FUNCTIONAL JOB ANALYSIS

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GUIDELINES FOR TASK ANALYSIS AND JOB DESIGN

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OVERVIEW

This guide is designed for managers, supervisors, educators, planners, and evaluators. Its purpose is to discuss ways to improve decisions that affect how human resources are used to provide health services. Improved decisions require up-to-date and detailed information about three components of human resources for health: (1) the workforce, (2) the work performed and (3) the work settings. This guide discusses how to establish an information system that links these three components to form a unified model of human resources planning, training, and utilization. For more detailed information about how to apply this method contact the author directly.

The policy of the World Health Organization (WHO) to promote coordinated health and human resources development (COHHRD) was established in 1976. The purpose of this coordination is to *"...promote the concept of integrated development of health systems and health personnel so that health services would be staffed by appropriate numbers and types of workers within a unified system*" (WHO, 1990, p. 7).

Coordination is complicated by the dispersal of responsibility for the functions of planning, training, and management among several different organizational settings. These 'sub-systems' must act in a coordinated fashion to accomplish the goals of improved human resources for health. These subsystems, however, do not always share a unified leadership structure. Indeed, it is common for each to be administered by different sectoral authorities. To optimize the human resources for health, several subsystems must be managed to achieve shared goals and purposes. One requirement for coordination of effort toward the common purpose is information about the performance and outcomes of the subsystems. This information must be understood by educators representing the supply side, employers (demand side) and planners seeking to link these two subsystems. The common element linking all constituents is the job each worker is expected to do.

Job titles alone do not convey enough information to assure common understanding among the different perspectives. A common language of human performance is needed to guarantee communication among these perspectives. The common language must contain descriptors of what work, eg, tasks and activities, is performed; the standards of quality performance; the skills, knowledge, values and attitudes required for quality performance; and the technologies (eg, tools, aids, materials, and equipment) employed in the conduct of health work. The common language must link the work, the worker and the work setting. Job descriptions with performance standards satisfy this need.

The remaining text details problems with developing human resources for health (HRH) and presents a description of a comprehensive method for improving HRH planning,

training and management.

Worldwide pressures to reform HRH

Two powerful social forces combine to force consideration of major reforms in personnel subsystems in health care settings. One of these forces is accountability. The other is humanism. The overwhelming majority of the expenditures of health care organizations is for salaries, wages, benefits, training and supervision of workers. The performance and productivity of these institutions is therefore very dependent upon the workers and the conditions of work performance. It is also the case that the capacity of the services setting to treat their patients in a caring, humane manner is highly related to the manner in which the organization treats its employees who are the agents of the service organization. The goal of reform of personnel systems must be accomplished through means which are consistent with the values of accountability and humanism.

Accountability and humanism

Accountability can be defined as the procedures to provide evidence that the expenditures to attain stated objectives in health care are actually achieving those objectives, or that measurements of the deficits in performance are available and plans for improvement are being implemented. Humanism in the context of health care means that health care should primarily be concerned with the whole human being, not just a cluster of presenting symptoms, diseases or disabilities. Socially, it means that quality health care should be accessible to all persons according to the principle of equity. Organizationally, it means that institutions and bureaucracies should treat human beings as citizens with rightful claims on the health care capacity and not as "clients" or supplicants for the services. This means that the focus should not be upon the input of resources into institutions and bureaucracies, but rather upon the output of their services to human beings and to society.

It is in this last point where accountability and humanism should and can come together. Some humanists are wary of the concept of "accountability" because of its reliance upon management, planning, the specification of objectives, the insistence upon quality control and measurements of results, using quantifiable data and methods of controlling many by the few. However, humanism cannot be well served in large, complex organizational settings unless full advantage is taken of the best managerial techniques. Accountability and humanism can share complementary concerns. Both are necessary to provide high quality health care, with equitable access and sustainable cost. But, how can these concerns be complementary?

The goal of effective health and human services is to increase the general quality of life -- not just the absence of disease. This challenge now depends upon how well institutions and organizations serve all the people. Our societies and our institutions have become too complex to be easily explained, managed or reformed. Effective caring in the health field calls for the discipline of management, the considered

application of technology and the compassion of individual concern. It is therefore the product of trained, competent, caring and committed persons serving in well-managed enterprises. The goal of reforming large, complex personnel systems must support the concept of effective caring. Thus, the methods employed must be sensitive to both humanitarian and accountability concerns and must promote the accomplishment of both types of objectives in an integrated, complementary manner.

Effective caring is an output of a system of services provision. There are at least three subsystems which contribute to effective caring.

The first is the subsystem of "*personal accountability*." This is manifest in the commitment of employees to be ethical, equitable, diligent, honest and free from corruption.

The second subsystem may be labeled "*professional accountability*." This is made up of the skills, attitudes and understandings that form the knowledge base of health-care services. To effectively care requires that each worker be responsible for both knowing and using those good practices which are the product of research and the state of the art, that the worker take part in the setting of those standards, that the worker submit to the measurement of his or her performance according to those standards, and that the worker strives to meet those standards where results show deficiencies.

The third major subsystem of effective caring is "*system accountability*." System accountability attempts to relate all of the parts -- human, material and organizational -- that are joined to achieve the health care purpose. It is here that factors affecting personal and professional performance are taken into account. The limitations of the work setting -- the materials, equipment, facilities -- are factored in to understand the effects upon the team's or an individual worker's performance. Likewise, the organizational structure, its policies, its norms and standards, and its incentives are evaluated. These assessments provide the basis for system reformation or in the contemporary jargon, "re-engineering."

These three subsystems emphasize the need to have an approach to reform that goes beyond the simple characterization of workers, or the work content or the organizational settings. The approach to improved worker performance must be based upon systems concepts which acknowledge the inter-relatedness of each sub-system and the contribution it makes to overall system performance. Task analysis based upon the models of Functional Job Analysis (Fine, et al.) is well suited to this requirement.

Why analyze work?

The system of health services which employs and directs the health workforce often does not have fully developed, detailed plans and strategies to deal with changing health and demographic conditions. To date there has been little basis for projecting the tasks and activities of the workers or for projecting the requirements for types and

numbers of employees. Changes in technology and standards of practice are not readily accommodated due to the lack of in-service education and training. Quality suffers from lack of regular, competent supervision which provides feedback on performance, detects needs for additional training and offers the encouragement and recognition necessary to maintain morale. Planning, recruitment, training and directing the health workforce is handicapped by the limitations described here:

Health planning and health workforce planning.

Health workforce planning is an integral part of health planning, but currently these activities are not well integrated especially at the provincial and sub-provincial levels. The means to translate service targets into specifications for workforce characteristics is limited by lack of well trained planners and the lack of technologies, ie, job and task analysis, to deal with the qualitative aspects of the workforce. Workforce planning capability at the regional level and below is not well developed and what exists relies heavily upon national projections and data sources. Research on workforce utilization, e. g., staffing patterns, delegation of functions, quality assurance, and supervision is not available to inform planners (Hall, 1992).

Recruitment and retention of health workers

Incentives for the recruitment of already trained and experienced personnel to under-served settings are not well developed. Likewise, incentives to practice primary care and to emphasize prevention in rural and under-served areas are rare. Indeed, most of the village clinics and health centers have meager resources which are often allocated to the most desperate clinical cases. Health workers may tend to over-prescribe the more expensive and potent drugs and neglect preventive care. Health workers may not apply their training to the basic health needs, choosing instead to work in other sectors. Current financing methods often provide perverse incentives which encourage deviation from national policies of ‘prevention first’.

In-service education and training

The existing trained health workforce lacks a systematic assessment of continuing education need. Also lacking is any widespread availability of in-service education systems to serve this need. Quality of the existing workforce is widely acknowledged as a very high priority, yet little capacity exists to address the systematic maintenance and upgrading of workers’ skills. Training for promotion to a higher level of responsibility is virtually non-existent.

Supervision and performance appraisal

The investment in worker training is at high risk unless there is a supervisory support structure to maintain and reinforce its effects. Typically, supervision is remote, intermittent, dependent on numerical quotas or targets as measures of performance,

lacking detailed job descriptions to specify the quality of performance, and not linked to remedial action to address performance discrepancies.

These are complex challenges. The coordination of all the elements of a human resources for health development system is a prerequisite for significant and sustainable solutions in any one of these problem areas. One human resources approach — Functional Job Analysis — can substantially improve the coordination of efforts among these disjointed components.

History and characteristics of FJA

This analytic procedure was developed by the W.E. UpJohn Institute for Employment Research, under the guidance of Dr. Sidney Fine. Dr. Fine was a pioneer in the efforts of the U.S. Department of Labor to identify and classify worker traits. In this method measurement scales have been developed to assess the universe of objects to which workers relate in their work settings. These are: Data, People and Things. Workers relate to these objects by using their skills and abilities in the domains of mental (cognitive), interpersonal, and physical functioning. Three other factors representing the requirements of work in the use of general educational abilities of reasoning, mathematics and language are also used (Fine, 1969).

Another key component of this technique is the careful distinction made between the 'prescribed' and the 'discretionary' content of work instructions. While the basic concepts of prescription and discretion were developed by Elliott Jaques (1956), Dr. Fine, working independently of Jaques, developed a scale which reflects the progression from much prescription and little discretion in instructions to much discretion and little prescription. In a practical way this scale describes the amount and type of direction (supervision) provided to the worker. This relates in a direct way to the amount of autonomy a worker has in the performance of each task—a characteristic which is very often a key factor in worker motivation.

All scales are ordinal and hierarchical, that is they proceed from the most simple to the most complex in such a way that each functional level in the hierarchy includes those below it and excludes those above it. The higher order action required in a listing of tasks always includes the lower order actions. Thus, it is possible to describe the range of requirements of jobs by selecting the highest functions in relation to the several scaled dimensions of work, ie, data, people, things, reasoning, mathematics, language and worker instructions.

Functional Job Analysis is a systems approach for understanding work. The system is conceptualized as consisting of three components: the worker, the work, and the work setting. Thus, all jobs exist within and are defined by these perspectives. Worker characteristics include qualifications, experience, education, and training. The nature of the work is defined by the functions, subfunctions, activities, and tasks and by the functional requirements of each task in relation to data, people, things, reasoning, math,

language, worker instructions, performance standards and training content. The definition of the work setting is derived from its purpose, goals, objectives, resources, and constraints designed to achieve certain outputs. All three components are constantly interacting to achieve productivity, worker growth (career development and increase in skills) and efficient and effective output.

COMPARING METHODS OF ANALYSIS

In selecting a technique for work analysis, it is essential to develop a clear statement of what information the technique is expected to produce. Listed below are some of the usual purposes for some of the existing analytic techniques, along with some general indications of the methodologies they involve.

Job descriptions

Job descriptions are written for the principal purpose of classifying the job in terms of wages, hiring, promotion, definition of reporting lines, numbers supervised, and special credentials required. Most descriptions attempt to stay within a loosely prescribed format, but they lack standardization in the precise use of language from job to job. Most work settings have a classification scheme that equates work responsibilities and wages. Job descriptions normally do not include specific listings of all tasks to be performed. General responsibilities are described, but there are no attempts to define kinds and degrees of knowledge or skill required to do the job.

Specification of job requirements

Often related to job descriptions are the requirements set by employers, professional associations, or unions. These groups set the qualifications that need to be considered when selecting or promoting workers. These qualifications may be stated in terms of experience, education, licensure, certification, or physical limitations. There are well-documented trends toward inflating these qualifications, and many studies have demonstrated that the stated qualifications are not always valid when the actual job activities are considered.

Physical activity measurements

The aim of this type of work analysis is to classify activity on the basis of physical action. Physical activity is usually a minor part of a health worker's job. However, when the job site layout requires a great deal of walking or motion, or when considerable travel is required (as in rural service delivery), the physical demands become important determinants of productivity. Studies are conducted with the intent to improve or redesign working conditions rather than improve the skills or mobility of the workers.

What methods are available?

Time studies

Often mislabeled as "time and motion" studies, these analyses are based upon clock measurements of physical activity. Through direct observation or viewing film or video recordings of workers in action, the analyst determines how long it takes to complete a procedure or sequence of tasks, such as giving an injection, completing a form, etc.

A limitation of such studies is that they have no means of accounting for mental actions, such as problem solving or information giving. The method does develop task lists or inventories, which are valuable in designing work flow, facilities, and work stations. These lists and inventories are often the beginning basis for staff budgeting or for projections of staffing needs. A supervisor can make a reasonable estimation of how many technicians are needed in a given laboratory if there is an independent measure of (1) the tasks normally performed and (2) how long it takes to set up and complete the most common tasks.

Motion studies

Motion studies determine exactly what physical motions are required in a task or set of tasks. They are concerned with the body movements required. With that information determined, the next step is to find ways to modify those motions by improving skills, streamlining work procedures, or finding tasks that may be performed by another worker with less physical ability. Only physical motion is studied and measures of weights and distances are not usually included.

Educational and vocational education measures

The usual reason for estimating educational and vocational education attainments is to determine job requirements. The routine demand for a "secondary school" credential is a familiar example. Educational attainment is often used as a proxy measure for character traits such as self discipline, tenacity, or perseverance. Likewise, educational attainment is often employed as a selection criterion when other, more direct evidence of task performance is not available (such as a licensure examination). As a means of obtaining a more qualified applicant pool, employers often adopt artificial barriers based upon inflated estimations of educational preparation. Because there is little curricula or grading standardization, there is little comparability from one educational institution to the next; therefore, adopting minimum grade levels or "diplomas" is an uncertain practice. Likewise, completion of a certain course or curriculum does not assure much about the content the student has learned or the proficiency s/he has attained.

In vocational education, estimates are somewhat easier and more valid. For the most part, training programs are designed with a specific vocational purpose in mind; therefore, the content and the practical learning are directly linked to the occupational

requirements. In the realm of continuing education, those who design educational programs to update and expand worker performance, must make assumptions about the basic educational skills (such as reading, mathematics, and language). Given the ample evidence that reading deficiencies are not limited to those with low levels of educational attainment one cannot feel secure in using grade of school completed as a proxy for the learning skills required.

Wage and salary measurements

Wage and salary amounts are highly correlated with defined ranges of skills, knowledge, abilities, and job classification. If that relationship is disturbed either by salaries that are considered more than the job level is worth or by workers who have attained education well beyond that required by the job level, then adjustments will be made. Either new categories are created and paid accordingly or all categories are adjusted so that the distinctions between them are once again acceptable.

Studies in this area have been handicapped by the lack of methods to isolate the generic knowledge and skill components of job tasks. Studies have relied instead upon proxy measures such as educational attainment, professional guesses, and census data. This is an extremely important area for investigation since the largest cost component of the health sector is the employed workforce.

Workflow studies

This type of analysis is used to detect and correct blockages that keep procedures from flowing smoothly and efficiently. These studies often augment and are used in combination with task analysis studies. Workflow studies are useful for determining the following information: 1) the sequence of task performance; 2) the interdependence of antecedent and follower tasks (when the output of one task is a necessary input to a follow-on task); and 3) the input into queuing models for analyzing constraints and bottlenecks in a system.

Computer-based modeling

Operations research using computers has been successfully applied to problems such as placement of emergency medical response teams, appointments scheduling in outpatient clinics, pharmacy management, and inventory control. Applications of this technology to workforce or workteam modeling have not enjoyed similar successes. The principle stumbling block to progress in this area is the input data to these models, because the data contain a large number of variables. In many cases, this large number exists because there is no standardization of meanings. A case in point is the current effort to standardize the meaning of terminology describing nursing and midwifery. It is virtually meaningless to compare simple "counts" of each type of health worker, not to mention the impossibility of comparing job contents between and among the various tiers of workers.

The limitations of each of these types of analyses are found in the confusion and inconsistency in the use of terms to describe the work, the workers, and the conditions of the work settings. These limitations can only be overcome when methods to define job contents and the precise knowledge and skills required for performance are uniformly adopted and applied. These elements do exist and they remain quite stable. The problem has been to define and begin to measure these stable components (tasks) so that the outputs of work effort can be classified and linked to the application (inputs) of knowledge and skills.

Analyzing health workforce outputs and the inputs necessary to produce them requires time, a standardized procedure, and special skills and knowledge. There are several methods and procedures for such analysis, with some of them demanding more training and expertise than others. The following section discusses ways to judge the usefulness of various methods for the different purposes for which they may be employed.

Task lists

Task lists, also called task inventories, are literally a listing of what an employee does during a workday. The lists are not usually standardized against any format or defined sets. More significant tasks are lumped together with the less consequential. The lists are configured to fit many different purposes. They may be used to improve efficiency of the workers' actions by eliminating activities that duplicate what someone else is already doing, or they may be used to identity overlapping responsibilities, which can become the basis for job sharing or job promotion.

Task lists are often mistaken for a "task analysis." Task listings rarely contain analyses of specific knowledge or skills required for completing the work to prescribed standards. Likewise, these listings rarely include the "outputs" of the actions taken by the worker. A physician may ask an elderly patient to move one of her extremities "in order to" judge the alertness and responsiveness of the patient, while a physical therapy aide may perform the same questioning to learn a specific range of motion. In both instances the actions are the same, but the outcomes are decidedly different and could not be considered the same task. It is critical that task listings and inventories include not only information about worker tasks but the specific "outputs" that the tasks elicit. This information is especially important when considering most educational design applications and for clarifying employee tasks. Similarly, if worker output information and the related performance standards have not been identified, supervisors will lack important information for managing employees and evaluating their performance.

Choosing a method of work analysis

Fundamentally, there are two types of work analysis. The first type includes all those techniques that identify and list the "tasks" of a job, describing them in a way that is

useful to the question at hand. Examples of this type of work analysis include:

1) job descriptions that are used to determine salary equity

2) inventories used to identify overlap or duplication of task performance, or

3) task listings used to identify time required for clusters of activity. This type of work analysis is most often called a "task listing."

The other type of work analysis also identifies each task, but then goes on to divide each task into component parts of skills, knowledge, equipment, purpose, and standards. While these methods are not often interchangeable, there are some methods that accomplish both purposes. Indeed, the Functional Job Analysis approach described below presents a unified system of concepts, observational methods, and methods of work and performance analysis that yields the descriptive and analytic information needed to address the full range of HRH development issues. Likewise, other methods have produced major analyses that are useful for both job and task analytic studies. Examples include Health Services Mobility Study (Gilpatrick, 1972) U.S. Department of Labor(1972); and the U.S. Department of Defense (1959). These analytic methods are few in number, and while they differ somewhat in emphasis, they all share a common focus on what is actually going on within each task that produces the results. The goal of this shared interest is to define the exercise of skills and knowledge on a task-by-task basis.

While all of the methods have proven useful for certain applications, each method produces somewhat different outputs. Each approach has been developed as a response to a specific need to learn more about job activities. Thus, the methods are not interchangeable, and what is ideal for one purpose may not work well when applied to another purpose.

Deciding to adopt or adapt methods

Workforce analysis methods must provide information to guide the most fundamental decisions affecting productivity and performance, ie, job design, selection, training, performance appraisal, and career progression. The methods must contain the potential for improved decision making (an action bias) as well as improved understanding. The ideal is to use an analysis approach which can provide a unified information base for decisions in each of these interdependent areas. Usually this will require the most basic and stable unit of analysis which is common to the worker, the work and the work setting -- the task. It is confusing and often wasteful to employ different methods with incomparable underlying assumptions or data elements for each type of personnel decision.

The decision or adopt or adapt a particular workforce analysis method must be based upon a clear vision of what future conditions will prevail and what the mission, goals and

objectives of the organization will be in the evolving environment of health care. The method must be dynamic, that is, able to adapt and respond to changing circumstances as funding, technology, and program or disease foci change.

The methods must be sustainable within and useful to the daily routines of workers and supervisors. They must provide information in a timely and practical way to the persons (usually called "supervisors") who make daily decisions about workforce utilization. Too often, workforce analysis "studies" are an episodic response to a "problem" rather than a systemic analysis and reform. They are often commissioned by higher levels of management and frequently the results are reported to the executives without the full explanation or involvement of the personnel most affected. Continuity and follow through are often missing in the piecemeal problem-solving and reactive responses. Analysis methods must be easily understood by the rank and file workers and their supervisors before acceptance of the results can be assured. Indeed, the literature is full of examples of workforce analysis studies that failed to produce the desired changes because they failed to face the reality that reform of personnel systems must occur at the lowest levels of the organization. The agents of the desired changes are the workers and supervisors who on a day to day basis accomplish the output of services delivery.

Lastly, and most importantly, the methods used must provide meaningful information. To be meaningful the information must meet the following criteria. It should be:

1. Valid and job-related. The information should relate to what is relevant to improved decision making. It must be grounded in the reality of the work setting and must adequately mirror the actual work performed.

2. Reliable. The information used by each person involved in the analysis must be consistent when applied to the same situation. The methods chosen should have simple, easily understood rules and techniques for the gathering of information.

3. Objective. The information used should be the outgrowth of a process that uses concrete, reproducible evidence rather than personal feelings, reactions, or assumptions. Concrete evidence refers to records, reports and direct first hand observations.

4. Quantifiable. The information should be defined, if possible, so that the things, people and events can be counted. This is difficult in human services settings where a large amount of the work is interpersonal. In this case, it is important to go beyond the quantification of the work information and to include some qualitative descriptions as well.

5. Unbiased. **Whenever possible information collected should be free from bias which** is due to circumstances beyond the control of the persons performing the work. What the worker can and cannot control in the work environment must be taken

into account to enable the analysis to account for the source of variation in the results. Otherwise, the assumption is often made that the variability in results is due to differences among the workers.

6. Practical. The information gathered in a workforce analysis should be defined so that you can actually get the information needed from the materials available to you or from observing activities well within the scope of daily work routines. Any large scale study which requires adjustment of daily routines has the potential of distorting the results. It is well known in scientific inquiry that the process of study will alter the phenomena under investigation.

Meaningful information gathered from studies which conform to these six criteria is the acid test of any method of workforce analysis. But, frequently the "science" of the study is not sufficient to assure its use for action planning and institutional change. The additional criteria of: credibility with the lower levels in the organizational structure; sustainability as part of the ongoing means of improving productivity; and flexibility and adaptability to changing conditions are equally influential in the decision to heed the results and to commit to an action plan.

Types of work analysis

Work performance analysis activities require time, special skills, special knowledge and precise methods. Much confusion exists in the field due to the imprecise use of some of the common phrases. 'Task analysis' is one such phrase. It may mean any kind of job study that inquires into the content of work, or it may mean itemizing the tasks of the activities of an occupation, or a true dissection of each activity into its component elements of knowledge, skill, purpose and related equipment need. This phrase has been applied to a broad array of different techniques. Almost every type of work analysis has been called 'task analysis' at one time or another.

Fundamentally, there are two types of work analyses. The first includes all those techniques that identify the 'tasks' of a job and simply describe them. Examples are: job descriptions which are used to determine salary equity; inventories used to identify overlap or duplication of task performance; or task listings used to identify time required for clusters of activity.

The other type of analysis also identifies each task and then goes on to divide each task into component parts of skills, knowledge, equipment, purpose and standards. While these methods are not often interchangeable there are examples of methods which accomplish both purposes. The Functional Job Analysis approach presents a unified system of concepts, observational methods, and methods of analysis of work and its performance which yield the descriptive and analytic information needed to address the full range of HRH development issues.

Task lists or task analysis: Which do I need?

The choice of a task list or a task analysis method depends largely upon the purpose of the inquiry. In many instances, task lists are quite adequate. For example, using task listings in studies of overlapping activities and in studies of gaps in services is a common application.

Some task listing methods also use a classification of the kinds of work found within a job or team of workers (such as management, service delivery, logistics support, etc.) to organize and present the findings. Other methods organize the tasks by listing them in the sequence they are performed, and still others create checklists in advance that contain all tasks thought to be performed in a work setting. In this way, task listings can provide the input into work flow studies and "systems" descriptions of inputs and outputs. Another application is the use of task listings as a personnel selection tool. Job applicants can be asked to use a task checklist to identify which tasks they are qualified to perform and which tasks they have experienced in other work settings. This listing adds considerable precision when matching a worker's previous experience with the demands of the job vacancy to be filled.

The most satisfactory task list method is one that combines the judgements of the supervisor and the worker in choosing actual tasks from a checklist. A secondary benefit of this approach is that the supervisor and the performer may discover differences in their perceptions of the job content. In resolving these discrepancies, both workers emerge with a better understanding of the expectations of the job.

Another advantage of the checklist approach is that it is possible to include clients or patients as respondents. Patients can report their sources of information about procedures or prescribed medications. Who explained things? What are the gaps in service?

Checklists can be used to detect duplication and overlap in job classifications. Overlap can be a problem when procedures are repeated by several different workers, as when more than one person takes financial or clinical history information from a patient. On the other hand, overlap can identify a subset of tasks performed by two different tiers in a career advancement ladder. The area of overlapping tasks can become the stepping stone for promoting a worker into the higher classification.

For the purpose of this guide, "task analysis" will be defined as follows: the identification -- using a standardized method -- of tasks that comprise a job, and the further identification of the skills, knowledge, abilities, responsibilities, and standards of performance required of the worker for successful job performance. This definition is very nearly equivalent to the U.S. Department of Labor definition of "job analysis." The terms "job analysis" and "task analysis", however, are distinct. "Job analysis" is the process of determining, by observation and interview, the contents of a job; the term "task analysis", on the other hand, is used to describe the product of such an effort. This guide will use these terms to refer to the conventional distinction between means

and ends.

In determining the appropriate standards of worker performance and the requisite skills needed to perform to these standards, task analysis is required because it yields detailed data. Most task analysis methods address the training, education, supervision, or performance appraisal activities and, therefore, they require information beyond the simple listing of tasks. Likewise, applications to planning and job design can be greatly enhanced by detailed information obtained from analyzed tasks.

Often projections about the supply and the requirements of health personnel are based upon categories of job titles and classifications of personnel in common use in a locality. Unfortunately, common use does not guarantee standardized meanings of these titles. This is a most vexing problem as one moves from one tier of government to another only to find that a "Nurse I" in a county civil service classification scheme is the highest classification, whereas in another county or in the State merit system, the title is the entry level of the promotional ladder.

FUNCTIONAL JOB ANALYSIS (FJA)

The definition of functional job analysis

> *"Functional Job Analysis (FJA) analyzes jobs by studying tasks. The decision to do so was a practical one that developed out of job family research carried out in the late 1930s to establish transferability among jobs. What was found was that job titles were unrealistic, unstable, and ultimately inaccurate and non-descriptive. What <u>was</u> stable were tasks. The same tasks showed up repeatedly in different jobs, and essentially it was task elements that were the basis of job relationships." (Fine, 1989)*

Functional Job Analysis (Fine, 1955) is:

1. a **conceptual system** which defines dimensions of work activity, eg, data, people and things and domains of human performance, ie, cognitive, affective, and psychomotor, and interrelates the two;

2. an **observational method** and thus a way of looking at and recording people at work; and

3. a **method of analysis** which relates all work output to the goals and objectives of the work organization and to the skills, knowledge and attitudes of the workers.

The fundamental unit of work is a 'task'.

- A job is made up of a series of tasks.

- Training is designed to prepare a worker to perform a series of tasks in his or her job.

- Supervision of worker performance is based upon how well a worker performs assigned tasks.

- Recruitment and selection criteria are based upon the requirements or qualifications to perform specified tasks.

- Classification of jobs is based upon an assessment of the complexity of the level of tasks which make up the job.

- Estimations of supply and requirements for various types of jobs are based upon the composition of tasks which make up the occupational category.

Tasks are the fundamental units of job design, job performance, and job management (Fine & Wylie, 1971).

In this system each task to be analyzed is derived from an objective of the work system. Each task is designed and is included in the workplace because it is a means of moving toward an objective. When it is done properly by a worker, the result of that task becomes an input to accomplishing an objective. A task, in this system, is an..."action or action sequence grouped through time designed to contribute a specified end result to the accomplishment of an objective for which functional levels and orientation(s) can be reliably assigned" (Wylie & Fine, 1969). Thus, FJA integrates systems analysis and task analysis in designing and managing jobs.

Task statements in this form are useful for:

1. Managers needing to assess the level of complexity of the job and compare its performance requirements with other jobs.

2. Supervisors who need to give clear, accurate instructions to workers and develop criteria for assessing whether the worker's performance is satisfactory.

3. Selection officers who need to decide qualifications needed to perform tasks and in the aggregate overall job qualifications.

4. Trainers and educators who are determining both classroom and on the job training needed by the worker to whom the task has been assigned.

Basic analysis of HRH activities

While planners and managers certainly need to know first, the numbers and types of occupations, both now and in the future, and second, some information about standards of care, the third and most important aspect of determining staffing requirements is based upon what the staff is doing now. No matter who is assessing the problems—the provider, the educator, the management specialist—the planner must always ask two basic questions:

What is the worker actually doing?
What does he or she have to know to do it?

When these questions are posed there is often a reaction of disbelief. The reaction is based upon a commonly held belief that the content of the work is widely known and perfectly public; thus, everyone (or at least someone in authority) knows what the workers are doing. In fact, research findings exist which show workers and supervisors disagree on twenty-five to thirty percent of the task content of a particular job. (Reif, 1980)

The most fundamental question, *"What is the worker doing?"* remains largely unanswered. Without this knowledge one can only know the results. For many purposes general outcome is sufficient. However, for improving utilization, and training content, for reducing costs, for reducing turnover and for planning career progression, general outcome data is insufficient.

How to conduct a job analysis study

Describing worker performance is accomplished by first describing the optimal performance, (ie, the duties, responsibilities, and competencies for each worker in the ideal work setting). The second step is the analysis (using various methods of performance analysis including direct observation and interviews) of the actual performance. The third step is to analyze the causes of discrepancies between optimal and actual performance and to reconcile these differences. This process results in descriptions of the workers' roles which can be used as the basis for training and education program development; for supervisory and managerial decisions; and for planning allocation of staffing mix to facilities or sites. Each job description contains a listing of tasks organized by functional categories. Each task is analyzed in terms of skill, knowledge, and attitude components.

The actual conditions of performance must also be described. These are the typical conditions under which the tasks are performed in the work setting. These settings may include hospitals, community-based clinics, home visitations, community meetings, etc. Once the setting has been analyzed the performance of the worker completing the tasks under those conditions is described. From these descriptions are derived the statements of competencies for each task included in the job description.

The next step is the determination of performance goals and standards. Once the content and conditions of performance have been considered it is possible to specify minimum and expected ranges of performance. These descriptions provide the worker-supervisor dyad the basis for communication, goal setting, performance contracting and appraisal.

What is a task?

Many of the tools developed for and used in the supervisory methods presented in these materials are based on tasks. To develop task-based job descriptions and other task-based tools and to use them effectively in these methods, you need to know something about tasks, task statements, and one-liner task statements. Refer to Appendixes 1 and 2 as references for these statements. These statements describe many of the tasks workers perform in the delivery of family planning services. The format of the task statements and one-liner task statements will be explained below, and further examples can be found in Appendix 1.

What is a task statement?

A task is the smallest complete unit of work activity into which a job is divided. A task statement describes a series of actions that contribute to a specified end result. A task statement has two main parts, the action part and the outcome of the action (end result). The action part consists of a series of verbs and phrases that specify exactly what actions a worker performs. The action part consists of mental actions, such as "reads", "adds", "decides", "compares;" physical actions, such as "writes", "removes", "fits", and "inserts;" interpersonal actions, such as "reassures", "asks", "interviews", and "informs;" or any combination of these three types (mental, physical, and inter-personal) actions. The outcome part is a phrase usually with one verb. The outcome part is placed at the end of the task statement and is immediately preceded by "in order to", or just "to." Read the task statement below. Notice that the action part in this task statement is underlined, the action verbs in the action part are underlined twice; the outcome part or results is placed in [brackets].

Example

Greets patient, asks for current address, compares with address recorded on appointment card, writes correct current address if different from recorded address, IN ORDER TO [maintain the correct current address on the patient's record].

Why use a task statement?

A task statement is based upon actual observation of the task, so it should be an accurate description of the actions being performed to achieve the specific outcome or result. Since action verbs are used in the task statements, a job description built on

tasks should define a worker's job and should be an effective tool in communicating work assignments. There should be little room for misinterpretation about what the worker should be doing if there is a task-based job description to which to refer.

Example 1

Greets patient, asks for current address, compares with address recorded on appointment card, writes correct current address if different from recorded address, IN ORDER TO [maintain the correct current address on the patient's record].

A **task statement**, however, contains more information than just the actions a worker performs to achieve a particular outcome. It also specifies some of the tools, materials, and work aids (such as specific information, patient records, parts of the patient's body, instruments and equipment) a worker may use in performing these actions, and any persons (such as co-workers or patients) with whom the worker interacts while performing the task. This additional information helps to more clearly define the task by indicating the situation in which the worker performs the task. In the example below, the tools, materials, aids, and the person(s) with whom the worker interacts are circled.

Example 2

Greets patient, asks for current address, compares with address recorded on appointment card, writes correct current address on appointment card if different from recorded address, IN ORDER TO [maintain the correct and current address on the patient's record].

What is the structure of a task statement?

Since a task statement is a description of a series of action verbs and phrases performed IN ORDER TO achieve a specific outcome or result, the best way to obtain an accurate task statement is to observe it being done.

By starting with a specified outcome in mind, such as obtaining a blood sample, and observing different workers obtaining a blood sample, at different times of the day and week, you can identify and focus on the actions that are necessary to obtain a blood sample regardless of who does them and when they are done. Before you write task statements, try to observe the tasks being performed by workers who are generally proficient in performing the task so that you can identify the "usual" sequence of these actions as the task is being done. You will not have to rely on constructing the task in your mind which may produce an inaccurate task statement. You will record the information you need on the Observation Worksheet (Figure 1) seen on the following page.

Writing task statements

When you observe a task in order to identify and write its action and outcome components, it is helpful to use the list of five questions presented below to identify all the information that you should include to make your task statement a precise description of the actions being performed. These five questions help break down the action-outcome components of a task into observable or identifiable parts and are used on the Observation Worksheet. The questions are those used by Sidney Fine.

Question 1. Who is doing the task?

This is always understood to be a "worker", not a particular person, such as Mary, or a particular job category, such as nurse. In a task statement you want to focus on the actions that are being done, not on the particular person who is performing the task, so that the same task statement may be assigned to more than one worker, if appropriate, without rewriting the task statement. However, "worker" is not stated in the task statement.

Question 2. Performs what actions?

This is the series of specific actions that describe what the worker does. You should use specific verbs such as "asks", "writes", "inserts", instead of summary verbs, such as "operates", "handles", etc. Use verbs that help specify what the worker does when she "operates" or "handles" a piece of equipment. Although this may not always be possible to do, the more specific you make these action verbs, the less chance there is for misinterpretation of the task statement by the reader. This is especially important when the task statements are used in assigning work.

Question 3. Using what tool, materials, or work aids?

This part should include at least the essential items that are necessary for the worker to perform the task. This would also include the people with whom the worker must interact when performing the task.

Question 4. Upon what instructions?

A task statement should indicate the nature and source of instructions the worker receives: whether the worker must follow verbal instructions, written guidelines, general routine procedures established in the clinic or whether the worker is free to choose the way in which to go about the task. This indicates the amount of discretion a worker needs to use in performing the task. In many cases, however, the sequence of actions is so specific that the source of instructions is implied, rather than stated explicitly.

Question 5. To accomplish what result?

Try to pinpoint the outcome or result of the series of actions you just described. Again, the more specific you are in identifying the outcome of the actions, the more explicit the

task statement is to the reader, and, more important, to the doer of the task. Generally, workers like to know "why" they do what they do.

Example 1

Suppose the task has to do with the disposition of incoming mail.

1. *Who (does the task)?* The worker. (Imagine that it is you.)

2. *Performs what actions?* Some of the actions you might do are: locating or gathering the mail when it is delivered; reading to whom the mail is addressed; sorting the mail into individual stacks for each person to whom mail is addressed and mail that has to be returned: giving the mail to addressees, or putting it where they will see it: assembling the mail to be returned to the post office.

3. *Using what tools, materials, and aids?* This probably would include the mail itself, something with which to assemble the mail to be returned, such as string or rubber bands; the designated place to put a co-worker's mail if she is not there to receive it.

4. *Upon what instructions?* The actions of the task itself are fairly sequential, indicating generally how the worker should do the task. The statement may, however, indicate that there is a specified place to put the mail if the person is not there to receive it.

5. *To accomplish what result?* To distribute incoming mail.

Then using this information to write the task statement it might read like this:

Task Statement: Allocates all incoming mail for the day, identifies the person(s) to whom the mail is addressed, sorts the mail into stacks for persons in the clinic and mail to be returned to sender, hands mail to each person to whom the mail is addressed or places mail in designated place, bundles mail to be returned to sender with rubber band or string, puts this bundle with outgoing mail to be brought to post office, IN ORDER TO distribute incoming mail.

Example 2

Suppose the task has to do with coding patient information.

1. *Who (does the task)?* The interviewer. (Imagine that it is you.)

2. *Performs what actions?* Some of the actions you might do are: scan and sort through various sources of information about a patient, compare information from these difference sources with criteria on prepared patient information forms, decide what information fits the categories, and write the correct codes on the form in the appropriate locations.

3. *Using what tools, materials, and aids?* This would include the information forms, pencils, and a workspace with desk and chairs.

4. *Upon what instructions?* The actions of the task itself are fairly sequential, indicating generally how the worker should do the task. The statement may, however, indicate that there is a specified way in which different types of information should be evaluated.

5. *To accomplish what result?* To register the patient.

Then using this information to write the task statement it might read like this:

Task Statement: Scans, compares given written, verbal or numeric information with prescribed criteria, decides in which category information fits, writes prescribed code mark (+, -, 0) on patient information form, IN ORDER TO code patient information.

In this example, the statement indicates that there are “prescribed criteria” and “prescribed code mark(s)” a worker needs to know.

Example 3

Suppose the task is to prepare a patient for an examination.

1. *Who (does the task)?* The clinical nurse. (Imagine that it is you.)

2. *Performs what actions?* Talking with, and observing the emotional state of patient on examining table while waiting for examination. Offers reassurance to the patient and explains what procedures will be conducted.

3. *Using what tools, materials, and aids?* This would include an examining table and instruments.

4. *Upon what instructions?* The order and nature of the actions is fairly flexible and determined by the nurse. The statement may, however, indicate that there is a typical way in which the preparation is conducted.

5. *To accomplish what result?* To prepare the patient for a clinical examination.

Then using this information to write the task statement it might read like this:

Task Statement: Talks with, observes emotional state of patient on examining table while waiting for examination, reassures patient and explains what will be done, using discretion as to how much information is needed and which instruments should be explained, IN ORDER TO prepare patient for physical examination.

In contrast to the previous example, the worker uses her discretion as to how much information is needed and which instruments should be explained.

The one-liner task statement

For convenience, task statements may be summarized into "*one-liner*" task statements. A one-liner task statement is a summarized statement of a task so that the task statement fits onto a single line. A one-liner task statement has the essential information of a full task statement: it has an *action part* and an *outcome or result part* which is preceded by the word "to." However, each part has been summarized into a single phrase. Read the example task statement and the one-liner below it.

Task Statement: Greets patient, asks for current address, compares with address recorded on appointment card, writes correct current address on appointment card if different from recorded address, IN ORDER TO maintain the correct and current address on the patient's record.

ONE-LINER*:* Asks patient for current address to maintain correct information on record.

The full task statement contains much more specific information about the task than the one-liner does, but the one-liner summarizes and conveys the general idea of the task.

Why use one-liner task statements?

There are three reasons why one-liner task statements are useful: One-liner task statements are brief, they convey the general idea of the task, and they can be used in lists of one-liner task statements to define the contents of a worker's job. A task listing of one-liners gives the reader a comprehensive picture of the job. If more specific detailed information about a particular task or about all tasks is needed, then refer to the full task statement(s). As mentioned, Appendix 1 contains additional examples of task statements. The one-liner task statement is included with each full task statement*.*

Writing one-liner task statements

A one-liner task statement summarizes the action and outcome parts of a task statement, each into a single phrase with one or two action verbs. Since the value of the one-liner is in its brevity, most pronouns are omitted, as are most of the articles such as "a", "the", etc. Only words essential to the meaning of the task should be included. In a one-liner, summary verbs (such as "operates", "handles", "interviews") may be used since they actually summarize a series of specific action verbs. However, it may not be possible to find one verb that adequately summarizes all of the actions described. In this case, the main action verb (or the two main verbs) or a synonym(s) may be used in the action part of the one-liner. "IN ORDER TO" is shortened to "TO" and the outcome part usually remains the same, except that it also is shortened by omitting all unnecessary words. Read the examples that follow.

Steps for writing one-liners

Step 1. Write outcome. Write the outcome part of the task statement. In most cases, to write the outcome part of the one-liner, you need only to shorten the outcome part given in the full task statement, omitting all but the essential words and replacing IN ORDER TO with "to."

Step 2. Summarize. Read the action part of the full task statement. Determine if the series of actions can be summarized by a summary verb and still convey what the original task statement means. If not, try to pick out the main action verb from those in the statement, and either use it or a suitable synonym in the one-liner. If a single verb is not sufficient, choose two action verbs from the list and use both together.

Step 3. Write action. Write the action part of each one-liner.

Step 4. Condense one-liner. You are trying to fit this statement all on one line, so read through the action and the outcome parts that you have written; omit all words that are not necessary to convey the meaning of the task statement. Make sure that the one-liner you have written conveys the same general idea as the full task statement. Check your answers. They do not have to be identical, but they should be very similar.

Example 1

Task Statement: Gathers, scans information from multiple sources, tallies specified events, adds cell totals if necessary, writes data on designated form according to prescribed procedure, IN ORDER TO prepare data for statistical report.

ONE-LINER: Gathers, tallies data to prepare figures for statistical report.

Example 2

Task Statement: Decides, schedules the sequence of activities necessary to orient new personnel to their respective position, takes into account the clinic schedule, job expectations of new employees and the individual staff potential for input into and actual application of training, IN ORDER TO plan for new staff orientation.

ONE-LINER: Schedules appropriate activities to plan new staff orientation.

Example 3

Task Statement: Removes previously obtained blood samples from numbered tray, places pairs of capillary tubes in corresponding numbered slots in centrifuge disk, makes sure that ends of tubes seat against gasket, tightly screws on disk cover, closes and secures lid and sets timer dial, activates centrifuge for prescribed duration, IN

ORDER TO process blood samples.

ONE-LINER: Operates centrifuge to process blood samples.

Notice that in all three examples the outcome part in the one-liner remains the same as in the task statement. In the first example, two specific action verbs “gathers, tallies” were necessary to adequately describe the actions of the task statements; in the second, one main action verb, “schedules”, the task statement, adequately conveys the meaning of the action part; and in the third, a summary verb, “operates”, summarizes the actions in the task statement.

Summary of task statements in FJA

A task statement describes a series of actions that contribute to a specified end result. It has an action part and an outcome part. Because it uses verb phrases and is based on actual observation, a task statement should be an accurate description of what actions are being performed to achieve the specified outcome or result. Listings of tasks as the basis for job descriptions are an effective means of communicating work assignments and allow little room for misinterpretation.

APPLICATIONS OF FJA TO IMPROVE HRH

Health Workforce Planning Applications

There are six general areas to which task data can be applied to workforce planning at the regional or program level.

Estimating Supply and Requirements

Nearly all current estimation models and techniques rely upon job or occupational titles as their basic unit of observation. FJA provides a description of the work that each job title performs. Additionally, FJA provides a new set of categories for projecting the skill, knowledge and abilities mix to accomplish health status objectives or health services outputs. Projections which are free from the constraints of traditional meanings of professional or occupational titles permit new ways of assembling the ‘team’ needed to assure competent performance.

Program planning and development

By selecting tasks from an existing data bank and sorting them into proposed job categories, forecasts can be make of the type and number of jobs, persons, and skills mix needed to accomplish specified program objectives and goals. Determinations of staffing mix and geographical distribution can be estimated more accurately.

Temporary Absences and Promotion

By identifying and intentionally creating overlap of tasks among jobs, plans can be made for temporary absences for in-service education leave and for systematic upgrading of duties to higher levels of promotion.

Expansion of services

By comparing the tasks performed in the current services mix to those required by an expansion of service, estimations of new personnel and training needs can be obtained.

Job description

One output of workforce planning should be an accurate and useful job description. Such a job description should include a listing of all the tasks allocated to the job. It should include a one page summary of the job and a brief description of seven main areas of performance required by the job, (ie, data, people, things, reasoning, mathematics, language and worker discretion).

Vacancies

A vacancy becomes an opportunity to reallocate tasks to other workers or to redesign the work procedures to improve effectiveness and quality. Changing task assignments alters the staffing mix and the indicators of staffing need which are the basis of more aggregated workforce planning estimations.

Health Personnel Management Applications

There are ten general areas to which task data can be applied to personnel management.

Job Design

A task listing is, in effect, a blueprint of how things get done and the significant behaviors that go into getting things done. When they are put on paper and related to the capacities of the people doing them a basis is established for determining by whom and in what way they might be best accomplished. Perhaps too much or too little is expected from certain assignments. Perhaps too many crucial high-level tasks have been assigned to persons not yet ready for them. Perhaps too many low-level tasks have been assigned to high-level, high capacity people. Each of these conditions represents a mismatch between the worker and the work with attendant costs.

Communications

Periodic review of current and new tasks and performance standards conducted by a worker and the supervisor together will establish a mutual understanding of job expectations.

Scheduling and Assigning

Vacation leaves, unexpected absences, unusually heavy work periods are managed more effectively if the supervisor has information about the most critical tasks involved.

Motivating

Use of career and mobility ladders assist workers and supervisors in visualizing short and long term advancement possibilities and aid in reducing frustration of jobs with little variety. Job enrichment is accomplished by rearranging tasks and their levels of difficulty. Adding more complex tasks provides the rationale for increased wages or promotions.

Performance

The performance variables that are developed as part of the task analysis can be weighted with regard to importance and used as a standard against which to judge the worker's performance.

Recruitment and selection

Detailed knowledge of a job facilitates identification and weighing of critical aspects of a job for use in forming selection criteria. Interview questions directly relating to the kinds and levels of skills required are formulated based on task data. Ultimately, recruitment is largely a self selection process. There is a need to present the work of the job so that the candidate can decide if it matches his/her experience, qualifications and interests. Presentations of job information derived from task data save time because they are clear and complete. Checklists of all tasks contained in the job are used to assess previous experience of the applicant and to convey the task content to those in the applicant pool.

Interviewing

The employment interviewer has the necessary information to conduct a thorough and structured interview. Each task in the task listing is an opportunity to formulate a question about the knowledge, skills, materials, equipment experience, amount of discretion/judgement used, and relationships with co-workers.

Training

Training needs can be assessed by presenting each employee with a list of task statements included in their job and asking them the mark the ones where they desire training. This assessment is checked and validated by the supervisor. Task data is then used to design training for a specific skill sequence or cluster of activities.

Qualifications

In communicating the qualifications required by a job the manager needs to know the skills, abilities, knowledge, efforts, responsibilities and working conditions specific to each task cluster.

Job Descriptions

A task listing containing all the tasks included in a job will be used to develop statements of duties and responsibilities, summaries of qualifications in relation to data, people, things, reasoning, mathematics and language. The amount of choice the worker has over the ways and means to accomplish the outcome is described as is the amount and nature of supervision. In addition to the planning applications of job descriptions this tool is essential in maintaining a current listing of current job information such as equipment requirements, supply items, facilities, etc. Indeed, these job descriptions with their detailed task listings are the core of a personnel information system.

Training and Educational Applications

There are three general areas to which task data can be applied to training and education.

Educational Planning

Planning of instructional programs attempts to simulate the conditions of job performance and the competencies to be developed. Once these practice competencies are described, they will serve as the basis for designing curricula, units of instruction and assessing professional performance, development, credentialing and certification.

Curriculum Design

Based upon competency descriptions, teaching and learning activities are designed to facilitate student progress through a unit of instruction. These activities are focused upon helping students develop the skills, knowledge base, values, and/or attitudes required for a particular competency. The compilation of several, related instructional units comprises the course syllabus. In this way the linkage between the field of practice and the educational setting is solidly formed. Once these descriptions are in use, both work managers and educators will have a higher degree of certainty about

how the various occupational titles fit into the delivery system.

Training Needs Assessment

FJA assumes that there is an appropriate time and place to train for the different skills that are part of holistic performance. Development of basic functional skills, (ie, data, people and things) calls for a broad educational environment usually found in pre-service training institutions. Specific content skills are the specific learning required in a specific job situation built around an employers standards. They are best learned on the job or in a setting that closely simulates the specific task requirements and working conditions of the job. The variation in time, place and circumstance for giving training is the fundamental reason that training needs should be carefully assessed and spelled out. This assures that those providing and those needing training both have a clear understanding of what the training is intended to achieve.

Classification of Functions, Subfunctions, and Activities

It is sometimes useful to classify or arrange tasks in groups according to a given standard, so that each group of tasks can be viewed as a whole rather than as the individual tasks that make up the group. Depending on the particular standard chosen to classify tasks, additional information about these groups of tasks in terms of their relationship to program goals can be obtained. For example, tasks may be grouped according to:

1. the types of actions performed,
2. the types of outcomes achieved,
3. the regular sequence of tasks in daily clinic operation,
4. the job titles of the workers who perform the tasks, or
5. their function in the overall delivery of health services.

Using functions as the standards for grouping related tasks enables one to look at the program functionally; that is, to see how these groups of related actions (tasks) contribute to the program's goals.

A three-level functional classification has related tasks arranged in groups; each group has a short title. The groups of tasks in Level 1 are arranged in related groups in Level 2 which then make up separate but related functions in Level 3; the functions contribute to program goals (See Appendix 2 for a sample classification structure for a healthcare facility).

The following are common functions in healthcare systems.

The ***Organization Management Function*** contains Subfunctions which deal with program administration. It is concerned with planning, organizing, and evaluating a human services program and also any direct administrative support activities. Since supervisors monitor

daily program operations, many of the tasks performed probably contribute to this Organization Management Function of the program.

Personnel Management Function is composed of related Subfunctions which correspond to all types of worker/worker relationships. The Manpower Management Function describes those actions which deal with the planning and recruitment for, and the selection, training, direction and evaluation of the workers in the facility. Many efforts of the supervisor are concentrated in this Function of the program.

The ***Service Delivery Function*** contains related Subfunctions which deal primarily with those interactions between the program and patients, such as patient recruitment, co-ordination of patient activities during a clinic visit, diagnosis of patient health status, medical treatment, the dispensing of medical supplies, community and patient education, and patient maintenance in the program. The groups of tasks that make up this Function should describe the worker/patient relationship, that is, all the various ways in which the staff, as representative(s) of the program, interact with patients.

Logistic Support Function is the group of related Subfunctions which deal with the supply support of the program. This Function is concerned with receiving, taking inventory and distributing supplies. It also includes assembling materials and instruments, operating equipment, and generally maintaining the clinic. These two functions can be identified with the worker/organization role.

BENEFITS AND LIMITATIONS OF FJA

Benefits

From the multitude of studies that highlight aspects of health workforce studies, several points become clear. A plethora of surveys are not needed. Linear projections of 'workforce statistics' are not useful to most planners. And, in most instances, more academic instruction for most types of health personnel is not required. What is needed is greater relevance of academic courses and refresher courses on the job.

Quality has replaced quantity as the central concern of health workforce planners, educators and managers (Goon, 1992). Better utilization of employed health professionals, and more versatility instead of less will improve effectiveness. Forecasts based upon factors that actually influence health professions needs will markedly improve estimates of supply and requirements. Employers and educators working together can achieve a practical, sustainable plan for the HRH. Accepting their combined judgements without an array of 'scientific' evidence will advance the field.

Above all, there is a need to replace the old, evolutionary trial and error methods of HRH development with a workable methodology which can facilitate coordination,

improve planning, streamline training, and reform management. The methodology to construct an integrated health personnel development system—the analysis of tasks—is available. Tasks and their elements remain quite stable regardless of their combinations and regardless of the delivery systems which contain them. FJA is a foundation for the continued improvement of HRH methods.

Limitations

Objectivity. Objectivity is clearly one of the strengths of the FJA method. This characteristic, however, can arouse resistance among individuals who are not familiar with the techniques. There is often a latent fear among workers that if a job and it's tasks are analyzed, then someone may conclude that the worker isn't doing much of anything. Or, that the worker is doing things he or she isn't supposed to, even though the content was never specified.

Attitude. This is closely related to the protective or proprietary attitude often expressed by professional associations that the regulation of task content is their prerogative and is not open to inspection by "outsiders." The latent fear here seems to be that total disclosure of the contents of the work of the entire health team will reveal inequities in compensation for tasks which are not supported by evidence of differences in level of task difficulty. Likewise, any careful assessment of the contents of a specific job may reveal that it has not changed over time even though the educational qualifications for entry may have increased.

Hierarchy. A third basis for resistance is the inherent status hierarchy and its rationale within the health professions. FJA and its attention to tasks and the required skill levels may reveal that the allocation of work among the several health team members is not necessarily due to level of complexity or educational attainment. The fear of loss of control or influence by the elite professionals over the lower status team members may cause them to resist data collection and to ignore or discredit evidence presented.

Lastly, there is some history of abuse of work assessment studies by managers. Experience has taught workers that when such studies are carried out they are not always to seek improvement of working conditions, but may be used to justify a reduction in force or a lowering of compensation rates through the realignment of job classifications.

SYSTEM REFORM USING TASK-BASED METHODS

Implementation Strategies and Tactics

Once the decision is made to undertake a major reform of the basis for workforce

decision making and once a method, which meets the above criteria, has been chosen it is necessary to define a strategy for planned organizational change. Information about the work, the workers and the work setting is very sensitive and fundamental to critical decision making. Any proposal to change the elements of an existing information system will need careful crafting.

Improved productivity through improved worker performance is the broad strategic goal. It is essential to articulate this goal in terms which are positive and generate involvement and commitment from all parts of the organization. It must be clearly understood that all variables affecting worker productivity will be analyzed. The work setting, the content of the work and the performance of the workforce will receive equal attention.

It is important to anticipate resistance to efforts to study the productivity of any organization and to deal with the concerns of all those affected. Keeping the emphasis on improving the work definition, the work setting and the capacities of the workers is an effective way to engage the interest of supervisors and workers who may feel they have been named as the cause of low productivity. It is essential to prevent any (further) alienation of the workers from the organization since the improvements in worker productivity will necessarily require their full participation in the analysis of factors affecting their performance and in efforts to improve that performance.

It is also important to define benefits of the task-based work analysis in terms of how the individual workers will be positively affected. It is essential that the worker-supervisor dyad be clear about what participation will be required and how their participation will result in improvements. The implementation of task analysis will require training of supervisors in the collection of task data and in the use of methods and materials based upon the knowledge of the task content. Implementation utilizes the supervisor as the change agent and as the principal collector/refiner of task data and as the principal user of the tools for personnel decision making that are developed from the task data bank. It is important to emphasize how this investment will improve the tools and techniques of supervision, personnel selection, performance evaluation and redesign of jobs.

Executive leadership must evaluate the compatibility of the existing system of information, ie, task listings, job descriptions, performance evaluations, training needs assessments, etc., with the one being proposed. If the existing personnel records and tools are based upon something other than task analysis or formal duty statements, then a plan for transition from one system of records to another must be formulated. Such a plan must specify how the existing personnel records will be maintained and what uses these records will continue to have in influencing employee performance ratings, compensation, promotions, opportunities for training, etc. This transition plan should specify which occupational titles will be analyzed and set out a timetable for the entire transition.

It is often the case that some elements of the existing system are to be retained. For

example, existing job descriptions may list some tasks or activities of the position described. These may be represent the summary or the broad, general outline of the duties and responsibilities of workers incumbent in those positions. To whatever extent these statements reflect a valid picture of the job contents they may be retained. It is advantageous in a transition to a new system to retain some familiar landmarks or formats to assist in the integration of the new materials. In this case the transition plan should clearly specify the existing elements to be retained and the integration of the new material into the total personnel system information.

Most personnel information systems exist within some larger framework of personnel classification systems. These larger systems may span many sectors of governmental or private sector endeavor. It will be necessary to examine the requirements of the larger system, which may require periodic reporting or standardized record keeping, to assure compatibility with the task-based information system. It is often the case that the task-based information will provide much more detailed and qualitatively better information than the existing standard. But, the existing system must simultaneously serve many constituencies and sectors and cannot be replaced solely by the efforts in the health sector. As in all organizational change efforts the inertia of the existing order will resist change. The innovation, in this case task-based information, will need to co-exist with the established methods and seek to compliment them in ways that the added value assures their continuance and use. Ideally, the lessons learned in transforming the health sector's personnel system to one which is task-based will guide the reform of the larger system.

Deciding the scope and the pace of the job analysis and task data base development process is an important step. The scope may be as limited as one job title, one occupational category/family or one services team. At the other extreme is a system-wide effort to describe every task performed in the organization. Choosing one job title has value as a pilot effort to experiment with the methods on a limited scale. One can then perfect the analytic methods, the training of an analysis team and scale up to accomplish a wider scope of study. An important limitation of the single occupational category is the lack of information about co-workers or team members whose jobs and tasks may provide input to or use the output from the unique job under analysis. Choosing to analyze the team of services providers and their supporting co-workers at the lowest, most basic level of service delivery is usually a good compromise between the single job title and the organization-wide scope.

The pace of the analysis is a critical factor in the maintenance of motivation among the analysis team members and in maintenance of support from executive management. It is important to show results within a few weeks after the initial, basic training workshop. These results are useful in the second and more advanced training workshop where the tasks statements will be analyzed and formed into job descriptions. It is recommended that the task data collection teams of two spend one to two weeks observing and recording tasks of one job while other pairs of analysts develop listings and full task statements for kindred jobs in the same setting. Using the same format and rules of

recording, the task data are comparable from job to job and can be aggregated into a data base. Once all the jobs in a given setting and the jobs of the supporting co-workers are analyzed the system is completely analyzed.

Detailed scaling of tasks for their complexity in the data, people, things, reasoning, mathematics, language, worker choice and error consequences can be continued by a small sub-set of all the analysts. Working full-time for a period of 12-14 weeks an analysis team can accomplish full job descriptions and task listings for a team of 4-8 job titles.

The sections that follow discuss the collection and use of data to accomplish three major tasks in the reform of health systems using task-based methods.

Planning and Staffing

1. Review of Current Systems of Personnel Information.

This review should identify key problem areas or deficiencies in HRD for health. The review begins with an analysis of the limitations, strengths and utilization of the existing methods of developing job descriptions, duty statements, selection criteria, training needs analysis, and performance appraisal. This review must also consider what information is available about the current working conditions and the nature of the work, ie, tasks, performed. It is possible that some work has already been done which has produced task listings. Careful consideration of these existing efforts must be made to avoid unnecessary duplication. It is also possible that the previous/existing work is not compatible with the job analysis method chosen. In this case judgements about revising/adapting existing information versus taking an entirely new approach will be necessary.

The formal review should obtain the views of all echelons of the organization, with special attention to the views of line supervisors who have the day-to-day responsibility of directing the workforce. It is also useful at this stage to involve the leaders and faculty from the training institutions which prepare the incumbents for their roles. The blending of perspectives from the field of practice and from the training institutions will add to the possibility of better integration of training with practice realities.

This review should also decide the priority ratings/rankings of key limitations or personnel information system needs. The review should also identify the sequence of actions needed to improve the current circumstance. Some actions are foundational to others and must occur before others can be undertaken. For example, improvements in specification of personnel performance standards often require the formulation of competency statements which in turn rely upon analysis of task content for skills and knowledge requirements.

2. Developing a Workplan for Task Analysis Implementation

This activity is based upon the analysis of priorities and recommended action items developed in the previous step. It requires the formation of an implementation plan of action for the major clusters of activity -- task data collection and analysis; job design, job description development or revision; training needs assessment and curriculum design; worker supervision and performance appraisal. The remainder of this section presents an outline of the major milestones of the implementation workplan. It is important to obtain appropriate reviews approvals and resources commitments to assure the top management support for the implementation of the task-based methods.

3. Staffing and Training

Once the organizational locus of the project is decided the assignment of responsibility to leaders and team members is made. Previous experience with implementation of task analysis data base development suggests that at least one full-time, high level staff member should be assigned as the director. It is not essential that this person be an expert in job and/or task analysis data base management. For someone with basic qualifications and training in a discipline which makes extensive use of taxonomies and of systems "thinking" the concepts and the methods of job analysis will be easily learned and applied. It is perhaps more important that the person chosen as the director have sufficient stature in the organization to be able to convene decision makers, command the respect of all echelons of the workforce and motivate temporary teams to be thorough and exacting in their data collection and analysis.

The balance of the team is comprised of supervisors and "expert" performers in the array jobs to be analyzed. These persons will have an additional responsibility to train others in the methods of job analysis and task data collection and analysis. It is also useful to secund or assign some persons from the training and education sectors to learn the methods, participate in the data collection and analysis and to then apply them to the formation of curricula and instructional modules. These persons from the educational sector are often most experienced and most available to accomplish the training of other personnel once the widespread implementation phase is in order. In most cases these team members will serve only briefly (6-8 weeks) as job and task analysts or they may combine the new responsibilities with their existing work devoting part-time to each set of duties. To whatever extent these persons also become workshop faculty or supervise field experience of other analyst trainees their period of service will be extended. In the longer term implementation of the task-based personnel system, it is recommended that all supervisors be given the basic training in writing/revising tasks and in job description development.

The basic training of the analysis team requires 5 to 6 days of workshop instruction and practice in the steps of observing and gathering task data; writing full task statements; classification and organization of task statements; and linking task statements to the objectives, goals and missions of the organization. Self-instructional materials, workshop exercises and procedures manuals are available from the author of this FJA

document to assist in this training. This training provides the foundation for collecting, classifying and storing task data in a task bank. Once the task bank is under development more advanced training in analysis of tasks for their skill and knowledge requirements and in the use of these task data for writing job descriptions is conducted. This advanced job analysis training workshop usually requires an additional 5 to 6 days of instruction and practice to master the use of task data.

It is recommended that the analysis team members work in pairs to provide the opportunity to discuss and clarify the tasks observed and to critique each others written descriptions of task statements. It is useful to select these pairs prior to the training and then arrange for both persons to work together during the training workshop.

Developing National, Regional or Sectoral Infrastructure

1. Training of Trainers in the Fundamentals of Applying Task-Based Supervisory Methods

The cadre of job analysts described in the preceding step will frequently become the training faculty in replications of job analysis workshops. The strategy of diffusion of these methods throughout the system will dictate if or when these first analysts become "expert" analysts and trainers. Even though supporting workshop materials are a substantial part of the training, it is important to provide some training or coaching in the conduct of workshops and in methods of mentoring other learners. The advantage of this "training of trainers" strategy is to accomplish a broader coverage of the geographic regions or other special differentiating conditions throughout a nation. It is also a useful step in the broader dissemination steps to follow. This approach creates an infrastructure for the supervisory training workshops described below.

2. Task Data Collection, Analysis and Data Base Development

The first phase involved in task data collection and analysis of health workers is to describe the optimal performance of practitioners and support personnel in the future health care practice settings. Optimal performance is the performance that represents the most desirable or satisfactory execution of the tasks associated with that particular role. Before one can begin to describe any performance, one must know whose performance is to be described. Thus, the first step in describing optimal performance is to identify the future roles. Sometimes it is difficult to identify future roles since one cannot always anticipate the changes of current roles in response to new technology or radical reallocation of resources. It is best to approach this step by convening a panel of experts who can prognosticate about: (1) the types of health problems which will be encountered in the future, (2) the impact of changes in demographic and epidemiological patterns on the health services system; and (3) the secondary impact of these changes on the future roles of the health workers.

3. Establish an Optimal Listing of Tasks

Having established the roles for which workers will be employed, the analyst team next identifies the optimal listing of tasks performed within each role. The specification of these tasks includes both the action and the outcome of the work performed (see above for detailed instructions on writing task statements.) Each task statement should represent optimal performance. It is advisable to organize these tasks according to the order of performance or into a series of functional categories (see Appendix 2 for details on classification by functions).

4. Analyze Tasks for Skills, Knowledge and Attitude Components

For each task, the analysts must identify the skills (interpersonal, mental or physical) required to perform the task. The analysis should list the information the practitioner must know to employ a skill in an appropriate application. Additionally, the analysis should indicate attitudes workers should have towards others, themselves, or their work to facilitate performance. This step does not involve the use of the scales to differentiate between levels of skill or knowledge. The purpose is to describe in enough detail to allow comparison with actual performance.

5. Analyze Actual Performance

Job analysis is the collecting of information concerning actual performance of tasks. There are several methods by which one can obtain this information. Most methods of job analysis involve one or more of the following specific techniques: questionnaires; daily diaries; task checklists; direct observation of workers performing tasks; direct participation of the analyst in the work under analysis; individual and group interviews; and reports of effective and ineffective performance from supervisors of the work under study. A technical conference of "experts" can collectively determine the tasks of a job under investigation.

6. Identify Performance Discrepancies

A performance discrepancy is a "mismatch" between the optimal set of tasks and the actual task performance. This will include tasks that are performed differently, not performed well or not performed at all. One also looks for tasks which are performed in the actual practice setting which were not included in the optimal description. This step is the precursor to the revision of the task listing for a particular job.

7. Revise Optimal Description of Performance

Having specified optimal performance and analyzed actual performance, the analyst must reconcile differences between the two descriptions. Again it is useful to engage a panel of "experts" to assist in answering the following questions:

Should missing tasks be added to the optimal description?

Should unconfirmed tasks (not verified in practice) be discarded?

Should tasks that are implemented differently in actual practice be modified?

To the extent that the trained analyst team consists of the desired array of perspectives, ie, professional practice, education and management, they may fulfill this expert review role. It will be important, also, to gain concurrence from key opinion leaders in professional associations, unions, and education to reinforce the conclusions and recommendations of the panel.

8. Adopt a Data Classification Scheme

This step is necessary to allow for the organization and use of large numbers of task statements. For example in analyzing a system of family planning services delivery in the state of Louisiana, USA, more than 550 discrete tasks have been described. In this case example the classification method was adapted from Functional Job Analysis. The functional approach is recommended because of its focus on the elements of the work which are interchangeable among the various job classifications. It has the added value of linking the action of each task with system objectives.

9. Scaling, Editing and Quality Checking the Task Data

Throughout the development of the national or regional capacity one should try to identify individuals who show strong aptitude for job and task analysis. These persons should receive further training in the methods and techniques of analyzing tasks for their levels of complexity in performance dimensions such as data, people, things, reasoning, mathematics, language, worker discretion, error consequences. This training involves the application of rating scales to the written actions of the task statements. Teams of three raters should be trained together using standardized rating schemes to increase the inter-rater reliability of the results. Examples of the rating scales used in the job analysis of family planning services and found in Appendix 4.

Other key functions are the editing of the task statements, the listing of performance standards, describing the work setting and specifying training content associated with each task. This is best accomplished by a team representing the several types of users of the task data, e.g. planners, educators, managers, supervisors, etc. It is useful to include in this team some of the persons who have received advanced training in scaling the task statements.

An important team member for this project will be someone with knowledge of computer data base development and management. While it is possible to manage a large amount of task data without computers, it is advantageous to plan for computer assistance in sorting, retrieving and printing task listings. Likewise, the formation of clusters of tasks with similar training content or skill requirements is greatly aided by the

power of computer data base management.

10. Job Description Development

Task-based job descriptions are the foundation for reforms in personnel selection, training, supervision, and performance appraisal. Job descriptions developed using the consensus judgements of the job/task analysts are the common currency among the various persons making decisions about the workforce. A brief workshop of 4-5 days can prepare supervisors to use the task data bank to revise or construct job descriptions. The larger purpose of this activity is supervisory systems development. Once job descriptions with detailed task listings are agreed upon these products can be used to evaluate worker performance, assess training needs and design in-service education.

This activity is not designed to fashion "the" immutable description of a job that would be standardized throughout the nation. Rather, it is intended to produce a generic template which can be adjusted at each performance site. The adjustments will come from the different compositions of teams of co-workers, the differences in facilities and working conditions and differences in disease and population characteristics from region to region.

Improving Services Through Better Performance

Once the task data bank is formed and is functional and once the job descriptions have been agreed upon it is possible to have a widespread implementation of task-based methods to improve worker performance. The findings of the systemwide review (see “Review of Current Status” above) will help set priorities among the various competing needs for improving HRH planning, training or management concerns. Workshops in the use of task data to improve job design, personnel selection, training needs assessment, training program development, worker supervision, performance appraisal and career development can be designed.

It is important to target these training workshops to the individuals where the day-to-day decisions about the workers, and the work settings are made. There are countless ways in which the task data bank can serve the goal of improved services through improved worker performance once it is in the hands of supervisors.

EXAMPLE: U.S.A.

In the early 1960’s as a part of the ‘War on Poverty’ the U.S. government enacted programs designed to enable low income citizens to be employed in human services programs. There was a widespread interest in admitting the talented, but untrained, ‘grassroots’ residents of communities into the services delivery workforce.

Qualifications for employment in programs such as family planning, primary care, preventive and public health services were often unnecessarily high and reforms of existing personnel classifications were needed. The technologies of job and task analysis developed during World War II to assist in massive retraining and deployment of the U.S. military forces, were applied to this domestic "war."

With funding from the federal government, the Tulane University School of Public Health and Tropical Medicine, conducted a systems and a task analysis of a statewide (Louisiana) family planning delivery system. The resulting "Task Dictionary" described more than 550 discrete tasks required to achieve the program's goals and objectives. These tasks were organized into a functional classification system and were analyzed for their levels of difficulty in nine dimensions of human performance. Performance variables, conditions of performance (tools, aids, equipment, materials and supplies) and training content were specified to complete the data base. (see example task data sheet following the text and bibliography).

Job descriptions were developed with careful attention to the gradual progression of skills, knowledge and experience required for promotion to the next highest level of functioning. Care was taken to avoid the use of traditional professional titles, (eg, doctor, nurse, social worker), in order to focus on the actual performance requirements rather than educational attainments of the incumbent workers.

Several applications were developed from these task-based job descriptions. For example, recruitment and selection from the neighborhood residents could not rely upon traditional guides such as educational credentials, previous work experience, or letters of reference from previous employers. Previous experience was deemed to be an important predictor of successful performance and a means to assess that prior experience related to current job requirements was developed. A 'Previous Experience Checklist' was designed for the applicant to check off the tasks of the family planning job they could perform and likewise those tasks for which they would need training on-the-job. In this case experiential qualifications and training needs were assessed simultaneously.

Training programs and workshops were designed to include self assessments, self-instructional textbooks, group training materials based upon simulations of actual performance requirements, and training outcome assessments. Training topics were defined by the functions, activities and tasks performed to accomplish the work objectives. Thus, participants in the training topics were selected for their contribution to the outcome of a team effort rather than for individual characteristics. Each training topic was designed with specific learning objectives, pre-test questions, listings of content and methods/materials, programmed learning text, group training materials and evaluation instruments.

Supervisory aids and performance appraisal tools were developed to reinforce the training experience and to assure continuous quality improvement. Extensive use of

performance contracting based upon listings of tasks was a feature of these approaches. Likewise, the emphasis upon self-assessment continued to be a foundation of these managerial techniques. Each task contained detailed listings of performance variables. These variables were used to define the quantity and the quality of performance which became the terms of the performance contract. The tools, aids, materials, and facilities defined the conditions of performance for which management accepted responsibility. In remote settings where direct supervision was unavailable, self-assessment using checklists of tasks and their critical performance standards enabled the worker and the supervisors to identify performance problems and to schedule training or supervisory consultation as needed.

The experience and the materials from the Louisiana Family Planning Program were adapted to other settings. The state of Alabama's Department of Mental Health utilized the task data base to describe the tasks of mental health services delivery in community mental health centers. Based upon a two-day workshop managers and supervisors from mental health settings edited and rewrote tasks taken from the family planning task dictionary to describe the entire range of tasks in community mental health services. Similarly, the Texas Department of Health Regional Headquarters staff adapted one-liner tasks from the family planning data base to the range of preventive and public health services and added environmental health services tasks to the pre-existing personal health services tasks. Training materials developed from the task dictionary of family planning services were developed and field tested in sixteen states. They were subsequently used in the training of federal family planning professional staff.

These experiences support the conclusion that once a human services delivery organization has been analyzed it can serve as a template for describing other organizations with different types of services. Given an existing task data base it is possible to adapt it to a new setting with a minimum amount of effort. Most of the tasks required for the management of the organization, the management of the human resources and the logistics support functions remain the same from setting to setting. Likewise, many of the service delivery activities, eg, patient recruitment, patient coordination/continuity, patient education, remain the same with only minor modification of disease-specific content required.

The opportunity to translate the learning materials into Spanish and to use them in a training workshop for university faculty from Cali, Colombia gave some preliminary evidence of the transferability of this technology to another culture. Faculty members from the Department of Social Medicine of the Universidad del Valle attended a ten day workshop to learn the development of task-based training materials and supervisory methods. The resulting Spanish language training materials were used to implement an urban model of primary health care services delivery (PRIMOPS) in Cali.

EXAMPLE: PAPUA NEW GUINEA

The task analysis materials and methods developed in the U.S. were adapted to the special circumstances (decentralization) and settings of PNG. The English language version of the materials was adapted to accommodate differences in availability of direct supervision and the literacy of the workers in the most remote sites.

A pilot test of the methods of collecting task data and constructing a task data base for the PNG national and provincial health services system was conducted involving supervisory and managerial personnel from three provinces and the national Department of Health. Two five-day workshops separated by a one week field assignment to obtain practice in applying data collection methods were successful in demonstrating the adaptability and utility of the training materials and methods. Each provincial team of three persons returned to their home setting and successfully analyzed the jobs of at least two primary health care workers. These task data were then used in a subsequent workshop to construct a pilot test of a performance appraisal instrument and improved methods of supervision.

The plan for field testing and refining the performance appraisal methods required direction and monitoring from the central Department of Health and due to changes in personnel no one with the basic training acquired in the workshops was available to supervise the pilot field-test. A follow-up visit by a WHO consultant, however, found interest remained high in the technology and its potential for improving planning, training and management of human resources for health.

Important lessons learned from this experience echo the general findings from similar technology transfer projects. It is essential to have a central authority/expert to oversee the stages of transfer and to assure the quality of the work in the field. Short-term, intermittent technical assistance is best utilized when there is a solid foundation in country to absorb and disseminate the new methods. Likewise, it is important to involve the several supporting organizations, eg, universities, other donor financed projects, in any change or innovation.

Decentralization without any mechanism for assuring standardization results in fragmentation of an already fragile capacity for assuring quality of services. One of the yet unrealized potentials for Functional Job Analysis in PNG is the standardization of job descriptions from province to province. This will permit the relatively few training institutions in the nation to prepare a cadre of workers who can be employed throughout the country. Similarly, the standardization of tasks and the tools, aids and materials needed for their performance will enable further refinement of working conditions and standards of quality.

What remains of the pilot effort is a high sustained interest in improving the planning, training and management of the human resources for health throughout the country. The FJA technology has been adapted to the local conditions with some success although the existence of an effective nationwide personnel system is far from

complete.

EXAMPLE: PEOPLE'S REPUBLIC OF CHINA

Six provincial Bureaus of Public Health are involved with a World Bank project to improve the methods of planning, training, managing and financing human resources for health in rural, remote areas. Functional Job Analysis Technology is the basis for reforms in human resource planning, in-service and pre-service training, quality management and quality improvement.

The transfer of the technology to a lesser developed country (PNG) was accomplished without the need for extensive translation of training materials into a language with a very different grammatical structure and technical vocabulary. This is not the case in China. With the assistance of local consultants from the Ministry of Public Health and from Shanghai Medical University the training and procedural manuals have been translated and revised to accommodate differences in culture.

Two two-week workshops have been conducted in China to train a cadre of trainers and job analysts to gather data and develop job descriptions in six provinces. The focus of the functional job analysis effort is at the township and village levels of service. Twelve job titles — three from the village and nine from the township level — are being analyzed.

The first workshop involved nearly forty participants. They learned how to collect, organize, analyze and retrieve task statements. Each province paired with another province to develop a job description for a single position which would be acceptable in all provinces. It was essential that the standardized methods of data collection and analysis be rigorously applied. Each provincial team returned to their headquarters and conducted training for prefectural level personnel in the methods of task data collection and analysis. Altogether more than two hundred persons have been trained in the methods.

A second workshop provided advanced training to the first workshop participants and additional depth and supervised experience for a select number of prefectural level trainees (n = 40). Trainees from the first workshop group provided lectures and demonstrations to the second group.

Currently, analyses of twelve jobs are underway. Extensive additions to the task dictionary are being made to accommodate the broad range of activity and responsibility of village health personnel in preventive and curative care. The basic task listing for the village doctor now contains more than five hundred tasks. The most extensive additions of new task data are in the functional area of services delivery. The classification scheme has been adapted to categorize the broad range of activities. Each task has

been analyzed for its performance variables, training content and working conditions. Likewise, each task has been scaled for its complexity along nine dimensions of human performance. The design of the field work requires development and agreement by at least two provinces before the final product (job description, task listing, task dictionary) is presented to all provinces for their revisions and adoption. The existence of this common data base will assure the comparability of job designs and the comparability of training curricula to prepare the workers.

Once the data base is completed (scheduled for July 1993) the focus will shift to the use of the task data for curriculum reform and for development of a formal and standardized system of performance monitoring and appraisal. Additional workshops demonstrating applications of task data to these activities are being developed.

This experience provides a crucial test of the transferability of this technology to a very different language and cultural base. FJA depends very much on the construction of English sentences with precise grammatical structures and syntax for its effectiveness. It appears from the preliminary results that the method retains its integrity in the Chinese language. There are the several examples of precise word meanings that do not have counterparts in the other language. These have been resolved by the use of the English word and its technical meaning rather than forcing a new meaning on an existing Chinese word.

The translations of the learning materials appear to be working well to enable the training to be conducted by local 'experts'. Computerization of the entire data base (estimated 2500 tasks) using a common classification and coding system is well along. This application of FJA is by far the most extensive and complete of the case examples cited. A high level of enthusiasm prevails in China about the potential of the FJA technology.

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APPENDIX 1: TASK STATEMENTS

This appendix provides number of illustrative task statements and one-liner summaries.

Example 1. Registration Clerk

TASK STATEMENT: Talks with, informs patient of reason for unusual delay in service, sympathizes with patient and, if possible, tells approximate time patient will be seen, IN ORDER TO maintain patient-clinic relationship.

ONE-LINER: Explains Delay to Maintain Patient-Clinic Relationship.

Example 2. Registration Clerk

TASK STATEMENT: Selects, collates, inserts specified blank forms in a folder, following prescribed procedures and sequence, obtains designated forms and folders from storage area, places blank record packets on supply shelf in preparation for use by self or co-worker, IN ORDER TO initiate a new record packet.

ONE-LINER: Inserts Blank Forms in File Folder to Initiate Record Packet.

Example 3. Stock Clerk
TASK STATEMENT: Fills out stock withdrawal slip each time supplies are taken from stock; records description and quantity of supplies withdrawn, and name of person requesting supplies, files card in designated place according to prescribed procedures, IN ORDER TO record supplies used in clinic.

ONE-LINER: Fills out Stock Withdrawal Slip to Record Supplies Used.

Example 4. Trainer
TASK STATEMENT: Gets, carries specified training aids (charts, pictures, models, samples, etc.) to room in which they are to be used, arranges for effective use, considers available display area, and previous visual aids arrangements, presentation agenda, expected audience size and seating arrangements, IN ORDER TO prepare material for use.

ONE-LINER: Arranges Training Aids to Prepare Material for Use.

Example 5. Personnel Supervisor
TASK STATEMENT: Checks time reports for persons under own supervision for errors in addition and hours claimed, uses daily work summary sheets as a resource if necessary, signs time reports, and/or payroll sheets, routes to payroll department before pay period deadline, IN ORDER TO authorize payment for time worked.

ONE-LINER: Audits, Signs Time Reports to Authorize Payment for Time Worked.

Example 6. Administrative Clerk
TASK STATEMENT: Scans each sheet in a stack of similar data sheets (reports, patient records, etc.), transcribes selected brief data from each sheet to a single listing or record, following prescribed instructions, IN ORDER TO formulate a specific listing of information.

ONE-LINER: Copies Specified Data from Records to Formulate Specific Listing.

Example 7. Statistical Analyst
TASK STATEMENT: Gathers, scans information from multiple sources, tallies specified events, adds cell totals if necessary, writes data on designated form, according to

prescribed procedure, IN ORDER TO prepare data for statistical report.

ONE-LINER: Compiles Information from Sources to Prepare Statistical Report.

Example 8. Scheduling Supervisor
TASK STATEMENT: Uses knowledge of clinics scheduled for the upcoming period, and of capabilities and availability of employees present, may refer to individual job position descriptions and task listings as planning aids for non-routine assignment of tasks, fills in, posts daily/weekly assignment sheets on periodic basis, IN ORDER TO provide personnel with a schedule for work assignments.

ONE-LINER: Uses Knowledge of Clinic and Personnel to Make Schedules.

Example 9. Registration Clerk
TASK STATEMENT: Greets patient, briefly explains the need for information, reads question, paraphrasing if necessary, listens to answers, writes answers in appropriate place on initial or revisit interview form, rephrases if necessary to fit blanks on form, uses patients' clinic and hospital records if applicable, IN ORDER TO record identifying information on forms.

ONE-LINER: Interviews Patient and Fills Out Form to Record Patient Information.

Example 10. Clinical nurse
TASK STATEMENT: Cleanses finger, explains procedure to patient, notes any physical indications of fear, reassures, calms patient, punctures finger with sterile lancet, fills capillary tube with blood, seals tube with clay, inserts tube in numbered tray, writes corresponding number on patient's route slip, directs patient to next service, IN ORDER TO obtain blood specimen to be used in testing for anaemia.

ONE-LINER: Prepares Patient of Blood Draw to Obtain Blood Specimen.

Example 11. Primary Care Nurse Supervisor
TASK STATEMENT: Uses appointment list for each clinic (Family Planning, Postpartum, Prenatal, Revisit/Supply, Problem and Teen), determines number of patients scheduled for following week's clinics, estimates quantity of supplies needed to cover various visit types, refers to list of standard items used, lists supplies, calculates quantities needed for following week's clinic, signs form or routes to authorized co-worker, IN ORDER TO prepare requisition for supplies.

ONE-LINER: Collects Information About Patient Scheduling to Prepare Requisition.

Example 12. Typist
TASK STATEMENT: Reads copy of draft of letter, compares against draft copy of letter, identifies typed errors in spelling, marks errors that can easily by corrected by changing one letter with a paper clip on the margin of the letter, marks errors that cannot be

corrected easily with a red pencil, returns copy to typist for correction or retyping, in order to proof-read typed copy of outgoing correspondence IN ORDER TO prepare reports and documents.

ONE-LINER: Proof-Reads and Types Copy to Prepare Documents

Example 13. Stocking Clerk
TASK STATEMENT: Unpacks supplies received, counts quantity received with quantity shown on requisition form and invoice / packing slip, checks off items received as ordered, records any discrepancies on receiving logs IN ORDER TO maintain and control inflow of inventory.

ONE-LINER: Receives and Checks Supplies to Maintain Inventory.

APPENDIX 2. CLASSIFICATION SYSTEM

This appendix provides an example of a classification system covering a broad variety of different worker functions.

100 Organizational Management

110 Planning a Service Program

111 Identifying Needs

112 Fund Raising

113 Budgeting

114 Programming

120 Organizing a Service Program

121 Delineating Organizational Relationships

122 Developing Organizational Relationships

130 Evaluating a Service Program

131 Establishing Standards for Evaluation

132 Monitoring Operations

133 Interpreting Results of Evaluation

140 Administrative Support Activities

141 Ordering

142 Assembling Information/Materials

143 Quality Control of Administrative Activities

144 Filing Administrative Records

145 Distributing Information/Materials

146 Operating Office Equipment

200 Personnel Management

210 Planning

220 Personnel Recruitment

230 Personnel Selection

240 Staff Training

241 Development of Training Materials

242 Delivering Training Materials

243 Evaluating Training

250 Directing Personnel

251 Scheduling Activities

252 Assigning Work Activities to Staff

253 Motivating Personnel

254 Informing Personnel

255 Managing Personnel Differences

256 Problem Solving

260 Personnel Evaluation

300 Service Delivery

310 Patient Recruitment

311 Preparing to Contact Patients

312 Locating Patients

313 Assessing Eligibility Status

314 Informing on Clinic Services

315 Appointing Patients to Clinic

320 Co-ordination of Patient Activities During Clinic Visit

321 Patient Intake

322 Routing Patients

323 Giving Instructions to Patients

324 Supporting Patients

325 Referring Patients

326 Exchanging Information on Patients

330 Diagnosis of Patient Health Status

331 History Taking

332 Testing

333 Examining Patients

340 Medical Treatment of Patients

350 Dispensing of Contraceptive Supplies

360 Community and Patient Education

361 Scheduling of Health Education

362 Developing Educational Materials

363 Delivering Health Education

370 Patient Maintenance

371 Flagging/Monitoring Patient Charts

372 Quality Control of Patient Records

373 Storing of Patient Information

374 Assembling Patient Records

375 Re-appointing Patients

376 Updating Patient Records

377 Closure of Patient Records__400

400 Logistic Support

410 Ordering Supplies

420 Receiving Supplies

430 Inventory

440 Distributing Supplies

450 Assembling Materials/Instruments

460 Operating Equipment

470 Maintaining the Clinic Facility

APPENDIX 3: PERFORMANCE VARIABLES

This is a example of the types of performance variables that might be used to assess worker performance. The variables would obviously have to be adapted to the specific job.

1. Patience in obtaining relevant answers.

2. Flexibility in responding to answers given.

3. Fewer than ___% of patients complain of workers being rude, discourteous or impatient.

4. Patients state that they do not understand fewer than ___% of questions.

5. Fewer than ___% of records must be redone due to illegible, incomplete, or inaccurate information.

6. Interview is completed within ___ to ___ minutes.

Training Content ---------- Tools/Aids/Materials-

1. Importance of courtesy and friendliness when questioning.

2. Techniques for asking questions to get relevant responses.

3. Effective listening techniques.

4. Initial interview form: general use, content, location.

5. Implication, definition and internal usage of each item on interview form.

6. Philosophy, goals and objectives of program.

7. What constitutes a 'complete' record.

8. Importance of accuracy in checking boxes on form.

1. Patient's hospital record.

2. Initial interview form, pen.

---------- Task Analysis Scales ----------

WORKER FUNCTIONS (See Appendix 4 for definition of the three sets of scales.)

Data	People	Things
3	2	1

GENERAL EDUCATION DEVELOPMENT

Reasoning	Math	Language
4	1	3

RESPONSIBILITY

Choice	Consequences of Human Error
3	2

APPENDIX 4: FJA RATING SCALES

At the bottom of Appendix 3 a number of scales were mentioned --- data, people, things, reasoning, mathematics, language, and choice --- which are used to characterize the complexity, type of skills used, or potential consequences of each task. Once tasks have been so characterized, and once job specifications are described in terms of the tasks involved, the functions of planning, training and managing health personnel can be greatly facilitated. The range of choices covered by each scale is shown below.

DATA FUNCTIONS SCALE

1 Comparing
2 Copying
3 Computing; compiling
4 Analyzing
5 Innovating; coordinating
6 Synthesizing

PEOPLE FUNCTIONS SCALE

1 Taking instructions, helping, serving
2 Exchanging information
3 Coaching; persuading; diverting

4 Consulting/counseling; instructing; treating
5 Directing
6 Negotiating
7 Monitoring

THINGS FUNCTIONS SCALE

1 Place or move objects into, through, or onto something else...
2
3
4
5
6 Placement of something very fine into, through or onto an area as fine as the thing being placed; or direct handling or manipulation of minute or ultra-fragile objects, materials, or instruments.....

REASONING DEVELOPMENT SCALE

1 Have common sense understanding to carry out simple one- or two-step instructions in the context of highly standardized situations....
2
3
4
5
6 Have knowledge of a field of study of the highest order, understanding the most difficult concepts....

MATHEMATICAL DEVELOPMENT SCALE

1 Recognize, compare, copy Arabic numerals
2
3
4
5 Have knowledge of advanced mathematical and statistical techniques such as differential and integral calculus, factor analysis, and probability determination; work with a wide variety of theoretical mathematical concepts

LANGUAGE DEVELOPMENT SCALE

1 Cannot read or write narrative, but follow simple oral, "pointing-out" instructions; sign name and understand ordinary routine agreements when explained, such as those relevant to employment; identify symbols and safety warnings; read printed addresses, lists
2
3

4
5
6 Comprehend, interpret, and discuss highly technical, theoretical works, involving abstract relationships and applications....

WORKER CHOICE SCALE

1 Inputs, output, supplies, and procedures are all specified. Little or no leeway is required of the worker in deciding how he/she will perform the task. Performance standards are rigidly set.
2
3
4
5
6
7
8 Direction and/or information comes to the worker in terms of needs (tactical, organizational, strategic, financial). The worker has complete freedom or power to make decisions and determinations regarding direction and courses of action (outputs) for major sections (division, groups) or his/her organization. He/she determines policies, goals, and procedures for the output, and creates guidelines and quality standards for its performance.

CONSEQUENCES OF ERROR TO HUMANS (H.E.C.) SCALE

1 No error in the performer's task performance could result in result in harm to a human
2
3
4
5
6
7
8 The most serious likely error would result in immediate and inevitable death