A STUDY TO IDENTIFY STAFFING REQUIREMENTS IN A NURSING DEPARTMENT OF A COMMUNITY BASED BLOOD COLLECTION AGENCY USING MANAGEMENT ENGINEERING TECHNIQUES

A Research Prospectus
Presented To
the Faculty of the
Department of Government and Public Service
Graduate Program in Public Service Administration
Russell Sage College

In Partial Fulfillment
of the Requirements for the Degree of
Master of Science in Public Service

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Aletta J. Kotwas

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THE PROBLEM AND ITS SETTING

The Statement of the Problem

The Northeastern New York Regional Blood Service is responsible for the collection and processing of over 70,000 units of blood annually in a thirteen county region and the distribution of blood and blood products to 30 hospitals within the region. Collection operations are variable in size, sponsor, distance from the processing center and hours. N.E.N.Y. maintains a fixed collection site at it's regional center and dispatches up to three mobile operations a day. An average of 270 units of blood a day are needed to assure proper supply. Too much or too little blood is poor management of the resource. Donors are of two types "walk ins" or "appointment". Scheduling techniques incorporated into the program using "waiting line" theories are

used to reduce donor waiting time and increase the average number of donors processed by staff.

This study proposes to identify the quantity and mix of staff required to operate a six bed mobile blood collection operation in a community based agency and to develop a methodology of staffing pattern manipulation that will influence scheduling and budgetary effectiveness.

Limitations

This study is limited to the measurement and analysis of the workload on a six bed blood collection operation. A six bed mobile is the most useful operation in this region comprising 30% of all mobile blood collection activities. This is not an in-depth study of worker motivations or behavior or an evaluation of the work environment.

Definition of Terms

Mobile blood collection operation. A preplanned, prescheduled blood collection activity dispatched from a regional center to the community. This operation is designed to safely collect blood from volunteers

to meet the transfusion needs of the region.

Full time equivalent. A full time equivalent (FTE) is a full time employee or any combination of part time employees equal to the paid hours/week of a full time employee. For instance, a 40 hour per week paid employee is equal to 1.0 FTE, thus 32 hours per week (paid) would be equal to 0.8 FTE and so on.

Productivity allowance. Productivity allowance is a weighing or leveling factor used to determine the amount of time staff are engaged in productive activities. Since it is unrealistic to consider workers produce at 100% efficiency an allowance factor is used to determine that percentage of time which is most representative of its departments productivity.

Donor belt-line. The physical arrangement of sequential "stations" used in processing blood donors. Examples of stations include eligibility testing and screening, blood collection, and post donation observation.

Activity. An activity is a defined amount of work that can be completed only by expending resources. An activity is defined by its beginning and ending events.

Constant activity. A constant activity is an

activity that must be performed regardless of the material or quantity produced.

Variable activity. A variable activity depends upon the quantity of the unit of service.

Unit of service. A unit of service constitutes one procedure or the item for count. The unit or item counted in this study has been determined as the number of donors processed.

Man hours per unit of service. A universal term used to describe the staff hours expended or required per unit of service. A productivity measure.

Time standard. A time standard is the average time spent on a procedure from the onset of the activity to its completion.

The Setting of the Problem

The American Red Cross Blood Services of the Northeastern New York Region operates within a 3.3 million dollar budget. Over 50% of the budget costs are related to salary. The blood collection department is responsible for one third of the salary costs.

The quality of the nursing department lies in the service it renders to the community. Responsibility

for the welfare of the blood donor at the collection site has been delegated to the registered nurse. The nurse is responsible for evaluating donor eligibility based upon a health history interview and physical findings; the detection of early signs and symptoms of impending donor reactions and the management of those reactions and other complications. The nurse provides the skills necessary for diplomatic relationships with the public, volunteers and other professionals, in screening and referring donors for additional medical care, in educating the public and orienting volunteers to the blood service and providing a quality blood product for the recipient. (Knox 1980)

The department is headed by the Director of Nursing, who reports directly to the blood service Medical Director. Reporting to the Director of Nursing are the Assistant Directors of Nursing, who are responsible for two production areas. Reporting to the Assistant Directors of Nursing are the head nurses. The head nurses are responsible for the direct management and supervision of the mobile collection activities.

The Need for the Study

Management of resources is one of the most

challenging functions facing the nurse administrator today. Personnel resources alone represent the major cost center of the nursing department. The combination of personnel, supplies and equipment creates a complex output system. This output system which carries out the organizations main mission requires formal standards in order to maintain appropriate production levels within budgetary limits. Without formal standards, informal standards may develop which confuse the organizational goals. Such a situation results in the employee being subject to criticism, whether justificably or not, of poor performance and inefficiency. To provide a fair days wages, the definition of a fair days labor needs to be established.

This system is further complicated by the demands of ever increasing government regulations and increased expectations of the blood collection process brought about by refined techniques. An administrative challenge lies in the need to cut costs, and maintain quality service.

Blood collection departments have expanded to meet these challenges often using staffing guidelines developed by intuition and experience. This intuitive

approach has periodically resulted in adverse staffing conditions. A problem arises when it is necessary to translate these judgmental practices into objective and measurable terms which will be easily understood by others.

Volunteer community blood banks must have a rational staffing approach that is sensitive to the details of the practice. Staffing guidelines developed from analyzing productivity using statistics provide information, insight, comparisons and refinements of details that cannot be obtained by qualitative judgment. Productivity analysis is a means of matching the staff to the workload requirements.

The need for this study essentially lies in the need of the nurse administrator to determine required staffing levels using quantificable techniques that will provide an objective means of evaluation and budgetary control.

THE REVIEW OF THE RELATED LITERATURE

Scientific Management

Interest in productivity is not new. At the beginning of the twentieth century, Frederick Taylor, Frank Gilbreth and Henry Gantt probably contributed the most to what we know as scientific management. "Scientific management (is) a wholehearted attempt to deal with every question arising in the conduct of business, or indeed of any human system of cooperation in the temper and spirit of the scientist and by using the tools of definition analysis, measurement, equipment and proof." (Urwick, 1956:8) Taylor promoted management by standards and systems, choosing the right person for the job, developing the best method of performance and timing it exactly. Gilbreth developed what is known as the motion-and-time study to a refined degree of utilization. Gantt developed flow charts used in production control. These men were the first

to promote production evaluation as a function of management. Ronald Fisher, H.F. Dodge and Walter Shewhart provided the industry with statistical tools for controlling quality production at low costs. (Levey and Loomba, 1973:497) Methods of statistical quality control and work sampling were developed, perfected and successfully applied to industrial problems during the 1930's and 1940's.

Management Science

Management science as it is known today was first attributed to the scientists of the United Kingdom. Management science evolved during World War II and was used to solve complex military problems. Management science provides theoretical and application models. The theoretical models include behavior theories of planning and control; inventory, maintenance and production scheduling. Application models include strategic, administrative and operational problems. Linear programming, dynamic programming simulation models, problem evaluation and review techniques, critical path method and cost effectiveness models are a few examples of the types of techniques used

production studies. A time study involves a stop watch and many observations to determine accurate times. There are basically six steps to the procedure.

a. Select employees that are representative of the average worker and observe the job being timed.

b. Select a full job cycle. Include all the job elements.

c. Time the job for all cycles.

d. Compute the normal time.

e. Determine allowance for personal time, fatigue and delays.

f. Determine the time standard as the sum of the normal standards (d) plus allowance (e).

3. Work Sampling. Work sampling is based on random sampling techniques. It is a statistical method of estimating what activities are happening what percent of the time. The procedure consists of three steps.

a. Delineate all productive and non-productive activities.

b. Observe the activity at intervals.

c. Calculate the proportion of productive activities in the following manner:

$$\text{Productivity} = \frac{\text{Number of productive activity observations}}{\text{Total number of observations}}$$

This calculation will produce a performance standard. For instance, if the standard is low the manager might consider adding additional duties to the job.

Work sampling methods have been used in service sector jobs such as libraries, banking, the health field and government.

4. Predetermined time study. Predetermined time studies consist of a catalog of times previously developed for common activity elements by industrial engineers. In this approach interviews are conducted with the supervisors and employees who have the best knowledge of the job. Predetermined time studies are used to evaluate existing as well as non-existant jobs. The procedure has six steps:

a. Observe the job or think it through

b. Record each job element

c. Consult a table of predetermined times and record the motion units.

d. Determine the sum of all the motion elements.

e. Estimate an allowance for personal time, delays and fatigue.

f. Determine the sum of the total motion and

allowance times. This will provide a standard.

5. Combined techniques. A combination of work measurement techniques might include:

a. Observing the job.

b. Recording detailed work elements.

c. Setting predetermined time standards.

d. Comparing historical data with the developed standard to varify the standard.

e. Timing job elements, as required.

(Adams 1978:310; Fetridge and Minor 1977:320 and Shubin 1968:134)

Workload Recording

Workload recording has about 10 years of widespread application in the U.S.. Workload recording is mandatory in 17 states and will soon be mandatory in all states for medicaid reimbursement. The College of American Pathologists (CAP) in 1969, designated its Laboratory Management and Planning Committee to develop a workload recording method. The committee after evaluating existing methods, decided its needs could best be met through the approach by the Canadian Association of Pathologists. The Canadian Workload Method was developed in 1954 and revised in 1969. Time studies

were carried out under uniform conditions in clinical laboratories of different sizes throughout the country. The CAP method is based upon the unit value concept which is crucial to the workload recording method.

In 1970, the first edition of "A Workload Recording Method for Clinical Laboratories" based largely on the 1969 published edition of the Canadian Schedule of Unit Values for Clinical Laboratory Procedures was published. The studies were developed from a standardized time study engineering format in numerous laboratories of varied size and activity in the U.S. and Canada. The data from both the Canadian and U.S. studies were merged after editing by the International Units Committee. (Sinton 1979:17)

Relative Value Units

Relative unit values were developed by individual laboratories and by the Association of State and Territorial Public Health Laboratory Directors (ASTPHLD) and the Center for Disease Control (CDC). The ASTPHLD - CDC method examines the time required to perform public health examinations, the number and time required to perform prescribed tests, the qualifications of the worker, the difficulty of the decisions involved and the

frequency each procedure is performed. The determination of procedural difficulty is based on the judgement of experts. (Levine, 1969:22)

Resource Monitoring System

Another method of examining productivity is the Resource Monitoring System (RMS), developed by the Hospital Association of New York State (HANYS). RMS is a method of applying time standards to activities within hospital functional centers and producing engineered productivity standards for individual departments. These standards are combined with exceptions reporting for internal control. In addition, it provides a data base for analysing financial reimbursement considerations. The RMS has been widely used in 40 states, particularly on a study by study basis in most of the hospitals in New York State and in 3 to 4 countries. The Management and Planning Services (MAPS) of HANYS has conducted more studies in hospital nursing services, particularly staffing, than any other area. (Macri & Reukart, 1980)

The CAP and RMS methods have been supported and recommended by administrators. Both systems have been used in conjunction with third party payers, health

planners and regulatory agencies.

Current Studies in Blood Banking

The College of American Pathologists has accepted the cooperation of the American Association of Blood Banks (AABB) to develop new blood bank laboratory standards and update those in need of revision. The AABB is presently in the process of developing time standards which accurately reflect blood banking procedure. Workload Recording Seminars are being conducted nationwide to prepare researchers with the backgrounds necessary to develop flow charts, collect data, time procedures and calculate standards. Until recently, emphasis in developing blood bank productivity standards has been placed on laboratory procedures. The AABB is currently seeking volunteer's to develop productivity standards for blood collection activities in community and hospital based blood banks (Boline, 1980).

Work Analysis

National productivity measurements have been used for years in industry. The procedure for measuring productivity is to relate the amount of input of

THE EXPECTED OUTCOME

The Expected Outcome

It is expected, that the development of productivity standards for the collection department at NENY will provide a management tool that will:

1. Determine required staffing in the collection department on a six bed mobile unit.

2. Assist in the comparison of these required numbers to existing numbers and qualifications of staff.

3. Assist in the utilization of resources in an effective manner.

4. Assist in forecasting future staffing requirements in the collection department.

5. Assist in the analysis of manual versus automatic procedures.

6. Assist in the definition of collection production problems.

7. Provide an ongoing method of effective budget control.

8. Document progress being made toward cost containment.

THE METHODOLOGY

The Data

The data of this research are of two kinds: primary data and secondary data. The nature of each of these two types of data are described briefly below.

The primary data. The primary data constitute workload volume statistics, department staffing levels, payroll data and predetermined time standards.

The secondary data. The secondary or descriptive data constitute American Red Cross policies, procedures, and interviews with professional operations and supervisory personnel.

The admissability of data. Only raw data obtained from the office of statistics, payroll and nursing office were used. Only the responses of staff experienced in the area of collection were used. The staff were randomly selected to reflect a variety of input. Although

attempts were made to minimize bias, it is acknowledged as being an ever present element of study.

Flow chart and interviews. A flow chart was developed representing an actual description of all work elements in proper sequence. The chart included all necessary steps in:

1. Donor registration such as greeting the donor, checking the donor's name and appointment, reviewing demographic data, blood type and other miscellaneous duties.

2. Donor preparation, such as obtaining and recording the health history interview, measuring and recording body temperature, pulse, blood pressure, weight, hemoglobin and obtaining the donor's signature.

3. Blood collection, such as identifying the donor with his record, labeling blood containers, affirmation of identification labels and numbers, examination of blood container, preparation for venipuncture, the phlebotomy, thorough anticoagulation, sealing and storage of the product, thorough donor instructions and the management of adverse donor reactions.

4. Daily preparation such as setting up the bloodmobile site, distributing and restocking supplies, orientation of volunteers, quality control activities

and packing up the bloodmobile.

Interviews were conducted with the Assistant Director of Nursing, the Head Nurses, phlebotomists, the Mobile Unit Assistants and volunteers actively engaged in mobile unit operations.

From data, interviews and observation each activity was broken down into simple motion elements. Only productive activities were recorded.

Constant and variable activities. All motion elements were further subdivided into either a constant or variable activity (Shubin, 1968:141).

The total hours required by the mobile unit collection personnel are made up of constant and variable donor care activities. Constant activities include setting up the mobile operation, orientation of volunteers, and quality control activities. Variable activities include registering donors, screening donors for eligibility and blood collection. The constant activities were used to identify those work elements that have to be performed regardless of the number of donors processed. The variable activities were used to identify those work elements that fluctuate with the number of donors processed.

Supervision was regarded as a constant 8 hours for

paid staff and a constant 7 hours for volunteer staff.

Anticipated time. Employees were directly involved in the generation of basic time data for each motion element through the interview processes and selected activities which required a stop watch. Three different time estimates were assigned to each motion element, expressed in decimal minutes.

1. A minimum time estimate, which represents the shortest time in which each motion element could be completed (with a probability of 1 in 100).

2. The most likely time estimate.

3. The maximum time estimate which represents the longest time in which each motion element could be completed (with a probability of 1 in 100).

An anticipated time standard was developed using the following formula:

$$AT = \frac{a + 4b + c}{b}$$

Where:

AT = anticipated time

a = minimum time

b = most likely time

c = maximum time

The three different time estimates for completing each motion element were based on the assumption that the probability distribution represents various possible completion times for each motion element. The probability distribution was chosen because of its flexibility of estimation and its limitations of time between the parameters of a and c. It permits straightforward calculation of the activity mean. The mean will establish a set of time standards for each activity to be most representative of the time it takes to perform that activity or that which will be expected of an average worker.

The most well known use of this formula is exemplified in the Program Evaluation and Review Technique (PERT) developed during the 1950's used for planning, scheduling and controlling large complex projects. (Chase, 1977:549)

Frequency. Each motion element was then multiplied by the frequency of occurance to determine a time standard.

Predetermined times. Predetermined times selected from the Resource Monitoring System (RMS) and the College of American Pathologists (CAP) methodologies were used to compare the results of the blood collection motion elements and activities.

Sum of motion elements. The motion elements were

combined to summarize the major mobile unit activities of the paid and volunteer staff.

Productivity allowance. Time standards in this study reflect consumed or productive activities. Time standards do not account for time staff wait for donors, personal time or employee fatigue. Since it it impossible to reach or maintain 100% efficiency in any industry, a weighing or leveling factor was calculated to compensate for delays and fatigue. This weighing factor attempts to make it possible for the average worker to perform the job as specified within a normal time period. The productivity allowance attempts to determine a fair time standard.

No specific percentage can be generally recommended. Each production activity must be evaluated in accord with the agencies policies, practices and philosophy of care. (Evans 1980:40)

The collection department at NENY is directed toward a 90% productivity level for paid staff and 80% productivity for volunteers. These levels of productivity were theoretically based on the need to provide adequate service while not producing overtime.

Required staffing. To determine the daily required staffing the following formula was used for each skill

level:

1. Variable standard X donors processed = Daily variable hours required

2. Daily variable hours required + constant hours required per bloodmobile = Total daily standard hours required

3. Total daily standard hours required ÷ productivity (%) = Total daily hours required

4. Total daily hours required ÷ hours/FTE = required FTE

Man Hours per unit of service. The desired, actual and budgeted man hours per donors processed were determined for paid and volunteer staff using the following formula:

Man hours per donors processed (MHDP) = FTE X hours ÷ donors processed

FINDINGS

Standards Development

The development of each standard is documented in Appendix 1 and 2. A summary of the standards development is demonstrated in Table 1.

TABLE 1

SUMMARY OF TIME STANDARDS DEVELOPMENT
(Decimal Hours)

FUNCTION	VARIABLE ACTIVITIES	CONSTANT ACTIVITIES
Paid Positions:		
Phlebotomist	0.19	3.4
Mobile Unit Assistant	0.05	3.8
Volunteer Positions:		
Schedule Clerk/Registrar	0.07	0.3
Hemoglobin Determination	0.05	0.16
Temperature Determination	0.01	0.05
Health History Interviewer	0.12	0.43
Pack Assembly	0.04	0.3
Donor Escort	0.03	0.05
Canteen/Observer	0.13	0.4

TABLE 2

EXISTING VERSUS REQUIRED STAFFING

POSITIONS	AVERAGE EXISTING FTE	%	REQUIRED FTE	%	VARIANCE FTE	%
Head Nurse	1.0	5	1.0	7	0	0
Phlebotomist	3.0	15	3.0	21	0	0
Mobile Unit Assistant	1.5	8	1.1	8	(0.4)	(37)
Officer of the Day	1.0	5	1.0	7	0	0
Schedule Clerk/Registrar	2.5	12	1.3	9	(1.2)	(93)
Hemoglobin Determination	1.0	5	0.9	6	(0.1)	(20)
Temperature Determination	1.0	5	0.2	2	(0.8)	(400)
Health History Interviewer	2.0	10	2.1	15	0.1	5
Pack Assembly	2.5	12	0.7	5	(1.8)	(257)
Donor Escort	1.5	8	0.5	4	(1.0)	(200)
Canteen/Observer	3.0	15	2.3	16	(0.7)	(32)
	20.0	100	14.1	100	(3.2)	(42)

This comparison indicates that there should be a reduction in MUA staff by 0.4 FTE's, a reduction in Schedule Clerk/Registrars by 1.2 FTE's, a reduction in staff that perform hemoglobin determinations by 0.1 FTE, a reduction in staff that perform temperature determinations by 0.8 FTE, an increase in health history interviewers by 0.1 FTE, a reduction in pack assembly staff by 1.8 FTE's, a reduction in donor escorts by 1.0 FTE's and a reduction in canteen/observers by 0.7 FTE. The implications of these changes will be discussed later in the study under recommendations.

Unit of Service

Desired man hours per donors processed (MHDP). The unit of service in this study has been defined as the number of donors processed. The desired man hours per donors processed for paid staff are 0.5 and for volunteers 0.8. Total MHDP are 1.3 as illustrated in Table 3.

TABLE 3

DESIRED MAN HOURS/DONORS PROCESSED
(to nearest FTE required)

			DONORS PROCESSED 81 WORKLOAD CAPACITY
POSITIONS	REQUIRED FTE's	DAILY HOURS WORKED	TOTAL HOURS
Paid Staff:			
Head Nurse	1	8	8	0.1
Phlebotomist	3	8	24	0.3
Mobile Unit Assistant	1	9	9	0.1
SUBTOTAL	5		41	0.5
Volunteer Staff:			
Officer of the Day	1	7	7	0.09
Schedule Clerk/Registrar	1	6	6	0.07
Hemoglobin Determination	1	6	6	0.07
Temperature Determination	0	6	0	0
Health History Interviewer	2	6	12	0.2
Pack Assembly	1	6	6	0.07
Donor Escort	1	6	6	0.07
Canteen/Observer	2	6	12	0.2
SUBTOTAL	9		55	0.8
TOTAL	14		96	1.3

The expanded role of the volunteer in this area should be theoretically well accepted and implemented. Note well that a transfer of shuttling duties from this position will change the constant variable activities by 1.1 hours. The calculations for required MUA's for desired capacity would then be 0.8 FTE.

Temperature Determinations. The temperature determination station once required 1.0 FTE to record, cleanse and recalibrate mercury thermometers. The character of the workload was changed by the introduction of an electronic thermometer. This piece of equipment has reduced the workload to seconds and reduced the requirement significantly to 0.2 FTE.

It is recommended that this station be combined with another station such as hemaglobin determination or health histories.

Theoretically, the elimination of this station will provide more physical space for other necessary operational functions of the donor beltline.

Schedule Clerk/Registrar. The staff analysis indicates an overall requirement of 1.3 FTE for schedule

clerk/registrar functions. Existing practice requires 3.0 FTE with an average of 2.5 FTE. This is a 1.2 FTE or 93% reduction compared to average current levels and a marked underutilization of staff at this function.

It is recommended that the Schedule Clerk/ Registrar functions be handled by 1.0 FTE.

Pack Assembly. The staff analysis indicates an overall requirement of 0.7 FTE for the pack assembly functions. Existing practice requires up to 3.0 FTE with an average of 2.5 FTE. This is a 1.8 FTE or 257% reduction compared to average current levels and a marked underutilization of staff at this function.

It is recommended that the pack assembly functions be handled by 1.0 FTE.

Donor Escort. The staff analysis indicates an overall requirement of 0.5 FTE for donor escort functions. Existing practice requires up to 2.0 FTE with an average of 1.5 FTE. This is a 1.0 FTE or 200% reduction compared to average current levels and a marked underutilization of staff in this function.

It is recommended that the pack assembly functions be handled by 1.0 FTE.

Canteen/Observer. The staff analysis indicates an overall requirement of 2.3 FTE for canteen/observer functions. Existing practices requires up to 3.0 FTE. This is a 0.7 FTE or 32% reduction compared to average current levels.

It is recommended that the Canteen/Observer functions be handled by 2.0 FTE.

Discussion. The reduction in the total number of staff will also reduce the actual man hours/donors processed. The use of unnecessary personnel, including volunteer increases recruiting, scheduling, orientation and retention costs. Volunteers as well as paid staff derive a certain esoteric benefit from their activities. Too much or too little available work generates potential dissatisfaction and turnover.

Monitoring System

Present productivity analysis in this department is obscure. It is recommended that an ongoing monitoring system be set up in four week intervals, utilizing required, actual and budgeted figures.

Workload analysis. Compare budgeted workload (unit of service) with actual workload. Determine the variance for that period.

Productivity analysis. Compare the required FTE

(the FTE required to handle the actual volume recorded) with the actual FTE that performed the work. Determine the variance for that period.

Budget analysis. Compare the actual paid FTE budgeted during the reporting period with the actual number of paid FTE (this includes all vacation, holiday and sick leave time). Determine the variance for that period.

Discussion. This is a cumulative analysis of workload, productivity and budget data. A ±5% variance is within acceptable limits. These analyses are used to base decisions about forecasting and budget effectiveness. Changes in the relationships can be an early indication of developments that may require adjustments to staffing.

Future Studies

This study was confined to a six bed mobile blood collection operation because of its frequent utility in the system and to make the study more manageable. This study has provided the groundwork for additional examination of the remaining mobile units of various sizes including 3, 9, 12, 15, 18, 21 and 24 bed units. Essentially, the variable activities have already

been established. Slight modifications may be required of the constant activities. Ultimately, with appropriate standards development, this study can be used as the basis for annual staffing requirements.

CONCLUSIONS

Nursing administrators face a challenge to provide high quality, cost-effective care. Although there is no effective way to measure the positive impact of professional and auxillary personnel on the quality of donor care, productivity reports provide the administrator with an ongoing indices of staffing, scheduling and budget expense. The methodology in this study offers a reasonable way to determine required staffing for a mobile blood collection operation, through time standard development. Furthermore, it provides a realistic workload capacity upon which to make appropriate staffing adjustments. Although the study applies directly to a six bed mobile blood collection operation, the methodology is adaptable to any service level concept.

The use of this system is dependent upon the users ability to keep the time standards current with existing practice. Developing current workload indices requires regular periodic updating.

In summary, this paper has demonstrated that management engineering techniques can be applied to a service agency and produce beneficial results.

APPENDIX 1

PAID STAFF TIME STANDARD DEVELOPMENT

	VARIABLE ACTIVITIES	CONSTANT ACTIVITIES
1. Phlebotomist:		
Direct Donor Care:		
Identification of donor, review of health history, positioning donor, evaluating & prepping venipuncture site, phlebotomy, donor observation, post donation instructions	0.18	
Treatments:		
Management of adverse donor reactions (6% mild, 3.1% moderate and severe)	0.01	
	0.19	
Assignments and set up		0.82
Orientation of Volunteers		1.39
Quality Control/Records		0.05
Volunteer follow up		0.01
Restocking		0.24
Assist H.N.		0.007
Clean up/pack		0.84
		3.4

APPENDIX 1 (con't)

	VARIABLE ACTIVITIES	CONSTANT ACTIVITIES
2. Mobile Unit Assistant		
Preparation and storage of blood	0.04	
Assist with adverse donor reactions	0.01	
	0.05	
Load truck at Center		0.5
Unload at mobile site		0.6
Set up at site, MUA area/clean up		0.4
Shuttles		1.1
Q.C.		0.1
Clean up		0.6
Unload at Center		0.5
		3.8
3. Head Nurse		
Eight hours supervision		8.0

APPENDIX 2

VOLUNTEER STAFF TIME STANDARDS DEVELOPMENT

	VARIABLE ACTIVITIES	CONSTANT ACTIVITIES
1. Schedule Clerk/Registrar		
Secure schedule and review instructions with nurse.		0.301
Procedure: greet donor, appointment explanations, issue number, and prepare 15 space form or utilize imprinter and 9 space form for repeat donors.	0.068	
2. Hemoglobin Determination		
Review instructions with nurse.		0.049
Procedure: cleanse and puncture ear lobe, obtain blood sample, drop sample in copper sulfate solution, add % for repeat tests and collecting samples for further hematocrit testing.	0.011	
3. Body Temperature Determination		
Review instructions with nurse.		0.049
Procedure: place probe under tongue, read digital readout when unit sounds a buzzer (electronic thermometer).	0.011	

APPENDIX 2 (con't)

	VARIABLE ACTIVITIES	CONSTANT ACTIVITIES
4. Health History Interviewer		
Review instructions with nurse		0.425
Procedure: perform blood pressure determination, obtain pulse & weight, review first five questions on the form, review all yes answers, record all data, consult with Head Nurse, attach signature	0.118	
5. Pack Assembly		
Review instructions with nurse		0.30
Procedure: prenumbering preparation, numbering and distribution	0.039	
6. Donor Escort		
Review instructions with nurse		0.049
Procedure: direct donor to collection bed, deliver units of blood from phlebotomist to MUA, escort donor from collection area to canteen	0.033	

APPENDIX 2 (con't)

	VARIABLE ACTIVITIES	CONSTANT ACTIVITIES
7. Canteen/Observer		
Review instructions with nurse		0.407
Procedure: prepare table and refreshments, observe donors post donation, instruct donor	0.127	
8. Officer of the Day		
Seven hours volunteer supervision		7.0

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