

AUDIT REPORT NO. 75-2

JANUARY 1975

PROGRAM AUDIT OF THE SCHOOL HEALTH SERVICES PILOT PROJECT

A REPORT TO THE GOVERNOR AND THE LEGISLATURE OF THE STATE OF HAWAII



THE OFFICE OF THE LEGISLATIVE AUDITOR

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The office of the legislative auditor endeavors to fulfill this responsibility by carrying on the following activities.

1. Conducting examinations and tests of state agencies' planning, programming, and budgeting processes to determine the quality of these processes and thus the pertinence of the actions requested of the legislature by these agencies.
2. Conducting examinations and tests of state agencies' implementation processes to determine whether the laws, policies, and programs of the State are being carried out in an effective, efficient and economical manner.
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PROGRAM AUDIT OF THE SCHOOL HEALTH SERVICES PROJECT

**A Report to the Governor and the Legislature of the
State of Hawaii**

**Submitted by the
Legislative Auditor of the State of Hawaii**

**Audit Report No. 75—2
February 1975**

FOREWORD

The legislature in 1970 authorized the initiation of a pilot project for school health services. The legislature expressed its desire to test and examine the feasibility of using health aides, under the supervision of public health nurses, to provide first aid, emergency care, and preventive care to students.

In 1973, the legislature requested our office to examine the effectiveness of the pilot project and to report our findings to the 1975 legislative session. This report is the result of our examination.

There are two major parts to this report. In Part II, we evaluate the effectiveness of the program, and the reader who wishes to obtain a quick overview of the results of our evaluation can refer to the summary on page 10. In Part III, we present our findings and recommendations with respect to a number of operational problems which we encountered during the course of the evaluation. The summary of findings with respect to these problems is to be found in page 49.

We requested the school health services advisory committee, which is responsible for coordinating, guiding, and evaluating the pilot project, to respond to the findings contained in the report. The committee's response is presented in Part V of this report.

We wish to acknowledge the cooperation and assistance extended to our staff by the personnel of the agencies we contacted during the audit.

Clinton T. Tanimura
Legislative Auditor
State of Hawaii

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PART I

INTRODUCTION AND BACKGROUND

Chapter 1

INTRODUCTION

In 1970 the state legislature, through the enactment of Act 130, authorized the establishment of a school health services pilot project. The pilot project was intended to provide direct emergency care and preventive health care services in the public schools through the use of health aides and school nurses. The 1973 committee on conference on the state budget¹ stated that an evaluation of the pilot project is needed before a decision can be made by the legislature on the future of the project. The legislature requested the legislative auditor to conduct the evaluation and determine whether the pilot project was cost-effective and whether its design would permit it to be extended statewide efficiently and effectively. This report is the result of that examination.

Objectives of the Examination

The examination had the following objectives:

1. To determine the effectiveness of the pilot project;
2. To examine selected management issues; and

¹Conference Committee Report No. 8, S.B. No. 1295, 1973, "A Bill for an Act Relating to the State Budget."

3. To estimate cost implications for a statewide program.

Scope of the Examination

The examination focused on the extent to which program objectives have been attained in the project schools. Certain other schools at which the new program was not in effect were designated as a "control group" for the purpose of comparing pilot project health services with regular school health services. The examination also included a review of management practices relating to the school health services program.

Organization of the Report

This report is presented in five parts.

Part I includes an introduction and some background on the school health services project.

Part II presents our findings regarding the effectiveness of the pilot project in achieving program objectives.

Part III presents our findings and recommendations regarding some selected problems relating to health screening policies

and procedures, general recordkeeping practices, and personnel policies and practices.

Part IV presents the costs of staffing should the project be expanded statewide.

Part V contains the response of the school health services advisory committee, which is responsible for coordinating, guiding, and evaluating the pilot project. Our comments on the committee's response are also included.

Chapter 2

SOME BACKGROUND

In the late 1950's, there was a growing concern over the lack of health services for students in Hawaii's public schools, and the department of education created 34 new health coordinator positions. These health coordinators were assigned to a number of schools to maintain health records and coordinate health services offered in the schools. Later additional non-health-related responsibilities were added to the coordinators' duties, diluting their role of health liaison to the schools, and the legislature, during the 1964 session, eliminated all health coordinator positions within the DOE. As a result, the department of health's public health nursing branch was asked to assume the coordination of all health services in the public schools.

In 1970, the legislature, recognizing a lack of adequate school health services, enacted Act 130, which established the school health services pilot project. The health services which the act intended for inclusion in the project were first aid and emergency care, and preventive health care. In addition, health center facilities were to be made available by the department of education.

The administration of the project was vested in the department of health (DOH) and the department of education (DOE) through an interdepartmental agreement in cooperation with the school health services advisory

committee.¹ The school nurses and health aides were to be provided, placed, and supervised by the department of health. The health aides were to be supervised by the school nurses and were to be "administratively responsible" to the respective school principals. The department of health's school health branch was to be responsible for the medical and nursing supervision of the project.

Organization and Function

The school health services system (which includes the pilot project) is basically a cooperative effort of the department of education, the department of health, and other cooperating agencies (e.g., Red Cross, Hawaii Heart Association). The general role of the DOH in school health services is to plan for school health services (in cooperation with the DOE), promulgate health regulations and standards, enforce regulations, and provide consultative services and selected health services in the schools. In each school, the day-to-day direction and implementation of school health services is the responsibility of the principal.

¹Act 130 provided for the formation of a school health services advisory committee to "coordinate, guide and evaluate" the pilot project. The committee was to be composed of 11 members (appointed by the governor) representing a variety of health-related organizations and government agencies. The committee was to be dissolved upon the completion of the project. The school health services advisory committee is referred to in this report also as the governor's advisory committee or GAC.

The following sections describe the function and role of the various organizational units in the DOH and DOE that are involved in providing the health services in the schools.

School health branch (DOH). The school health branch (SHB), in the children's health services division of the DOH, is primarily concerned with the health needs of the school-aged child. The major functions of this branch are the planning, coordination, and development of statewide school health programs and, in cooperation with the department of education and other cooperating agencies, providing health services in the public schools. The SHB also provides selected health services (e.g., vision and hearing screening) directly to parochial schools, smaller private schools, and preschools. Under Act 130, Session Laws of Hawaii 1970, the SHB is responsible for the medical and nursing supervision for the school health services pilot project.

Public health nursing branch (DOH). The public health nursing branch (PHNB), under the medical services division of the DOH, is responsible for all aspects of public health nursing throughout the State. The PHNB plans and conducts public health nursing services in support of such public health programs as maternal and child health, handicapped children's health, mental health, communicable diseases and immunization, and dental health, as well as school health services. Presently, public health nurses provide school health services, not including emergency care, to approximately 75 percent of the public schools in the State. The remaining 25 percent of the public schools are served by the SHB's Act 130 personnel as part of the school health services pilot project. The PHNB also provides health services to those private and parochial schools requesting its services.

Epidemiology branch (DOH). The epidemiology branch (EPI) in the communicable diseases division of the department of health is responsible for the prevention and control of communicable diseases in Hawaii. The major activities of this branch include: monitoring the

incidence of communicable diseases, investigating sources of disease outbreaks, disseminating information and providing consultation to health personnel and the public, operating clinics, and promoting and providing vaccines for the immunization and protection of the public.

The epidemiology branch's role in school health services is to assure compliance with Act 51, Session Laws of Hawaii 1974.² The epidemiology branch is responsible for monitoring the level of immunizations in the schools, conducting followup with parents and, if necessary, excluding from school students with deficient immunizations. The branch also conducts immunization projects in schools.

Student affairs section (DOE). In the department of education, the student affairs section in the special program branch of the office of instructional services is charged with the responsibility of maintaining liaison with the DOH and the various DOE units (i.e., districts and schools). The student affairs section serves the superintendent of education in a staff capacity and has no line authority to implement health services in the schools.

Scope of School Health Services

Health services rendered in project and non-project schools are similar in character. They include (1) emergency health assistance, (2) health problem identification, and (3) follow-up.

Emergency health assistance. Emergency care in the schools runs the gamut of care for illness and injury—from headache to serious illness, from minor scrapes and sprains to serious injury. Treatment includes administration of

²Act 51 requires all students admitted to any school for the first time in the State of Hawaii to be immunized against communicable diseases as specified by the department of health.

first aid, dispensation of certain medications,³ sending children home and sending children to a hospital by ambulance or by other means.

Health problem identification. The school health services program seeks to identify students with health problems that may impede learning or require treatment. These may include hearing or vision problems or learning disability, as well as disease.

Two activities, health screening and health record review, contribute to health problem identification. Health screening consists of the administration of hearing and vision tests and height/weight checks. Health records are reviewed to determine whether students have received the physical examinations and immunizations they are required by law to have before being admitted to school. The status of students' physical examinations, immunizations, and tuberculin tests is recorded and maintained on a department of education standard form (DOE Form 14), the Pupil's Health Record.

Follow-up. Students who lack physical examinations or immunizations or tuberculin testing may be referred to physicians for the needed service. When students are suffering from a health deficiency that impedes learning or otherwise needs attention, health personnel advise parents of the deficiency, recommend medical attention, and in some cases provide health counseling. If there is danger of an epidemic or large numbers of students lack immunizations, the epidemiology branch of the department of health may schedule clinics to provide the needed protection.

Limitation of the School Health Services Program

The school health services program is not intended to be a highly sophisticated health care delivery system. It is instead oriented to the

³Medication is not permitted to be dispensed in non-project schools by school personnel.

delivery of emergency care for relatively minor injury and illness, the prevention of communicable disease, and the detection of health problems that may impair learning. When more serious illness or injury occurs, other health programs and agencies or private physicians are expected to provide the care and greater sophistication of treatment that serious illness or injury requires.

This is not to say, however, that existing health programs necessarily address the whole range of existing or potential school-centered health problems. There could be a number of health problems that are important and need to be considered in the school setting. One might argue, for instance, that vehicular and aircraft noises not only impair the learning process at some schools, but also could have some effect on students' hearing. Certainly, students who do not receive adequate nutrition suffer from a health problem that has very real effects on their performance in school. Similarly, one may question whether venereal disease prevention programs adequately address upper grade level students, and one may question whether the more complex emotional and health needs of higher grade level students are well served by existing programs.

Whatever the case, these more difficult questions nevertheless lie outside the province of the school health care program as it now is structured. Addressing them in the school setting would require both a different approach to school health care and more and better qualified school health care personnel.

Health Personnel for Project and Non-Project Schools

This section identifies the personnel who perform school health services in project schools and non-project schools.

Project schools. Health services at project schools are performed primarily by health aides and school nurses. Each project school has one health aide (except for Hilo high school which

has two health aides) who mans the health room and provides the day-to-day health care services. In authorizing the provision for school health services in the pilot project schools, the legislature appeared to have wanted a health aide to be available during the entire school day to administer first aid to the injured and ill. The legislature also believed that day-to-day health services in the schools could be effectively delivered by paraprofessionals and did not require the continuous presence of school nurses. In view of this intended need for a paraprofessional person, the minimum health-related qualification requirement of a health aide is the possession of a current Red Cross first aid certificate.

A school nurse is responsible for supervising the health aides at the project schools that make up a high school complex.⁴ The school nurse also renders follow-up services on the cases referred to her by the health aides. The qualification requirements of a school nurse include the possession of a current license to practice as a professional nurse.

The personnel rendering the three basic health services in project schools are identified below:

1. Emergency health assistance.

Emergency health assistance is provided in project schools by the health aide. A health aide's activities are limited to first aid service which includes such things as taking a student's temperature, cleaning and dressing minor wounds, and providing physical comfort to an injured or ill student. The health aide is permitted to dispense medication only after clearance is received from the parent, physician, and the chief of the school health branch of the department of health.

⁴A complex is a group of public schools serving clientele of a common geographic area and consists of a local high school and all of its elementary and intermediate feeder schools. Each complex is usually identified by the name of the high school into which all schools feed, or the geographic area served, such as the "Roosevelt complex" or the "Molokai complex."

2. **Health problem identification.** The testing of students' vision, hearing, and height and weight for the identification of any health problems is performed primarily by the health aides, except that, in some of the project schools, the school nurse provides this service. In most schools (project and non-project), the speech and hearing teacher, who is a member of the DOE district-level diagnostic team, performs hearing tests. Health aides also do the reviewing of health records to identify the students who need preventive health measures such as immunization and tuberculin testing.

3. **Follow-up.** Students identified with health problems such as vision or hearing deficiencies are referred by the health aide to the school nurse for follow-up. After examination of the student, the school nurse advises the family of the student of the medical attention needed. In cases which require frequent contacts and consultation with the family or long-term care, the public health nurse of the public health nursing branch of the department of health is brought into the picture. This is because the public health nurse's target group is the families and community to which she is assigned.

Non-project schools. Health services in non-project schools are performed by teachers, school administrative personnel, and public health nurses (PHN) who are assigned the schools in a geographical area. A few non-project schools use volunteers to staff health rooms throughout the school day. To assist schools with the provision of emergency health assistance, the departments of education and health and the Hawaii State Chapter of the American Red Cross have jointly agreed that the Red Cross will train volunteers for services.

The personnel rendering the three basic health services in non-project schools are identified below.

1. **Emergency health assistance.** In some instances, teachers dispense minor first aid. For more serious cases, students are sent to the health room (if one exists) or the school

administrative office. Except for those schools with parent volunteers, the health room is not manned throughout the day. If a child is in need of assistance, school administrative personnel (generally the principal, vice principal, or secretary) attend to the student's needs.

School administrative personnel generally provide minor first aid or allow the student to rest until "well." For more serious cases, an ambulance is called or the student is sent home (by release from school or via parent pick-up). No medication may be dispensed in non-project schools.

2. **Health problem identification.** A PHN is responsible for coordinating and administering the screening and health record reviews in non-project schools. Teachers, volunteers, and, in some instances, public health nurses perform vision screening. Students with deficiencies are rescreened by the public health nurses. In elementary schools, teachers and volunteers conduct height and weight screening.

3. **Follow-up.** If a student is believed to have a health defect, an immunization deficiency, or a noncurrent physical examination, identified either through screening or record review, the parents are advised that the student needs medical attention. The public health nurse is responsible for visiting the homes to encourage parents to seek medical assistance or provide health counseling.

Description of School Health Services Pilot Project

School complex designation for pilot-testing. The pilot project began in the fall of 1970-71 school year. The six high school complexes chosen for the project reflect the urban, suburban, and rural settings specified by Act 130. These complexes were Roosevelt, Kailua, Campbell, Baldwin, Hilo, and Kauai, and

their respective feeder schools. As of September 1974, the complexes selected for pilot testing include a total of 57 schools or 25.9 percent of the 220 regular public schools and cover a total of 46,284 students or 26.2 percent of the total of 176,381 public school enrollment.⁵

Limited expansion of the pilot project. In 1974, the legislature appropriated \$175,000 to provide for the limited expansion of the pilot project. The funds were allotted in the latter part of 1974 and four additional complexes and Mauka Lani elementary in the Campbell complex and Kaelepulu elementary in the Kailua complex are presently being added to the pilot project.⁶

Project expenditures. Table 2.1 depicts the total expenditures incurred by the project.

Table 2.1
Pilot Project Expenditures
FY 1971 to FY 1974

1970-71	\$246,991
1971-72	300,877
1972-73	315,492
1973-74	309,747

Table 2.1 shows that the expenditures incurred by the pilot project have progressively increased, except for FY 1973-74 when the expenditures declined slightly due to fiscal constraints placed on the project.⁷

⁵Appendix A-1 shows the complexes and their respective feeder schools as well as the total enrollment by school.

⁶The four complexes and their respective feeder schools and the two additional schools in the existing project complexes are shown in appendix A-2.

⁷DOH, school health branch, *Annual Report, 1973-74*, SHS Pilot Project.

PART II

RESOURCES AND EFFECTIVENESS EVALUATION

Chapter 3

INTRODUCTION

Part II of this report contains a detailed review of the several health care operations which make up the school health care system. The organization of this part reflects the orientation of the school health care program to emergency health care, health problem identification, and follow-up activities. This part also contains comparisons of health care delivery in project and non-project schools;¹ an appraisal of health services by students; and the availability of health care resources and the effectiveness with which they are used.

Chapter 4 describes the basic methodology of the study. Chapter 5 focuses on the demand for emergency health care and its delivery. Chapter 6 reviews the health problem identification process. Chapter 7 discusses the student health records generated by the health problem identification process, together with shortcomings in the records. Chapter 8 reports on students' appraisal of the health care program. Chapter 9 examines the equipment and facilities with which and from which health care is dispensed and the findings concerning health care programs.

¹Wherever the terms—"project and non-project schools"—appear in the report, they refer to groups of schools selected for comparison.

Summary of Findings

In summary, we find the following:

1. There is a need for readily accessible emergency health assistance services in the schools, particularly in the elementary grade levels.
2. Non-project schools send home a significantly higher percentage of health room illness and injury cases than project schools do. Students in project schools lose less school time due to illness and injury than do students in non-project schools.
3. The project schools provide a wider range of health screening services than the non-project schools.
4. Project schools are not significantly better than non-project schools at maintaining required and recommended physical examination, tuberculin testing, and immunization levels.
5. Students in project schools were more satisfied with health services than students in non-project schools. Also, student satisfaction with health services is higher in the elementary grade levels than in the intermediate and high school grade levels.
6. Health services rendered by health aides in project schools cost less per case than health services rendered by school personnel in non-project schools.

Chapter 4

EVALUATION METHODOLOGY

Introduction

This chapter contains a discussion of the construction of the statistical sample from which the evaluation drew information regarding school emergency health care, health problem identification, and follow-up services. The methodology followed in the compilation of specific statistical information appears in the pertinent chapters throughout this part.

Selection of Sample Project and Non-Project Schools¹

To construct a sample of schools within which we could study school health care and compare its quality in project and non-project schools, we selected a total of 44 schools including all grade levels in the K-12 range. Half the schools are served by the pilot project (project schools); half are not (non-project schools).

In addition, we selected eight schools for special visitation to determine the effect of extreme variations of school enrollment on school health services. Finally, four schools with voluntary aides were surveyed to determine the effectiveness of this arrangement and the problems, if any, encountered in administering a volunteer program of this type.

To ensure uniformity in the comparison of project and non-project schools, we "matched" schools of each type according to school district, grade level, enrollment size, and socio-economic conditions of the community.² Thus, for instance, Roosevelt and Kalani are project and non-project high schools of similar enrollment size in the Honolulu school district, and serve relatively high income communities. Recognizing that no two schools are alike in all respects (Roosevelt, for instance, has one less grade and a smaller student body than Kalani), we grouped the schools by grade levels (elementary, elementary and intermediate, intermediate, and intermediate and high schools) to the extent that they appeared to attain aggregate characteristics of comparability. We derived the enrollment size groupings from DOE's staffing guidelines for vice principals for 1975 (i.e., one vice principal for school enrollment of 751-1999, and two vice principals for schools with enrollment over 2000).

We did not use all the schools in this sample in every analysis, but the variations, which are identified where they occur, are so minor that they do not detract from the validity of the study's findings.

¹The schools selected are identified in appendix B-1.

²Appendix B-2 indicates the grouping of selected schools by grade levels, and appendix B-3 indicates the groupings of selected schools by enrollment size.

Data Constraints

The ideal framework for evaluation of the pilot project would be a students' health status comparison, over a period of years, in "matched" project and non-project schools. However, the paucity of data pertaining to students' health status and the inconsistency of records maintained over the years in both project and non-project schools precluded use of much of the data maintained at the schools. Consequently, we developed our own survey forms and requested the selected schools to record the data on the forms. In the course of our analysis, we noted that certain schools have not complied with the intents and purposes of the surveys. In such cases, we have not utilized that portion of data in our evaluation.³

³Where this occurs in our evaluation, we have so noted in the text of the report.

Due to time constraints, the data gathering period encompassed a school survey period of approximately three months, from early September through late November 1974. While the data gathering period was relatively short, the emergence of clearly discernible trends and patterns in the data indicated that the data gathering period was sufficient for our purpose.

Our evaluation concentrated on the project and non-project schools referred to in this chapter. While there is always the possibility of drawing erroneous conclusions from sampled data, we have attempted to minimize this possibility by the selection of representative schools and by utilizing, where possible, statistically significant sample sizes.

Chapter 5

EMERGENCY HEALTH ASSISTANCE

Introduction

Emergency care for illness and injury that occur at school is one of the objectives of the school health care pilot project. To know how project schools compare with non-project schools in the delivery of such care, it is necessary to know what experience both types of schools have had in dispensing care. This chapter examines data drawn from the project and non-project school samples to determine the number of emergency care cases which normally occurs in the schools, examine the manner in which it relates to such factors as school grade levels and school enrollment sizes, consider the disposition of the cases noted and apply a measure of effectiveness—the amount of class time lost to treatment of illness or injury. These elements permit assessment of the performance of project and non-project schools.

Summary of Findings

In general, we find the following:

1. Emergency health assistance needs vary by grade level and size of school. On a per student basis, small schools at the lower grade levels have the greatest need for emergency health assistance.

2. The percentage of health room cases sent back to class is much greater in project schools than in non-project schools.

3. Project school students reporting to the health room lose less school time than non-project school students.

Description of Surveys

Methodology. To measure the effectiveness of the delivery of emergency health assistance by health aides in project schools, we compared project and non-project school health room logs. Computations made from health room log data permitted evaluation of: (1) emergency health assistance needs, (2) the disposition of emergency assistance cases, and (3) the incidence of school time lost. Selected project, non-project, and special visitation schools (see appendix B-1) maintained daily health room logs over a period of three months—September through November 1974. The “health room log” was a form upon which either the health aide or designate in each school recorded daily health room cases.

In recording each case on the health room log, the health aide or designate was to categorize the case as *injury*, *illness*, or *other* and include a brief description of the ailment. The category of *injury* included, among others, abrasions, lacerations, and insect bites. Headaches, menstrual cramps, and medications were to be categorized as *illness* cases. The category of *other* included health screening activities (e.g., vision screening, pediculosis screening) and non-health services such as the provision of sanitary pads and band-

aids. Fifty consecutive school days out of the sample period provided the data for analysis.

Problems associated with non-project school data. There were discrepancies between project and non-project school data, primarily in the number of cases recorded in the health room logs. At face value, the data showed that the majority of non-project schools had a much lower caseload than project schools (see appendix C-1), although project and non-project schools matched for similar characteristics should have produced comparable data. There are several plausible explanations.

The discrepancy of caseloads between project and non-project schools may be attributed to the failure of non-project schools to report all cases receiving health assistance. In many non-project schools, no one individual was responsible for dispensing health assistance. Instead, several designated individuals provided services. Apparently, recordkeeping was fragmented, and a centralized recording process using the health room log was lacking. In some non-project schools, teachers who dispensed first aid for minor complaints may not have reported to the health designate cases to be recorded in the health room log.

During a follow-up to reconcile data discrepancies during the survey period, certain non-project school personnel confirmed that they did not record all cases. Thus, the health room log data for non-project schools did not truly represent the total number of cases receiving health assistance. We, therefore, have not used certain data for comparative analysis to avoid distortion of results.

Assessment of Need

One aspect of the evaluation of emergency health assistance is an assessment of the need for emergency health care services. The demand for such services can be measured through the data gathered in the daily health room logs. The data which were employed consisted primarily of the

total number of cases for each of the three categories (*injury, illness, and other*) and a total of all three categories. The data were compiled to compare project and non-project schools. However, as stated in the previous section, non-project schools in many instances did not record all emergency health care cases. Consequently, needs assessment is based only on project school logs.¹

For the 50-day sampling period, the total number of cases for the categories of *injury, illness, and other* for all of the selected project schools was:

Injury	8,696 (37.3%)
Illness	9,168 (39.3%)
Other	<u>5,449 (23.4%)</u>
Total	23,313

Of the 23,313 health room cases, 17,864 or 76.6 percent were injury and illness cases which required emergency health assistance services. A similar percentage is shown in the 1973-74 school health services pilot project (SHSPP) annual report. Approximately 77 percent of the cases in all project schools were *injuries and illnesses*.² All of these cases required some kind of emergency health assistance.

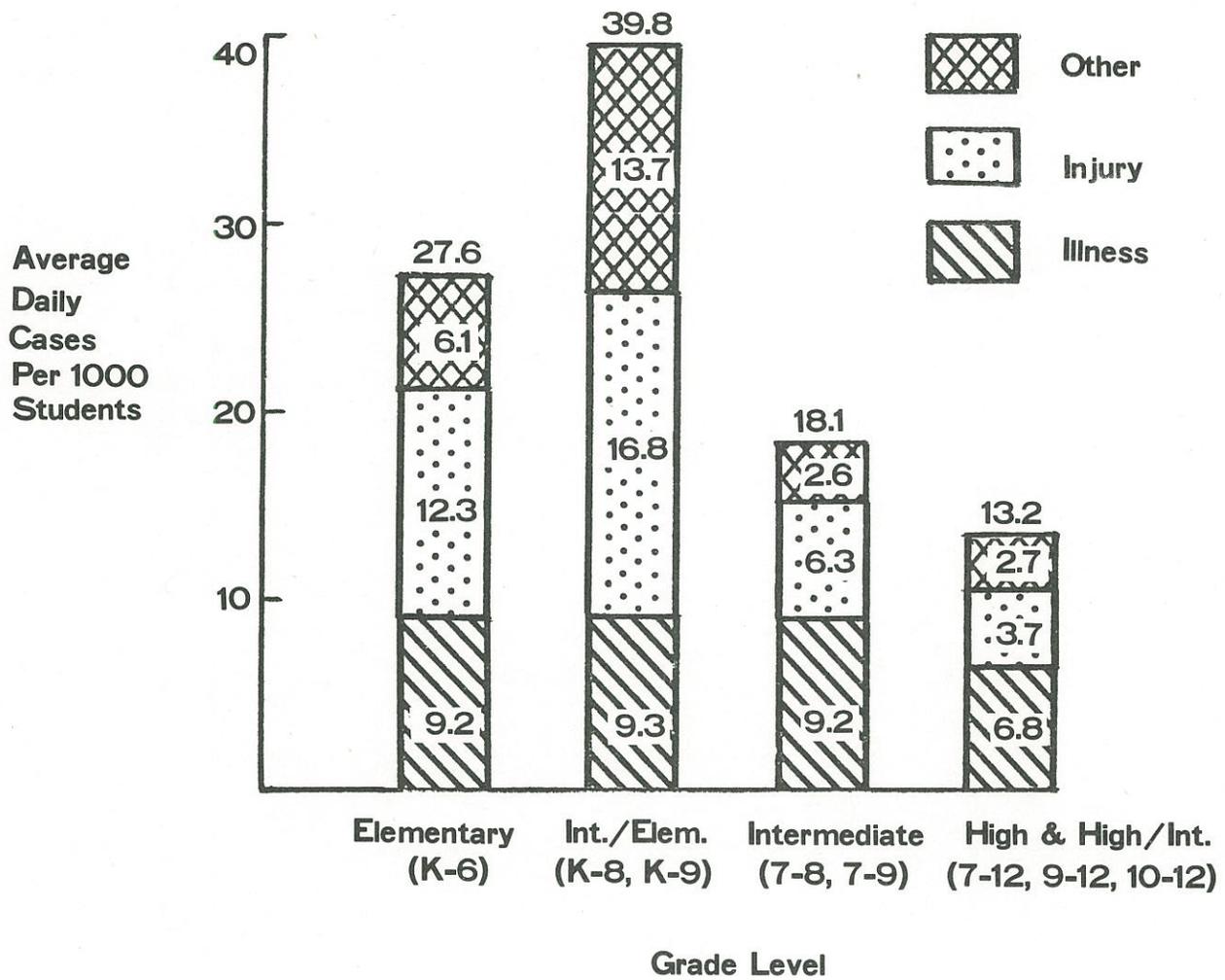
Grade level. Of the four grade levels in the study, the intermediate/elementary group had the highest average daily cases (39.8 per 1000 students). Elementary schools had an average daily case rate of 27.6 per 1000; intermediate schools, 18.1 per 1000; and high and high/intermediate schools, 13.2 per 1000. (See figure 5.1.)

¹A comparison between our data and data obtained from an annual report compiled by the department of health on the school health services pilot project (1972-1973) was made in order to verify the general validity of our sample. Our data with respect to injury, illness, and other cases are comparable to the normalized data (daily cases/1000 students).

²DOH, school health branch, *Annual Report, 1973-74, SHS Pilot Project*, p.5.

Figure 5.1

Average Daily Cases Per 1000 Students by
Grade Level for Selected Project Schools



These findings reveal a greater level of need for emergency health assistance in the lower grade levels than in the upper grade levels. In general, these findings may be attributed to the age of the students. As students become older, they are expected to be more independent, and they exercise more individual judgment as to when they need to report to the health room. Therefore, every ill or injured student may not necessarily report to the health room. As a result, in the high schools, the level of demand for emergency health services in proportion to the total enrollment is relatively low.

An analysis of the type of case which is most prevalent for each grade level group also is shown in figure 5.1. At both the elementary and intermediate/elementary levels *injury* cases predominate over *illness* cases. At the upper grade levels, which include intermediate and high school age students, *illness* cases are more prevalent than *injury* cases. This would seem to indicate that as students get older they are less prone to injuries, whether acquired in school or elsewhere.

Enrollment size. We performed two kinds of analysis to measure variation by school enrollment size. The first analysis was based on average daily cases for three enrollment size groups. The second analysis used average daily cases per 1000 students to arrive at a more accurate picture of the degree of need for emergency health assistance. This permitted a valid comparison between the enrollment size groups.

As might be expected, the average number of daily health room cases increases as enrollment size increases. The small schools have an average of 17.2 cases per day. The large schools have an average of 22.9 cases per day. The very large schools have an average of 27.3 cases per day. Thus, the very large schools appear to have the heaviest caseload (see figure 5.2).

Data normalized to average daily cases per 1000 students present a different picture, however. As enrollment size increases, the

average daily cases per 1000 students decrease. The small schools have the highest average daily cases per 1000 students (37.3). Average daily cases per 1000 students go down to 19.2 for the large schools. The average further decreases to 12.2 daily cases per 1000 students for the very large schools (see figure 5.3).

The small schools, which consisted of elementary and intermediate/elementary grade levels, shows the highest average daily cases per 1000 students. This finding may be attributed, in part, to easier access to the health room and, possibly, greater familiarity with the health aide. Just the opposite may be true in the very large schools. The health room may be less accessible and there may be less familiarity with the health aide. Therefore, the students in the very large schools may be more reluctant to report to the health room.

The high average of daily cases per 1000 students in the small schools would seem to indicate a real need for emergency health assistance. Both the grade level and enrollment size analyses, based on average daily cases per 1000 students, substantiate the general conclusion that small schools at the lower grade levels have the greatest need for emergency health assistance.

Disposition of Emergency Assistance Cases

The second aspect of the evaluation of emergency health assistance was an examination of the disposition of health room cases. "Disposition" refers to that part of the process of rendering of health care services in which a decision is made as to whether a child remains in school or is sent home. The disposition of cases was grouped in three categories: (1) *health room rest of day*, (2) *return to class*, and (3) *sent home*.

To assess the effectiveness of the treatment process, we conducted two analyses of dispositions. The first examined the disposition of all cases reported by the selected project and

Figure 5.2

Average Daily Cases by Enrollment
Size for Selected Project Schools

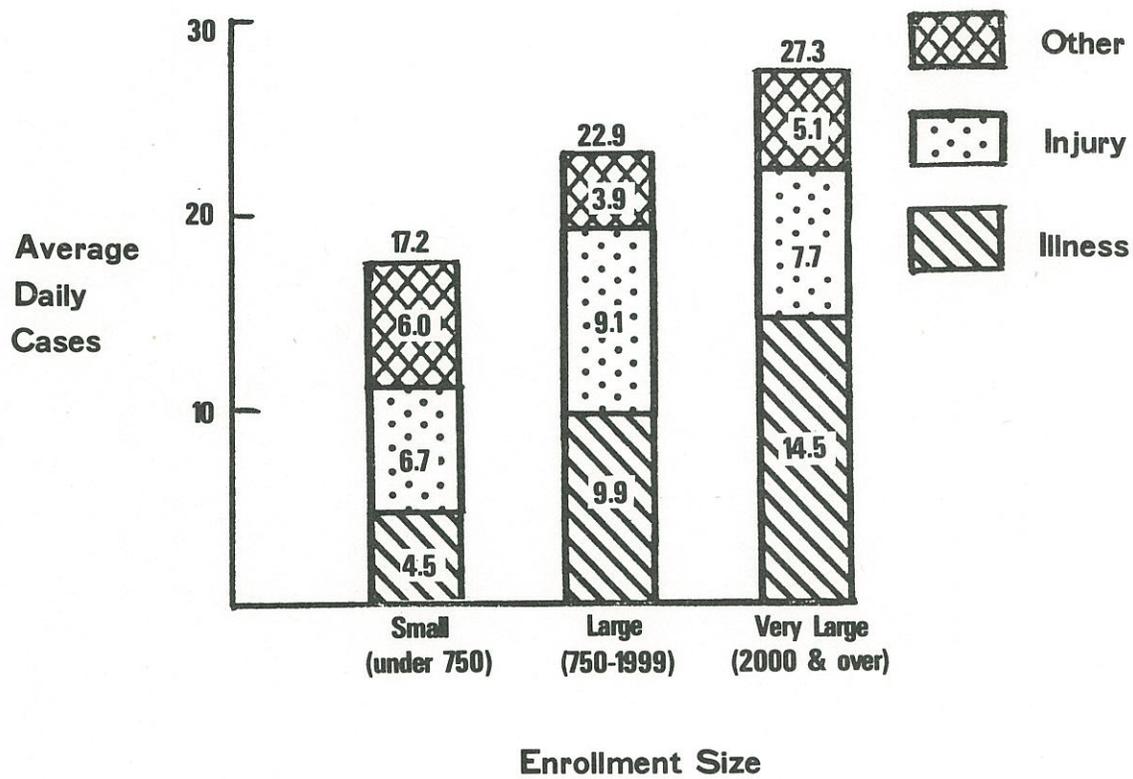
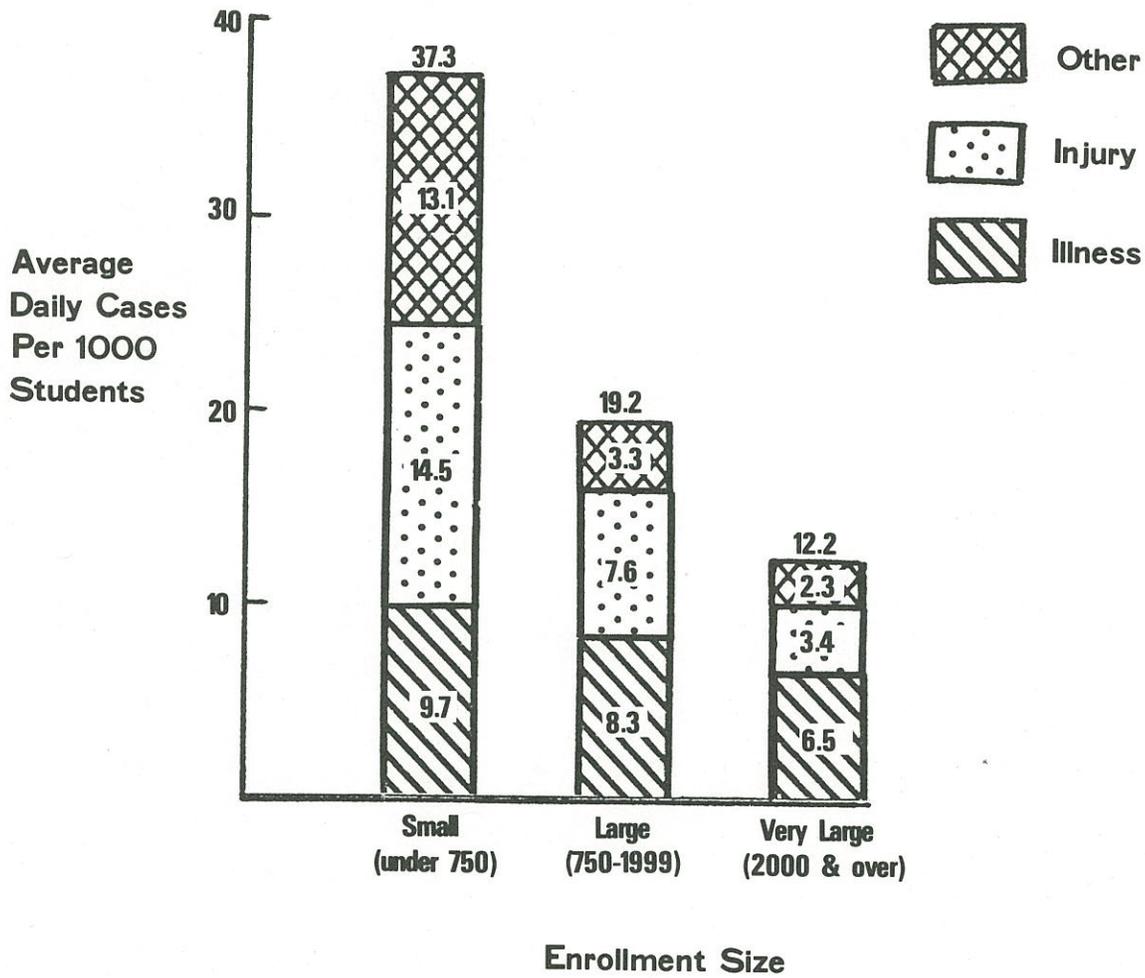


Figure 5.3

Average Daily Cases Per 1000 Students by Enrollment Size for Selected Project Schools



non-project schools, by grade level and enrollment size. The second measured estimated school time lost per case according to the disposition of the cases.

Grade level. We find that overall, a significantly higher percentage (49.9 percent) of health room cases in non-project schools is sent home than in project schools (17.0 percent). In every grade level grouping, the percentage of health room cases sent home in non-project schools is at least twice as large as in project schools (see figure 5.4). We also find that in the higher grade levels in both the project and non-project schools, the percentages of health room cases sent home are larger than in the lower grades. The high percentages in the non-project schools may in large part be attributed to the fact that non-project schools do not have trained personnel designated to handle only health-related problems.

Enrollment size. Figure 5.5 shows that for each enrollment size group (small, large, and very large), non-project schools have a significantly greater tendency to send health room cases home than project schools. For both project and non-project schools, as enrollment increases, the percentage of health room cases being sent home also increases. The primary reasons for this increase even in the project schools may be the greater number of daily cases (see figure 5.2).

In summary, we find that by both the grade level and enrollment size breakout, the percentage of health room cases sent home in non-project schools is much greater than in project schools. We also find that in the higher grade levels in both the project and non-project schools, the percentages of health cases sent home increase. Finally, we find that as enrollment size increases, the percentage of cases sent home also increases.

Incidence of School Time Lost

To estimate school time lost in the disposition of cases, we constructed a sample of *illness*, *injury*, and *other* cases recorded at eight

project and eight non-project schools over a period of several consecutive school days. We then calculated time lost per case and average time lost for all cases in the categories of *illness*, *injury*, or *others*.

The following table, comparing project and non-project schools, shows the average school time lost per case in the *illness*, *injury*, and *other* categories and percentages of cases sent home.

The percentage of cases sent home in this sample shows that non-project schools, in all ailment categories, send home a greater percentage of cases.

The results indicate that (on the average) twice as much school time is lost in cases occurring in non-project schools as in project schools. The overall difference can be attributed to differences in time lost for *illness* cases, as no discernible difference is evident in the sample for *injury* and *other* categories. Cases of *illness* constitute the greatest percentage of cases sent home in project and non-project schools and account for the most time lost per case.

Evaluation of school time lost for specific ailments. The analysis of school time lost based on the cases in the broad categories of *illness*, *injury*, and *other*, however, may not be an accurate indicator in the overall evaluation of the "treatment process" due to the wide variation in types of cases included under these categories. To minimize possible distortion due to these variations, we performed another analysis of time lost, using specific types of cases recorded in the health room log.

For this study we selected recorded cases of "headaches," "stomachaches," and "menstrual cramps." The selection of these particular ailments allowed for similar input from both project and non-project schools, as all schools report these complaints.

The sample, drawn from the same eight project and non-project schools used previously, contained 205 total cases of headache, stomachache, and menstrual cramps from the

Figure 5.4

Percentage of Health Room Cases Sent Home by
Grade Level in Selected Project and Non-Project Schools

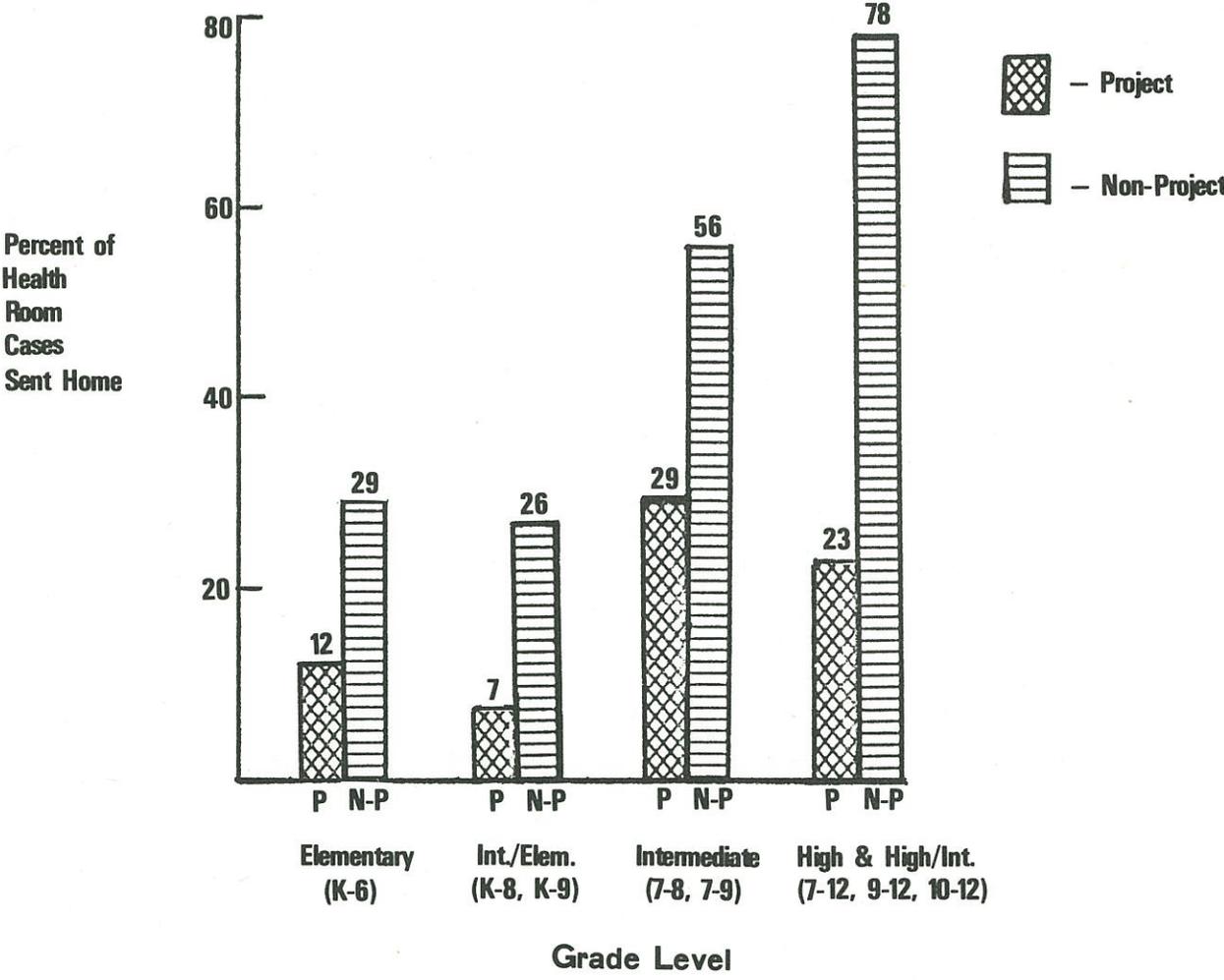


Figure 5.5

Percentage of Health Room Cases Sent Home by Enrollment Size for Selected Project and Non-Project Schools

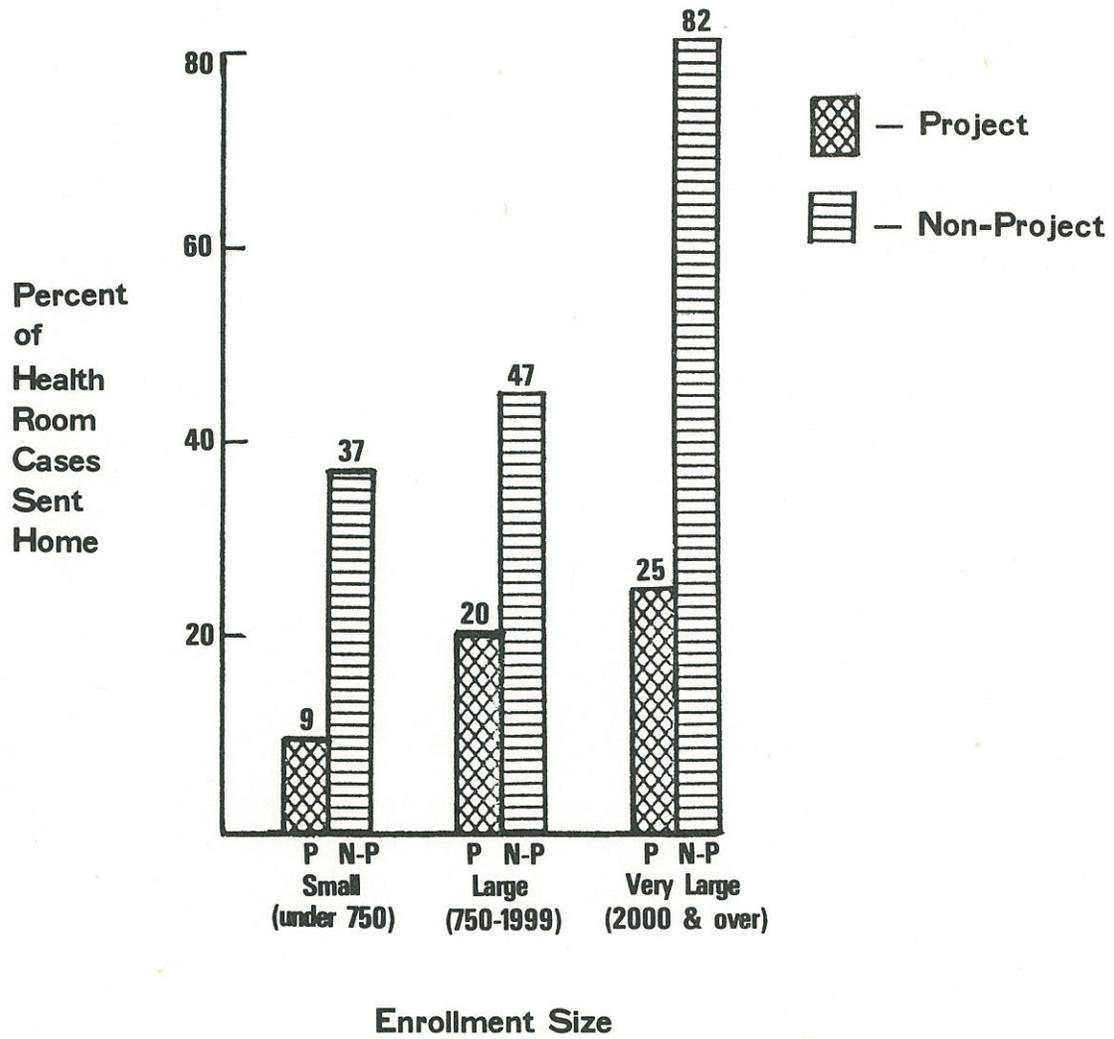


Table 5.1

**School Time Lost in Project and Non-Project Schools for
Health Room Cases of Illness, Injury, and Other**

<i>Schools</i>	<i>Ailment</i>	<i>No. of cases</i>	<i>No. sent home</i>	<i>% sent home</i>	<i>Average school time lost per case (hours)</i>
Project	Illness	186	71	38.1	1.8
	Injury	146	11	7.5	.6
	Other	75	6	8.0	.6
Total		407	88	21.6	1.1
Non-Project	Illness	167	126	75.4	3.0
	Injury	43	6	13.9	.6
	Other	20	3	15.0	.7
Total		230	135	58.6	2.4

project schools and 177 cases from the non-project schools. The analysis of time lost shown in table 5.2 reveals that the project schools lose less school time per case for all three types of cases sampled. The school time lost per case is consistently less for project schools and by a similar margin in all cases.

Again, the percentage of cases sent home is approximately twice as great in non-project schools as in project schools.

Results of both analyses indicate that project schools lose less school time per case and send fewer cases home than non-project schools. Apparently, project schools are better able to handle health cases without sending students home.

In summary, based on analyses of school time lost, we find that the average student time

lost is less in project schools than in non-project schools. We also find that the percentage of health room cases sent home in non-project schools is substantially greater than in project schools.

Conclusions

By comparison with non-project schools, the schools included in the health services pilot project render emergency health assistance services more effectively, sending home fewer students, and losing less class time.

All schools need emergency health assistance, but their degree of need varies by grade level and size of school. Small schools at the lower grade levels show the greatest need for emergency health assistance.

Table 5.2

School Time Lost in Project and Non-Project Schools for Cases of Headache, Stomachache, and Menstrual Cramps

<i>Schools</i>	<i>Ailment</i>	<i>No. of cases</i>	<i>No. sent home</i>	<i>% sent home</i>	<i>Average school time lost per case (hrs)</i>
Project	Headache	77	21	27.3	1.4
	Stomachache	86	27	31.4	1.6
	Menstrual cramps	42	16	38.1	1.6
Total		205	64	31.2	1.5
Non-Project	Headache	80	47	58.7	2.5
	Stomachache	76	42	55.3	2.5
	Menstrual cramps	21	16	76.2	2.7
Total		177	105	59.3	2.5

Chapter 6

HEALTH PROBLEM IDENTIFICATION

Introduction

Besides providing emergency treatment for injury and illness that occur in the schools, the school health program attempts to discover health problems which may affect students' performance in class or which may require medical treatment. To detect such health problems, school health personnel test students' vision for acuteness and such problems as cross-eye or color blindness, test students' hearing ability, and check students' height and weight. Health personnel record their findings in permanent student health records.

This chapter reviews the student health testing procedures used in the schools and applies performance criteria to the testing program to compare testing in project and non-project schools. The chapter describes the surveys used to assemble the information necessary to make this comparison, considers the extent to which students in all schools receive testing services, and assesses the promptness with which the testing services are performed.

Summary of Findings

In general, we find the following:

1. Project schools provide more health screening and record review services than the non-project schools.

2. Project schools as a group appear to be more effective than the non-project schools in initiating and completing these services.

Description of Health Problem Identification Activities

Although there are wide variations in the types of health screening conducted in the schools, three major health screening activities are conducted routinely in most schools. They are the vision, hearing, and the height and weight screening programs.¹ For the purpose of our health screening analysis, we have focused on these three screening activities. A brief description of the screening activities follows.

In the project schools, Act 130 health aides perform vision screening, while in the non-project schools, teachers and volunteers and, in some cases, public health nurses do the screening. There are four types of vision screening tests. They are (1) the visual acuity test (Snellen Chart test), which tests an individual's ability to perceive from a 20-foot distance under proper conditions of illumination; (2) the plus lens test or the convex lens test, which determines an individual's ability to do close work; (3) the cover test,

¹Other screening activities are conducted in the schools as the need arises. Some of these activities include: pediculosis, dental, cardiac, hemoglobin, and tuberculin screening.

which screens for possible eye muscle imbalance, such as cross-eye or strabismus; and (4) the color test, which, as the name implies, tests for color-weak vision.

The purpose of the hearing tests is to discover all pupils with hearing deviations so those pupils with significant hearing losses may be referred for medical care. The measure of hearing acuity is the ability to hear tones produced by an audiometer, an instrument which electronically generates tuning fork-like tones of varying intensity.

Most of the hearing screening tests conducted in the schools for both project and non-project schools are performed by the department of education's district office speech/hearing therapists. However, health aides in some project schools also conduct hearing screening.

Height and weight screening generally is conducted only in the elementary schools, by health aides in the project schools and by teachers and volunteers in non-project schools. The purpose of the height and weight screening is identification of overweight and underweight students.

Health aides in the project schools and teachers or public health nurses in the non-project schools review student health records. These are maintained on a standard form, the *Pupil's Health Record*, DOE Form 14. This permanent health record follows the student from grade to grade and from school to school. The health record provides information about the student's health such as results of physical examinations, illnesses experienced, immunizations received, screening test results, and yearly comments by the teacher on the student's health. Health record reviews detect students who lack preventive health measures (immunizations, physical exams, etc.) and students with significant health problems (e.g., allergy, asthma, diabetes, cardiac conditions).

Evaluation Criteria

The ideal measure of the effectiveness of the health screening and record review program would be the number of cases detected by each screening or record review program, expressed as a percent of the total number of pupils with the selected health problems or with deficiencies in health measures. However, the data required for such a measure were unavailable. Instead we used the following substitute measures:

1. The number of health screening activities conducted in each school.
2. The number of students screened expressed as the percent of the total student population.
3. The promptness of screening and review activities, expressed as the number of screening activities completed within a specified time period.

We then compared the performance of project and non-project schools with respect to the above measures. The results of the comparisons appear in subsequent sections of this chapter.

The description of the survey. The data utilized for the evaluation of the health screening and record review program were obtained through a survey questionnaire sent to the 44 selected project and non-project schools. Part I of the screening survey section of the questionnaire requested the schools to provide information on each health screening and record review activity conducted, including the target group screened, the target group size, and the total numbers actually screened during the 1972-73 and the 1973-74 school years. Part II of the questionnaire requested the schools to provide information on the status of the screening and review activities, i.e., whether the screening activities were completed, still in progress, or not started, as of November 27, 1974, for all the health screening and record review activities planned for the 1974-75 school year.

Comparison of Project and Non-Project Schools

Data comparing the performance of project and non-project schools appear below.

Comparison of the number of services provided. Table 6.1 summarizes the number of selected project and non-project schools, grouped by grade levels, conducting selected health screening and record review activities during the 1973-74 school year. The table shows that more project schools than non-project schools provide the various health screening and record review services examined for the evaluation. For example, in the health screening portion of the table, 21 (100 percent) of the project schools surveyed provide visual acuity testing, while 17 (81 percent) of the non-project schools did so. Only project schools perform the other types of vision screening, i.e., the plus lens, cover, and color testings. Thirteen (62 percent) project schools provide these services.

Eighteen (86 percent) of the project schools conduct height and weight examinations; nine (43 percent) of the non-project schools do so.

Table 6.1 clearly shows that project schools have superior health record review services. Except for one intermediate school which failed to check for incomplete or missing records, all 21 project schools perform all of the health record review services which we examined. Non-project schools' performance of these same services, however, range from 16 (76 percent) to 18 (86 percent) of the total non-project school sample.

As noted previously, most of the hearing screening tests for both the project and non-project schools in our survey are conducted by the department of education's district speech/hearing therapists. During the 1973-74 school year, the groups screened in most school districts were grades kindergarten and 2. In the Kauai school district, grades 5, 8, and 11 also were screened. In the windward school district kindergarten students were not routinely

screened by the district personnel. During this same period, some of the health aides in the project schools conducted additional hearing screening. Of the 21 project schools, eight (38 percent) reported providing additional hearing screening services. In six of these eight schools, health aides screened additional grades. The other two schools (elementary schools) in this group screened all students not screened by the department of education's district speech/hearing therapists.

The project schools thus provide more health screening and record review services than the non-project schools do.

Comparison for service coverage. To determine the percentage of the target group receiving health screening services provided, we measured the number of students screened in each school and for each activity against school enrollments. The results of this examination for the 1973-74 school year are summarized in table 6.2 below. The table compares the percentages of the student population screened by the four grade level groupings of the project and non-project schools.

Table 6.2 also shows that with the exception of acuity vision screening by the high/intermediate project schools, the project schools serve more students and provide better coverage at each grade level grouping in all of the health screening and record review activities examined than non-project schools do.

Assessment for promptness. While it is desirable to conduct many different screening services for as many students as possible, it is equally desirable that these screening activities be done early in the school year, so student deficiencies can be detected as early as possible. This increases opportunities for early care and treatment and reduces the likelihood of disruption of student educational progress.

To evaluate the schools for promptness, we asked the selected sample schools to report on the status of their screening activities as of November 27, 1974, approximately three

Table 6.1

Number of Health Screening Activities and Record Reviews
Conducted in School Year 1973-74

Grade level grouping	No. of schools in sample* Project/ non-proj.	Health Screening Activities					Record Review Activities			
		Number of Schools - Project/Non-Project					Number of Schools-Project/Non-Project			
		Acuity	Plus lens	Cover	Color	Height and weight	Immunizations	TB or X-ray	Phys. exams.	Missing or incomplete
<i>Elementary:</i>										
Project	8	8	8	8	8	8	8	8	8	8
Non-Project	8	8	0	0	0	7	8	8	8	7
<i>Inter.-Elem. :</i>										
Project	5	5	5	5	5	5	5	5	5	5
Non-Project	4	2	0	0	0	2	3	3	3	3
<i>Intermediate:</i>										
Project	3	3	0	0	0	2	3	3	3	2
Non-Project	3	2	0	0	0	0	3	3	3	3
<i>High-Inter.:</i>										
Project	5	5	0	0	0	3	5	5	5	5
Non-Project	6	5	0	0	0	0	2	2	4	3
Totals:										
Project	21	21 (100%)	13 (62%)	13 (62%)	13 (62%)	18 (86%)	21 (100%)	21 (100%)	21 (100%)	20 (95%)
Non-Project	21	17 (81%)	0 (0%)	0 (0%)	0 (0%)	9 (43%)	16 (76%)	16 (76%)	18 (86%)	16 (76%)

*Two schools, a project high school and a non-project intermediate-elementary school, were deleted from the table due to the unavailability of data.

Table 6.2

**Student Coverage in Health Screening and Record Review Programs
Of Selected Project and Non-Project Schools
School Year 1973-74**

Grade Level Group	Enroll- ment 9/21/73 Project /Non- Project	Health Screening Activities					Record Review Activities				
		% of Students Served—Project/Non-Project					% of Records Reviewed—Project/Non-Project				
		Acuity	Plus Lens	Cover	Color	Height and Weight	Immuni- zations	TB or X-ray	Phys. Exams.	Missing or In- complete	
<i>Elementary:</i>											
Project	5,148	101*	39	38	17	101*	75	75	75	75	
Non-Project	5,200	82	0	0	0	88	45	33	54	37	
<i>Elementary-Intermediate:</i>											
Project	2,764	93	28	28	20	100	75	49	59	56	
Non-Project	2,521	59	0	0	0	29	13	13	16	38	
<i>Intermediate:</i>											
Project	4,544	26	0	0	0	6	97	58	97	58	
Non-Project	4,198	25	0	0	0	0	0.4	0.1	0.6	0.6	
<i>Intermediate-High:</i>											
Project	9,352	14	0	0	0	4	98	98	98	98	
Non-Project	10,032	22	0	0	0	0	13	1	11	18	
<i>Total:</i>											
Project	21,808	47	13	13	6	40	90	78	88	79	
Non-Project	21,951	41	0	0	0	24	18	10	20	22	

*These columns show more than 100 percent because students were screened twice, or because screened students may leave the school district prior to the official enrollment count from which these percentages are derived.

months after the start of the 1974-75 school year. The results of the survey are presented in table 6.3. The table is organized to show, for each activity, the number of project and non-project schools that indicated that the specific screening or record review services would be provided (column a); that had completed the service (column b); that had begun but not completed the activity (column c); or that had not started (column d) as of November 27, 1974.

The table shows that, except for the height and weight screening activity, the project schools have a higher completion rate in health screening activities than the non-project schools. The completion rate for the various screening activities in project schools range from 62 percent to 92 percent, while non-project schools' completion rate range from 29 percent to 73 percent.

Except for one school which did not start the acuity screening, all of the project schools had begun or completed their screening activities and record review activities. As many as five non-project schools had not started various health screening services by the end of the test period.

The project schools as a group appear to be more effective than the non-project schools in initiating and completing the screening and record review activities.

Conclusions

The schools of Hawaii are charged with the responsibility of providing pupils with educational opportunities. If pupils are to realize the maximum benefit from these opportunities they should have good health and the fullest use of their physical and mental faculties. Poor health or losses in physical faculties (e.g., vision, hearing) affect pupils' learning progress in school. Many of these dysfunctions can be prevented or ameliorated by immunization and proper precautions. Most vision and hearing handicaps are correctable with glasses and hearing aids. For these reasons it is urgent that health screening and record review programs not only be conducted, but also be conducted as early as possible so that pupils with handicaps and inadequate health protection can be identified and treated. It is also important that screening and record review programs extend to as many students as possible to minimize the number of undetected cases.

The comparative study of project and non-project schools reveals that the Act 130 project schools with health aides provide more health screening and record review services, screen a larger proportion of the student population, and provide health services more promptly than the non-project schools without health aides. We conclude that the project schools have been significantly more effective in conducting screening and record review programs.

Table 6.3
Status of Health Screening and Record Review Activities
In Selected Project and Non-Project Schools
As of November 27, 1974

	(a) Total no. of schools providing services	Status of activity						(a) Total no. of schools providing services	Status of activity					
		(b) Completed		(c) In progress		(d) Not started			(b) Completed		(c) In progress			
		No.	%	No.	%	No.	%		No.	%	No.	%		
<i>Health screening activities</i>								<i>Health record review activities</i>						
<i>Acuity:</i>								<i>Immunizations:</i>						
Project schools	21	14	(67)	6	(29)	1	(5)	Project schools	21	16	(76)	5	(24)	
Non-project schools	22	10	(45)	7	(32)	5	(23)	Non-project schools	20	8	(40)	12	(60)	
<i>Plus lens:</i>								<i>TB/X-ray:</i>						
Project schools	13	12	(92)	1	(8)			Project schools	21	17	(81)	4	(19)	
Non-project schools	7	2	(29)	3	(43)	2	(29)	Non-project schools	20	9	(45)	11	(55)	
<i>Cover:</i>								<i>Physical examinations:</i>						
Project schools	13	11	(85)	2	(15)			Project schools	21	16	(76)	5	(24)	
Non-project schools	3	2	(67)			1	(33)	Non-project schools	20	9	(45)	11	(55)	
<i>Color:</i>								<i>Missing/incomplete records:</i>						
Project schools	13	11	(85)	2	(15)			Project schools	21	16	(76)	5	(24)	
Non-project schools	2	1	(50)			1	(50)	Non-project schools	15	7	(47)	8	(53)	
<i>Height and weight:</i>														
Project schools	16	10	(62)	6	(38)									
Non-project schools	11	8	(73)	1	(9)	2	(18)							

Chapter 7

HEALTH STATUS OF STUDENTS

Introduction

State law requires that students receive a physical examination and certain immunizations against communicable diseases before entering school. These are important public health measures because they increase the probability of detecting health problems in school age children and preventing communicable diseases in a susceptible population. Student health records contain inquiries as to student compliance with these health measures. An examination of the health records, then, can indicate the extent to which students generally have had physical examinations and been immunized, and this information, in turn, can provide a basis for comparing compliance in project and non-project schools.

This chapter explains the techniques we used to survey student health records in project and non-project schools, reports the extent of examination indicated by the records, and examines the time elapsed since last immunizations. In all these particulars, this chapter compares performance in project schools with that in non-project schools.

Summary of Findings

In general, we find that:

1. The percentage of missing health records in both project and non-project schools increases with grade levels.

2. The health records of numerous students in both project and non-project schools show no record of immunizations and other required health testing and examinations. The percentage of health records lacking these entries increases with the grade level.

3. Project school students, as indicated by health records, generally have been immunized or examined more recently than non-project school students.

4. Many students in both project and non-project schools are not in compliance with the preventive health requirements mandated by law.

Description of Survey

We conducted a sample survey of 1388 first, 4th, 7th, and 11th grade students at 19 project and 20 non-project schools. The survey included a review of the "pupil's health record" (DOE form 14)¹ files as well as a

¹The *Pupil's Health Record* (DOE form 14) is the approved health certificate form for immunizations and physical examination and represents the permanent health profile of all students enrolled in Hawaii's public school system. The record is generated at the time a student enters the public school system and is updated and maintained in each grade and school by either a health aide or school personnel. The physician's findings and recommendations, immunizations, and past health history, significant information from parents, teacher observations, dental inspections, results of screening tests, and all other information bearing on the student's health are recorded on the form 14.

review of three items contained in the health record: diphtheria, pertussis, and tetanus (DPT) immunization;² physical examination; and tuberculin test. From this review, we determined the percentage of missing records and the percentage of records that lacked entries for physical examination, DPT or DT immunization, and tuberculin test. The examination of the health records also noted the dates of each student's most recent physical examination; diphtheria, pertussis, and tetanus (DPT) or DT immunization; and tuberculin test. The purpose of this review was to determine whether the status of each student's physical examination, DPT or DT immunization, and tuberculin test met time limit standards recommended by the department of education and the department of health.

Immunization and Health Examination Standards

For standards we used the statutes pertaining to immunization, tuberculin testing, and physical examination as well as the recommendations of the DOE and DOH.

Under section 298-42, HRS, "No child shall be admitted to any school for the first time in the State unless such child presents to the appropriate school official certification from a licensed physician stating that the child has received immunization from communicable diseases as required by the department of health."³ The section also requires a tuberculin test or X-ray to be taken. Section 298-47, HRS, states that "No child shall be admitted to any school for the first time in the State unless such child presents to the appropriate school

official a certification from a licensed physician stating that the child has undergone a physical examination." In addition to these statutory health requirements, periodic physical examinations prior to a child's entrance into the 4th, 7th, and 10th grades are highly recommended by both the department of education and the department of health.

Health Record Status

Of the 1388 students surveyed (673 in project schools and 715 in non-project schools), 81 had no health record (see table 7.1). The information in the table is categorized by the number of schools and students surveyed in each grade level.

The table shows a total of 31 missing forms (4.6 percent) in project schools and 50 missing forms (7.0 percent) in non-project schools. Of the 31 records missing in project schools, four (1.9 percent) are missing in grade 1; two (1.0 percent) in grade 4; 15 (9.7 percent) in grade 7; and 10 (10.0 percent) in grade 11. In non-project schools, nine (4.1 percent) of the records are missing in grade 1; 14 (6.4 percent) are missing in grade 4; 14 (8.0 percent) in grade 7; and 13 (13.0 percent) in grade 11.

The percentage of missing health records in both project and non-project schools increases with grade level. The low percentage of missing records in grades 1 and 4 (see table 7.1) may be attributed, at least in part, to: (1) state laws requiring immunizations, tuberculin test, and physical examination prior to a child's entry into the public school system; and (2) the greater emphasis placed on the child's health in the elementary grade levels.

Physical Examination, Immunization, and Tuberculin Test Status

The survey further reveals that the health records of numerous students in both project and non-project schools show no record of a physical examination; immunization against

²Immunizations against diphtheria, pertussis, and tetanus (DPT) are given as a combined shot. Pertussis is not required after age 6.

³Department of Health, State of Hawaii, *Public Health Regulations*, Chapter 7, Examination, Vaccination and Immunization, requires the following immunizations at school entry: Diphtheria, Tetanus, Pertussis (if not over 6 years of age), Poliomyelitis, and Measles (Rubeola).

Table 7.1

**Percent of Missing Form 14's by Grade Level
In the Selected Project and Non-Project Schools**

Grade level	Project schools				Non-project schools			
	No. schs surveyed per grade level	No. of students surveyed	No. of students without Form 14	% of Form 14's missing	No. schs surveyed per grade level	No. of students surveyed	No. of students without Form 14	% of Form 14's missing
1	11	210	4	1.9	11	220	9	4.1
4	11	208	2	1.0	11	220	14	6.4
7	8	155	15	9.7	9	175	14	8.0
11	5	100	10	10.0	5	100	13	13.0
Total		673	31	4.6		715	50	7.0

diphtheria, pertussis, and tetanus (DPT or DT); and test for the presence of absence of tuberculosis (see table 7.2). The table shows the total number of health records reviewed, the number of health records without appropriate entries, and the percentage of total missing entries by grade level.

Out of 1311 health records reviewed (642 project school records and 669 non-project school records), 26 project school records (4.0 percent) show no entry for physical examination and 27 non-project school records (4.0 percent) are without a physical examination entry. With respect to the DPT or DT immunization, the table shows that 26 (4.0 percent) of the project school health records and 25 (3.7 percent) of the non-project school health records lack entries. The tuberculin test appears to be the largest health deficiency with 126 (19.6 percent) of the project school and 134 (20.0 percent) of the non-project school records lacking tuberculin test entries.

The percentage of health records lacking physical examination, DPT or DT immunization, and tuberculin test entries increases with the grade level. The remarkably large number of

records reflecting no tuberculin testing may suggest that there are serious deficiencies in this detection program. Whatever the reason, the disease in question is so serious and the apparent incidence of nontesting so large, that this should be the subject of early inquiry.

Elapsed Time From Last Examination

The comparison of project and non-project school health records reveals that: (1) the average elapsed time from a student's latest physical examination, DPT or DT immunization, and tuberculin test increases with the grade level; (2) at project schools students generally have been immunized or examined more recently than at non-project schools; and (3) neither project nor non-project schools are following DOE and DOH recommendations relating to reexamination and immunization.

As shown in figures 7.1 through 7.3 the average time since students' most recent physical examination, immunization, or tuberculin test increases with the grade level. On the average, the elapsed time from the latest physical examinations in grade 1 is 1.06 years in project

Table 7.2

**Percent of Missing Health Record Entries for Physical Examination
DPT or DT Immunization, and Tuberculin Test
By Grade Levels in the
Selected Project and Non-Project Schools**

Grade		No. of records reviewed	Physical exams		DPT or DT immunization		TB testing	
			No. of records without entries	% of records without entries	No. of records without entries	% of records without entries	No. of records without entries	% of records without entries
1	Project	206	10	4.8	9	4.4	10	4.9
	Non-Project	211	8	3.8	8	3.8	12	5.7
4	Project	206	3	1.5	4	1.9	40	19.4
	Non-Project	206	8	3.9	7	3.4	55	26.7
7	Project	140	7	5.0	5	3.6	52	37.1
	Non-Project	161	9	5.6	8	5.0	34	21.1
11	Project	90	6	6.7	8	8.9	24	26.7
	Non-Project	91	2	2.2	2	2.2	33	36.3
Total	Project	642	26	4.0	26	4.0	126	19.6
	Non-Project	669	27	4.0	25	3.7	134	20.0

schools and 1.05 years in non-project schools. The elapsed time increases to 6.55 years and 8.70 years, respectively, by grade 11.

Average elapsed time since prior entry is highest for DPT and DT immunization. In grade 1, it is 1.52 years for project schools and 1.55 years for non-project schools. In grade 4, it is 3.56 years in project schools and 3.58 years in non-project schools; and in grade 11, 6.80 years for project schools and 9.15 years for non-project schools. This may be because diphtheria, pertussis, and tetanus and the DT immunization boosters are valid for ten years, so the majority of students receive the booster only once during their school years.

It is apparent that students in project and non-project schools alike are not following the DOE and DOH recommendations for physical

reexamination prior to entrance into the 4th, 7th, and 10th grades, and it appears that 11th and 12th grade students in non-project schools may need immunization boosters and tuberculin retesting.

Noncompliance With Preventive Health Requirements

Part II, chapter 298, HRS, and school entry regulations promulgated by the DOH, require all children of compulsory school age (kindergarten through grade 12) entering school in Hawaii for the first time to receive: (1) the basic or booster immunizations against diphtheria, pertussis, and tetanus (DPT); polio, rubeola (measles); and rubella (German measles) within two years prior to the date of school entry; (2) a tuberculin test or a chest X-ray prior to school entry; and (3) a

Figure 7.1

**Average Years Elapsed Since Latest Physical Examination
Entry by Grade Level in Selected Project and Non-Project Schools**

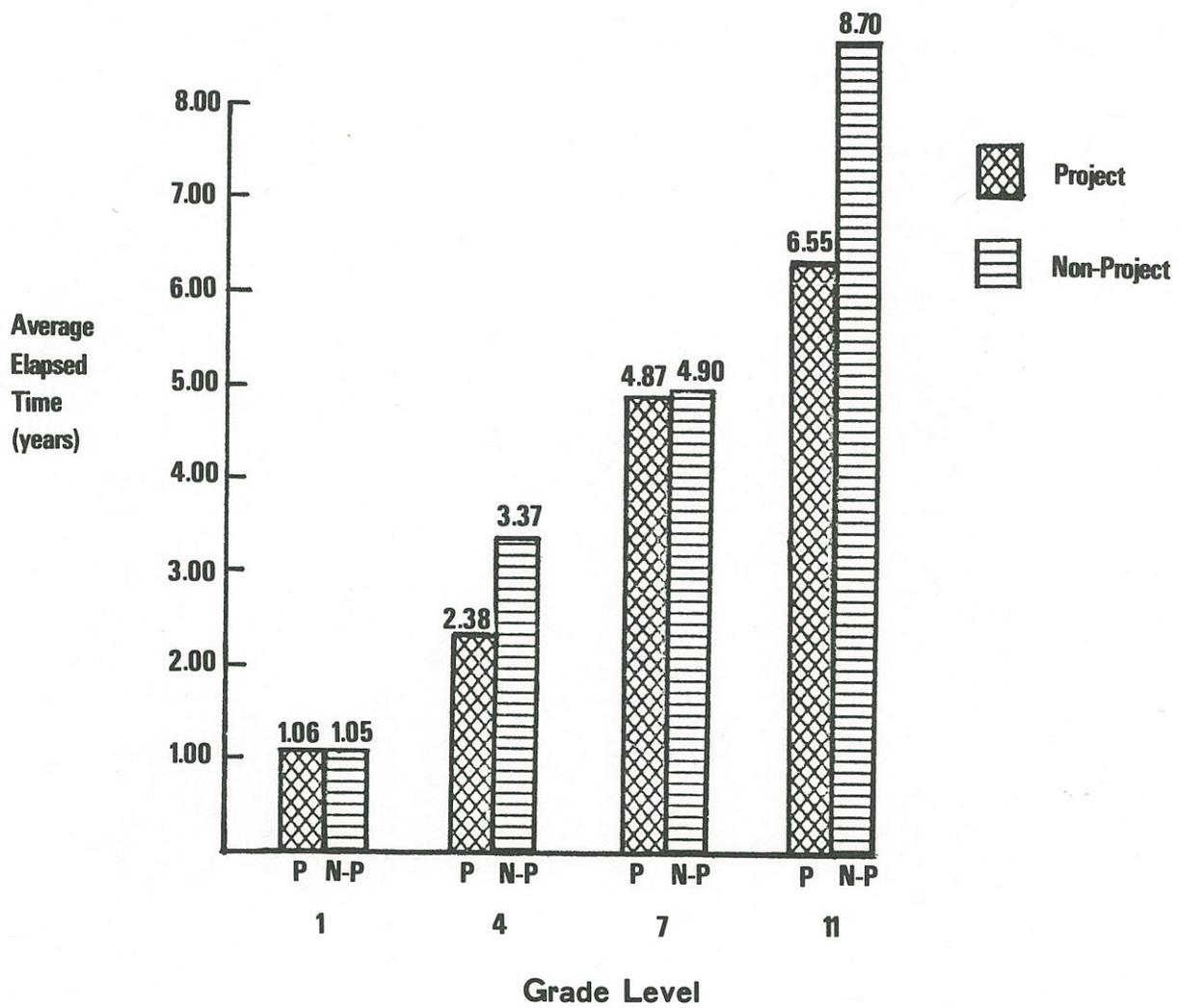


Figure 7.2

Average Years Elapsed Since Latest DPT or DT Entry by Grade Level in Selected Project and Non-Project Schools

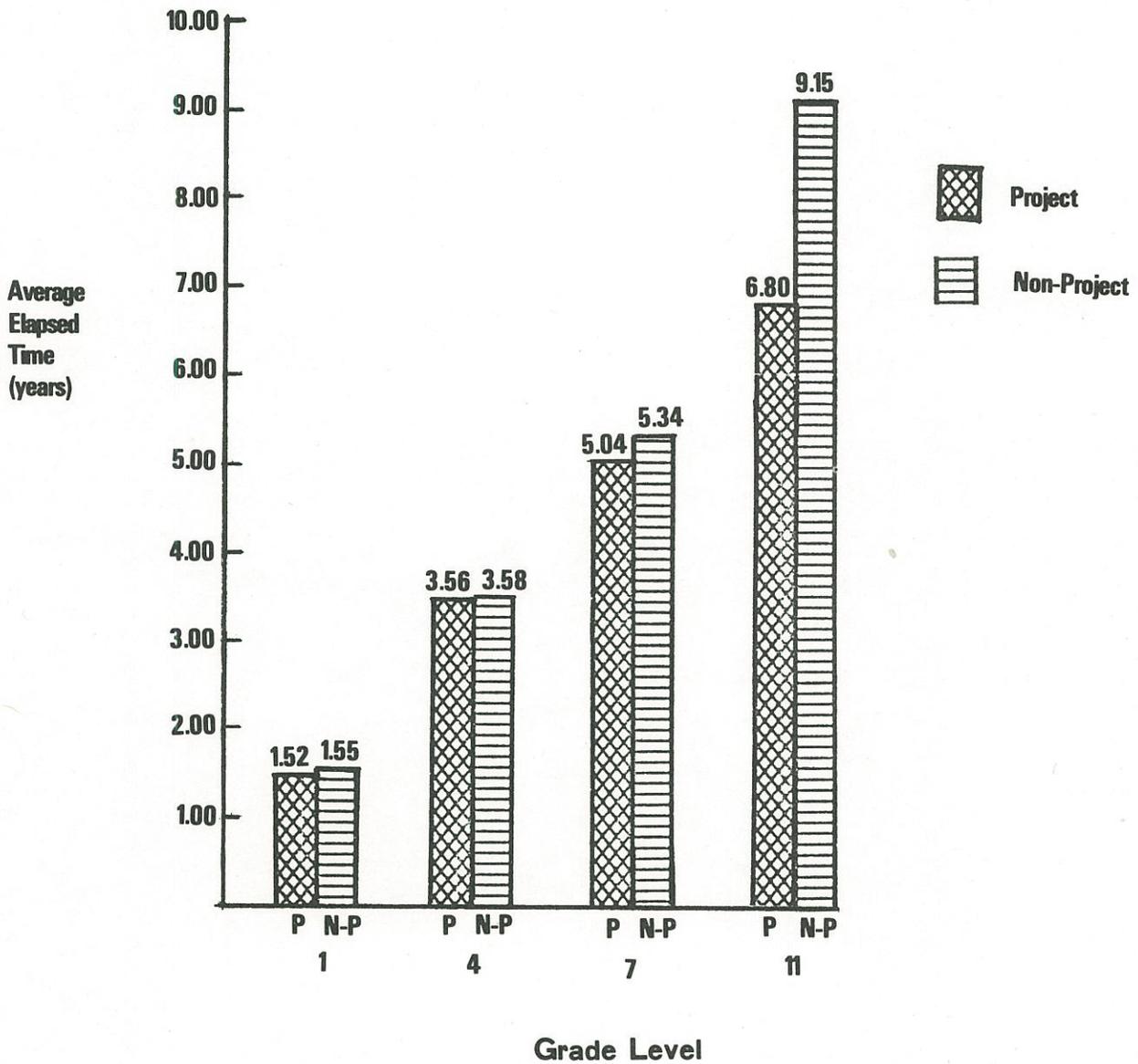
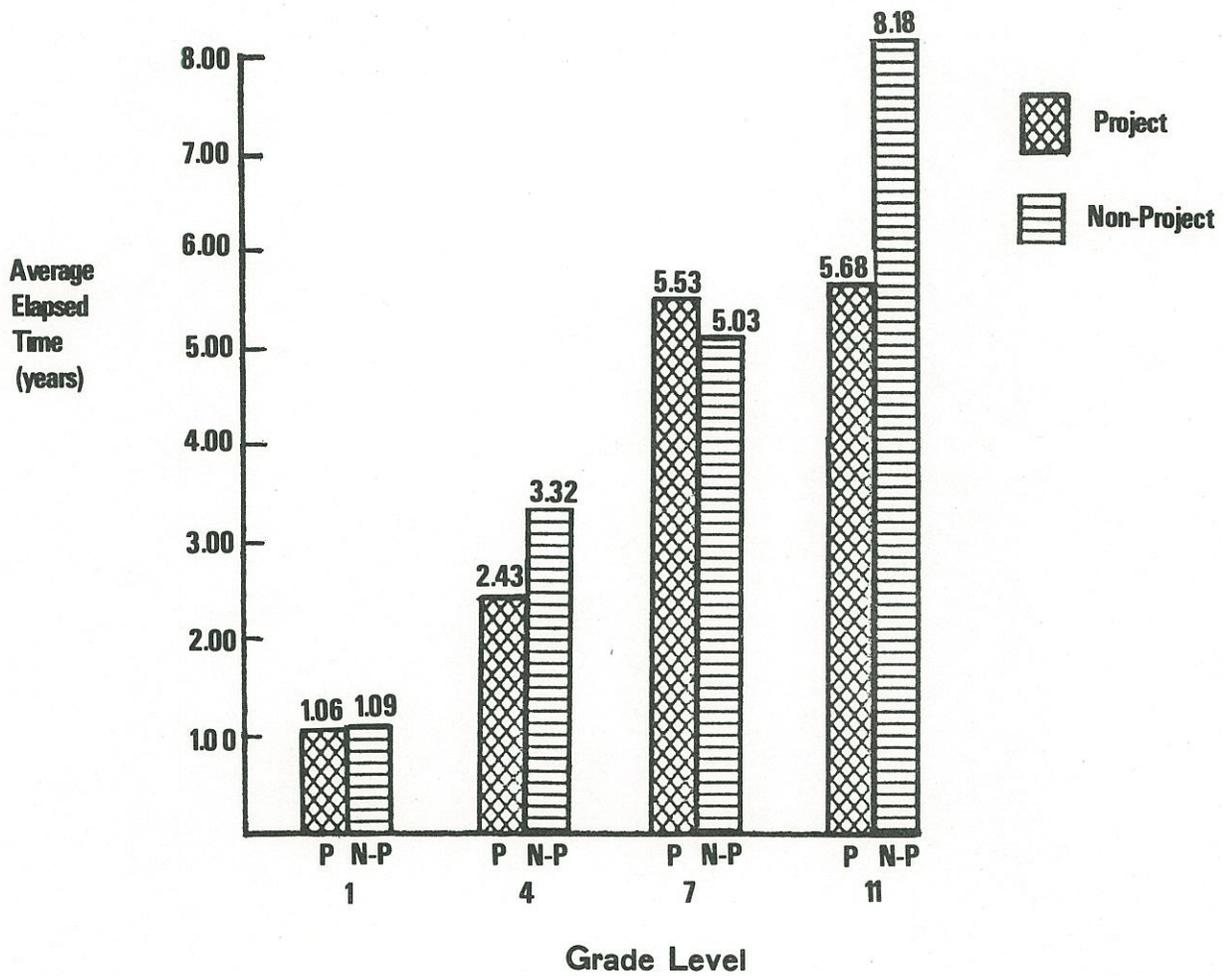


Figure 7.3

Average Elapsed Time Since Latest Tuberculin Test Record Entry by
Grade Level in Selected Project and Non-Project Schools



medical examination no more than 12 months prior to, or 30 days following school entry. New students who have not complied with these requirements are to be admitted on a provisional basis for 90 days if they present evidence from a physician or the DOH indicating that they are in the process of meeting the requirements. Students who are not in the process of meeting the requirements are not to be admitted to school.

Under section 298-49, HRS, "If a child does not complete his immunization and tuberculin requirement...or his physical examination requirement within the three month period provided after provisional entry into school, the department of education shall refer the child to the department of health. The department of health shall cause a notice to be sent to the parent of the child stating that if the required immunizations, tuberculin test, or physical examination is not completed within thirty days of the date of the notice, the child shall not be admitted to school." Enforcement of the immunization and tuberculin test requirements is the responsibility of the department of health.

Our examination of the records of 39 new enrollees in the selected project and non-project schools revealed that many of them were in violation of the immunization, tuberculin, and physical examination requirements. Of 18 new

students in project schools and 21 new students in non-project schools, 14 had no health record (form 14) or temporary health record (form 14a).

Of the 14 new students without health records, four students were in project schools, and ten were in non-project schools. While the sample is too small for absolute conclusions to be drawn, it does appear that better controls should be applied, particularly in the non-project schools, to assure that each new student has a health record.

Conclusions

The review of the health records does not indicate that project schools are significantly better at maintaining required and recommended physical examination, tuberculin testing, and immunization levels than non-project schools. Rather, a majority of students in both types of schools are not in compliance with recommended health guidelines, receive fewer physical examinations than they should, and receive less immunization and tuberculin testing than they should. There may be a number of upper grade level students whose DPT immunizations have expired, and a distressingly large number of students may have received no tuberculin test.

Chapter 8

STUDENT APPRAISAL OF SERVICES

Introduction

Student satisfaction of school health services may be ascertained by field surveys or, in a negative sense, by complaints filed. Using data supplied by the department of education, this chapter reports on the degree of satisfaction with the school health program, as expressed by students interviewed by the department. The chapter compares the responses of students at project schools with those of students at non-project schools. The chapter also notes the possibility of using the incidence of lawsuits as a measure of program effectiveness.

Summary of Findings

In general, we find that the great majority of students in the project schools are satisfied with the health services provided in their schools.

Student Satisfaction

In May 1973, the student affairs section of the department of education conducted a survey of six student affairs programs, including school health services. Approximately 3000 students, in grades 4-12, representing 57 schools, were surveyed. Included in the 57 schools were 12 project and 45 non-project schools.

In the area of school health services, the survey participants were asked to indicate their degree of satisfaction with the program by checking one of the following responses: *very much*, *somewhat*, *not at all*, *don't know*.

The examination of the results shows wide variations in student satisfaction ranging from a high of 100 percent to a low of 22 percent. Student satisfaction represents the percentage of the total students surveyed in each school who expressed a *very much* or *somewhat* satisfied rating in their respective schools. A comparison of the results by the three grade level categories (i.e., elementary, intermediate, and high schools) reveals wide variations in student satisfaction in each grade level group, ranging from 92 percent to 22 percent in the high schools, 100 percent to 48 percent in the intermediate schools, and 100 percent to 63 percent in the elementary schools. The elementary school group generally gave higher satisfaction ratings than the other groups. The intermediate school group indicated the next highest level of satisfaction, and the high school group was least satisfied. This may indicate lower quality health services in many of the upper grade level schools, or it may indicate that higher grade level students are more demanding consumers.

The examination of the student satisfaction ratings within each grade level group reveals that the pilot project schools are invariably

among the schools with the higher ratings while the non-project schools generally are rated lower. For example, out of the 19 schools surveyed in each grade level group, the pilot project schools are included among the top five in the high school group, the top six in the intermediate school group, and the top nine among the elementary school group. While some of the non-project schools are rated high, only non-project schools appear in the lower half of the rankings in all three groups. In addition to a higher relative ranking, the actual percentage figures for the project schools are high. The percentage range for the pilot project schools in each of the three groups is as follows: 92 percent to 69 percent for the high schools; 100

percent to 82 percent for the intermediate schools; and 100 percent to 91 percent for the elementary schools.

Lawsuits

Another measure of consumer reaction to school health services is incidence of lawsuits filed against the State for improper rendering of emergency health assistance to students. However, no such suits were filed during the 1970-74 period against either project or non-project schools, so no conclusions can be drawn.

Chapter 9

DIRECT SERVICES RESOURCES

Introduction

The number and qualifications of personnel who actually dispense health care in the schools, the facilities they use to dispense health care, and the supplies that are available to them clearly are all keys to the quality of health care in the schools. This chapter reports the results of surveys undertaken to measure these factors, and compares the results in project schools with those in non-project schools. The chapter also notes the importance of such considerations as privacy, quiet, and comfort in rooms devoted to school health care, and compares the situation in project schools with that in non-project schools.

Summary of Findings

In general, we find the following:

1. Health services personnel rendering direct health assistance in project schools, for the most part, meet the health training requirement. In contrast, many of the health designates in non-project schools do not meet the health training requirement.
2. Project schools provide health services at a lower cost per case than non-project schools.
3. Although volunteer aides have performed an invaluable service in the absence of full-time health aides, it is not a sound

program alternative for providing school health services.

4. In comparison to non-project schools, the pilot project schools are better equipped with facilities and supplies to carry out the health program.

Quality of Resources

DOE regulation 1710-14 states that "the school is responsible for providing immediate and temporary care for students who become ill or are injured on school premises. The administering of first aid is the responsibility of the principal or the persons designated by him."

While the DOE policy specifically assigns responsibility for the provision of health services to the school principal, a variety of persons render direct health assistance, particularly in non-project schools. To identify the persons who actually administer health care in both project and non-project schools, we conducted a survey of principals of 22 project and 22 non-project schools. The survey indicates that principals, vice principals, counselors, librarians, teachers, school administrative services assistants (SASA's), and, in one case, the school custodian, are providing health services to students in non-project schools.

Act 130 and the memorandum of agreement between the department of education

and the department of health require the principal of each project school to serve as administrator for the pilot project in his school. Principals in some project schools have delegated this administrative responsibility to the vice principal. In all project schools, the health aides are the ones providing substantially all direct health assistance.

Our survey of principals revealed that those persons rendering direct health assistance in project schools are, for the most part, better qualified, in terms of health-related training than their counterparts in non-project schools (see table 9.1).

The table shows the number of persons who provide health assistance, the number and percentage of those persons with first aid and nursing training, and the number and percentage of those who have received training within the past three years. The information in the table is categorized by grade level. Of the 28 persons who provide health assistance in the project schools, 27 (96 percent) have received first aid or nursing training. In the non-project schools, where 70 persons render health assistance, only 25 (36 percent) have received training. In addition, of the 27 trained personnel in the project schools, 20 (71 percent) have received some form of health training within the past three years. In the non-project schools, none of the persons who provide health assistance have received training within the past three years.

The fact that the majority of persons providing health assistance in project schools have received some form of health-related training would seem to indicate that they are better equipped to administer first aid than those persons in non-project schools who have not received the benefit of training.

Efficient Use and Cost of Resources

Besides comparing the training received by health personnel in project and non-project schools, our survey sought to compare the actual time spent in providing health services by

persons in project and non-project schools. Our survey revealed that health personnel in project schools spend an average of 33.6 hours per week on student health while their counterparts in the non-project schools spend an average of 14.9 hours per week rendering health services.

As shown in table 9.2, the time spent by health aides (approximately 32.3 hours per week)¹ accounts for most of the time spent on health services in project schools. Health designates in project schools average only 1.3 hours per week on health-related matters. From the table it appears that health aides and designates in project schools spend the greatest amount of time rendering assistance in the intermediate and high school grade levels (7-12, 9-12, 10-12) and the least amount of time in the intermediate (7-8, 7-9) grade levels. It is interesting to note that the same does not apply in non-project schools; there health designates in the intermediate grade levels spend more time rendering health assistance than they do in other grade levels.

Health aides provide services at a lower cost than do principals, vice principals, etc., in non-project schools. The cost of health services, based on man-hours spent in rendering health assistance, averages \$101 for project schools in comparison to a range of \$75-\$142² for non-project schools. On a per-case basis, the project schools incur a cost of approximately \$.91 per case, and the non-project schools incur costs ranging between \$1.60 and \$3.00 per case.

Volunteer aide schools. We surveyed five schools with a volunteer aide program: Liholiho elementary (Honolulu), Nimitz elementary (central), August Ahrens elementary (leeward),

¹Health aides work a scheduled 6-1/2 hours a day, 5 days a week.

²The office of research and planning in its report entitled, *Basic School Staffing Study*, March 1974, page 3, reported average salaries for vice principals and SASA's of \$16,576 and \$10,165, respectively, for the school year 1974-75. The estimated hourly rates of \$9.50 for vice principals and \$5 for SASA's were used in our cost calculations.

Table 9.1

Health-Related Training of Health Aides and School Personnel

<i>School grade level</i>	<i>Total no. of project and non-project schools surveyed</i>	<i>Project Schools</i>					<i>Non-Project Schools</i>			
		<i>Total no. of persons providing health assist.</i>	<i>Tot. no. persons with first aid or nursing training</i>	<i>%</i>	<i>Tot. no. persons who received training in past 3 yrs.</i>	<i>%</i>	<i>Total no. of persons providing health assist.</i>	<i>Tot. no. persons with first aid or nursing training</i>	<i>%</i>	<i>Tot. no. persons who received training in past 3 yrs.</i>
Elementary (K-6)	16	12	12	100	8	67	27	11	41	0
Elementary-Intermediate (K-8, K-9)	10	5	5	100	3	60	10	2	20	0
Intermediate (7-8, 7-9)	6	4	3	75	3	75	17	1	6	0
High and High & Intermediate (7-12, 9-12, 10-12)	12	7	7	100	6	86	16	11	69	0
Total	44	28	27	96	20	71	70	25	36	0

Table 9.2

**Personnel Time and Cost for School Health Services
In Project and Non-Project Schools
For Period October 21–25, 1974**

<i>School level</i>	<i>Project</i>						<i>Non-Project</i>				
	<i>No. of schools</i>	<i>Average manhours/school</i>			<i>Average no. of cases/school</i>	<i>Estimated cost/school</i>	<i>No. of schools</i>	<i>Average man-hours/school</i>	<i>Average no. of cases/school</i>	<i>Estimated cost/school*</i>	
		<i>HA</i>	<i>HD</i>	<i>Total</i>						<i>SASA</i>	<i>VP</i>
Elementary	8	31.2	1.8	33.0	77	\$102	7**	14.0	34	\$ 70 – \$133	
Elem.–Inter.	5	31.0	1.5	32.5	83	99	5	8.1	35	41 – 77	
Intermediate	3	26.5	0.7	27.2	148	79	3	30.3	55	152 – 288	
Inter.–High & High	6	37.2	1.3	38.5	160	114	6	13.8	69	69 – 131	
Average	22	32.3	1.3	33.6	111	\$101	21	14.9	47	\$ 75 – \$142	

*The SASA and vice-principal positions have been used to determine the non-project school costs. The two figures depict the costs if the emergency assistance services were provided by the SASA and vice-principal, respectively. The actual cost, therefore, would run somewhere between these two costs, plus the teachers' time devoted to health services.

**Waipahu Elementary School excluded – volunteer aide school.

Palisades elementary (leeward), and Waipahu elementary (leeward). Liholiho, Nimitz, and Palisades elementary schools are staffed by Red Cross-trained volunteer health room aides.

Except at Liholiho elementary, the health rooms are staffed throughout the school day by volunteer mothers. In some schools, volunteers usually work at least one day per week in either the morning or afternoon shift. This requires a complement of at least 10 aides for a five-day school week, and stand-by volunteers for substitute duty. In other schools, one aide may staff the health room for the entire school day and rotate accordingly. Supervision is usually provided, as needed, by the principal, vice principal, or school administrative services assistant. Supervision is generally more intensive during the early part of school year due to training and orientation, growing less intensive as the school year progresses.

A number of advantages can be cited for having a volunteer aide program. For non-project schools, the obvious benefit is that emergency health assistance service is available. Although the health designates spend much time in coordination and supervision, the program frees them from providing emergency health assistance duties, which can be more time-consuming. While the volunteer health room aide program has provided an invaluable service to schools and their students in the absence of a full-time aide, it is not a sound program alternative for providing school health services. *First*, the volunteer program is designed primarily to meet only one of the objectives of the pilot project, i.e., emergency assistance. Moreover, the volunteers may not dispense medication. *Second*, recruitment of volunteers continues to be a problem and, because of the high turnover rate, an inordinate amount of time must be spent each year on recruitment, training, orientation, and scheduling.

Facilities and Supplies

In January 1971, the department of education and the department of health jointly

developed and approved a list of health room items for use throughout the state public school system.³ Items on the list are divided into three major categories: nonexpendable items, expendable items, and health room environment. We used this list, with a few modifications, as a basis for our supplies and equipment inventory survey. The primary purpose of the inventory survey was to determine whether schools are prepared and equipped to provide emergency care of the ill and injured and to compare the project and non-project schools' facilities, equipment, and supplies.

Facilities. The memorandum of agreement between the department of education and the department of health states that the department of education shall provide and maintain adequate space for school health services. There is no comparable policy in the non-project schools. Table 9.3 shows the comparative status of the health rooms.

All selected project schools have health rooms which are staffed during regular school hours. In contrast, only 10 (44 percent) of the 22 selected non-project schools have health rooms. The remaining 12 (56 percent) of the non-project schools provide emergency services at various locations within school facilities. Eight use the administrative office, two use the teachers' lounge, one uses a general purpose room, and at one school, the students report either to the teacher or the principal.

Some environmental considerations. Although availability of health rooms is more essential in providing satisfactory health services in the schools, such environmental aspects as privacy, relative quiet, and the safety and comfort for students also are desirable. Without such conditions, students may not be properly cared for.

³ University of Hawaii School of Nursing memorandum to the Governor's Advisory Committee on School Health Services, dated June 29, 1971, Subject: School Health Services Pilot Project Evaluation Final Report: October 1970-June 1971, page 26 of report.

Table 9.3
Status of Health Room Availability in Selected
Project and Non-Project Schools

<i>School level</i>	<i>No. of schools</i>	<i>Availability of health room</i>		<i>If no health room location serviced</i>			<i>How manned</i>	
		<i>Yes</i>	<i>No</i>	<i>Admin. office</i>	<i>Lounge</i>	<i>Others</i>	<i>All times</i>	<i>As needed</i>
<i>Project:</i>								
Elementary	8	8					8	
Intermediate—elementary	5	5					5	
Intermediate	3	3					3	
High & high—intermediate	6	6					6	
Total	22	22					22	
<i>Non-Project:</i>								
Elementary	8	5	3	2	1		2	6
Intermediate—elementary	5	1	4	1	1	2		5
Intermediate	3	2	1	1			1	2
High & high—intermediate	6	2	4	4			3	3
Total	22	10	12	8	2	2	6	16

In the project schools special health rooms are provided, and conditions conducive to health care generally prevail. However, in some schools this is not always true. For example, the health room in Stevenson intermediate is a large room with partitioned sections for the health aide and a counselor, and a soda dispensing machine stands inside the doorway. Consequently, a large number of students tend to congregate in this area and create commotion and distractions.

The conditions which exist in the non-project schools tend to be extremely poor. The administrative offices and general purpose rooms used for health care do not provide the environment conducive to the care of the sick and injured. School lounges appear to more closely meet the conditions required of a health

room. However, staff and teachers use the lounges, and school lounges are not necessarily near to the administrative staff personnel who provide emergency health services. At Kapaa elementary, for example, the lounge is about 150 feet away from the administrative office. This arrangement is inconvenient.

Supplies and equipment. Supplies and equipment are essential items in providing emergency services to the students. The lack of any of the items jointly agreed upon by DOE and DOH as essential to the health services program adversely affect the quality of service. The supplies and equipment inventory is the criteria used to compare the project and non-project schools.

Inventory. Our inventory of recommended health room items found the selected project schools far better equipped than non-project schools. Only a few recommended items were missing in the project schools, while many items were missing in the selected non-project schools.

There are a total of 52 items on the inventory list. In an item-by-item comparison, the non-project schools fall far short of the project schools. For example, at the elementary level, all project schools were better equipped. In the elementary/intermediate level, the non-project schools were better equipped than

the project schools in only two expendable items, sterile gauze pads and sponges. At the intermediate level and the high and high/intermediate level, the non-project schools fared better only in one of the total 52 recommended items.

Some important items, such as a first aid manual, were not available. Only 8 of the non-project schools have a first aid manual, 18 have cots, 10 have mattresses, and 17 have blankets. In the 22 project schools, the only missing item from the list was mattresses.

PART III

SELECTED PROBLEMS

Chapter 10

INTRODUCTION

This part presents our findings and recommendations with regard to operational problems in the delivery of school health services, which we discovered in the course of evaluating health care in project and non-project schools. Chapter 10 presents a summary of findings. Chapter 11 discusses such procedural matters as administration of medication, accident reporting, height and weight screening, and student health record maintenance. Chapter 12 deals with the administrative problems of school nurse and health aide workloads, proposed additional health aide duties and the adequacy of health personnel training.

Summary of Findings

The evaluation of health care services in project and non-project schools reported in Part II presents evidence that health care is more effective and efficient in project schools than it is in non-project schools. However, there are shortcomings in health care that are common to project and non-project schools, and other

shortcomings that are peculiar to one or the other class of schools.

In project as well as in non-project schools, we find that:

Accident reporting criteria and procedures are unclear, height and weight screening as currently conducted appears to be of doubtful value, and student health records at higher grade levels are poorly maintained.

In project schools, we find that:

Workload of school nurses and health aides vary widely, some personnel do not meet minimum qualifications, and proposals to add nonhealth duties to the functions of health aides would be detrimental to the program.

In non-project schools, we find that:

Medication is being dispensed by some school personnel contrary to department of education policy.

Chapter 11

OPERATIONAL PROBLEMS

Introduction

This chapter discusses certain operational shortcomings of the school health care system which we noted during our evaluation of student health care in project and non-project schools. These shortcomings have to do with the dispensation of medication in non-project schools and accident reporting, health record maintenance, and health screening in both project and non-project schools.

Summary of Findings

In non-project schools:

1. Some non-project schools are dispensing medication although department of education policies forbid them to do so.

In project and non-project schools:

1. Criteria and procedures for reporting accidents are not clear, and school health personnel do not follow uniform procedures.

2. An insignificant number of students screened for height and weight are referred for follow-up evaluation.

3. All pertinent information is not entered in the student health records and the records do not reflect the current health status of the students.

Medication Services Not Allowed in Non-Project Schools

Our examination revealed that medication services are provided in project schools but medication is not allowed to be dispensed in non-project schools.

Current policy. In August 1972, the superintendent of education issued a memorandum to the district and assistant superintendents and to all school principals which states:

“Medication will not be administered by school personnel. This position is consistent with the present teachers collective bargaining agreement negotiated with the Hawaii State Teachers Association, and with Department Regulation 1710-14.1, which in part states: ‘Under no circumstances may school personnel diagnose illness, prescribe or administer medication of any sort to pupils.’

“However, Department of Health School Health Personnel, assigned to Act 130, Health Services Pilot Project Schools, may administer medication to children in schools when the appropriate forms... have been completed and processed. The public health nurse may administer

medication directly, but the health aide will administer medication only under the direction or supervision of the public health nurse or School Health Physician.”¹

The need for medication services. To determine the demand for medication services, we examined the practices and experiences of the pilot project schools.

During the 1972–73 and the 1973–74 school years, there were approximately 215 and 226 requests by parents for medication to be dispensed to their children in the pilot project schools. The more frequent requests for medication during the two years were for hyperactivity and allergies. Table 11.1 summarizes the medication requests, by diagnosis, in the pilot project schools for the two school years. If medication requirements of pupils in project and non-project schools were comparable, and non-project school personnel adhered strictly to the policy forbidding the dispensing of medication, it is estimated that medication services were denied to over 600 students in non-project schools during the 1973–74 school year.

Table 11.1

Medication Requests by Parents for Students in Pilot Project Schools

Request by diagnosis	1972-73	1973-74
Hyperactivity	87	104
Allergy		
Beesting	72	29
Asthma	3	30
Urticaria	12	3
Other	3	2
Minimal brain dysfunction	15	29
Convulsive disorder	5	9
Chronic abdominal pain	3	2
Infections	5	13
Miscellaneous	10	5
Total	215	226

¹Memorandum from superintendent to district superintendents, assistant superintendents, and all principals, August 22, 1972.

Medication assistance in non-project schools. To determine what provisions are made for students requiring medication in non-project schools, we made inquiries during the field work phase of the evaluation. Twenty non-project schools were included in the field work survey. Of the 20, 9 were intermediate or high schools and 11 were elementary schools. No medication assistance services were provided in the nine secondary schools because the students were old enough to administer their own medication. Five of the elementary schools also provided no medication assistance. If students required medication during the day, the parents were asked to come to school to administer the medication. The remaining six elementary schools admitted or the data at the school showed that medication was being dispensed. The services provided in these schools include storing the medication, reminding students to take the medication, and dispensing the medication to the students.

Therefore, some of the non-project schools are providing medication assistance to students in violation of department of education policies. Although their intentions may be good, these non-project school personnel are exposing themselves and the schools to possible lawsuits.

Recommendation. In view of the need for medication services in the non-project schools and for the protection of school personnel, we recommend that the departments of health and education, in consultation with the attorney general, jointly resolve the medication problem confronting the non-project schools.

Accident Reporting Procedures Unclear

DOE regulation number 1710–14.1 states, “if an accident occurs on school property, it should be reported on the department’s accident report form (form 411–A).”² Specifically, an

²State of Hawaii, department of education, regulation 1710–14.1, Emergency Care for Sick or Injured Students.

accident report must be completed and submitted immediately following an accident or any other unusual incident (e.g., fights) which causes damage or injury to a student or his property.

The accident report form requires the following information: name, address, grade and age of the injured student; location of the accident; activity involved (e.g., athletics); period of the day in which the accident occurred; nature of the injury (i.e., abrasion, bruise, etc.); part of the body injured; name of witness to the accident, if any; immediate action taken; and the degree of injury (i.e., permanent, temporary disability, etc.). The report requires a brief explanation of how the accident and injury occurred and suggested preventive measures. Copies of the accident report are submitted to the school's district office, the office of the attorney general, and the DOE's office of instructional services, student affairs section. In addition, a copy of the report is retained by the school. According to the DOE, the accident reports are used by the schools, district, and state offices of the DOE as well as other state departments to: "(a) Get a clearer picture of injuries and accidents in our public schools; (b) analyze causes and suggested preventive measures from the field; (c) help in reducing and preventing accidents and injuries to our children; and (d) aid the Department and its personnel in all damage and liability cases."³

Interviews with health designates in both project and non-project schools revealed that the criteria utilized in filing and submitting accident reports vary from school to school. Of the 38 project and non-project schools surveyed, 12 schools submitted accident reports for every accident or injury which occurred on school property. Nineteen schools submitted an accident report only for serious accidents and or injuries requiring medical attention, and 7 schools left reporting to the discretion of the

health designate. Because of the inconsistencies in reporting, the form 411's filed with the DOE have not been used for school accident analysis.

For the most part, health designates interviewed expressed concern over accident reporting and seemed confused as to specific criteria which should be utilized in reporting accidents and injuries. It appears that the confusion, especially in project schools, lies with the conflicting criteria for accident reporting. In the instructions relating to accident reporting contained in the pilot project health aide manual, "reports should be kept of the following types of injuries: (1) all injuries requiring doctor's care and (2) all injuries keeping students out of school one-half day or more."⁴ On the other hand, the instructions for completing accident report form 411-A issued by the DOE's student affairs section state that "all accidents and injuries not involving workmen's compensation (Form WC-1 and WC-5) are to be reported in this form (Form 411-A)."

The conflicting criteria as to when a form 411-A must be completed and submitted to the various state agencies seem to account for the application of differing criteria utilized by the schools. Such conflicting criteria illustrate a lack of coordination and communication between the department of education's student affairs section and the department of health's school health branch. While the health aide manual is only used in the project schools, the question still arises as to which set of criteria the schools are to utilize: those issued by the DOE or those issued by the DOH.

Recommendations. We recommend that the department of education and the department of health establish a standard set of criteria for accident reporting. In addition, we recommend that the two departments jointly establish the procedures to be followed when

³State of Hawaii, department of education, *Instructions for Completing Accident Report, Form 411-4*.

⁴State of Hawaii, department of health, school health branch, *Accident Report Form*.

reporting accidents and injuries which occur on school property. Some suggested criteria would be those contained in the health aide manual, i.e., all injuries requiring a doctor's care, and all injuries keeping students out of school for one-half day or more.

Questionable Value of Height and Weight Screening

Any statewide screening program, once formulated, should be reviewed and reevaluated periodically to determine the cost-effectiveness of the program in light of current conditions. At a minimum, the review should examine the rationale for the activity and specify the ends being sought.

Our examination of health screening activities revealed that the utility and need for height and weight screening tests are questionable. Height and weight screening presently being conducted in the pilot project schools shows an insignificant number of referrals for followup evaluations. Table 11.2 shows the number of students screened for height and weight as well as the number and percentage of students referred for evaluation from school year 1971-72 through school year 1973-74.

Table 11.2
No. of Students Screened for Height and Weight
In the Pilot Project Schools
During the SY 1971-72 Through 1973-74*

School year	No. of students screened for height and weight	No. of students referred for further evaluation	% of total referred
1971-72	27,729	75	.27%
1972-73	27,729	4	.01
1973-74	20,556	231	1.12
Total	76,014	310	0.41%

*State of Hawaii, Department of Health, Student Health Services Branch, *Annual Report* for the years 1971-72, 1972-73, and 1973-74.

The table shows that over the past three years, only 0.41 percent of all students screened were referred for further evaluation. And although the school health services pilot project annual reports for the past three years have questioned the value of height and weight screening, no new evaluation of the procedure has been made.

Recommendation. We recommend that the department of health evaluate the need for mass height and weight screening, including the identification of the uses to be made of the data.

Poor Recordkeeping of Student Health Records

Individual health records are essential elements of a school health services program. Health records should reveal whether each student has received the required immunizations, screening tests, and examinations; whether recommendations for students under continuing medical care are adhered to; and whether students who require special handling in the educational setting are given the attention they require. Health records should contain specific positive and negative clinical findings and the results of any special tests or examinations conducted by the school, as well as a summary of health findings, comments or recommendations significant to the school and the student's parents. These records, then, can be a valuable source of data for understanding the growth, development, health, and other characteristics of individual students.

In our survey of the status of form 14's in the schools and review of procedures, we find that the present survey is of doubtful utility, particularly in the upper grade levels, for several reasons.

First, we find that a significant number of health status items are missing from the records. Of those items with entries, the elapsed time of the immunization or test is often well beyond recommended limits, particularly in the higher grade levels. This is due to both noncompliance

with recommended health procedures and the failure to update records.⁵ In either case, the records are not current enough to be genuinely useful.

Second, records generally are reviewed on a "time available" basis. Consequently, student followup based on record review depends on the reviewer's workload.

⁵In 1973, \$37,000 was appropriated for field PHN's to update immunization records of children in grades K-3.

Third, the format of form 14 has not been revised to incorporate new requirements. For example, rubella immunizations (now required for children below age 10) are not identified on the form. Conversely, annual "health history comments" are no longer required for students above elementary level.

Recommendations. We recommend that an evaluation be conducted of the recordkeeping and review procedures of the pupil's health record (DOE form 14) to ensure compliance with the intent of maintaining individual health records. We also recommend that the format of the pupil's health record be revised to incorporate current regulations and recommended procedures.

Chapter 12

STAFFING AND PERSONNEL PROBLEMS

Introduction

This chapter presents findings and recommendations regarding staffing and training of health care personnel in the schools. Sections dealing with project schools focus on staffing patterns and workload, the proposed use of health aides for duties not connected with health care and job performance evaluations for health aides. Other sections deal with the qualifications of personnel in both project and non-project schools.

Summary of Findings

In project schools, we find that:

1. There are wide variations in the workloads of school nurses and health aides.
2. Proposed additional duties for health aides would detract from their role as providers of health care.

In non-project schools, we find that:

1. School personnel designated to administer school health care in most cases do not have current first aid training certification.

Variations in Workload Assignments

The staffing criteria established by Act 130 places one health aide in each school and a

school nurse in each high school complex. Because of the varying student populations of schools and of the number of schools in each complex, the staffing pattern presently being utilized results in an inequitable distribution of workload. This is illustrated below.

Comparison of school nurses' workload.

The school nurses are responsible for: 1) the administration of the school health services pilot project operation within the complex, 2) supervision of health aides, and 3) the rendering of professional nursing services (e.g., counseling and follow-up) upon referrals. To perform these health services responsibilities, the school nurse must relate directly to each of the health aides in her complex, to the various school personnel, and to students. Therefore, the school nurses' workload is dependent to a large degree on the number of schools and the total student population in the complex.

A review of the distribution of schools and student population by pilot project complex reveals wide variations. This is shown in table 12.1 below.

As indicated in table 12.1 the number of schools for which a school nurse is responsible range from a low of four in the Kauai complex to a high of 14 in the Hilo complex. Similarly, complex enrollment also varies widely, ranging from 2,999 to 12,295 students. It should also be noted that the complexes with the larger number of schools also have the larger enrollment sizes. As noted previously, one of the

professional services rendered by the school nurse is the follow-up of students referred to her. Table 12.1 indicates that there is a high degree of correlation (though not linear) between follow-up cases and enrollment. For example, Kauai, the smallest pilot project complex, also had the smallest number of referrals (120 cases) during the 1973-74 school year. At the other extreme, Kailua had the largest number of referrals (307 cases) during the same period. On a per student basis (i.e., the relationship of the number of referrals to enrollment), however, we find a different referral pattern. In the three smaller complexes, the percentage of referrals ranged from 3.5 to 4.4 percent. For the three larger complexes, this percentage ranged from 2.1 to 2.5 percent. These data indicate that perhaps nurses assigned to large complexes may have a heavier follow-up workload than they can handle.

Table 12.1
Number of Schools, Enrollment, and Referrals
By Pilot Project Complex

Complex	No. of schools	Complex enrollment	No. of referrals 1973-1974	Percentage of referrals to enrollment
Kauai	4	2,999	120	4.0%
Baldwin	8	5,224	230	4.4
Roosevelt	9	7,810	277	3.5
Campbell	9	8,858	182	2.1
Hilo	14*	9,015	199	2.2
Kailua	13	12,295	307	2.5
Total	57	46,201	1,315	

*Actual number of health aides in the Hilo complex is 15. There are two health aides at Hilo High School.

In summary, the assignment of the school nurses on the basis of one school nurse per complex has caused a wide disparity in supervisory workload and direct service follow-up capability.

Health aides' workload. As stated previously, each project school is staffed with one health aide regardless of enrollment size, except for Hilo high school which has two health aides. Health aides provide direct emergency assistance, health screening, and record review services. The number of records maintained and reviewed as well as the number of students screened are approximately proportional to student enrollment. Our review of health room logs indicated that, in general, the emergency health assistance workload also increases with student enrollment as indicated in figure 5.2 of chapter 5 though not in a linear fashion. Thus, like school nurses, the workload of health aides in general is related to enrollment size.

Proposed expansion of the pilot project. The legislature by Act 218, SLH 1974, appropriated the sum of \$175,000 to extend the school health services pilot project to four additional complexes. The four complexes selected by the department of health and the department of education are shown in appendix A-2. Three of the complexes are relatively small in size and two of the complexes (Molokai and Waialua) have smaller enrollments than the Kauai complex discussed previously. Also many of the schools within these added complexes, e.g., Maunaloa and Kilohana in the Molokai complex, are very small in size. From all indications, it appears that the department of health will continue to utilize the same criteria (namely one health aide per school and one school nurse per complex) to staff these new expansion complexes. In light of the previous discussions regarding the application of these criteria, it appears that even greater inequities will arise.

Recommendation. We recommend that the staffing standards for school nurses and health aides be established on more rational bases than those presently being utilized. These bases should include enrollment size, grade level of the school, geographical location, and socio-economic composition of the student body.

Proposed Expansion of Health Aide Duties

The department of education and the department of health are considering making the health aides responsible for general campus supervision and JPO supervision.¹ This proposal requires the health aides to be on the school grounds, leaving the health room unmanned. We find that the expansion of duties of the health aides will be detrimental to the quality of emergency care services provided by health aides. The details are provided in the following sections.

The DOE/DOH proposed expansion of duties will extend the workday of the health aides as well as expand the duties. A general work schedule under the new proposal is depicted in table 12.2. The table shows that the

health aides will be responsible for campus supervision, including JPO duties, prior to the start of school between 7:20 and 8:00 a.m. and after school between 2:20 and 3:00 p.m. Although the proposed schedule does not show it, the health aides are also slated for campus supervision duties during the morning recess.² Under this plan, the health aides would be in the health room for approximately 5 hours 25 minutes of the time students are in school. This, in essence, means cutting back on direct services to students by approximately one hour, about 15 percent of the current health room staffing time.

Current health aides' operations. At the present time the health aides work on a 7-hour per day schedule, including one-half hour for lunch. Seventeen of the 20 health aides reported

Table 12.2
A Proposed General Work Assignment Schedule
For the Eight-Hour Day*

<i>Work schedule</i>	<i>Duration</i>	<i>Work task</i>
7:20 – 8:00 a.m.	40 min.	Campus supervision. General supervision of the campus including supervision of JPO's.
8:00 – 12:00 noon	4 hrs.	Health services. The aide will provide whatever health services are needed. His primary work station will be to man the health room or dispensary.
12:00 – 12:45 p.m.	45 min.	Lunch period for the aide.
12:45 – 2:20 p.m.	1 hr. 35 min.	Health services in health room.
2:20 – 3:00 p.m.	40 min.	Campus supervision. General supervision of the campus, and supervision of JPO's.
3:00 – 4:05 p.m.	1 hr. 5 min.	Other preparatory and paper work that must be performed in conjunction with assigned duties such as checking health records.
Total	8 working hrs. per day	

*Other variants to this proposed work schedule are being considered by the department of education.

Source: Department of Education, budget services branch, memorandum to school health services branch chief, dated July 19, 1974, subject: Health and Safety of School Children.

¹Department of education, budget services branch, memorandum to school health services branch chief, July 19, 1974, Subject: Health and Safety of School Children.

²*Ibid.* Proposed Job Description: Educational or Health Aide.

that their workday starts prior to the start of school and 18 of 20 work after school ends. The amount of time spent by the health aides prior to the start of school varies from 5 to 40 minutes while the time spent after school ranges from 5 to 60 minutes. During these periods, health aides provide emergency services to students.

Our review of health room logs of some sample schools for a one-week period indicated that students required health services assistance both before and after school hours (see figure 12.1).

The data show that there is a substantial demand for health services during the 7:30 to 8:30 a.m. period and lesser demand after school ends. There also is a substantial demand during the 10:00 to 11:00 a.m. period, the time most schools have their morning recess and a time when campus supervision duties are proposed for the health aide. Therefore, based on the above, the proposed expansion of duties would remove the health aides from the health rooms during periods when there are relatively heavy demands for health services assistance. Either the health room needs to be manned by other school personnel during the time the health aides are away, or students need to wait for the health aides to return in order to receive health services. In the first case the school staff (generally a principal, vice principal, or secretary) would be providing the emergency care, while the health aide trained for this function is elsewhere. In the second situation, students in need may be kept waiting unattended. In addition, students waiting for the return of the health aide might lose class time because they would be receiving health care after starting time for classes.

Utilizing health aides as campus supervisors may also affect relationships between health aides and students. The manner in which the health aides operate at the present time does not necessarily require the health aides to assume the kind of relationship which exists between students and teachers or students and school administrative staff (principals, vice prin-

cipals, counselors, etc.). Consequently, students would probably tend to feel more at ease with health aides and to confide in them. In general, health aides have been able to establish good rapport with students. This eases the task of providing emergency health assistance. This relationship may change if the health aide also assumes the authoritarian role implicit in campus supervision.

Recommendation. We recommend that health aide duties be health-related only, except in those situations where the size of the school is such that the health care activities would not occupy the full time of the health aide. However, in no instance should the other duties take precedence.

Inadequate Enforcement of Training Requirements

In this section, we discuss our findings and recommendations on the training requirements of the department of education's principals and health designates and the department of health's pilot project personnel.

Principals and health designates. The responsibility for the health and welfare of students is spelled out in the department of education's policy 1710-14 which states:

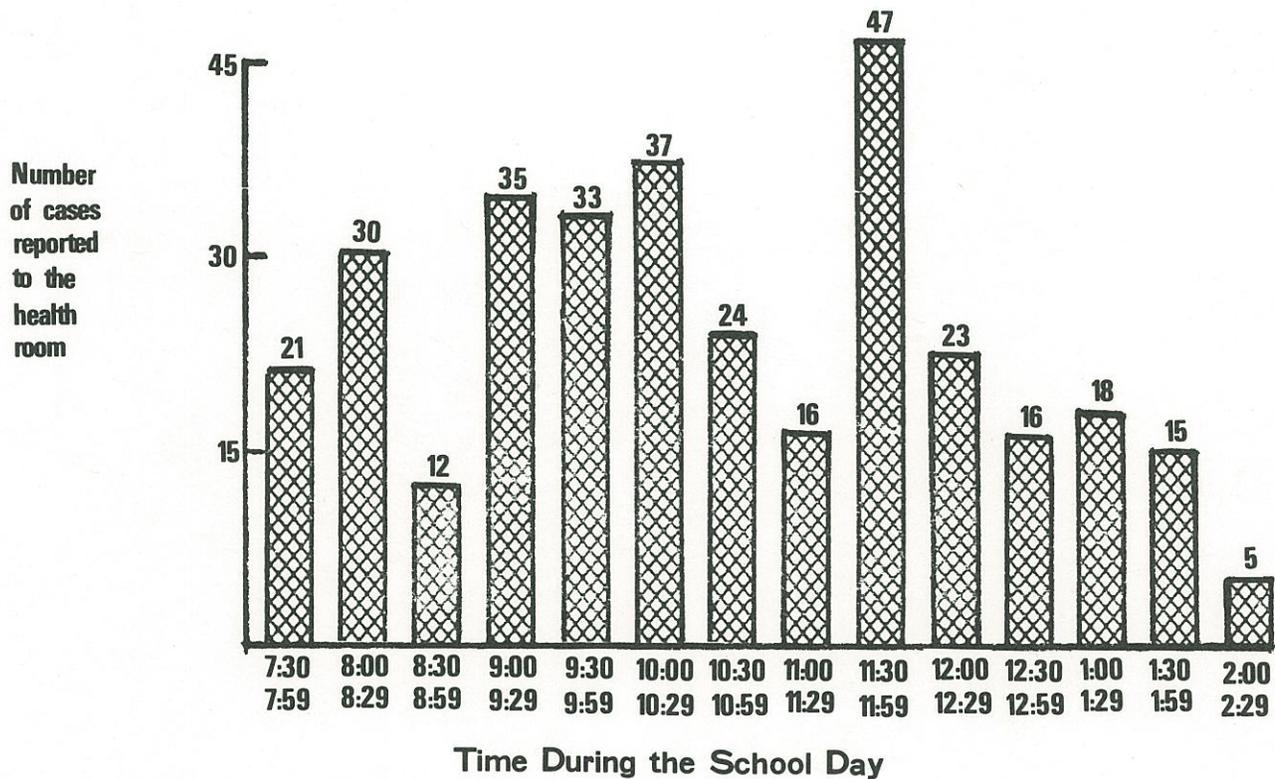
"The school is responsible for providing immediate and temporary care for students who become ill or are injured on school premises. The administering of first aid is the responsibility of the principal or the person designated by him."

Policy No. 1710-14.1 further states in part:

"The principal and/or his designees should be well trained in first aid and should be available at all times to render this help when needed."

Figure 12.1

Number of Reported Health Room Cases During the Week of October 7—11, 1974 for One-Half Hour Intervals During the School Day for Selected Project Schools*



*Project schools sampled were Nuuanu, Hilo Union, Puunene, and Kalaniana'ole.

In a memorandum dated March 1973, the deputy superintendent of DOE states:

“The individual administering first aid must be currently certified by the American Red Cross. The standard first aid course must be repeated every three years in order to maintain the ‘current certification status.’”³

The fact that many injuries occur in schools (see chapter 5 of this report) substantiates the need for adequately trained personnel in schools. During the course of our study, a survey was conducted to determine the first aid certification status of health designates in both project and non-project schools. The results of this survey are shown in table 12.3. The data in table 12.3 show that, despite present certification requirements, only one health designate out of 40 (2.5 percent) was in compliance with regulations. The remainder had received no training or had not maintained certification.

Table 12.3
Status of First Aid Certification of
40 Health Designates

Status	No. of HD's	%
None	11	27.5%
Expired	28	70.0
Current	1	2.5
Total	40	100.0%

The data in the table above indicate that, although the department of education has established regulations to ensure that properly trained school personnel provide health services, the department is not monitoring compliance with these regulations.

³Memorandum from DOE deputy superintendent to district superintendents and principals, subject: Red Cross Certified First Aid Training, March 5, 1973.

Health aides. The minimum qualification requirement for a health aide is graduation from high school and possession of a current Red Cross First Aid Certificate. The requirement for a *current* first aid certificate is essential to assure that the latest and most efficient techniques are being utilized to render emergency health services to students.

As part of our evaluation, the health training and health background of the health aides were reviewed. The results are presented in table 12.4 below.

Table 12.4
Qualifications of Health Aides in
Selected Project Schools

Educational qualifications:

Bachelor's degree in other than nursing	2
Nursing certificates or diploma	8
Registered nurse (3)	
Licensed practical nurse (5)	
High school diploma	11
Total	21

Training:

No. with Red Cross First Aid Certificate	20
No. without current Red Cross First Aid Certificate	1
Total	21

The data in the table show that approximately 47 percent of the health aides interviewed have professional backgrounds that far exceed minimum qualifications. Two health aides possess bachelor's degrees in fields other than nursing. Three health aides are registered nurses, and five health aides are licensed practical nurses.

It appears that project personnel were generally very effective in attracting and hiring highly qualified health aides. Of the 21 health aides surveyed, 20 met the minimum qualifications. The one health aide who did not meet the minimum qualifications had an expired

Red Cross Certificate at the time of hire. At the time of our review two months after the individual was employed, the individual noted above was still without a current certificate.

School nurses. At the present time Red Cross certification is not a qualification requirement for school nurses. The minimum requirements are based on education, professional nursing experience, and a current license to practice as a professional nurse.

This appears to be an inconsistent qualification policy, inasmuch as 1) health aides are required to possess a current Red Cross First Aid Certificate and 2) school nurses are required to maintain the technical proficiency of health aides, including the provision of training. We are

of the opinion that evidence of a school nurse's qualifications in the current techniques of first aid should be equal to or greater than that of a health aide.

Recommendations. In view of our findings, we recommend that:

- 1. The department of education enforce the current Red Cross First Aid certification requirement for the principal or his designate;*
- 2. The department of education establish a monitoring system to assure continuing compliance with the regulation; and*
- 3. School nurses be required to possess a current Red Cross First Aid Certificate.*

PART IV

STAFFING COST ESTIMATES

Chapter 13

COST ESTIMATES FOR HEALTH AIDES AND SCHOOL NURSES

As of September 1974, the 57 schools in the school health services pilot project were being served by 58 health aides and 6 school nurses. The 57 schools represent 26.4 percent of the 220 regular public schools and cover approximately 26.2 percent of the public school enrollment. This part presents our estimate of personnel cost (health aides and school nurses) associated with the statewide expansion of the school health services program should this be the decision of the legislature.

Assumptions

The assumptions made in estimating the number and cost of health aides are explained below.

Minimum and maximum health aides at each school. The cost estimates for health aides assume that there would be at least one health aide at each school. This is because illnesses and injuries occur at all times during the school day and someone should be ready to render immediate care. In this regard, the use of a part-time health aide who would be present only for part of the school day would not be satisfactory. Also, from the workload data compiled in our evaluation, we believe that two health aides would be the maximum number of health aides needed.

Health aide's function. The health aide should man the health room during the entire school day. This means that the person should not be assigned duties that would be required to be performed outside of the health room such as campus supervision. While the health aide's duties should not be diluted with nonhealth activities, there would more than likely be situations, especially in schools with small enrollments (43 of the 220 schools are projected to have enrollments of less than 400 students) where the health services would not fill a full day. In these situations, the health aide should be able to assume other duties, but in no instance should the other duties take precedence over any health service activity.

Staffing Standard

The primary function of health aides is to render emergency health assistance. This task takes precedence over all other health activities and occupies the largest share of the health aide's time. Our survey of health room logs shows, not surprisingly, that the number of reported emergency health assistance cases increases with enrollment size.¹ However, we

¹See chapter 5 for detailed discussion of emergency health assistance findings.

also found that on a per student basis (reported cases/enrollment), the “demand” for services 1) decreases significantly with increasing grade level, and 2) decreases with increasing school size. In other words, in relation to a student’s “need” for health room services, the age of students and the size of the schools are significant factors. On the basis of a school-by-school examination of our sample of 22 project schools, we have found no consistent pattern of differences due to geographic or socio-economic factors.² However, in any further implementation, geography and socio-economic status should be considered as possible factors affecting demand for school health services.

Our evaluation indicates that the emergency health assistance activities can be used as a measure of “need” in a health room.³ We have used the “average number of injury and illness cases in the health room,” taking into consideration the grade levels of the school and enrollment size as the criterion for determining staffing requirements for health aides.

Health Aide Staffing Requirements

As stated previously, we have assumed that each school would have at least one full-time health aide. In ascertaining the threshold at which a school would require one and one-half or two health aides, we used the standard that, on the average, there would be no more than one health case in the health room at any time. Because of the relatively irregular flow of illness and injury cases during a school day, we have taken the varying demands into consideration in deriving the standard.

²These findings are not conclusive as they are based on a limited sample size.

³Analysis of another major health aide function, health screening, indicates a similar relationship between screening activity and school grade level and enrollment characteristics.

The staffing requirement for health aides by grade level and enrollment size is shown below.

Table 13.1
Health Aide Requirement for a School
By Grade Level and Enrollment

Grade level	No. of health aides/enrollment		
	1	1-1/2	2
K-6, K-8, K-9, K-12	1-1000	1001-1400	Over 1400
7-8, 7-9	1-1200	1201-1800	Over 1800
7-12, 8-12, 9-12, 10-12	1-1400	1401-2000	Over 2000

The above table shows that schools at the elementary grade level (K-6, K-8, K-9, K-12) would be entitled to one health aide for enrollments up to 1000, and one and one-half for enrollments between 1001 and 1400, and two health aides for enrollments over 1400. Similarly, at the intermediate grade level, it is one for enrollments up to 1200, one and one-half for 1200-1800, and two for over 1800. And at the high school level it is one for up to 1400, one and one-half for 1400-2000, and two for over 2000.

The number of health aides and substitute health aides required in a statewide system is shown below in table 13.2.

Table 13.2 shows a total health aide staffing of 271 including 25 full-time equivalent (FTE) substitute health aides. The substitute health aide positions are intended to provide resources for substitution of regular health aides and assistance in screening activities and recordkeeping, especially at the beginning of a school year.

Table 13.2
Number of FTE Health Aides Staffing Health Rooms

School districts	Enrollment	No. of schools	No. of health aides/school			Total FTE health aides
			1	1½	2	
Honolulu	45,787	55	43	10	2	62.0
Central	34,003	41	35	4	2	45.0
Leeward	34,392	30	18	8	4	38.0
Windward	24,200	29	22	4	3	34.0
Hawaii	17,640	28	26	1	1	29.5
Maui	12,501	23	22	1	—	23.5
Kauai	7,468	14	14	—	—	14.0
Total	175,991	220	180	28	12	246.0
FTE substitute HA's						25.0
Total FTE HA's						271.0

Alternative School Nurse Staffing Requirements

Inasmuch as total health aide staffing requirements took into consideration the number of schools, enrollment, grade level factors, substitution requirements, and ancillary screening activities, the primary determinant for school nurse staffing is the school nurse/health aide (SN/HA) staffing ratio, a general measure of supervisory workload. Table 13.3 indicates school nurse staffing requirements for three alternative SN/HA ratios of 1:6, 1:8, and 1:10. On a ratio of one school nurse for every six health aides a statewide program would require 41 nurses. On a ratio of one to eight, it would be 32 nurses, and on a ratio of one to ten, it would be 24 nurses. These figures represent our estimates of a reasonable range of supervisory workload. Geographical factors have not been taken into account which may be of consequence in neighbor island school nurse staffing, particularly in the Hawaii and Maui districts.

Table 13.3
Number of School Nurses for Three SN/HA Ratios And Three Health Aide Staffing Standards

School district	No. of schools	Enrollment	SN/HA		
			1:6	1:8	1:10
Honolulu	55	45,787	10	8	6
Central	41	34,003	8	6	5
Leeward	30	34,392	6	5	4
Windward	29	24,200	6	4	3
Hawaii	28	17,640	5	4	3
Maui	23	12,501	4	3	2
Kauai	14	7,468	2	2	1
Total	220	175,991	41	32	24

Statewide Staffing Costs

Table 13.4 below presents estimated total staffing costs for health aides and school nurses

Table 13.4
Number of School Nurse and FTE Health Aide Positions and
Estimated Personnel Cost in Statewide Program for Three SN/HA Ratios
(In thousand dollars)

	Ratio of SN/HA					
	SN/HA = 1:6		SN/HA = 1:8		SN/HA = 1:10	
	Positions	Cost	Positions	Cost	Positions	Cost
Health aide	271	\$1,137	271	\$1,137	271	\$1,137
School nurse	41	568	32	444	24	333
Total	312	\$1,705	303	\$1,581	295	\$1,470

for three school nurse supervisory ratios. The table shows overall cost implications of offering the services provided by health aides and school nurses to all public schools in the State.

Table 13.4 indicates a range in estimated total cost from \$1.5 million (for school nurse/health aide ratio of 1:10) to \$1.7 million (for school nurse/health aide ratio of 1:6).

The staffing costs of the health aides were calculated at a pay rate of approximately \$3 per hour.⁴ A 6-1/2-hour per day work schedule is assumed. Two other items which also have been

included in the staffing cost are 1) vacation pay which is normally paid to the health aide at the close of each school year, and 2) pay for one-week orientation and training.

The costs of the school nurse staffing were obtained by using an estimated \$13,860 as the average annual salary for a typical school nurse. The average was derived by examining the current salaries of the school nurses.

The cost estimates include only the cost of wages and salaries of health aides, substitute health aides, and school nurses. The cost of supplies, health facility, furnishings, and indirect costs such as administrative costs are not included in the cost estimates. We also have not estimated the spillover benefits and cost savings associated with expansion, in particular cost savings accruing from reduced staffing requirements in other school-health-related activities.

⁴ School health aide positions are temporary positions and, therefore, there are no set pay schedules. The rate setting is an ongoing process and established as required. The pay rates of the HA's have been relatively comparable to that of the SR-6C grade of the white-collar non-supervisors (HGEA), unit 03. The rate shown in this unit's schedule is the basis for projecting HA personnel costs.

PART V

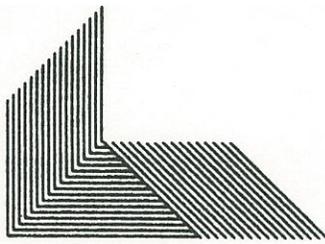
RESPONSE OF THE AFFECTED AGENCY

RESPONSE OF AFFECTED AGENCY

A preliminary draft of this audit report was transmitted to the governor's school health services advisory committee for its comments on the findings and recommendations contained in the report.

A copy of the transmittal letter to the committee is included as attachment 1 of this part and the response of the committee is included as attachment 2.

We are pleased to note that the governor's school health services advisory committee is in agreement with the findings and recommendations of the audit.



February 28, 1975

Dr. Roy Kuboyama, Chairman
Governor's School Health Services
Advisory Committee
Hawaii Medical Association
510 South Beretania Street
Honolulu, Hawaii 96813

C O P Y

Dear Dr. Kuboyama:

Enclosed are 12 copies of our preliminary report of the *Program Audit of School Health Services Project*. The term "preliminary" indicates that the report has not been released for general distribution. However, copies of this report have been forwarded to the governor and the presiding officers of both houses of the legislature. In addition, we have forwarded a copy to the director of the department of health, the chairman of the board of education, and the superintendent of education.

Since your committee is responsible for coordinating, monitoring, and making recommendations relating to the school health services pilot project, I would appreciate a written response as to whether your committee agrees with the basic findings of the report. Please have your written comments submitted to us by March 5, 1975. Your comments will be incorporated into the report and the report will be finalized and released shortly thereafter.

We appreciate the assistance and cooperation extended by your committee to our staff.

Sincerely,

Clinton T. Tanimura
Legislative Auditor

Enclosures

GOVERNOR'S SCHOOL HEALTH SERVICES ADVISORY COMMITTEE

March 3, 1975

RECEIVED

MAR 4 1975

**OFFICE OF THE AUDITOR
STATE OF HAWAII**

Mr. Clinton T. Tanimura
Legislative Auditor
The Office of the Auditor
State of Hawaii
State Capitol
Honolulu, Hawaii 96813

Dear Mr. Tanimura:

The Governor's School Health Services Advisory Committee members have read in detail and discussed the *Program Audit of the School Health Services Project* conducted by the Office of the Legislative Auditor, State of Hawaii.

The Committee thanks the 1973 State Legislature for making the evaluation by the Auditor's Office possible and agrees with the findings and recommendations made in the audit.

Appreciation is expressed to the Legislative Auditor's Office for a very comprehensive, fair and unbiased report on the School Health Services Pilot Project. The report shows a great deal of effort and manhours work in researching this program.

The Governor's School Health Services Advisory Committee from the evaluation presented to them, recommends that the Pilot Project (ACT 130 - 1970) be made into a permanent program and that the School Health Services program be expanded to all the public schools in the State of Hawaii.

Sincerely,

Roy F. Kuboyama

ROY F. KUBOYAMA, M.D.
Chairman

RFK:cha

APPENDICES

**Pilot Project High Schools and Feeder Schools
1974-75**

School Complex	Enrollment*	School Complex	Enrollment
Roosevelt High School	1,688	Baldwin High School	1,316
Kawanakoa Intermediate	1,114	Iao	500
Stevenson Intermediate	1,318	Kahului	899
Maemae	915	Kihei	449
Nuuanu	298	Lihikai	796
Pauoa	606	Puunene	184
Lincoln	656	Waihee	270
Noelani	384	Wailuku Elementary	<u>810</u>
Manoa	<u>831</u>	Total	<u>5,224</u>
Total	<u>7,810</u>		
Kailua High School	2,616	Hilo High School	2,044
Waimanalo Elementary & Intermediate	977	Hilo Intermediate	917
Kailua Intermediate	1,422	Hilo Union	571
Kalaheo High & Intermediate	1,325	DeSilva	356
Enchanted Lake	709	Haaheo	136
Aikahi	726	Kapiolani	672
Kainalu	864	Kaumana	193
Kailua	697	Keaukaha	201
Keolu	711	Kalaniana'ole Elementary & Intermediate	863
Lanikai	235	Mountain View Elementary & Intermediate	263
Maunawili	657	Keeau Elementary & Intermediate	429
Mokapu	935	Waiakea Elementary	602
Pope	<u>504</u>	Waiakea Intermediate	845
Total	<u>12,378</u>	Waiakeawaena	<u>923</u>
		Total	<u>9,015</u>
Campbell High School	2,024		
Barbers Point	848	Kauai High & Intermediate School	1,311
Ewa Beach	799	Kalaheo	407
Ewa	447	Koloa	476
Ilima Intermediate	1,393	Wilcox	<u>805</u>
Iroquois Point	830	Total	<u>2,999</u>
Makakilo	760		
Pohakea	965		
Kaimiloa	<u>792</u>		
Total	<u>8,858</u>		

*Source: DOE, *Public and Private School Enrollment*, September 20, 1974.

**High Schools and Feeder Schools Added to Pilot Project
In 1974-75**

School Complex	Enrollment*	School Complex	Enrollment
Molokai High & Intermediate	725	Pearl City High	2,435
Kaunakakai Elementary	340	Highlands Intermediate	1,491
Kilohana	105	Lehua	755
Kualapuu	274	Manana	825
Maunaloa	<u>110</u>	Momilani	493
Total	<u>1,554</u>	Palisades	1,283
Konawaena High & Intermediate	1,291	Pearl City	891
Konawaena	565	Pearl City Highlands	<u>840</u>
Honaunau	230	Total	<u>9,013</u>
Hookena	146	Waialua High & Intermediate	1,064
Holualoa	235	Haleiwa	600
Kealakehe	<u>882</u>	Waialua	<u>460</u>
Total	<u>3,349</u>	Total	<u>2,124</u>
Schools picked up:			
Mauka Lani (Campbell Complex)	272		
Kaelepulu (Kailua Complex)	<u>204</u>		
Total	<u>476</u>		

*Source: *DOE, Public and Private School Enrollment*, September 20, 1974.

SELECTED SCHOOLS IN EVALUATION SURVEY

Project Schools	Grade Levels	Enrollment Sept. 1974	Non-Project Schools	Grade Levels	Enrollment Sept. 1974
Honolulu District:		3,910	Honolulu District:		4,037
Roosevelt High	10-12	1,688	Kalani High	9-12	1,975
Stevenson Intermediate	7-9	1,318	Niu Valley Intermediate	7-8	1,138
Nuuanu Elementary	K-6	298	Hokulani Elementary	K-6	328
Paoua School	K-6	606	Aliiolani School	K-6	596
Leeward District:		4,829	Leeward District:		4,698
Campbell High	9-12	2,024	Waipahu High	9-12	2,092
Iiima Intermediate	7-8	1,393	Waipahu Intermediate	7-8	1,123
Ewa Elementary	K-6	447	Momilani Elementary	K-6	493
Pohakea School	K-6	965	Waipahu Elementary	K-6	990
Windward District:		5,239	Windward District:		5,776
Kailua High	9-12	2,616	Castle High	9-12	2,636
Kailua Intermediate	7-9	1,422	King Intermediate	7-9	1,961
Kailua Elementary	K-6	697	Kapunahala Elementary	K-6	695
Pope Elementary	K-6	504	Kahaluu Elementary	K-6	484
Hawaii District:		3,907	Hawaii District:		3,041
Hilo High	10-12	2,044	Konawaena High & Intermediate	7-12	1,291
Kalaniana'ole Elem. & Int.	K-9	863	Kealahou Elementary	K-8	882
Kaau Elementary & Intermediate	K-9	429	Naalehu School	K-8	303
Hilo Union School	K-6	571	Konawaena Elementary	K-6	565
Maui District:		2,399	Maui District:		2,483
Baldwin High	9-12	1,316	Maui High	9-12	1,211
Kahului School	K-8	899	Kamehameha III School	K-8	994
Puunene School	K-8	184	Haiku School	K-8	278
Kauai District:		2,523	Kauai District:		2,517
Kauai High & Intermediate	7-12	1,311	Kapaa High & Intermediate	7-12	1,140
Kalaheo School	K-8	407	Kekaha School	K-8	425
Wilcox Elementary	K-6	805	Kapaa Elementary	K-6	952
TOTALS: 22 Schools		22,807	22 Schools		22,552

Special Visitation Schools

Wailupe Valley School	K-6	173
August Ahrens School	K-6	1,970
Ewa Beach Elementary (P)*	K-6	799
Haaheo School (P)	K-6	136
Kilohana School	K-6	105
Kaunakakai School	K-6	340
Hanalei School	K-6	102
Kilauea School	K-6	87
TOTALS: 8 Schools		3,712

*Denotes project schools.

Volunteer Aides Schools

Liholiho Elementary	K-6	545
Palisades Elementary	K-6	1,283
Nimitz Elementary	K-6	832
Waipahu Elementary	K-6	990
TOTALS: 4 Schools		3,650

**Grouping of Selected Project and Non-Project Schools
By Grade Level**

Project Schools	Enrollment Sept. 1974	Non-Project Schools	Enrollment Sept. 1974
Elementary (K-6):		Elementary (K-6):	
Nuuanu Elementary (K-6)	298	Hokulani Elementary (K-6)	328
Pauoa School (K-6)	606	Aliiolani School (K-6)	596
Ewa Elementary (K-6)	447	Momilani Elementary (K-6)	493
Pohakea School (K-6)	965	Waipahu Elementary (K-6)	990
Kailua Elementary (K-6)	697	Kapunahala Elementary (K-6)	695
Pope Elementary (K-6)	504	Kahaluu Elementary (K-6)	484
Hilo Union School (K-6)	571	Konawaena Elementary (K-6)	565
Wilcox Elementary (K-6)	<u>805</u>	Kapaa Elementary (K-6)	<u>952</u>
	4,893		5,103
Intermediate/Elementary (K-8, K-9):		Intermediate/Elementary (K-8, K-9):	
Kahului School (K-8)	899	Kamehameha III School (K-8)	994
Puunene School (K-8)	184	Haiku School (K-8)	278
Kalaheo School (K-8)	407	Kekaha School (K-8)	425
Kalaniana'ole Elem. & Int. (K-9)	863	Kealakehe Elementary (K-8)	882
Keaau Elem. & Int. (K-9)	<u>429</u>	Naalehu School (K-8)	<u>303</u>
	2,782		2,882
Intermediate (7-8, 7-9):		Intermediate (7-8, 7-9):	
Ilima Intermediate (7-8)	1,393	Waipahu Intermediate (7-8)	1,123
Stevenson Intermediate (7-9)	1,318	Niu Valley Intermediate (7-8)	1,138
Kailua Intermediate (7-9)	<u>1,422</u>	King Intermediate (7-9)	<u>1,961</u>
	4,133		4,222
High & High/Intermediate (7-12, 9-12, 10-12):		High & High/Intermediate (7-12, 9-12, 10-12):	
Kauai High & Intermediate (7-12)	1,311	Kapaa High & Intermediate (7-12)	1,140
Campbell High (9-12)	2,024	Waipahu High (9-12)	2,092
Kailua High (9-12)	2,616	Castle High (9-12)	2,636
Baldwin High (9-12)	1,316	Maui High (9-12)	1,211
Roosevelt High (10-12)	1,688	Kalani High (9-12)	1,975
Hilo High (10-12)	<u>2,044</u>	Konawaena High & Int. (7-12)	<u>1,291</u>
	10,999		10,345
TOTALS: 22 Schools	22,807	22 Schools	22,552

**Grouping of Selected Project and Non-Project Schools
By Enrollment Size**

Project Schools	Enrollment Sept. 1974	Non-Project Schools	Enrollment Sept. 1974
Small (250-749):		Small (250-749):	
Nuuanu Elementary (K-6)	298	Hokulani Elementary (K-6)	328
Pauoa School (K-6)	606	Aliiolani School (K-6)	596
Ewa Elementary (K-6)	447	Momilani Elementary (K-6)	493
Kailua Elementary (K-6)	697	Kapunahala Elementary (K-6)	695
Pope Elementary (K-6)	504	Kahaluu Elementary (K-6)	484
Hilo Union School (K-6)	571	Konawaena Elementary (K-6)	565
Puunene School (K-8)	184	Haiku School (K-8)	278
Kalaheo School (K-8)	407	Kekaha School (K-8)	425
Keaau Elem. & Int. (K-9)	<u>429</u>	Naalehu School (K-8)	<u>303</u>
	4,143		4,167
Large (750-1999):		Large (750-1999):	
Wilcox Elementary (K-6)	805	Kapaa Elementary (K-6)	952
Pohakea School (K-6)	965	Waipahu Elementary (K-6)	990
Kahului School (K-8)	899	Kamehameha III School (K-8)	994
Kalaniana'ole Elem. & Int. (K-9)	863	Kealakehe Elementary (K-8)	882
Kailua Intermediate (7-9)	1,422	Niu Valley Intermediate (7-8)	1,138
Stevenson Intermediate (7-9)	1,318	Waipahu Intermediate (7-8)	1,123
Ilima Intermediate (7-8)	1,393	King Intermediate (7-9)	1,961
Kauai High & Int. (7-12)	1,311	Konawaena High & Int. (7-12)	1,291
Baldwin High (9-12)	1,316	Kapaa High & Int. (7-12)	1,140
Roosevelt High (10-12)	<u>1,688</u>	Mauai High (9-12)	1,211
	11,980	Kalani High (9-12)	<u>1,975</u>
			13,657
Very Large (2000 & over):		Very Large (2000 & over):	
Campbell High (9-12)	2,024	Waipahu High (9-12)	2,092
Kailua High (9-12)	2,616	Castle High (9-12)	<u>2,636</u>
Hilo High (10-12)	<u>2,044</u>		4,728
	6,684		
TOTALS: 22 Schools	22,807	22 Schools	22,552

**THE EXCLUSION OF EMERGENCY HEALTH ASSISTANCE CASELOAD DATA
OF THE NON-PROJECT SCHOOLS IN THE
ASSESSMENT OF HEALTH NEEDS**

A major aspect of the evaluation of the pilot project dealt with an assessment of the need for emergency health care services in the selected project and non-project schools. Health room cases were recorded on the health room log and data were initially compiled to compare project and non-project schools such that the demand for such services could be measured in some significant fashion. However, in the process of the collection of data from the health room logs, large discrepancies arose between the project and non-project data, primarily in the number of cases recorded. The magnitude of these discrepancies was so large that the reported non-project school caseload was excluded from needs assessment analysis.

In toto, the project schools recorded almost three times more health room cases than the non-project schools. The total number of cases reported for the 10-week sampling period in the non-project schools was only 7,984 as compared to 23,313 in the project schools (see tables C.1 and C.2). On the normalized basis of daily cases per 1000 students, there also existed a wide discrepancy with project schools showing a daily caseload of 20.4 cases per 1000 and the non-project schools indicating only 7.1 daily cases per 1000 students.

Followup investigations, both during and after the survey period, indicated a high degree of noncompliance of some non-project schools in the recordation of all health room cases on the health room log. Non-project schools oftentimes did not record all health room cases on the health room log. This was primarily due to the lack of a centralized and standardized recordation procedure in which all ailments would have been recorded.

Waipahu elementary, on one hand, is a non-project school which makes extensive use of volunteers in the health room and this school reported the highest caseload of all selected non-project schools.

On the other hand, at Kalani high, recordkeeping occurs on a fragmented basis with no centralized recording process utilizing the health room log. All campus excuse slips (for health or any other reason) at Kalani are issued either through the office or through the teachers, if students have notes from their parents. As the students leave campus with their passes, their names are not recorded on a central registry with the office. Since students may be sent home for health reasons directly from the classroom, these cases would not be recorded on the health room log.

A similar situation exists at Momilani elementary, another non-project school, which recorded very few health ailments. Again, there was no centralized recordation procedure in which every health case would be recorded on the logs provided. The situation at Momilani, however, was different in that teachers themselves are allowed to dispense first aid for minor complaints by students. Small cuts and bruises which can be handled by band aids are usually not recorded in any central registry. Thus, for this school, an assessment of health needs relying primarily on the health room log would be inaccurate.

Another dimension may be a general degree of apathy towards health and safety reporting by some schools. The two schools mentioned above, for example, also were among those reporting on DOE form 411 the lowest number of accidents (normalized for enrollment) in SY 1973-74 of the selected non-project schools. As in the case of health room log reporting, the reported totals were many orders of magnitude below that of most other schools with similar grade levels and enrollment size.

Hence, the non-project schools, in almost every case, show a very low caseload of emergency health ailments (table A1.2), and, therefore, was not utilized in the assessment of the need for emergency health care services.

**Emergency Health Assistance Cases Reported
By Selected Project Schools**

<i>Project schools</i>	<i>Enrollment</i>	<i>Tot. no. of cases</i>	<i>Cases per day</i>	<i>Daily cases per 1000 students</i>
Roosevelt	1,688	633	12.7	7.5
Stevenson	1,318	1,363	27.3	20.7
Nuuanu Elem.	298	420	8.4	28.2
Pauoa	606	587	11.7	19.3
Campbell	2,024	586	11.7	5.8
Ilima Inter.	1,393	927	18.5	13.3
Ewa Elem.	447	265	5.3	11.9
Pohakea	965	879	17.6	18.2
Kailua High	2,616	2,123	42.5	16.2
Kailua Inter.	1,422	1,458	29.2	20.5
Kailua Elem.	697	1,661	33.2	47.6
Pope Elem.	504	970	19.4	38.5
Hilo High	2,044	1,390	27.8	13.6
Kalaniana'ole	863	1,753	35.1	40.7
Keaau Elem.	429	1,018	20.4	47.5
Hilo Union	571	1,088	21.8	38.2
Baldwin High	1,316	1,690	33.8	25.7
Kahului	899	1,029	20.6	22.9
Puunene	184	519	10.4	56.5
Kauai High	1,311	835	16.7	12.7
Kalaheo	407	1,218	24.4	59.9
Wilcox	805	901	18.0	22.4
Totals	22,807	23,313	466.3	20.4

Sources: "Public School Enrollment—State Totals," Hawaii State Department of Education, September 20, 1974; and project evaluation of the school health assistance program—health room logs, Office of the Auditor, 1974.

**Emergency Health Assistance Cases Reported by Selected
Non-Project Schools**

<i>Schools</i>	<i>Enrollment</i>	<i>Tot. no. of cases</i>	<i>Cases per day</i>	<i>Daily cases per 1000 students</i>
Kalani High	1,975	187	3.7	1.9
Nui Valley	1,138	529	10.6	9.3
Hokulani Elem.	328	248	5.0	15.2
Aliiolani	596	268	5.4	9.1
Waipahu High	2,092	510	10.2	4.9
Waipahu Inter.	1,123	586	11.7	10.4
Momilani Elem.	493	78	1.6	3.2
Waipahu Elem.	990	1,118	22.4	22.6
Castle High	2,636	537	10.7	4.1
King Inter.	1,961	956	19.1	9.7
Kapunahala Elem.	695	257	5.1	7.3
Kahaluu Elem.	434	146	2.9	6.0
Konawaena High	1,291	315	6.3	4.9
Kealakehe Elem.	882	326	6.5	7.4
Naalehu	303	39	0.8	2.6
Konawaena Elem.	565	126	2.5	4.4
Mau High	1,211	389	7.8	6.4
Kam III	994	560	11.2	11.3
Haiku	278	165	3.3	11.9
Kapaa High	1,140	356	7.1	6.2
Kekaha	425	74	1.5	3.5
Kapaa Elem	952	214	4.3	4.5
Totals	22,552	7,984	159.7	7.1

Sources: Hawaii State Department of Education, "Public School Enrollment—State Totals," September 20, 1974; project evaluation of the school health assistance program—health room logs, Office of the Auditor, 1974.

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- 1966 1. Examination of the Office of the Revisor of Statutes, 66 pp. (out of print).
- 1967 1. Overtime in the State Government, 107 pp.
2. Management Audit of Kula Sanatorium, 136 pp.
- 1968 1. Financial Audit of the Department of Health for the Fiscal Year Ended June 30, 1967, v.p. (out of print).
2. Financial Audit of the Department of Planning and Economic Development for the Fiscal Year Ended June 30, 1967, v.p. (out of print).
3. Financial Audit of the Department of Regulatory Agencies for the Fiscal Year Ended June 30, 1967, v.p. (out of print).
4. Financial Audit of the Department of Hawaiian Home Lands for the Fiscal Year Ended June 30, 1967, 54 pp.
5. Financial Audit of the Oahu Transportation Study for the Period July 1, 1962 to August 31, 1967, 68 pp.
6. Financial Audit of the Hawaii Visitors Bureau for the Period July 1, 1966 to January 31, 1968, 69 pp. (out of print).
7. State Capital Improvements Planning Process, 55 pp. (out of print).
8. Financial Audit of the Hilo Hospital for the Fiscal Year Ended June 30, 1967, 43 pp. (out of print).
9. Financial Audit of the Hawaii Visitors Bureau for the Period July 1, 1967 to June 30, 1968, 42 pp.
- 1969 1. Financial Audit of the General Fund, State of Hawaii, for the Fiscal Year Ended June 30, 1968, v.p. (out of print).
2. Financial Audit of the Judicial Branch, State of Hawaii, for the Fiscal Year Ended June 30, 1968, v.p. (out of print).
3. Financial Audit of the State Department of Budget and Finance for the Fiscal Year Ended June 30, 1968, v.p.
4. General Audit of the Department of Personnel Services, State of Hawaii, 129 pp. (out of print).
5. A Summary of the General Audit of the Department of Personnel Services, 53 pp.
6. Financial Audit of the Samuel Mahelona Memorial Hospital for the Fiscal Year Ended June 30, 1968, 34 pp.
7. Financial Audit of the Honokaa Hospital for the Fiscal Year Ended June 30, 1968, 41 pp.
8. Financial Audit of the Kohala Hospital for the Fiscal Year Ended June 30, 1968, 34 pp.
9. Financial Audit of the Kona Hospital for the Fiscal Year Ended June 30, 1968, 44 pp.
10. Financial Audit of the Kauai Veterans Memorial Hospital for the Fiscal Year Ended June 30, 1968, 30 pp.
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- 1970 1. Management Audit of the Department of Water County of Kauai, 65 pp.
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- 1971 1. Financial Audit of the State School Lunch Services Program, Department of Education for the Fiscal Year Ended June 30, 1970, v.p. (out of print).
2. Audit of the County/State Hospital Program, 124 pp. (out of print).
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4. Audit of the Hawaii Educational Television System, 153 pp.
- 1972 1. Audit of the Office of the Public Defender, 39 pp.
2. Financial Audit of the Department of Agriculture for the Fiscal Year Ended June 30, 1971, v.p.

3. Financial Audit of the Department of Labor and Industrial Relations for the Fiscal Year Ended June 30, 1971, v.p.
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- 1974 1. Financial Audit of the Department of Regulatory Agencies, 67 pp.
2. Financial Audit of the State Department of Defense and Civil Air Patrol (Hawaii Wing), 52 pp.
- 1975 1. Financial Audit of the Hawaii Housing Authority, 78 pp.

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- 1965 1. Long and Short Range Programs of the Office of the Auditor, 48 pp. (out of print).
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