

Estimating Pediatric Primary Care Provider Visits In a Capitated Environment: Encounter vs. Claims Databases

ERNEST P. SCHLOSS, PhD¹, DIRECTOR OF RESEARCH, EDUCATION & PROGRAM DEVELOPMENT; VICKY LEWIS, RN, PhD², QUALITY MANAGER/SYSTEMS ANALYST; NANCY MARTIN, RN, MSN², QUALITY INTEGRATION LEADER; AND MARLENE PITTS, BSN, RN¹, MANAGER, MANAGED CARE

¹Children's Clinics for Rehabilitative Services, Tucson, Ariz.; ²Pima Community Access Program, Tucson, Ariz.

ABSTRACT

Purpose. To evaluate the accuracy of insurance claims data indicating underutilization of primary care visits by children with special health care needs (CSHCN).

Design. The study was a retrospective comparison of primary care provider (PCP) utilization by 1,131 CSHCN, using secondary data from electronic claims-and-encounters databases in a Medicaid health maintenance organization (HMO) and a commercial HMO.

Methodology. The study was conducted at the Children's Clinics for Rehabilitative Services (Children's Clinics) in Tucson, Ariz., a provider of specialty care to CSHCN. All the children in the study were eligible for specialty services under Arizona's statewide program for CSHCN and were simultaneously en-

rolled, from Oct. 1, 1995 through Sept. 30, 1996, in either one or both of the managed care plans for their primary care. Identical PCP-visit information for the same 1-year period was collected from the plans' claims-and-encounters databases, and the number of primary care visits as computed from both databases was compared.

Principal findings. Health plan claims data show that only 14 percent of the patients visited a PCP during the course of a year. The encounter data indicate that 59 percent of the same cohort had PCP visits.

Conclusions. Encounter databases capture more information about PCP visits than insurance claims databases in capitated environments.

Key terms: utilization; insurance; physician services; primary health care; children

INTRODUCTION

A variety of data sources have been used to describe and analyze children's use of primary care services. A number of these studies have used national, federally sponsored surveys, including the National Ambulatory Medical Care Survey,¹ the National Medical Care Utilization and Expenditure Survey,^{2,3} or the National Health Interview Survey and its Child Health Supplement.⁴⁻¹⁰ Additionally, local or regional studies, or studies that are organization-specific have used insurance claims databases,¹¹⁻¹⁴ automated pharmacy data,¹⁵ or reviews of medical records.¹⁶⁻¹⁸

Studies of general primary care utilization, not just those involving children, often use data from automated insurance claims databases to describe and analyze patients' visits to physi-

cians.^{19,20} These secondary data sources are readily accessible to researchers and range from large payers, e.g., Medicaid claims files, to individual physician's office billing systems.¹⁹

This article specifically addresses insurance claims databases, as these were the data we used in a 1996 study of the utilization and costs of services underwritten by different health care payers to the population of children with special health care needs (CSHCN) at the Children's Clinics for Rehabilitative Services (Children's Clinics) in Tucson, Ariz. (unpublished observations).

Our 1996 study suggested significant underutilization of primary care services by these children. We were concerned about their apparent lack of primary care services, due to the potential for increased health problems from inadequate preventive health and lack of early detection and diagnosis of illness. Our finding pointed to a serious health issue, because children with complex medical problems need primary care services at least as much as children without this added burden. We also began to question whether the claims data in our study were indeed capturing all primary care visits by our population of children. We wished to rule out, through the current study, several competing explanations for the children's low use of primary care services as documented by the original study data.

Our researchers recognized that there might have been systemwide underreporting of primary care contacts by capitated primary care providers (PCPs). This could have occurred, because compensation to PCPs who were capitated for this population

Author correspondence:

Ernest P. Schloss, PhD

Director of Research, Education
& Program Development
Children's Clinics for Rehabilitative
Services
2600 N. Wyatt Drive
Tucson, AZ 85712
Phone: (520) 324-3027
Fax: (520) 324-3129
E-mail: ernie.schloss@tmcaz.com

This study was supported by a grant from the Flinn Foundation.

This paper has undergone peer review by appropriate members of MANAGED CARE'S Editorial Advisory Board.

was not dependent on reporting the provision of services to the health plans via claims submission. Employees in physician offices as well as managed care plan representatives suggested to us that the time and effort incurred in reporting utilization was not directly paid for, even if it was a contractual requirement. Capitated PCPs often do not send billing information, such as HCFA 1500 forms, to the health maintenance organization (HMO). They report that their offices are overburdened with paperwork already and, because they are paid a capitated fee regardless of the number of encounters, it is not a priority for them to make sure every bill is sent to the managed care plan. Encounter data, on the other hand, are required by the HMOs for their internal monitoring, for reports to the National Committee for Quality Assurance (NCQA), and for other purposes. These data, therefore, tend to be more accurate. HMOs will sanction physicians for not providing encounter data, whereas there are no financial sanctions for not providing billing information.

Only a few studies have raised concerns about the completeness of insurance claims data to measure children's use of physician services. Davidson and colleagues¹³ compared children's utilization of primary care physicians under different payment arrangements in Suffolk County, New York. Based on an audit of patient records, the investigators discovered an underreporting of visits by capitated primary care physicians, and the reported primary care visits by that group were adjusted accordingly.

Fink²¹ reviewed the use of HMO data systems for usage in population-based access-to-care studies. He reported that there was "little more than anecdotal information on the rate of nonreporting of encounter information." Fink noted that NCQA found an underreporting of data by capitated physicians; presumably this is because the capitated physicians have no financial incentives to report the data, i.e.,

they are not paid by the visit.²²⁻²³

METHODS

The Children's Clinics is the southern Arizona contractor for the Arizona Department of Health Services' Children's Rehabilitative Services (ADHS/CRS), the primary funding source for CSHCN in Arizona. The Children's Clinics provides nearly 30 general and specialty clinics at one site for CSHCN and serves approximately 3,700 patients per year. In addition to a full range of interdisciplinary specialty clinics, the Children's Clinics also offers multispecialty clinics for children with cerebral palsy, scoliosis, spina bifida, and other chronic and disabling conditions.

Based on the earlier finding that a large proportion of Children's Clinics patients were not receiving needed primary care visits, we developed a primary care clinic to serve CSHCN who were already being seen at the Children's Clinics for specialty care but were not receiving regular care from a primary care practitioner. The general concept was to provide primary care and specialty services under one roof for the convenience and enhancement of care for the patients and families. This enhanced version of the "medical home" concept, promulgated by the American Academy of Pediatrics (AAP),²⁴ was aimed at providing several benefits, including: better written and oral communication between primary care providers, pediatric subspecialists, and allied health professionals, and easy access to a multitude of onsite services, including nurses, therapists, social services staff, and psychologists, as well as laboratory, pharmacy, and radiology services.

This study was a comparison between the utilization of PCPs by a cohort of Children's Clinics patients as measured by claims data versus encounter data from two health plans—a Medicaid managed care plan and a commercial HMO. At the time of the study, both plans capitated PCPs for all primary care services. This sample of

patients was the subject of the 1996 descriptive study of CSHCN utilization and costs of care (unpublished observations), with subsequent examination of PCP-usage by the same cohort in an expanded 1999 study (unpublished observations).

Again, the original 1996 study used insurance claims data that showed a substantial underutilization of primary care by the sample. Based on a recommendation from our managed care staff and the participating health plans, the subsequent study was a retrospective review of PCP encounter data for the identical cohort of Children's Clinics patients, in an attempt to validate the PCP-visit data contained in the 1996 study. We obtained both the claims-and-encounters data from the two health care plans, which were part of the 1996 study. In this way, we were able to capture the majority of PCP visits for these children.

Although we considered doing a medical record audit to verify visits, the Medicaid and HMO plan representatives told us that their computerized encounter database included primary care procedure codes, dates of service, providers, and insurance status for all original study participants (N=1,131). While these data would not have resolved the question of whether specialists or other unknown providers had delivered primary care, the database appeared to be sufficiently robust to answer most of the research questions. This database was quite different from the claims database used in the original study, which was based on billing data submitted to the two health plans and extracted from their claims processing systems.

We signed an agreement with both health plans to share data for research study purposes, to assure patient confidentiality, and to affirm that study results were to be reported in aggregate form only. Each health plan was given a list of patients who had been enrolled in the original study and was asked to provide a file containing encounter information about PCP visits during the

ESTIMATING PEDIATRIC PRIMARY CARE PROVIDER VISITS

study year, Oct. 1, 1995 through Sept. 30, 1996.

The study focused specifically on children who were eligible for services funded by the ADHS/CRS. This population consists of medically complex, chronically ill, or physically disabled children between the ages of 0 and 21 who could benefit from access to comprehensive, integrated, multidisciplinary pediatric specialty services.

The sample of 1,131 patients selected for the original study was jointly served by three payers that included the commercial HMO, the Medicaid plan, and the ADHS/CRS. Each of these organizations provided data for the study. The ADHS/CRS program provides carve-out funding for specialty services related to specific eligible diagnoses, while the other two programs cover primary care and all other acute care services. A child was included in the study if he or she was enrolled for any length of time during the study period.

The children in the sample were comparable in their overall demographic characteristics to the Children's Clinics' population as a whole, as well as to the statewide CSHCN population covered by ADHS/CRS (unpublished data, Children's Clinics). Table 1 shows distribution of the chronic diagnoses of these children that qualified them to be seen at the Children's Clinics. The mean age of the children was 4.0 years, and 54 percent of the sample was male; 46 percent was female. We had no information about either ethnicity or family income, although 90 percent of the children were eligible for Medicaid (unpublished observations).

Of those 1,131 patients, all of whom were enrolled in the ADHS/CRS specialty care program, 90 percent were also enrolled in the Medicaid plan, and 7 percent were enrolled in the HMO. The remaining 3 percent of patients were enrolled in both (Table 2).

We used the encounter data sets of the Medicaid plan and the HMO. Duplicate information was deleted from the database, and the remaining data were standardized between the two

TABLE 1 Chronic diagnoses of CSHCN in this sample

Diagnostic category	Number	Percent
Sickle-cell disease	2	0.2
Scoliosis	21	1.9
Metabolic diseases	19	1.7
Cleft lip/cleft palate	65	5.8
Neurofibromatosis	9	0.8
Myelomeningocele (spina bifida)	26	2.3
Cerebral palsy	207	18.3
Cystic fibrosis	4	0.4
Circulatory	168	14.9
Sense organs	144	12.7
Other musculoskeletal	209	18.5
Other nervous system	78	6.9
Other	179	15.8
Total	1,131	100

TABLE 2 Funding sources for the children

	Number	Percent
Medicaid Plan	1,018	90
HMO	84	7
Medicaid Plan and HMO	29	3
Total	1,131	100

health plans.

The definition of a primary care visit was: one date of service equaled one primary care visit, regardless of the number of procedure codes or visit diagnoses for that date. This definition was selected because a child may have had more than one diagnosis within one visit (e.g., upper respiratory infection and otitis media), or several procedures during a single visit (e.g., immunization, exam, treatment). The number of primary care visits per patient was then calculated and used in the analyses.

Primary care provider, as a physician category, was defined by the health plans and included pediatricians (72.8 percent), family practitioners (16.3 percent), other physician specialties (6.8 percent), nurse practitioners (2.5 percent), or physician assistants (1.6 percent).

RESULTS

Our 1996 study revealed that primary care services were either vastly underutilized or vastly underreported for the children in the study sample. Only 168 patients (14 percent) had

billed charges for services from a PCP during the course of a year.

But when we re-examined the encounter data, we found that 687 patients (59 percent) had at least one primary care visit during the study period. This means that 519 patients' primary care visits were missing from the claims database used in the 1996 study. While even the follow-up study indicated a serious underutilization of primary care, similar to that reported by Byrd, Hoekelman, and Auinger,¹⁴ the use of the claims database in the original study severely undercounted patient visits.

CONCLUSION

Our decision to implement a primary care program for CSHCN in a specialty pediatric environment was based on incomplete data. At the time, we were unaware that we were dealing with unreliable information, as we were using insurance claims databases that have been commonly used in health services research. Our re-examination of primary care utilization by CSHCN using the encounter database, however, still led us to the same conclusion, i.e., there was a serious underutilization of

PCPs by our patients, although the magnitude of the problem was not so great as we had originally thought.

Our findings could be important for program administrators and policy makers to consider, given the large number of capitated environments in health care today. Researchers using insurance claims databases may severely undercount primary-care use of capitated physicians, not only in the case of CSHCN, but in other patient populations as well. It seems that encounter databases, while less readily available, capture more information about patient visits in communities with a large proportion of capitated PCPs.

Acknowledgements

The investigators gratefully acknowledge the generous assistance of United HealthCare of Arizona and Arizona Physicians IPA in the acquisition and analysis of data for this research.

References

- Ferris TG, Saglam D, Saford RS, Causino N, Starfield B, Culpepper L, et al. Changes in the daily practice of primary care for children. *Arch Pediatr Adolesc Med.* 1998;152:227-233.
- Rosenbach ML. The impact of Medicaid on physician use by low-income children. *Am J Public Health.* 1989;79(9):1220-1226.
- Stoddard JJ, St. Peter RF, Newacheck PW. Health insurance status and ambulatory care for children. *N Engl J Med.* 1994;330(20):1421-1425.
- Newacheck PW, Taylor WR. Childhood chronic illness: prevalence, severity, and impact. *Am J Public Health.* 1992;82(3):364-371.
- Newacheck PW. Characteristics of children with high and low usage of physician services. *Med Care.* 1992;30(1):30-42.
- Newacheck PW, McManus M, Fox HB, Hung Y-Y, Halfon N. Access to health care for children with special health care needs. *Pediatrics.* 2000;105(4):760-766.
- Newacheck PW, Stoddard JJ, Hughes DC, Pearl M. Health insurance and access to primary care for children. *N Engl J Med.* 1998;338(8):513-519.
- Holl JL, Szilagyi PF, Rodewald LE, Byrd RS, Weitzman, ML. Profile of uninsured children in the United States. *Arch Pediatr Adolesc Med.* 1995;149:398-406.
- Aday LA, Lee ES, Spears B, Chung CW, Youssef A, Bloom B. Health insurance and utilization of medical care for children with special health care needs. *Med Care.* 1993;31(11):1013-1026.
- Lieu TA, Newacheck PW, McManus MM. Race, ethnicity, and access to ambulatory care among US adolescents. *Am J Public Health.* 1993;83(7):960-965.
- Valdez BR, Ware JE Jr, Manning WG, Brook RH, Rogers WH, Goldberg GA, et al. Prepaid group practice effects on the utilization of medical services and health outcomes for children: results from a controlled trial. *Pediatrics.* 1989;83(2):168-180.
- Shatin D, Levin R, Ireys HT, Haller V. Health care utilization by children with chronic illnesses: a comparison of Medicaid and employer-insured managed care. *Pediatrics.* 1998;102(4):e44.
- Davidson SM, Manheim LM, Werner SM, Hohlen MM, Yudkowsky BK, Fleming GV. Prepayment with office-based physicians in publicly funded programs: results from the children's Medicaid program. *Pediatrics.* 1992;89(4):761-767.
- Byrd RS, Hoekelman RA, Auinger P. Adherence to AAP guidelines for well-child care under managed care. *Pediatrics.* 1999;104:536-540.
- Fishman PA, Shay DK. Development and estimation of a pediatric chronic disease score using automated pharmacy data. *Med Care.* 1993;37(9):874-883.
- Perrin JM, Greenspan P, Bloom SR, Finkelstein D, Yazdgerdi S, Leventhal JM, Rodewald L, Szilagyi P, Homer CJ. Primary care involvement among hospitalized children. *Arch of Pediatr Adolesc Med.* 1996;150: 479-486.
- Kempe A, Beaty B, Englund BP, Roark RJ, Hester N, Steiner JF. Quality of care and use of the medical home in a state-funded capitated primary care plan for low-income children. *Pediatrics.* 2000;105(5):1020-1028.
- Szilagyi PG, Zwanziger JR, Lance E, Holl JL, Mukamel DB, Trafton S, et al. Evaluation of a state health insurance program for low-income children: implications for state child health insurance programs. *Pediatrics.* 2000;105(2):363-371.
- Longo, DR, Daugrid AJ, Spencer DC. Assessing the quality of primary care: the use and importance of reimbursement data. (Information for managed care contracting). *J Health Care Finance.* 1995;21:13-31.
- Ruffin, M. Capitation and informatics. *Physician Exec.* 1995;21:21-26.
- Fink R. HMO data systems in population studies of access to care. *Health Serv Res.* 1998;33(3):741-770.
- National Committee for Quality Assurance. Report card pilot project: key findings and lessons learned: 21 plans' performance profiles. Technical report. Washington: National Committee for Quality Assurance; 1993.
- National Committee for Quality Assurance. Maryland: HMO performance measurement pilot project, final evaluation. Washington: National Committee for Quality Assurance; 1995.
- American Academy of Pediatrics, Committee on Practice and Ambulatory Medicine. Recommendations for preventive pediatric health care (RE9939), American Academy of Pediatrics policy statement. 2000. Available from: <<http://www.aap.org/policy/periodicity.pdf>>