
Screening and Referral Outcomes of School-Based Health Services in a Low-Income Neighborhood

THE EFFECTIVENESS OF A SCHOOL HEALTH PROGRAM in responding to the health needs of children has been questioned by many observers. The low yield of routine physical examinations, absence of satisfactory followup of children with disclosed defects, inadequate linkages with other health care providers, and lack of attention to behavioral and emotional difficulties have been widely criticized.

In an effort to fill in many of the gaps and to address some disadvantages of the traditional school health services, the Division of Community and Social Pediatrics of Harlem Hospital Center is conducting a health program at two elementary schools in central Harlem. The two schools, with a total of approximately 2,000 students, are located in a medically indigent area where children are largely dependent on public medical care.

The program provides casefinding, followup, and health education. Two years after the program began, we evaluated it for one of the schools with respect to its effectiveness in disclosing health problems, insuring followup, and maintaining linkages with other health care providers and the school staff. We reviewed the school health records for January–March 1974 for 221 second graders who were in the program for 1 year. From this review, we obtained information on health status, referral process, and referral outcome.

The Setting

The two schools are located in the upper triangle area of the Central Harlem Health District, an area that contains two large public housing complexes. Because the boundaries for this triangle area are the same as for the census tract in which it is located and most of the students of the two schools come from the two housing complexes, the information gathered for the census tract provides a description of the students' environment.

According to the 1970 census, 10,591 persons lived in this area; 79 percent were black, 17 percent were of Puerto Rican birth or parentage, and 4 percent were of other ethnic groups. There were 2,693 children 6–14 years old, and 80 percent of the elementary school children were in public schools. Only 34 percent of the persons 25 years and older had completed high school. The most frequent occupational groups were clerical workers, service workers, and transit operators. The median income was \$6,175; 87 percent of all heads of families were employed. About 20 percent of the families' incomes were below the poverty level.

According to the classified telephone directory and the American Medical Association's list of members and nonmembers, no private physicians practice in the area. Only two pediatricians live or practice nearby. The area has no direct public transportation to the two largest hospitals in the community; travel on two buses or bus and subway is required. The only pediatric care available is at the New York City Child Health Station, located in one of the housing complexes. This station recently extended its functions to provide treatment in addition to well-baby care; it is a major source of care for children in the area.

The School Health Program

The health team for each school consists of two part-time pediatricians, one registered nurse with training in health education, and two community health paraprofessionals. (Most traditional school health programs in New York City have only a physician and a nurse several half-days a week.) The following services were provided by the program:

- Health assessment and casefinding by means of mass screening examinations and laboratory tests.
- Followup of children referred elsewhere because of health problems disclosed by the examinations, espe-

cially through close liaison with backup hospitals in the community.

- Screening procedures carried out by trained paraprofessionals who were primarily responsible for the followup of referred children.
- Health education which emphasized not only teaching in the classroom but also activities for the children, parents, and teachers.

The community health paraprofessionals maintained a vital link between the classroom, the home, and the school health program. They were trained to complete a structured interview and medical history form, to measure height and body weight, to perform vision and audiometric screening, and to take temperatures. These paraprofessionals obtained the children's medical histories when they entered school. Later, the pediatricians gave the children physical examinations, and the paraprofessionals tested the children's vision and hearing and measured their height and weight. The paraprofessionals also screened most of the students for anemia.

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When health problems were observed by the pediatricians, the nurse sent notices to the parents, and the community health paraprofessionals either telephoned the parents or visited them at home to inform them about the conditions and to tell them how to obtain medical attention for their children. If parents failed to obtain the care after several notices or home visits, the paraprofessionals—with parental consent—took the children to hospital clinics or accompanied the parents during the initial visits to the clinics.

Students, teachers, and parents participated in the health education component of the program. A discussion series, "Family Life Education," was held at the school during the day. The series was aimed at improving understanding of body functions and family life, particularly as they concern reproduction and sexuality.

Sessions on nutrition were held days and evenings at the school. The nutrition component consisted of (a) a program for parents on consumer education, food purchasing, and low-calorie cooking and (b) a weight loss class for obese children that emphasized diet education. The community health workers took such children hiking, bicycling, roller skating, or engaged them in other physical activities.

School Health Records

The school health records were useful for retrospective analysis. Personal and medical information about a child were recorded on two forms. One form was the school medical record of the New York City Health Department. The other form was a prestructured record designed by the school health team for interviewing and history taking by the community health paraprofessionals; it included selected sociodemographic characteristics, previous sources of medical care, histories of family members, growth and development, past illness, immunization status, and results of the physical examination. After completing the physical

examination, the pediatrician reviewed the child's history and entered any health conditions requiring medical attention in the section "diagnosis and recommendations."

Study Method

During the spring of 1974, two research workers—trained in abstracting school health records—reviewed the records of all the second graders, under the supervision of a physician. The program had been in existence for only 2 years, and the examinations were performed shortly after admission. Therefore, second graders were selected for the study because they had been in the program for at least 1 year. A total of 221 records were studied. All the second graders had received vision and hearing tests and had their height and weight measurements taken; however, 31 did not receive physical examinations—primarily because they had been transferred to the school in mid-semester.

For the purpose of this study, a health problem was defined as any abnormal finding noted by the examining physician. A referral was defined as a notation by the examining physician of a positive finding for which further consultative, diagnostic, or therapeutic intervention was needed. Information about the referral process was abstracted from the chronological notes on the health record and categorized according to a conceptual framework of the referral process, which consisted of contacting the parents, getting the child to a facility, receiving a return report from health care providers, and carrying out the action recommended. From this framework, we collected information on the referral process, method of contact with parents, parental knowledge of the health problem, parental refusal to cooperate, place of referral, report from health care provider, result of the report, and action recommended by the provider.

Referral outcome was determined by whether attention was received for the specific condition for which the child had been referred: "Attention was received" if (a) care had been received and the condition was corrected or resolved, (b) care had been received but the condition was still present or uncorrectable, or (c) the condition was presently under care. "Attention was not received" when the health record showed no evidence of action on referral or that there was only initial contact with parents or health facilities without further followup.

The status of referral outcome was determined by the information on the records of action taken on or before January 1, 1974, for health conditions disclosed in the examinations performed during the school year starting in September 1972.

Findings

Demographic information. Almost all students in the study lived in the two housing projects across the street from the school. About 75 percent of the students were

black, and the remainder were Puerto Rican or other Hispanic groups. Almost two-thirds lived in families having two adults, including persons 18 years or over; the remainder were living with three or more adults. The average number of children at home was 3.4, and 60 percent of the study students were living in families with three or more children. The school health records for 75 percent of the students listed a telephone number where parents could be reached.

Sources of care. Forty percent of the students' families had registered with Medicaid; this figure may be an overestimation because school health records generally are not updated if Medicaid coverage lapses. Only 15 percent of the families had sought private medical care, mostly from private physicians. A small number of students went to "storefront" medical group clinics and to the Health Insurance Plan of Greater New York (HIP). Almost two-thirds (62 percent) of the students had received preschool medical care at the New York City Child Health Station. More than three-fourths of the students received inpatient or outpatient care at hospitals—Harlem Hospital, Columbia Presbyterian Medical Center, and other hospitals in east Harlem.

In the following summary of the sources of care, the sums of the numbers and percentages of students who used each facility are greater than the total number of children because many children attended more than one facility:

Type of facility	Ever used	
	Number	Percent
Child health station	120	62.2
Hospital	148	76.7
Private physician	29	15.0

Immunizations and laboratory tests. The immunization status of the students was uniformly good. About 88 percent had received three initial doses and one subsequent dose of DTP, and about 87 percent received three initial doses and one subsequent dose of trivalent oral poliomyelitis vaccine. Approximately 95 percent had received vaccination for rubella and for measles. However, only 79 percent had all of these immunizations; the remaining 21 percent lacked at least one, as shown in the following table.

Immunization	Number with information recorded	Immunized	
		Number	Percent
DTP	216	191	88.4
Poliomyelitis	216	188	87.0
Measles	215	205	95.3
Rubella	218	203	93.1
All of the above	219	172	78.5

Sixty-four percent or 141 students were screened for anemia, and 6 percent of these had low hematocrit levels of 33 percent or less. The mean hematocrit level was 37.7, with a standard deviation of 2.7. The distribution of hematocrit levels was as follows:

Hematocrit (percent)	Number	Percent
30 or less	2	1.4
31-33	7	5.0
34-36	39	27.6
36 or more	93	66.0
Total	141	100.0

Approximately 80 percent of the students received a tine test for tuberculosis, either through the school health program or at other facilities. One student who had been given a BCG inoculation had a positive skin test.

Physical examinations. As mentioned earlier, for this study any abnormal finding noted by the examining physician that was indicative of, or potentially related to, a health condition was defined as a health problem. Complete physical examinations were performed on 190 or 86 percent of the students; no abnormal findings were recorded for 81 of these students. For the remaining 109, the abnormal findings were: 72 students, 1; 22 students, 2; 9 students, 3; 4 students, 4; 1 student, 5; and 1 student, 6. Thus, a total of 170 health problems were noted among the 190 students examined. However, if dental conditions are excluded, more than half of the students had no health problems and only 4 percent had three or more.

Skin, eyes, nose and throat, dental, cardiovascular, and speech and hearing conditions accounted for almost four-fifths of the 170 health problems disclosed by the examinations. The most frequent specific problems were, in order of prevalence, dental caries, enlarged tonsils, speech impediments, and heart murmur (table 1).

Referrals. Further consultative, diagnostic, or therapeutic care was recommended for 111 or two-thirds of the 170 health problems. The examining physician referred children with 60 percent of the 111 problems to outpatient departments of Harlem and Presbyterian Hospitals; children with 18 percent to the school health services—school physician, school dentist, or guidance counselor—mostly for dental and speech problems; children with 19 percent to other health care providers, usually previous sources of care; and children with 3 percent to private physicians.

All children with dental problems were referred to the dental service program within the school, which is responsible for followup of these problems. The activities and results of this followup were rarely entered on the school medical records because the dental program was under a separate administrative entity. Therefore, the referral outcome for health problems other than dental is a more valid measure of the success of the health team's effort in the referral process. If dental problems are excluded, children with two-thirds of the health problems did receive medical attention. Care was not initiated for children with five health problems primarily because these problems were only

Table 1. Specific health problems, by referral recommendation and referral outcome

Health problems	Number	Referral recommended	Attention received
Skin:			
Eczema	4	3	3
Impetigo	1	1	..
Traumatic	5	2	2
Other	2	2	..
Eyes:			
Strabismus	5	3	3
Other congenital ¹	2	1	1
Lacrimal duct obstruction	1	1	1
Traumatic	1	1	1
Refractive ²	7	5	4
Ears:			
Serous otitis	1	1	1
Acute otitis	1	1	..
Nose and throat:			
Oral thrush	1	1	1
Enlarged tonsils	20	5	3
Tonsillitis	1	1	..
Other	2	1	1
Dental and dentition:			
Caries	47	38	32
2° enamel dysplasia	1
Wide space between teeth and malocclusion	3	2	1
Prophylaxis needed	2	2	1
Chest and pulmonary:			
Bronchitis	3	2	1
Cardiovascular:			
Functional murmur	11	7	6
Organic murmur	1	1	1
Abdomen:			
Umbilical hernia	3	2	1
Mass	1	1	1
Genital and urinary:			
Phimosis	1	1	..
Right hydrocele	1	1	..
Undescended testicles ..	1	1	..
Hypospadias	1	1	1
Vaginal discharge	1	1	..
Extremities:			
Abnormality of spine	1	1	..
Club foot	1
Flat feet	3
Thumb and toe deformity .	1	1	1
Other	1	1	1
Central nervous system:			
Mental retardation	1	1	1
Hydrocephalus	1	1	1
Seizure	2	2	2
Speech and hearing:			
Failed audio test	4	3	2
Speech impediment	12	11	7
Physical appearance:			
Obesity	7	1	..
Small stature	1
Pallor	3	1	..

¹ Including congenital ptosis and asymmetric eyes.

² Including minor and major refractive problems, failed vision test, and amblyopia.

³ All children with dental caries were referred to the school dental service which assumed major responsibility for dental followup. Because activities of dental followup were seldom entered on the medical record, this figure does not reflect the referral outcome for dental care.

recently discovered (table 2). No apparent relationships were seen between the receipt of attention and Medicaid status, telephone availability, or family size.

Discussion

The classic studies of Yankauer and associates concluded that periodic medical examinations of elementary students are of little value from a casefinding standpoint (1-4). Studies of mass-screening physical examinations showed that a range of 13 to 21 percent of the children examined had some health defects or adverse conditions that required attention (1,2,5-7). But consistently less than 5 percent of the children examined had previously unknown abnormalities (2,5). Health problems of school-age children consisted mainly of visual, hearing, dental, nutritional, and skin problems (5,8,9). Most of these problems could be identified by paraprofessionals using screening tests, without physical examinations by health professionals (10).

In our study, the examining physician noted that 57 percent of the children had one or more health problems. No major health problems were commonly disclosed by the screening component of the school health program. Many of the conditions found in this study are functionally important but not life threatening. Dental caries was the most prevalent problem noted by the examining physician; this finding is consistent with that of other studies (9,11). The incidence of anemia—5 percent of the children had hematocrit levels lower

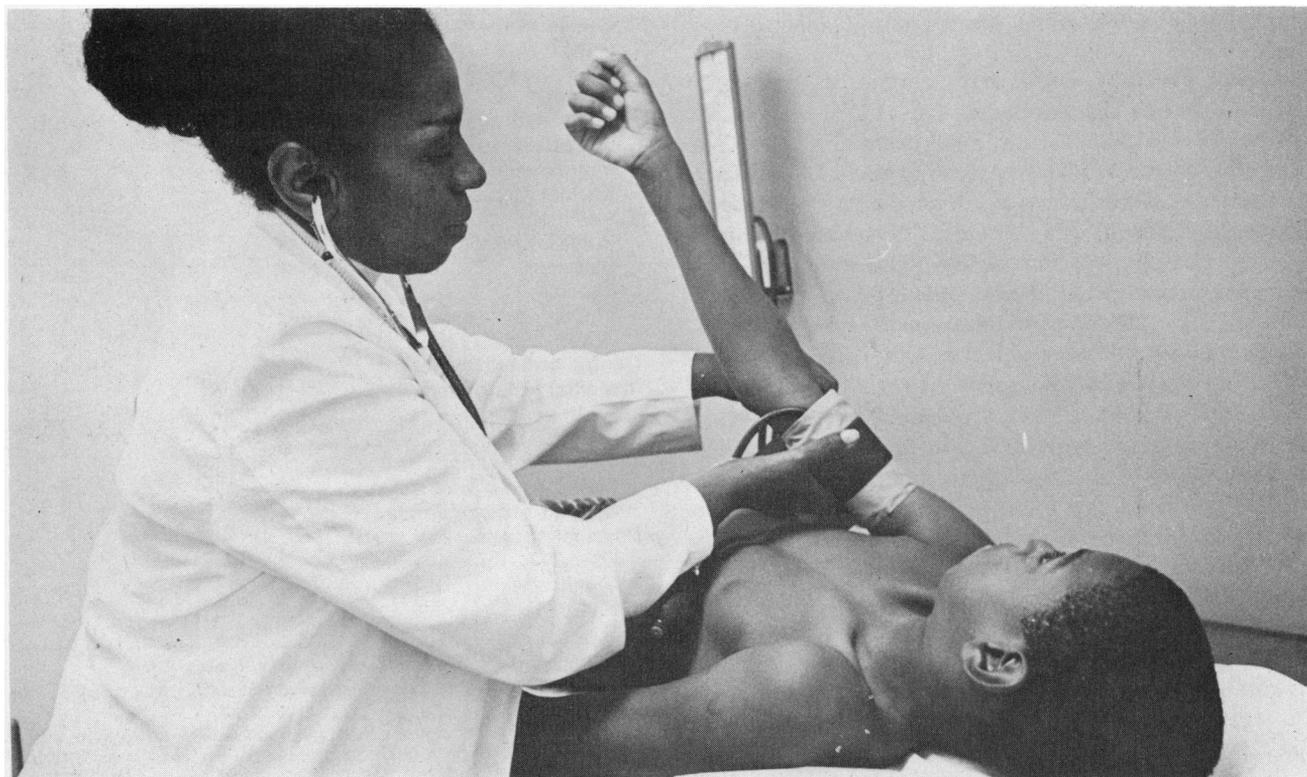
Table 2. Referral outcome for 69 health problems, excluding dental

Referral outcome	Number	Percent
Attention not received	22	31.9
Care not initiated ¹	5	7.3
Initial action taken ²	17	24.6
Attention received	47	68.1
Presently under care	17	24.7
Care received, health problem corrected	27	39.1
Care received, health problem not corrected	3	4.3

¹ No evidence was found on record concerning action taken pursuant to examining physician's referral.

² Including initial contact with parent or facility, or both, without further followup and parental refusal.

Summary of findings. Of 190 students examined, 109 or 57 percent had a total of 170 health problems. Referral for further consultative, diagnostic, or therapeutic care was recommended for children with 111 health problems. When dental problems were excluded, 87 of the 190 students had a total of 116 medical problems, an average of 0.5 problem per child. Referrals were recommended for children with 69 medical problems, and attention was received for 47 of these. Of the 22 problems for which attention was not received, action was not initiated for 5 and initial action was taken for 17.



than 33 percent—was similar to the findings of nationwide studies and indicated the importance of this screening procedure (12-14). Five percent of the students had vision problems; a finding that is also comparable with that of other studies (5,6). Children with enlarged tonsils and heart murmur were frequently noted by the examining physician, but few warranted referral for further care. In the past few years, many observers in other parts of the country have questioned the value of mass tine test screening because of its low case yield. This study revealed one child with a positive tine skin test as a result of previous BCG inoculation. However, because central Harlem has a high prevalence of tuberculosis, this routine screening procedure will be continued in this school.

The greatest lack in most school health programs is the followup of children who are in need of care. The School Health Utilization Study performed in New York City schools in 1965 (15) disclosed that 31 percent of the children referred for treatment at backup facilities had not been placed under satisfactory care at the end of the year. The study also showed that the average time lapse from the date a defect was discovered until a referral form was issued and returned was more than 5 months. A study of a health evaluation project of an elementary school in Harlem (8) found that 56 percent of the children who took part in the health evaluation had physical or laboratory findings indicating a need for further medical or dental attention, and all were referred for diagnosis and treatment. However, the analysis of referral showed that about three-quarters of the children referred for further evaluation either failed to receive any medical attention, or care was delayed for many months, or the school did not receive completed reports. Most school health programs have ignored Yankauer's suggestion that "concentration of attention and effort to meet the needs of selected children who can be screened from the larger group by means other than a periodic physical examination would appear to be a more constructive role for school medical personnel in elementary schools than a more general diffusion of their efforts" (3).

In our study, children with two-thirds of the medical problems recommended for further care did receive attention; this proportion is considerably higher than the referral completion rate reported for traditional school health programs using the usual staffing patterns (8,16). In relating socioeconomic factors and family background characteristics to referral outcome, Cauffman and associates (16) found that referral outcome was significantly related to social rank, parent education, parent occupation, family size, and ethnicity.

In view of the low socioeconomic status and educational level, as well as the ethnicity of our study area, we believe that the better rate of attention received for referred children than that of populations of higher or comparable socioeconomic status resulted from the

effort of the school health team and especially from the effective use of community health paraprofessionals.

The high rate of students with hospitals as their source of medical care and the high proportion of referrals made to the outpatient departments of the two backup hospitals are indicative of the dependency of the study students on large municipal and voluntary hospitals in upper Manhattan. The findings that only 15 percent named a private physician as a source of medical care and that children with only two health problems disclosed in the physical examination were referred to private physicians also illustrated the inaccessibility of private medical care in the community.

A limitation of the method of using school health records to analyze the referral process was the inadequacy of the forms and associated procedures for recording information essential to the followup of a health problem. Although it was the policy of the school health program to contact parents whenever a health problem needing medical attention was noted, only half of the records of health problems disclosed had an entry regarding parental contact. Moreover, of those parents contacted, more than half of the records did not indicate the method of contact. Parental previous knowledge of the health problem was seldom indicated on the school health record.

There is a need for a more effective school health recordkeeping system. The health team spent a large proportion of time keeping and updating various health records and forms. In many instances the same information was being recorded on two or more forms. Certain records were designed by the team, and other records were mandated by the New York City Health Department. This double "bookkeeping" resulted both in duplication and gaps in the health data system because no unified medical record existed.

As a result of the study, the research team and school health staff collaborated in revising the recordkeeping system. The school medical records were consolidated and redesigned so that a unified health record containing all relevant information for each child was available. A daily activity record was constructed to record all daily staff activities such as first aid, conferences, examinations, screening, followup, referral forms issued, immunization, and outside activity. With this form, monthly or yearly activities of each health team member could easily be obtained for both mandatory and internal reportings. An active case log was established so that those children in need of care could be identified, and appropriate highlight information pertaining to their specific active condition and the progress of followup would appear in this log.

The logsheet is a specific record of information on parental contact, method of contact, previous knowledge of the health problem, places of referral, treatment recommended, and treatment outcome; it clearly depicts the status of the referral process. When medical attention was received, the case would be "deactivated."

Implications

The results of this evaluation of the school health program underscore the importance of relevant school-based health services in medically underserved areas. Although extensive and traditional casefinding did not disclose major previously unknown health conditions, the monitoring of the referral process and surveillance of the referral outcome for children with health problems are priority activities in areas without ready access to health services. Maintenance of satisfactory immunization status is another function that can be performed well by a school health service. Public schools in low-income areas are particularly well suited for health monitoring because their students are enrolled from communitywide bases. Surveillance and monitoring of referral and followup activities require trained paraprofessionals as well as an adequate medical record system. School health resources must be concentrated on monitoring of children's health status, linking students who need medical care with sources of this care, health education, and the prevention and treatment of prevalent health problems that are functionally important in school-age children.

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SYNOPSIS

MAY LAN, SHU-PING (New York County Health Services Review Organization, New York City), LOEWENSTEIN, REGINA, SINNETTE, CALVIN, ROGERS, CONSTANCE, and NOVICK, LLOYD: *Screening and referral outcomes of school-based health services in a low-income neighborhood. Public Health Reports, Vol. 91, November-December 1976, pp. 514-520.*

A school health program, conducted by the Division of Community and Social Pediatrics of Harlem Hospital Center at two elementary schools in central Harlem, provides

screening, followup, and health education services. The children attending these schools are largely dependent on public medical care, with low accessibility and lack of continuity of care. The effectiveness of the program's services were evaluated with respect to screening and referral outcomes.

During the spring of 1974, the school health records were reviewed for the 221 children who had been in the program for 1 year in one of the schools. The evaluation results indicated that although major health conditions were not commonly dis-

closed by the screening component of the program, the examining physicians noted that 57 percent of the children had one or more health problems. Children with dental caries were the most frequently observed as well as the most frequently referred for care. Children with two-thirds of the medical problems who were referred for further care received medical attention. The program demonstrates the capability of relevant school-based health services in a low-income neighborhood to address the medical needs of elementary school children.