Access to Health Care and Community Social Capital

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Objective. To test the hypothesis that variation in reported access to health care is positively related to the level of social capital present in a community.

Data Sources. The 1996 Household Survey of the Community Tracking Study, drawn from 22 metropolitan statistical areas across the United States ($n = 19{,}672$). Additional data for the 22 communities are from a 1996 multicity broadcast media marketing database, including key social capital indicators, the 1997 National Profile of Local Health Departments survey, and Interstudy, American Hospital Association, and American Medical Association sources.

Study Design. The design is cross-sectional. Self-reported access to care problems is the dependent variable. Independent variables include individual sociodemographic variables, community-level health sector variables, and social capital variables.

Data Collection/Extraction Methods. Data are merged from the various sources and weighted to be population representative and are analyzed using hierarchical categorical modeling.

Principal Findings. Persons who live in metropolitan statistical areas featuring higher levels of social capital report fewer problems accessing health care. A higher HMO penetration rate in a metropolitan statistical area was also associated with fewer access problems. Other health sector variables were not related to health care access.

Conclusions. The results observed for 22 major U.S. cities are consistent with the hypothesis that community social capital enables better access to care, perhaps through improving community accountability mechanisms.

Key Words. Access, social capital, managed care

This study examines variability in access to health care across 22 major U.S. cities. We examine how reported experience with access to health care is related to two types of community characteristics: (1) health care system variables, including managed care penetration and competition and physician supply, and (2) measures of social capital. By addressing these

relationships, the study explores whether access to care may be potentially improved through public health collaborations, general social capital interventions, or health care system interventions.

During the 1990s, managed care came to dominate the health care financing and delivery market. As health costs increased in the 1990s, employers moved employees into HMO plans and offered fewer employees insurance benefits (Institute for the Future 1998). Greater managed care penetration has resulted in downward pressure on health care prices, costs, and rate of utilization for insured persons, at least initially and for some types of services. It has also resulted in less revenue to care for the growing number of uninsured.

However, the increase in managed care has also resulted in a new focus on the health of communities, a focus that is coincident with the emerging understanding of the broad determinants of health and the healthier community movement. The determinants of health are now understood to include social and community characteristics such as income distribution, sense of community, and social networks that operate through their impact on individual stress (Ahern, Hendryx, and Siddharthan 1996; Evans, Barer, and Marmor 1994; Hendryx and Ahern 1997; House, Landis, and Umberson 1988; Patrick and Wickizer 1995). As our understanding of the social aspects of human health has deepened, communities are assuming more responsibility for improving the health status of citizens by initiating new collaborative institutions such as community care networks, which combine available assets in more efficient and effective ways.

A recent study by Cunningham and Kemper (1998) showed significant community variation in reported access to health care for the uninsured after accounting for need and a set of sociodemographic variables. The authors speculated that certain community-level variables such as physician supply may account for some of this variation but did not empirically examine community variables. Our study extends the

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Cunningham and Kemper research by including measures of (1) community health care characteristics such as managed care penetration and competition and (2) general community social capital indicators. Furthermore, we investigate citizen perceptions of access to health care for both uninsured and insured persons.

We hypothesize that reported access to care is positively associated with community social capital. The concept of social capital reflects the belief that levels of interpersonal trust, engagement in civic affairs, and reciprocity norms among citizens in a community determine the extent of cooperative and mutually beneficial behaviors occurring within the community. We explore in more detail in the Discussion section of this article the mechanism by which social capital may achieve this outcome, but our position, in brief, is that social capital improves the likelihood and impact of community accountability mechanisms, and accountability mechanisms help protect and improve access to care. This hypothesis is derived from Putnam's (1993) findings, beginning with the study of Italian postwar local governments and extending to the study of local government performance in the United States, that the level of social capital is a powerful predictor of the effective functioning of democratic government institutions. We extend the application of Putnam's social capital concepts to the functioning of the health care institutions in 22 major U.S. cities.

With respect to the other independent variables investigated, we expect physician supply will not be related to access because of the more than adequate supply of these resources in virtually all large metropolitan areas. The expected impact of HMO penetration and HMO competition on people's reports of health care access is less clear. Although managed care may improve access to outpatient and preventive services for those covered by insurance, it may also reduce access to hospitalizations and specialty services.

METHODS

Sources of Data

The data for this multicity study are from four principal sources: the Community Tracking Study (CTS) Household Survey, the National Institute for Health Care Management (NIHCM) Data Source, the National Association for City and County Health Officials 1997 National Profile of Local Health Departments, and a multicity broadcast media marketing database.

The CTS is the result of an initiative of the Robert Wood Johnson Foundation. Survey data collection focuses on 60 metropolitan statistical areas (MSAs) nationwide, randomly selected with probability in proportion to population to insure representation of the U.S. population. In this study, we limit the analysis to 22 of the 48 MSAs with populations of 200,000 or more persons because of data availability from the other sources (the media marketing database included 24 of the 48 CTS MSAs, and 2 MSAs were lost because of missing data from the NIHCM).[1]

Sample selection occurred primarily through random-digit dialing, supplemented with field samples to represent persons who do not have telephone service. Families within households included the respondent, their spouse, children under age 18, and children age 18–23 who were full-time students. All interviews were conducted by telephone (including cell phones used in the field for persons without telephones) and were conducted in English or Spanish. During the course of the interview, information was obtained on all adults in the family as well as one randomly selected child.

Persons in the 22 MSAs in this study numbered 19,672. The final sample represents a 65 percent response rate. No information was collected from families that refused to participate, and consequently, the potential for bias from survey nonresponse could not be ascertained. However, person-level weights were poststratified to account for nonresponse based on age, sex, race or ethnicity, and years of education. Estimates reported in this article were weighted to be representative of the noninstitutionalized civilian U.S. population as well as representative of each of the 60 sites, using the weights created in the CTS study.

Individual level personal characteristics treated as independent variables in this study include sex, age, race or ethnicity, income, number of persons in the household, years of education, insurance coverage (yes/no), HMO enrollment (yes/no), and self-reported health status. Income was measured in two ways: by the log of reported family income and by calculating a measure of relative income, which was family income divided by the mean family income for the MSA in which the person resided. Health status was measured by two variables for adults: the SF-12 Physical Composite Score and the SF-12 Mental Health Composite Score. For children, health status was assessed by the proxy's rating of general health (SF-12 item 1; a higher score indicates worse health). We also used the Household Survey to create a community-level variable, the proportion of the community covered by Medicaid or other state public insurance.

Additional descriptions of the methodology of the CTS Household Survey can be found elsewhere (Cunningham and Kemper 1998; Kemper, Blumenthal, Corrigan, et al. 1996).

The NIHCM (1999) Data Source served as our source for information on 1996–97 MSA level health care supply and managed care characteristics. Five variables were collected from this source: nonfederal primary care physicians per 100,000 persons (primary care defined as family and general practice, internal medicine, obstetrics/gynecology, and pediatrics), nonfederal, nonprimary care specialist physicians per 100,000 persons, hospital beds per 100,000 persons, number of HMO plans, and HMO market penetration (defined as total HMO enrollment divided by total MSA population). HMO variables were obtained by the NIHCM from *Interstudy Competitive Edge 8.1.* Hospital bed supply was obtained from *Hospital Statistics* (Healthcare InfoSource, Inc., a subsidiary of the American Hospital Association). Physician supply was obtained from *Physician Characteristics and Distribution in the U.S.* (American Medical Association).

The National Association for City and County Health Officials 1997 National Profile of Local Health Departments was used for data on public health collaborations and public health service provision. Surveys were mailed to all local health departments nationwide in 1996–97 and were completed by local health department officials. The response rate was 88 percent, and no metropolitan areas represented in the CTS were lost because of nonresponse to this survey. For this study, we included only local health departments that matched a CTS site. The 1997 National Profile of Local Health Departments was funded through a Centers for Disease Control and Prevention cooperative agreement with the National Association of County and City Health Officials.

Two variables were derived from the profile for this study: The first is the number of collaborations or partnerships with other state or community organizations, including other local health departments, state health departments, other state agencies or units of government, community health centers, migrant health centers, health care providers, insurance companies, nonprofit/voluntary organizations, the faith community, and others. This variable is a count of the number of collaborations and ranges potentially from 0 to 13. This is a conceptual measure of public health collaborations, and the internal consistency reliability of the measure is 0.92. The second is the number of services the health department provided, contributed resources to, or contracted for, including adult immunizations, behavioral health, case management, child health, chronic disease

treatments, dental health, home health care, maternal and prenatal care, primary care, substance abuse services, sexually transmitted disease services, and others. The variable is a count ranging potentially from 0 to 12.

The multicity broadcast media marketing database is a combination of citizen survey data and published sources of MSA statistics, made available as a gift to our university by Leigh Stowell and Associates, Inc. (Seattle, WA). The measure of general social capital used in this analysis represents a contextual variable developed for each MSA. It is a composite variable of six individual elements pertaining to the level of interpersonal trust, reciprocity sentiments, sense of personal efficacy, sense of personal safety, voting behavior, and civic engagement in each MSA. This range of elements reflects well the type of broader social context that scholars such as Putnam (1993) and McKnight (1995) view as essential for the development and sustenance of effective families, neighborhoods, and communities. The published sources include statistics on crime reported to the police, used as a surrogate for sense of personal safety, taken from the FBI Uniform Crime Reports for 1996. Crime is measured as 100,000 minus the crime rate per 100,000; thus, a higher score indicates higher personal safety. Voting rates in 1996 were used as one surrogate measure for civic engagement. A second civic engagement indicator is a 1 to 4 rating of each MSA on the level of activity of fraternal orders, based on their number and membership size (Weiss 1994). Annual 1996 per capita contributions to the United Way were used as a surrogate of reciprocity, entered into the database from the annual August report of *The Chronicle of Philanthropy.*

The survey-based measures are derived from a multi-MSA data set developed for the purpose of characterizing major U.S. and Canadian TV/radio/newspaper markets with respect to their distinctive "cultures." The individual-level survey data sample sizes are 1,200 or more for each MSA. Surveys are conducted by telephone using random-digit dialing, beginning with MSA prefixes. At least 12 callbacks per number were attempted, using experienced interviews, resulting in response rates of 72 to 78 percent per MSA. The psychometric scales from the survey are measures of social trust and sense of personal efficacy. The survey consists of 42 items that have been used by political scientists to study social capital correlates and the consequences of varying levels of social capital on governmental performance in education, voting behavior, and gender and race equity in cross-city comparisons (Moon, Lovrich, and Pierce 2000). Items were based on sociology and political science sources (Lovrich and Pierce 1999), and scores were developed using cluster analysis methods to

obtain nationwide norms against which any particular MSA can be compared (Pierce and Lovrich 1996). Based on these norms, respondents were grouped into one of three categories (low, middle, and high levels of trust and of self-esteem.) The social capital indicators include measures of trust (e.g., "people will be honest with you as long as you are honest with them") and self-esteem, which is a measure of social capital to the extent that it represents trust in one's own capacity to engage in purposeful efforts (e.g., "I often feel that my opinions are not taken seriously"). Individual level survey data were aggregated to the mean score for the MSA.

There is not a single agreed method for measuring social capital (Fukuyama 2000). For the calculation of the general social capital measure for each MSA, each of the six indicators was standardized to mean $= 50$ and $SD = 10$. General social capital is the mean of these six standardized measures of trust, efficacy, personal safety, reciprocity, voting participation, and civic engagement. This measure combines survey data on trust with counts of group membership, measures of social capital suggested by Fukuyama (2000) and Putnam (1993), and also other measures to represent all three theoretical components of social capital. We examine the internal consistency of this measure to confirm that it may be treated as a measure of a single construct.

Dependent Variable: Measure of Access to Care

The measure of access to care is derived from the Household Survey. The measure used here is very similar to that developed in the Cunningham and Kemper (1998) study. Individuals were asked two questions: (1) During the past 12 months was there any time when you didn't get the medical care you needed? (2) Was there any time during the past 12 months when you put off or postponed getting medical care you thought you needed? Follow-up questions identified specific reasons as to why care was postponed. Access to care was measured dichotomously. Individuals were considered to have had difficulty accessing health care if they answered "yes" to the first question or "yes" to the second question and if the reasons cited for the second question included the cost of care, problems with health insurance or referrals, difficulty finding physicians or making appointments, or proximity to clinicians. We selected these types of access problems to reflect the major obstacles to receipt of needed care; other choices such as "bad experience with doctor," "caring for family members," or "didn't think it

was serious enough" were not considered genuine health care system-related access problems.

Database Merging and Weighting

Data sets were merged using the MSA as the merge variable. The Stowell data were available for 24 of the 48 MSAs. We checked definitions of MSAs from the various sources and excluded two additional MSAs because the geographic boundaries from the NIHCM did not coincide with the MSA boundaries employed in the CTS. Thus, data from all sources on matching MSAs were available for 22 MSAs. The Stowell MSA level indicators were weighted prior to merging with the CTS to adjust for underrepresentation of Stowell survey respondents with respect to race, education, and income. The CTS weights were used in final analyses.

Analysis

The conceptual framework used to select independent variables is based on Andersen's widely used model of access to care (Andersen 1995; Andersen and Newman 1973). Access is a function of the need for health care, enabling factors such as income and insurance and predisposing factors such as preferences and expectations. The conceptual framework used to measure social capital is based on work by Putnam (1993), Fukuyama (2000), and McKnight (1995) regarding the impact of social capital on how community institutions function.

   The conceptual basis for the health care sector variables encompasses expected relationships between the structure of the health care sector and access to care. Structure variables include the number of hospital beds, the number of primary care and specialty physicians, the degree to which managed care has penetrated a community (proportion of people insured by HMOs), and the extent of competition in a community measured by number of HMO plans available in the MSA. Within the Andersen model, we may view both health sector and social capital variables as community-enabling variables.

   Variable distributions were examined, and the variables used in multivariate analyses were tested for multicollinearity. Hierarchical modeling was used to test individual and community effects on people's access to health care (Bryk and Raudenbush 1992; Sullivan, Dukes, and Losina 1999). The statistical analysis was done using SUDAAN Proc Multilog developed for use with categorical dependent variables. This procedure

estimates parameters using generalized estimating equations and employs a robust variance estimation method for describing the dependence of responses within clusters (Shah, Barnwell, and Bieler 1997). We tested three successive models: (1) a model that included the Anderson individual-level need, enabling, and predisposing variables; (2) a model that added community-level health care sector variables; and (3) a model that added general community social capital. During intermediate model fitting, we eliminated predictor variables from further consideration when their *F* values were less than 1, as this resulted in unstable model estimates.

Model fit was estimated by a Wald chi-square statistic with a Satterwaite correction for numerator degrees of freedom (Shah, Barnwell, and Bieler 1997). The chi-square tests the null hypothesis that all parameters are equal to zero. Incremental improvement in model fit from the individual to the first community model, and the first to the second community model was tested using the difference between the chi-square statistics with degrees of freedom equal to the number of added predictors. Models were run using the individual as the unit of analysis and individual variables from the Household Survey as level 1 variables. Community was treated as the nesting variable, and community indicators were used as level 2 variables.

RESULTS

Summary of Dependent and Independent Variables

Table 1 summarizes all weighted dependent and independent variables. The final disposition of each potential predictor is given in the far right column, indicating whether the variable was kept in final models, deleted because of multicollinearity, or deleted because of interim model *F* values < 1. Variables deleted for *F* values < 1.0 included the log of family income, "other" race, public health services, bed supply, HMO market penetration rate, and the percentage of the sample covered by public insurance.

Variation in Access and Social Capital

The variation among the 22 MSAs in the weighted percent of persons with access problems was 11.8 to 19.9% (MSA level mean = 16.4, *SD* = 2.2). The six components of social capital were intercorrelated with a Cronbach alpha

Table 1:   Summary of Weighted Independent and Dependent Variables

Variable	Mean or Percentage	Final Model Disposition
Access to care problem	17.0%	Dependent variable
Female	51.0%	Kept
Black	13.0%	Kept
White	61.6%	NA (dummy reference)
Hispanic	18.3%	Kept
Other race	7.0%	Dropped for $F < 1$
Family income	$38,089	Dropped for $F < 1$
Relative family income	0.97	Kept
Household size	2.81	Kept
Adult	74.2%	Dropped for multicollinearity with age
Age in years	35.4	Kept
Years education (adults)	13.0	Kept
Physical Composite Score (adult)	49.4	Kept
Mental Health Composite Score (adult)	51.9	Kept
Child health	1.71	Kept
Uninsured	14.8%	Kept
Enrolled in HMO	41.9%	Kept
Community variables		
Percent of sample on public insurance	5.2%	Dropped for $F < 1$
Hospital beds per 100,000	304.0	Dropped for $F < 1$
Primary care physicians per 100,000	107.3	Kept
Specialist physicians per 100,000	156.3	Dropped for multicollinearity with primary physician supply
Number of HMO plans in market	13.7	Kept
HMO penetration rate	32.0%	Dropped for $F < 1$
Number of public health services provided	4.2	Dropped for $F < 1$
Number of public health–community collaborations	8.9	Kept
General community social capital	48.2	Kept

of 0.76. The variation among the 22 MSAs in community social capital was 38.7 to 56.4 (MSA level mean = 49.6, SD = 5.1). The three MSAs with the lowest social capital were Las Vegas, Miami, and West Palm Beach. The three MSAs with the highest social capital were Baltimore, Columbus, and Denver. Social capital and access problems at the MSA level correlated at −0.25.

Results of Hierarchical Models

Results of the models estimated to predict access problems are summarized in Table 2. Column A includes only the individual level predictors. Reported access to care problems are associated with females, non-Hispanic

Table 2: Model Results to Predict Problem with Health Care Access

Variable	Individual Predictors (A)		Individual and Health Sector Predictors (B)		Individual, Health Sector, and Social Predictors (C)	
	Estimate (SE)	*Odds*	*Estimate (SE)*	*Odds*	*Estimate (SE)*	*Odds*
Intercept	−3.86 (0.19)[d]		−3.71 (0.26)[d]		−3.23 (0.24)[d]	
Female	0.355 (0.057)[d]	1.426	0.356 (0.057)[d]	1.428	0.355 (0.057)[d]	1.426
Black	−0.092 (0.075)	0.912	−0.081 (0.075)	0.922	−0.092 (0.074)	0.912
Hispanic	−0.504 (0.084)[d]	0.604	−0.476 (0.085)[d]	0.621	−0.503 (0.090)[d]	0.604
Relative family income	−0.194 (0.036)[d]	0.785	−0.189 (0.034)[d]	0.792	−0.192 (0.034)[d]	0.788
Household size	0.034 (0.019)	1.034	0.034 (0.019)	1.033	0.034 (0.019)	1.034
Age in years	−0.014 (0.0016)[d]	0.986	−0.014 (0.0015)[d]	0.986	−0.014 (0.0015)[d]	0.986
Years education (adults)	0.118 (0.007)[d]	1.112	0.118 (0.007)[d]	1.112	0.118 (0.007)[d]	1.112
Physical Composite Score (adult)	−0.029 (0.002)[d]	0.972	−0.028 (0.002)[d]	0.972	−0.028 (0.002)[d]	0.972
Mental Health Composite Score (adult)	−0.012 (0.002)[d]	0.988	−0.012 (0.002)[d]	0.988	−0.011 (0.002)[d]	0.988
Worse child health	0.534 (0.034)[d]	1.414	0.531 (0.034)[d]	1.412	0.531 (0.034)[d]	1.412
Uninsured	0.992 (0.104)[d]	2.696	0.987 (0.102)[d]	2.688	0.977 (0.101)[d]	2.656
Enrolled in HMO	0.238 (0.060)[d]	1.269	0.237 (0.059)[d]	1.267	0.234 (0.059)[d]	1.264
Number of HMO plans in market	NA		−0.009 (0.0043)[a]	0.991	−0.010 (0.003)[c]	0.990
Primary care physicians per 100,000	NA		−0.00046 (0.0005)	0.999	−0.0006 (0.0004)	0.999
Number of public health–community collaborations	NA		0.0044 (0.0021)[a]	1.005	0.005 (0.002)[b]	1.005
General community social capital	NA		NA		−0.010 (0.004)[b]	0.990
Satterwaite adjusted Wald chi-square (df)	322.8 (5.23)		341.7 (5.70)		351.4 (5.81)	

[a]$p < 0.05$; [b]$p < 0.02$; [c]$p < 0.01$; [d]$p < 0.001$.

ethnicity, lower relative family income, poor child health ratings, younger age, higher education, poorer physical and mental health, HMO enrollment, and lack of health insurance.

Column B summarizes model results when health sector variables are added to the individual predictors. All individual level predictors remain unchanged, and two community-level health care system attributes are significant. Greater access problems are associated with fewer HMO plans and also with more public health–community collaborations. This model represents a significant improvement in fit relative to the

column A model (improvement in Satterwaite chi-square = 18.9, df = 0.47, $p < .01$).

Column C summarizes model results when general community social capital is added to the individual and health sector predictors. Other individual and community effects remain unchanged. The social capital effect is significant; higher social capital is related to fewer reported access problems. Coefficients for individual and community variables change very little relative to model A. Model C relative to model B improves significantly (difference in Satterwaite chi-square = 9.7, df = 0.11, $p < .01$).

DISCUSSION

These results support the hypothesis that social capital is related to improved health care access. We speculate this occurs because social capital (i.e., trust among citizens, reciprocity, and civic engagement) likely improves the functioning and efficiency of community social institutions (Putnam 1993). The current research extends prior work by demonstrating that the benefits of social capital may extend from local government institutions in general to local health care institutions in particular.

This study is not able to examine the direct mechanisms by which social capital may improve access. However, social capital (Putnam 1993) refers to three interdependent community factors, namely, interpersonal trust, civic engagement (i.e., active participation in public affairs), and norms of reciprocity (i.e., generalized expectations of cooperative behavior). Reciprocity norms are thought to lower transaction costs, facilitate cooperation, restrain opportunism, and balance self-interest and solidarity. Networks of civic engagement increase costs to transgressors in economic exchanges because others know of the transgression. Networks facilitate communication and the flow of information about others' trustworthiness, reinforce reciprocity norms, develop reputations, and facilitate informal problem solving. Arising from reciprocity norms and civic engagement are trust in one another and a "confident self-discipline" (i.e., self-efficacy). Putnam found that social capital improved institutional performance; he had 12 primary measures of government institutional performance, including the number of family health clinics developed by the government, and the government's local health care spending budget.

If we extend this reasoning to health care institutions, we may argue that social capital improves access in the same manner that social capital

improves local government functioning. Social capital may operate to create more humane, efficient, better coordinated, broader, or deeper health care systems. The following speculative features may operate in high social capital communities: Physicians may be more likely to accept underfunded patients. Insurers may be more likely to stay in the market as a community commitment and not just for financial self-interest and may be more likely to retain a fuller range of covered services. Employers may be more likely to provide better coverage to employees. Sectors of the health care system such as physicians and hospitals, or hospitals and aftercare institutions, may be better at coordinating care, and patients may be willing to absorb higher out-of-pocket costs because of perceptions of institutional quality and trust. (In other findings from these data not shown here, higher out-of-pocket costs were associated with higher social capital, but social capital lowered out-of-pocket costs for the uninsured.) For other discussions of the central role of trust in business and health care system functioning, see Fukuyama (1999) and Annison and Wilford (1998).

These speculations are supported by site visit results in 12 of the CTS locations (Steinberg and Baxter 1998). A key to positive health system change and improved institutional functioning is community accountability. They define community accountability as "the structures and processes communities use to make health system change consistent with local standards of behavior, shared values, or community goals." The accountability mechanisms may be formal, such as health care coalitions and collaborations, contractual agreements or other legal structures, or press coverage, or informal "professional culture." Where communities lack common values and a strong sense of community, few accountability mechanisms were present in this site visit study. Social capital may be the element of values and sense of community that operates to improve both the probability and impact of accountability mechanisms because in higher social capital communities, reputations matter, and shared values and community goals are more likely to exist. Conversely, in low social capital communities, common values and goals are lacking, and reputations do not travel through the community because its residents are more disengaged, resulting in weakened accountability mechanisms.

One of the key objectives of accountability mechanisms is to protect access to care for vulnerable populations (Steinberg and Baxter 1998). Accountability initiatives to protect access are designed to ensure that institutions are providing high-quality care to all segments of the population. For example, in one CTS site, a study of the burden of indigent care

revealed that one institution was not providing its share. This institution came under close scrutiny, and community initiatives were prompted to improve access and explore financing models for the uninsured. In another site, a hospital association that provides a leadership role in community health included representation from physicians and business leaders on its governing body. Our view is accountability mechanisms are more likely to arise and be successful when the three theoretical components of social capital—trust, civic engagement, and reciprocity norms—are in place.

Even though the magnitude of the observed effects was modest, the findings reported here are important because they are shown to be independent of individual-level predictors known to be powerful correlates of access and because they are independent of health system characteristics. In addition, the results cannot be attributed to common method variance but represent completely separate sources of information. The measure of access from the Household Survey represents self-reported perceptions, whereas the measures of social capital are collected from independent surveys and data sources unconnected to the Household Survey.

It is intriguing that although the measure of general social capital was related to access as hypothesized, a measure specific to public health-community collaborations was significant in the opposite direction—collaboration was negatively associated with access. This may be a function of the inclusion of specific communities where public health officials are striving to engage in collaborations because access problems are known to exist. However, if social capital in general improves access, but public health collaborations—which might reasonably be viewed as a manifestation of social capital—show the opposite effect, it might be the case that social capital operates in ways the public health collaboration variable does not represent. What these other ways may be is an important question for further research. One possibility is public health collaborations affect a relatively small proportion of the population when it comes to access and that access for the population in general is more dependent on broader community functioning.

The reporting of fewer access to care problems was related to one other health system variable: more HMO plans in the MSA. This community feature is in contrast to individual HMO enrollment, which was associated with more access problems. The presence of more HMO plans in a community may represent greater competition for customers,

resulting in downward price pressure and more effective control of health insurance premiums and out-of-pocket costs. In other analyses not shown here, more HMO plans were associated with reduced out-of-pocket costs. More HMO plans also increases the probability that plans are locally owned, and locally owned plans may be more committed to providing better access to their enrollees.

Finally, some findings among the individual-level variables may seem unexpected. Family income did not predict reported access problems, although relative family income did—the higher the relative income, the fewer access problems reported. Relative income may better capture community variability because the same income may enable either higher or lower standards of living depending on the community in question. Higher level of education predicted more reported access problems; after adjusting for income, health status, insurance, and other variables, persons with higher education may be more sensitive to and/or better able to articulate the access problems they experience.

There are a number of study limitations that require us to be cautious about our conclusions. Causal relationships between access and community variables cannot be definitively established because of the cross-sectional nature of the data. We cannot conclude definitively that a particular community-level phenomenon impacts individual behavior. The effects are limited to large urban areas and may not generalize to smaller cities, rural areas, or subareas such as urban cores. The measures of public health services and collaborations are only counts of these activities, unadjusted for population coverage or MSA size (although we did examine collaboration rates per capita and found no difference in results).

In conclusion, this study suggests social capital may play a role in improving access to health care, perhaps a more important role than at least some structural health care sector variables. Such results are consistent with the theoretical role of social capital in making more efficient use of existing community physical capital resources and in promoting community accountability mechanisms. Further research is needed to confirm the role of social capital and to investigate the mechanisms by which it may improve access to health care. If social capital does contribute to more effective community accountability, the question also arises as to whether, and how, to manipulate it to improve health care services.

NOTE

1. The 22 MSAs in the study are Atlanta, Baltimore, Chicago, Cleveland, Columbus, Denver, Greensboro, Houston, Knoxville, Las Vegas, Los Angeles, Miami, Minneapolis, Philadelphia, Phoenix, Pittsburgh, San Francisco, Seattle, St. Louis, Tulsa, Washington DC, and West Palm Beach.

REFERENCES

Ahern, M., M. Hendryx, and K. Siddharthan. 1996. "The Importance of Sense of Community to People's Perceptions of Their Health Care Experiences." *Medical Care* 34: 911–23.

Andersen, R. 1995. "Revisiting the Behavioral Model and Access to Medical Care: Does It Matter?" *Journal of Health and Social Behavior* 36: 1–10.

Andersen, R., and J. F. Newman. 1973. "Societal and Individual Determinants of Medical Care Utilization in the United States." *Milbank Memorial Fund Quarterly* 51: 95–124.

Annison, M. H., and D. S. Wilford. 1998. *Trust Matters: New Directions in Health Care Leadership.* San Francisco: Jossey-Bass.

Bryk, A. S., and S. W. Raudenbush. 1992. *Hierarchical Linear Models.* Newbury Park: Sage.

Cunningham, P. J., and P. Kemper. 1998. "Ability to Obtain Medical Care for the Uninsured: How Much Does It Vary Across Communities?" *Journal of the American Medical Association* 280: 921–7.

Evans, R. G., M. L. Barer, and T. R. Marmor. eds. 1994. *Why are Some People Healthy and Others Not?* New York: Aldine de Gruyter.

Fukuyama, F. 1999. *The Great Disruption: Human Nature and the Reconstruction of Social Order.* New York: Free Press.

Fukuyama, F. 2000. *Social Capital and Civil Society.* Unpublished manuscript.

Hendryx, M. and M. Ahern. 1997. "Mental Health Functioning and Community Problems." *Journal of Community Psychology* 25: 147–57.

House, J. S., K. R. Landis, and D. Umberson. 1988. "Social Relationships and Health." *Science* 241: 540–5.

Institute for the Future. 1998. *A Forecast of Health and Health Care in America.* Menlo Park, CA: Institute for the Future.

Kemper, P., D. Blumenthal, J. M. Corrigan, P. J. Cunningham, S. M. Felt, J. M. Grossman, L. T. Kohn, C. E. Metcalf, R. F. St. Peter, R. C. Strouse, and P. B. Ginsburg. 1996. "The Design of the Community Tracking Study: A Longitudinal Study of Health System Change and Its Effects on People." *Inquiry* 33: 195–206.

Lovrich, N. P., and J. C. Pierce. 1999, April. "*Civic Capital, Educational Governance and Educational Outcomes in American Cities: An Exploratory Analysis.*" Louisville, KY: The 29th Annual Meeting of the Urban Affairs Association.

McKnight, J. 1995. *The Careless Society: Community and Its Counterfeits.* New York: Basic Books.

Moon, D., N. P. Lovrich, and J. C. Pierce. 2000. "Political Culture in Canada and the United States: Comparing Social Trust, Self-Esteem, and Political Liberalism in Major Canadian and American Cities." *Social Science Quarterly* 81 (3): 826–36.

National Institute for Health Care Management. 1999. *NIHCM Health Care System Datasource*, 2nd edition. Washington, DC: National Institute for Health Care Management.

Patrick, D. L., and T. M. Wickizer. 1995. Community and Health. In: *Society and Health*, edited by B. C. Amick, S. Levine, A. R. Tarlov, and D. C. Walsh. New York: Oxford University Press, 46–92.

Pierce, J. C., and N. P. Lovrich. 1996. *Political Culture and Public Life.* Chicago: Annual Meeting of the Midwest Political Science Association.

Putnam, R. D. 1993. *Making Democracy Work: Civic Traditions in Modern Italy.* Princeton, NJ: Princeton University Press.

Shah, B. V., R. G. Barnwell, and G. S. Bieler. 1997. *SUDAAN User's Manual* (release 7.5). Research Triangle Park, NC: Research Triangle Institute.

Steinberg, C. R., and R. J. Baxter. 1998. "Accountable Communities: How Norms and Values Affect Health System Change." *Health Affairs* 17 (4): 149–57.

Sullivan, L. M., K. A. Dukes, and E. Losina. 1999. "An Introduction to Hierarchical Linear Modeling." *Statistics in Medicine* 18: 855–88.

Weiss, M. J. 1994. *Latitudes & Attitudes: An Atlas of American Tastes, Trend, Politics, and Passions.* Boston: Little Brown and Co.