-parent households in poverty?

Cultural/Language Barriers
- What percentage of the population is of minority status?
- What percentage of the population is monolingual (not including English) or has limited English-speaking proficiency?

Educational Barriers
- What percentage of the population lacks a high school diploma?

Insurance Barriers
- What percentage of the population lacks health insurance?
- What percentage of the population is unemployed?

Housing Barriers
- What percentage of the population rents its shelter (house or apartment)?

SUMMARY

Catholic Healthcare West, San Francisco (CHW), has developed a national Community Need Index (CNI) in partnership with Solucient, an information products company, to help health care organizations, not-for-profits, and policymakers identify and address barriers to health care access in their communities.

The CNI aggregates five socioeconomic indicators long known to contribute to health disparity—income, culture/language, education, housing status, and insurance coverage—and applies them to every zip code in the United States. Each zip code is then given a score ranging from 1.0 (low need) to 5.0 (high need). Residents of communities with the highest CNI scores were shown to be twice as likely to experience preventable hospitalization for manageable conditions—such as ear infections, pneumonia or congestive heart failure—as communities with the lowest CNI scores.

The CNI provides compelling evidence for addressing socioeconomic barriers when considering health policy and local health planning. The tool highlights health care disparities between geographic regions and illustrates the acute needs of several notable geographies, including inner city and rural areas. Further, it should enable health care providers, policymakers, and others to allocate resources where they are most needed, using a standardized, quantitative tool. The CNI provides CHW with an important means to strategically allocate resources where it will be most effective in maintaining a healthy community.

often are unfamiliar with health services in their new neighborhoods, and, as a result, programs intended for them sometimes go underused. [6] An inability to understand material written in English also is associated with increased health risk. [7]

Education Forty million people in the United States are unable to read health information documents, and another 50 million do so only with difficulty. [8] Lack of education has been cited as a major indicator of poor health in many studies. [9] Hospitalization rates among the illiterate may be twice as high as among those who have literacy skills. [10]

Educational quality also has an impact on health: Students who attend low-performing schools are less likely than others to receive adequate health education and to be able to comprehend medical information; on the other hand, they are more likely to engage in high-risk behavior. Such behavior includes unhealthy eating, unprotected sex, inability to recognize early disease symptoms, and noncompliance with medication for chronic health problems. [11]

Educational barriers, moreover, often turn into impediments to employment, thus further increasing the likelihood of poverty and lack of insurance. [12]

(Data concerning education must be treated with care. While measuring the percentage of people in an area with a high school diploma is a straightforward method, it does not accurately reflect whether individuals are literate. In many instances, even those with high school diplomas may be functionally illiterate with regard to health and medical information.) [13]

Insurance According to the Kaiser Commission on the Uninsured, lack of health insurance forces people to forgo primary care treatment options, leading to a markedly increased likelihood of hospitalization for chronic conditions. [14] Such conditions include hypertension, asthma, and diabetes, which are generally manageable. Uninsured people are also significantly less likely to have cancer diagnosed at an early stage.

Late diagnosis leads to higher death rates from otherwise treatable conditions and to increased

Figure 1

Annual Admission Rate per 1,000 Population by CNI Score: All Service Lines

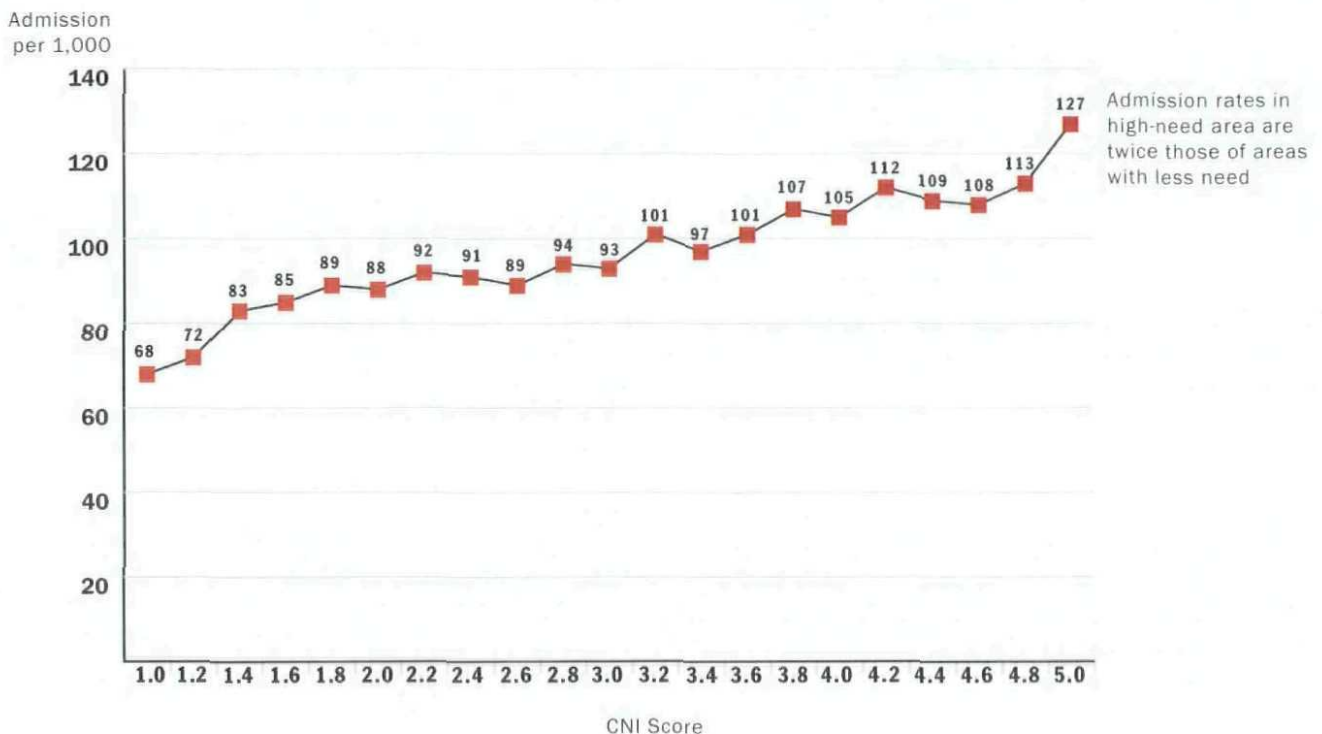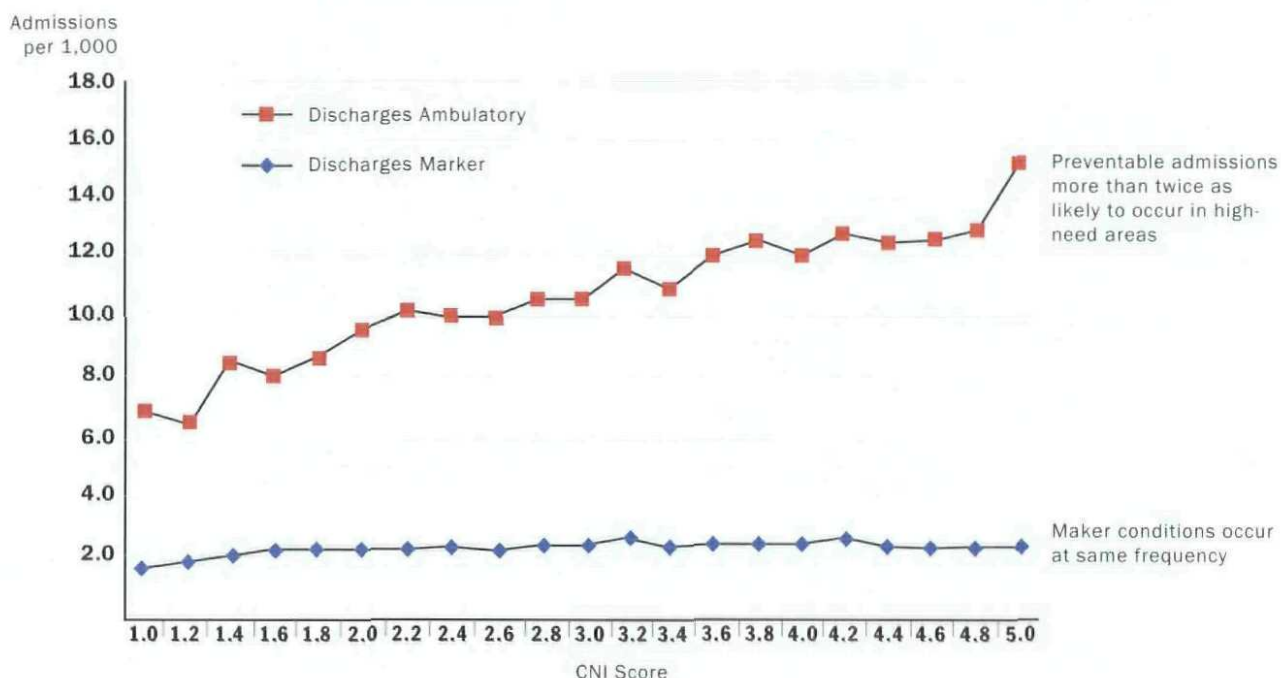Admission rates in high-need area are twice those of areas with less need

CNI Score

Figure 2

Annual Admission Rate per 1,000 Population by CNI Score: Ambulatory vs. Marker Conditions

acute care hospitalization for serious complications of chronic diseases that are normally manageable.[15] As the ranks of uninsured people (including those who are employed but choose to forgo insurance) continue to grow, this indicator of community need is likely to increase in importance. Today an estimated 45 million people in the United States lack health insurance.[16]

Housing Increased rental housing (as opposed to housing owned by the resident) is associated with more transitory lifestyles, a less stable home, and an environment that inhibits disease prevention.[17] For example, rental housing is more likely than owned housing to be substandard and to be located in neighborhoods with higher crime rates, lower quality schools, limited healthy food choices, and fewer recreational opportunities.[18] This measure does not reflect whether such neighborhoods also have a significant homeless population, a factor that could influence demands on local health systems and, because a lack of stable shelter tends to facilitate illness, increase the overall health risk.

CALCULATING THE CNI

Following our team's identification of the major barriers to effective health care, CHW partnered with Solucient, an Evanston, IL-based consulting firm, to develop the data sets and statistical models that would be used to create and test the proposed index. Measurements were computed using current demographic estimates for U.S. counties (provided by Claritas, a San Diego firm) and insurance coverage estimates (provided by Solucient). The measurements were based on the answers to nine questions concerning the five barriers (see **Box,** p. 33).

In formulating the CNI, we assigned each zip code in the nation a score of 1, 2, 3, 4, or 5 for each of the nine barrier measures. A score of 1 represented the lowest rank nationally for the statistics listed, and a score of 5 indicated the highest rank. For example, a zip code scoring a 1 for the educational barrier would contain a highly educated population; a zip code with a 5 would have a very small percentage of even high school graduates.

For the two barriers with only one statistic each (education and housing), the single statistic listed

Figure 3

Zip Codes Showing Different Levels of Need
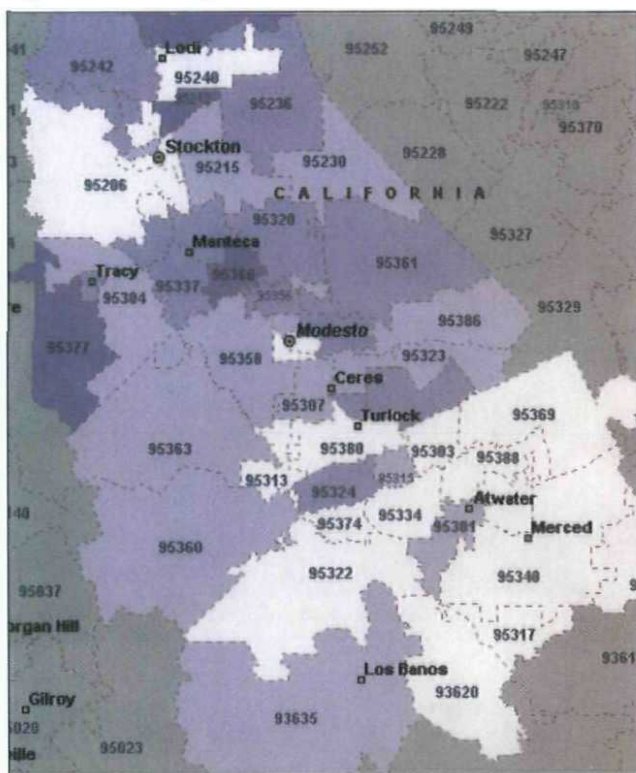
was used to calculate the barrier score. For the three barriers with more than one component statistic (income, cultural, and employment), the variation and contribution of each statistic for its barrier was analyzed and the mean value employed.

Once each zip code was assigned a score from 1 to 5 for each of the five barriers, the mean score was again calculated to yield the CNI score. Each of the five barrier scores received equal weight (20 percent each) in the CNI score. A score of 1.0 indicates a zip code with the lowest socioeconomic barriers, while a score of 5.0 represents a zip code with the most socioeconomic barriers.

EVALUATING THE CNI'S INTEGRITY

To test the validity of the CNI as a measure of barriers to health care access and subsequent poor health, we looked specifically at hospital use. Our hypothesis was that, as an accurate measure of access to care, the CNI should demonstrate that people living in communities of higher need would have more inpatient admissions (both in total and for admissions that, in an ideal setting, would be treated on an outpatient basis). The

CNI was used to analyze admission rates per 1,000 populations, where available. Scores were compared in three categories:
- Total acute care admissions
- Ambulatory sensitive conditions
- Marker conditions

"Ambulatory sensitive conditions" include conditions that, if treated properly in an outpatient setting, do not generally require an acute care admission.[19] These conditions include otitis media, chronic obstructive pulmonary disorder, pneumonia, congestive heart failure, and cellulitis. That these conditions are manageable on an outpatient basis has been well documented in a number of studies.[20]

In contrast, "marker conditions"—such as appendicitis and acute myocardial infarction—are more serious and usually require treatment on an inpatient basis, regardless of the patient's socioeconomic status.[21] In theory, hospitalization for marker conditions is independent of socioeconomic status and, therefore, provides a useful statistical control.

We discovered a strong correlation between high CNI scores and hospital admission rates. For communities in the 23 states that publicly report discharge data, total admissions per 1,000 population showed hospitalization rates for the most needy communities (CNI=5.0) that were 60 percent higher than those for communities with the lowest need (CNI=1.0) (see **Figure 1,** p. 34).

When admission rates for ambulatory sensitive conditions that could have been treated in an outpatient setting were compared to CNI scores, the correlation was even stronger, with the most highly needy communities experiencing admission rates that were almost twice as high (97 percent) as those for the lowest-need communities (see **Figure 2,** p. 35).

We found no relationship between CNI scores and marker admission rates. That absence proves a causal relationship between CNI scores and preventable hospitalization for manageable conditions.

USING THE CNI

CHW used the CNI scores to map the communities our hospitals serve. We provided the base data and zip code-level CNI maps to our hospitals for use in their community benefit analysis and planning. While it is too early to tell whether our efforts have had an impact on community health, the CNI did identify areas of need. CHW hospitals have formed new partnerships and

strengthened existing ones with others in their areas to address identified local health disparities.

For example, the CNI map in **Figure 3**, p. 36, shows the CNI scores for zip codes in San Joaquin, Merced, and Stanislaus counties in California. In reviewing the CNI data for these areas, the director of community health at St. Joseph's Medical Center in Stockton, a CHW facility, was surprised by the results for a zip code—95207— that was thought to be an upper-middle class area. The CNI score for 95207 was 4.2, which is in the highest-need quintile. This discovery prompted St. Joseph's staff, in collaboration with other community organizations, to do a more in-depth analysis of what was going on in 95207. The CNI data showed that 48 percent of children in that zip code are living in single-parent homes and are in poverty. Further study found that 52 percent of the children qualify for the federal free lunch program at school. In response, St. Joseph's has revised the routes for its mobile clinic (called the CareVan) so that it now makes regular stops at the area's elementary schools, providing free health screenings and immunizations.

In Sacramento, the CNI confirmed a need for a community health clinic in the city's North Highlands area. From 17 to 30 percent of that community's residents lack health insurance; 24 to 43 percent of its households are headed by single parents living in poverty. To meet the health need in that area, CHW's Mercy San Juan Medical Center is investing an estimated $300,000 a year to operate a community clinic at a local school.

We will update the CNI data regularly and track whether our efforts are having an effect on community health and preventable hospitalization for manageable conditions. A review of data from California's Office of Statewide Health and Planning Department, for example, shows that in San Joaquin, Stanislaus, and Merced counties—an area in which CHW operates two hospitals—there were more than 15,500 admissions for ambulatory sensitive problems. This figure represents 12.5 percent of all admissions in those counties. Over time, we will see whether our prevention efforts in high-need communities lead to fewer preventable hospitalizations for manageable conditions.

CHW and Solucient have agreed to share the methodology with other health systems and community benefit organizations in an effort to improve community needs analysis nationally. A number of other hospitals and health systems have, for a nominal fee, purchased the CNI data (see **Box**).

Efforts by some of these organizations further validate the CNI's usefulness as a tool that can help them be more strategic in the allocation of their community benefit dollars. For example, CHRISTUS Schumpert Health System, Shreveport, LA, is using CNI data to determine where to provide community benefit grants and investments. Provena Health, Joliet, IL, has built a robust database that includes CNI data, relevant hospital discharge data, and a comparison of the percentile ranking for each zip code to the national average. Finally, Froedtert Memorial Hospital, Milwaukee, is aiding in best-practice migration that targets asthma-treatment efforts adopted by urban physicians and hospitals.

As we had intended, the CNI is helping to build coalitions among hospitals, health departments, clinics, health associations, and neighborhood centers that are working to help people avoid hospitalization for a manageable condition.

A NEW PUBLIC HEALTH TOOL

The ability to pinpoint neighborhoods with significant barriers to health care access may be an important new tool for public health advocates and care providers. Because it considers multiple factors that limit health care access, the CNI may be more accurate and useful than existing needs assessment methods in identifying neighborhoods with disproportionate unmet health needs.

The CNI can also serve as an educational tool

Organizations Using the CNI

Other health care systems hospitals now using the CNI are:

- **CHRISTUS Schumpert Health System,** Shreveport, LA
- **Erlanger Health System,** Chattanooga, TN
- **Froedtert Memorial Hospital,** Milwaukee
- **Lodi Memorial Hospital,** Lodi, CA
- **Memorial Hospital of Gulfport,** Gulfport, MS
- **North Mississippi Health Services,** Tupelo, MS
- **Parkland Memorial Hospital,** Dallas
- **Phoebe Putney Memorial Hospital,** Albany, GA
- **Provena Health,** Joliet, IL
- **San Juan Regional Medical Center,** Farmington, NM
- **St. Mary's Hospital,** Evansville, IN
- **St. Vincent Hospital,** Billings, MT
- **The Methodist Hospitals,** Gary, IN

for elected officials in developing programs, forming partnerships, and drafting policies that address serious barriers to access in local communities. And it can help health care organizations and public health officials as they plan hospitals and other health care facilities and services in specific locations.

Because members of high-need communities are more likely than others to seek preventive medicine in the most expensive setting—the emergency room—we hope that, with continued strategic use of the CNI to address the causes of health dispari-

ty, the cost of health care itself may be reduced.

This study also speaks to the need for enhanced partnerships with health organizations and community groups to effect real change in the way health care is viewed nationally. The goal is to help health care organizations, not-for-profit groups, and policymakers identify and address barriers to health care in their communities. Use of the CNI as a national model to assess community needs will elevate the discipline of community benefit into a science. ■

NOTES

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HEALTH PROGRESS.