Spillovers of Uninsurance in Communities

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Abstract

Purpose. To evaluate whether the relative size of the local uninsured population results in pecuniary spillovers and non-pecuniary real spillovers on privately insured adults.

Methods. Survey data on 23,956 working-age privately insured adults from the 2003 Community Tracking Study (CTS) Household Survey were used to estimate multilevel logistic regression models to test for the existence of pecuniary and non-pecuniary real spillovers. The main hypothesis is that privately insured adults will have poorer potential/realized access to health care and a lower assessment of provider satisfaction and trust in communities with higher uninsurance rates.

Results. All results describe effects on adults with private health insurance. Other things equal (including charity care), higher community uninsurance was associated with lower odds that an insured adult would have a place to go when sick (OR=0.63; 95% CI=0.60, 0.68) as well as with lower odds of having a doctor's visit (OR=0.89; 95% CI=0.85, 0.92), having a check up (OR=0.91; 95% CI=0.88, 0.94), and seeing a specialist when needed (OR=0.85; 95% CI=0.76, 0.95). Higher community uninsurance was also associated with lower odds of being very satisfied with the choice of primary care doctors (OR=0.75; 95% CI=0.72, 0.78), lower odds of being very satisfied with health care (OR=0.90; 95% CI=0.86, 0.94), lower odds of trusting doctors (OR=0.93; 95% CI=0.91, 0.96), and lower odds of being very satisfied with specialists (OR=0.87; 95% CI=0.82, 0.92). A higher percent of the locally uninsured population with no cost-related access difficulties was associated with lower odds of being seen by a specialist (OR=0.95; 95% CI=0.93, 0.98), lower odds of being very satisfied with the choice of primary care doctor (OR=0.93; 95% CI=0.91, 0.95), and lower odds of being very satisfied with health care (OR=0.95; 95% CI=0.93, 0.97).

Conclusion. There are substantial spillover effects of community uninsurance on the access to—and satisfaction with—health care for the privately insured population. These effects appear to arise both from pecuniary spillovers (associated with the provision of charity care) and real spillovers (associated with market responses to lower demand for health care services).

1. Introduction

There are about 47 million people without health insurance coverage in the US and the relationships between uninsurance and health care access difficulties for uninsured persons are well documented (Rowland, 2008; Institute of Medicine, 2002). Studies have shown that uninsured adults have lower access to health care and poorer health outcomes than insured adults (Ayanian et al., 2000; Baker et al., 2001; Dor, Sudano, and Baker, 2006). There is also compelling evidence that the problem of uninsurance not only affects individuals but, more importantly, communities and the overall effectiveness of local health care systems (Pauly and Pagán, 2007).

In *A Shared Destiny: Community Effects of Uninsurance*, the Institute of Medicine's Committee on the Consequences of Uninsurance hypothesized that "the burden of financing care for uninsured persons affects the health services available to all community residents… The pathway proposed is that of lower provider revenues resulting from the combination of the lower use of health services by uninsured persons (compared with use by insured persons), as well as the uncompensated costs incurred when uninsured persons do receive health care" (Institute of Medicine, 2003: pp. 6-7). This conceptual framework implies that there are pecuniary or financial spillovers from the uninsured population in a community to everyone else in the same community whenever the uninsured population receives uncompensated health care that is not fully subsidized by external financial resources (e.g., from philanthropy or state/federal funds). These costs either reduce provider net income or are shifted to the insured population. Most of the emphasis in this type of analysis is on the fiscal spillover to the privately insured through cost shifting. Our work in contrast emphasizes effects of uninsurance on the quality of or access to care of the privately insured.

Although this conceptual framework is very useful, it does not capture the full range of possible spillovers. In particular, there may also be non-pecuniary or real spillovers resulting from community uninsurance. Non-pecuniary real spillovers will exist when lower uninsured demand results in a lower quality and quantity of health care services for all consumers in the local health care market *and*—at the same time—the insured cannot participate in a separate or segmented market for medical care (Pauly and Pagán, 2007). Thus, non-pecuniary real spillovers imply lower quality of health care for everyone at the local level regardless of the amount of charity or below-cost care provided to the uninsured.

In this paper we explore a conceptual framework of community uninsurance effects that incorporates the role of local pecuniary and non-pecuniary spillovers in impacting health care access and assessment outcomes for the population with private health insurance coverage. We focus on the consequences of community uninsurance for the privately insured population because this is precisely the population segment that would ultimately have to pay to provide better access to health care for the uninsured (by, for example, taking on a higher tax burden).

The usual argument put forth about the need to provide health insurance coverage to the uninsured is based on the idea that improving access to health care via health insurance coverage is "the right thing to do." However, without minimizing the importance and power of this moral judgment, we note that different people have different moral preferences and weights that they place on different dimensions of equity. As a result, it will be helpful to find additional reasons why it would be in the insured majority's advantage that everyone around them has health insurance coverage. We believe that recognizing the existence of non-pecuniary real spillovers could be important for people who put a high value on the quality, variety, and availability of health care services in their community.

We use survey data from the 2003 Community Tracking Study (CTS) Household Survey (n=31,935) to empirically test some of the predictions from our model of the community effects of uninsurance. More specifically, we estimate multilevel logistic regression models to test for the existence of pecuniary and non-pecuniary real spillovers of community uninsurance on privately insured adults. We study four measures of potential and realized access to health care services (having a usual source of health care or a medical home, visiting a doctor, visiting a doctor for preventive care, and seeing a specialist when needed) and four measures of assessment of health care providers (satisfaction with the choice of primary care doctors, satisfaction with health care, trust that doctors would put medical needs above all other considerations when treating medical problems, and satisfaction with specialists seen).

The main hypothesis of the study is that adults with private health insurance coverage will have poorer potential/realized access to health care and a lower assessment of health care providers in communities with higher—as compared to lower—uninsurance rates. Moreover, this effect will persist even after controlling for the amount of charity care; i.e., potentially there will be real spillovers, especially in smaller communities.

2. Conceptual Framework

The conceptual framework developed in the 2003 community uninsurance report released by the Institute of Medicine proposes that health care providers receive lower revenue relative to costs when the uninsured population at the local level uses relatively low levels of health care services and incurs high uncompensated care costs (Institute of Medicine, 2003). This uncompensated care burden in a local community is passed on from the uninsured to the insured population through, for example, higher public and private spending, as well as higher taxes.

These financial or pecuniary spillovers from the uninsured to the insured population could be particularly large if the provision of health care services for the uninsured population is not partially subsidized by private or public entities outside of the local community. Community uninsurance could also result in non-pecuniary or real spillovers. That is, uninsured individuals may demand a lower quality and quantity of medical care in the relevant community (local health care market), which would ultimately impact the quality of care available to everyone—including the insured—at the local level (Pauly and Pagán, 2007).

How does the quality of care supplied to insured demanders is specifically affected by increases or decreases in the proportion of the local population without health insurance coverage? The answer to this question depends in part on how the uninsured behave (compared to their behavior if they were insured). We will describe two polar cases, recognizing that in reality these behaviors will be mixed, though probably in variable proportions. At one extreme, people without health insurance coverage may seek only the quantity and quality of health care services which they are able and willing to pay (Institute of Medicine, 2001). The presence of a larger share of low demanders would imply that the market demand for health care services in all dimensions would be smaller than if everyone were insured, and this smaller and less well supported market may yield lower quality of care for all.

At the other extreme, suppose that the uninsured seek and obtain the same quantity and quality of health care as if they were insured but do not pay for it. Suppose that they also impose on health care suppliers the cost of provided but unpaid health care services. There will be potentially two effects on the insured. Most obviously, providers will either shift costs to the insured or experience lower net incomes. Secondly, the quality of care providers now will choose to supply may be lowered (Pagán, Balasubramanian, and Pauly, 2007).

Here we provide a strong example of the real spillovers. Let the unit of quantity be defined as "health provider encounters." The quality and mix of services per encounter may vary. For example, in the case of health care management for adults with type 2 diabetes, an encounter might be a visit to a primary care physician (PCP), a physical examination, and a laboratory evaluation, or it might a visit to a PCP with a physical examination and laboratory evaluation, together with consultations with a nephrologist and an ophthalmologist (American Diabetes Association, 2008). In effect, "quality" here includes what the PCP does or says, as well as other services that are part of the "quality per encounter," and may be so perceived by consumers.

The key factor that can lead to "real spillovers" is that some of these quality dimensions or activities may have a fixed cost component at the market/community level. It is that fixed cost that prevents market segmentation or perfect product differentiation by health insurance coverage status, although disparities in quality by health insurance coverage status may also be inhibited if individual suppliers feel compelled to provide the same quality to all even if it would be feasible to discriminate (e.g., for equity or fairness concerns). The frequency of testing, larger volumes of drug prescribing, or more intensive outpatient office staffing probably have little or no fixed cost, but do have a positive and constant marginal cost, and so could be more easily segmented across providers. However, there is a potentially substantial fixed cost for a given market/community to have capital-intensive medical devices, to set up an ophthalmology practice, or to staff and equip a specialized nephrology practice. Even if marginal cost is constant over the relevant change, average cost will be declining due to the high fixed cost. Thus, relatively high fixed cost implies that there will not be a number of segregated providers of capital-intensive specialized medical services, but generally only one in all but large markets.

For these quality dimensions which display "quality economies of scale," the main determinant of what price suppliers will need to receive to cover their total cost depends on the volume they can expect to have at that price. To take an obvious case, if the anticipated volume of a capital-intensive (high fixed cost) medical service is very low in a small market/community, so that the equipment would be idle much of the time, the price needed to cover the cost of the services—even at only normal profit—would be so high that even generous insurers would not cover it. In contrast, in a large densely populated metropolitan area, the average cost can be relatively low. We want to permit a quality variable such as "specialized consultations per encounter" to potentially vary with price, but we know that the price will be too high to be feasible in low volume situations, even with a somewhat generous set of clinical indications for such a consultation.

The discussion above leads to an intuitively obvious point: quality dimensions ("quality per encounter") with high fixed cost will be substantially lower (even zero) in markets where the number of potential demanders willing and able to pay their own way is low. We have already made the equally obvious point that the demand per encounter is likely to be lower—other things equal, including demographic characteristics and illness distribution—in markets with smaller populations. The less obvious point about community uninsurance spillovers is that, even with a given population, uninsurance takes people out of the market for costly health care services. In effect, in two markets of the same size but with one having 5% uninsured and the other 30%, the high uninsurance market is approximately 26% smaller (for costly health care services that only the insured are able and willing to pay). If, in addition, the demand for health care services of the insured is more price inelastic than the demand of the uninsured, the minimum population needed to make supplying a high fixed cost dimension of quality feasible is going to be larger if

much of the population is uninsured—and higher uninsurance rates lead to lower quality for all patients, regardless of their individual health insurance coverage status—in markets with a given population size.

Figure 1 illustrates this case. D_S^0 is the market demand for a quality-enhancing service in a smaller town with a given proportion p_0 of uninsured, and D_L^0 is the demand in a larger city with the same proportion. Suppose that the number of encounters per person is the same. The curve **P(AC)** shows the break-even price (i.e., the price that would just cover average cost) of this quality dimension. The service will be provided in the large city but not in the small town (i.e., Q_L^0). The service intensity (i.e., the proportion of encounters with this quality add-on) will be Q_L^0 divided by the number of encounters.

// Figure 1 Here //

If the proportion uninsured falls, the market demand for this quality-enhancing service increases to D_S' and D_L'. It is obvious that the quality per encounter in this dimension will be positive in both cities—although it will still be lower in the smaller city. The point is that health insurance coverage improves quality, and does so to a greater extent in the smaller city. More generally, if the **P(AC)** curve takes the traditional "curved-L" shape, the impact of this shift in demand will be greater at smaller levels of **Q** than at higher levels of **Q** where the supply curve is nearly horizontal.

Now, consider the polar opposite case in which the uninsured receive health care services for which they pay nothing (free charity care). The number of encounters per person is initially as before—the same for the uninsured as the insured— but now the uninsured do not pay neither for

any basic (lower) quality care they might receive nor for any increases in quality. What impact would this have on the quality level received by the insured (as well as the uninsured)?

In this case, there are two separable effects on health care suppliers. First, the cost of free care is initially borne by health care suppliers; assuming that the use of the uninsured is a given fixed amount, this generates a lump sum reduction in net revenues for health care suppliers. Second, if we assume that suppliers choose to—or are compelled to—provide the same quality-intensity to all, the presence of uninsured demanders who receive increments in quality that they do not pay for in effect raises the marginal cost of quality of health care suppliers. In effect, uninsured people who receive free care levy two kinds of "taxes" on health care suppliers: a fixed-dollar-amount profits tax, and an excise tax on improvements in quality.

How suppliers will respond to such charges depends in part on their objectives. In the short run, the lump-sum cost of charity care should not change either the price charged to paying (insured) customers or the quality level if the supplier is already maximizing profits (either because it has profit as a goal or because it needs as much profit as it can get to survive). It will have already set price and quality at the profit-maximizing level, which will be the same regardless of the amount of charity care; there will be no room to cost-shift or quality-shift. If, in contrast, it is a non-profit firm in conditions that sometimes allow it to pursue some objectives other than profit maximization or loss minimization, there may be an income (or long-run survival) effect of a larger lump-sum charity care charge that will induce it to move closer to its profit-maximizing price and/or to reduce quality. In such a case, we would expect higher free care burdens to be associated with higher prices and/or lower quality. In the long run, a higher free care burden will compel the exit of some profit-maximizing firms, which may lead to higher prices and lower quality for the surviving firms.

However, when a higher free care burden increases the marginal cost of quality, even profit-maximizing firms will reduce the equilibrium level of quality at any given price. This effect will occur on all dimensions of quality, not just on those with higher fixed costs. The size of the response will depend on the insured demand elasticity for quality and any variation in the marginal cost of quality (little is known about either of these parameters).

In all, the real spillover model predicts that a higher proportion of uninsured in a community will result in no change in prices, given quality, while the pecuniary spillover model predicts higher prices to privately insured patients. The real spillover model also predicts lower levels of dimensions of quality whose production involves a fixed cost. In smaller markets, the pecuniary spillover model predicts reductions in all dimensions of quality. Moreover, pecuniary spillovers will be greater, for a given proportion uninsured, the higher is the level of charity care per insured person; the pecuniary spillover model predicts an inverse relationship between price and all dimensions of quality.

3. Data and Methods

Data from the 2003 Community Tracking Study (CTS) Household Survey were used to assess how pecuniary spillovers and non-pecuniary real spillovers from community uninsurance onto the insured population are related to selected potential and realized health care access measures as well as to personal assessments of local health care systems and providers by privately-insured survey participants. The CTS is a national study on health care systems' access, use, and change (Center for Studying Health System Change, 2006). The CTS household and physician surveys have been conducted about every two years since 1996 in 60 communities selected at random throughout the contiguous US. These communities include 48 metropolitan areas with a population of more than 200,000, three communities with a population of less than

200,000, and nine non-metropolitan areas. The CTS also includes periodic site visits with leaders in the health care systems of 12 of the 48 large metropolitan areas (Boston, Cleveland, Greenville, Indianapolis, Lansing, Little Rock, Miami, Newark, Orange County, Phoenix, Seattle, and Syracuse). Larger survey samples were also collected in these 12 communities to be able to analyze their health care systems more in depth.

CTS communities encompass local health care markets. These are communities where residents usually obtain health care services and where physicians practice medicine, and they mostly conform to either metropolitan statistical areas (defined by the Office of Management and Budget) or non-metropolitan economic areas (defined by the Bureau of Economic Analysis) (Center for Studying Health System Change, 2006).

The 2003 CTS Household Survey is a nationally representative telephone survey of the civilian non-institutionalized population. Data were collected on 46,587 people (25,419 families) residing in the 60 CTS sites (Center for Studying Health System Change, 2005). The survey was conducted by Mathematica Policy Research, Inc. and it includes questions on household composition, health insurance coverage, use of health care services, health expenses and bills, unmet medical needs, sources of health care, affordability of medical care, patient trust and attitudes, satisfaction with health care and health plans, health status, employment and employer health insurance offerings, earnings, and various demographic characteristics (Center for Studying Health System Change, 2005).

Survey participants in households selected for the CTS were classified into family insurance units (FIUs). FIUs are composed of an adult household member, his/her spouse, dependent children under 18 years old, and any dependent children 18 to 22 years old who were

also full-time students (Center for Studying Health System Change, 2005). We included the working age adult population (individuals ages 18 to 64) with private health insurance coverage and excluded respondents with missing data, for a final sample of 23,956 respondents.

<u>Dependent Variables: Health Care Access</u>

We utilized four measures of access obtained from responses to the following questions: (1) "Is there a place that [you/fill NAME] USUALLY go(es) to when (you/he/she) (is/are) sick or need(s) advice about your health?"; (2) "Since [insert MONTH/YEAR 12 months ago], about how many times has [fill NAME] seen a doctor?"; (3) "(Were any of these visits/Was this visit) for routine preventive care such as a physical examination or check up?"; and (4) "In the last 12 months, did [you/NAME] see a specialist ? Specialists include such doctors as surgeons, allergists, (obstetricians,) (gynecologists,) orthopedists, cardiologists, and dermatologists. Specialists mainly treat just one type of problem."

For question (2) respondents were asked not to count overnight hospital visits or visits to the emergency room. We dichotomized responses to questions (2) and (3) into having or not having a visit to a doctor, and having or not having a physical exam or a check up visit, respectively. Question (3) was asked to all persons who saw a doctor in the previous 12 months. "Don't know" and "refused" responses were excluded from the analysis.

The first access measure (having a usual source of health care or a medical home) is intended to gauge *potential* access because it captures whether the respondent has an ongoing relationship with the local health care system (Brown et al., 2004). The second, third, and fourth measures are intended to capture *realized* access because they are related to visiting a doctor (or specialist) and, more importantly, visiting a doctor for preventive care (Brown et al., 2004). Having

a periodic physical exam or check up presumes better continuity of care and it is likely to capture proactive rather than reactive health care utilization.

Dependent Variables: Assessment of Health Care System Providers

We utilized four measures of assessment of health care providers obtained from responses to the following questions: (1) "Now I would like to ask you about satisfaction with your choice of doctors. First, primary care doctors, such as family doctors or general practitioners, who treat a variety of illnesses and give preventive care. Are you satisfied or dissatisfied with the choice you personally have for primary care doctors?"; (2) "The next questions are about your satisfaction with health care. All things considered, are you satisfied or dissatisfied with [(the health care you have received/the health care you and your family have received)] during the last 12 months?"; (3) "Please think about the doctor you usually see when you are sick or need advice about your health. For each of the following statements, tell me whether you strongly agree, somewhat agree, somewhat disagree, or strongly disagree. I trust my doctor to put my medical needs above all other considerations when treating my medical problems"; and (4) "Are you satisfied or dissatisfied with the choice you have for specialists?"

Question (2) includes all persons in families where at least one person had a hospital or health care provider visit in the previous twelve months. For question (2) respondents also were asked to consider if they did not receive the services they thought they needed. Question (3) includes responses from all adults who have a usual source of care or had at least one visit to a doctor in the previous twelve months. Question (4) includes responses from persons who had seen a specialist in the previous twelve months. We dichotomized the responses to questions (1),

(2), and (4) as "very satisfied" versus otherwise, and the responses to question (3) as "strongly agree" versus otherwise. "Don't know" and "refused" responses were excluded from the analysis.

The first assessment measure is included to capture satisfaction with the choice of primary care physicians. The second assessment measure captures general satisfaction with local health care providers after an encounter has taken place (i.e., realized access). The third assessment measure captures patient trust with their doctor. The fourth assessment measure is included to capture satisfaction with the choice of specialists. These measures encompass different dimensions on how community uninsurance impacts the behavior and the financial stability of health care providers beset by uninsurance (e.g., Pagán, Balasubramanian, and Pauly, 2007).

Independent Variables: Individual and Community Levels

The health care access and assessment variables described above are likely to be influenced by individual-level predisposing and enabling factors, as well as the perceived need of health care services (Andersen, 1995). Health care access and assessment variables also are likely to be influenced by community-level characteristics (Brown et al., 2004). We included self-reported health status, years of age, years of education, race/ethnicity, marital status, gender, and household income divided by the poverty level as individual-level variables in all our regression models.

We also included two community-level variables—median household income and the Gini coefficient in the community (see Pagán and Pauly, 2006)—besides our main community-level variables of interest (i.e., community uninsurance and charity care, see discussion below). All of the community-level variables were estimated taking into account sampling weights designed to obtain accurate estimates for each community (Center for Studying Health System Change, 2005).

Community-level median household income adjusts for the level of community wealth and, thus, the general burden of providing health care services to the local uninsured population. The Gini coefficient was included to adjust for the level of income inequality in the community. Wealth and income inequality are likely to be related to the willingness and ability of localities to support health care services for the uninsured (Andersen et al., 2002) and social cohesion (Subramanian, Blakely, and Kawachi, 2003). The Gini coefficient is an index of income inequality that ranges from zero to one (i.e., from an equal distribution of income to having all the income going to one household; thus, the higher the index, the higher the level of inequality).

Independent Variables: Community-level Uninsurance and Charity Care

Individual-level health insurance coverage status was determined by responses to the following question: "According to the information we have, [NAME] does not have health care coverage of any kind. Does [NAME] have health insurance or coverage through a plan I might have missed?" This question was asked after a series of questions querying the type/source of health insurance coverage of each survey participant. Respondents answering "no" to this question were coded as uninsured while all other respondents were coded as insured (i.e., all persons covered by private insurance, Medicare, Medicaid, military, state, or other plans). Self-reported survey data on health insurance coverage status collected through a telephone interview has been shown to have high accuracy/validity (Nelson, 2000; Thompson, 1998). Community-level uninsurance was defined as the proportion of respondents in the local community who answered no to the question above.

We measured community-level charity care by the proportion of uninsured respondents that reported not having cost-related problems obtaining medical care during the past year

(Herring, 2005). CTS Household Survey respondents who reported postponing or not getting needed medical care within the previous 12 months were asked the following question: "Did you not get the medical care you needed or have delays getting medical care you needed for any of the following reasons? Worry about the cost." For an uninsured person, an answer of "yes" to this question means that he/she had cost-related difficulties in obtaining health care. This implies that all other uninsured persons—those who did not answer "yes"—were either able to obtain the health care that they needed, or delayed/postponed care due to non-cost related reasons. Thus, the proportion of uninsured respondents who reported not having cost-related problems obtaining medical care during the past year is a measure of those who are likely to have received—or had access to—charity care. Of course, increases in the proportion of the population that is uninsured will also increase the total burden of charity care on the insured even if the proportion of the uninsured reporting no cost problems remains constant.

Herring (2005) showed that the proportion of uninsured respondents in a community with no cost-related problems obtaining medical care is a good proxy for the aggregate local-level availability of charity care. The uninsured population can obtain health care services from different providers in different markets (e.g., primarily from a public hospital, an academic health center, or a community health center in a given locality, or through a combination of these providers). Thus, excluding any types of providers by focusing on, for example, hospital uncompensated care instead of care provided by local clinics, will result in a biased measure of charity care. Herring (2005) used data from the CTS Household Survey (1996-1997, 1998-1999, and 2000-2001) to show that hospital charity care per capita (obtained from the American Hospital Association Annual Surveys), the average free hours of health care provided by physicians (obtained from the CTS Physician Surveys), and whether the community had a federally qualified

community health center were all associated to whether an uninsured person reported no cost-related difficulties obtaining care during the past year (n=18,551). Herring (2005) also argued that this measure would not be endogenous to the proportion of uninsured in the community because this measure captures "the underlying altruism of people towards the uninsured in a given market" rather than "the actual provision of charity care per se". In other words, the absence of cost-related difficulties in obtaining care by the uninsured is the "degree of financial burden which they [the insured] feel is acceptable for the uninsured to bear" (Herring, 2005: p. 239).

Multilevel Modeling

Multilevel logistic regression was used to evaluate how the proportion of the local uninsured population and the local level of charity care (i.e., the proportion of the uninsured population with no cost-related difficulties in obtaining medical care) were related to potential and realized health care access and the assessment of the health care system by the privately insured. The idea here is that the coefficient of the charity care measure should capture pecuniary spillovers of uninsurance whereas the coefficient of the community uninsurance variable should capture non-pecuniary real spillovers because we had adjusted for the availability of charity care at the local level (largely paid by the privately insured).

These regression models also include other individual and community level variables that are likely to be related to the six access/assessment dependent variables introduced above. Multilevel or hierarchical logistic regression models were used because the 2003 CTS Household Survey data were collected in 60 communities (i.e., individual responses are nested/clustered within communities) (Diez Roux, 2001). The two-level logistic regression models discussed above

were estimated using the GLLAMM module (Generalized Latent, Linear, and Mixed Models) in Stata/MP 10.1 (Rabe-Hesketh and Skrondal, 2008; Skrondal and Rabe-Hesketh, 2004).

4. Results

Table 1 presents the descriptive statistics (means or proportions) for the full sample of respondents from the 60 CTS communities (column 1) as well as for the sample divided by the 30 communities with relatively low and high community uninsurance (columns 2-3) and the 30 communities with relatively low and high charity care use (columns 5-6). That is, the 60 CTS communities were ranked from low to high uninsurance, and from low to high charity care use, and then they were divided into two groups for each separate ranking. P-values of Wald tests of differences in means or proportions are also presented in columns 4 and 7. About 89% of privately insured respondents had a usual source of care. Almost 80% of respondents had at least one doctor's visit in the past year, 60.11% had a doctor's visit for preventive care (a physical exam or check up), and 96.30% had seen a specialist when needed. Two-thirds (67.14%) of the privately insured were very satisfied with their choice of primary care providers and 63.55% were very satisfied with the health care they had received during the last 12 months. About 69% strongly agreed with the statement that they trusted their doctor would put their medical needs above all other considerations when treating their medical problems. Almost three-fourths (73.72%) of the privately insured were very satisfied with their choice of specialists seen during the last year.

Only 9.10% of privately insured respondents were in fair or poor health, their average age was 40.87 years, and they had 13.92 years of education. Close to 77% of respondents were non-Hispanic white, 9.53% were non-Hispanic black, 9.07% were Hispanic/Latino, and 4.76% belonged to other racial/ethnic minority groups. About 71% of respondents were married and 50.95% were women. Privately insured respondents earned about 459% of the family poverty level

and they resided in communities with a 15.15% uninsurance rate. Privately insured respondents lived in communities where 67.71% of uninsured respondents reported no cost-related difficulties obtaining medical care. The median household income in these communities was $47,510 and the mean Gini coefficient was 0.38.

// Table 1 Here //

Table 1 also reports the means/proportions for privately insured respondents divided by the 30 communities with relatively low and high community uninsurance (columns 2-3; P-values of Wald tests of differences in column 4) and the 30 communities with relatively low and high charity care use (columns 5-6; P-values of Wald tests of differences in column 7). The 30 low uninsurance communities had an uninsurance rate of 10.20% compared to 20.64% in the high uninsurance communities—a 10.44 percentage-point differential. The percentage of the uninsured population with no cost-related access difficulties was 58.31% in the 30 communities with low charity care use compared to 76.91% in the 30 communities with high charity care use—a 18.60 percentage-point differential.

Note that the potential and realized health care access measures as well as health care system assessment measures (i.e., the first eight variables in Table 1) for the privately insured were almost always higher in communities with relatively low community uninsurance and in communities with relatively low charity care use (most of them statistically significant at the 5% level). For example, 91.32% of adults with private health insurance coverage had a usual source of care in the 30 communities with relatively low uninsurance compared to 86.54% in the 30 communities with relatively high uninsurance. This difference is statistically significant at the 1% level.

Adults with private health insurance coverage had better health, more years of education, and a higher income in communities with low uninsurance than in communities with high uninsurance. The distribution of privately insured racial/ethnic minorities was also different in low and high uninsurance communities, with a larger share of privately insured adults of black and Hispanic origin in communities with high uninsurance compared to communities with low uninsurance. The differences for the privately insured across communities with low and high charity care use were not as pronounced, but they were still statistically significant for race/ethnicity; i.e., there were proportionally more privately insured minority (black and Hispanic) residents in communities with high charity care use than in communities with low charity care use.

Health Care Access Results

Table 2 reports the adjusted odds ratios for privately insured adults obtained from the multilevel logistic regression models of having a usual source of care (a place to go when sick or in need of advice about health), having a doctor's visit in the past year, having a doctor's visit for routine preventive care (a physical exam or check up), and having seen a specialist in the last 12 months when needed. Insured adults with private health insurance coverage were more likely to have a usual source of care if they were older or married. Women were more likely to have a usual source of care than men. Hispanics and other minorities were less likely to have a usual source of care than blacks and whites. Similar effects of personal characteristics were found for other health care access measures: having a doctor's visit, having a doctor's visit for preventive care, and seeing a specialist, except that—unlike the results for having a usual source of care—health status and income (divided by the family poverty level) become statistically significant.

We now focus on our variables of interest—percent uninsured in the community (non-pecuniary real spillovers) and percent of the uninsured population with no cost-related access difficulties (pecuniary spillovers). For privately insured adults, community uninsurance was negatively related to having a place to go when sick, having a doctor's visit, visiting a doctor for routine preventive care, and seeing a specialist in the last 12 months when needed. The coefficients were also statistically significant at the .1% level for the first three measures, and the 1% level for the last measure (seeing a specialist when needed). Percent of uninsured population with no cost-related access difficulties was statistically significant only for whether a privately insured adult had a doctor's visit for preventive care and saw a specialist when needed.

Thus, although both pecuniary and non-pecuniary real spillovers seem to be present, the evidence seems to indicate that non-pecuniary spillovers are present and substantial. Table 3 reports the simulated effects of changes in community uninsurance and charity care on potential and realized access. We analyzed changes in the probabilities of potential and realized access resulting from a ten percentage point change in community uninsurance (from the sample mean of 15.15% to 25.15%) and from a ten percentage point change in the percent of the uninsured population with no cost-related access difficulties (from the sample mean of 67.71% to 77.71%). All other variables were kept at the sample means. A 10 percentage point increase in community uninsurance was associated with a 4.05 percentage point decrease in the probability that a privately insured adult reported having a place to go when sick (OR=0.63; 95% CI=0.60, 0.68), an 1.61 percentage point decrease in the probability that he/she had a doctor's visit in a year (OR=0.89; 95% CI=0.85, 0.92), a 2.23 percentage point decrease in the probability that he/she had a doctor's visit for routine preventive care (a physical exam or check up) (OR=0.91; 95% CI=0.88,

0.94), and a 0.31 percentage point decrease in the probability of seeing a specialist in the last 12 months when needed (OR=0.85; 95% CI=0.76, 0.95).

<center>// Table 3 Here //</center>

<u>Assessment of Health Care System Providers' Results</u>

Table 4 reports the adjusted odds ratios obtained from the multilevel logistic regression models (of privately insured adults) being very satisfied with the choice of primary care physician, being very satisfied with health care they have received during the last 12 months, strongly agreeing with the statement that they trusted their doctor would put their medical needs above all other considerations when treating their medical problems, and being very satisfied with the choice of specialist seen. Insured adults with private health insurance coverage were more likely to be very satisfied with their choice of primary care physician if they were in good, very good or excellent health compared to those in fair or poor health. They were also more likely to be very satisfied with their choice of primary care physician if they were older. Satisfaction with the choice of primary care physician was lower for Hispanics and other minorities when compared to whites and blacks. Satisfaction with the choice of primary care physician was higher for women than for men. These results were very similar for the level of satisfaction with health care received, and for trust in doctors. Notable exceptions to these results were education (negatively related to trust in doctors) and income divided by the family poverty level (positively related with satisfaction with health care received).

<center>// Table 4 Here //</center>

We focus again on our variables of interest—percent uninsured in the community (non-pecuniary real spillovers) and percent of the uninsured population with no cost-related access

<center>24</center>

difficulties (pecuniary spillovers). Community uninsurance was negatively related to (a privately insured adult) being very satisfied with the choice of primary care physician, being very satisfied with health care received during the last 12 months, strongly agreeing with the statement that they trusted their doctor would put their medical needs above all other considerations when treating their medical problems, and being very satisfied with the choice of specialist seen. The coefficients were also statistically significant at the .1% level. Percent of the uninsured population with no cost-related access difficulties was statistically significant for being very satisfied with the health care received during the last 12 months and for being satisfied with the choice of primary care doctor.

Although both pecuniary and non-pecuniary real spillovers seem to be present, non-pecuniary spillovers are present and they seem to be substantial. Table 5 reports the simulated effects of changes in community uninsurance and charity care on personal assessments of health care system providers. We analyzed changes in the probabilities of personal assessments of ehalth care system providers resulting from a ten percentage point change in community uninsurance (from the sample mean of 15.15% to 25.15%) and from a ten percentage point change in the percent of the uninsured population with no cost-related access difficulties (from the sample mean of 67.71% to 77.71%). Again, all other variables were kept at the sample means. A 10 percentage point increase in community uninsurance was associated with a 7.06 percentage point decrease in the probability that a privately insured adult reported being very satisfied with his/her choice of primary care doctor (OR=0.75; 95% CI=0.72, 0.78), a 2.70 percentage point decrease in the probability that he/she was very satisfied with the health care received (OR=0.90; 95% CI=0.86, 0.94), and a 1.38 percentage point decrease in the probability that he/she trusted their doctor would put their medical needs above all other considerations when treating their medical

problems (OR=0.93; 95% CI=0.91, 0.96). Also, a 10 percentage point increase in the percent of the uninsured population with no cost-related access difficulties was associated with a 1.76 percentage point decrease in the probability that a privately insured adult reported being very satisfied with their choice of primary care doctor (OR=0.93; 95% CI=0.91, 0.95), and a 1.24 percentage point decrease in the probability that he/she was very satisfied with the health care received (OR=0.95; 95% CI=0.93, 0.97).

// Table 5 Here //

Sensitivity Analysis

We also estimated multilevel logistic regression models with interaction terms between percent uninsured in the community (non-pecuniary real spillovers) and percent of the uninsured population with no cost-related access difficulties (pecuniary spillovers), and selected variables: Community size (metropolitan areas with a population larger than 200,000 versus smaller metropolitan areas and non-metropolitan areas), income level (earning 250% or more above the family poverty level versus less than 250% of the family poverty level), and ethnicity/race. The idea here is to evaluate whether or not non-pecuniary and pecuniary spillovers vary across these dimensions.

For the "having a place to go when sick" regression, the adjusted odds ratio of community uninsurance was lower in the smaller metropolitan areas (and non-metropolitan areas; OR=0.58; 95% CI=0.56, 0.61) than in the larger metropolitan areas (OR=0.70; 95% CI=0.63, 0.78). The same results were found for having a doctor's visit; i.e., the adjusted odds ratio of community uninsurance was lower in the smaller metropolitan areas (and non-metropolitan areas; OR=0.87; 95% CI=0.84, 0.91) than in the larger metropolitan areas (OR=0.93; 95% CI=0.86, 0.99). In other

words, non-pecuniary real spillovers associated with health care access measures are larger in smaller communities than in larger communities, as predicted by our model. For the three health care access indicators, there were no differences by community size in the adjusted odds ratios of charity care (the percent of the uninsured population with no cost-related access difficulties).

The adjusted odds ratios for community uninsurance also differed by community size for being very satisfied with the choice of primary care physicians [(OR=0.78; 95% CI=0.74, 0.82) for smaller communities and (OR=0.67; 95% CI=0.60, 0.75) for larger communities] and being very satisfied with the health care received during the last 12 months [(OR=0.99; 95% CI=0.94, 1.04) for smaller communities and (OR=0.88; 95% CI=0.79, 0.97) for larger communities]. However, the larger effect for these health care assessment measures was in larger rather than in smaller communities.

For most of the health care access and assessment indicators, the adjusted odds ratio of community uninsurance and charity care were similar for the privately insured population earning less than 250% of the family poverty level compared to those earning 250% or more of the family poverty level. The exception was being very satisfied with the choice of primary care physicians. The adjusted odds ratio of community uninsurance was smaller for the higher income privately insured (OR=0.71; 95% CI=0.50, 0.99) than for the lower income privately insured (OR=0.86; 95% CI=0.73, 1.00), which suggests that non-pecuniary real spillovers are larger for the higher income privately insured (i.e., those earning 250% or more of the family poverty level).

We did not find substantial differences by race/ethnicity except for the "trust in doctor" regression. The adjusted odds ratio of community uninsurance was lower for Hispanics than non-Hispanics. Thus, non-pecuniary real spillovers seem to be larger for privately insured Hispanics

than for privately insured non-Hispanics when it comes to strongly agreeing with the statement that they trusted their doctor would put their medical needs above all other considerations when treating their medical problems.

We also estimated similar models with interaction terms between percent uninsured in the community and percent of the uninsured population with no cost-related access difficulties, and a set of chronic health conditions available in the 2003 CTS Household Survey (diabetes, arthritis, chronic obstructive pulmonary disease, hypertension, heart disease, cancer, and depression). The idea here was to see if pecuniary and non-pecuniary spillovers vary by health conditions that may require a more intense use of costly resources, some of them with high fixed cost.

For the "having a place to go when sick" regression, the adjusted odds ratio of community uninsurance was lower for adults with hypertension (OR=0.40; 95% CI=0.25, 0.63) compared to adults with no hypertension (OR=0.61; 95% CI=0.55, 0.68). For having a doctor's visit, the adjusted odds ratio of community uninsurance was lower for adults with chronic obstructive pulmonary disease (OR=0.27; 95% CI=0.12, 0.63) compared to adults without it (OR=0.79; 95% CI=0.76, 0.83). Similar results were found for satisfaction with the choice of primary care physicians (for arthritis and chronic obstructive pulmonary disease), trust in doctor (arthritis), and being seen by a specialist (chronic obstructive pulmonary disease and cancer). The adjusted odds ratios of the interaction terms between the percent of the uninsured population with no cost-related access difficulties and chronic health conditions were statistically insignificant at conventional levels except for heart disease in the "specialist seen" regression. The results for the multilevel logistic regression models with interaction terms with seven selected chronic health conditions suggest that non-pecuniary real spillovers are larger for adults with some of these health conditions (hypertension, arthritis, chronic obstructive pulmonary disease, and cancer). Differences in

pecuniary spillovers of community uninsurance across the seven chronic health conditions considered seem to be relevant for heart disease only.

We augmented our logistic regression models of health care access/assessment with other community-level variables that could alter the measured effects of our main variables (community uninsurance and charity care). More specifically, we adjusted for the number of physicians per 1,000 population (estimated from the 2000-2001 CTS Physician Survey), the proportions of the Hispanic and Black populations, and the percentage of the population earning less than 100% of the family poverty level. The correlation coefficient between the number of physicians per 1,000 population and community uninsurance (charity care) was -0.24 (0.02). The correlation coefficients were relatively high for the proportion of Hispanics in the community and community uninsurance (0.61), and for the percentage of the population earning less than 100% of the family poverty level and community uninsurance (0.67). In the logistic regression models, physician supply and the percentage of the population earning less than 100% of the family poverty level were positively related with most of the health care access and assessment indicators while the proportions of the Hispanic and Black populations were not statistically significant at conventional levels. Our results on community uninsurance and charity care (the percent of the uninsured population with no cost-related access difficulties) were not sensitive to the inclusion or exclusion of these community-level indicators.

Lastly, we also estimated alternative logistic regression specifications—with non-linear (quadratic) terms for community uninsurance and charity care, and with an interaction term between community uninsurance and charity care. The coefficients of the non-linear terms were statistically insignificant at conventional levels in most of the models. The coefficients of the

interaction terms were all negative and statistically significant, suggesting that the effect of charity care is larger the higher the proportion of uninsured in the local community.

5. Discussion

The impact of changes in the proportion of the local population with no health insurance coverage on the insured population depends on the degree of market segmentation that is economically rational, on the amount of charity or below cost care (if any) furnished by health care providers, and on the source of resources to cover the cost of charity and below cost care. The simplest model is the one we have described above in our conceptual framework. Because of economies of scale relative to the size of the local market for a given service, market segmentation does not occur. If there is little or no charity or below cost care—e.g., as is probably the case for prescription drugs and scanning services provided by for profit firms—then the reduction in health care quality experienced by the insured is positively related to the proportion of the local uninsured population. There is a real spillover but the relationship need not be proportional.

If a non-negligible amount of charity care is provided, a key consideration is the source of financing of such care. If it is from a source outside the revenues of providers in the particular market (e.g., from a state fund or from philanthropic sources), higher levels of charity care per uninsured person should alleviate some of the demand constraint on the uninsured population and allow the market equilibrium quality of care to increase. The impact of an increase in charity care (care for which payment is not required) on quality and, therefore, on the insured depends as well on the relative size of the uninsured population; that is, the impact on the insured population depends on the total cost of charity care, which depends both on the cost per uninsured person and the number or proportion of uninsured people. In this case there is no negative pecuniary

spillover; if anything the effect of higher charity care levels per uninsured population on quality and access for the insured may be positive.

The prediction is different if the cost of the charity care must be borne by the provider in the market. At a minimum, higher levels of charity care per uninsured person (given some proportion of uninsured persons in the market) will reduce the net income of providers. Providers may simply absorb this reduction in profits, and continue to choose the quality level demanded by their insured customers. In this case, the level of charity care per uninsured person will have no effect on market level (and insured) quality. There will be no pecuniary spillover and the indication that this is so is a non-significant coefficient on the charity care measure used in our analyses above. A significant coefficient on the proportion uninsured then implies only real spillovers.

However, another possibility is that providers will note that, if they must provide the same quality level to insured and uninsured customers, increasing quality increases the losses they suffer from charity care since higher quality care has a higher cost, and that higher cost is not being covered for the uninsured patients. Thus, there is a negative pecuniary spillover. Holding constant the number or proportion uninsured, one would expect increases in charity care per uninsured person to be associated with lower quality levels for insured persons.

A key insight is that the size of the spillover per insured person probably depends on both the charity care cost per uninsured person and the proportion of the population that is uninsured; the impact on the insured depends on the total amount of charity care burden, not just on the burden per uninsured person. Thus, an increase in charity care per uninsured person lowers quality to a larger extent if there are more uninsured people.

This has an implication for tests to determine whether any spillovers we observe are pecuniary or real. If there is no pecuniary spillover, then the coefficient on charity care per uninsured person will be zero. But what if there is a negative effect of charity care on overall quality? This shows that there are pecuniary spillovers, but how can we tell if there are real spillovers as well? Just observing a negative effect of the proportion uninsured on quality is not proof of real spillovers, because there should be negative effects on quality from increasing the proportion uninsured even if there are only pecuniary spillovers and even holding constant the amount of charity care per uninsured person (given that changes in the proportion uninsured change the amount of charity care borne by the insured).

The right thought experiment is to increase the proportion uninsured while holding total charity care constant. For that to happen, the amount of charity care per uninsured person has to fall by just enough to offset the increase in the proportion uninsured. But if the amount of charity care per insured person falls, that will have an offsetting effect on quality compared to the effect of increasing the uninsured proportion. One needs to determine whether the combined effect of the two changes is negative. For example, suppose we increase the uninsured proportion from 10% to 20% of the population. The estimated regression coefficient tells us that such a change should reduce the quality measure by 25% (in the case of a privately insured adult reporting being very satisfied with his/her choice of primary care doctor discussed in the results). But what change in charity care per uninsured person is required to keep the total pecuniary charity care burden constant? Beginning with a mean of about 60% for the measure of charity care per uninsured person, that proportion would have to fall by about 30%. The regression coefficient on the variable proxying the expense per uninsured person implies a 7% increase in quality from a ten-percentage-point reduction in charity care per uninsured population, so a 30 percentage point

reduction would increase quality by 21%. Thus, the net effect of real spillovers here would still be present, and would amount to a 4% reduction.

Our empirical results definitely suggest that there are real spillovers in the case of the quality measures where the proportion uninsured has a significant effect on quality but a measure of charity care per uninsured person is not significantly different from zero. In two cases, the coefficient on charity care per uninsured person is negative and significant. In the case treated in the numerical example above, there is still a net negative effect (though we do not comment on statistical significance). For the other case, the impact of charity care (the pecuniary cost) burden is so large relative to the effect of the proportion uninsured that we cannot reject the null hypothesis of no real spillover (and support the hypothesis of a pecuniary spillover).

Although the empirical evidence presented in this study points out to the existence of both pecuniary and non-pecuniary spillovers of uninsurance across different dimensions of health care access and quality indicators derived from the 2003 CTS Household Survey, our study has several limitations. First, due to data constraints, we focused only on eight dimensions of potential and realized health care access as well as on quality-related assessments of health care system providers by respondents. These measures are self-reported and they are likely to be imperfect. Second, although our measure of community uninsurance is fairly accurate due to the sampling design of the CTS (i.e., respondents clustered in communities where they obtain services, with sample sizes large enough to estimate the proportion of the local population without health insurance coverage), this may not be the case for our measure of charity care at the community level. Nonetheless, we are not aware of a data source which includes an accurate assessment of all the possible sources of charity care in local communities. Third, there is always the possibility that we did not adequately capture all the factors that are likely to be related to heath care access and

quality (e.g., individual-level predisposing and enabling factors, perceived need of health care services, and community-level variables). Our sensitivity analysis partially addressed this concern.

Expanding health insurance coverage rates is an important policy objective given the clear connection between health insurance coverage, access to health care, and health. However, the mechanisms by which different types of community uninsurance spillovers may impact the insured population have not been fully explored. The results from our study point out that (not) covering the uninsured population in local communities could also result in positive (negative) pecuniary and non-pecuniary real spillovers on the privately insured population in these same communities. This is an important finding because non-pecuniary spillovers seem to be relevant and, as such, their existence provides an additional economic rationale for the social/community benefits that could be derived from providing health insurance coverage to the uninsured, particularly coverage for services that have been deemed to be effective at a reasonable cost.

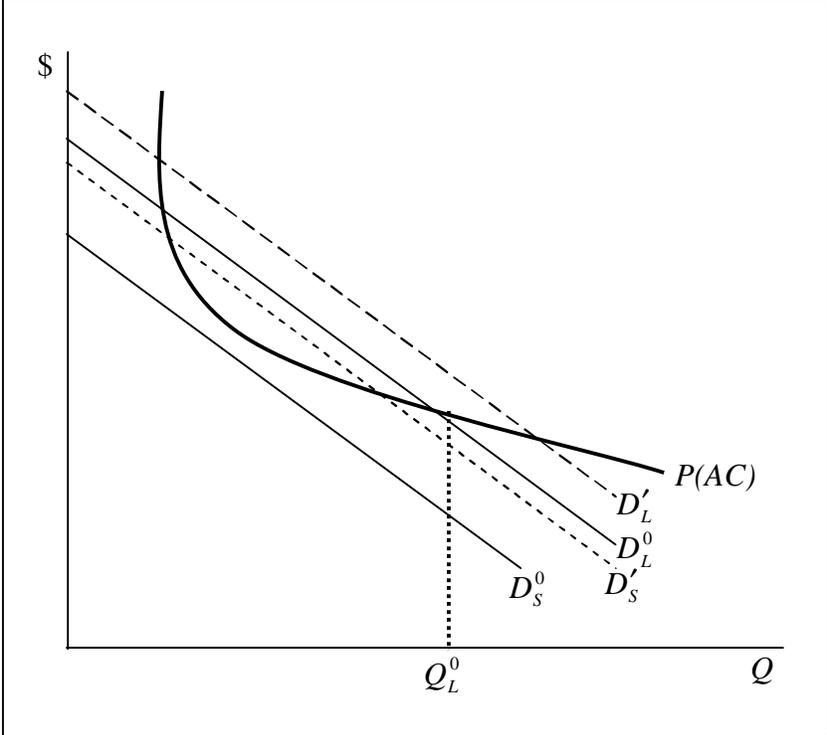**Figure 1: Average Cost and Demand in Small and Large Markets**

Table 1: Descriptive Statistics: Full Sample and by Community Uninsurance and Charity Care Use

		Community Uninsurance			Charity Care Use		
	All	**Low**	**High**	**P-value[a]**	**Low**	**High**	**P-value[a]**
Individual-level variables							
Had a place to go when sick or in need of advice about health (%)	89.06	91.32	86.54	0.00	90.16	87.98	0.07
Had a doctor's visit in the past year (%)	79.64	80.38	78.82	0.17	80.27	79.03	0.27
Had a doctor's visit for preventive care (%)	60.11	61.26	58.83	0.07	60.28	59.94	0.80
Has seen specialist in the last 12 months when needed (%)	96.30	96.84	95.65	0.08	96.81	95.80	0.12
Very satisfied with choice of primary care physician (%)	67.14	69.26	64.77	0.00	69.04	65.26	0.02
Very satisfied with health care (%)	63.55	65.63	61.19	0.00	64.85	62.27	0.09
Trust doctors (%)	69.34	70.53	67.96	0.04	70.44	68.23	0.06
Very satisfied with choice of specialist seen (%)	73.72	73.69	73.74	0.97	74.01	73.35	0.70
Fair or poor health (%)	9.10	8.26	10.03	0.01	8.64	9.55	0.20
Age (years) (mean)	40.87	40.85	40.89	0.90	41.15	40.60	0.13
Education (years) (mean)	13.92	14.03	13.80	0.03	13.89	13.95	0.61
Race/Ethnicity (%)							
White	76.64	83.95	68.53	0.00	83.69	69.74	0.00
Black	9.53	6.87	12.48	0.02	6.69	12.31	0.02
Hispanic	9.07	4.75	13.86	0.00	4.53	13.51	0.00
Other	4.76	4.43	5.13	0.49	5.09	4.44	0.53
Married (%)	71.48	73.61	69.11	0.01	72.68	70.30	0.20
Female (%)	50.95	50.79	51.12	0.73	51.34	50.56	0.39
Income/family poverty level (mean)	4.59	4.78	4.38	0.03	4.52	4.66	0.45
Community-level variables							
Percent uninsured in community (%)	15.15	10.20	20.64	0.00	13.98	16.28	0.13
Percent of uninsured population with no cost-related access difficulties (%)	67.71	65.77	69.86	0.16	58.31	76.91	0.00
Median household income/1,000 (mean)	47.51	53.11	41.29	0.00	47.57	47.46	0.97
Gini coefficient (mean)	0.38	0.36	0.40	0.00	0.37	0.39	0.03
N	23,956	13,050	10,906		11,729	12,227	

Notes: a. Wald test of differences in means/proportions by low/high community uninsurance and low/high charity care use (i.e., comparison between the 30 communities with low and high community uninsurance and charity care use, respectively).

Table 2: Adjusted Odds Ratios of Potential and Realized Health Care Access

	Had a place to go when sick or in need of advice about health		Had a doctor's visit in the past year		Had a doctor's visit for routine preventive care		Has seen specialist in the last 12 months when needed	
	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI
Individual-level variables								
Fair or poor health	1.05	(0.78, 1.41)	2.27***	(1.74, 2.95)	1.20	(0.99, 1.46)	0.79	(0.45, 1.42)
Age (years)	1.02***	(1.01, 1.03)	1.02***	(1.01, 1.02)	1.03***	(1.02, 1.03)	1.04***	(1.03, 1.05)
Education (years)	1.02	(0.98, 1.06)	1.06***	(1.03, 1.08)	1.04***	(1.02, 1.06)	1.08*	(1.01, 1.16)
Black	0.85	(0.65, 1.12)	0.94	(0.74, 1.18)	1.73***	(1.39, 2.15)	0.44***	(0.27, 0.71)
Hispanic	0.53***	(0.42, 0.67)	0.71***	(0.59, 0.86)	1.07	(0.91, 1.25)	1.06	(0.60, 1.89)
Other	0.48***	(0.35, 0.64)	0.68**	(0.51, 0.91)	1.02	(0.83, 1.25)	1.49	(0.86, 2.57)
Married	1.44***	(1.15, 1.80)	0.98	(0.85, 1.12)	0.99	(0.89, 1.11)	0.96	(0.66, 1.38)
Female	2.03***	(1.81, 2.29)	2.82***	(2.56, 3.12)	2.59***	(2.35, 2.86)	1.33	(0.89, 1.97)
Income/family poverty level	1.04	(0.99, 1.09)	1.07***	(1.03, 1.10)	1.04***	(1.02, 1.07)	1.08*	(1.02, 1.15)
Community-level variables								
Percent uninsured in community/10	0.63***	(0.60, 0.68)	0.89***	(0.85, 0.92)	0.91***	(0.88, 0.94)	0.85**	(0.76, 0.95)
Percent of uninsured population with no cost-related access difficulties/10	0.98	(0.95, 1.01)	1.00	(0.99, 1.02)	0.99*	(0.98, 1.00)	0.95**	(0.92, 0.98)
Median household income/1,000	1.00	(0.99, 1.00)	1.00	(1.00, 1.00)	1.01***	(1.00, 1.01)	1.04***	(1.03, 1.05)
Gini coefficient	36.43***	(10.40, 127.63)	9.07***	(4.06, 20.26)	7.00***	(4.11, 11.91)	637.41***	(64.59, 6,290.16)
N	23,885		23,956		23,956		9,896	

Notes: *p<0.05 **p<0.01***p<0.001

Table 3: Simulated Effects of Changes in Community Uninsurance and Charity Care
on Potential and Realized Health Care Access

	Had a place to go when sick or in need of advice about health	Had a doctor's visit in the past year	Had a doctor's visit for routine preventive care	Has seen specialist in the last 12 months when needed
	%	%	%	%
Community uninsurance				
Percent uninsured in community (Baseline=15.15%)	92.01	84.98	64.79	98.25
Percent uninsured in community (New=25.15%)	87.96	83.37	62.56	97.94
Percentage point change	-4.05	-1.61	-2.23	-0.31
Charity care				
Percent of uninsured population with no cost-related access difficulties (Baseline=67.71%)	92.18	85.05	64.91	98.26
Percent of uninsured population with no cost-related access difficulties (New=77.71%)	92.05	85.08	64.65	98.18
Percentage point change	-0.13	0.03	-0.26	-0.08

Table 4: Adjusted Odds Ratios of Assessment of Health Care System Providers

	Very satisfied with choice of primary care physician		Very satisfied with health care		Trust doctors		Very satisfied with choice of specialist seen	
	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI
Individual-level variables								
Fair or poor health	0.77*	(0.62, 0.94)	0.70***	(0.58, 0.85)	0.73***	(0.60, 0.88)	0.73**	(0.61, 0.89)
Age (years)	1.01***	(1.01, 1.01)	1.01***	(1.00, 1.01)	1.01***	(1.00, 1.01)	1.02***	(1.01, 1.03)
Education (years)	1.01	(0.99, 1.04)	1.00	(0.97, 1.02)	0.98*	(0.95, 1.00)	0.99	(0.95, 1.02)
Black	1.04	(0.87, 1.25)	0.93	(0.76, 1.15)	0.96	(0.79, 1.16)	0.84	(0.62, 1.14)
Hispanic	0.78**	(0.66, 0.94)	0.74*	(0.58, 0.93)	0.63***	(0.52, 0.76)	0.89	(0.68, 1.18)
Other	0.73**	(0.59, 0.90)	0.84	(0.61, 1.16)	0.87	(0.67, 1.12)	0.85	(0.60, 1.20)
Married	0.93	(0.84, 1.03)	1.07	(0.94, 1.23)	0.83**	(0.74, 0.94)	1.11	(0.93, 1.32)
Female	1.31***	(1.18, 1.45)	1.11**	(1.04, 1.19)	1.16**	(1.04, 1.30)	1.07	(0.92, 1.26)
Income/family poverty level	1.02	(1.00, 1.05)	1.07***	(1.05, 1.10)	1.00	(0.98, 1.03)	1.02	(0.98, 1.06)
Community-level variables								
Percent uninsured in community/10	0.75***	(0.72, 0.78)	0.90***	(0.86, 0.94)	0.93***	(0.91, 0.96)	0.87***	(0.82, 0.92)
Percent of uninsured population with no cost-related access difficulties/10	0.93***	(0.91, 0.95)	0.95***	(0.93, 0.97)	0.99	(0.98, 1.00)	1.00	(0.98, 1.00)
Median household income/1,000	0.99***	(0.98, 0.99)	1.00	(1.00, 1.00)	1.00*	(1.00, 1.01)	0.98***	(0.98, 0.99)
Gini coefficient	14.32***	(5.53, 37.03)	2.94*	(1.22, 7.07)	2.62***	(1.57, 4.35)	3.20*	(1.04, 9.84)
N	22,062		22,791		20,815		9,586	

Notes: *p<0.05 **p<0.01***p<0.001

**Table 5: Simulated Effects of Changes in Community Uninsurance and Charity Care
on Assessment of Health Care System Providers**

	Very satisfied with choice of primary care physician	Very satisfied with health care	Trust doctors	Very satisfied with choice of specialist seen
	%	%	%	%
Community uninsurance				
Percent uninsured in community (Baseline=15.15%)	62.68	53.73	72.14	74.54
Percent uninsured in community (New=25.15%)	55.62	51.03	70.76	71.82
Percentage point change	-7.06	-2.70	-1.38	-2.72
Charity care				
Percent of uninsured population with no cost-related access difficulties (Baseline=67.71%)	63.10	53.92	72.22	74.67
Percent of uninsured population with no cost-related access difficulties (New=77.71%)	61.34	52.68	72.05	74.59
Percentage point change	-1.76	-1.24	-0.17	-0.08

Table A1: Descriptive Statistics: Full Sample and by Community Uninsurance and Charity Care Use (for the Top 10 and Bottom 10)

	All	Community Uninsurance			Charity Care Use		
		Low	High	P-value[a]	Low	High	P-value[a]
Individual-level variables							
Had a place to go when sick or in need of advice about health (%)	89.06	90.71	83.82	0.00	90.11	86.47	0.10
Had a doctor's visit in the past year (%)	79.64	81.80	76.20	0.01	77.85	77.74	0.96
Had a doctor's visit for preventive care (%)	60.11	65.31	57.11	0.00	58.53	60.21	0.48
Has seen specialist in the last 12 months when needed (%)	96.30	98.17	95.85	0.02	96.77	97.42	0.48
Very satisfied with choice of primary care physician (%)	67.14	70.64	59.97	0.00	69.82	65.90	0.06
Very satisfied with health care (%)	63.55	69.14	60.78	0.00	64.23	62.64	0.66
Trust doctors (%)	69.34	69.77	65.05	0.02	70.41	68.90	0.52
Very satisfied with choice of specialist seen (%)	73.72	72.77	70.09	0.46	74.46	75.50	0.77
Fair or poor health (%)	9.10	7.83	11.28	0.02	7.43	8.06	0.48
Age (years) (mean)	40.87	41.33	40.45	0.20	41.72	40.16	0.00
Education (years) (mean)	13.92	14.42	13.87	0.00	13.69	14.03	0.09
Race/Ethnicity (%)							
White	76.64	84.99	58.66	0.00	83.09	65.68	0.02
Black	9.53	5.73	9.71	0.11	8.13	10.25	0.53
Hispanic	9.07	4.09	25.52	0.00	4.73	20.18	0.01
Other	4.76	5.19	6.11	0.63	4.05	3.88	0.89
Married (%)	71.48	73.08	67.06	0.06	77.02	72.35	0.03
Female (%)	50.95	50.90	49.27	0.24	50.36	50.70	0.83
Income/family poverty level (mean)	4.59	5.47	4.38	0.00	4.44	4.74	0.25
Community-level variables							
Percent uninsured in community (%)	15.15	6.78	26.89	0.00	13.07	15.73	0.42
Percent of uninsured population with no cost-related access difficulties (%)	67.71	68.08	72.39	0.39	46.20	83.78	0.00
Median household income/1,000 (mean)	47.51	60.68	39.81	0.00	46.22	52.91	0.23
Gini coefficient (mean)	0.38	0.35	0.41	0.00	0.36	0.37	0.37
N	23,956	3,810	3,304		2,989	3,643	

Notes: a. Wald test of differences in means/proportions by low/high community uninsurance and low/high charity care use (i.e., comparison between the 10 communities with the lowest and the highest community uninsurance and charity care use, respectively).

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