

The effects of a community-based partnership, Project Access Dallas (PAD), on emergency department utilization and costs among the uninsured

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ABSTRACT

Background Approximately 19% of non-elderly adults are without health insurance. The uninsured frequently lack a source of primary care and are more likely to use the emergency department (ED) for routine care. Improving access to primary care for the uninsured is one strategy to reduce ED overutilization and related costs.

Methods A comparison group quasi-experimental design was used to evaluate a broad-based community partnership that provided access to care for the uninsured—Project Access Dallas (PAD)—on ED utilization and related costs. Eligible uninsured patients seen in the ED were enrolled in PAD ($n = 265$) with similar patients not enrolled in PAD ($n = 309$) serving as controls. Study patients were aged 18–65 years, <200% of the federal poverty level and uninsured. Outcome measures include the number of ED visits, hospital days and direct and indirect costs.

Results PAD program enrollees had significantly fewer ED visits (0.93 vs. 1.44; $P < 0.01$) and fewer inpatient hospital days (0.37 vs. 1.07; $P < 0.05$) than controls. Direct hospital costs were ~60% less (\$1188 vs. \$446; $P < 0.01$) and indirect costs were 50% less (\$313 vs. \$692; $P < 0.01$).

Conclusions A broad-based community partnership program can significantly reduce ED utilization and related costs among the uninsured.

Keywords health services, primary care, public health

Introduction

National data indicate that nearly 19% of non-elderly individuals are without health insurance or nearly 49 million Americans.¹ Young adults demonstrate higher rates of being uninsured with 30% of 19–25 year olds, 28.3% of 26–34 year olds and 22.0% of 35–44 year olds as compared with 14.4% of 55–64 year olds.¹ These rates increase for individuals with lower incomes to 34.4% for 19–25 year olds, 36.4% for 26–34 year olds and 31.5% for 35–44 year olds.¹ In these age brackets, males have higher rates of being uninsured as compared with their female counterparts.¹ Many of the uninsured are in working families with ~60% having at least one individual with full-time employment.² Being uninsured is more common among individuals with

lower incomes and education levels, and among ethnic minorities.¹ Minority and low-income Americans without insurance generally lack a regular source of medical care, and suffer from medical conditions that are either preventable or

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easily treated in the outpatient setting.³ Consequently, the uninsured are four times more likely than the insured to forgo or postpone needed preventive care, three times more likely to skip recommended tests or treatments, more likely to be hospitalized for ambulatory care-sensitive conditions, more likely to be diagnosed with late-stage colorectal cancer, melanoma, breast cancer and prostate cancer, more seriously ill upon hospitalization and three times more likely to die in the hospital.^{4–7} Although insurance alone is not sufficient for eliminating health outcome disparities, access to care is necessary for improving health outcomes.^{3,8}

Emergency departments (ED) have become a vital source of care for those without insurance who generally lack a source of primary care, since they are required to evaluate and treat patients regardless of the ability to provide payment.^{9,10} Consequently, although care delivered through the ED is frequently for non-urgent problems, it is substantially more costly than comparable care delivered elsewhere and can produce significant charges for the uninsured.^{11–13} Additionally, having a regular source of primary care provides continuity of care and increases the likelihood of patients' receiving preventive screening, both of which are absent in the ED setting.^{14,15} ED overutilization is becoming a significant financial problem for hospitals as well.¹⁶

Improving access to care for the uninsured may be an effective strategy for reducing ED utilization and related costs, while also providing better management for patients with chronic disease.^{12,17–20} Current proposals for addressing lack of insurance in the USA, focus on providing health care to all through universal coverage, tax credits or an expanded Medicaid program, or by expanding existing private insurance through increased availability and affordability.^{2,21} However, generally absent from these deliberations is a discussion of the existing approaches which have evolved in local communities for meeting the needs of the uninsured. Improving access to care offers the additional possibility of reducing health disparities and increasing health-related quality of life.^{16,22–24}

Community-level approaches to caring for the uninsured tend to reflect local needs and desires, and conclusions about their effectiveness tend to be based on process and system capacity measures rather than more tangible health-related outcomes.²⁵ Consequently, little is known about whether local faith-based or other community programs can provide health and/or financial benefits to the individuals and communities they serve.^{26,27} The experience of local organizations engaged in meeting the health needs of the uninsured can provide valuable information on managing and delivering care in a cost-effective way.²⁸ Project Access Dallas (PAD) is a community-wide faith-health

partnership that was developed to provide access to care and preventive services for low-income working individuals without health insurance residing in Dallas, TX. PAD's geographical focus is 'Central Dallas,' an area characterized by high proportions of groups who are likely to use the ED as a source of care—racial and ethnic minorities, adults with less than high school education and those with low socioeconomic status.^{22,29–33} PAD was the result of a long-term partnership between faith-based organizations, government agencies and social service organizations, hospitals and the local medical society, several universities and a medical school. By creating an organizational and administrative infrastructure, PAD provides coordinated access for the uninsured to existing faith-based community health clinics, volunteer primary and specialty care physicians, and local hospitals and pharmacies. The current study was developed to examine the effects of PAD on reducing ED utilization, hospital days and associated direct and indirect costs among patients enrolled in the program. Our hypothesis was that the patients enrolled in PAD would have significantly fewer ED visits and hospital days than comparison patients, and that their direct and indirect costs related to ED utilization and hospitalization would be significantly less during the 12-month period following enrollment into the project.

Methods

Participants and methods

Patients seeking care at the Baylor University Medical Center ED (located in Central Dallas) between 10 April 2003 and 30 July 2004 were included in the present study. Eligible study patients were identified by a trained research assistant (RA) based in the ED during daytime weekday hours and by using a patient recording system for those seen after hours and on weekends. Patients were eligible for enrollment if they resided in the target area zip code, had an income of <200% of the federal poverty level; were not eligible for health insurance through the local public hospital system; were not receiving Medicaid or Medicare and exceeded the average ED visit rate (1.5 ED visits during the past 12 months). Patients meeting the PAD eligibility criteria were approached by the RA during daytime hours, and after hours patients were contacted within 5 days of their ED visit, until the monthly enrollment quota of 17 patients was met. Consenting patients were enrolled by the RA on a continuous basis until the enrollment quota for the month was reached (intervention group) over the 16-month study period. All other eligible patients using the ED during the study period that were not contacted to participate in the

study served as a comparison group (control group). Patients were followed for 1 year based on the month of enrollment. The study protocol was approved by both the Baylor University Medical Center and the UT Southwestern Medical Center Institutional Review Boards.

Enrolled patients completed an intake interview and health risk assessment (HRA), administered by a community-clinic or hospital-based coordinator, to assess their general level of health and for assignment to community care coordination (CCC) services. Screening for CCC eligibility is provided for the four primary components of the care coordination program: (i) identifying and addressing social concerns, (ii) identifying patients with or at risk of developing type 2 diabetes, (iii) identifying patients with depression and (iv) providing education and referrals for cancer screening.

PAD program

After completing the intake interview and HRA, enrolled patients were assigned to either *CCC* or *self-care* based on their responses to the CCC screening survey. *CCC* patients were assigned to a community health worker (CHW) with whom they were expected to meet monthly; *self-help* patients were not assigned to a CHW, but had access to the patient telephone help line for medical care questions and could request CHW services as needed. About 20% of PAD patients were assigned to *CCC*. During the study period, the PAD network included 600 physicians, 15 hospitals, 8 community charity health clinics, 8 ancillary service support organizations, 1 national laboratory service organization and >40 000 nationwide pharmacies. Volunteering physicians, partnering clinics and participating hospitals referred patients for enrollment into the program.

All PAD patients were assigned to a primary care provider, could be referred to specialty physicians depending on their medical needs, received \$750 a year in pharmacy benefits and were eligible for laboratory tests, ancillary procedures and inpatient hospital care. PAD's primary goal was to improve access for the uninsured to a coordinated system of care, and to begin better addressing the full range of health needs that affect the uninsured. Participating physicians, hospitals and ancillary partners determined their level of participation by agreeing to donate their services to a specified number of patients per year.

Measures

Direct ED costs, indirect ED costs, number of hospital days, number of ED visits and hospital costs were collected

from an administrative database at enrollment and retrospectively 1 year following enrollment.

Direct ED costs: direct ED costs were the sum of the direct costs of all ED visits for the year following enrollment and refers to costs associated with the delivery of care during an ED visit or hospital admission.

Indirect ED costs: indirect ED costs were the sum of the indirect costs for all ED visits for the year following enrollment and includes the fixed costs related to building, maintenance, staffing and utilities.

Number of hospital days: this variable was the sum of the number of inpatient hospital days following an ED visit for the year after enrollment.

Number of ED visits: this variable was the total number of ED visits during the year (12-months) following enrollment.

Health risk assessment: the HRA was collected at baseline by an RA and screened for Healthy People 2010 Leading Health Indicators including: physical activity, weight control, tobacco use, substance abuse, responsible sexual behavior, mental health, injury and violence and immunizations. These data were collected for determining study subjects' general level of health and to guide CHW counseling for health promotion and disease prevention among *CCC* patients.

Severity score: all patients received a severity score for each ED visit, which was based on a subjective assessment derived through consultation between the attending physician and the ED nurse—the scores ranged from 0 to 5 with 0 being *not serious* and 5 being the *most serious*. Although not an objective measure of true disease severity, the scores allow comparison between the two study groups to assure comparability of severity upon presentation to the ED.

Data analysis

Simple comparisons of the outcome measures across the two groups were completed followed by models that included the demographic variables and their interactions with the group. Due to the non-normality of the data, several approaches were examined. Parametric *t*-tests, the non-parametric Mann–Whitney *U*-tests and categorical analyses involving chi-square and logistic regressions were used. The logistic models involved a step-wise procedure which removed the interaction terms sequentially (highest *P*-value removed) until all remaining interactions had a *P*-value of 0.10 or less; any main effects not involved in the remaining interactions were sequentially removed (highest *P*-value

removed) until all remaining main effects had a *P*-value of ≤ 0.05 .

During the 1-year study period, a large number of study subjects and comparison subjects had no additional ED visits. Having a large number of *zero* visits created a floor effect in the data across all the outcome measures with zero visits resulting in zero costs and hospital days. Since transformations were unable to resolve the floor effect, the *actual* values of the outcome variables and *dichotomized* values that take into account the floor effect were reported. Direct and indirect costs were dichotomized at \$50 (versus $> \$50$), while number of ED visits and number of hospital days were dichotomized at 0 (versus ≥ 1).

Table 1 Sample characteristics

Variable	Enrollees (<i>n</i> = 265)	Controls (<i>n</i> = 309)	<i>P</i> -value
Age (mean \pm SD)	35.7 (\pm 12.0)	35.0 (\pm 12.1)	0.49
Race			
Black	182 (68.7%)	229 (74.1%)	0.25
Hispanic	55 (20.8%)	48 (15.5%)	
White	28 (10.6%)	32 (10.4%)	
Sex			
Females	166 (62.6%)	168 (54.4%)	0.05 ^a
Males	99 (37.4%)	141 (45.6%)	
Marital status			
Divorced	7 (2.6%)	12 (3.9%)	0.33
Married	49 (18.5%)	60 (19.4%)	
Single	203 (76.6%)	235 (76.1%)	
Widowed	6 (2.3%)	2 (0.6%)	
Payor group			
Government	20 (7.6%)	21 (6.8%)	0.26
Private	19 (7.3%)	13 (4.2%)	
Self/unknown	223 (85.1%)	274 (89.0%)	
Severity score (mean \pm SD)	3.25 (\pm 1.42)	3.13 (\pm 1.63)	0.34

^aChi-squared test.

Results

Project Access program participants (*n* = 265) and controls (*n* = 309) were similar on most demographic variables (Table 1). The vast majority of patients in both groups were Black, followed by Hispanic and Whites, respectively. Similarly, most were single, had no health insurance and had comparable levels of visit severity. Patients with government or private insurance were sometimes enrolled into the program when their insurance was about to expire or were for some other reason unable to access the insurance. Although females outnumbered males in both groups, sex was statistically (*P* = 0.05) different across the two groups; significantly more females were enrolled in PAD (62.6%) than in the control group (54.4%).

Compared with controls, PAD participants had significantly fewer ED visits (*P* < 0.01) and hospital days (*P* < 0.05) and less direct (*P* < 0.01) and indirect costs (*P* < 0.01). Table 2 indicates that the average number of ED visits for enrollees during the year following enrollment was 0.93 visits, compared with 1.44 visits for control patients. PAD patients were also less costly to treat and used significantly less hospital resources than the control patients. Related to direct costs, treating control patients was more than two and one-half times (\$1188) more costly than treating enrollees (\$446). An interaction effect was observed between enrollment and sex (*P* = 0.10); disproportionately fewer males incurred higher direct costs among PAD enrollees than among the males in the control group. The same was true for indirect costs, with PAD patients accounting for less than half the expenditure level (\$313) of a typical control patient (\$692). Finally, PAD patients spent on average less than one-half day (0.37) in the hospital compared with more than one full day (1.07) for controls. When the analyses were repeated using the dichotomized outcome variables, the results were identical, with only the level of significance changing (Table 3).

Table 2 PAD enrollment status and hospital utilization

Outcome variable	Enrollees (<i>n</i> = 265)	Controls (<i>n</i> = 309)	(df) <i>t</i> -value	<i>P</i> -value	
				Independent <i>t</i> -test	Mann-Whitney <i>U</i> -test
Direct costs, mean (SD)	\$445.6 (1911)	\$1188 (4625)	(423) 2.58	0.01	<0.01
Indirect costs, mean (SD)	\$313.3 (1335)	\$692.1 (2646)	(470) 2.21	0.03	<0.01
Number of hospital days, mean (SD)	0.37 (2.4)	1.07 (5.6)	(427) 1.98	0.05	0.02
Number of visits, mean (SD)	0.93 (1.7)	1.44 (2.6)	(542) 2.80	<01	<0.01

Table 3 PAD enrollment status and hospital utilization (dichotomized)

Dichotomized outcome variable	Enrollees (n = 265)	Controls (n = 309)	P-value ^a	Odds ratio
Direct costs, freq (%)				
≤\$50	169 (63.8)	168 (54.4)	0.02	1.48
>\$50	96 (36.2)	141 (45.6)		
Indirect costs, freq (%)				
≤\$50	180 (67.9)	180 (58.3)	0.02	1.52
>\$50	85 (32.1)	129 (41.8)		
Number of hospital days, freq (%)				
None	251 (94.7)	279 (90.3)	0.05	1.93
One or more	14 (5.3)	30 (9.7)		
Number of visits after contact, freq (%)				
None	156 (58.9)	147 (47.6)	<0.01	1.58
One or more	109 (41.1)	162 (52.4)		

^aChi-squared test.

Discussion

Main findings

Project Access Dallas (PAD) is a broad-based community partnership, created for the purpose of eliminating health disparities, by developing a healthcare network for the uninsured. This 1-year comparison group trial indicated that PAD reduced the reliance of uninsured patients on using the ED for their medical care needs and related costs. PAD participants had significantly fewer ED visits, hospital days, and less direct and indirect costs than control patients.

What is already known on this topic

A recent review found that case management, the most described intervention to reduce non-emergent ED use, has the potential to reduce ED use and improve social and clinical outcomes in non-elderly individuals described as ‘frequent users’ of the ED (between 4 and 10 visits per year).³⁴ Frequent users of the ED tend to have complex medical issues and suffer from other social and behavioral disorders such as homelessness, mental illness and chemical dependency. Unlike the current study, these studies specifically targeted frequent users with concurrent social, behavioral and medical issues. The goal of the PAD program was to provide access to health care for uninsured, low-income individuals or the ‘working poor.’ Therefore, the findings of the present study extend what is known about the utility of providing access to care in the context of ED utilization to a broader population.

Similar to the PAD program, other studies have found that a collaborative relationship between a community-based

clinic and hospital can benefit both the hospital and patients.³⁵ For example, prior to establishing a community-based clinic/hospital partnership in a low socioeconomic county in California, 28% of hospital ED visits were for non-emergent care producing an annual loss of \$1 million to the hospital. The partnership reduced non-emergent care visits to 9% and reduced the annual loss by \$600 000. Similarly, another study of primarily African American females with a mean age of 53 years enrolled indigent patients with one of five chronic conditions into a program that provided free primary care and disease management services and found that program enrollees could reduce their number of yearly ED visits and costs by more than half.¹⁸ Another study assessed ED visits in a medically underserved urban community of individuals primarily aged 18–45 years before and after a community health center was established.³⁶ Over a 3-year period, individuals who had visited the ED at least once decreased from 22.1 to 13.8%. Additionally, there was a decrease in individuals who reported that the ED was ‘the best place to treat their problem’ and who cited a lack of physician availability as a reason for visiting the ED. The PAD program reinforces these findings that access to primary care resources can reduce the reliance on the ED for non-emergent health care.

Much of the research on the uninsured has focused on health-care financing, and how to affordably expand health insurance coverage or improve access.³⁷ However, little research examines how the current health care system can improve access to care for the uninsured or improve health outcomes. The PAD design assumes that by providing health-care resources *upstream* before individuals develop serious disease, it is possible to reduce the *downstream* costs associated with expensive hospitalizations and acute care services. In Texas, for example, the annual *downstream* cost for treating uninsured patients is ~\$4.1 billion, with the largest single share of costs being hospital care delivered for acute illness.³⁸ A significant portion of this cost is unreimbursed with hospitals assuming responsibility. Other parts of the country which have experimented with the PAD approach have witnessed reduced costs associated with providing access to appropriate preventive and primary care.³⁹ Our study reinforces these findings and demonstrates that existing but underutilized health system capacity (e.g. unused hospital space, physician appointments and specialty services) can significantly reduce health resource utilization and expenditures. Indeed, the effectiveness of the PAD approach and the findings of the present study provide critical information needed in federal-level discussions related to resolving the growing problem of uninsurance.⁴⁰

Study limitations

There are a number of limitations associated with this study. First, the study is not a randomized clinical trial. Since we used a comparison group instead of randomization, it is possible that our intervention and control groups differ on important unknown or unmeasured characteristics. For example, since the study enrolled volunteers in the PAD program while controls were assigned to the comparison group, it is possible that the PAD enrollees were more motivated to seek better health based on their own predispositions rather than the PAD program. Although the study design provides a measure of control and it is unlikely that patient characteristics alone could account for the findings observed. Furthermore, this study was restricted to the information available from secondary data sources. Due to the large number of presenting complaints and diagnoses, it was not possible to create meaningful classifications for the ED visits at enrollment. Another study limitation is the lack of data on primary care utilization during the PAD intervention, which was beyond the scope of the present study.

What this study adds

PAD provides a model for improving access to care for uninsured individuals by utilizing a donated-care program that delivered charity care for medically indigent patients through a broad-based community partnership. Donated care programs have received considerable attention and appear to have a significant impact on improving access to care among the uninsured.^{25,41} The present study demonstrated significant improvements in several outcomes that could improve patients' quality of life and reduce hospital financial burden. Due to the increasing concern regarding health disparities, and the financial implications of uninsured individuals, the PAD program provides relevant scientific information on the benefits of community-based donated care models that can be replicated in other urban environments.

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