

US Emergency Department Costs: No Emergency

ABSTRACT

Background. Many perceive emergency department (ED) overuse as an important cause of high medical care costs in the United States. Managed care plans and politicians have seen constraints on ED use as an important element of cost control.

Methods. We measured ED-associated and other medical care costs, using the recently released 1987 National Medical Expenditure Survey of approximately 35 000 persons in 14 000 households representative of the US civilian, noninstitutionalized population.

Results. In 1987, total ED expenditures were \$8.9 billion, or 1.9% of national health expenditures. People with health insurance represented 86% of the population and accounted for 88% of ED spending. The uninsured paid 47% of ED costs themselves; free care covered only 10%. For the uninsured, the cost of hospitalization initiated by ED visits totaled \$3.3 billion, including \$1.1 billion in free care. Whites accounted for 75% of total ED costs. The ED costs of poor and near-poor individuals accounted for only 0.47% of national health costs.

Conclusions. ED use accounts for a small share of US medical care costs, and cost shifting to the insured to cover free ED care for the uninsured is modest. Constraining ED use cannot generate substantial cost savings but may penalize minorities and the poor, who receive much of their outpatient care in EDs. (*Am J Public Health.* 1996;86:1527-1531)

Patrick H. Tyrance, Jr, David U. Himmelstein, MD, and Steffie Woolhandler, MD, MPH

Introduction

Emergency department (ED) visits have increased,¹ many are for nonurgent complaints,^{2,3} and charges per visit are high. These facts fuel the perception that ED overuse (particularly by the uninsured) is an important cause of high medical care costs^{4,5} and cost shifting.⁶ In his health care reform proposal, the president underscored this view, promising substantial ED savings that would reduce cost shifting from the uninsured.⁷ Managed care plans routinely restrict ED use through several mechanisms: copayments, prior approval requirements, financial incentives for physician gatekeepers, and the threat of retrospective denial of payment after visits are completed.

Our analysis of nationwide data on ED costs challenges these perceptions and policy prescriptions. ED use accounts for a small fraction of medical spending, and cost shifting from uninsured ED patients is minuscule. Moreover, restricting ED use would disproportionately burden minorities and the poor, who are most reliant on EDs for care. Strategies that reduce demand for ED services (e.g., improved primary care; violence, drug abuse, and accident prevention programs) should be pursued to improve health, not because of anticipated cost savings.

Methods

Sample

We analyzed recently released data from the Household and Medical Provider Survey segments of the 1987 National Medical Expenditure Survey (NMES). The survey collected extensive information on medical care use and expenditures by or on behalf of approxi-

mately 35 000 people in 14 000 households. Each household was surveyed quarterly, and data were collected on demographics, health status, and use and sources of payment for health services during 1987. The Medical Provider Survey queried the EDs, physicians, hospitals, and home health care agencies used by these individuals to verify service use and diagnoses. Providers supplied data on payments received from third parties and total charges for care.

The NMES used a stratified multistage area probability design. The survey was designed to provide unbiased estimates for the US civilian, noninstitutionalized population and for subgroups of special policy interest: the elderly, low-income families, Blacks, and Hispanics.

Variables

On the basis of self-report, we classified individuals into mutually exclusive ethnic categories: Black (including Hispanic origin), White (non-Hispanic), Hispanic (excluding Blacks), and other. For the analysis of income, we classified individuals as poor (income below the federal poverty level), near-poor (100%–124% of poverty level), low-income (125%–199% of poverty level), middle-income (200%–399% of poverty level), or

Patrick H. Tyrance, Jr, is a student at Harvard Medical School and the John F. Kennedy School of Government, Harvard University, Cambridge, Mass. David U. Himmelstein and Steffie Woolhandler are with the Center for National Health Program Studies and the Division of Social and Community Medicine, Department of Medicine, Cambridge Hospital and Harvard Medical School, Boston, Mass.

Requests for reprints should be sent to David U. Himmelstein, MD, Center for National Health Program Studies, 1493 Cambridge St, Cambridge, MA 02139.

TABLE 1—US Emergency Department (ED) Spending: Data from the 1987 NMES

	Total ED Expenditure, millions (90% CI)	Per Capita ED Expenditure (90% CI)	ED Spending as % of Group's Personal Health Expenditures	ED Spending as % of National Health Expenditures, by Group
Insurance status				
Uninsured	\$1101 (\$988, \$1213)	\$37 (\$35, \$39)	4.68	0.23
Insured	\$7728 (\$7388, \$8076)	\$38 (\$36, \$40)	2.35	1.62
Race/gender^a				
Black	\$1374 (\$1199, \$1550)	\$47 (\$41, \$53)	3.18	0.29
Male	\$696 (\$544, \$848)	\$51 (\$40, \$62)	3.74	0.15
Female	\$678 (\$596, \$760)	\$44 (\$38, \$49)	2.77	0.14
White	\$6686 (\$6228, \$7145)	\$36 (\$34, \$39)	2.34	1.40
Male	\$3208 (\$2926, \$3490)	\$36 (\$33, \$39)	2.53	0.67
Female	\$3479 (\$3167, \$3792)	\$37 (\$34, \$40)	2.19	0.73
Hispanic	\$556 (\$462, \$649)	\$30 (\$25, \$35)	3.33	0.12
Male	\$264 (\$197, \$330)	\$28 (\$21, \$36)	3.51	0.06
Female	\$292 (\$233, \$351)	\$31 (\$25, \$38)	3.12	0.06
Age, y				
≤ 17	\$2226 (\$2042, \$2400)	\$35 (\$32, \$38)	4.56	0.47
18–45	\$3923 (\$3585, \$4263)	\$37 (\$34, \$41)	3.77	0.82
46–64	\$1499 (\$1244, \$1753)	\$36 (\$30, \$42)	1.72	0.31
≥ 65	\$1207 (\$1069, \$1345)	\$43 (\$38, \$48)	1.07	0.25
Income^b				
Poor	\$1583 (\$1400, \$1767)	\$51 (\$45, \$57)	3.02	0.33
Near-poor	\$686 (\$453, \$865)	\$61 (\$42, \$79)	3.18	0.14
Low-income	\$1372 (\$1223, \$1523)	\$41 (\$37, \$46)	2.90	0.29
Middle-income	\$2792 (\$2543, \$3004)	\$33 (\$30, \$36)	2.40	0.59
High-income	\$2441 (\$2208, \$2674)	\$31 (\$28, \$34)	2.14	0.51
Total	\$8855 (\$8471, \$9118)	\$37 (\$35, \$39)	2.40	1.86

Note. CI = confidence interval.

^aFigures for Asians and Pacific Islanders, Native Americans, and Alaskan Natives are omitted because too few individuals from these groups were included in the National Medical Expenditure Survey (NMES) sample.

^bPoor = below federal poverty level; near-poor = 100%–124% of federal poverty level; low-income = 125%–199% of federal poverty level; middle-income = 200%–399% of federal poverty level; high-income ≥ 400% of federal poverty level.

high-income (400% of poverty level or higher).

The NMES determined the cost of care from the provider survey and the sources of payment from the household survey. The NMES defines free care as charges billed to patients that are neither covered by any third-party payer nor paid by the patient or family. Discounts offered to Medicare, Medicaid, and many HMOs are not classified as free care.

We calculated figures for personal health care expenditures by summing the costs of all medical care received by noninstitutionalized civilians, regardless of the source of payment. We divided outpatient spending into "ED costs" (which included the cost of laboratory and other services provided during an ED visit) and "all other outpatient costs." The latter category included spending on prescribed medicines, home health, medical equipment, dental visits, office visits, and hospital outpatient (except ED) visits. We used the National Center for Health Statistics' figure for total national health spending, which includes spending

for public health activities, research, construction, the military, and other items not encompassed in our personal health spending figure.

The NMES gathered information on insurance status at each round of interviews. We assumed a patient's insurance status at the time of an ED visit (or hospital stay) to be his or her insurance status at the proximate NMES interview, and we excluded from our insurance status analysis the less than 0.05% of persons who failed to report that variable. To analyze inpatient costs associated with ED visits, we identified all visits that respondents reported led to hospitalization and linked the ED visit to a hospital stay commencing within 3 days.

We used SAS-PC statistical software⁸ and the SUDAAN program,⁹ which corrects for the NMES' complex sample design in calculating confidence intervals.

Results

In 1987 ED expenditures totaled \$8.9 billion (90% confidence interval [CI] =

\$8.5 billion, \$9.1 billion)—\$37 per capita (90% CI = \$35, \$39), 2.4% of personal health expenditures, and 1.9% of national health expenditures (Table 1).

Private insurance paid 42% of ED costs, Medicaid 13%, Medicare 9%, and other third parties (e.g., CHAMPUS [the Civilian Health and Medical Program of the Uniformed Services], the Department of Veterans Affairs, workers' compensation) 15%. Patients paid 19% of ED costs out of pocket. Free care totaled \$187 million (90% CI = \$146 million, \$230 million), only 2% of ED costs.

The insured accounted for 86% of the population and 88% of ED spending (\$7.7 billion [90% CI = \$7.4 billion, \$8.1 billion], vs \$1.1 billion [90% CI = \$1.0 billion, \$1.2 billion] for the uninsured). Per capita ED expenditures were similar for the uninsured and insured, but accounted for nearly twice as high a proportion of the uninsured's total personal health expenditures (Table 1). The uninsured paid more of their ED costs out of pocket than did the insured (47% vs 15%). Government programs (e.g.,

**TABLE 2—US Per Capita Personal Health Expenditures among Race and Gender Groups, by Type of Service:
Data from the 1987 NMES**

Race/Gender	Per Capita Total (90% CI)	Hospital Inpatient (% of Per Capita Total) (90% CI)	Outpatient Excluding Emergency Department (% of Per Capita Total) (90% CI)
Black	\$1483 (\$1354, \$1613)	\$942 (63.5) (\$847, \$1038)	\$494 (33.3) (\$428, \$560)
Male	\$1364 (\$1154, \$1573)	\$855 (62.7) (\$699, \$1012)	\$458 (33.6) (\$340, \$577)
Female	\$1587 (\$1424, \$1750)	\$1018 (64.1) (\$869, \$1167)	\$525 (33.1) (\$482, \$569)
White	\$1558 (\$1486, \$1630)	\$825 (53.0) (\$763, \$887)	\$697 (44.7) (\$677, \$717)
Male	\$1422 (\$1310, \$1535)	\$774 (54.4) (\$673, \$875)	\$612 (43.0) (\$583, \$641)
Female	\$1686 (\$1608, \$1765)	\$873 (51.2) (\$805, \$940)	\$777 (46.1) (\$753, \$801)
Hispanic	\$896 (\$798, \$993)	\$483 (54.0) (\$402, \$564)	\$382 (42.6) (\$342, \$423)
Male	\$797 (\$635, \$959)	\$431 (54.1) (\$293, \$568)	\$338 (42.4) (\$276, \$400)
Female	\$994 (\$879, \$1109)	\$536 (53.9) (\$437, \$635)	\$427 (43.0) (\$384, \$470)
Total	\$1474 (\$1410, \$1539)	\$800 (54.3) (\$746, \$854)	\$637 (43.2) (\$618, \$656)

CHAMPUS, state and municipal funds) covered 21% of ED costs for the uninsured, other third parties (e.g., workers' compensation, auto and other insurance) covered 21%, and free care accounted for 10%. For the insured, private insurance covered 47%, Medicare 10%, Medicaid 14%, other government programs 7%, free care 1%, and other sources 6%.

Whites accounted for 75% of total ED expenditures, Blacks for 16%, Hispanics for 6%, and others for 3% (Table 1). Per capita ED expenditures were \$47 (90% CI = \$41, \$53) for Blacks, \$36 (90% CI = \$33, \$39) for Whites, and \$30 (90% CI = \$25, \$35) for Hispanics. These expenditures represented a higher proportion of health spending for Blacks and Hispanics than for Whites. While Black males' average ED expenditures were higher than those of other groups, they represented only 8% of total ED costs and 0.2% of national health spending.

People aged 65 and older had the highest absolute ED expenditures (\$43 per capita [90% CI = \$38, \$48]) but incurred only 1.1% of their medical care costs in EDs. Conversely, for those younger than age 18, ED costs averaged only \$35 (90% CI = \$32, \$38) but represented 4.6% of their total medical care spending.

The poor and near-poor had higher per capita ED expenditures and spent a larger share of their total medical care dollars in EDs than did the more affluent.

Hospitalization followed 15.3% of all ED visits, including 10.2% of visits by the uninsured and 16.0% of visits by the insured. These emergency admissions accounted for 24% of all hospitalizations for both groups.

Inpatient costs for patients admitted through the ED totaled \$49.0 billion (90%

CI = \$45.5 billion, \$52.5 billion), \$3.3 billion (90% CI = \$2.5 billion, \$4.1 billion) of this amount was for the uninsured. The uninsured paid \$725 million (90% CI = \$491 million, \$959 million) of this amount out of pocket, hospitals gave \$1.1 billion (90% CI = \$0.5 billion, \$1.7 billion) worth of free care (0.6% of total hospital costs), and third parties covered the rest.

Total inpatient costs for uninsured patients (including both emergency and nonemergency hospitalizations) amounted to \$12.8 billion (90% CI = \$11.1 billion, \$14.4 billion), 6.7% of inpatient costs; free inpatient care for the uninsured totaled \$2.8 billion (90% CI = \$1.9 billion, \$3.6 billion). The average cost per admission for the uninsured was about one-fifth lower than that for the insured, whether or not the patient was admitted via the ED.

The per capita personal health care expenditure in 1987 for Whites was nearly twice that of Hispanics and 5% more than that of Blacks (Table 2). Per capita outpatient spending (excluding ED costs) for Whites was 42% higher than that for Blacks and 83% higher than that for Hispanics. Outpatient spending (excluding ED costs) as a proportion of personal health spending was markedly lower for Blacks (33%) than for Whites (45%) or Hispanics (43%).

Discussion

EDs account for less than 2% of national health spending, and the uninsured and insured use similar amounts of ED care. The false perception that ED overuse, particularly by the uninsured, is a major contributor to rising medical care

costs^{4,5,7,10} has three questionable corollaries: (1) insuring the uninsured would generate large cost savings by decreasing ED use and emergency hospitalizations; (2) restricting access to EDs by requiring large copayments, prior approval, or both is a useful cost control strategy; and (3) high medical care costs result from patients' misbehavior and excessive demands for care.

The uninsured account for only 12% of ED costs (and 8% of ED admissions), and they pay 47% of ED costs themselves. Workers' compensation, auto insurance, and government funds pay much of the rest. Free ED care for the uninsured totaled only \$114 million in 1987, with inpatient free care costs for ED admissions adding \$1.1 billion. Hence, cost shifting from uninsured ED patients added less than 1% to the average hospital bill.

Our findings contradict the widespread impression that hospitals provide large amounts of uncompensated ED care to the uninsured. This impression may have arisen because many academic emergency physicians work at urban teaching hospitals that provide disproportionate shares of care for the uninsured and free ED care. Thus, previous research on this topic analyzed data from a handful of hospitals that apparently provide more free care than most.^{11,12} The NMES data provide a more reliable national perspective.

We found that emergency admissions accounted for 24% of inpatient stays nationwide for both the insured and the uninsured. In contrast, in a study of five Massachusetts hospitals, 51% of all inpatients and 68% of uninsured inpatients

were admitted through the ED.¹³ Figures from California fell between the Massachusetts estimate and our national figures.¹⁴

The misconception that high ED use causes high medical costs is part of a paradigm that identifies Americans' excessive use of care as the main cost driver. In this view, insurers must discourage patients from overusing care through copayments, deductibles, and so forth, and they should manage physicians' behavior to curtail their ordering and referrals. This strategy rests, in part, on findings from the Rand Health Insurance Experiment, in which 95% copayments decreased total utilization and reduced ED costs by one third, from \$32 to \$22 per capita (1984 dollars).¹⁵ Medicaid managed care experiments have yielded similar results¹⁶: large percentage reductions in ED use, but modest dollar savings.

Moreover, if nonurgent ED use were diverted to more appropriate settings, savings would likely be far smaller than these figures or other projections¹⁷ suggest. The \$200 charge for ED care for a migraine seems impressively wasteful. For the insurer, care elsewhere is far cheaper. But for society as a whole, shifting the patient to a doctor's office or clinic might add primary care costs while subtracting little from ED expense.⁶ EDs have high fixed costs; they must be staffed 24 hours a day to treat real emergencies, and EDs that might otherwise be idle can often accommodate nonemergency visits without additional staff.⁶ Projected ED savings can materialize only if we shut many EDs, not if we run them half full. Interestingly, Canada's per capita ED costs¹⁸ are lower than ours despite Canada's threefold higher ED visit rate.^{18,19} Evidently factors other than volume can drive costs.

One policy variant blames minorities and the poor for the high health costs in the United States.²⁰ Yet Blacks and Hispanics have lower per capita health expenditures than Whites, despite high rates of illness. Nor can substance abuse and violence explain our high costs relative to Canada. Both "external causes" of death (including violence) and the costliest addictions (alcohol and tobacco) are at least as common in Canada.²¹⁻²³ In keeping with other estimates,²⁴ we found that inpatient costs of trauma in the United States (excluding hip fracture and low back pain) were only 5% of hospital costs. HIV-related costs, often perceived as an important factor in medical inflation, will consume only 1% of US health care spending in 1995.²⁵

A recent study found 25% fewer physician visits among patients who identified the ED as their routine source of care.²⁶ Our data confirm that groups with reduced access to primary care—the poor, uninsured people, and Black men—are disproportionately dependent upon EDs^{13,14,26,27}; they spend at least as much on ED care as other groups but have markedly lower outpatient utilization. Of particular concern is the low outpatient use by Black males, whose life expectancy is shorter than that of any other demographic group. Constraints on ED use may worsen care for them and for other groups whose health status and access to care are already compromised.

Health insurance reform is just one step toward improving access to care and decreasing the need for ED visits. Nonfinancial barriers; the scarcity of primary care practitioners in inner cities and rural areas; the inability of low-wage workers to take time off work; real and perceived racial discrimination; psychiatric comorbidity; and language barriers all obstruct access to primary care, increasing reliance upon EDs.²⁸⁻³¹

Assignment of insurance status in the NMES is inexact because insurance coverage may have changed between the interview and the ED visit, an interval that averaged about 30 days. A few hospitals probably included ED charges with inpatient charges for patients admitted through the ED. But these visits should not greatly affect total ED costs, and they would, in any event, appear in our figures for ED-associated inpatient costs. The household survey-derived figures for free care surely include both over- and underestimates. But large errors that would substantially change our key findings are unlikely.

The 1987 NMES is more than 8 years old, but it has only recently been released and it provides the most up-to-date, comprehensive, and detailed data available on medical expenditures. While ED visits have increased, especially for Medicare and Medicaid patients, ED visits by the uninsured have increased more slowly.³²

"Nonurgent" ED visits symbolize our failure to provide accessible primary care to all. ED use for illness caused by drugs and violence identifies an equally serious policy failure. However, the problem is not the cost of ED care, but the lack of better alternatives: readily available personal physicians³³⁻³⁶ for those lacking access, and enhanced career and leisure opportunities and aspirations for persons afflicted by drug use and violence. A

reduction in ED visits is worthwhile only if it is a bellwether of improved health care and social conditions. Restricting patients from using the ED will have little effect on health costs. □

Acknowledgments

This work was supported by a health professional training grant from the National Institutes of Health and by grant 93:00334-00 from the Pew Charitable Trust.

References

1. *Hospital Statistics (1993-1994 and Previous Years)*. Chicago, Ill: American Hospital Association; 1993.
2. Grumbach K, Keane D, Bindman A. Primary care and public emergency department overcrowding. *Am J Public Health*. 1993;83:372-377.
3. McCaig LF. National Hospital Ambulatory Medical Care Survey: 1992 Emergency Department Summary. *Adv Data Vital Health Stat*. 1995; no. 245. DHHS publication PHS 94-1250.
4. Wehmer R. Let's put a stop to emergency room abuse. *Tex Med*. 1992;88:9-10.
5. Kusserow RP. *Use of Emergency Rooms by Medicaid Recipients*. Washington, DC: US Dept of Health and Human Services, Office of the Inspector General; 1992.
6. Kellerman AL. Nonurgent emergency department visits: meeting an unmet need. *JAMA*. 1994;271:1953-1954.
7. The White House Domestic Policy Council. *Health Security: The President's Report to the American People*. Washington, DC: US Government Printing Office; 1994.
8. *SAS Language*. Reference version 6.04. Cary, NC: SAS Institute Inc.
9. *SUDAAN: Professional Software for Survey Data Analysis*. Version 6.2. Research Triangle Park, NC: Research Triangle Institute; September 1992.
10. Friedman E, Hagland MM, Hudson T, McNamara P. The sagging safety net. Emergency departments on the brink of crisis. *Hospitals*. 1992;66:26-40.
11. Mitchell TA, Rimmel RJ. Level of uncompensated care delivered by emergency physicians in Florida. *Ann Emerg Med*. 1992;21:1208-1214.
12. Saywell WM, Nyhuis AW, Cordell WH, Crockett CR, Woods JR, Rodman GH. An analysis of reimbursement for outpatient medical care in an urban hospital emergency department. *Am J Emerg Med*. 1992;10:8-13.
13. Stern RS, Weissman JS, Epstein AM. The emergency department as a pathway to admission for poor and high-cost patients. *JAMA*. 1991;266:2238-2243.
14. Ahern M, McCoy HV. Emergency room admissions: changes during the financial tightening of the 1980's. *Inquiry*. 1992;29:67-79.
15. O'Grady KF, Manning WG, Newhouse JP, Brook RJ. The impact of cost sharing on emergency department use. *N Engl J Med*. 1985;313:484-490.
16. Miller ME, Gengler DJ. Medicaid case management: Kentucky's patient access and care program. *Health Care Financing Rev*. 1993;15:55-69.

17. Baker LC, Baker LS. Excess costs of emergency department visits for non-urgent care. *Health Aff.* 1994;13:162-171.
18. *Hospital Indicators, 1989-90*. Ottawa, Ont: Statistics Canada; 1993.
19. Weil TP. Clinton's health reform and emergency department volumes: a return visit. *Ann Emerg Med.* 1993;22:852-854.
20. Schwartz LL. *The Medicalization of Social Problems: America's Special Health Care Dilemma*. Washington, DC: American Healthcare Systems Institute; April 1994: 1-11. Special report.
21. Stephens T, Schoenborn C. Adult health practices in the United States and Canada. *Vital Health Stat [5]*. 1988; no. 3. DHHS publication PHS 88-1497.
22. Centers for Disease Control and Prevention. Medical care expenditures attributable to cigarette smoking—United States, 1993. *MMWR Morb Mortal Wkly Rep.* 1994;43:469-472.
23. *Health Statistics from the Americas: Mortality since 1960*. Washington, DC: Pan American Health Organization; 1991.
24. Miller TR, Cohen MA, Rossman SB. Victim costs of violent crime and resulting injuries. *Health Aff.* 1993;12:186-197.
25. Hellinger FJ. Forecasts of the costs of medical care for persons with HIV: 1992-1995. *Inquiry.* 1992;29:356-365.
26. Baker DW, Stevens CD, Brook RH. Regular source of ambulatory care and medical care utilization by patients presenting to a public hospital emergency department. *JAMA.* 1994;271:1909-1912.
27. Ullman R, Block JA, Stratmann WC. An emergency room's patients: their characteristics and utilization of hospital services. *Med Care.* 1975;13:1011-1120.
28. Rask KJ, Williams MV, Parker RM, McNagney SE. Obstacles predicting lack of a regular provider and delays in seeking care for patients at an urban public hospital. *JAMA.* 1994;271:1931-1933.
29. White-Means SI, Thornton MC. Nonemergency visits to hospital emergency rooms: a comparison of blacks and whites. *Milbank Q.* 1989;67:35-57.
30. Padgett DK, Brodsky B. Psychosocial factors influencing non-urgent use of the emergency room: a review of the literature and recommendations for research and improved service delivery. *Soc Sci Med.* 1992;35:1189-1197.
31. Yarboro TL. Emergency room use by patients from the family practice of a black physician. *J Natl Med Assoc.* 1990;82:93-97.
32. US General Accounting Office. *Emergency Departments Unevenly Affected by Growth and Change in Patient Use*. Washington, DC: US Government Printing Office; January 1993. Publication GAO/HRD-93-4.
33. Shesser F, Kirsch T, Smith J, Hirsch R. An analysis of emergency department use by patients with minor illness. *Ann Emerg Med.* 1991;20:743-748.
34. Buesching DP, Jablonowski A, Vests E, et al. Inappropriate emergency department visits. *Ann Emerg Med.* 1985;14:672-676.
35. McNamara P, Witle R, Konig A. Patchwork access: primary care in EDs on the rise. *Hospitals.* 1993;67(10):44-46.
36. Orr ST, Charney E, Straus J, Bloom B. Emergency room use by low income children with a regular source of health care. *Med Care.* 1991;29:283-286.