

PEDIATRICS®

OFFICIAL JOURNAL OF THE AMERICAN ACADEMY OF PEDIATRICS

Impact of Medicaid Disenrollment on Health Care Use and Cost

Mary E. Rimsza, Richard J. Butler and William G. Johnson

Pediatrics 2007;119:e1026-e1032

DOI: 10.1542/peds.2006-2747

This information is current as of May 7, 2007

The online version of this article, along with updated information and services, is located on the World Wide Web at:

<http://www.pediatrics.org/cgi/content/full/119/5/e1026>

PEDIATRICS is the official journal of the American Academy of Pediatrics. A monthly publication, it has been published continuously since 1948. PEDIATRICS is owned, published, and trademarked by the American Academy of Pediatrics, 141 Northwest Point Boulevard, Elk Grove Village, Illinois, 60007. Copyright © 2007 by the American Academy of Pediatrics. All rights reserved. Print ISSN: 0031-4005. Online ISSN: 1098-4275.

American Academy of Pediatrics

DEDICATED TO THE HEALTH OF ALL CHILDREN™



Impact of Medicaid Disenrollment on Health Care Use and Cost

Mary E. Rimsza, MD^a, Richard J. Butler, PhD^b, William G. Johnson, PhD^a

^aSchool of Computing and Informatics, Arizona State University, Tempe, Arizona; ^bDepartment of Economics, Brigham Young University, Provo, Utah

The authors have indicated they have no financial relationships relevant to this article to disclose.

ABSTRACT

OBJECTIVE. The objective of this study was to compare the health care use of children who are covered by public insurance and uninsured children who live in a large urban area and the potential impact of disenrollment on health care use and costs if these children become uninsured.

METHODS. The 2004 health care transactions for 43 313 uninsured children and 168 722 children who were insured by Medicaid/State Children's Health Insurance Program and living in the Phoenix metropolitan area were analyzed using a community-wide administrative health database (Arizona HealthQuery). Using a multivariate model of health care use by currently uninsured children, we examined the effect of 10% disenrollment of the children who were currently insured by Medicaid/State Children's Health Insurance Program.

RESULTS. A 10% disenrollment would increase the costs of health care in the community by \$3 460 398 annually, or \$2121 for each child disenrolled. This increase in costs is attributed to a shift of care from ambulatory settings to more expensive emergency departments and an increase in hospital days. We determined that 69% of the change in emergency department visits, 58% of the change in hospital stays, and 74% of the change in ambulatory visits would be attributable to the change in insurance status.

CONCLUSIONS. Programmatic changes that result in disenrollment from public insurance programs will increase the number of emergency department visits and hospital days as well as the total community costs of health care. These increases in health care use can be expected to aggravate community problems of emergency department overcrowding and inpatient bed shortages. The majority of the changes in use are attributable to changes in insurance status, which results in a shift of care from less expensive ambulatory settings to emergency departments and increases in hospital days when children lose Medicaid/State Children's Health Insurance Program coverage.

www.pediatrics.org/cgi/doi/10.1542/peds.2006-2747

doi:10.1542/peds.2006-2747

Key Words

Medicaid, uninsured children, emergency department, health care costs, SCHIP

Abbreviations

SCHIP—State Children's Health Insurance Program

AZHQ—Arizona HealthQuery

ED—emergency department

CTS—Community Tracking Study

Accepted for publication Nov 8, 2006

Address correspondence to Mary E. Rimsza, MD, Center for Health Information and Research, School of Computing and Informatics, Ira A. Fulton School of Engineering, Arizona State University, PO Box 874711, Tempe, AZ 85287-4711. E-mail: mrimsza@asu.edu

PEDIATRICS (ISSN Numbers: Print, 0031-4005; Online, 1098-4275). Copyright © 2007 by the American Academy of Pediatrics

IN AN EFFORT to contain costs, many states have made programmatic changes in their public health insurance programs (Medicaid/State Children's Health Insurance Program [SCHIP]) that have resulted in disenrollment of children. A recent survey of state Medicaid program directors revealed that every state implemented at least 1 new Medicaid cost containment measure in fiscal year 2005.¹ The most prevalent measures involved freezing provider payment rates, increasing premiums, or raising copayments. Although reducing the number of children who are enrolled in public insurance programs will, all else equal, reduce state Medicaid and SCHIP expenditures, the reductions in these expenditures do not represent an equal reduction in expenditures for the health care of the affected people from the viewpoint of state or federal governments or society as a whole. The net effect of these cost containment strategies can be understood only by considering all of the immediate and subsequent effects of the changes.

People who disenroll from Medicaid or SCHIP programs as a result of programmatic changes are not likely to replace public program insurance with private commercial insurance,^{2,3} because it is unlikely that people who live near the poverty level will be able to afford the premiums that are associated with private commercial health insurance. This report examines the effect of disenrollment on both health care use and costs by estimating the impact of a 10% decrease in Medicaid/SCHIP enrollment in Arizona. The assumed value of 10% represents a lower bound on the likely impact of most changes that are proposed by state governments. Most of the changes in cost-sharing or eligibility that were observed in other states have produced much larger reductions in enrollment, even for very small increases in costs, to people who are insured by Medicaid.^{4,5}

METHODS

The 2004 health care transactions for children who were younger than 18 years and lived in Maricopa County, Arizona, which includes the Phoenix metropolitan area, were analyzed using a community health database, Arizona HealthQuery (AZHQ). This database currently includes health care transactions on >4 million Maricopa County residents, including all Medicaid and SCHIP participants and patients who receive care at federally qualified community health centers, the county's public hospital and its affiliated clinics, a religiously affiliated free clinic, and most of the private hospitals in the county. Arizona's SCHIP program is an expansion of its Medicaid program and administered by the same agency. Families apply for both SCHIP and Medicaid using the same application and are allocated to SCHIP or Medicaid on the basis of family size and income. Place of service was divided into 3 categories: emergency department (ED) visits, inpatient hospitalizations, and ambulatory care visits. Visits to private physician's offices, community

health centers, and hospital-based ambulatory care centers were considered ambulatory care visits.

The behavioral model of health care use and access by Anderson et al⁶ proposed that use is a function of need (health problems), enabling factors (community resources for care, ability to afford care including insurance status), and characteristics of the individual and his or her community. Following the model of Andersen et al,⁶ we included in our analysis personal characteristics that may affect use, including age, gender, race/ethnicity, and amount of care that is for ambulatory care-sensitive conditions.

The financial and health care use impact of a 10% disenrollment of the Medicaid/SCHIP-insured children was estimated, assuming that all of the disenrolled children became uninsured and these children would exhibit medical usage patterns just like the currently uninsured who had the same characteristics (age, gender, race, ethnicity, provider, and care for ambulatory care-sensitive conditions). An ambulatory care-sensitive condition was defined as a condition that could be treated in a primary care setting if timely care were provided and includes conditions such as gastroenteritis and urinary tract infections.⁷ We assumed that children who disenroll would become uninsured because only a small percentage of Medicaid/SCHIP-enrolled children have access to employer-sponsored coverage and the premiums for this employer-sponsored coverage are usually not affordable for families who are eligible for Medicaid/SCHIP.³ We combined the estimated coefficients of a multivariate model of health care use by currently uninsured children with children who are currently enrolled in Medicaid/SCHIP and then assumed that 10% of the latter group become uninsured. A system of logistic regression equations was used to estimate the probability of ED visits, inpatient days, and ambulatory office visits, and a system of 3 nonlinear regression equations was used to estimate the quantity of services for each of the 3 services if 10% of the Medicaid/SCHIP recipients become uninsured.

Each system of equations is estimated for all Medicaid/SCHIP-insured and uninsured children. Differences in use for uninsured and Medicaid/SCHIP-insured children are influenced by differences in demographic characteristics and by differences in insurance coverage. We used a regression decomposition, also known as the Oaxaca decomposition in the econometrics literature, to evaluate the differences between encounters by the uninsured and encounters by the Medicaid/SCHIP insured.^{8,9} The regression decomposition was modified to fit health care comparisons, to separate differences in use between Medicaid/SCHIP-insured and uninsured children into differences as a result of the characteristics of the people and differences as a result of insurance. This decomposition separates observed differences in outcomes (probabilities of use or quantities of use) into

differences that are associated with a person's demographic variables and differences as a result of the insurance coverage.

The net changes in use for Medicaid/SCHIP-insured and uninsured children if 10% of the Medicaid/SCHIP-insured children became uninsured were calculated by multiplying the quantities of services by the numbers of children in each group before and after the simulated 10% disenrollment. Total health care expenditures are based on 2004 payments for ambulatory care visits, inpatient hospitalizations, and ED visits paid by Arizona's Medicaid program. The average amount paid for each service was multiplied by the quantity of each service before and after the simulated disenrollment to estimate the aggregate change in health care expenditures. Because most of the health care costs for the uninsured are paid by federal and state governments through Medicare and Medicaid in the form of disproportionate share hospital adjustments and indirect medical education payments in addition to other federal programs, such as funding for community health centers and the Maternal and Child Health Bureau, we assume that the cost of care for children who become uninsured are community costs. Indeed, federal and state funds have been estimated to cover 87% of the total costs of uncompensated care.^{10,11} Potential savings from programmatic changes in Medicaid/SCHIP also are offset by increased Medicaid medically needy spending, increased tax subsidies to private insurance, and increased costs that are associated with uncompensated care.²

The Oaxaca decomposition is a mathematical technique that first was used to measure discrimination. We used this technique to separate the difference in the dependent variable between the 2 insurance groups into the difference that was attributable to observable characteristics (ie, the portion of the difference that is ex-

plained by differences in the mean characteristics that are included in the model) and unobserved factors (ie, the portion of the difference that is attributable to differences in the coefficients between the 2 groups). The difference that is attributable to unobserved factors was considered to be the measure of the effect of insurance.^{8,12}

RESULTS

There were 40 945 uninsured children and 163 742 Medicaid/SCHIP-insured children in the AZHQ database for whom complete data were available on all demographic and health care use variables that were used in the analysis. The majority of the children in both insurance groups were from racial or ethnic minorities. The most common ethnic group was Hispanic: 62% of the Medicaid/SCHIP-insured children and 56% of the uninsured children were Hispanic (Fig 1). Children were divided into 4 age groups: 0 to 4 years, 5 to 9 years, 10 to 14 years, and 15 to 17 years. Within the 0- to 4-year age group, the costs were similar for 0- to 1-year-olds and the entire group. The majority of the Medicaid/SCHIP-insured children and uninsured children were younger than 10 years: 76% of the Medicaid/SCHIP-insured and 69% of the uninsured children (Fig 2). Fifty percent of the children were male in both the Medicaid/SCHIP-insured and uninsured groups. For the uninsured children, there were 800 ED visits per 1000 children in the year compared with 500 per 1000 children who were enrolled in Medicaid/SCHIP. The uninsured also had a higher average number of hospital days, averaging 1500 hospital days per 1000 children in the year compared with 500 hospital days for the Medicaid/SCHIP-enrolled children. The Medicaid/SCHIP-enrolled children averaged 2200 ambulatory visits per 1000 children in the year compared with 600 visits per 1000 children

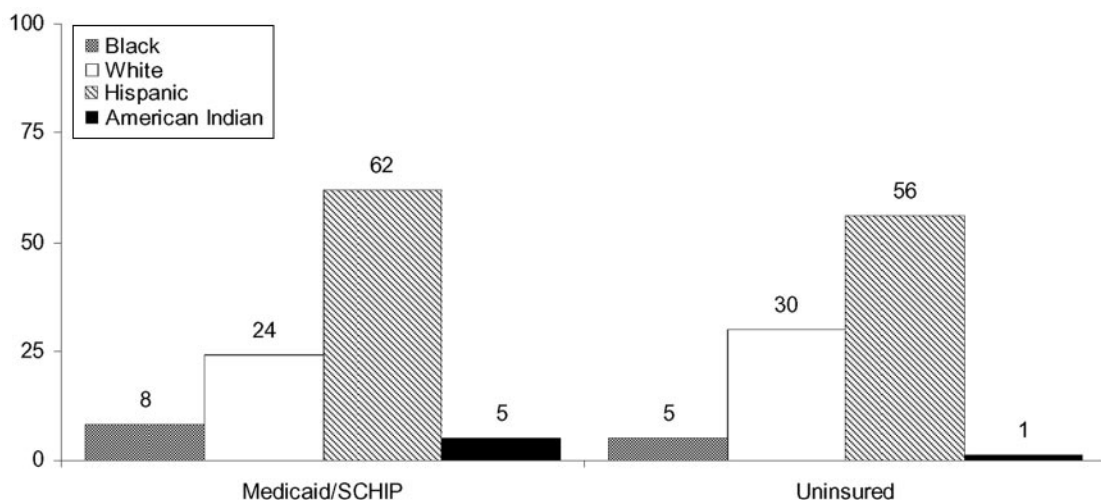


FIGURE 1
Racial and ethnic distribution of children.

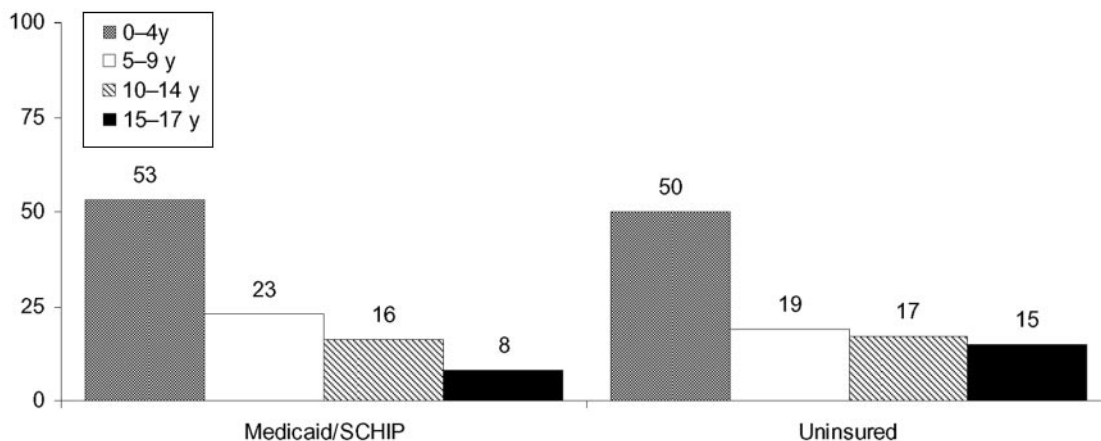


FIGURE 2
Age distribution of children versus insurance status.

for the uninsured. The total number of visits by facility for uninsured children and Medicaid/SCHIP-insured children is shown in Fig 3.

Figure 4 shows the annual changes in ED and inpatient service use if 10% (16 327) of the Medicaid/SCHIP-enrolled children disenroll and become uninsured. The total number of uninsured ED visits would increase from 32 076 to 43 716, and the total number of uninsured hospital days would increase from 60 570 to 78 251. The total number of ED visits in the community would increase by 2772, and the total number of hospital days would increase by 9273.

The total number of ambulatory visits by uninsured children would increase from 21 013 to 30 812 with a 10% disenrollment, and the number of ambulatory visits by Medicaid/SCHIP-insured children would decrease from 356 849 to 321 327. The net effect on service use in the ambulatory setting associated with a 10% disenroll-

ment is that the total number of ambulatory visits would decrease by 25 723.

To determine the total financial effect of disenrollment on health care costs, we used the mean payments for uninsured visits by facility type from AZHQ data and multiplied the cost of the visit by the change in number of visits if 10% of the currently enrolled Arizona Health Care Cost Containment System patients were disenrolled and became uninsured. The mean payment for visits in 2004 was \$795.57 for ED visits, \$586.55 for inpatient hospital visits, and \$162.64 for ambulatory visits. These amounts are paid by Arizona's Medicaid program and include all services that are provided in these settings, including pathology, laboratory, radiology, and physician services. The payments are ~30% of the charges for these services. Assuming that these payments are indicative of the true cost of care, ED care would increase by \$2 205 320 and the cost of inpatient

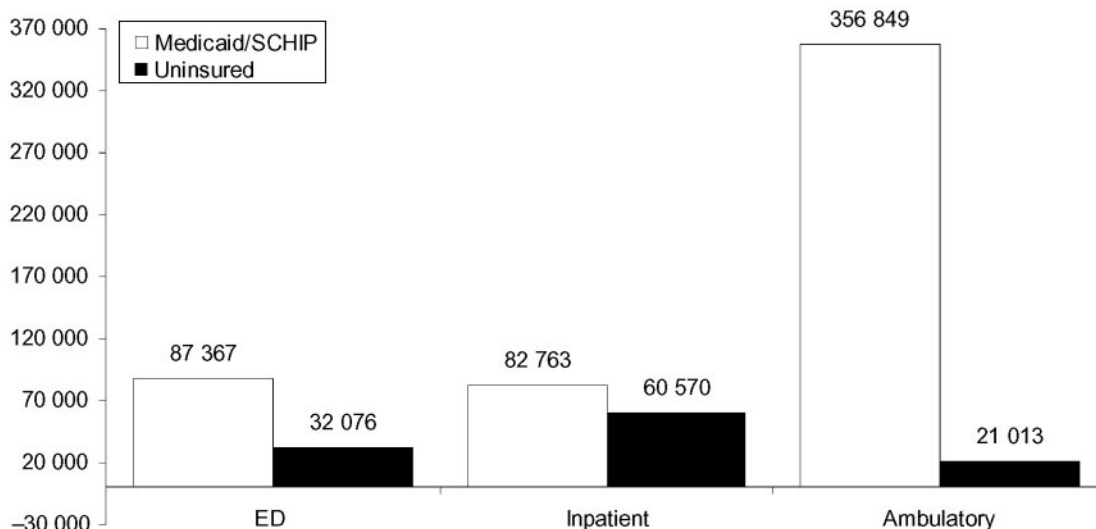


FIGURE 3
Number of health care services according to facility, 2004.

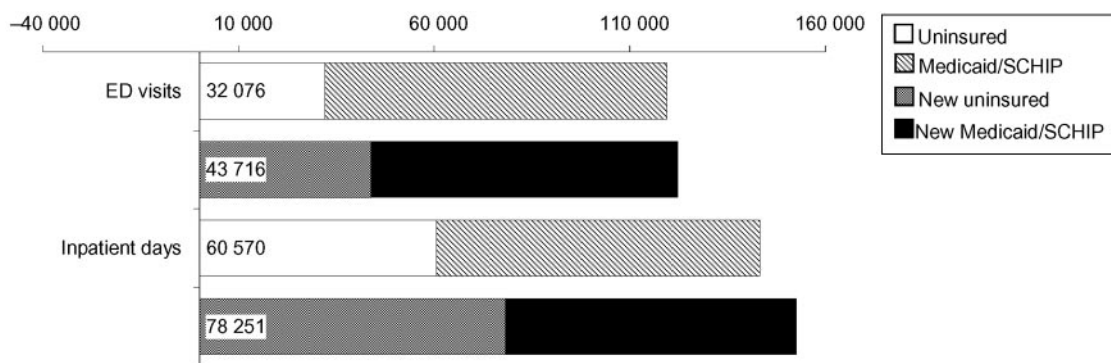


FIGURE 4
Changes in ED and inpatient service utilization with 10% disenrollment.

care would increase by \$5 439 078. However, the cost of ambulatory care would decrease by \$4 183 589. The net increase in total costs would be \$3460.809, or \$2121 for each child who was disenrolled. Using the Oaxaca decomposition, we determined that 69% (8031) of the ED visits, 58% (10 254) of the hospital days, and 74% (7251) of the change in ambulatory visits would be attributable to the change in insurance status.

DISCUSSION

This study demonstrates the changes in health care use and costs if a randomly chosen 10% of the children who are currently enrolled in Arizona's Medicaid/SCHIP program disenrolled and became uninsured. Our analysis of the health care encounters for both the Medicaid/SCHIP-insured and uninsured children is a function of each child's age, gender, race, type of treating physician, ambulatory care-sensitive condition, and place of service. In fact, the overall characteristics of the uninsured and Medicaid/SCHIP-insured populations are so similar that when the likelihood of being uninsured is estimated as a function of these variables, the populations are virtually indistinguishable. Thus, the populations are not different because of observable characteristics but because they are equally likely to be uninsured given their characteristics. Because we hold observable characteristics and broad health indicators constant, it is likely that the differences observed are attributable to insurance coverage.

This analysis is not based on actual changes that have occurred in the Arizona Medicaid/SCHIP program or changes in other states but rather is a model for the effects of any programmatic change (eg, increased premiums; enrollment caps; decreased eligibility; enrollment barriers such as more frequent renewals, citizenship documentation) that results in disenrollment. Although we modeled the effect of a 10% disenrollment, most of the changes in cost-sharing or eligibility that have been enacted in other states have produced much more than a 10% disenrollment. For example, the outcomes of increased cost-sharing as a result of increases in

premiums of 1% to 5% of family income by Washington's Basic Health Plan, Minnesota's Minnesota Care, and Hawaii's Quest program resulted in reductions in enrollment that ranged from 18% to 57%,⁴ and Texas recently experienced a 29% reduction in SCHIP enrollment in <1 year after increasing premiums, adding a 90-day waiting period for benefits, and reducing the enrollment period from 12 months to 6 months.⁵

Our simulation assumed that children who leave the Medicaid/SCHIP program would be random with respect to their medical needs. This is plausible if the policy change that results in disenrollment affects children with a random set of health needs, such as enrollment caps. Some policy changes that result in disenrollment may not be random. For example, increased paperwork requirements (eg, proof of citizenship) may be more likely to affect healthy children than chronically ill children because the parents of chronically ill children may be more willing to take the time to complete the paperwork requirements; in this case, our estimates would be an upper bound on the actual cost increases. However, if disenrollment is generated through a policy of higher copayments for hospitalizations, and ED and ambulatory visits, then this might disproportionately affect those with potentially the greatest medical needs and our disenrollment estimates would be a lower bound on the actual cost increases.

Our study demonstrates that the uninsured are more likely than Medicaid/SCHIP-insured children to receive health care in expensive sites (the ED and hospital) and less likely to receive care in the ambulatory setting. These findings are similar to our findings in Yuma, Arizona, where we found that uninsured children were nearly 4 times more likely to use the ED than insured children for ambulatory care-sensitive conditions.⁸ This increase in ED and hospital care may be attributable to the lack of preventive services and timely access to health care for acute care problems if a child is uninsured. Because the uninsured often are unable to obtain health care in physicians' offices, they go to the ED, where they know they cannot be turned away because

of the Emergency Medical Treatment and Active Labor Act. However, the cost of nonemergent care that is provided in the ED is much higher than similar services that are provided in physicians' offices.

Because of the shift in care from ambulatory sites to EDs and hospitals that is associated with disenrollment, our study demonstrates that the total number of ED visits and hospital days in the community increases as the number of children who disenroll increases. Our findings differ from Cunningham,³ who reported that Medicaid/SCHIP cuts that resulted in disenrollment would not affect the total number of ED visits. However, his analysis was based on 2000–2001 and 2003 Community Tracking Study (CTS) household surveys rather than administrative health data. In the CTS, the number of ED visits is self-reported, and those that resulted in hospitalization were excluded. Also, in the CTS survey, insurance coverage was determined at the time of the interview and not the time of the visit, as in our study. Finally, Cunningham assumed that 12% of the disenrolled children would acquire private insurance, whereas we assumed that these children would become uninsured.

Most states make programmatic changes in their Medicaid/SCHIP programs in an effort to decrease their costs for these programs. However, this study demonstrates that programmatic changes that result in disenrollment actually increase the total health care costs for the community. Most of the health care costs for the uninsured are paid by federal and state governments through Medicare and Medicaid in the form of disproportionate share hospital adjustments and indirect medical education payments in addition to other federal programs, such as funding for community health centers and the Maternal and Child Health Bureau. Indeed, federal and state funds have been estimated to cover 87% of the total costs of uncompensated care.¹¹ Potential savings from programmatic changes in Medicaid/SCHIP also are offset by increased Medicaid medically needy spending, increased tax subsidies to private insurance, and increased costs that are associated with uncompensated care.² In a previous analysis of Medicaid disenrollment in an agricultural community, we concluded that 10% disenrollment would increase the number of uninsured children by 21% and increase the community's health care costs as a result of a shift in sites of care from less expensive ambulatory office sites to more expensive EDs and increased hospitalizations.¹²

The behavioral model of health care use and access by Anderson et al⁶ proposed that use is a function of need, enabling factors, and characteristics of the individual and his or her community. In this study, we used a community health database to assess the effects of Medicaid/SCHIP policy changes on health care use and costs. Following the model of Andersen et al,⁶ we included in our analysis personal characteristics that may affect use, in-

cluding age, gender, race/ethnicity, and amount of care that is for ambulatory care-sensitive conditions. Although perceived and actual health needs are more difficult to assess, we did include in our analysis past visits for ambulatory care-sensitive conditions as well as specialty type of primary care provider. By using a community health database, community factors (eg, Medicaid/SCHIP acceptance by the community, availability of safety net providers, location of EDs) also are included in the analysis. Using the Oaxaca decomposition, our analysis demonstrates that the most important of these factors in determining health care use by facility is insurance status.

Recent changes in Medicaid requirements that requires US citizens to provide proof of citizenship for Medicaid enrollment may lead to increased disenrollment in Arizona. We hope to assess the accuracy of our simulation during the next 2 years using our AZHQ database to compare health care use of Arizona Medicaid/SCHIP recipients who disenroll because of lack of citizenship documents.

There are some limitations to our study. First, it is based on data from a large, urban community in the Southwest, where the majority of the Medicaid/SCHIP population as well as the uninsured are Hispanic. Second, the costs of disenrollment were based on Medicaid/SCHIP payments in Arizona. These payments are ~30% of charges for such services in Arizona. The actual costs are likely somewhere between these payments and charges. Therefore, our results likely underestimate the true costs of disenrollment. Third, although all ambulatory visits to private physicians' offices for the Medicaid/SCHIP-insured children are included in the analysis as well as ambulatory visits for both the Medicaid/SCHIP-insured and uninsured patients to federally qualified community health centers, public clinics, and free clinics, some ambulatory visits for uninsured patients may not be included if they receive ambulatory care in other sites. This would result in an underestimation of the costs of disenrollment. Fourth, we assumed that children who disenrolled from Medicaid/SCHIP would become uninsured because either they were not eligible for private insurance or their families could not afford private insurance premiums. However, some low-income families may be able to gain access to private health insurance.

CONCLUSIONS

This study shows that cost containment strategies that result in disenrollment from Medicaid or SCHIP programs can be expected to increase care at expensive sites, including EDs and hospitals, and decrease care that is received in physicians' offices. Such changes in site of care not only will increase health care costs but also will aggravate current community problems of ED overcrowding and inpatient bed shortages. The total number

of ED visits and inpatient days can be expected to increase as well as the amount of uncompensated care that is provided by hospitals and EDs that serve as safety net providers when Medicaid/SCHIP-insured children disenroll.

ACKNOWLEDGMENTS

We gratefully acknowledge the financial support of St Lukes Health Initiatives and the cooperation of the Arizona Health Care Cost Containment System in the preparation of this report.

REFERENCES

1. Smith V, Gifford K, Ellis E, Wiles A, Rudowitz R, O'Malley M. *Medicaid Budgets, Spending and Policy Initiatives in State Fiscal Years 2005–2006: Results of a 50 State Survey*. Washington, DC: The Kaiser Commission on Medicaid and the Underinsured; 2005. Publication 7392
2. Selden TM, Hudson JL. How much can really be saved by rolling back SCHIP? The net cost of public health insurance. *Inquiry*. 2005;42:16–28
3. Cunningham PJ. Medicaid/SCHIP cuts and hospital emergency department use. *Health Aff (Millwood)*. 2006;25:237–247
4. Ku L, Coughlin TA. Sliding scale premium health insurance programs: four state experiences. *Inquiry*. 2000;36:471–480
5. Dunkelberg A, O'Malley M. *Children's Medicaid and SCHIP in Texas: Tracking the Impact of Budget Cuts*. Washington, DC: The Kaiser Commission on Medicaid and the Uninsured; 2004. Publication 7132
6. Aday L, Andersen R, Fleming G. *Health Care in the U.S.: Equitable for Whom?* Beverly Hills, CA: Sage Publications; 1980
7. Falik M, Needleman J, Wells B, Korb J. Ambulatory care sensitive hospitalizations and emergency visits: experiences of Medicaid patients using federally qualified health centers. *Med Care*. 2001;39:551–561
8. Oaxaca R. Male-female wage differences in urban labor markets. *Int Econ Rev*. 1973;9:693–709
9. Means SI, Rubin RM. Is there equity in the home health care market? *J Gerontol*. 2004;59B:S220–S229
10. Johnson WG, Rimsza ME. The effects of access to pediatric care and insurance coverage on emergency department utilization. *Pediatrics*. 2004;113:483–487
11. Hadley J, Holahan J. *Who Pays and How Much? The Cost of Caring for the Uninsured*. Washington, DC: The Kaiser Commission on Medicaid and the Uninsured; 2003. Publication 4088
12. Johnson TJ, Johnson WG, Rimsza ME. The effects of cost-shifting in the State Children's Health Insurance Program. *Am J Public Health*. 2006;96:709–715

Impact of Medicaid Disenrollment on Health Care Use and Cost

Mary E. Rimsza, Richard J. Butler and William G. Johnson

Pediatrics 2007;119:e1026-e1032

DOI: 10.1542/peds.2006-2747

This information is current as of May 7, 2007

Updated Information & Services

including high-resolution figures, can be found at:
<http://www.pediatrics.org/cgi/content/full/119/5/e1026>

References

This article cites 8 articles, 3 of which you can access for free at:

<http://www.pediatrics.org/cgi/content/full/119/5/e1026#BIBL>

Subspecialty Collections

This article, along with others on similar topics, appears in the following collection(s):

Office Practice

http://www.pediatrics.org/cgi/collection/office_practice

Permissions & Licensing

Information about reproducing this article in parts (figures, tables) or in its entirety can be found online at:

<http://www.pediatrics.org/misc/Permissions.shtml>

Reprints

Information about ordering reprints can be found online:

<http://www.pediatrics.org/misc/reprints.shtml>

American Academy of Pediatrics

DEDICATED TO THE HEALTH OF ALL CHILDREN™

