

A public health model of Medicaid emergency room use

by Martin de Alteriis and Thomas Fanning

This study builds a public health model of Medicaid emergency room use for 57 upstate counties in New York from 1985 to 1987. The principle explanatory variables are primary care use (based in physicians' offices, freestanding clinics, and hospital outpatient departments), the concentration of poverty, and geographic and hospital

availability. These factors influence the emergency room use of all Medicaid aid categories apart from the Supplemental Security Income recipients. Inherent in these findings are a number of policy implications that are explored in this article.

Introduction

Visits made to emergency rooms by recipients whose condition does not require emergency treatment are a perennial concern. Such visits should be made to a physician's office or a clinic, if at all. Whatever one's perspective, these are troubling. When hospital emergency rooms are already overcrowded, a large number of nonurgent recipients increases the waiting time for urgent recipients. Because the cost of emergency room (ER) visits is higher than the cost of clinic or physician visits, nonurgent ER visits increase the taxpayer's burden. Finally, recipients who rely on ERs for primary care do not get efficient, coordinated, or continuous primary care.

Inappropriate visits have risen sharply in recent years, especially among the poor (Habenstreit, 1986), prompting some States to take action regarding their Medicaid recipients. In 1988, New York State passed legislation allowing for 15 demonstration programs that will attempt to reduce inappropriate ER use by Medicaid recipients¹. This research is prompted by New York's initiative, and is aimed at aiding the demonstration projects that should begin later this year.

Background

Thus far, studies on ER use have tended to rely on surveys of a relatively small sample size. Nevertheless, a notable degree of consistency unites the findings, be they from Sweden, the South of England, or the South Bronx. Links have been established between nonurgent visits and lack of available primary care, geographic accessibility, loneliness, disability, and psychosocial problems (Wood and Cliff, 1986; Habenstreit, 1986; Andren and Rosenqvist, 1985).

When the indigent in the United States were the subject of this research, some interesting contrasts emerged. It was noticed that welfare recipients have higher levels of nonurgent (also termed inappropriate or marginal) visits.

¹New York State social services law was amended by the addition of section 364-K.

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A study of 1,212 ER visits conducted in Minnesota in the early 1980s compared various types of payment groups (Dickhudt, Gjerdingen, and Asp, 1987). Sixty-one percent of all ER visits by welfare recipients were deemed inappropriate, compared with 33 percent of all ER visits by private insurance payers, and 13 percent of all ER visits by Medicare recipients. On the basis of that research, Dickhudt, Gjerdingen, and Asp (1987) called for cost-cutting incentives to curtail the use of ER visits by welfare recipients. Another study conducted in Arkansas at the same time found that 15 percent of Medicaid pediatric ER visits were inappropriate (compared with 8 percent for all other patients) (Field et al., 1987). Yet the most interesting feature of this study was that a higher percent of the Medicaid ER patients required hospital admission than did all other patients, 16 percent to 10 percent, respectively. It should be noted that Medicaid recipients tend to have more health problems than the rest of the population.

Research on the supply of Medicaid primary care services, and substitution of one primary care site by another, is also relevant to this study. A substantial number of office-based primary care physicians do not see Medicaid recipients or specifically limit the size of their Medicaid practices (Perloff et al., 1987; Held and Holahan, 1985). When there is a lack of office-based physicians, many Medicaid recipients are treated in freestanding clinics or hospital outpatient departments (OPDs) (Cohen, 1989; Long, Settle, and Stuart, 1986). Nevertheless, the availability of such services is also limited. This can divert patients to hospital ERs (Davidson, 1982). In all of this, the effect of relative fee schedules must be kept in mind. Emergency room visits in New York State are reimbursed at far higher levels than clinic or physician visits. In 1986, for example, the average visit² to a physician's office cost the Medicaid program \$28. At the same time, the average clinic (freestanding or OPD) visit cost \$51 and the average visit to an ER cost \$72. This led some county officials to allege that their clients were being sent to ERs by some physicians in their districts (New York State, 1988).

²The Medicaid Management Information System measures physician use in claims and clinic use in visits. The average visit to a clinic approximates 1.7 claims in physicians' offices. These dollar estimates standardize claims into visits to allow for comparisons to be made.

New directions

All of the ER studies referred to in the previous section are limited by their sample sizes (rarely above 1,000 and frequently below 100), and geography (almost all were conducted in one city or one hospital). The focus is usually on inappropriate visits, and the issue of visits which would not have occurred if adequate primary care had been available at an earlier time point is not raised. All of this limits the utility of these studies to policymakers. A model of ER use by Medicaid recipients that considers broader issues is needed. A number of issues are of particular importance.

The main hypothesis of this study is that ER use will be high when primary care use is low. The precise relationship between ER use and primary care provided in physicians' offices, freestanding clinics, and outpatient departments will be investigated. All three have different qualities as substitutes for the ER. For example, some Medicaid recipients may feel more comfortable in freestanding clinics than in physicians' offices, while outpatient departments provide a direct substitute for nonemergency primary care to Medicaid recipients visiting the hospital. However, the supply of freestanding clinics is limited in some counties, and not all hospitals have OPDs.

Another aspect of the supply side of services also requires attention, namely the behavior of hospital ERs themselves. This is especially relevant in light of recent studies of Medicaid's political economy that have noted the significance of medical providers in determining the levels of services delivered (Barrilleaux and Miller, 1988). Anecdotal evidence in the State of New York suggests that some physicians refer Medicaid eligibles to hospital ERs as a result of the low fees for physician-based primary care visits and the high fees for ER visits (New York State, 1988). The sources of this evidence suggested that physicians would do this only if they knew that local ERs had the capacity to treat these patients. If these reports are correct, it would be expected that ER use would be high where ERs had excess capacity.

Several other factors should also be considered in a model of Medicaid ER use. Rural and urban differences are one of these. It might be expected that Medicaid recipients in rural areas would make fewer visits to ERs, given that there are fewer hospitals in these regions, considerable distances to travel for many Medicaid recipients, and difficulties in transportation. In other words, the costs associated with ER use would act as deterrent. A more sociological explanation of ER use would look at cultural factors such as socialization, attitudes, and knowledge about health care (Parboosingh and Larsen, 1987). For example, where a culture of poverty prevails, individuals would have had negative experiences with—and therefore attitudes towards—health care. They would also be lacking in knowledge about effective preventive care.

A study using Medicaid billing data also can probe differences among the various aid categories in the program. There are major differences between these groups. These are: Aid to Families with Dependent Children (AFDCs), mainly single mothers and their children; Supplemental Security Income for the Aged,

Blind, and Disabled (SSI); home relief (HRs), mainly single adults, many of whom have severe problems; and Medicaid-only (MA-only) which includes all those whose income does not allow them to claim the forms of public assistance already listed, but is low enough to allow them to receive medical assistance.

This article is intended to address these issues, looking at ER use in the context of broader public health issues, and providing a starting point for implementing programs that could improve the situation.

Data and methods

This study examines the ER and primary care use of Medicaid recipients in upstate New York from 1985 to 1987. The main variables are taken from the New York State Medicaid Management Information System (MMIS) for the State's 57 upstate counties. These counties constitute the entire State with the exclusion of New York City. The average annual number of Medicaid eligibles in these counties averaged over 1 million per year from 1985 to 1987. In terms of region, the counties range from rural areas (with less than 20 percent of the population living in urban areas) to those dominated by major cities such as Syracuse and Buffalo. The suburbs of New York City, such as Westchester and Nassau, are also included among the upstate counties.

The data do not distinguish between appropriate and inappropriate ER use, even though ER visits which resulted in hospitalization are excluded. Given the broader definition of inappropriate ER use we are interested in, i.e., to include visits that should not have taken place because the recipient should be receiving adequate and continuous primary care, this is not considered a problem. However, the study does look at two different measures of ER use that give an indication of the nature of the problem. The first measure looks at all visits made within a county in each year. The second measure takes recipients whose only form of primary care was in the ER.

The measures of primary care use reflect the measures of ER use. When the aggregate number of visits is being considered, the average number of primary care visits per eligible per year is used. In these models, measures are available for physician-based primary care claims, freestanding primary care visits, and outpatient primary care visits. When the aggregate number of recipients is being considered, recipients whose only source of primary care occurred in the ER in the year in question is the measure of primary care use. In this instance, it is not possible to distinguish between physician and clinic use, because many recipients of primary care tend to visit both clinics and physicians in the course of the year.

Hospital behavior was investigated using American Hospital Association data (American Hospital Association, 1986, 1987, and 1988). The total number of beds in hospitals that had ERs in a county was divided by the population, to measure the demand on hospitals which should affect their availability for Medicaid recipients. Beds in psychiatric and military hospitals were excluded from the analysis, because the purpose was to measure

Table 1
Mean values of regression variables for upstate
New York: 1985-87

Variables	Mean
Emergency room visits per eligible	0.47
Emergency room recipients per eligible	8.7
Primary care use per eligible	
Physician-based claims	3.14
Freestanding clinic visits	0.23
Outpatient department visits	0.22
Primary care recipients per eligibles	
Eligibles per population	9.7
Hospital beds per population	4.7
Small counties	33.3
Urban	15.7

SOURCES: New York State: Data from the Medicaid Management Information System; (American Hospital Association, 1986, 1987, and 1988); Rockefeller Institute of Government: *New York State Statistical Yearbook, 1988*. Albany, New York.

hospital accessibility to the general public. The concentration of poverty in a county was measured by the ratio of Medicaid eligibles to the county population. Regional differences between the counties were controlled by creating dummy variables that group the small and urban counties. In this analysis, 1980 Census data were used. Small counties were defined as those with less than 30 percent of their populations living in standard metropolitan statistical areas (SMSAs). Urban counties

were defined as those with a major city (100,000 or more) in the county or a New York City suburb with more than 95 percent of their population living in an urban area. The mean values of the major explanatory variables are presented in Table 1.

Ordinary least squares regressions were performed, along with the appropriate regression diagnostics. There was little multi-collinearity (the highest correlation was between physician-based primary care visits and OPD visits: $r = 0.47$). There was no evidence of spatial autocorrelation. There were traces of heteroscedasticity that were removed by logging the dependent variable.

Findings

The major finding was that ER visits are negatively associated with primary care visits among the combined total of AFDC, HR, and MA-only recipients in the counties of upstate New York (Table 2). Physician-based primary care claims, freestanding primary care visits and outpatient primary care visits all substitute for ER visits at about the same level for all aid categories except SSI. Hospital availability is shown to be related to ER visits for the bulk of Medicaid recipients, but again, not for SSI recipients.

However, the demographic variables are related to ER visits in the expected manner for all categories of Medicaid recipients. The ratio of eligibles to the total county population is related to ER use. Small rural

Table 2
Ordinary least squares regression of Medicaid emergency room visits in New York State: 1985-87

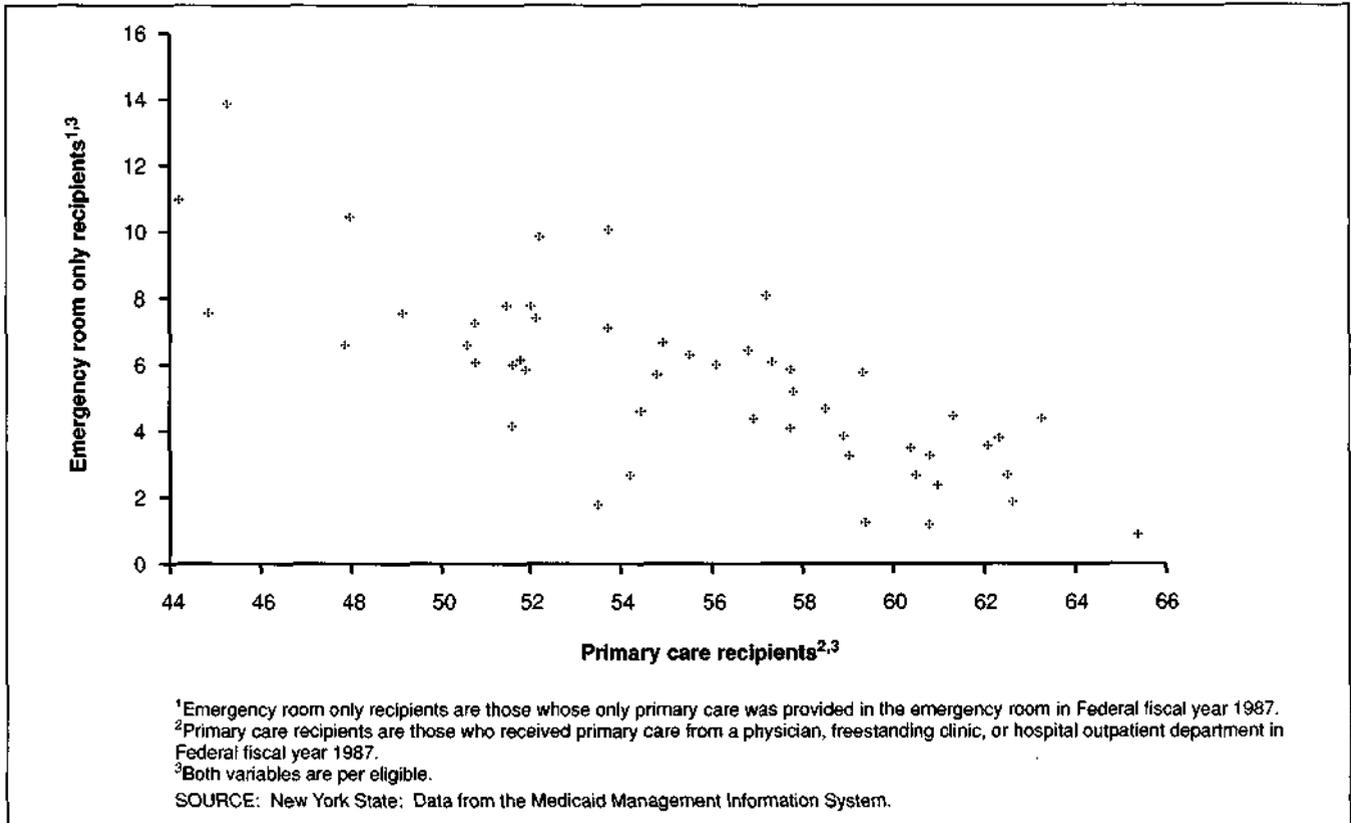
Independent variables	Log of emergency room visits per eligible				
	AFDC	Home relief	Medicaid only	SSI	Non-SSI Total
Supply factors					
Physician claims per eligible	-0.18 (6.6)	-0.18 (5.4)	-0.17 (5.6)	-0.03 (1.3)	-0.23 (7.2)
Freestanding clinic visits per eligible	-0.17 (3.0)	-0.12 (1.4)	-0.21 (1.8)	0.12 (1.8)	-0.25 (3.2)
Outpatient department visits per eligible	-0.14 (2.3)	-0.14 (3.0)	-0.17 (1.3)	0.09 (1.0)	-0.20 (2.3)
Hospital beds per capita	0.04 (4.4)	0.04 (3.3)	0.03 (2.3)	0.02 (1.2)	0.03 (2.6)
Controls					
Eligibles per population	0.14 (2.2)	0.14 (2.2)	0.33 (4.2)	0.45 (2.5)	0.28 (4.3)
Rural counties	-0.15 (3.8)	-0.15 (3.6)	-0.04 (0.7)	-0.25 (4.6)	-0.13 (3.2)
Urban counties	-0.09 (1.7)	-0.04 (0.6)	-0.19 (2.7)	-0.20 (2.6)	0.00 (0.02)
1986	0.05 (1.3)	0.03 (0.7)	-0.01 (0.3)	0.01 (0.1)	-0.01 (0.04)
1987	0.07 (1.7)	0.01 (0.25)	-0.20 (3.0)	-0.12 (1.4)	-0.12 (2.5)
Constant	-0.23	-0.15	-0.91	-0.91	-0.27
Standard error of the estimate	0.22	0.24	0.27	0.30	0.23
N	167	167	167	167	167
R ²	0.41	0.33	0.40	0.30	0.44
Adjusted R ²	0.37	0.28	0.36	0.25	0.40
F	11.05	7.70	10.57	6.65	12.34

NOTE: Figures in parentheses are *t*-scores. AFDC is Aid to Families with Dependent Children. SSI is Supplemental Security Income.

SOURCES: New York State: Data from the Medicaid Management Information System; (American Hospital Association, 1986, 1987, and 1988); Rockefeller Institute of Government: *New York Statistical Yearbook, 1988*. Albany, New York.

Figure 1

Medicaid emergency room only recipients and primary care recipients in upstate New York: 1987



counties use less ER services than all other counties, although the large urban counties do not use more services than the rest of the State.

Figure 1 is a scatterplot of ER-only recipients of primary care as a percent of all eligibles in a county against the percent of recipients who received primary care in a clinic or physician's office. It shows the tradeoff between these two variables.

Table 3 shows that the same factors that are influential for ER visits are also influential for ER recipients. These data do not distinguish between the primary care sites, but given that the provision of primary care is the major issue, this is not considered a problem. One major difference between the regression based on recipients and that based on visits is in the fit of the model. Whereas the previous regression could explain 40 percent of the variance in visits, this regression explains 76 percent of the variance. This may occur because the second measure comes closer to capturing the essence of the problem than the one dealing with aggregate visits. Persons who receive primary care only in the ER are not receiving continuous and consistent attention. Persons who receive primary care in a physician's office or clinic are far more likely to be receiving such attention.

Discussion

The tradeoff between primary care use and ER use is one of the most important relationships in this model. It is obvious, over time and across the regions of New York State, that low use of primary care is

Table 3
 Ordinary least squares regression of Medicaid emergency room recipients in New York State: 1987

Independent variable	Emergency room only recipients per eligible
Constant	0.28
Primary care recipients per eligible	-0.42 (11.1)
Eligibles per population	0.19 (4.8)
Hospital beds per population	0.01 (2.4)
Small rural counties	-0.06 (1.7)
Urban counties	-0.01 (2.9)
R ²	0.78
F	0.76
Standard error of the estimate	0.13
N	0.57

NOTE: Figures in parentheses are t-scores.

SOURCES: New York State: Data from the Medicaid Management Information System; (American Hospital Association, 1986, 1987, and 1988); Rockefeller Institute of Government: *New York State Statistical Yearbook, 1988*. Albany, New York.

associated with high use of the ER and vice versa. This suggests that high ER use is a public health issue, which cannot be resolved simply by measures taken inside the ER itself. The issue is not merely one of inappropriate use, it is one of ensuring that all Medicaid recipients have

access to continuous and quality primary care which will benefit their overall health status.

The problems in ensuring Medicaid recipients access to physician-based primary care have been given much attention (Perloff et al., 1987; Mitchell and Schurman, 1984; Mitchell and Cromwell, 1980). Given the low fees paid by the State, access to primary care in a physician's office will no doubt be difficult to achieve. On the other hand, nonmonetary incentives, such as reduced bureaucracy, use of social workers to ensure recipients keep appointments, and increased time of payment might have a positive impact. It is clear that care provided in freestanding clinics can reduce ER use, and providing these services in underserved areas—possibly through a mobile clinic 1 day a week—could be a solution. The development and expansion of OPDs could also be beneficial. With imagination and commitment, progress could be made in this area. It is to be hoped that New York State's ER demonstration projects will be able to provide some interesting information.

This study does not recommend the use of these regression coefficients for any form of cost-benefit analysis. Increasing the provision of physician-based primary care appears to offer the most cost-effective means of reducing ER use. However, even in the unlikely circumstances of a huge increase in the number of services provided at current rates, this would probably not reduce overall expenditures. In all of this, the low physician reimbursement levels allowed by the State of New York, and the supply of substitute services discussed in this article has to be kept in mind. Therefore, targeting special populations (such as non-SSI recipients with no other form of primary care) is the most sensible way to proceed. Case management of those with very high levels of ER use (for example, recipients with more than five ER visits per year) could yield significant savings. However, the issue is not simply one of reducing obvious and apparent costs; it concerns the overall health of the poor. Inadequate primary care may lead to higher rates of inpatient care because of illnesses that could have been prevented by adequate primary care, resulting in significant costs to the State's Medicaid program. In addition, recipients in poor health will likely be less able to find and maintain permanent employment that could allow them to leave welfare. Future research in this area should study these issues.

It is not surprising that counties with a high concentration of Medicaid eligibles have higher than average ER use. This is consistent with the information noted earlier in this article. Because primary care visits have been controlled for statistically, it is presumed that lifestyle, a "culture of poverty", and patterns of behavior are responsible for this. As a result of this finding, demonstration projects should focus on these issues in the poorer counties. This could include outreach programs, which would educate Medicaid recipients, and attempt to direct them towards regular primary care. The sort of demonstration being considered could arrange for transportation on a weekly or monthly basis to a physician prepared to accept Medicaid patients, or to a clinic. In conjunction with this, a social worker could be assigned as a case manager to ensure that appointments are kept on a regular basis.

Until now, attention had not been focused on the behavior of hospitals as suppliers of ER services. However, it is not unreasonable to expect that hospitals have such a role, and that their attitudes and practices will differ according to their situations. It is expected that hospitals whose facilities are relatively underused would be more likely to accept nonurgent ER visits. This is likely to be reflected in the way nonurgent Medicaid patients are treated. Rather than facing a long wait to be seen and, quite possibly, disapproval when the nonurgent nature of their complaint is discovered, they would face a shorter wait and a more benign reaction. Subsequently, the recipients whose experience was relatively pleasant would be likely to return to the ER in the future. Such recipients would also be likely to spread the word about their treatment and encourage others to attend the ER.

There is evidence that hospital administrators are extremely alert to the revenues which can be generated from ERs, and have developed programs to attract private payers (Riffer, 1986). Given that Medicaid ER fees are comparable to private insurance fees, there is no reason to expect that hospitals would treat Medicaid recipients differently in this instance. Problems arise, however, if the facility is overutilized and urgent cases cannot be treated quickly enough because of the nonurgent recipients demanding attention (French, 1989). This suggests that an overutilized ER would be far more likely to consider developing its OPD, or implementing prior authorization or copayment schemes to reduce Medicaid ER use, than an underutilized ER.

The lower use of ER services in the small rural counties can be explained by difficulties in geographic access. Most of the smaller counties have only one county hospital, and their systems of public transport are not very extensive. Therefore, it is far more difficult for a recipient to reach an ER in a smaller county than in a larger county. This leads to the conclusion that there will be fewer ER visits in the smaller counties and that these counties are not the most appropriate target for demonstration programs. However, the finding that Medicaid recipients in urban counties make relatively fewer ER visits than their peers in medium size counties is also interesting, given that ERs in the urban counties ought to be more geographically accessible. Possible reasons for this could center on the atmosphere and the attitude of the hospitals. Urban hospitals are more likely to face severe pressures on their ERs (Habenstreit, 1986) and this could have an effect on their policies towards nonurgent cases.

The fact that there is no association between ER and primary care use for SSI recipients does not mean that this population is using ERs appropriately. Other studies have shown that the lonely and the disabled are likely to be repeat ER users (Andren and Rosenqvist, 1985). The findings reported here suggest that increasing SSI recipients' already high levels of primary care will not lower their ER use. SSI recipients' use of all Medicaid services tends to be high, reflecting their legitimate health needs. The SSI population should be targeted for different types of programs than the other Medicaid groups in the ER demonstration projects. Special outreach programs, for example, may be the most appropriate means of alleviating this group's inappropriate ER use.

Summary

This study has demonstrated that Medicaid ER use is associated with Medicaid primary care use. High levels of ER use are related to low levels of primary care use and vice versa. It appears that the primary care can occur in physicians' offices, freestanding clinics, and outpatient departments. The availability of (or the pressure on) hospitals is an explanatory factor in ER use. Hospitals that are under less pressure have a higher level of ER use than hospitals that are under greater pressure. Higher rates of Medicaid eligibles as a percentage of the counties population are associated with higher rates of ER use. It is hoped that these findings will help plan future policies towards addressing these issues.

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