

part of the Weighted Airman Promotion System. With few exceptions the nurse responses were of high quality. The scanned data and keypunched data were merged by matching on case control number, to form complete case records for CODAP analysis.

VI. ANALYSIS

General

Each completed job inventory is, in a sense, an individual's job description since it specifies a person's work activities and indicates how his work time is distributed. Together with the individuals' identification and background information, the job descriptions obtained from a large-scale survey comprise a bank of information describing people and jobs in an occupational area. The set of computer programs labelled CODAP is in essence a data retrieval and analysis system designed to operate on this data bank to provide occupational information for researchers and Air Force management.

Conversion of Ratings to Percent Time Estimates

As a first step in the analysis the computer converts the 7-point relative time-spent ratings to estimates of percent time spent on each task. An individual's time-spent ratings are summed, and the total is taken to represent 100% of his work time. Each 7-point scale rating is then converted to a percentage of the sum of the individual's ratings. Thus, each respondent's ratings are forced to add to 100%.

The time-spent ratings and percentage estimates are rough data and should not be converted to hours or minutes. The relative time-spent rating procedure is used because previous research has shown that it is impractical to ask survey respondents to estimate hours and minutes, or to estimate the percentages of time spent on a large number of tasks.

The percent time values based on the relative ratings, at the least, provide an index in terms of which tasks may be listed in sequence from the most time-consuming to the least time-consuming. In addition, when the percentage estimates are consolidated for various subgroups of nurses, the average time-spent values appear to be reasonable; and subtotals of percentages for related tasks, such as "Percent Time Spent on All Administrative Tasks in the Inventory," are in substantial agreement with what is generally known about the division of duties in the Nurse Corps.

Percent Members Performing

While the computed percent-time values are only an index, data summaries showing the percentage of nurses who perform a task are considered to be accurate. These figures are based simply on nurses' responses indicating whether or not they spend any time on each listed task. For large samples the "percent performing" data are believed to be accurate to within one or two percent for most task statements. The accuracy depends in part on the specificity and clarity of the statement. For example, "Apply cold by

alcohol sponge" is a specific statement to which nurses could readily answer, "Yes, I do that" or "No, I don't." On the other hand, "Develop nurse staffing plans" is more ambiguous and may or may not have been reported as performed by nurses who assisted in developing only some limited portion of a nurse staffing plan. There may be a small amount of inflation due to some respondents' checking tasks which they have never performed, but which they think they might be called upon to perform at some time. Involved definitions of "present job" have been unsatisfactory; the concept has been left open to common sense with good results.

CODAP Report IDs

The results of every CODAP analysis performed are stored on computer tapes at the Air Force Human Resources Laboratory's Occupational Research Division, along with tape files of all of the original responses. The products of each analysis are called a "report," and each report is identified by a unique six-character code. In subsequent parts of this paper, when computer reports are referred to, their identifying codes are given as "Report IDs." Any selection of CODAP reports can be reprinted from tape in any sequence. The requester must specify the Report IDs in the sequence he wants them. The computer prints the reports in the specified sequence, numbers the pages and prints out a table of contents.

Composite Job Descriptions for Specified Subgroups

A consolidated duty and task description can be produced for any group of respondents who can be defined by any combination of responses to items in the job inventory. By collating the occupational survey data with other personnel tape files, it is also possible to produce descriptions for subgroups defined by other variables -- for example, aptitude scores and other test scores not in the job inventory.

Composite Description for General Nurse DAFSCs. Table 3 shows the top and bottom portions of a consolidated task description for 1,658 General Nurses -- all surveyed active duty nurses who reported their Duty Air Force Specialty Code (DAFSC) as either 9751 or 9755. To the right of the task statements in Table 3 are four columns of numbers showing (a) the percentage of group members (General Nurses) who reported performing each task, (b) the average percentage of time spent on each task by those who performed it, (c) the average percent time spent on each task by all members of the group, and (d) the cumulative sum of values in the third column.

Insert Table 3 about here

The values in the third column, "average percent time spent by all members," are mathematically identical to "percentage of total group work time." The column adds to 100%. The figures in the

TABLE 3
Nurse, General

Cumulative sum of average percent time spent by all members.....
 Average percent time spent by all members.....
 Average percent time spent by members performing.....
 Percent of members performing.....

<u>Task No.</u>	<u>Task</u>				
51	Answer telephone calls for or from patients or hospital staff members	93.55	0.84	0.78	0.78
350	Observe and record condition of patients	90.47	0.81	0.74	1.52
351	Observe and report changes in condition of patients	87.58	0.77	0.68	2.20
289	Label specimens and fill out laboratory specimen request forms	90.53	0.73	0.66	2.86
24	Administer intramuscular medications	92.64	0.71	0.66	3.52
35	Administer oral medications	91.50	0.70	0.64	4.16
154	Coordinate with physician regarding patient care	85.77	0.72	0.62	4.77
309	Make entries in ward cardexes	81.91	0.74	0.61	5.38
188	Take and record blood pressures	92.82	0.64	0.59	5.98
116	Check off completed patient care in cardex to insure compliance with physicians' orders	80.82	0.73	0.59	6.57
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426	Perform spinal puncture and administer spinal anesthesia	3.20	0.12	0.00	99.88
555	Serve as research consultant	3.02	0.13	0.00	99.89
394	Perform cutdowns	3.44	0.11	0.00	99.89
393	Perform cricothyroidotomy	3.14	0.09	0.00	99.89

third column, for any subset of tasks, may be added to yield an estimate of the total time spent on the subset.

The tasks are listed in descending sequence of values in the third column (i.e., in terms of group time spent), so that the group's most time-consuming tasks appear at the top of the list. (The tasks can also be listed in descending order of the percentage of members performing)

The fourth column makes it possible to identify the most time-consuming tasks which account for a given percentage of a group's work time. In Table 3, for example, the tenth value in the fourth column shows that the General Nurses' 10 most time-consuming tasks account for only 6.57% of the total group's work time.

In Table 3 the smallness of the time-spent values for individual tasks is explainable as follows: (a) the nurse tasks are broken out in considerable detail, so that most nurses had to check a fairly large number of tasks to describe their jobs. The General Nurses rated an average of 207 of the total 648 tasks in the inventory. When 100 percentage points are spread over more than a hundred items, most or all of the resulting values must be less than 1%. In addition (b) the 7-point time-spent rating scale imposes some restrictions on the possible range of computed values. An individual rater is unable to report more than seven times as much time spent on one task as on any other. As a result, in Table 3 the largest time-spent values are probably underestimates and the smallest time-spent values are probably overestimates.

With reference again to Table 3, the first column of numbers, headed "Percent of Members Performing," gives several types of information. The topmost values in this column are around 90% and thus identify tasks performed by almost all General Nurses. The full printout identifies 92 tasks in the inventory which are performed by 70% or more of the General Nurses, and 165 tasks which are performed by 50% or more (i.e., most) of the General Nurses. Thus there is a great deal of commonality in the tasks performed by General Nurses. The "top" tasks are therefore candidates for inclusion in a core curriculum. The bottom tasks on the list -- those performed by very few General Nurses -- are candidates for exclusion from a core curriculum since the probability that a nurse will encounter them on any given assignment is very small. Certainly, decisions to include or exclude tasks from training cannot be made automatically based on number performing. For example, emergency tasks such as giving artificial respiration may be performed by a few nurses in their present assignments, but should obviously be included in nurse training because of their criticality when they are required.

Two features of composite task descriptions must be remembered: (a) the description is based on group averages and may not accurately represent the work of any one person, and (b) the composite description may obscure the existence of meaningful subgroups. The General Nurse description, for example, is heavily weighted by the large number of General Duty Hospital Staff Nurses in the sample. The work performed

by smaller subgroups such as Head Nurses, or nurses in Pediatric Clinics or on OB Wards, may not appear among the top tasks of the total group description.

Composite Descriptions for Other Nurse DAFSC Groups. Tables 4 through 9 show the 10 most-performed tasks for each major nurse specialty group other than General Nurses. By "most-performed" is meant the tasks reported by the largest numbers of people. Only the percent members performing data are presented. The tasks are listed in sequence of members performing. These descriptions have good "face validity" -- that is, they agree well with what is generally known about nurse specialties, and thus tend to support the validity of the survey findings. In the full printouts a sizable core of "common" tasks is evident in each specialty group. Most nurses therefore appear to have been well classified in terms of official Air Force Specialty designations. A possible exception is the small group of Flight Nurses, Aerospace, DAFSCs 9761A/66A, part of whose description is shown in Table 9. These six nurses had few tasks in common. The Aerospace Flight Nurse classification was fairly new at the time of the survey, and it is possible that this role has since taken on better definition. However, at the time of the survey, the Aerospace AFSC appears to have been an almost meaningless category in terms of the tasks listed in the nurse job inventory.

Insert Tables 4-9 about here

Other Composite Job Descriptions. Additional descriptions, computed for the following nurse subgroups, were provided to the Nursing Resources Study Group and are on computer tapes:

(a) Separate descriptions for "Entry Level" and "Fully Qualified" nurses in each DAFSC category.

(b) Separate descriptions for each grade group in each DAFSC category.

(c) Groups defined by grade only, combined from all AFSCs.

(d) Nurses with differing lengths of service, within each DAFSC group. For example, General Nurses, DAFSCs 9751/55, with 1-6 months active federal military service (AFMS); those with 7-12, 13-18, and 19-24 months AFMS; those in their third year, fourth year, fifth year, etc., up to General Nurses with 21-30 years AFMS.

(e) Nurse groups with differing educational backgrounds.

(f) Nurses who spend more than average amounts of time on Community Health tasks.

(g) General Nurses and Psychiatric Nurses (combined) who work in hospitals, and those who work in dispensaries.

(h) "Job Title Groups" selected on the basis of responses to the questionnaire item, "Check one box to indicate your primary job title."