The Impact of Health Insurance Coverage on Health Care of School Children

JOY G. CAUFFMAN, Ph.D., MILTON I. ROEMER, M.D., and CARL S. SHULTZ, M.D.

THE IMPACT of health insurance on the receipt of medical care by families has been well documented, but the impact of health insurance on the receipt of health care by children following referral from a school health program has not been explored. Many studies have shown that at all ages, childhood included, insured persons receive more medical and dental care, hospitalization, and prescribed drugs than do noninsured persons (*1*, *2*). There is little doubt that the overall increase in the volume of medical care received by Americans over the last 30 years is, in large part, attributable to the extension of insurance against medical costs. While the most widespread form of insurance covers hospitalization for about 75 percent of the population, its protective effect doubtless fans out to other elements of health care by cushioning family budgets against the major expense of hospitalization.

School physicians and dentists have been examining children for years. Every school nurse, however, can report instances of defects discovered but not corrected. While many factors exert an influence on the family's behavior toward a child's health problem, insurance coverage would be expected to be one of these factors. Despite this probable connection between a family's health insurance coverage and the outcome of referral from school health examinations, elementary and secondary school authorities have shown little direct interest in the insurance status of pupils. (An exception is the widespread interest of school authorities in promoting insurance to cover services required after accidental injury.) This is in contrast to the interest of college health administrators in the insurance field.

We have examined directly the association between the likelihood of a child receiving professional care following referral from a school health program and the health insurance coverage of his family. Our hypotheses were that insurance coverage would be associated with a greater likelihood of receipt of needed health care and that certain types of insurance would be more effective than others.

Methodology

A comprehensive description of the basic procedures followed in this study has been reported elsewhere (*3*). The methodology for studying health insurance coverage, however, requires explanation here.

Data regarding 458 fourth grade children with health defects (92.5 percent of the sample) were used. These children attended 48 Los Angeles city schools, 24 located in lower social

Dr. Cauffman is with the University of Southern California School of Medicine, Los Angeles. Dr. Roemer is with the School of Public Health, University of California at Los Angeles. Dr. Shultz is with the Division of Community Health Services, Public Health Service. *This research was supported by contract No. DHEW–PH–108–64–17 from the Division of Community Health Services, Public Health Service. Computing assistance was obtained from the Health Sciences Computing Facility, University of California at Los Angeles.*

rank study areas and 24 in upper social rank study areas. Lower social rank areas included Venice, social rank 5; and West Adams and Leimert, social rank 4. Upper social rank areas included West Los Angeles, Palms, West Wilshire, Wilshire Pico, and West Hollywood, social rank 2. The selection of these study areas was based upon "Background for Planning," a source of demographic information for Los Angeles County (*4*). The author, Marchia Meeker, developed an index to permit a socioeconomic ranking of all study areas by using three indicators—occupation, income, and education. On a six-point scale, an index score of six designates the lowest stratum or social rank 6; a score of one, the highest stratum or social rank 1.

Children with defects were identified through dental, otological, and general medical examinations which were administered by dentists, otologists, and other physicians during the 1963–64 school year. All children with medical or a combination of medical and dental defects (422) entered the sample, whereas 20 percent of the children with only dental defects (73) were selected by use of a systematic sampling technique. If a child had more than one defect, the physician's or dentist's urgency rating on a 4-point scale was used to determine saliency. Only the most salient defect was included when a child had more than one defect.

Parents were notified by school personnel that their child had a defect needing attention and advised that professional care should be sought. When parents took positive action following notification, the nurse recorded on the health record card that the child had received professional attention. "Received attention" was defined as meaning the child's defect has been corrected, the child has been taken for care but care was deemed unnecessary or the condition was uncorrectable, or the child is under private or clinic care (*3*).

Two instruments, a report of a single health defect and an interview schedule, were adapted and utilized in gathering data from pupil health records and from parent interviews, respectively. These instruments were initially developed by Dr. Ira Gabrielson and Dr. Lowell Levin of the Yale University School of Medicine. Eight school nurses surveyed the records and 14 field investigators interviewed parents. The school's reports on the outcome of referral served as the dependent variable. Data from the parents' reports, such as family background characteristics and health insurance information, yielded the independent variables.

Field investigators asked parents if they belonged to a health insurance plan. Those parents who said they did were asked to identify the plan and to verify their membership. Investigators found it necessary to recontact some parents to obtain specific and accurate insurance information. Parents frequently named an employer, union, or organization through which they paid their premiums, rather than the name of the insurance plan itself. In these instances, Doreen H. Abbott and Peter M. Douglas, School of Public Health at the University of California at Los Angeles, contacted the organization or employer to determine the identity of the insurance carrier. In all, they verified that 93.6 percent of the families who claimed to have insurance actually did.

Licensing of all commercial insurance companies was then checked. The California State Department of Insurance provided an official list of insurance organizations authorized to transact business in the State (*5*), against which the insurance organizations named by parents were compared. In addition, letters were written to representatives of all insurance carriers or sponsors to verify that each provided one or more health insurance policies.

Finally, all plans were categorized by type of sponsorship and mode of practice. The types of sponsorship included were commercial insurance companies, providers of service, and consumers or their employers. The mode of practice was either individual or group.

This classification along two dimensions yielded a typology of six health insurance plans with varying combinations of sponsorship and practice (*6*). The provider sponsorship combined with individual practice plans are illustrated by Blue Cross and Blue Shield. An example of provider sponsorship and group practice is the Ross-Loos Clinic Plan. The Kaiser-Permanente Health Plan, important in California, illustrates sponsorship by consumers or their employers combined with group practice. The combination of commercial sponsor-

Table 1. Health insurance categories related to high-low social ranks, Los Angeles, Calif., 1963–64

Insurance categories	Families in high social ranks		Families in low social ranks	
	Number	Percent	Number	Percent
Mode of practice:				
Individual	123	75.9	120	75.0
Group	39	24.1	40	25.0
Type of sponsorship:				
Commercial	83	51.2	91	56.9
Provider or consumer	79	48.8	69	43.1

NOTE: Of 344 insurance plans reported by families, 322 were verified and classified.

ship and individual practice was the commonest type of plan. Statistical assistance in analyzing these plans and making other appropriate statistical tests was provided by John A. Emrick and Edward A. Warburton of the School of Public Health of the University of California at Los Angeles.

Results

Insurance coverage. It is of interest to describe first the extent of insurance coverage. Of the 458 families, 75.1 percent had some form of protection—a rate corresponding well with the national average. Sixty different insurance carriers were involved. Of these, 51 were commercial insurance companies which covered 45.9 percent of the families within the six categories of plans. The remaining nine included Blue Cross and Blue Shield plans, the Kaiser-Permanente Health Plan, the Ross-Loos Clinic Plan, and several smaller independent plans. For purposes of data analysis, families with multiple health insurance plans were represented by only one plan. When both the father and the mother belonged to separate plans, the father's plan was used for analysis.

The distribution of insured and noninsured families by socioeconomic rank also coincided with nationwide findings of the National Health Survey (*7*). Coverage in the high socioeconomic ranks was 81.5 percent, compared with 69.6 percent in the low socioeconomic ranks—a statistically significant difference ($P<0.01$). Further, health insurance categories were analyzed by social rank and families in high social ranks did not differ significantly from families in low social ranks with respect to either type of sponsorship or mode of practice (table 1). It was no surprise that private, individual practice predominated with 75.5 percent of the insured families enrolled under plans based on this type of practice. The remaining 24.5 percent of the families were covered by plans using group practice clinics.

The distribution of insured families was found to be significantly related to racial-ethnic background. Of Negro families and families with Spanish surnames surveyed, 66.7 percent were protected by health insurance as compared with 81.4 percent of Caucasian and oriental families ($P<0.001$). When social rank was controlled, this association disappeared in high social ranks and became weaker ($P<0.05$) in low social ranks. This suggested that the racial-ethnic background of the family was probably unimportant in relation to insurance coverage in high social ranks but might have been important in low social ranks.

Furthermore, as shown in table 2, fathers who had had an education beyond high school were more likely to be insured than those with a high school education or less ($P<0.001$). When social rank was controlled, significant relationships disappeared in high social ranks, but remained ($P<0.01$) in low social ranks. Fathers with white-collar occupations were not significantly more likely to have health insurance cov-

Table 2. Education and occupation of father as related to family health insurance coverage, Los Angeles, Calif., 1963–64

Variables	Fathers carrying health insurance	
	Number	Percent
Education:		
More than high school	[1] 151	84.4
High school or less	177	69.7
Occupation:		
White collar	100	80.6
Blue collar	158	74.5

[1] $P<0.001$.

NOTE: The number of fathers does not add up to 344 because some fathers were unemployed and others were not living with their families.

erage than fathers with blue-collar occupations. This finding may reflect the negotiated fringe benefits achieved by blue-collar workers in many industries.

Finally, for combined social ranks, size of family was not significantly related to health insurance coverage. However, in upper social ranks coverage was slightly greater among smaller families, while in lower social ranks it was slightly greater among larger families.

Receipt of medical care. The critical question was the relationship of health insurance coverage to receipt of health care by the child with a school-detected defect. In the 344 families with health insurance, 52.3 percent of the children (180) received attention for their defects; 37.7 percent of the children (43) in the 114 families without insurance received attention. This finding was significant at the 0.01 level of confidence and was in the predicted direction.

Of course, this relationship may reflect the lower socioeconomic status of the noninsured families. However, when social rank was controlled the relationship disappeared in high social ranks, but remained in low social ranks ($P<0.05$). Higher income families obtained health care for their children with or without insurance coverage. In lower income families, however, insurance made a difference in the likelihood of securing care.

Another form of health-related insurance is available to all children attending the Los Angeles city schools. This is the Student Accident Insurance Plan (SAIP), authorized by the board of education and underwritten by the Occidental Life Insurance Company of California. Of the 458 families in this study, only 15.8 percent subscribed to SAIP. Of these families who elected SAIP, 50.7 percent obtained corrective health care for their children, while 48.5 percent of the families who did not elect SAIP obtained care. This difference was not statistically significant nor was the relationship between membership in SAIP and membership in a health insurance plan.

As shown in table 3 the sponsorship of the health insurance plan by commercial carriers in contrast to that by providers of service or consumers made no significant difference in the receipt of care. Likewise, it made no significant difference in the receipt of care if service was by professionals in individual or group practice. A difference, however, was found regarding periodic health examinations among children whose families were members of group practice plans as opposed to children whose families were members of solo practice plans. Periodic checkups, which may be taken as an index of the plan's preventive orientation, were received by 50 percent of the children under the group practice insurance plans, compared with 36.2 percent of the children under the more conventional solo practice insurance ($P<0.05$). When social rank was controlled, this effect of group practice insurance disappears in high social ranks, but remains in low social ranks. Those families in the lower income groups participating in group practice arrangements were more likely to obtain preventive services. We know that this type of plan tends to offer more comprehensive benefits, with fewer extra expenses for the patient (*8*).

Table 3. Relationship of health insurance categories to outcome of referral for school-detected defects, Los Angeles, Calif., 1963–64

Insurance categories	Children receiving attention	
	Number	Percent
Mode of practice:		
Individual	125	51.4
Group	43	54.4
Type of sponsorship:		
Commercial	89	50.9
Provider or consumer	79	53.0

Health care may be facilitated by governmental programs, even in the absence of health insurance. In our sample of low-income families, 212 were self-supporting, while 35 were recipients of public assistance and, therefore, entitled to certain health services financed by welfare agencies. These publicly aided families secured care for their children in 45.7 percent of the instances; other low-income families secured care in 35.9 percent of the instances. This difference, however, is not statistically significant and the availability of public assistance

seemed to be no guarantee that care would be obtained.

Finally, one may ask if there is a relationship between corrective care and the nature of a defect. Of the 458 defects identified in the study, 186 were visual, 104 were dental, and 168 were medical (excluding dental and visual). The latter included 30 orthopedic disorders, 29 hearing defects, 29 weight problems, 21 nose and throat problems, 21 mental-emotional difficulties, and 38 "all other" conditions. We know, however, that virtually all health insurance coverage is confined to benefits for hospitalization and certain physician services; insurance for dental care and visual refractions or eyeglasses has been very uncommon.

Therefore, we examined the receipt of health care by insured and noninsured persons according to two main diagnostic groupings—dental and visual defects and medical defects. Apparently insurance coverage was associated with a greater likelihood of corrective care for both diagnostic groupings, but the relative value of insurance was significantly greater ($P<0.05$) for medical than for dental and visual conditions (table 4).

From these findings one cannot assert that health insurance coverage was solely responsible for the fact that children from insured rather than from noninsured families were more likely to receive attention. Health insurance enrollment was associated with features of a family's life and culture which influence directly the attention given to child's health problems. Noninsured families were more likely to be of low social rank (low income and education) and deprived minority ethnic background. Even among the lower social rank families examined a range of income and educational levels existed and may partially have accounted for the insured-versus-noninsured differentials within this rank.

Table 4. Relationship of diagnostic groupings to outcome of referral for school-detected defects, Los Angeles, Calif., 1963–64

Diagnostic groupings	Children receiving attention	
	Number	Percent
Insured:		
Dental and visual defects	105	47.9
Medical defects	[1] 75	60.0
Noninsured:		
Dental and visual defects	24	33.8
Medical defects	19	44.1

[1] $P<0.05$.

Despite these limitations, the fact emerged that health insurance coverage was associated with greater attention to the care of defects found in school examinations. The specific value of coverage was underscored by the finding of a higher association of care with insured status for medical defects than for dental or visual defects (which were seldom actually covered by insurance policies). Insurance, furthermore, may have had a beneficial overall effect on family behavior by bringing the family into closer general contact with the world of scientific medicine.

It would seem, therefore, that there are at least two important implications from these findings for school personnel. First, among children of families from lower social ranks more intensified referral activities might be directed toward all noninsured families. Second, all noninsured families, particularly those in low social ranks, should be encouraged to procure health insurance coverage. This might be done through educational efforts by schools, parent-teacher associations, local medical societies, and other groups. Such coverage undoubtedly would enhance the success of referrals from school health examinations.

Summary

The relationship between family health insurance coverage and the likelihood of children receiving professional care following referral from a school health service program has been explored using a sample consisting of 458 fourth grade children with health defects. These children attended 48 Los Angeles city schools where their defects were identified through school health examinations. Data relating to these children were obtained from school health records, interviews with parents, and communications with insurance personnel.

Children from insured families were more likely to receive care for their defects than were

children from noninsured families. The probability of receiving care for school-detected defects, however, was not affected by categories of health insurance coverage (type of sponsorship and mode of practice). Children from families that belonged to group practice plans were more likely to obtain periodic health examinations outside the school setting than were children from families that belonged to solo practice plans. Although more families from high social ranks had health insurance coverage, the beneficial effects of coverage, as measured by the child's receipt of health care for the specific school-detected defect and by the child's receipt of periodic health checkups, were greater among families in low social ranks. Benefits of coverage also were greater for medical than for dental and visual defects.

It is suggested that school personnel direct intensified referral activities toward noninsured families, particularly those in low social ranks. Furthermore, both school and community leaders should encourage these noninsured families to obtain health insurance coverage.

REFERENCES

(1) Anderson, O. W., and Feldman, J. J.: Family medical costs and voluntary health insurance: A nationwide survey. McGraw Hill, New York, 1965, pp. 55–75.

(2) Somers, H. M., and Somers, A. R.: Doctors, patients, and health insurance. Brookings Institution, Washington, D.C., 1961, pp. 167–187.

(3) Cauffman, J. G., Petersen, E. L., and Emrick, J. A.: Medical care of school children: Factors influencing outcome of referral from a school health program. Amer J, Public Health 57: 60–73, January 1967.

(4) Meeker, M.: Background for planning. Welfare Planning Council, Los Angeles Region, Los Angeles, 1964, pp. 1–92, i–lxvii.

(5) State of California Department of Insurance: Insurance organizations authorized by the insurance commissioner to transact business of insurance in the State of California during 1964. San Francisco, 1964, pp. 1–22.

(6) Sasuly, R., and Roemer, M. I.: Health insurance patterns: A conceptualization from the California scene. J Health Hum Behav 7: 36–44, Spring 1966.

(7) U.S. Public Health Service: Medical care, health status, and family income, United States. PHS Publication No. 1000, Series 10, No. 9. U.S. Government Printing Office, Washington, D.C., 1964, pp. 5–10.

(8) Williams, J.: Family medical care under three types of health insurance. Foundation on Employee Health, Medical Care, and Welfare, New York, 1962, pp. 1–202.

Detecting Immunity to Rubella

A test for detecting immunity to rubella has been developed by scientists of the Public Health Service's National Institutes of Health. Called the hemagglutination-inhibition (HI) test, it employs the biological principle of hemagglutination, or red blood cell clumping, used successfully in studies on influenza and other diseases. The new test enables a physician to determine within 3 hours whether an expectant mother has antibody protection against the disease.

Other advantages of the HI test are its simplicity, sensitivity, and reliability. It can disclose immunity years after infection. None of the previous techniques of rubella antibody measurement—neutralization, complement fixation, and fluorescence—has all these attributes, although each has had its own area of usefulness.

The new immunity test is so inexpensive and easy to perform that it is expected to become routinely available soon in hospitals, health departments, and other laboratories.

In addition, it promises to speed the availability of rubella vaccines since the effectiveness of experimental attenuated virus preparations being used in clinical trials can be judged with far greater rapidity.