

Community-Level Uninsurance and the Unmet Medical Needs of Insured and Uninsured Adults

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Objective. To examine the relationship between community-level uninsurance rates and the self-reported unmet medical needs of insured and uninsured adults in the U.S.

Data Sources. 2000–2001 Community Tracking Study, which includes data from 60 randomly selected U.S. communities. The sample is representative of the contiguous U.S. states.

Study Design. Multilevel logistic regressions were employed to investigate whether the local uninsurance rate was related to having reported unmet medical needs within the last year. The models also included individual and community variables that could be potentially related to both community uninsurance rates and having reported unmet medical needs.

Principal Findings. The community uninsurance rate was positively associated with having reported unmet medical needs, but only for insured adults. On average, a five percentage point increment in the local uninsured population is associated with a 10.5 percent increase in the likelihood that an insured adult will report having unmet medical needs during the 12-month period studied.

Conclusion. Local health care delivery systems seem to be negatively affected by high uninsurance rates. These effects could have negative consequences for health care access, even for individuals who are themselves insured.

Key Words. Uninsured, communities, access, spillovers

The availability and affordability of health insurance is a major policy concern in the U.S. About one-fifth of the U.S. population between the ages of 18 and 64 (36.3 million) lacks health insurance and the size of this population is expected to rise as health insurance becomes more costly relative to income for many people (DeNavas-Walt, Proctor, and Mills 2004; Rowland 2004). For most of the last decade, yearly job-based health insurance premium increases were higher than increases in both earnings and inflation (Gabel et al. 2001). If the premiums for health insurance continue to increase faster than

personal income, recent estimates suggest that the percentage of uninsured workers could increase by more than 50 percent by 2009 (Gilmer and Kronick 2001).

The U.S. uninsured population is not homogeneously distributed across Census regions, states, and communities. For example, 2001 uninsurance rates for the adult population under the age of 65 range from 10.4 percent in the New England region to 24.3 percent in the West South Central region, and from 8.7 percent in Iowa to 26 percent in Texas (Fronstin 2002). Cunningham and Ginsburg (2001) show that variation in uninsurance rates across 60 selected U.S. communities is high, ranging from a low of 4.7 percent in Rochester, NY to a high of 28.9 percent in Miami, FL.

A recent Institute of Medicine (IOM) report concludes that “uninsured residents have worse access to health care in communities with high uninsured rates than they do in communities with relatively low rates” (IOM 2003, p. 7). The IOM primarily argues that health care providers may face serious financial difficulties when they have to provide mostly uncompensated care to a relatively large uninsured population, while having a smaller insured population that can be charged more than cost. Consequently, many outpatient providers and hospitals may be faced with lower revenue streams that could drive them to reduce the quantity and quality of health services provided, or could even force them to relocate or cease the delivery of health services altogether. Local and state governments are also likely to be faced with heavier burdens of care for the uninsured, which may ultimately result in reduced government-provided health care per uninsured person (Thorpe 2004).

However, the consequences for the uninsured are not the story for the entire community. Insured people could patronize hospitals selectively in which there are fewer uninsured and, therefore, there would be no need for those hospitals to reduce services. Moreover, their insurance will generally cover the higher hospital costs associated with the uninsured and the percentage of hospital cost paid out of pocket is negligible. Thus, there is no necessary logical connection between the uninsured burden and what is

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available to the insured. Another key issue is whether the costs of uninsurance are covered from external sources (e.g., a state government program), or whether the insured must cover those costs themselves; in the former case, the situation of the insured in a given community is likely to be better on all dimensions than in the latter case.

Although there is some empirical evidence that uninsured adults—particularly those with low-income levels (e.g., Cunningham 1999)—have greater difficulties accessing health care in communities with high rates of uninsurance, it is not known whether any negative access-related effects extend to the insured population (e.g., Cunningham and Kemper 1998; Cunningham 2004). Moreover, extant research has not taken into account the complex contextual relationship between individual-level access to health care and community-level uninsurance rates after accounting for both individual and community effects.

The purpose of this study is therefore to analyze the relationship between community uninsurance rates and individual health care access for both insured and uninsured adults. Using data from the 2000 to 2001 Community Tracking Study Household Survey (CTSHS), we estimate multilevel logistic regression models to assess whether community uninsurance is related to an individual's reported access to care. For the purposes of this study, access to care is defined as having reported unmet medical needs within the year prior to the interview date. We hypothesize that both insured and uninsured adults residing in communities with relatively high proportions of uninsured adults would be more likely to report that they had unmet medical needs within the last year than if they lived in communities with lower proportions of uninsured adults.

CONCEPTUAL FRAMEWORK

The absence of public or private health insurance could have health, economic, and social effects on individuals, families, and communities by influencing different aspects of the health care system (IOM 2004; Thorpe 2004). An initial issue is what determines the proportion uninsured and their access to care. The ideal model would be one in which those proportions are wholly exogenous (depending, say, on the number of small firms or part time workers in a town). Then we could simply relate the variation in uninsured to the fate of the insured. If instead different communities respond by providing more or less easy access to the uninsured, that access may itself affect the number of

uninsured (Herring 2005) and, in turn, the levels of provision of services may positively depend on the number of uninsured, so that the levels of provision of services absorb some of the exogenous effect of various numbers of uninsured.

There are several hypothesized mechanisms by which relatively high rates of community uninsurance can impact access to health care and, ultimately, population health for the insured. Virtually all depends on the extent to which markets for the provision of care can be kept separated. As already noted, at one extreme a separate health delivery system (perhaps in certain parts of town) cares only for the insured, and provides them with the same care regardless of the number of uninsured. At the other (generally more realistic) extreme all or most health care providers care for both types of patients. One mechanism for spillover effects on the uninsured is related to provider response to financial difficulties. The lower use of or payment for health services by the uninsured may impose financial burden on providers, especially hospitals, which force them to cut back on the range of services and quality for all (IOM 2003, p. 27).

A second mechanism is related to consumer financing. High local uninsurance could increase the price of health care and it could discourage use by the insured if they pay proportional coinsurance. This is generally not an issue for hospital care but it is relevant in the case of other health services.

The third mechanism relates to the variety, convenience, and quality of care in the community. Newhouse et al. (1982) showed that, with regard to access to specialized physicians especially in smaller towns, the availability fell if there were fewer demanders of potential services. While they focused on population per se, a similar argument would apply to community-level uninsurance. By shrinking the market, uninsurance may reduce the options for division of labor and, therefore, access to specialized services. If a higher proportion uninsured means fewer customers with insurance that will cover high prices, and if providers are subject to economies of scale or scope, providers may be forced to cut the intensity and availability of care for everyone in the community.

There is evidence that specific kinds of services may be less available to the insured when there are more uninsured who use the same providers. The level of uninsurance can have adverse effects on primary care, emergency medical services, specialty services, and hospital care (IOM 2003). Physicians practicing in communities with increasing rates of uninsurance are more likely to curtail unprofitable services and shorten hours of service. There is also some evidence that high or increasing community uninsurance rates are associated

with overcrowding of hospital emergency departments (GAO 1993; Derlet 2002) and the closing of hospital trauma services (Dailey, Teter, and Cowley 1992; Selzer et al. 2001). High local uninsurance rates reduce the availability of specialty care (e.g., burn units and psychiatric care) in smaller cities as some specialty care services are used relatively more by uninsured patients (IOM 2003) and as they need high volumes to be efficient. Reductions in specialty care availability are particularly relevant in rural communities because many providers may decide to relocate to areas where there would be sufficient demand for their services (Ormond, Wallin, and Goldenson 2000).

METHODS

Data Source

We used data from the 2000 to 2001 CTSHS ($N = 59,725$) to explore how the uninsured proportion affects individual users of care. The CTSHS was designed to track changes in the health care system and their effects at the local level in a sample of U.S. communities and it has been described in detail elsewhere (CSHSC 2003). The CTSHS is representative of households in the contiguous U.S. states. Survey information was collected on the composition of the household, demographic and socioeconomic characteristics, health status, health care utilization, and personal experiences with the U.S. health care system. Interviews were conducted from September 2000 to September 2001.

Fifty-one metropolitan areas and nine nonmetropolitan areas in the contiguous U.S. states were selected at random, and respondent households were drawn from these communities using random digit dialing. Larger samples were drawn from 12 communities selected for intensive study. The CTSHS used area probability sampling to ensure that the sample was representative of households without a phone.

Individuals in households selected for interviews were put together into family insurance units (i.e., family groupings consisting of an adult household member, his/her spouse and dependent children under the age of 18, or any dependent children who were full-time students between the ages of 18–22). Most of the collected data were provided by one respondent within each family insurance unit.

We utilized only the core CTSHS data (i.e., data from the 60 sites) for this study because we were interested in estimating the percentage uninsured population 18–64 years of age for each site. Our final sample consisted of

37,089 adults at 60 sites, after excluding a small supplemental sample, those below the age of 18 or above the age of 64 years, and those with missing data for any of our variables of interest.

Analytic Strategy

We used multilevel logistic regression to analyze how community-level uninsurance rates were related to self-reported access to health care in separate samples of insured and uninsured adults. CTSHS respondents were asked the following question: "During the past 12 months, was there anytime that you didn't get the medical care you needed?" We used the answer to this question as our "unmet medical needs" dichotomous-dependent variable.

Our empirical specification assumed that health care utilization was determined by the perceived need for services (self-reported health status), individual predisposing characteristics (age, years of education, racial/ethnic background, marital status, and gender), enabling factors at the individual level (health insurance and household income), factors at the community/contextual level (percentage uninsured, median household income, and income inequality in the community of residence). These factors were grouped and included in the model based on previous research suggesting that health care utilization and access vary substantially across these dimensions (Andersen and Davidson 2001; Andersen et al. 2002). We did not include cross-area price differences as explanatory variables because price levels might be affected by the community level of uninsurance.

Uninsurance was defined as not being covered by private or public health insurance plans at the time of the interview. The independent variable of greatest interest to us was the estimated percentage uninsured in the community of residence. We also included the community-level median household income and an income inequality measure (Gini coefficient) to control for wealth levels and distribution, as well as the general willingness of communities to support health-related services (Andersen et al. 2002). The Gini coefficient is a summary measure of income inequality that can be estimated for each community. The index can range from zero (perfectly equal distribution of income) to one (all income in the community goes to one person or household). Thus, higher values of the Gini coefficient indicate higher income inequality.

Community contextual variables were included in the model because there is some evidence that they are also related to health care utilization and health outcomes (e.g., mortality) (Subramanian, Blakely, and Kawachi 2003).

All the contextual-level variables were calculated using the person-level sampling weights available in the CTSHS to make site-specific estimates (CSHSC 2003).

Income levels affect the demand for medical care and the level of health. Income inequality could be related to health because it may reflect the degree of social distance across different income groups as well as disparities in community-level spending in health care (Kawachi and Kennedy 1999). Whether it affects access, given the level of health, is not known. Income inequality could also reduce social cohesion, which could affect the likelihood that individuals will support more local spending in public health (Kawachi and Berkman 2000).

Multilevel models are appropriate for our study because we are interested in an individual-level dependent variable but we had both community- and individual-level variables as predictors. This allows us to assess how community-level variables were related to individual outcomes after controlling for individual-level effects (Diez Roux 2001). The models included random effects to account for the dependence in the variation in community effects within each of the 60 communities. All the random effects logistic regression models were estimated using GLLAMM in *Stata* 8.2 (Skrondal and Rabe-Hesketh 2004).

RESULTS

Unmet Medical Needs and Sample Characteristics

Table 1 reports the weighted means of all the dependent and independent variables for the full sample, and for the insured and uninsured groups. About 17 percent of working age adults in our CTSHS sample were uninsured and 8.7 percent of the total sample reported that they had unmet medical needs. Eighteen percent of uninsured adults reported to have had unmet medical needs within the last year compared with 6.8 percent of insured adults.

The differences between the insured and uninsured populations in most of the characteristics listed were large and statistically significant. A higher percentage of uninsured adults reported to be in fair or poor health—and had lower SF-12 physical component summary scores—than insured adults. On average, the uninsured were also relatively younger, had fewer years of education, were disproportionately black or Hispanic, and were less likely to be married or female. The mean household income to poverty-level ratio was almost twice as high for the insured compared with the uninsured (4.31 versus

Table 1: Sample Means by Health Insurance Status

	<i>All</i>	<i>Insured</i>	<i>Uninsured</i>	<i>p-Value*</i>
<i>Individual-level variables</i>				
Unmet medical needs	0.087	0.068	0.180	.000
Uninsured	0.165			
Fair or poor health	0.143	0.127	0.222	.000
SF-12 physical component summary	49.506	49.599	49.035	.020
Age	39.740	40.641	35.183	.000
Years of education	13.270	13.552	11.842	.000
White	0.711	0.746	0.537	.000
Black	0.117	0.111	0.152	.001
Hispanic	0.128	0.100	0.273	.000
Other	0.043	0.044	0.039	.318
Married	0.608	0.649	0.400	.000
Female	0.514	0.520	0.480	.000
Household income/poverty level	3.983	4.309	2.328	.000
<i>Community-level variables</i>				
Percentage uninsured in community	0.150	0.146	0.169	.000
Median household income/1,000	45.059	45.346	43.608	.000
Gini index	0.385	0.384	0.392	.000
<i>N</i>	37,089	32,002	5,087	

*Wald test of differences in means/proportions by health insurance status.

2.33). The uninsured were concentrated in communities with lower median household income and more income inequality when compared with the insured.

Community Rankings

Tables 2 and 3 report the weighted means for four subgroups ranked by the percentage uninsured population, for separate insured and uninsured samples. We also report the results of adjusted Wald tests of differences in means/proportions by community ranking categories.

In Table 2, the percentage of the insured adult population who reported having unmet medical needs ranged from 5.6 percent in the lowest quartile of the 60 communities (low local-level uninsurance) to 8.3 percent in the highest quartile (high local-level uninsurance). The local-level uninsurance rate ranged from 8.2 percent in the lowest quartile to 22.3 percent in the highest quartile. However, Table 3 shows that the percentage of the uninsured adult population who reported having unmet medical needs remained fairly constant across the four groups of communities. The differences in unmet medical needs across

Table 2: Characteristics of Insured Individuals in 60 Communities Ranked by Concentration of Uninsured Adults

	Community Ranking				<i>p-Value*</i>
	1-15	16-30	31-45	46-60	
<i>Individual-level variables</i>					
Unmet medical needs	0.056	0.061	0.072	0.083	.002
Fair or poor health	0.109	0.105	0.138	0.156	.000
SF-12 physical component summary	50.364	50.128	48.874	49.269	.000
Age	40.701	40.717	41.116	39.831	.057
Years of education	13.829	13.844	13.297	12.516	.000
White	0.830	0.810	0.774	0.552	.000
Black	0.068	0.094	0.135	0.136	.010
Hispanic	0.066	0.053	0.055	0.250	.001
Other	0.035	0.044	0.035	0.062	.249
Married	0.644	0.656	0.667	0.615	.102
Female	0.504	0.510	0.530	0.533	.000
Household income/poverty level	4.623	4.526	4.056	4.114	.006
<i>Community-level variables</i>					
Percentage uninsured in community	0.082	0.118	0.159	0.223	.000
Median household income/1,000	50.283	48.771	42.114	41.185	.001
Gini index	0.365	0.366	0.395	0.407	.000
<i>N</i>	7,824	8,199	8,768	7,211	

*Wald test of differences in means/proportions by community ranking categories.

communities ranked by the proportion uninsured in the population were only statistically significant for the insured population only.

The percentage of both insured and uninsured adults in fair or poor health was higher in communities with relatively high community uninsurance rates. The fact that the proportion of insured adults in fair/poor health is higher in communities with high uninsurance rates indicates that there could be other community-level characteristics that are correlated with community uninsurance but are unobserved. Insured minorities and those with lower household income levels tended to be more concentrated in communities with a high proportion of uninsured adults, while insured whites resided in communities with lower proportions of uninsured adults.

Multilevel Logit Models of Unmet Medical Needs

Table 4 shows the results from multilevel logit models of unmet medical needs, reported separately for insured and uninsured samples. Before

Table 3: Characteristics of Uninsured Individuals in 60 Communities Ranked by Concentration of Uninsured Adults

	Community Ranking				<i>p</i> -Value*
	1-15	16-30	31-45	46-60	
<i>Individual-level variables</i>					
Unmet medical needs	0.171	0.188	0.186	0.172	.723
Fair or poor health	0.151	0.199	0.232	0.244	.001
SF-12 physical component summary	50.753	49.200	48.208	49.270	.001
Age	33.749	34.410	35.715	35.486	.010
Years of education	12.516	12.181	11.826	11.495	.000
White	0.693	0.627	0.645	0.346	.000
Black	0.136	0.151	0.193	0.118	.499
Hispanic	0.138	0.165	0.128	0.501	.000
Other	0.034	0.057	0.033	0.035	.292
Married	0.298	0.318	0.383	0.486	.000
Female	0.429	0.492	0.472	0.494	.131
Household income/poverty level	2.785	2.644	2.272	2.087	.001
<i>Community-level variables</i>					
Percentage uninsured in community	0.083	0.119	0.160	0.229	.000
Median household income/1,000	50.071	48.634	42.381	40.303	.000
Gini index	0.367	0.365	0.394	0.412	.000
<i>N</i>	631	977	1,548	1,931	

*Wald test of differences in means/proportions by community ranking categories.

proceeding to the main findings, note that insured and uninsured adults in fair/poor health are more likely to report having unmet medical needs than those in better health. The results also show that the SF-12 physical component summary score is negatively related to the likelihood of reporting unmet medical needs. Age is negatively related to having reported unmet medical needs but the coefficient of this variable is only statistically significant for the insured population. Years of education is positively related to reporting unmet medical needs. Uninsured non-Hispanic blacks and Hispanics are less likely to report unmet medical needs than uninsured non-Hispanic whites and others. Both insured and uninsured women are more likely to report having unmet medical needs than their male counterparts. As we would expect, household income (divided by the poverty level) is negatively related to reporting having unmet medical needs. Median household income in the community is positively related to unmet medical needs for the insured population only. The community-level Gini index of inequality is positively associated with having unmet medical needs for both the insured and the uninsured.

Table 4: Multilevel Logit Models of Unmet Medical Needs

	<i>Insured Coefficient</i>	<i>Uninsured Coefficient</i>
Percent uninsured in community	0.020*** (0.002)	- 0.001 (0.007)
Fair or poor health	0.466*** (0.086)	0.376*** (0.139)
SF-12 physical component summary	- 0.044*** (0.003)	- 0.057*** (0.005)
Age	- 0.019*** (0.003)	- 0.004 (0.003)
Years of education	0.033** (0.016)	0.082*** (0.021)
Black	- 0.042 (0.085)	- 0.737*** (0.156)
Hispanic	0.098 (0.096)	- 0.893*** (0.196)
Other	0.339*** (0.107)	- 0.078 (0.231)
Married	0.053 (0.067)	0.160 (0.150)
Female	0.163*** (0.058)	0.185* (0.099)
Household income/poverty level	- 0.054*** (0.011)	- 0.098*** (0.026)
Median household income/1,000	0.036*** (0.002)	- 0.000 (0.005)
Gini index	6.937*** (0.505)	1.776** (0.901)
Constant	- 4.676*** (0.317)	- 0.439 (0.648)
Variance of comm. random effect	0.062 0.003	0.125 (0.007)
Log likelihood/1,000,000	- 28.040	- 10.022
N	32,002	5,087

Notes: Standard errors in parentheses.

*Significant at 10%;

**Significant at 5%;

***Significant at 1%.

The main results show that the community uninsurance rate is positively and significantly associated with having reported unmet medical needs within the preceding 12 months, but this finding only applies to the insured. We estimate that a five percentage point increase in the community-level uninsured population is associated with a 10.5 percent increment in the likelihood

that an insured adult will report having unmet medical needs within the last 12 months (OR = 1.10; 95 percent CI = 1.08, 1.13).

We also considered whether other community-level variables were related to having reported unmet medical needs.¹ More specifically, we included the number of physicians per capita and the average monthly hours of charity care provided by local physicians (Cunningham et al. 1999). These variables were calculated using the CTS Physician Survey. The coefficients for both of these variables are negative and statistically significant but our main result did not change. Our preferred model specification excludes these variables as they are likely to be endogenous and in part they both reflect the community uninsurance effects that we are attempting to capture.

DISCUSSION

We found that about 18 percent of uninsured working-age adults reported having unmet medical needs within the last year compared with roughly 7 percent of insured working-age adults. The demographic and socioeconomic differences between the insured and uninsured populations were large and statistically significant. On an average, uninsured adults had poorer health, were younger, had fewer years of education, were disproportionately black or Hispanic, and were less likely to be married or female. They also had poor self-reported health status, but we cannot tell if this is an effect or a cause of being uninsured. The mean household income to poverty-level ratio was almost twice as high for the insured compared with the uninsured. The uninsured disproportionately resided in communities with relatively low median household income and much more income inequality.

After adjusting for other variables, we found that the community uninsurance rate was positively associated with having reported unmet medical needs. Most notably, these results were statistically significant for the insured and insignificant for the uninsured. We estimate that a five percentage point increment in the uninsured population is associated with a 10.5 percent increase in the likelihood that an insured adult will report having unmet medical needs within a given year.

The finding that community uninsurance has a relatively large and consistent impact on health care access for the insured subpopulation—but not for the uninsured subpopulation—is particularly interesting and somewhat surprising. A possible explanation for this result is that being uninsured itself would capture most of the variation in unmet medical needs for the

overall population as the uninsured have been shown to have relatively lower access to care than the insured (IOM 2002). Being uninsured powerfully predicts the likelihood of having unmet medical needs and, as a result, individual uninsurance status would overwhelm the potential contextual effects of living in a community with high rates of uninsurance. For example, uninsured individuals in communities with a low concentration of uninsurance are about three times more likely than their insured neighbors to have had unmet medical needs.

Alternatively, uninsured adults are able to get health care from safety net providers regardless of their ability to pay (Hadley and Cunningham 2004). If the relative per capita availability and quality of safety net providers across communities is about the same regardless of the proportion uninsured, that would explain the insignificant effect. However, if the relative availability and quality of local health care systems across communities varies substantially with the proportion insured, then there could be a larger effect of community uninsurance rates on perceived unmet medical needs for insured adults compared with uninsured adults.

It is possible that unmet medical needs are underreported by some uninsured adults if they are unable to identify need because of their lack of having a usual source of health care. Although it is difficult to assess the degree of underreporting of unmet medical needs, there is no reason to believe that our community-level uninsurance results would be different for the uninsured population unless the likelihood of underreporting is correlated with community-level uninsurance.

While many strongly believe that being uninsured has negative consequences for the uninsured when it comes to individual health and access to health care, the reality is that this conviction has so far not been enough to advance comprehensive health care reform. The approximately three percentage point increase in the proportion of the insured with unmet medical needs from the least to the most uninsured communities may be a stronger motivation for action. But it may not be known to the insured, or it may also not be regarded to be of sufficient value to warrant the further subsidies the insured would have to pay to alleviate the problem.

Most of the prior discussion on the spillover effects of community-level uninsurance only deals with the direct effect of uninsurance on the health and health care access of the uninsured, a population that probably also lacks political influence. As a result, increasing health insurance coverage has not been a major concern for the insured majority. The results presented here suggest that insured people and their political representatives should be

concerned about the uninsured for at least one additional reason; because relatively high local uninsured populations could have negative consequences for the insured (as well as for their uninsured fellow citizens).

Our main findings are policy relevant because insured adults are typically in a better economic position to influence the political process. The likelihood of adopting reforms that will lead to increases in health insurance coverage will certainly be higher if the constituency base that fully understands the negative consequences of uninsurance becomes larger. Still, until there is enough awareness that uninsurance affects all members of society, it is unlikely that this issue will move from a topic of policy debate to one of policy action.

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NOTE

1. The correlation coefficients between all the community-level variables considered are the following: uninsurance and income, -0.562 ; uninsurance and the Gini index, 0.609 ; uninsurance and charity care, 0.541 ; uninsurance and physicians per capita, 0.0152 ; income and the Gini index, -0.760 ; income and charity care, -0.355 ; income and physicians per capita, 0.302 ; the Gini index and charity care, 0.413 ; the Gini index and physicians per capita, -0.026 ; and charity care and physicians per capita, 0.067 .

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