

A Time Study

NURSING SERVICES
in Small
Manufacturing Plants

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FOREWORD

In discharging its primary responsibility--the promotion and maintenance of the health of the nation's workers--the Division of Occupational Health of the Public Health Service utilizes the knowledge and skills of a variety of specialized personnel. The medical, engineering, chemical, toxicological, statistical, and nursing professions are among those contributing greatly to the work of this Division.

Nursing consultants, upon request, make available to State industrial hygiene agencies, educational institutions, industries, and industrial nurses, their background of training in, and experience with, worker health problems. They assist in the preparation of educational materials and numerous research studies.

An increasingly urgent need, in recent years, has been for the development of information as to the amount of nursing service required in industry. The need for such information has been increased by the demands of the defense program, which have accentuated the shortage of nurses. To augment available data on this subject, the present study was undertaken in cooperation with the Division of Public Health Nursing of the Public Health Service. The data here presented, although quite significant, indicate that further research is needed, and it is hoped that additional studies will be made which will pave the way for better utilization of nursing personnel in the field of occupational health.

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We wish, also, to thank management, physicians, and nurses in the plants where the study was conducted, and the personnel of the industrial hygiene bureaus, State departments of health, for their splendid cooperation.

DEFINITIONS

1. Direct nursing services shall include those services which are provided for an employee, and may be listed as follows:
 - a. Nursing care for industrial injuries and illnesses
 - b. Nursing care for nonindustrial injuries
 - c. Nursing care for medical complaints such as headache, colds, upset stomachs, and others
 - d. Interview regarding a health problem when no treatment is given, but care is directed toward health guidance
 - e. Immunizations
 - f. Health examinations, which shall include that part of the examination delegated by the examining physician to the nurse, and may include such activities as obtaining health and occupational histories, vision testing, collection of laboratory specimens, and follow-up on physical findings
 - g. Home nursing, which shall include visits to the homes of employees for the purpose of giving nursing care, determining whether or not the employee is receiving adequate care, or for other related reasons
 - h. Interpretative services in behalf of an individual employee which shall include conferences with physicians, management,

- . and supervisory personnel for the purpose of interpreting an employee's physical and emotional capacity as it relates to his productivity as a worker, or to interpret real or suspected effects of the work environment on the health status of the employee
 - i. Recording (professional notes) on employee's individual record
 - j. Review of records for follow-up purposes
2. Indirect services shall include those activities which are performed in behalf of the employee in areas which affect his health; these may be listed as follows:
- a. Educational activities, which shall include such activities as group teaching, preparation of articles for the plant paper, review and selection of pertinent health education materials, and the training (and supervision) of first aid workers
 - b. Environmental sanitation and safety, which shall include such activities as attendance at safety committee meetings, participation in the investigation of accidents, plant inspection, reporting of suspected environmental hazards, and other related activities
 - c. Reports, which shall include such activities as preparing compensation or accident reports, and collecting and tabulating data for preparation of monthly and special reports

- d. Administration of the health service, which shall include such activities as conferences with the physician or management for the purpose of discussing questions of operational policy and the preparation of manuals
 - e. Maintenance of the health unit, which shall include such activities as cleaning and sterilizing instruments, setting up treatment tables and examining rooms, and other related activities
 - f. Housekeeping, which shall include a multiplicity of activities which frequently the nurse must perform, such as putting away supplies, making beds, cleaning cabinets and equipment, dusting, and related activities
 - g. Clerical work, which shall include such activities as answering the telephone, filing, typing, and other general clerical work
 - h. Recreational program, which shall include such activities as the nurse may perform in relation to the plant program
3. Other activities shall include additional responsibilities which have been assigned to the nurse and which may or may not have a direct relationship to the plant health program. Also included in this broad category are professional activities and non-nursing activities which include non-health service clerical work, and personal and unoccupied time.

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EVENTS LEADING TO STUDY

Early in the national emergency, the National Security Resources Board, realizing the shortage of nurses, asked the American Nurses' Association to estimate the number of nurses needed in the various fields of nursing. This request was referred by the American Nurses' Association to the joint board of the six national nursing organizations. At a meeting called to discuss this question, the president of the American Association of Industrial Nurses expressed the hope that some objective studies could be made for establishing valid ratios for estimating the number of nurses needed in the industrial health field.

At about the same time, the Division of Nursing Resources, Public Health Service, had been assisting the states in making studies of all nursing service needs. In an attempt to gauge industrial nursing needs, the ratio of 9 hours of nursing time per 100 employees per week was applied to the total working population. The resulting estimates, however, were so high in comparison with the number of nurses now believed to be employed in industry, that it was questionable whether that number of nurses was needed, or would find employment, in the field.

To meet in part the obvious need for more information on nursing activities in industry, the Division of Occupational Health and Public Health Nursing agreed jointly to initiate a study. Because of limited funds and time, it was decided to confine this study of nursing services to a sample of small manufacturing plants. Small plants were considered to be especially appropriate for such a study, since they employ over 70 percent of American workers. The majority of these plants have limited, on location, medical consultation, and the major part of the responsibility for the administration and the direction of the health program is vested in the plant nurse.

NATURE AND SCOPE OF STUDY

OBJECTIVES

The objectives of the study were:

1. To determine the scope of nursing activities in a sample of plants.
2. To apply a time study method for the determination of the amount of nursing time spent on nursing functions and related activities.
3. To secure additional information useful in formulating a methodology for determining the number of nurses required to meet employee health service needs.

SCOPE OF STUDY

The study was limited to twelve manufacturing plants in Georgia and Connecticut, ranging in size from 76 to 1,479 employees. Each of eleven plants employed one full-time nurse, and the other plant employed two full-time nurses. It is not intended to imply either that the nursing services studied are representative of other health services existing in these states or in other industries throughout the country, or that they represent the optimum in occupational health programs. No attempt was made to evaluate the quality of nursing services. Insofar as possible, information pertaining to the policies and practices currently in use in the health services studied were noted.

METHOD

The industrial hygiene bureaus of the State health departments were requested to select in their respective states good plant health services in moderately hazardous manufacturing industries.

Every effort was made to select plants of comparable size; but because of the difficulty encountered in finding plants having on-location medical consultation, the sample includes industries of fairly diversified size.

In preparation for conducting the study, an advisory committee was appointed to consult with the Division and to assist in defining the scope, content, and techniques for making the study.

Preliminary observations were made in industry for the purpose of clocking a random sampling of nursing activities and to select those which would lend themselves to timing. The publications Duties and Responsibilities of the Nurse in Industry^{1/} and Nursing Practices in Industry^{2/} were also used as a basis for selecting items to be included in the questionnaire and for clocking.

Work sheets, including questionnaires, were designed to secure identifying data on the plant and information on the scope of the health program, as well as the professional policies under which the plant health service operates; and to record nursing activities observed and the amount of time spent on each activity.

Before the study was started in the selected states, a trial run was made in a plant to test the usability of the work sheets, questionnaires, and the techniques for making the study.

^{1/} Committee on Professional Standards, AAN: Duties and Responsibilities of the Nurse in Industry. American Association of Industrial Nurses, Inc., New York, N. Y., 1949.

^{2/} Whitlock, Olive M., et al: Nursing Practices in Industry. Public Health Bulletin No. 283. U. S. Government Printing Office, Washington, D. C., 1944.

During the study, seven working days were spent at each plant. The first day was spent in meeting and becoming acquainted with plant personnel concerned with the health program and in explaining the objectives and the purpose of the study. The nurses were requested to follow their usual routine and disregard, insofar as possible, the observer. The following five days were devoted to keeping a record of the actual time, in minutes, spent by the nurse on each separate activity which she performed. Activities which required less than one minute were not included, and the time was charged to the activity just completed or the activity which followed. This did not exclude a single visit made by an employee to the health service facilities. The last day was spent in filling in the previously prepared questionnaire and in preparing a job description which included those activities for which the nurse was responsible.

It is obvious that a week is too short a period to observe every activity for which the nurse may be responsible. In an effort to obtain additional data, the nurses were asked to keep a record of the time spent on each activity for one month and to estimate the hours spent on broad areas of function. It was found that neither of these requests could be fulfilled because of the heavy work load in some plants and the time required for recording the information on the work sheets; nor were the nurses able to estimate, with any degree of accuracy, the number of hours spent on broad areas of function.

DESCRIPTIVE FACTS ABOUT THE SAMPLE

The plants studied manufactured such article as food, food containers, textiles, chemicals, clothing, cosmetics, metal novelties, and railroad equipment and testing instruments.

Table 1 shows by plant the numbers of employees and health service personnel. It will be noted that approximately 1,000 dependents of the workers in plant 3 also used the health service facilities. Clerical service was available to the nurse and physician in two plants. All plant health facilities had maid or porter service for general cleaning, and five plants had additional part-time maid services to help with other housekeeping duties, such as cleaning equipment and cupboards, making beds, and similar routine duties.

With one exception, a physician was employed by the industry to visit the plant and to give consultation on medical questions and problems. In one of the plants a physician was on call for emergencies and was available to consult with the nurse on specific medical questions which arose.

The administrative responsibility for nursing activities in the plants studied was vested most frequently in the personnel director, with the president or other executive and the plant manager ranking second. In one plant the nurse was responsible to the vice president through the personnel director, and in the three other plants the administrative responsibility was vested respectively in the full-time plant physician, the industrial relations manager, and the production manager.

Table 2 shows the education and work experience of the thirteen nurses employed full-time in the twelve plants included in the study. Seven of the nurses had some college work. Of these seven, one had a degree in nursing education. Two others had three years of college study, one having

Table 1. -- Number of employees, and number of health service personnel, by plant; observations from nursing study of 12 plants with fewer than 1,500 employees, 1951

Item	Group A			Group B									Group C			Group D		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Number of employees																		
All employees	6,597	76	275	300*	320	355	363	365	486	678	906	994	1,479					
Males	3,319	63	180	225	241	229	241	241	181	187	853	767	1,182					
Females	3,278	13	205	95	114	234	124	124	305	491	53	227	1,297					
Number of health service personnel																		
Physicians:																		
Full-time	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Part-time	10	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
On-call	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nurses	13	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Clerks	2	0	0	**	**	0	0	0	**	0	0	0	0	0	0	0	0	0
Heads, part-time**	5	0	0	1	0	0	1	0	1	0	1	0	0	1	1	1	1	1

* Plus approximately 1,000 dependents.

** As needed and when available.

*** All health facilities had maid or porter service for general cleaning.

Table 2. -- Replies to questions concerning education and experience of 13 nurses; observations from nursing study of 12 plants with fewer than 1,500 employees, 1951

Education and experience	Nurse number												
	1	2	3	4	5	6	7	8	9	10	11	12	13
	Education												
College:	No	No	No	No	No	No	No	No	No	No	No	Yes	No
Degree	No	No	No	No	15 cr	No	2 cr	No	3 yrs	3 yrs	No	No	No
Credits	No	No	No	No	1	No	No	No	No	1	No	No	No
Courses (not matriculated)	No	No	No	No	1	No	No	No	No	1	No	No	No
Clinical post graduate courses	No	No	No	No	No	No	1	1	1	No	No	No	No
	Experience												
Industrial nursing	1 1/2 yrs	9 yrs	9 yrs	8 yrs	8 yrs	5 yrs	3 1/2 yrs	3 yrs	3 yrs	1 1/2 yrs	1 yr	1 yr	3 mos
Institutional:													
General duty	No	4 yrs	2 yrs	2 yrs	1 yr	No	1 yr	No	No	2 mos	3 yrs	No	1 yr
Private duty	3 yrs	8 yrs	3 yrs	5 yrs	No	9 yrs	4 mos	20 yrs	No	No	No	No	16 yrs
Supervision	No	No	No	8 yrs	No	No	No	2 yrs	No	No	No	1 yr	No
Public health nursing ..	No	No	No	No	No	No	No	No	3 1/2 yrs	No	No	No	No
Physician's office	No	No	No	No	No	No	No	3 yrs	No	No	No	No	No
Military	No	No	No	No	6 mos	4 yrs	No	No	No	No	No	No	1 yr
Laboratory	No	No	No	No	No	No	No	No	No	3 yrs	No	No	No

majored in nursing education and one in public health nursing. Another one had 15 college credits and a course in industrial nursing. One had a 1-credit course in industrial nursing, at the university, and two others had taken basic courses at the university. Three of the thirteen had clinical post-graduate nursing courses, one in anesthesia, one in poliomyelitis, and one in pediatrics. Five of the thirteen had no formal education experience following their nurse's training course.

The work experience of the nurses is indicated in table 2.

Eleven of the thirteen nurses were members of the American Association of Industrial Nurses, and ten were members of the American Nurses' Association.

FACTORS INFLUENCING FUNCTION OF NUR

PLANT POLICIES

There was minor variation from plant to plant in the scope of the occupational health programs, as shown in table 3.

Preplacement health examinations were given to all employees in the twelve plants. Eight plants provided periodic health examinations to all employees, and two reported that these examinations are given only to factory workers, but that other employees may have them if they wish. Five plants reported that other health examinations, such as transfer and terminal examinations, are given on a selective basis. With one exception, the health examinations were given usually in the plant health service facilities. In one plant all employees were sent to the physician's office for health examinations. In several other plants employees were sent to the plant physician's office on the days when he did not visit the plant.

Eight plants reported some activity in the area of recreational programs. One of these was sponsored through community resources, and another one was relatively limited.

Table 3. -- Replies to questions concerning plant policies affecting health service work-load; observations from nursing study of 12 plants with fewer than 1,500 employees, 1951. (Replies received from all 12 plants.)

Question	Number of plants replying in affirmative
Are preplacement health examinations given to all employees?	12
Are periodic health examinations given to:	
All employees?	8
Factory workers only?.....	2
Is there a recreation program for employee group?	8
Are employees required to report to the health service before reporting off duty on account of illness and injury?	10
Are employees required to report to the health service before returning to work following an illness or injury?	12
Are home visits made to employees?	8
Is there a program for health and safety education?	12
Does the plant participate in community mass-survey activities?	11

Ten plants requested employees to visit the health service before reporting off duty because of illness or injury, and employees in the other two plants were encouraged to do so.

All twelve plants requested employees to report to the health service following absence because of illness or injury. In this connection, the length of absence varied from one day in some plants to one month in another.

Home visits were made by nurses in eight plants. In five of these plants the visits were infrequent and on a selective basis.

All twelve plants reported some activity in health and safety education.

Eleven of the plants participated in community chest X-ray surveys. The twelfth plant, which did not participate, took chest X-rays on all employees at the time of employment and when periodic health examinations were given. In addition to the chest X-ray survey, the plants in one state participated in the syphilis survey.

PROFESSIONAL POLICIES AND PRACTICES

Established professional policies and practices were relatively uniform, as shown in table 4.

None of the health service facilities had a completed nursing procedure manual, but in two plants the nurses were preparing such a manual which will include the functions of the nurse, emergency orders for the care of employees, procedures for selected nursing treatments, and other pertinent materials. Several plants had a manual which contained the policies of the company as they related to the health program, and they had inserted in this manual the plant physician's approved orders for emergency treatment.

Table 4. -- Replies to questions concerning professional practices; observations from nursing study of 12 plants with fewer than 1,500 employees, 1951. (Replies received from all 12 plants.)

Question	Number of plants replying in affirmative
Is there a nursing procedure manual?	2
Are there physician-approved written orders for emergency treatment of employees?	8
Are redressings or other follow-up treatment given to employees with compensable disabilities?	12
If yes, are the physician's orders for treatment secured in	
a. Writing?	11
b. Orally?	1
Are treatments requested by private physicians for other than compensation cases given in the health unit?	12
If yes, are the physician's orders for treatment secured in	
a. Writing?	11
b. Orally?	1
Is a trained first aid worker responsible for emergency care when the nurse is absent from the unit?	8
Are individual cumulative health records kept for each employee?	7*
Are health records kept confidential?	12
Does the nurse submit reports to management? ..	12
Is nursing consultation available to the nurses?	12

* The 3 plants which kept only compensation and health examination reports in an individual folder are not included.

Eight of the plants had physician-approved written orders for emergency care of sick or injured employees. Five of the written orders had not been reviewed since early 1950, and one, which was dated prior to 1950, had not been reviewed by the present plant physician.

All twelve plants reported that redressings and follow-up treatments are given in the health unit to employees who have compensable injuries or illnesses. The amount of care given varies, depending upon the physical facilities and the wishes of the physician who is caring for the patient. Eleven of the nurses reported that they obtained written orders for treatment from employees' private physicians, but that they accepted verbal orders for treatment from the plant physician. One secured written orders from both the plant and private physicians, and one accepted verbal orders for all treatments.

All twelve plants reported that selected treatments and medications are given to employees when requested by their private physician for conditions other than compensable injuries and illnesses. Eleven of the nurses reported that they obtained written orders from the physician for all medications, and one accepted both written and verbal orders.

In eight plants a first-aid worker was responsible for emergency care when the nurse was temporarily absent from the health unit. With one exception, all of these first-aid workers had been provided with written instructions. In three other plants employees gave themselves first aid from a kit, and in one an office employee gave first aid to employees during the absence of the nurse. Three nurses had a plan for the follow-up of all employees who had received first aid during their absence, and the others performed a follow-up only on the employees who required additional treatments or redressings.

In seven plants cumulative health records, which incorporated all available information on the health of an individual worker, were kept for each employee. In three others health examination reports and records of a compensable nature were filed in individual folders for each employee, but all recordings of visits were made in a log book. In one no provision had been made for filing any records in individual folders.

All nurses reported that they submitted reports to management on a weekly, monthly, or annual basis. These reports included a count of visits according to varied classifications. A few reported that a narrative was included, but those reviewed contained only a sentence or two which served to clarify a segment of the statistical report.

Nursing consultation services from the State health department were available to all nurses, and one nurse had access to nursing consultation from the plant's insurance carrier. All of the nurses knew their consultant, but the majority seemed vague as to what kind of help they might expect from her.

JOB RESPONSIBILITIES OF NURSES

There were minor variations in the broad areas of work in which the nurses functioned, but considerable variation in the degree of responsibility in these broad areas, as shown in table 5.

Nursing Care for Injuries and Illnesses.--In the area of direct services to employees all nurses were responsible for emergency nursing care of industrial illnesses and injuries, nonindustrial injuries, and medical complaints, and for interviews regarding health problems.

Immunizations.--Six nurses carried some responsibility in an immunization program. Two gave influenza vaccine annually to all employees upon request. One gave typhoid

Table 5. -- Replies to questions concerning job responsibilities of nursing personnel; observations from nursing study of 12 plants with fewer than 1,500 employees, 1951. (Replies received from all 12 plants.)

Question	Number of plants replying in affirmative
Direct services	
Care industrial illnesses and injuries	12
Care non-industrial injuries	12
Care medical complaints	12
Interviews regarding health problems	12
Immunisations	6
Health examinations	12
Procure history, measure height and weight	10
Vision testing	7
Hearing testing	0
Temperature, pulse, respiration	8
Blood pressure	3
Collect laboratory specimens	9
Laboratory tests	9
Urinalysis	8
Blood work	5
I-rays, chest	1
Basal metabolism	1
Electrocardiogram	1
Chaperone women workers	8
Conferences with employee regarding findings	11
Recording physician's findings	1
Home visits	8
Interpretative services to management and supervisors	12
Recording of professional notes	12
Review of records for follow-up purposes	9
Indirect services	
Environmental sanitation and safety	12
Plant inspections	8
Investigations of accidents	4
Member of safety committee	9
Reports	12
Monthly or annual	12
Special reports	10
Competition reports	9
Administration of the health service	12
Procure physician's written orders for emergency treatment	12
Conferences with management and plant physician on policy	12
Planning space and equipment needs	12
Educational activities	11
Group teaching	4
Preparation of articles for plant paper	2
Review and selection of health education materials	10
Training and supervision of first-aid workers	7
Recreation program (member of committee)	1
Housekeeping and maintenance of the health service facilities	12
Clerical (health service)	10
Other activities	
Clerical (non-health service)	3
Care for dependents of employees	1

vaccines; another gave typhoid, diphtheria, and tetanus vaccines and vaccinations; and two gave immunizations of various types at infrequent intervals.

Health Examinations.--The nurses in all twelve plants participated in the health examination program. The specific functions for which they were responsible varied widely. Ten secured all or a portion of the employee's personal and medical history. In two plants the physician obtained the history. Vision tests were performed by seven nurses, three of whom used an approved vision-testing machine. Hearing tests, when performed, were done exclusively by the physician. Eight nurses took temperature, pulse, and respiration. Ten measured height and weight. Only three took blood pressure readings.

Nine nurses were responsible for collecting some laboratory specimens. Two collected only urine specimens, four collected urine specimens and drew blood for Kahn tests; three collected urine specimens and blood specimens for determining red and white cell counts and hemoglobin.

Nine nurses were responsible for some laboratory tests. Simple routine urinalyses were performed by eight nurses, three of whom did microscopic tests when indicated. Five did some blood work. One did red and white counts on a selective basis and as ordered by the plant physician, and two determined hemoglobin only. Red and white cell counts and hemoglobin were done by two nurses, one of whom had been a laboratory technician prior to becoming a nurse. Only one nurse was responsible for taking X-rays and performing basal metabolism and electrocardiogram tests.

Eight of the nurses chaperoned women workers during the health examinations. Eleven nurses shared responsibility with the physician for interpreting to employees the physical findings. One acted as secretary to the physician and recorded his findings.

Home Visits.--Home visits were a responsibility of eight nurses, five of whom made home visits infrequently and on a selective basis. Two visited all ill employees, and one of these nurses was responsible for taking application blanks to employees entitled to make a claim for benefits under the sick benefit plan.

Interpretative Services.--All nurses were responsible for some interpretative services on the health status of employees to management, the plant physician, private physicians, and other community health and social facilities.

Recording.--All nurses were responsible for keeping a record of services rendered.

Review of Records for Follow-up.--Nine nurses considered themselves responsible for reviewing their records for follow-up purposes.

Sanitation and Safety.--In the area of indirect services all nurses were responsible for some phase of the sanitation and safety program. One was responsible for the entire sanitation and safety program in the plant. Two participated only to the extent of sharing any observations or information bearing on the plant safety and sanitation program. Plant tours were made by eight nurses. Of these, one was responsible for the supervision of the sanitation of the washrooms and toilets, and another was responsible for the sanitation of the cafeteria, washrooms, dressing rooms, and toilets. Four participated in the investigation of accidents. Nine were members of the safety committee, two of these nurses serving as secretaries of the committee.

Reports.--All nurses were responsible for preparing reports for management on the activities of the health service program. Nine were responsible for compensation, and three, for reports on absenteeism.

Administration of Health Service.--Eleven nurses were responsible for the management of the health service facilities, and one carried a portion of the responsibility when the full-time physician was not on duty. All considered it their duty to secure physician-approved written orders for emergency care of sick and injured employees, but four had not yet obtained them. None of the nurses was totally responsible for planning space and equipment needs, but all participated in this activity.

Educational Activities.--Eleven nurses were responsible for some phase of an educational program. Ten reviewed and selected health education materials. Seven trained and supervised the first-aid workers. Two prepared articles for the plant paper, and four were responsible for group teaching. One held classes twice a year on personal hygiene; another participated in the in-service training program for supervisors on sanitation and safety; another taught first aid to supervisors and key personnel; and the fourth held classes on pertinent subjects as the need indicated. Three were cooperating with local universities in providing observations and field experience for nurses who are preparing themselves to work in this field.

Housekeeping and Maintenance of the Health Service Facilities.--All nurses were ultimately responsible for the maintenance and housekeeping of the health service facilities, but two had sufficient maid service so that their primary function in this area was the supervision of the maid.

Clerical Work.--All except two nurses were responsible for the major part of the clerical work originating in the health service. Two had half-time clerical workers, with access to their services at other times during the day. Three others had some work done in the main office whenever the clerks were available.

Recreation Programs.--One nurse was a member of the employee recreation committee.

Miscellaneous Activities.--One nurse was responsible for emergency care for dependents of the employee group, for conducting a child health clinic, and for the administration and supervision of a nursery for pre-school children.

Two nurses were responsible for non-health service general clerical work in the plant; one, for two hours of clerical work per day; and the other one, for general clerical work when time was available. A third was occasionally given clerical work to perform when the office clerks in the plant were overburdened.

Two other nurses were responsible for ordering flowers for employees who were off ill.

Outside Activities.--In addition to responsibilities connected with the health program, five nurses held offices in their local industrial nurses' association. Two were presidents of the local club, one of them also serving as vice president of the State Industrial Nurses' Association. One was a member of the board of directors of the State Industrial Nurses' Association; another was secretary for the local club; and another was chairman of one of the working committees of the local club.

ACTIVITIES PERFORMED BY NURSES AND CLOCKED DURING WEEK OF OBSERVATION

With one exception, the regular work week for nurses in the twelve plants studied was 40 hours. One nurse worked 36 1/2 hours per week. Because all of the nurses, except two, considered themselves on call for emergencies during the lunch period, the percentage distribution of time has been calculated on the basis of the number of hours spent from the time that the nurse entered the plant in the morning until she left it at night.

Tables 6 and 7 reflect the experience of nurses in plants grouped according to the size of the employee population: those under 250, 250 to 499, 500 to 999, and 1,000 to 1,499; hereafter, these four groups will be referred to as groups A, B, C, and D, respectively. Eleven plants were served by one nurse each; the twelfth plant had two nurses. This plant falls in group C.

Since the analyses showed no marked sex differences with reference to the utilization of the health services the data for males and females have been combined in the material that follows.

It is quite probable that there would have been a different percentage distribution of time among the specific activities if observations had been made at another period, for example one month earlier or later.

Table 6 shows the percentage distribution of nursing time according to specified activity, while table 7 shows the number of direct services per 100 employees, according to specified activity. In this connection the number of direct services refers to the number of employee visits.

DIRECT SERVICES

It will be noted in table 6 that the percentage distribution of nurses' time spent on direct services varied from 23 percent in group A, to 54 percent in group D. Table 7 shows that the volume of work varied from 17 services per 100 employees in group D to 82 services

Table 6. — Percentage distribution of nursing time, according to specified activity during a week of observation; nursing study of 12 plants with fewer than 1,500 employees, 1951

Activities	Size of plant (number of employees)				
	All plants	Group			
		A	B	C	D
Percent of nursing time					
	100.0	100.0	100.0	100.0	100.0
All activities					
Total direct services					
Direct services for employees					
Care for industrial injuries and illnesses...	12.7	22.5	41.7	45.3	53.6
Care for nonindustrial injuries	6.1	2.3	7.5	5.2	3.6
Care for medical complaints	1.9	.3	2.1	1.8	.7
Interviews regarding health problems	13.3	7.7	10.2	19.0	17.8
Immunizations	2.4	1.4	3.1	1.3	2.4
Health examinations	6.5	2.9	2.8	12.4	-
Home visits	1.4	-	2.6	-	11.8
Indirect services in behalf of individual employees					
Recording	4.0	1.1	5.3	2.4	3.8
Review of records for follow-up purposes	6.5	6.5	6.7	4.6	13.3
Others .....	.2	.3	.3	.1	-
	.4	-	.8	*	-
Total indirect services					
Indirect services for employees					
Educational activities	28.9	30.7	26.0	33.0	22.6
Environmental sanitation and safety .....	.7	5.0	.3	.3	-
Reports	1.9	4.6	2.4	.5	2.1
Administration of health services	1.7	7.1	1.3	.8	2.2
Maintenance of the health unit	2.6	2.9	3.0	1.0	5.4
Housekeeping activities	4.1	2.7	3.6	5.8	2.2
Clerical; telephoning, typing, filing, others	4.5	4.9	4.0	6.2	.6
Recreation program, others	13.2	11.5	11.1	18.1	10.1
	.2	-	.3	.3	-
Total other activities					
Other activities					
Care of dependents and supervision of nursery	28.4	30.8	32.3	26.2	23.8
Missions activities with community agencies ..	1.3	-	2.4	-	-
Professional organization activities .....	.1	-	.3	-	-
Professional reading .....	.3	.2	.5	-	-
Non-nursing activities .....	.9	-	.1	2.5	-
Lunch period	13.5	27.1	14.6	8.4	11.4
Rest period	8.9	7.2	9.8	8.0	7.0
Other	3.4	4.3	4.2	1.3	5.4
Number of nurses	13	1	7	4	1
Number of hours on duty	562.4	12.5	302.5	173.7	43.7
Number of plants	12	1	7	3	1
Average number of employees	6,397	76	2,461	2,576	1,479
Males	3,319	63	1,267	1,007	182
Females	3,278	13	1,197	771	1,297

* Less than .05 of 1 percent.

** In addition to employees approximately 1,000 dependents.

Note 1: Dash (-) indicates activity was not performed by nurse during week observed.

Note 2: The 12 plants classified by size into 4 groups (under 250 employees, 250-499, 500-999, and 1,000-1,499) are referred to in the text as groups A, B, C and D, respectively.

Table 7. — Number of direct services per 100 employees according to specified service during a week of observation; nursing study of 12 plants with fewer than 1,500 employees, 1951

Services	Size of plant (number of employees)				
	All plants	Group			
		A	B	C	D
Number of services per 100 employees					
Total direct services	36.1	31.6	48.1	34.0	27.4
Care for industrial injuries and illnesses	6.0	13.2	10.6	3.8	1.8
Care for nonindustrial injuries	2.0	1.3	3.5	1.4	.4
Care for medical complaints	18.0	36.8	17.6	22.3	10.1
Interviews regarding health problems..	1.8	5.3	3.3	.8	.6
Immunizations	*	-	.1	-	-
Health examinations	1.8	2.6	1.5	2.2	1.4
Home visits .....	.2	-	.6	-	-
Interpretative services in behalf of individual employees	3.1	7.9	5.7	1.3	1.4
Recording	3.0	13.2	4.6	2.0	1.5
Review of records for follow-up purposes .....	.1	1.3	.2	.1	-
Others .....	.1	-	.4	.1	-
Average number of employees	6,597	76	2,464	2,578	1,479

* Less than .05 of 1 percent.

Note 1: Dash (—) indicates activity was not performed by nurses during week observed.

Note 2: The 12 plants classified by size into 4 groups (under 250 employees, 250-499, 500-999, and 1,000-1,499) are referred to in the text as groups A, B, C and D, respectively.

in group A. An average of 36 services per 100 employees was rendered by all nurses, and 43 percent of their time was spent on activities in this category.

Industrial Injuries and Illnesses.--Time spent on the care of industrial injuries and illnesses varied from 2 percent in group A to 8 percent in group B. The number of services rendered per 100 employees varied from 2 in group D to 13 in group A. An average of 6 services per 100 employees was rendered by all nurses and accounted for 6 percent of their total time.

Nonindustrial Injuries.--Time spent on the care of nonindustrial injuries varied from less than 1 percent in groups A and D to 2 percent in group B. The number of services rendered per 100 employees varied from less than 1 in group D to 4 in group B. An average of 2 services per 100 employees was rendered by all nurses, and 2 percent of all nurses' time was spent on this activity.

Medical Complaints.--Time spent on the care of medical complaints was higher than for any other direct service. The range varied from 8 percent in group A to 19 percent in group C. The number of services rendered per 100 employees varied from 10 in group D to 37 services in group A. An average of 18 services per 100 employees was rendered by all nurses, and 13 percent of all time was spent in this activity.

Interviews Regarding Health Problems.--Time spent on this activity was observed in eleven plants and varied from 1 percent in groups A and C to 3 percent in group B. The number of services rendered per 100 employees varied from less than 1 in groups C and D to 5 in group A. An average of 2 services per 100 employees was rendered by all nurses and accounted for 2 percent of their time. The amount of time spent and the number of services rendered

do not reflect the total activity in this area because some health information was also given to employees visiting the health service for another reason.

Immunizations.--Immunizations were given in one plant during the week of observation, and the time consumed was relatively negligible.

Health Examinations.--Time spent on health examinations varied widely, from 3 percent in groups A and B to 12 percent in group C. The number of health examinations performed per 100 employees ranged from 1 in groups B and D, to 3 in group A. An average of 2 examinations per 100 employees was performed, and 7 percent of all nurses' time was spent on this activity. There were many reasons for this wide variation, particularly with reference to time. For one thing, various types of health examinations were given; these ranged from a relatively simple health examination to a rather complete one, including X-ray of the chest; the determination of red and white cell counts, and hemoglobin; and urinalysis. In one plant additional X-ray pictures and laboratory tests, such as basal metabolism rate, electrocardiogram tests, and others, were made when indicated. Another reason was the varying degree to which the plant physician delegated responsibility to the nurse.

As was indicated previously, table 5 shows the extent to which the nurses participated in the performance of health examinations. However, this table does not indicate the completeness of the activity. For example, the nurses took histories in several plants; but the health histories taken in some plants were much more complete and detailed than the ones taken in the other plants. In like manner, vision testing was done by the nurses in 7 plants; but in

some plants a Snellen chart was used, while in others an approved vision testing machine was used, and the examinations were thus more time consuming. It will also be noted in table 5 that five nurses were responsible for laboratory blood tests, but, again, in some plants these tests were more extensive than in others.

Home Visits.--Home visits were made by three nurses in group B during the week of observation. This activity accounted for 3 percent of their time, and the number of visits made was less than 1 per 100 employees. There was a wide variation in the amount of time spent by these three nurses. The primary reason for this variation was the travel time involved. In one plant all employees visited lived within a short distance of the plant. In another plant the employees lived scattered in a large metropolitan area, and slightly over 67 percent of the time spent on home visiting was actually travel time.

Interpretative Services.--Time spent on providing interpretative services regarding the health status of individual employees to management, plant physician, private physicians, and others varied from 1 percent in group A, to 5 percent in group B. It accounted for 4 percent of all nursing time.

In those plants where the greatest activity was observed in this area, the nurses seemed to have effective working relationships within the plant as well as with private physicians and other agencies within the community. For example, in two of the plants the personnel director, nurse, and plant physician worked closely on job placement and on the follow-up of employees who were off duty because of illness or injury. In like manner, there were frequent communications with the private physician who was treating the employee in his home or in a hospital.

Recording.--Recording of professional notes on the employee's cumulative health record is generally considered to be a part of the service given to an employee. However, to save the employee's time when the health service is busy, many nurses use some type of log where they enter his name, together with notes on services provided. Later, as time permits, these notes are amplified and transferred to the employee's record. Therefore, the number of services in connection with recording in table 7 refers to intervals of recording rather than to the number of individual records written during the week of observation. The time spent on recording varied from 5 percent in group C to 13 percent in group D. The number of intervals per 100 employees devoted to recording varied from 2 in groups C and D to 13 in group A. This activity accounted for 7 percent of all nurses' time. In group C one nurse dictated most of her notes to a part-time secretary, while the other nurses did their recording in long hand. There was considerable variation among plants due primarily to a variety of record systems, some of which were more complete than others.

Review of Records for Follow-up Purposes.--Review of records for follow-up purposes was observed in seven plants in groups A, B, and C. The time spent on this activity was less than 1 percent in all groups.

Other.--Other activities in the area of direct services were observed in three plants in groups B and C and consisted primarily of telephone calls to and from employees who were off duty ill; in one instance, a sick employee was accompanied to his home.

INDIRECT SERVICES

It will be noted in table 6 that there was considerable variation from group to group in the amount of time spent on indirect services. This was probably due primarily to the size of the employee population, differences in the scope of health programs as they affected the function of the nurse, and the amount of clerical and housekeeping assistance which was provided to the health service. The time spent on indirect services varied from 23 percent in group D, to 39 percent in group A. All nurses spent an average of 29 percent of their time providing indirect services.

Education.--Educational activities directed toward the employee groups were observed in six plants during the week of observation. The time spent varied from less than 1 percent in groups B and C to 5 percent in group A. Activities observed consisted of reviewing health education materials, preparing articles for plant papers, and setting up exhibits.

Environmental Sanitation and Safety.--Time spent on programs of environmental sanitation and safety ranged from less than 1 percent in group C, to 5 percent in group A. All nurses spent an average of 2 percent of their time in this activity. Activities observed consisted of plant tours, attendance at safety committee meetings, participation in the investigation of accidents, and conferences with the safety director or supervisors regarding accidents or potential accident hazards.

Reports.--In nine plants time was spent on reports to management during the week of observation. The amount of time spent varied from less than 1 percent in group C to 7 percent in group A. Reports were prepared on monthly activity, compensation costs, and absenteeism. In addition, special reports were prepared, as requested by management.

Administration of Health Service.--All nurses spent time during the week of observation on the administration of the health service. The amount of time spent ranged from 1 percent in group C, where one plant employed a full-time medical director, to 5 percent in group D. Activities observed consisted of conferences with management and the plant physician regarding policy, planning for changes in physical facilities, preparation of written orders for emergency treatment of sick and injured employees, redesigning of record forms, and planning for new equipment.

Maintenance of the Health Unit.--Time spent on the maintenance of the health unit varied from 2 percent in group D to 6 percent in group C. An average of 4 percent of the total time of all nurses was spent for this work. Activities observed consisted of cleaning and sterilizing instruments and equipment; setting up treatment table and examining rooms; refilling stock bottles; and checking, cleaning, and replenishing first-aid kits.

Housekeeping.--Time spent on housekeeping activities ranged from less than 1 percent in group D to 6 percent in group C. This activity accounted, on the average, for 5 percent of the total time spent by all the nurses. Activities observed consisted of storing supplies; making beds; dusting, cleaning, and arranging cabinets; folding gauze bandages; and cleaning laboratory glassware and safety equipment.

Activities having to do with the maintenance of the health unit and housekeeping have purposely been grouped separately because it was believed that there might be some difference of opinion as to whether or not some of the activities listed under the maintenance of the health unit require the professional skills of the nurse. It should be

stated at this time that hospitals and public health organizations have demonstrated that trained aides can perform most, if not all, of the activities grouped under the maintenance of the health unit.

Health Service Clerical Work.--Time spent on health service clerical work ranged from 10 percent in group D to 18 percent in group C. One of the plants in group C was staffed with two nurses, and it had an extremely busy health service and no clerical assistance. Activities observed in this area consisted of answering the telephone, filing, typing, making tabulations for statistical reports, preparing routine reports, and writing routine letters.

Recreational Program and Other Activities.--One of the seven nurses in group B spent 2 percent of her time on the employee recreational program during the week of observation. Another nurse in group D spent time on miscellaneous welfare services.

OTHER ACTIVITIES

Other activities included a group of miscellaneous activities assigned to the nurse, lunch periods, rest periods, and non-nursing activities, which include non-health service clerical work, and personal and unoccupied time. Time spent on other activities ranged from 20 percent in group C to 39 percent in group A. See table 6.

Care of Dependents.--One of the seven nurses in group B spent 18 percent of her time during the week of observation providing emergency care and preventive services for dependents of the employee group. Activities observed consisted of administering and supervising a "nursery for pre-school children," conducting a child health clinic for pre-school children, and providing emergency care for illnesses and injuries. A total of 38 different intervals of time was devoted to this activity.

Liaison Activities with Community Agencies.--One of the seven nurses in group B spent 2 percent of her time during the week of observation on liaison activities with community agencies, which included a conference with the local visiting nurse association regarding their respective programs and a similar conference with the department of health.

Professional Organizational Activities.--The nurse in group A and two nurses in group B spent time carrying out officer responsibilities in connection with their professional nursing organizations. The time spent was less than 1 percent in both groups. Activities observed consisted of planning an agenda for a meeting, reviewing by-laws for the local industrial nurses' club, handling telephone calls to and from club members regarding plans for the meeting, and similar activities. The plant managements seemed to accept the fact that their nurse had a responsibility in this area, and one personnel director told the observer that they were proud that their nurse held an office in her professional organization.

Professional Reading.--During the week of observation two nurses in group B and one nurse in group C spent time on professional reading and in consulting technical references for information on medical and health problems which had been presented to them by employees. The time spent ranged from less than 1 percent in group B to 3 percent in group C.

Non-Nursing Activities.--Time spent on non-nursing activities ranged from 8 percent in group C to 27 percent in group A. An average of 14 percent of all nursing time was spent in this area. Observations in this category included non-health service clerical work, making change for vending machines, ordering flowers for sick employees, personal and unoccupied time.

Non-health service clerical work, typing and proofreading, was observed in three plants, and the time spent ranged from 1 percent in two plants to 2 percent in another. The average for the three plants was 2 percent.

Time spent on personal items ranged from less than 1 percent in one plant to 10 percent in another. Four spent less than 2 percent of their time on personal items, while four others spent less than 5 percent.

Unoccupied time was observed in eleven plants, and the time spent ranged from less than 1 percent in two plants to 31 percent in another. The larger percentages were observed in two plants. One plant had less than 15 minutes; four had less than one-half hour, and another four had between 1 and 3 hours of unoccupied time.

The amount of unoccupied time observed may have been due to several reasons. Four nurses reported their units less busy than usual during the week of observation. Some nurses may have functioned differently with an observer present. In some instances, they may have lacked the ability and knowledge to utilize time when the flow of work dropped below the usual level.

Scheduled lunch periods varied from 30 minutes to 1 hour, depending upon the policy of the plant. All except two plants had a cafeteria or lunch bar, and the time spent for lunch usually was dependent on the time required to go through the cafeteria line, to be served, and to eat lunch. The time spent on this activity varied from 7 percent in groups A and D to 10 percent in group B, where two nurses went home to lunch. The all-plant average was 9 percent, or approximately 45 minutes. During the week of observation the nurse in plant 4 had two luncheon conferences with representatives from community agencies, and the time was charged to "liaison activities with community agencies."

In eleven plants all employees were allowed rest periods varying from 10 to 15 minutes, depending upon the policy of the plant. The time spent varied from 1 percent in group C to 5 percent in group D. The all-plant average was 3 percent.

SUMMARY OF EXPENDITURE OF NURSES' TIME

Table 8 shows a summary of the expenditure of nurses' time during the week of observation. As anticipated, the amount of time spent on direct services to employees increased as the employee population increased. In contrast to this, the average time devoted to providing services to individual employees decreased as the employee population increased.

Other data secured and tabulated, but not included in the tables, show that there was wide variation in the way in which nurses' time was utilized, even in plants of comparable size. For example, in group B, which includes plants ranging in size from 250 to 499 employees, there was considerable variation in the demand for services from the employee groups. In one plant with an employee population of 300, a total of 46 services were rendered in connection with injuries, medical complaints, and health examinations; while in another plant with 363 employees a total of 190 services were rendered. The amount of time spent on providing these services ranged from 17 to 32 percent. This same type of variation occurred in group C.

In the area of indirect services there also was considerable variation from plant to plant in the way in which nurses' time was utilized. In six plants nurses spent time on educational activities, but the time varied from less than 1 percent in four plants to 5 percent in another. Time was spent on sanitation and safety in all plants, but the amount varied from less than 1 percent in five plants to 8 percent in another. Without exception, the largest block of time spent in the area of indirect service was on housekeeping, maintenance of the health unit, and general health service clerical work. These activities accounted for 22 percent of all nursing time during the week of observation.

Table 8. - Summary of expenditure of nursing time, and activities performed, during a week of observation, by size of plant; nursing study of 12 plants with fewer than 1,500 employees, 1951

Activities	All plants	Size of plant (number of employees)			
		Group			
		A	B	C	D
		Percent of nursing time			
All activities	100.0	100.0	100.0	100.0	100.0
Direct services	42.7	22.5	41.7	46.8	53.6
All other activities	57.3	77.5	58.3	53.2	46.4
		Average number of minutes per activity			
All activities	8.6	14.7	6.9	7.7	7.1
Direct services	6.1	9.2	6.4	5.6	5.5
All other activities	12.4	17.7	12.4	11.7	10.8
		Average number of activities per nurse			
All activities	302.5	174.0	291.0	337.8	370.0
Direct services	163.0	62.0	169.1	219.0	257.0
All other activities	119.5	112.0	121.9	118.8	113.0
		Total number of activities performed			
All activities	3,932	174	2,037	1,351	370
Direct services	2,379	62	1,164	876	257
All other activities	1,553	112	853	475	113
		Total number of minutes nurses on duty			
All activities	33,745	2,990	18,119	10,421	2,625
Direct services	14,420	573	7,562	4,678	1,407
All other activities	19,325	1,977	10,587	5,543	1,218
Number of nurses	13	1	7	4	1
Average number of employees..	6,597	76	2,464	2,578	1,479

Note 1: "All other activities" includes indirect services for employees, and other activities.

Note 2: The 12 plants classified by size into 4 groups (under 250 employees, 250-499, 500-999, and 1,000-1,499) are referred to in the text as groups A, B, C and D, respectively.

In the area of other activities there was an even wider variation in the way in which time was utilized. In one plant the nurse spent 18 percent of her time on providing services to dependents. One spent two percent of her time in conferences with personnel from community agencies. Several nurses spent time on professional activities and reading. Nurses in three plants in group B and in one plant in group C were so busy with professional services to employees and the accompanying clerical and housekeeping activities that the time spent on other non-nursing activities was low as compared with that found in other plants. Non-nursing activities, exclusive of health service clerical work and housekeeping, accounted for 14 percent of all nursing time, and the variations among the twelve plants ranged from 2 to 41 percent.

There seemed to be a tendency for the time spent on non-nursing activities to be greater in the smaller plants, where the demands for service to employees was less pressing. This may be due to the fact that these nurses and plant management need nursing consultative help to plan for better utilization of nursing time, or the smaller plants may not need the services of a full-time nurse.

DISCUSSION AND CONCLUSIONS

The data tabulated and discussed in this report represent the experience of twelve manufacturing plants, ranging in size from 76 to 1,479 employees, during one week of observation. Eleven plants were staffed with one nurse each, and the twelfth plant employed two nurses.

The activities performed by nurses and clocked during the week of observation have been grouped to conform with the recommendations set forth in the American Association of Industrial Nurses' publication, Duties and Responsibilities of the Nurse in Industry.

All of the nurses were found to be functioning in the broad areas of activities as outlined in this document, but some of the duties were not performed in all plants during the week of observation. There was considerable variation from plant to plant in the degree of responsibility assigned to the nurse, particularly in the areas of health examinations, and sanitation and safety. In four plants the nurses' responsibilities were limited by the administrative plan of management. In one plant, the nurse had such a heavy program of providing health services to employees that she was prevented from fulfilling her assigned responsibilities in sanitation. Some nurses were observed to be carrying responsibilities not specifically mentioned in the Duties and Responsibilities of the Nurse in Industry. Several were making home visits, and others were participating in an immunization program. Another provided services to dependents of employees which included emergency care, holding a child health clinic for pre-school children, and administering and supervising a nursery for pre-school children. Another spent time with nursing students who were visiting the plant and the plant health service.

The amount of time spent on direct and indirect services, exclusive of housekeeping and general health service clerical work, accounted for 42 to 63 percent of the nurses' time. There are no available valid standards against which to judge how the nurses' time should be allocated to the various program elements. However, in some instances, it would seem that time spent on non-nursing activities, such as clerical and housekeeping, and in unoccupied time could have been utilized to better advantage. For example, in several plants nursing time could have been used effectively on formulating a planned procedure for follow-up of those employees who have received emergency treatment from a first-aid worker; organizing and maintaining a record system which would incorporate into individual employee folders all information on services rendered; drafting copies of written orders for emergency care of employees for the physician's

approval and signature; or more time could have been spent preparing narrative reports to management.

The professional practices which had been established in the plants studied were fairly uniform, but some were not in accordance with those recommended by the American Association of Industrial Nurses or with those found in the publication Nursing Practices in Industry.

It is difficult to evaluate with any degree of accuracy the correlation, if any, between the education and experience of the nurse and the utilization of her time and the professional standards which were currently in effect in the health service programs. Even in this small sample of plants, there were many variables which could distort apparent correlation, such as the size of the employee population and the volume of the emergency work load, managements' philosophies as to the nurses' function, and the individual nurse's innate potentials for planning and organizing her work. Data from a larger sample are necessary before valid conclusions can be drawn.

There seemed to be no relationship between the salary paid to nurses and their educational background and length of service with the company. For example, in the two plants paying the lowest salaries, one nurse had been with the company one year, and the other one, fourteen years. The nurse receiving the highest salary had been with the company three years and had no educational experience since nurses' training.

Time studies serve a useful purpose in that they are an excellent device for uncovering time being devoted to non-nursing activities, such as clerical and housekeeping duties and unoccupied time. This time can be utilized more effectively when the program objectives are directed toward such preventive measures as case-finding, follow-through, health counseling, and rehabilitation.

Because knowledge as to the extent of the actual need for health services is basic to the determination of the amount of nursing time required in industry, it is obvious that valid conclusions cannot be drawn from the use of the time study alone. Such studies reflect what is now being done in existing programs without considering whether or not these programs are meeting current employee health service needs.

RECOMMENDATIONS

To determine how much nursing service can profitably be used by industry, the employee health service needs should first be defined. This would mean establishing criteria for predetermining the health service needs of employee groups. Demonstrations of plant health programs which would provide all types of occupational health services, in a situation where management and the nursing and medical professions are cooperating fully, would also contribute much practical information.

1. Wherever possible, studies of health services should be approached on a team basis. This means that medical and nursing service should be studied together because a large portion of the nurse's area of function is dependent upon the experience and philosophy of the plant physician, and the policies and practices which he establishes.
2. The plant physician, nurse, and management, together with available consultants, should review periodically their health service programs to determine how effectively health service needs are being met; and to determine what activities are being performed by nurses which could be done more economically by other personnel. This type of review is essential in all health service programs if we are to spread the services of the nurses we have to serve most equitably the community as well as industry.

3. Before hiring a nurse for their plant, management and the plant physician, together with available nursing consultants, should critically review the proposed work load and determine whether or not a nurse's professional skills can be fully utilized. When a small plant cannot effectively utilize the services of a full-time nurse, management may consider sharing the services of a nurse with another small plant rather than depleting further its community nursing resources.

4. Studies of nursing consultation services should be made to determine:

- (a) What methods, techniques, and procedures now employed are effective in assisting the nurse to improve her performance, and what methods can be devised for sharing with other consultants those concepts and techniques which are successful.
- (b) To what extent such measures as group conferences, work shops, and institutes can be employed to give the plant nurses opportunity to share experience and ideas for providing optimum health services.
- (c) To what extent orientation programs can be established for the purpose of assisting the new nurse entering industry to function more effectively and with more security.