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A STUDY TO DEVELOP A MODEL FOR THE ALLOCATION OF MEDICAL SUPPLY FUNDS TO THE VARIOUS CLINICAL SERVICES AT KELLER ARMY COMMUNITY HOSPITAL BASED UPON INPATIENT WEIGHTED UNITS AND AMBULATORY WEIGHTED UNITS

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The study developed a model for the allocation of supply funds to the various clinical services at Keller Army Community Hospital, West Point, based upon inpatient weighted units (IWUs) and ambulatory weighted units (AWUs).

The 1987 inpatient and outpatient workload and supply budgets of Keller were examined. The hospital workload was converted from the MCCU system to the DRG-based IWU, AWU system. The DRG-based workload was then summed to determine the total workload for the hospital. This was then divided into the actual 1987 budget to determine the supply cost per IWU/AWU.

It was not possible to accurately determine inpatient supply budgets due to the lack of a cost-based accounting system. The system currently in place only identifies costs to the ward level, not by service. Therefore, the study concentrated on the outpatient clinics where the financial system tracked costs to specific clinics.

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19. ABSTRACT Continued:

A comparison, by clinic, of the MCCU and DRG-based budgets identified those that would be financial losers under the DRG system (i.e., under the DRG-based budgeting system these clinics would not have gotten as much money as they did under the MCCU system). Conversely, some clinics were identified as winners.

This analysis demonstrated that there would have been some very large (in excess of 500%) shifts in funds. Such large shifts in the budget could not be implemented without creating a great deal of turmoil within the hospital. Therefore, several models were examined that would phase in the implementation of the budget shifts.

The model chosen capped the shift in funds (as a percentage of the difference in the old and new budgets) at 24.9% the first year. During the remaining three years, the budgets were implemented using a Sum of Years Digits Method. This model brought seven clinics on-line the first year and the remainder by 1993.

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Definitions

The definitions of key terms are provided below:

1. Diagnosis Related Groups (DRGs) - A homogeneous set of case types or patient groups which, in the opinion of physicians, require roughly similar products (i.e., services or regimens of care), and hence, consume similar amounts of hospital resources (Grimaldi and Michelletti 1983, 3).

2. Services - Those activities or departments which provide clinical support or devices to a patient.

3. Relative Weighted Products (RWPs) - Dispositions weighted by the CHAMPUS relative cost weights. Each disposition from a service is assigned to a DRG and is weighted by the appropriate CHAMPUS weighting factor for that DRG. The sum of weighted dispositions for a clinical service or Medical Treatment Facility (MTF) is the total RWPs for that level of accumulation (Optenberg et al. 1988a, 2).

4. Case Mix Index (CMI) - Total RWPs for a medical treatment facility (or other level of accumulation) divided by the total dispositions for which the RWPs were determined. The CMI gives RWPs per disposition or the average CHAMPUS weight of all dispositions from the particular level of accumulation (Optenberg et al. 1988a, 2).

5. MTF CMI (FY 1987) - Average RWPs per disposition across the MTF for FY 1987. This factor is used to adjust all subsequent case mix calculations to the MTF average for the base year (Optenberg et al. 1988a, 2).

6. Clinical Service Relative Case Mix Index (RCMI) - The clinical service CMI divided by the FY 1987 MTF CMI. This standardizes workload credit such that the average discharge across all services receives a workload credit of 1.00. For a given service, a RCMI of 1.35 would indicate that based on case mix alone, that services' cost per disposition should be 35% higher than the MTF average, with everything else being equal (Optenberg et al. 1988a, 2).

7. Inpatient Work Units (IWUs) - The workload credit given to an average DOD disposition. Total IWUs for a MTF are calculated by multiplying the MTF's total MEPRS dispositions by the MTF's RCMI.

8. Ambulatory Work Units (AWUs) - The workload credit given an average outpatient visit. The AWUs are determined by multiplying the third level MEPRS clinic category visits by the appropriate AWU weight. Total AWUs for a MTF are calculated by summing the AWUs from each clinic (Munley 1988, 1).

9. Medical Work Units (MWUs) - The sum of IWUs and AWUs.

10. Third level MEPRS clinic category visits - The categorization of the various clinics down to the level that allows specific identification of the procedures that they perform.

11. Medical Expense and Performance Reporting System (MEPRS) - The automated system that accumulates expense and workload data for each MTF (and department within the MTF).

12. Medical/Surgical Unit AID - A locally established APC code used to account for expenses incurred in the provision of healthcare to AIDs patients who were on the medical/surgical unit.

Chapter I

Introduction

The impetus for this project originated from two sources. The first was the author's interest in Diagnosis Related Groups (DRGs) and their applicability to the uniformed services healthcare environment. The second was provided by the Deputy Commander for Administration (DCA) at Keller Army Community Hospital (KACH), United States Military Academy (USMA), West Point, New York. It was his opinion that the imminent introduction of DRGs would necessitate significant changes in the way in which supply funds were allocated to the different services within the hospital.

On 14 November 1986 Congress directed, through P.L. 99-661, the use of a DRG-based measure as the primary means of health resource allocation within the Department of Defense (DOD). Implementation, initially scheduled for FY 1988, was delayed until FY 1989 when DOD realized that a program could not be effected by 1 October 1987. The driving force behind P.L. 99-661 was the escalating cost of healthcare within the DOD. It was thought that a DRG-based system would reduce inefficiency and costs as it had in the civilian healthcare sector. To implement P.L. 99-661,

several changes had to occur within DOD's healthcare system. The most important of these was the development of an accurate workload measure.

Since 1957, the Military Care Composite Unit (MCCU) has been the measure of workload within Army MTFs. The MCCU was found to be insensitive to both workload trends and types, as well as omitting key elements of information. Because of this, there have been several attempts to develop a more appropriate measure. These included the Composite Work Unit (CWU) and the Health Care Unit (HCU). However, neither of these was felt to reflect an accurate measure of workload. The success experienced with DRGs in the civilian sector led the military to examine the feasibility of using them as a workload measure. This examination led to the development of the MWU. The MWU is made up of two parts: (1) the Inpatient Weighted Unit (IWU) and (2) the Ambulatory Weighted Unit (AWU). In contrast to the CWU and HCU, the IWU provides workload credit for inpatient care based on discharges (dispositions), rather than admissions and bed days. The AWU was found to be a much better measure of ambulatory workload than the HCU and was very compatible with the DRG based IWU.

During FY 1989 HSC intended to track both MWUs and MCCUs. The MCCU would continue to be the measure of workload for a hospital or service, and hence, the measure by which medical supplies would be allocated. In addition, HSC would provide MTFs with an MWU-based budget throughout the year. This would enable MTFs to see how resources would

have been distributed had MWUs been the official workload measure (Optenberg et al. 1988a, 1 and Munley 1988, 2).

Initial application of the DRG-based measure to 1986 Health Services Command (HSC) MTF workload data necessitated significant reallocations of supply funds to each MTF (had the DRG system been in use at the time). This finding suggested that a similar change would occur within the MTFs (Optenberg et al. 1988a, 1 and Optenberg et al. 1988c, xxix).

The author applied the same process to the 1987 clinical services data from KACH that had been used on the 1986 HSC MTF data. The author intended to quantify the differences that would have occurred in the amount of medical supply funds received by each service had they been using MWUs rather than MCCUs as their workload measure. A model was then developed for the allocation of medical supply funds and a theoretical MWU based budget was developed for FY 89.

Research Problem

The research problem for this study was to develop a model for the allocation of medical supply funds to the various clinical services at Keller Army Community Hospital, United States Military Academy, West Point, New York, based upon Inpatient Weighted Units and Ambulatory Weighted Units.

Objectives

The objectives of this study were to:

1. Conduct an extensive literature review of the Army Medical Department's (AMEDD) workload measurement techniques, DRGs (particularly how they are used to allocate resources), and the Army's methods of allocating medical supply funds.

2. Classify the individual clinical services' 1987 workload data into IWUs and AWUs.

3. Identify the actual medical supply expenses of each service at KACH for the year 1987.

4. Identify those costs incurred by providing ancillary support, to workload which occurred outside of the hospital, (i.e. CHAMPUS prescriptions filled by the hospital pharmacy) so that those costs may be subtracted from the calculations.

5. Compare the budget each service was actually given, to the budget each would have received based upon the IWU/AWU system.

6. Identify services which will be "money makers" and "money losers" under the IWU/AWU system.

7. Develop a theoretical budget for each service, based upon IWUs and AWUs.

8. Develop a model for the allocation of supply funds to each service at KACH, based upon AWUs and IWUs.

Criteria

The following criteria directly impacted on the recommendations that were made as a result of this study:

1. A difference of five percent or more, between the actual and predicted budget of each service, was considered significant. The author selected this arbitrary figure to identify those services which were considered 'winners' and 'losers'.

2. The developed model must be acceptable to the Commander and Deputy Commander for Administration at KACH.

3. The model chosen must not cause any immediately significant changes in the ability of the clinical services to provide care.

Assumptions

In pursuing this study, the following assumptions were made:

1. The CHAMPUS-based relative weights for DRGs were representative of the supply costs used to treat patients at KACH, within a specific DRG.
2. The workload data provided by KACH was accurate.
3. The budget data provided by KACH was accurate.
4. Patient data collection from 1987 was an accurate basis for this study.
5. Grouping of patients into DRGs, using MEPRS (Medical Expense and Performance Reporting System) was accurate.
6. The MEPRS DRG discharge was the DRG responsible for incurring the majority of the supply costs.

Limitation

For the purpose of this study the following limitation applied: Data used for research was limited to that which was acquired through the Patient Administrative Systems and Biostatistics Agency (PASBA) and Automated Quality Care Evaluation Support System (AQCESS) data bases.

Research Methodology

An extensive literature review was conducted into the methods used to calculate IWUs and AWUs. To ensure that the budgets examined exclusively reflected the clinical services' workload, the total medical supply budget for only the clinical services (AMSC 847792) was used as the baseline, rather than the total MTF supply budget. Those expenses incurred by the ancillary services, in providing service to other departments, were not included in the total expenses of each clinical service. This is because those expenses were considered as a cost of doing business and because those expenses were not available from the cost accounting system. Using this approach ensured that only the "true" expenses were considered in the calculations.

Calculation of IWUs

All dispositions from the individual clinical services were assigned to a DRG and weighted by the appropriate CHAMPUS-relative weight for that DRG. The sum of weighted dispositions for a clinical service, which is the total relative weighted products (RWPs), was calculated.

The case-mix index (CMI) for each service (the total RWPs for the service, divided by the total dispositions for which RWPs were determined) was calculated.

The KACH CMI (average RWPs per disposition across KACH for FY 1987) were determined, and subsequently used to determine the services' relative case-mix index (RCMI).

The total IWUs for each service were determined by multiplying the services' total MEPRS dispositions by their RCMI (Optenberg et al. 1988a, 2).

Calculation of AWUs

The ambulatory inpatient and outpatient visits were determined and total ambulatory visits calculated for each ambulatory subaccount. The total AWUs for each service (ambulatory) were determined by multiplying the services' total MEPRS outpatient visits by the appropriate AWU weight (Optenberg et al. 1988c, 22-24 and Munley 1988, 1 and Encl 1).

Calculation of Expenses and Budgets

The 1987 medical supply expenditures were divided by the number of MWUs (IWUs + AWUs) for KACH, to determine the dollar rate per MWU. The budget for each service was determined by multiplying the MWUs per service by the dollar rate per MWU.

These MWU-derived budgets were compared to the actual service budgets (under the MCCU system) from 1987 to

determine 'winners' and 'losers'. Using the information above, a theoretical supply budget for each service was determined.

Model Formulation

The process used throughout this analysis was synthesized to develop a model for the allocation of supply funds to each service at KACH. The final model met the criteria of this study. Significant changes that were indicated by the chosen model were phased into the operation of the hospital.

Review of the Literature

In 1965, with the implementation of Medicare and Medicaid, the United States ushered in a new era of payment for healthcare. It was to be the era of retrospective, cost-based reimbursement with an emphasis on quality and a corresponding lack of emphasis on costs. Under this type of system, hospitals were reimbursed for whatever they spent. There were no incentives to control costs. Higher costs resulted in higher reimbursements. As a result of this lack of cost containment, healthcare costs skyrocketed. In 1965, healthcare costs in the United States were $41.9 billion dollars. By 1980, costs had reached $247.5 billion and by 1985, they were $425 billion dollars. Costs are projected to reach $750 billion dollars by 1990. Concurrent with this unabated escalation of costs was the increased involvement of the federal government as a payer of the bills (Grimaldi and Michelletti 1982, 2 and Waldo, Levit and Lazenby 1985, 1-3).

A variety of other reasons have contributed, and continue to contribute, to the escalation of healthcare costs. These included increased unit prices for the purchase of labor, utilities and other resources, and increases in the quantity purchased. There have also been several changes related to the population. These included increases in the size of the population, increases in the per capita use of healthcare, and an increasing elderly population -- with concomitant increases in their use of

healthcare. Improvements in the quality of medicine provided, as well as enhanced third party coverage -- lead to increased usage and, hence, costs. In addition, the significant technological improvements and proliferation of subspecialties among healthcare providers have contributed to the increases in healthcare costs. The combined effect of these various factors was the realization by the public and the government that something had to be done quickly to curb the ever increasing costs of health care.

Several approaches were tried to reduce the costs of healthcare. These included the implementation of the Certificate of Need (CON) programs. By requiring a CON, planning agencies could restrict capital expenditures and, therefore, costs. Another method was the use of utilization controls such as Professional Standards Review Organizations (PSROs). These were designed "to check the necessity and appropriateness of care received by federal patients". The intended incentive was that procedures deemed to be inappropriate would not be reimbursed. Hospitals would then be less likely to continue doing them. Rate setting programs were the other approach used and have been the fastest growing of the three types since the first two approaches failed to reduce or curb costs (Grimaldi and Michelletti 1982, 9).

The two basic types of rate setting systems are retrospective and prospective. Retrospective rate setting, as the name implies, established the rate (cost for the procedure) after care has been delivered and the costs have

been incurred. This system resulted in skyrocketing healthcare costs, as exemplified by Medicare. Prospective rate setting systems, on the other hand, established the amount the hospital will be reimbursed -- prior to performing the procedure. To enable this type of system to work, some type of patient classification scheme had to be developed. Researchers at Yale University had been working on such a system since the 1960's and, in fact, had developed one by 1975 (Shakno 1984, 2).

Diagnosis Related Groups (DRGs), as developed by the researchers at Yale University in the late 1960s, were a means of classifying patients by diagnosis. The purpose of DRGs was: to aggregate similar diagnoses so that patients

> could be classified into medically meaningful categories or groups having a relatively low variation in their lengths of stay. In 1975, the Health Care Financing Agency (HCFA) began working with Yale to develop, and then later to improve, a hospital inpatient payment system based on DRGs. Each DRG is clinically coherent and is distinct with respect to both length of stay and cost (Hartzke 1983, vi).

The utility of DRGs lay in the belief that they were "a valid identification and measurement of hospital products or output". This "output" of a hospital was the "mix of services that it provided in the course of treating its patients". The ultimate goal of DRGs was to enable the hospital to group those services that were appropriate for each type of patient. Pivotal to this concept was the recognition "that certain patient demographic characteristics, diagnostic, and therapeutic services were common to patients with a particular problem". Identifying

these patients allowed a framework to be developed within which similar patients were grouped together. Having this framework then allowed the examination of a hospital's products, since each patient would be expected to receive similar services. The diagnosis was the focal point of a patients' treatment. It facilitated "the identification of the pattern of care and, hence, the types and levels of resources required to treat the illness" (Hartzke 1983, iii).

Since 1983, the Department of Health and Human Services has used DRGs to reimburse hospitals for Medicare patients. Although DRGs have not substantially reduced healthcare costs they have at least slowed their growth. During this same period, the DOD has also been experiencing continuously rising costs associated with providing healthcare to its many beneficiaries. Congress took note of stable Medicare costs and rising DOD healthcare costs and mandated the use of a DRG-based system within the DOD. The purpose behind such a move was to achieve successes similar to those within the civilian sector. As Hartzke stated:

> One of the principle objectives of a reimbursement system is to provide incentives for the efficient operation of the hospital. DRG-based, prospective reimbursement systems encourage hospital efficiency through positive cost containment incentives. Therefore, this system does not penalize a hospital for efficiency, an oft-cited defect in cost-based reimbursement (1983, vi).

On 14 November 1986, Congress passed Public Law 99-661.

Section 1101, entitled Diagnosis Related Groups, stated:

> (a) The Secretary of Defense, after consultation with the other administering Secretaries, shall establish by regulation the use of diagnosis related groups as the primary criteria for allocation of resources to facilities of the uniformed services.
> (c) Such regulations shall establish a system of diagnosis related groups similar to the system established under section 1886(d)(4) of the Social Security Act (42 U.S.C. 1395ww(d)(4)). Such regulations shall include the following:
> (1) A classification of inpatient treatments by diagnosis related groups and a similar classification of outpatient treatment.
> (2) A methodology for classifying specific treatments within such groups.
> (3) An appropriate weighting factor for each such diagnosis related group which reflects the relative resources used by a facility of a uniformed service with respect to treatments classified within that group compared to treatments classified within other groups.

It further mandated specific "Reports to Congress", which the Secretary of Defense must make. These included:

> (c) (1) Not later than 1 July, 1987, the Secretary of Defense shall submit to Congress a report detailing--
>
> (A) any plans to establish or implement a system of healthcare enrollment (other than as required under section 702 (a)(2)(C) under section 1099(a) of title 10, United States Code (as added by subsection (a)(1)); and
>
> (B) the plan of the Secretary for completing the implementation of such system.
>
> (2) The Secretary shall submit to Congress--
>
> (A) not later than May 1, 1987, a report on plans of the Secretary for establishing diagnosis related groups for inpatient services under section 1100(a) of title 10, United States Code (as added by subsection (a)(1)); and
>
> (B) not later than May 1, 1988, a report on plans of the Secretary for establishing diagnosis related groups for outpatient services under such sections (United States. House. Committee on Armed Services. 99th Cong., 2nd sess. H.R. 4428. Washington: GPO, 1986).

The Office of the Assistant Secretary of Defense for Health Affairs (OASD[HA]) requested that the Congress support a phased approach to changing the workload measure to comply with the legislation. The phased implementation of the DRG system was scheduled to take five years with initial implementation beginning in FY 1989. During this time, the MTFs would establish case-mix profiles and become familiar with the new measures, while OASD[HA] "developed and tested the necessary automation packages to support the new work unit and related hospital level decision support systems" (Tri-Service Performance Measurement Working Group 1987, 1).

The phased approach had three components: short term, mid-term, and long term. The short term, from FY 1988 through FY 1989, would be used to "refine and integrate

databases, develop software for use at the MTF level, and to create a resource allocation simulation model for testing policy decisions". During this time there would be limited resource allocation based upon DRGs. (Tri-Service Performance Measurement Working Group 1987, 2).

From FY 1990 to FY 1991, the mid-term phase, resource allocation based upon DRGs would begin. Finally, for FY 1992 and beyond, "the availability of the Composite Health Care System (CHCS) would allow the MTFs to link specific resource use with individual patients and, therefore, improve case-mix management capability at the hospital level" (2).

Prior to examining how the military was going to comply with the mandate from Congress it would be helpful to discuss the methods previously used to measure workload. Within the Army, the Military Care Composite Unit (MCCU) was the measure of workload for a hospital or service since 1957. The MCCU measured and credited workload based on the following formula:

$$\text{MCCU} = \frac{\begin{array}{l}(10) * (\#\text{ of admissions}) \\ + (10) * (\#\text{ of live births}) \\ + (1) * (\#\text{ of bed days}) \\ + (0.3) * (\#\text{ of clinic visits})\end{array}}{}$$

Although medicine has changed significantly since 1957, the MCCU has not. As evidenced by the above formula, the number of admissions was an important contributor in the MCCU calculation. The number of admissions was not, however, the end product of a hospital's workload - patient care was. The underlying assumption of the MCCU is that each patient

will consume an equal amount of resources while receiving their treatment. This was simply not true. Thus, the MCCU was insensitive to both workload trends and types as well as omitting key elements of information. In addition to the MCCU, Health Services Command (HSC) also used a cost variable to allocate supply dollars.

The cost variable, unique to each MTF, represented the amount of money that each will receive per MCCU. It was based on historical data and, so, inherently reflected an estimate of the MTF's case-mix. However, this 'inherent reflection' was not precise. For instance, an MTF which was inefficient would continue to be funded at the same rate under the MCCU system due to its inability to account for differences in case-mix. Therefore, attempts were undertaken to develop a more accurate workload measure. These attempts resulted in the Composite Work Unit (CWU) and the two digit Health Care Unit (HCU). However, neither of these were felt to be accurate measures of workload. Therefore, the DOD looked elsewhere for a suitable measure. The success the civilian sector had experienced with DRGs led to the military's investigation into the applicability of using them as a possible method of workload measurement (Health Care Studies and Clinical Investigation Activity 11-15 June 1984, 39 and Optenberg et al. 1988a, 1).

The Navy was the first of the Services to begin investigating the applicability of DRGs within the military healthcare system. In their research, Rieder and Kay found that DRGs "explained significantly more of the total

variation in length of stay (LOS) for patients at Naval hospitals than the other currently used grouping techniques". In fact, DRGs explained 25% of the variation in LOS; this was greater than any other method tested and was statistically significant. However, this amount of explained variance was less than the 43% found in similar DRG-based studies. One of the reasons for this difference was that Navy diagnosis and surgery codes were less specific than those used in the DRG system. Nevertheless, DRGs were still a better method than any other method previously used by the Navy (1985, 266-270).

In 1985, the Tri-Service Performance Measurement Working Group (TPMWG) was established by the OASD(HA) with the mission of developing productivity measures that would lead to the provision of more efficient and cost effective quality medical care. One of their first steps was to evaluate the two digit HCU and expand it to a three digit level. At the three digit level, the HCU provided a significantly enhanced sensitivity to shifts in patient case complexity. However, as neither the two or three digit HCU were based on DRGs, the TPMWG did not recommend that the three digit HCU be used as a replacement for the two digit HCU. This was due to the mandate of The National Defense Authorization Act for Fiscal Year 1987, which directed "the use of DRGs as the primary criteria for allocation of inpatient resources". The TPMWG did however, make several recommendations regarding the use of the three digit HCU. Of these recommendations, the group's recalibration of the

ambulatory portion of the HCU was most important. This was because it resulted in, "an ambulatory workload measure more compatible with the DRG-based inpatient work unit (IWU) that they had developed" (Optenberg, et al. 1988c, 1-7 and United States. House. Committee on Armed Services. 99th Cong., 2nd sess. H.R. 4428. Washington: GPO, 1986).

In 1988 the TPMWG developed the MWU, a DRG-based measure which provided the information needed by managers as well as being sensitive to an MTF's case-mix and workload intensity. The MWU was composed of the IWU and the AWU (both the IWU and the AWU are discussed in the Research Methodology section of this paper).

More work and analysis has been, and continues to be, conducted into the actual use of the MWU within HSC. However, the majority of research at HSC was focused at allocating supply funds to the MTFs - not within the MTFs. Therefore, the purpose of this study was to take the research one step closer to the user and look at the allocation of medical supply funds within the hospital.

Chapter 2

Methodology

Descriptive Statistics

Data for all clinical services that had inpatient and outpatient workload was collected through the MEPRS data base and the Individual Patient Data System (IPDS). The inpatient workload from each clinical service is listed in Appendix A. Shown in Appendix B is the workload from the outpatient clinics.

The first step in the statistical process was the calculation of IWUs and AWUs for each clinical service. Shown in Appendix C is the IWU data for inpatient services, while Appendix D contains the AWU data for outpatient services. With this information it was possible to calculate the total number of IWUs and AWUs for each service as well as for KACH. The formula and an example are shown as follows:

IWUs = RCMI x total inpatient MEPRS dispositions

Total IWUs for KACH:

IWUs = .8443 * 4303

IWUs = 3633.2157

The second step in the statistical process was the calculation of supply dollars spent by each service or clinic in the provision of healthcare. Appendix E contains the break out of supply dollars to each inpatient service, while Appendix F contains the supply dollars for each outpatient clinic. Appendix E clearly demonstrates the accounting system for inpatient services. There are four main inpatient cost pools at KACH and each one is composed of a variety of clinical services. Although the workload for each individual service is collected, this is not entirely the way that the budgets are allocated. Actually, the budgets and expenses are all rolled up into the four cost pools.

This created major problems in linking specific expenses to specific services' workload. The most obvious example of this is the ICU. This cost pool has two components: ICU Med (for medical patients) and ICU Surg (for surgery patients). Although the ICU has a large budget (35% of the total inpatient supply budget) the MEPRS system does not track ICU workload (i.e., it is impossible to obtain a breakout of ICU workload by service or category of patient). As a result of this, it is impossible to determine an accurate supply rate per MCCU or IWU. Therefore, a budget was not calculated for the ICU. In addition, the cost pool Medical/Surgical Unit AID (MSU AID) does not receive any

workload credit. However, the MSU AID incurred expenses in the provision of healthcare on the MSU and so its budget was combined with that of the MSU.

Although it was possible to calculate a budget (Appendix G) for the four inpatient cost pools based upon IWUs, they were not very helpful budgets. With the current system for collecting expense and workload data, it was impossible to tie specific expenses to specific workload. For instance, the current system did not provide a method for determining how much of the expenses incurred by the operating room or central sterile supply should be allocated to a specific patient (diagnosis). For this reason, the author decided not to pursue the development of an IWU-based budget for the inpatient services at KACH (this will be discussed in more detail in Chapter 3).

The outpatient clinic workload and expenses were calculated in much the same manner as the inpatient services. The most noticeable aggregation of workload and expenses occurred in the Pediatric Clinic (Appendix F). Here, all workload was aggregated from the Nursery to the Well Baby Clinic at the Stewart Army Subpost Clinic (STAS). In general the same was done with the expenses, but there were a few differences. The first of these was in the Adolescent Clinic, which received a budget, whereas the other clinics (falling under the Pediatric Clinic) did not.

This also happened in the Social Work and Obstetrics Clinics. In all of these cases, the expenses and workload were aggregated to those clinics which provided similar

services; or were setup in such a manner (i.e. Obstetrics and Gynecology) that their workload and expenses occurred in the same clinic or cost pool.

Discussion and Findings

Prior to proceeding any further with the statistical analysis, a calculation of the descriptive statistics was performed on workload and expenses for both inpatient and outpatient services. These descriptive statistics, including the mean, standard deviation and minimum and maximum values can be found in Appendix H. An examination of these statistics showed that KACH had approximately 564 more AWUs than IWUs. This indicated that KACH was more outpatient intensive than inpatient intensive. In addition, as indicated by the standard deviation, the AWUs vary among clinics to a lesser degree than IWUs.

An analysis of the descriptive statistics for supply dollars revealed an unexpected result. That was, per work unit, AWUs were more expensive than IWUs. Of course, this only applied to the supply expenses portion of the total budget. If the total expenses had been included in the calculation (i.e. manhours, pharmacy, pathology, etc.) then, as expected, IWUs would have been more expensive than AWUs.

Of the 21 ambulatory clinic budgets included in the study (Appendix I) ten of them were "losers" based upon the DRG-based budget. Two of these, the Emergency Room (ER) and Orthopedic Appliance Clinic (OAC) were the only ones with

target budgets in excess of $20,000. For these ten "losers" the mean budget was $19,250. However, when the two clinics (ER and OAC) were deleted from the group the mean budget was only $10,063, a drop of almost 47%. By itself this did not seem very significant. It did, however, gain increased significance when the same analysis was done for workload for the same clinics.

For the ten "losers", the mean workload was 1,727 AWUs. It dropped 30%, to 1,204 AWUs, when the same two clinics (ER and OAC) were dropped from the calculation. This smaller drop in work units, rather than in dollars, represented the high cost of operating these two clinics. This was particularly true in the case of the OAC, which had a budget of $72,000 (the highest in the entire hospital) and only did 55.49 AWUs of work.

Of the twelve "winners", two (Nutrition Care and Primary Care) did not originally have budgets. This made it difficult to evaluate their AWU-based budget. Of the remaining ten "winning" clinics, the highest target budget was $8,000 for the Orthopedic Clinic. The Internal Medicine Clinic had a target budget of $7,000, while the mean budget for the remainder of the clinics was $3,950. Dropping the Orthopedic Clinic from the group lowered the mean by 11%, to $3,500. A corresponding evaluation of the ten-winner workload revealed a mean of 189 AWUs. Deleting the Orthopedic Clinic from the group resulted in a 17% drop, to 156 AWUs.

Again, this may not have seemed significant at first. However, after closer examination, it was clear, that after the Primary Care Clinic, the Orthopedic Clinic did the most work of any of the "winning" clinics in the hospital (489 AWUs). Contrary to the Orthopedic Appliance Clinic, the Orthopedic Clinic had a low supply cost, but it had a much higher workload. This raised the question, for both clinics, of how they were tracking their expenses and workload.

Dropping two of the "winners" and three of the "losers" from some of the calculations served only to emphasize the impact they had on the total budget and workload of the entire hospital. All five were retained in the study so that their predicted budgets could be analyzed. In addition, the author realized that any model for the allocation of supply dollars must include these five clinics due to the amount of workload they accounted for within the hospital.

The next step in the analysis was the examination of the MCCU predicted budget and the real budget. Although it was not clear from the data available, the actual budget was determined from historical expenses. As a result, the budgets inherently reflected any efficiencies or inefficiencies that may have existed within each clinic. The MCCU budget, on the other hand, was at least an attempt to allocate supply funds based on workload. The major problem with the MCCU system was that all work was considered to be equal; i.e., a clinic visit was a clinic

visit, regardless of where it occurred or the amount of resources it consumed. This was easily demonstrated by comparing any two clinics with similar amounts of ambulatory MCCUs. For instance, the Cast and Otorhinolaryngology Clinics had 840 and 841 MCCUs respectively and their MCCU-based budgets were almost identical ($4,302 and $4,310 respectively). On the other hand, their actual budgets were not even within $10,000 dollars of each other. Their AWU budgets were not as different as their actual budgets, but nor were they identical. This variance reflected the difference in the type of procedures they performed and the amount of resources it took to perform them.

The final step in the analysis was the examination of the percentage shifts in funds, from the original budget to the DRG-based budget. This was actually more revealing and important than the predicted budgets. These represented the shifts that the clinics would have to contend with if these budgets were accepted. The mean shift in funds was 110%, with a high of 437% (Occupational Health) and a low of 8% (Podiatry). Removing the Orthopedic and Orthopedic Appliance Clinics from the analysis resulted in a mean shift of 104%, a change of 6% ($87,991). No other clinics were deleted from the analysis due to the small amount of money they represented (i.e., Medical Exams, 407% change was only $6,103).

Budget Transition Alternatives

Immediate implementation of the AWU-based budget resulted in an absolute change in supply dollars of $216,151. This represented an absolute change of 93% of the total supply budget. Obviously this was too large a portion of the entire budget to be reallocated. The impact on the entire system was too severe. Therefore, something had to be done to make the implementation of the DRG-based budget more acceptable. The author's first approach was to remove the two clinics that did not have a budget to begin with (Nutrition Care and Primary Care). This made the absolute change $182,253, or 78%. This was still a large percentage of the total budget to reallocate.

The second approach was to delete the three Orthopedic related clinics (Ortho., Cast, and Ortho. App.) along with the first two (Nutrition Care and Primary Care). This reduced the absolute change to $73,459, or 54%. Utilizing this approach significantly reduced the amount of the budget that was reallocated. However, it did not provide a clear way to allocate supply funds to the latter three clinics.

The third approach was to aggregate the workload, expenses, and budgets of the three orthopedic-related clinics and to delete Nutrition Care and Primary Care. This resulted in a potential reallocation of $135,241, or 58%. This approach provided a method of allocating supply monies to the three orthopedic related clinics, in a manner based on the DRG system.

The final approach was the most highly correlated (of the three) to the current method of budget allocation. Nevertheless, the author rejected the idea of a one year transition to the DRG-based model. While the potential total shift in funds was the lowest percentage of the three approaches, projected shifts in individual clinic budgets were often much larger. This was especially true in smaller clinics.

Appendix J shows that the absolute changes from the actual budgets to the predicted budgets varied from 15% to 558%. A sudden drop in the supply budget placed severe constraints on operations for those clinics with smaller target budgets. On the other hand, a sudden increase in the supply budget, without a commensurate increase in production output, made a clinic appear inefficient. An incremental transition over several years gave the clinics time to adjust to a new productivity measurement unit and lessened the budgetary shock of the transition. The author considered three possible alternatives for transition to the DRG based measure.

Alternative 1: Capped Changes

One method for limiting the shock of transition was to "cap" shifts in funds as a percentage of the change from the clinics' actual budgets. This method brought facilities on-line during the transition period in a manner based upon their deviation from the regression line. The large changes necessitated revising the groups (based upon amount of change) into which the clinics were broken. Of the 18 clinics in this study, two (Mental Health and General Surgery) had changes of less than 5%. These were considered insignificant and were therefore not evaluated any further. Of the remaining 16, five had budgetary changes within + or - 25%, three had changes within 50%, two had changes within 100%, and six had changes in excess of 100% (Appendix K).

This method resulted in seven clinics being brought on-line in the first year, three in the second, one in the third, and seven in the fourth. Each year, for the first three years, the capped shift in funds resulted in funds not allocated (e.g. in 1991 there was $23,846). These funds were reserved for a variety of uses, ranging from capital investments to assisting clinics that experienced difficulties in implementing their new budgets.

Alternative 2: Reverse Depreciation

Normally, depreciation is thought of as a means of allocating the differences between cost and salvage value over a set number of periods in the life of an asset. Various methods are used to accelerate depreciation so that the earlier life of the asset reflects greater depreciation than the later periods. One method typically used is the sum-of-years'-digits (SYD) method. SYD depreciation is calculated by the following formula:

$$SYD = \frac{(Cost - Salvage\ Value) * (Life\ Period + 1)}{(Life * (Life + 1)/2)}$$

The expression Life Period + 1 in the numerator is the life of the asset in the first period, which normally decreases each subsequent period. This expression exhibits a descending pattern of depreciation over the life of the asset. The expression Life * (Life + 1)/2 in the denominator is the sum of the digits 1 + 2 + ... Life (QUE 206).

By substituting the target budget for the cost and the actual 1987 budget for the salvage value the formula becomes:

$$SYD = \frac{(Target\ Pudget - Actual\ Budget) * (Life\ Period + 1)}{(Life * (Life + 1)/2)}$$

Finally, calculating the differences using a life of four periods and reversing the sequence of periods from 1,2,3,4 to 4,3,2,1 provides a schedule of budget transition with the least change the first year and the greatest change the last year. The SYD transition schedule is at Appendix L. A schedule of budget shifts is at Appendix M.

This alternative did not bring any clinic on-line until the end of the transition period. However, the effect of shifts in supply dollars was minimized the first year of the transition. With the exception of the Orthopedic budget, the greatest one year drop in a clinic budget was less than 20%, Appendix N.

Alternative 3: First Year Cap and Three Years of Depreciation

The third alternative combined aspects of the first two alternatives. By using a combination of both alternatives, seven clinics were brought on-line in the first year. The remaining clinics were brought on-line by 1993, using the SYD approach. This alternative left supply funds available each of the first three years (i.e., $23,846 available in 1993) that were used for a variety of other purposes. The projected budgets are reflected in Appendix O, with the annual shift in funds at Appendix P.

Evaluation of the Alternatives

Two criteria were used by the author to evaluate the alternatives: (1) transition time to the target budgets and, (2) amount of shock to the clinics during the transition.

Capping the shift in funds was not only the most direct of the three alternatives, but it also resulted in bringing the most clinics on-line in the shortest amount of time. However, as a result it produced significant shock to the system as a whole.

Reverse depreciation created the least shock of the three alternatives. However, it did not bring any clinics on-line until the final year of the transition period. An advantage of this approach was that it allowed the clinics time to adjust to the DRG-based workload measure.

Combining the first two alternatives resulted in less shock than the first alternative, but more than the second. Of course, it also had the advantage of bringing seven clinics on-line in the first year, with the remaining clinics being brought on- line in the last three years.

Chapter 3

Conclusions and Recommendations

Conclusions

The most obvious shortfall of the current cost accounting system was the inability to account for inpatient costs down to the individual patient level. This made it impossible to accurately track the costs incurred in the provision of care, and hence, the costs of each department. Without this information, it was difficult to compare departmental costs. It was this very knowledge that was needed by the leadership of the hospital. Trying to determine where to make changes, without this type of information, left the manager making uneducated guesses rather than informed decisions.

In addition to the inpatient wards, there were several other areas that consumed supplies, which were not tracked at the individual patient level (operating rooms, recovery rooms, etc..). All of these operations incurred expenses for all types of patients (i.e. internal medicine, orthopedic, general surgery, etc..). Without an accurate system to account for their costs, it was impossible to determine a department or services true supply costs.

It was evident from the data available that some of the clinics (i.e. Med Exams, Occupational Health) received exorbitant increases in their budgets under a DRG-based

system. These increases were probably not necessary; at least not the full amounts predicted using DRGs. Certainly they required some increase over the budget they received in 1987; but, perhaps only a portion of the amount predicted. The author's belief that increases were not necessary was based upon the fact that these same clinics have been able to fulfill their missions with significantly less money. Of course, they would be able to do more with an increased budget. It remains to be seen just how much more they could do and by how much their budgets should be increased.

From the data available for this study, it appeared that several clinics may not have accounted for all of their workload. This was most apparent in the Orthopedic Clinic. In discussions with the current NCOIC, the author learned that in the study year the system for accounting for clinic visits was inaccurate. In many cases, a patient would enter the clinic (and get logged in at the reception desk) to see one of the Orthopedic physicians. The physician would, in turn, use supplies from either the Cast or the Orthopedic Appliance Clinic -- without registering the patient into either of these two clinics. This had the result of making the Orthopedic Clinic appear very expensive and inefficient, with just the opposite effect on the other two clinics. The reason for these results was partially explained by the physical setup of the three clinics (one entrance to all three with no checkpoint in between each clinic).

This study substantiated the belief that DRGs could be utilized as a means of allocating supply monies within a

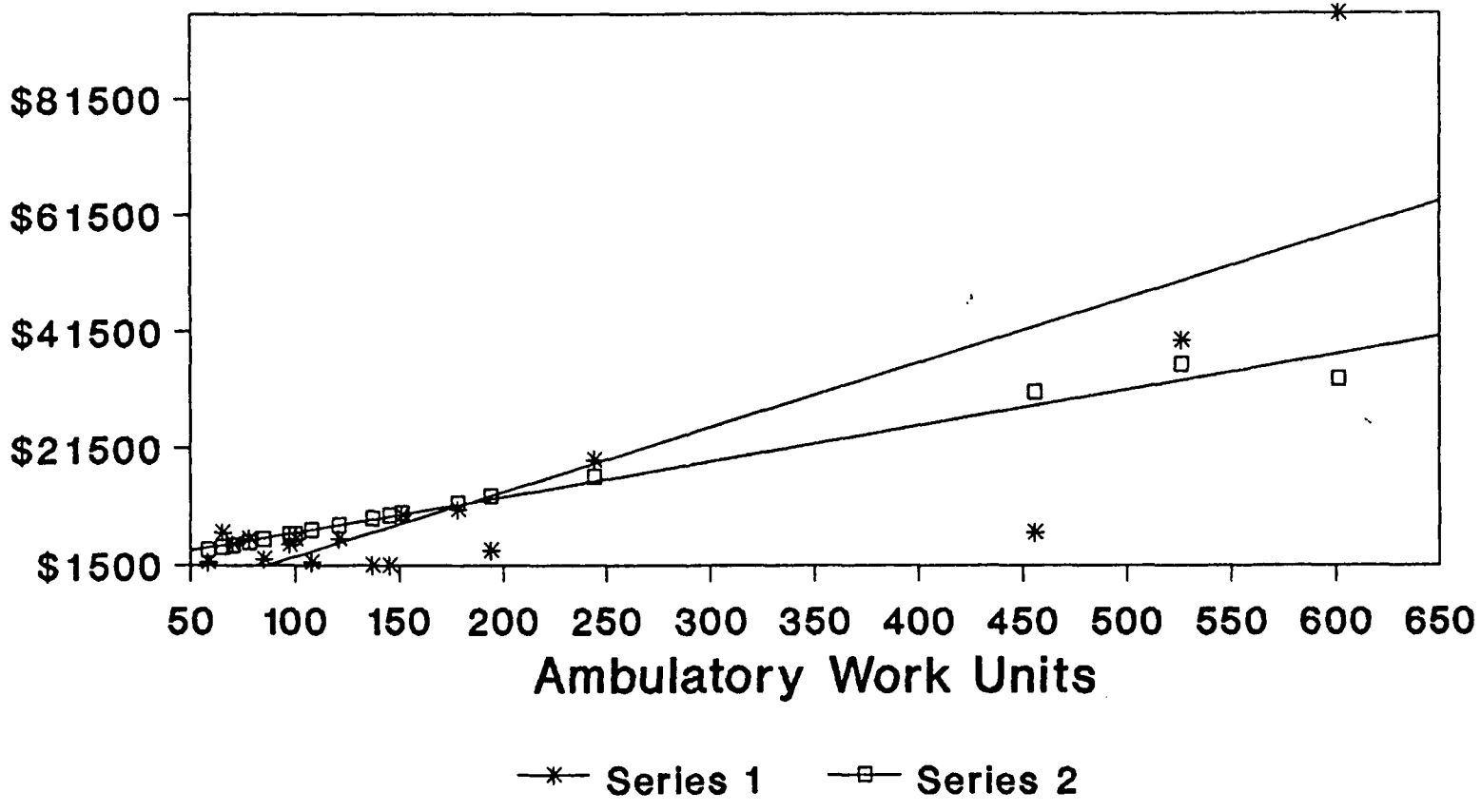
military hospital and that they were a better method than MCCUs. As shown in Appendix R, 98% of the variance (R^2 of .9814) in total supply dollars (predicted) was explained by the independent variable in the model (number of AWUs). When this was compared to the R^2 (.6457) for the total supply dollars (actual budget, based upon MCCUs), it was even more apparent that the DRG based workload measure was a better predictor of supply costs. This can be seen even more readily in Figure 1 (pg. 37).

In Figure 1, Series 1 is the line representing the budget that should have existed, based upon MCCUs, for 1987. The asterisks represent the actual budgets for each clinic. It is clearly obvious that there was a great deal of variance around the line. Series 2 is the line representing what the predicted budget would have been, based upon AWUs. The boxes represent the predicted budgets for each individual clinic. Here, it was clearly obvious that the variance around the line was very small.

FIGURE 1

AWU Workload and Budgets

series 1 is actual and 2 is predicted



The study also demonstrated that the transition to a DRG-based system would have to be phased into operation. Any attempt to immediately institute a DRG-based system would cause more problems than anything else. This was apparent when the wide shifts in funds were examined. Some of the predicted budgets differed from the actual budgets by more than 400%, an amount that was too large to absorb in a short period of time.

All of the budget transition alternatives were viable methods of transitioning to a DRG-based workload measurement system. Of the three, the third alternative offered the most acceptable means of transition.

Also obvious from this study was the fact that the data available for this study was almost two years old. This made evaluation of this data quite straight forward, but the applicability of the findings was questionable. Given the number of changes that have occurred in the hospital, it was possible that some of the results did not apply at this time. In fact, this was the case in the majority of areas in the military healthcare system. The availability of real time data was quite limited, and so useful evaluations of the data (that allow real time decisions to be made) were difficult to make.

This model, even though applied to a small MEDDAC, could be applied to a larger MEDDAC or MEDCEN. In fact, it might be easier to evaluate the inpatient workload and budget due to the existence of unique wards. This would allow the supply costs for certain types of patients to be

determined (very much like they were for the outpatient clinics) and examined in relationship to the amount of workload done by each clinic.

Recommendations

In order to fully succeed (i.e. increase efficiency, decrease costs) under the DRG-based system hospitals have to have a cost accounting system that allows them to identify costs down to the inpatient level. There are numerous other areas that must also have cost accounting systems developed. Among these are: (1) Central Medical Supply, (2) Operating Rooms, (3) Recovery Rooms, (4) Inpatient Pharmacy, (5) Inpatient Radiology, and (6) Inpatient Lab. The first step in this process would be a study to determine what these costs are, by service, and by category of patient.

Those clinics that are to receive exorbitant amounts of money under the DRG system will have to be reevaluated to determine if the amount indicated by DRGs is the amount that they really need. Even though there is significant evidence to show that DRGs are a valid measure of workload, and hence costs, it is possible for a clinic to be given too much money. The result would be a clinic that goes from appearing efficient to one that appears inefficient.

In addition to the clinics that would receive large increases in their budgets there are several clinics that would lose a great deal of money. Both these positive and negative outliers would probably be adversely affected by a transition to a DRG-based workload measure. Further study of these outliers would greatly assist in explaining the deviations present in these clinics.

Given the overriding importance of record keeping, a better system, or at least a more accurate one, must be developed that will ensure all workload is captured and recorded in the correct clinic. Under a DRG system perhaps the most important aspect of workload is documenting it, in the correct place, and with the correct information. Failure to properly document all workload will result in less than optimal 'reimbursement'. Ultimately this will cause the clinic and the hospital to receive less money than they actually deserve.

The significant loss of money incurred by the Orthopedic Service is evidence of improper tracking of patient care. However, in the case of Orthopedics, it may be necessary to evaluate them in more detail. Their actual budget was so large that it might be necessary to treat them as an outlier (similarly to MEDCENS), rather than to drastically reduce their budget. This does not mean that there is not any room for them to become more efficient. Rather, it means that the Orthopedic Service needs to be studied in more detail.

The model that should be used for the allocation of supply funds to each service at Keller is the third transition alternative. A capped shift the first year, followed by a reverse depreciation transition the final three years, provides for the smoothest transition. In addition, as indicated in Chapter 1, the indicated changes were so significant that phasing them into the hospital budget is a requirement. Not only does Alternative 3

minimize transition shock, but it also brings the maximum number of clinics on-line in the first year. Appendix O contains the theoretical budget for each service, based upon AWUs. As previously indicated, it is not possible, given the current data available, to develop an MWU-based theoretical budget.

In addition to utilizing this model to allocate supply funds, it would be helpful to evaluate the FY 1988 supply costs. Several changes have occurred in the management of supply funds at Keller that would probably change some of the results of this study. Among these are the creation of Primary Care and Community Medicine and Cadet Health Clinic budgets. In FY 87 these did not exist, even though workload was being accounted for in these two areas.

A system should be developed that would allow the facility to have access to its patient care data, in a usable form, in real time. Currently, the DRG coding software exists only at PASBA. The facility must submit their data and then wait for PASBA to code it before the facility can then request the coded data back so that they can evaluate it. This obviously places the management of the facility at a disadvantage, and will increase the difficulty they experience in managing the facility supply budget in a DRG environment.

Having the above type of information would also assist the hospital management in evaluating the case mix of the various clinics within the hospital. Currently this information is not available. Certainly, an educated guess

is possible, particularly given the experience of the hospital's leadership. But it is just that -- an educated guess.

In fact, regardless of the model used to allocate funds within an MTF, it will be practically useless without having accurate, complete, real-time data. Once the systems that can produce such data are available to the hospital's leadership, it will be possible to fully maximize the hospital's efficiency to excel within a DRG-based environment.

Appendix A

1987 MCCU Inpatient Workload for Clinical Services

UCA CODE	CLINIC SERVICE	Abbreviated Name*	Adj. Disp.**	MCCUs
AA	Internal Medicine	IC	1,093	15,650
BA	General Surgery	GS	583	8,134
BI	Urology	UR	80	1,013
CA	Gynecology	GYN	123	1,969
CB	Obstetrics	OB	213	4,964
DA	Pediatrics	PED	144	2,454
DB	Nursery (Newborn)	NUR	233	2,816
EA	FP Medical	FPM	220	3,766
EC	FP OB	FPO	71	1,375
ED	FP GYN	FPG	2	22
EF	FP Pediatrics	FPP	1	580***
FA	Orthopedics	ORT	998	14,699
FB	Podiatry	POD	78	1,032
GA	Psychiarty	PSY	22	229
HA	Opthamology	OPT	70	1,013
HB	Otorhinolaryngology	OTO	234	2,912

* These are the abbreviations the author will use in the appendices

** Adjusted Dispositions are total dispositions less bad records

*** The large difference is a demonstration of the variability encountered between workload accounting systems (adj. disp. is MEPRS based, received from PASBA, whereas MCCUs is from a manual accounting system within the PAD office)

Appendix B

1987 MCCU Outpatient Workload Data

UCI CODE	CLINIC SERVICE	Abbreviated Name (1)	Total Visits (2)	MCCUs
AA	Internal Medicine Clinic	IMC	11,554	3,466.0
AL	Nutrition Clinic	NC	789	236.7
AP	Dermatology Clinic	DC	5,040	1,512.0
BA	General Surgery Clinic	GSC	4,388	1,316.0
BD	Opthamology Clinic	OPC	3,634	1,090.2
BF	Otorhinolaryngology Clinic	OTOC	2,806	841.8
BI	Urology Clinic	URC	1,978	593.4
CB	Gynecology Clinic	GYNC	3,128	1,486.5
CC	Obstetrics Clinic	OBC	1,827	**
DA	Pediatric Clinic	PEDC	10,434	3,687.3
DB	Adolescent Clinic	ADC	677	***
DC	Well Baby Clinic	WBC	1,180	***
EA	Orthopedic Clinic	OC	13,524	4,057.2
EB	Cast Clinic	CC	2,801	840.3
EE	Orthopedic Appliance Clinic	OAC	1,702	510.6
EF	Podiatry Clinic	PODC	4,613	1,383.9
FD	Mental Health Clinic	MHC	1,463	728.1
FE	Social Work Clinic	SWC	775	****
BG	Family Practice Clinic	FPC	7,305	2,180.7
HA	Primary Care Clinics	PCC	29,056	8,716.8
HB	Medical Examination Clinic	MEC	4,220	1,266.0
HC	Optometry Clinic	OPTC	10,942	3,282.6
HD	Audiology Clinic	AUDC	3,913	1,173.9
HF	Community Health Clinic	COHC	1,681	504.3
HG	Occupational Health Clinic	OHC	5,713	1,713.9
BI	Emergency Medical Care	EMC	15,731	4,719.3

1 These are the abbreviations the author will use in the appendices

2 Total Visits includes all visits conducted by the appropriate clinic, regardless of whether or not it was an outpatient or inpatient visit.

** Obstetric workload was combined (prior to collection) with that of the Gynecology Clinic

*** Both Well Baby and Adolescent workload was combined (prior to collection) with that of the Pediatric Clinic

**** Social Work workload was combined (prior to collection) with that of the Mental Health Clinic

Appendix C

1987 IWU Workload Data

UCA CODE	CLINIC SERVICE	DSPO	RWPs	CMI	RCMI	IWUs
AA	IM	1093	767.66	0.7023	0.8661	946.64
BA	GS	583	482.42	0.8275	1.0205	594.95
BI	U	80	55.41	0.6926	0.8541	68.32
CA	GYN	123	99.52	0.8091	0.9978	122.72
CB	OB	213	128.74	0.6044	0.7454	158.77
DA	PED	144	75.16	0.5220	0.6437	92.69
DB	NUR	233	45.52	0.1954	0.2409	56.12
EA	FPM	220	172.23	0.7829	0.9654	212.38
EC	FPO	71	41.49	0.5844	0.7207	51.16
ED	FPG	2	0.85	0.4241	0.5230	1.04
EF	FPP	1	0.40	0.4042	0.4985	0.49
FA	ORT	998	808.93	0.8106	0.9996	997.60
FB	POD	78	56.96	0.7302	0.9005	70.23
GA	PSY	22	20.23	0.9195	1.1339	24.94
HA	OPT	70	47.23	0.6747	0.8321	58.24
HB	OTO	234	143.38	0.6127	0.7556	176.81
Total Services		4303	2683.21	0.6847	0.8443	

Total IWUs = (RCMI)*(Total MEPRS Dispositions) = 3633.2157

Appendix D

1987 AWU Workload Data

UCA CODE	CLINIC SERVICE	Total Visits	AWU Weight	AWUs
AA	IMC	11,554	.0395	456.38
AL	NC	789	.0127	10.02
AP	DC	5,040	.0216	108.86
BA	GSC	4,388	.0345	151.38
BD	OPC	3,634	.0276	100.29
BF	OTOC	2,806	.0305	841.80
BI	UC	1,978	.0397	78.52
CB	GYNC	3,128	.0236	73.82
CC	OBC	1,827	.0260	47.50
DA	PEDC	10,434	.0200	208.68
DB	ADC	677	.0254	17.19
DC	WBC	1,180	.0156	18.40
EA	OC	13,524	.0362	489.56
EB	CC	2,801	.0200	56.02
EE	OAC	1,702	.0326	55.48
EF	PODC	4,613	.0211	97.33
FD	MHC	1,463	.0332	52.98
FE	SWC	775	.0213	17.70
BG	FPC	7,305	.0268	194.80
HA	PCC	29,056	.0263	764.17
HB	MEC	4,220	.0326	137.57
HC	OPTC	10,942	.0163	178.35
HD	AUDC	3,913	.0150	58.69
HF	COHC	1,681	.0389	65.39
HG	OHC	5,713	.0255	145.68
BI	EMC	15,731	.0335	526.98
BJ	FMC	91	.0286	2.60
				4197.43

Appendix E

Supply Dollars by Inpatient Service

COST POOL	CLINIC	IWUs	TOTAL IWUs/ MWUs	INPT MCCUs	MED EXP FY 87	NON-MED EXP FY 87	TOTAL SUPPLY EXP	ACTUAL SUPPLY BUDGET
MSU			3367.14	53473	$42,008	$18,620	$60,628	$56,000
	IM	946.65		15650				
	FPIM	212.39		3766				
	GS	594.95		8134				
	OPT	58.25		1013				
	OTO	176.81		2912				
	U	68.33		1013				
	GYN	122.73		1969				
	FPG	1.05		22				
	PED	92.69		2454				
	FPPED	0.5		580				
	ORT	997.6		14699				
	POD	70.24		1032				
	PSY	24.95		229				
MSU AID					$1,075	$829	$1,904	$1,100
ICU				0	$29,135	$9,118	$38,253	$45,000
	ICU MED							
	ICU SURG							
OB			266.07	9155	$22,827	$8,403	$31,230	$25,000
	OB	158.77		4964				
	FPOB	51.17		1375				
	NUR	56.13		2816				
TOTAL		3633.21	3633.21	62628	$95,045	$36,970	$132,015	$127,000

Appendix F
Supply Dollars by Outpatient Clinic

COST POOL	CLINIC	AWUs	AMB MCCUs	MED EXP FY 87	NON-MED EXP FY 87	SUPPLY EXP FY 87	SUPPLY BUDGET FY 87
	NC	10.02	236.7	$66	($14)	$52	$0
	PEDC	244.69	3687.3	$11,482	($11,482)	$0	$6,500
	NURC	0.00		$0	$0	$0	$0
	PED-K	0.00		$0	$0	$0	$0
	PED-S	0.00		$0	$0	$0	$0
	ADC	0.00		$0	$12,027	$12,027	$13,000
	ADC-K	0.00		$0	$0	$0	$0
	ADC-S	0.00		$0	$0	$0	$0
	WBC	0.00		$0	$0	$0	$0
	WB-K	0.00		$0	$0	$0	$0
	WB-S	0.00		$0	$0	$0	$0
	OC	489.57	4057.2	$4,406	$2,645	$7,051	$8,000
	CC	56.02	840.3	$15,618	$40	$15,658	$16,000
	OAC	55.49	510.6	$76,525	$28	$76,553	$72,000
	PODC	97.33	1383.9	$4,087	$15	$4,102	$5,000
	MHC	70.69	728.1	$96	$3,296	$3,392	$5,000
	SWC	0.00		$0	$0	$0	$0
	FPC	194.81	2180.7	$5,380	($1,668)	$3,712	$4,000
	PCC	764.17	8716.8	$4,575	($4,575)	$0	$0
	MEC	137.57	1266.0	$0	$422	$422	$1,500
	OPTC	178.35	3282.6	$13,906	$316	$14,222	$11,000
	COHC	65.39	504.3	$675	$4,916	$5,591	$7,000
	OHC	145.68	1713.9	$638	$795	$1,433	$1,500
	EMC	526.99	4719.3	$32,652	$16,646	$49,298	$40,000
IM CARE				$0	$0	$0	$0
	IMC	456.38	3466.2	$9,026	$701	$9,727	$7,000
	DERM	108.86	1512.0	$2,918	$202	$3,120	$2,000
SURGERY				$0	$0	$0	$0
	GS	151.39	1316.4	$9,531	$204	$9,735	$10,000
	U	78.53	593.4	$5,717	$7	$5,724	$6,000
EENT				$0	$0	$0	$0
	OPTC	100.30	1090.2	$5,930	$243	$6,173	$6,000
	OTOC	85.58	841.8	$2,249	$7	$2,256	$2,500
	AUDC	58.70	1173.9	$2,275	$38	$2,313	$2,000
OB/GYN				$0	$0	$0	$0
	GYNC	121.32	1486.5	$2,825	$368	$3,193	$6,000
	OBC	0.00		$0	$0	$0	$0
TOTALS		4197.43	45308.1	$210,581	$25,173	$235,754	$232,000

Appendix G

Inpatient Workload and Budgets

COST POOL	CLINIC	IWUs	TOTAL IWUs/ MWUs	INPT MCCUs	ACTUAL SUPPLY BUDGET	MWU BASED BUDGET	% CHG ACTUAL TO MWU
MSU			3367.14	53473	$56,000	$76,088	36%
	IM	946.65		15650			
	FPIM	212.39		3766			
	GS	594.95		8134			
	OPT	58.25		1013			
	OTO	176.81		2912			
	U	68.33		1013			
	GYN	122.73		1969			
	FPG	1.05		22			
	PED	92.69		2454			
	FPP	0.5		580			
	ORT	997.6		14699			
	POD	70.24		1032			
	PSY	24.95		229			
MSU AID					$1,100		
ICU				0	$45,000		
	ICU MED						
	ICU SURG						
OB			266.07	9155	$25,000	$6,012	-76%
	OB	158.77		4964			
	FPOB	51.17		1375			
	NUR	56.13		2816			
TOTAL		3633.21		62628	$127,000	$82,100*	

* The difference between the two totals reflects the lack of workload (in MSU AID and ICU) necessary to calculate a budget for these two areas.

Appendix H
Descriptive Statistics

Data Element	Mean	Standard Deviation	Minimum	Maximum
Workload				
IWUs	292.98	348.43	55.95	958.39
AWUs	152.39	184.80	0.00	764.17
INPT MCCUs	4740.42	5319.49	229.00	15650.00
AMB MCCUs	2059.46	1914.84	236.70	8716.80
Supply Dollars (Budgeted)				
Inpatient	$27,366	$22,475	$1,100.00	$56,000
Outpatient	$6,105	$12,988	$0	$72,000

Appendix I
Ambulatory Workload and Budgets

COST POOL	CLINIC	AWUs	AMB MCCUs	SUPPLY BUDGET FY 87	MWU BUDGET	% CHG ACTUAL TO MWU
	NC	10.02	236.7	$0	$553	
	PEDC	244.69	3687.3	$6,500	$13,502	-30%
	NUR	0.00		$0		
	PED-K	0.00		$0		
	PED-S	0.00		$0		
	ADOL	0.00		$13,000		
	ADC-K	0.00		$0		
	ADC-S	0.00		$0		
	WBC	0.00		$0		
	WBC-K	0.00		$0		
	WBC-S	0.00		$0		
	OC	489.57	4057.2	$8,000	$27,059	232%
	CC	56.02	840.3	$16,000	$3,096	-80%
	OAC	55.49	510.6	$72,000	$3,067	-95%
	PODC	97.33	1383.9	$5,000	$5,379	7%
	MHC	70.69	728.1	$5,000	$3,907	-21%
	SWC	0.00		$0		
	FPC	194.81	2180.7	$4,000	$10,767	169%
	PCC	764.17	8716.8	$0	$42,237	
	MEC	137.57	1266.0	$1,500	$7,603	406%
	OPTC	178.35	3282.6	$11,000	$9,857	-10%
	COHC	65.39	504.3	$7,000	$3,614	-48%
	OHC	145.68	1713.9	$1,500	$8,052	436%
	EMC	526.99	4719.3	$40,000	$29,127	-27%
IM CARE				$0		
	IMC	456.38	3466.2	$7,000	$25,255	260%
	DERMC	108.86	1512.0	$2,000	$6,016	200%
SURGERY				$0		
	GSC	151.39	1316.4	$10,000	$8,367	-16%
	UC	78.53	593.4	$6,000	$4,340	-27%
EENT				$0		
	OPTC	100.30	1090.2	$6,000	$5,543	-7%
	OTOC	85.58	841.8	$2,500	$4,730	89%
	AUDC	58.70	1173.9	$2,000	$3,244	62%
OB/GYN				$0		
	GYNC	121.32	1486.5	$6,000	$6,705	11%
	OBC	0.00		$0		
	TOTALS	4197.43	45308.1	$232,000	$232,000	0%

Appendix J

Percent Changes in Clinic Budgets

(actual to predicted)

CLINIC	TARGET SUPPLY BUDGET	PREDICTED SUPPLY BUDGET	TOTAL CHANGE	PERCENT CHANGE
PEDC	$19,500.00	$16,556.03	($2,943.97)	-15.10%
NC				
PEDC-K				
PEDC-S				
ADC				
ADC-K				
ADC-S				
WBC				
WBC-K				
WBC-S				
ORTC	$96,000.00	$40,736.43	($55,263.57)	-57.57%
CC				
OAC				
PODC	$5 000.00	$6,596.25	$1,596.25	31.93%
MHC	$5,000.00	$4,790.81	($209.19)	-4.18%
SWC				
FPC	$4,000.00	$13,202.67	$9,202.67	230.07%
MEC	$1,500.00	$9,323.40	$7,823.40	521.56%
OPTC	$11,000.00	$12,087.15	$1,087.15	9.88%
COHC	$7,000.00	$4,431.61	($2,568.39)	-36.69%
OHC	$1,500.00	$9,873.03	$8,373.03	558.20%
EMC	$40,000.00	$35,715.19	($4,284.81)	-10.71%
IMC	$7,000.00	$30,929.81	$23,929.81	341.85%
DC	$2,000.00	$7,377.67	$5,377.67	268.88%
GSC	$10,000.00	$10,260.01	$260.01	2.60%
UC	$6,000.00	$5,322.14	($677.86)	-11.30%
OPTC	$6,000.00	$6,797.54	$797.54	13.29%
OTOC	$2,500.00	$5,799.93	$3,299.93	132.00%
AUDC	$2,000.00	$3,978.22	$1,978.22	98.91%
GYNC	$6,000.00	$8,222.11	$2,222.11	37.04%
OBC				
TOTAL	$232,000.00	$232,000.00	$0.00	0.00%

Appendix K

Alternative 1
Capped Changes FY 1990 (25%)

CLINIC	PREDICTED SUPPLY BUDGET	TOTAL CHANGE	1990 CHANGE	1990 BUDGET	PERCENT CHANGE
PEDC	$16,556.03	($2,943.97)	($2,943.97)	$16,556.03	-15.10%
NURC					
PEDC-K					
PEDC-S					
ADOC					
ADOC-K					
ADOC-S					
WBC					
WBC-K					
WBC-S					
ORTC	$40,736.43	($55,263.57)	($24,000.00)	$72,000.00	-25.00%
CC					
OAC					
PODC	$6,596.25	$1,596.25	$1,250.00	$6,250.00	25.00%
MHC	$4,790.81	($209.19)	($209.19)	$4,790.81	-4.18%*
SWC					
FPC	$13,202.67	$9,202.67	$1,000.00	$5,000.00	25.00%
MEE	$9,323.40	$7,823.40	$375.00	$1,875.00	25.00%
OPTC	$12,087.15	$1,087.15	$1,087.15	$12,087.15	9.88%*
COHC	$4,431.61	($2,568.39)	($1,750.00)	$2,500.00	-25.00%
OHC	$9,873.03	$8,373.03	$375.00	$1,875.00	25.00%
EMC	$35,715.19	($4,284.81)	($4,284.81)	$35,715.19	-10.71%*
IMC	$30,929.81	$23,929.81	$1,750.00	$8,750.00	25.00%
DC	$7,377.67	$5,377.67	$500.00	$2,500.00	25.00%
GSC	$10,260.01	$260.01	$260.01	$10,260.01	2.60%*
UC	$5,322.14	($677.86)	($677.86)	$5,322.14	-11.30%*
OPTC	$6,797.54	$797.54	$797.54	$6,797.54	13.29%*
OTOC	$5,799.93	$3,299.93	$625.00	$3,125.00	25.00%
AUDC	$3,978.22	$1,978.22	$500.00	$2,500.00	25.00%
GYNC	$8,222.11	$2,222.11	$1,500.00	$7,500.00	25.00%
OBC					
TOTAL	$232,000.00	$0.00	($23,846.13)	$205,403.87	0.00%

* Clinic on line with the predicted budget.

Appendix K

Alternative 1
Capped Changes FY 1991 (50%)

	PREDICTED SUPPLY BUDGET	TOTAL CHANGE	1991 CHANGE	FY 1991 SUPPLY BUDGET	PERCENT CHANGE
PEDC	$16,556.03	($2,943.97)	($2,943.97)	$16,556.03	-15.10%
NURC					
PEDC-K					
PEDC-S					
ADOC					
ADOC-K					
ADOC-S					
WBC					
WBC-K					
WBC-S					
ORTC	$40,736.43	($55,263.57)	($48,000.00)	$48,000.00	-57.57%
CC					
OAC					
PODC	$6,596.25	$1,596.25	$1,596.50	$6,596.25	31.93%*
MHC	$4,790.81	($209.19)	($209.19)	$4,790.81	-4.18%
SWC					
FPC	$13,202.67	$9,202.67	$2,000.00	$6,000.00	230.07%
MEC	$9,323.40	$7,823.40	$750.00	$2,250.00	521.56%
OPTC	$12,087.15	$1,087.15	$1,086.80	$12,087.15	9.88%
COHC	$4,431.61	($2,568.39)	($2,568.30)	$4,431.61	-36.69%*
OHC	$9,873.03	$8,373.03	$750.00	$2,250.00	558.20%
EMC	$35,715.19	($4,284.81)	$4,284.00	$35,715.19	-10.71%
IMC	$30,929.81	$23,929.81	$3,500.00	$10,500.00	341.85%
DC	$7,377.67	$5,377.67	$1,000.00	$3,000.00	268.88%
GSC	$10,260.01	$260.01	$260.00	$10,260.01	2.60%
UC	$5,322.14	($677.86)	($678.00)	$5,322.14	-11.30%
OPTC	$6,797.54	$797.54	$797.00	$6,797.54	13.29%
OTOC	$5,799.93	$3,299.93	$1,250.00	$3,750.00	132.00%
AUDC	$3,978.22	$1,978.22	$1,000.00	$3,000.00	98.91%
GYNC	$8,222.11	$2,222.11	$2,222.40	$8,222.11	37.04%*
OBC					
TOTAL	$232,000.00	$0.00	($33,902.76)	$189,528.84	0.00%

PRE- FY 91 $42,471.16
18.31%

* Clinics on line in FY 1991.

Appendix K

Alternative 1
Capped Changes FY 1992 (75%)

CLINIC	PREDICTED SUPPLY BUDGET	TOTAL CHANGE	1992 CHANGE	1992 BUDGET	PERCENT CHANGE
PEDC	$16,556.03	($2,943.97)	($2,943.97)	$16,556.03	-15.10%
NUR					
PEDC					
PEDC					
ADOC					
ADOC-K					
ADOC-S					
WBC					
WBC-K					
WBC-S					
ORTC	$40,736.43	($55,263.57)	($55,267.20)	$40,732.80	-57.57%*
CC					
OAC					
PODC	$6,596.25	$1,596.25	$1,596.50	$6,596.50	31.93%
MHC	$4,790.81	($209.19)	($209.19)	$4,790.81	-4.18%
SWC					
FPC	$13,202.67	$9,202.67	$3,000.00	$7,000.00	230.07%
MEC	$9,323.40	$7,823.40	$1,125.00	$2,625.00	521.56%
OPTC	$12,087.15	$1,087.15	$1,086.80	$12,086.80	9.88%
COHC	$4,431.61	($2,568.39)	($2,568.30)	$4,431.70	-36.69%
OHC	$9,873.03	$8,373.03	$1,125.00	$2,625.00	558.20%
EMC	$35,715.19	($4,284.81)	($4,284.00)	$35,716.00	-10.71%
IMC	$30,929.81	$23,929.81	$5,250.00	$12,250.00	341.85%
DC	$7,377.67	$5,377.67	$1,500.00	$3,500.00	268.88%
GSC	$10,260.01	$260.01	$260.00	$10,260.00	2.60%
UC	$5,322.14	($677.86)	($678.00)	$5,322.00	-11.30%
OPTC	$6,797.54	$797.54	$797.40	$6,797.40	13.29%
OTOC	$5,799.93	$3,299.93	$1,875.00	$4,375.00	132.00%
AUDC	$3,978.22	$1,978.22	$1,500.00	$3,500.00	98.91%
GYNC	$8,222.11	$2,222.11	$2,222.40	$8,222.40	37.04%
OBC					
TOTAL	$232,000.00	$0.00	($44,612.56)	$187,387.44	0.00%

PRE - FY 1992 $44,612.56
19.23%

* Clinics on line in FY 1992.

Appendix K

Alternative 1
Capped Changes FY 1993 (76%+)

CLINIC	PREDICTED SUPPLY BUDGET	TOTAL CHANGE	1993 CHANGE	1993 BUDGET	PERCENT CHANGE
PEDC	$16,556.03	($2,943.97)	($2,944.50)	$16,555.50	-15.1[illegible]%
NUR					
PEDC-K					
PEDC-S					
ADOC					
ADOC-K					
ADOC-S					
WBC					
WB-K					
WB-S					
ORTC	$40,736.43	($55,263.57)	($55,267.20)	$40,732.80	-57.5[illegible]%
CC					
OAC					
PODC	$6,596.25	$1,596.25	$1,596.50	$6,596.50	31.9[illegible]%
MHC	$4,790.81	($209.19)	($209.19)	$4,790.81	-4.18%
SWC					
FPC	$13,202.67	$9,202.67	$9,228.00	$13,228.00	230.70%*
MEC	$9,323.40	$7,823.40	$7,823.40	$9,323.40	521.56%*
OPTC	$12,087.15	$1,087.15	$1,086.80	$12,086.80	9.88%
COHC	$4,431.61	($2,568.39)	($2,568.30)	$4,431.70	-36.69%
OHC	$9,873.03	$8,373.03	$8,373.00	$9,873.00	558.20%*
EMC	$35,715.19	($4,284.81)	($4,284.00)	$35,716.00	-10.71%
IMC	$30,929.81	$23,929.81	$23,929.50	$30,929.50	341.85%*
DC	$7,377.67	$5,377.67	$5,377.60	$7,377.60	268.88%*
GSC	$10,260.01	$260.01	$260.00	$10,260.00	2.60%
UC	$5,322.14	($677.86)	($678.00)	$5,322.00	-11.30%
OPTC	$6,797.54	$797.54	$797.40	$6,797.40	13.29%
OTOC	$5,799.93	$3,299.93	$3,300.00	$5,800.00	132.00%*
AUDC	$3,978.22	$1,978.22	$1,978.20	$3,978.20	98.91%*
GYNC	$8,222.11	$2,222.11	$2,222.40	$8,222.40	37.04%
OBC					
TOTAL	$232,000.00	$0.00	$21.61	$232,021.61	75%+
			PRE - FY 93		($21.61) -0.01%

* Clinics on line in FY 1993.

Appendix I

Alternative 2
Projected Budgets: Sum of Years Digits Method

CLINIC	FY 1990	FY 1991	FY 1992	FY 1993
PEDC	$19,205.60	$18,911.21	$18,616.81	$18,322.41
NURC				
PEDC-K				
PEDC-S				
ADOC				
ADOC-K				
ADOC-S				
WBC				
WBC-K				
WBC-S				
ORTC	$90,473.64	$84,947.29	$79,420.93	$73,894.57
CC				
OAC				
PODC	$5,159.63	$5,319.25	$5,478.88	$5,638.50
MHC	$4,979.08	$4,958.16	$4,937.24	$4,916.32
SWC				
FPC	$4,920.27	$5,840.53	$6,760.80	$7,681.07
MEC	$2,282.34	$3,064.68	$3,847.02	$4,629.36
OPTC	$11,108.72	$11,217.43	$11,326.15	$11,434.86
COHC	$6,743.16	$6,486.32	$6,229.48	$5,972.64
OHC	$2,337.30	$3,174.61	$4,011.91	$4,849.21
EMC	$39,571.52	$39,143.04	$38,714.56	$38,286.08
IMC	$9,392.98	$11,785.96	$14,178.94	$16,571.92
DC	$2,537.77	$3,075.53	$3,613.30	$4,151.07
GSC	$10,026.00	$10,052.00	$10,078.00	$10,104.00
UC	$5,932.21	$5,864.43	$5,796.64	$5,728.86
OPTC	$6,079.75	$6,159.51	$6,239.26	$6,319.02
OTOC	$2,829.99	$3,159.99	$3,489.98	$3,819.97
AUDC	$2,197.82	$2,395.64	$2,593.47	$2,791.29
GYNC	$6,222.21	$6,444.42	$6,666.63	$6,888.84
OBC				
TOTAL	$231,999.99	$232,000.00	$232,000.00	$231,999.99

Appendix M

Alternative 2
Shift in Funds: Sum of Years Digits Method

CLINIC	FY 1990	FY 1991	FY 1992	FY 1993	TOTAL
PEDC	($294.40)	($588.79)	($883.19)	($1,177.59)	($2,943.97)
NURC					
PEDC-K					
PEDC-S					
ADOLC					
ADOC-K					
ADOC-S					
WBC					
WBC-K					
WBC-S					
ORTC	($5,526.36)	($11,052.71)	($16,579.07)	($22,105.43)	($55,263.57)
CC					
OAC					
PODC	$159.63	$319.25	$478.88	$638.50	$1,596.26
MHC	($20.92)	($41.84)	($62.76)	($83.68)	($209.20)
SWC					
FPC	$920.27	$1,840.53	$2,760.80	$3,681.07	$9,202.67
MEC	$782.34	$1,564.68	$2,347.02	$3,129.36	$7,823.40
OPTC	$108.71	$217.43	$326.14	$434.86	$1,087.14
COHC	($256.84)	($513.68)	($770.52)	($1,027.36)	($2,568.40)
OHC	$837.30	$1,674.61	$2,511.91	$3,349.21	$8,373.03
EMC	($428.48)	($856.96)	($1,285.44)	($1,713.92)	($4,284.80)
IMC	2,392.98	$4,785.96	$7,178.94	$9,571.92	$23,929.80
DC	$537.77	$1,075.53	$1,613.30	$2,151.07	$5,377.67
GSC	$26.00	$52.00	$78.00	$104.00	$260.00
UC	($67.79)	($135.57)	($203.36)	($271.14)	($677.86)
OPTC	$79.95	$159.51	$239.26	$319.02	$797.74
OTOC	$329.99	$659.99	$989.98	$1,319.97	$3,299.93
AUDC	$197.82	$395.64	$593.47	$791.29	$1,978.22
GYNC	$222.21	$444.42	$666.63	$888.84	$2,222.10
OBC					
TOTAL	$0.18	$0.00	($0.01)	($0.01)	$0.16

Appendix N

Alternative 2
Percent of Funds Shifted: Sum of Years Digits Method

CLINIC	FY 1990	FY 1991	FY 1992	FY 1993	TOTAL
PEDC	-1.51%	-3.02%	-4.53%	-6.04%	-15.10%
NURC					
PEDC-K					
PEDC-S					
ADOLC					
ADOC-K					
ADOC-S					
WBC					
WBC-K					
WBC-S					
ORTC	-5.76%	-11.51%	-17.27%	-23.03%	-57.57%
CC					
OAC					
PODC	3.19%	6.39%	9.58%	12.77%	31.93%
MHC	-0.42%	-0.84%	-1.26%	-1.67%	-4.18%
SWC					
FPC	23.01%	46.01%	69.02%	92.03%	230.07%
MEC	52.16%	104.31%	156.47%	208.62%	521.56%
OPTC	0.99%	1.98%	2.96%	3.95%	9.88%
COHC	-3.67%	-7.34%	-11.01%	-14.68%	-36.69%
OHC	55.82%	111.64%	167.46%	223.28%	558.20%
EMC	-1.07%	-2.14%	-3.21%	-4.28%	-10.71%
IMC	34.19%	68.37%	102.56%	136.74%	341.85%
DC	26.89%	53.78%	80.67%	107.55%	268.88%
GSC	0.26%	0.52%	0.78%	1.04%	2.60%
UC	-1.13%	-2.26%	-3.39%	-4.52%	-11.30%
OPTC	1.33%	2.66%	3.99%	5.32%	13.30%
OTOC	13.20%	26.40%	39.60%	52.80%	132.00%
AUDC	9.89%	19.78%	29.67%	39.56%	98.91%
GYNC	3.70%	7.41%	11.11%	14.81%	37.04%
OBC					

Appendix O

Alternative 3
Combined Approach

CLINIC	1990 BUDGET	1991 BUDGET	1992 BUDGET	1993 BUDGET
PEDC	$16,556.03	$16,556.03	$16,556.03	$16,556.03
NURC				
PEDC-K				
PEDC-S				
ADOLC				
ADOC-K				
ADOC-S				
WBC				
WBC-K				
WBC-S				
ORTC	$72,000.00	$66,789.41	$56,368.22	$40,736.43
CC				
OAC				
PODC	$6,250.00	$6,307.71	$6,423.13	$6,596.25
MHC	$4,790.81	$4,790.81	$4,790.81	$4,790.81
SWC				
FPC	$5,000.00	$6,367.11	$9,101.34	$13,202.67
MEC	$1,875.00	$3,116.40	$5,599.20	$9,323.40
OPTC	$12,087.15	$12,087.15	$12,087.15	$12,087.15
COHC	$2,500.00	$5,113.60	$4,840.80	$4,431.61
OHC	$1,875.00	$3,208.01	$5,874.02	$9,873.03
EMC	$35,715.19	$35,715.19	$35,715.19	$35,715.19
IMC	$8,750.00	$12,446.64	$19,839.91	$30,929.81
DC	$2,500.00	$3,312.95	$4,938.84	$7,377.67
GSC	$10,260.01	$10,260.01	$10,260.01	$10,260.01
UC	$5,322.14	$5,322.14	$5,322.14	$5,322.14
OPTC	$6,797.54	$6,797.54	$6,797.54	$6,797.54
OTOC	$3,125.00	$3,570.82	$4,462.47	$5,799.93
AUDC	$2,500.00	$2,746.37	$3,239.11	$3,978.22
GYN	$7,500.00	$7,620.35	$7,861.06	$8,222.11
OB				
TOTAL	$205,403.87	$212,128.24	$220,076.97	$232,000.00
Funds Remaining	$26,596.13	$19,871.76	$11,923.03	$0.00

Appendix P

Alternative 3
Shift in Funds

CLINIC	FY 1990	FY 1991	FY 1992	FY 1993
PEDC	($2,943.97)	$0.00	$0.00	$0.00
NURC				
PEDC-K				
PEDC-S				
ADOLC				
ADOC-K				
ADOC-S				
WBC				
WBC-K				
WBC-S				
ORTC	($24,000.00)	($5,210.59)	($10,421.19)	($15,631.79)
CC				
OAC				
PODC	$1,250.00	$57.71	$115.42	$173.13
MHC	($209.19)	$0.00	$0.00	$0.00
SWC				
FPC	$1,000.00	$1,367.11	$2,734.22	$4,101.33
MEC	$375.00	$1,241.40	$2,482.80	$3,724.20
OPTC	$1,087.15	$0.00	$0.00	$0.00
COHC	($1,750.00)	($136.40)	$272.80	$409.20
OHC	$375.00	$1,333.01	$2,666.01	$3,999.02
EMC	($4,284.81)	$0.00	$0.00	$0.00
IMC	$1,750.00	$3,696.64	$7,393.27	$11,089.91
DC	$500.00	$812.95	$1,625.89	$2,438.84
GSC	$260.01	$0.00	$0.00	$0.00
UC	($677.86)	$0.00	$0.00	$0.00
OPTC	$797.54	$0.00	$0.00	$0.00
OTOC	$625.00	$445.82	$891.64	$1,337.47
AUDC	$500.00	$246.37	$492.74	$739.11
GYNC	$1,500.00	$120.35	$240.70	$361.06
OBC				
TOTAL	($23,846.13)	$3,974.37	$8,494.30	$12,741.48

Appendix Q

Alternative 3
Percent Shift in Funds

CLINIC	PCT SHIFT FY 90	PCT SHIFT FY 91	PCT SHIFT FY 92	PCT SHIFT FY 93
PEDC	-15.10%	0.00%	0.00%	0.00%
NURC				
PEDC-K				
PEDC-S				
ADOLC				
ADOC-K				
ADOC-S				
WBC				
WBC-K				
WBC-S				
ORTC	-25.00%	-5.43%	-10.86%	-16.28%
CC				
OAC				
PODC	25.00%	1.15%	2.31%	3.46%
MHC	-4.18%	0.00%	0.00%	0.00%
SWC				
FPC	25.00%	34.18%	68.36%	102.53%
MEC	25.00%	82.76%	165.52%	248.28%
OPTC	9.88%	0.00%	0.00%	0.00%
COHC	-25.00%	-1.95%	3.90%	5.85%
OHC	25.00%	88.87%	177.73%	266.60%
EMC	-10.71%	0.00%	0.00%	0.00%
IMC	25.00%	52.81%	105.62%	158.43%
DC	25.00%	40.65%	81.29%	121.94%
GSC	2.60%	0.00%	0.00%	0.00%
UC	-11.30%	0.00%	0.00%	0.00%
OPTC	13.29%	0.00%	0.00%	0.00%
OTOC	25.00%	17.83%	35.67%	53.50%
AUDC	25.00%	12.32%	24.64%	36.96%
GYNC	25.00%	2.01%	4.01%	6.02%
OBC				
TOTAL	-10.28%	1.71%	3.66%	5.49%

Appendix R

Regression Analysis
AWUs and Predicted Budget

---------- REGRESSION ANALYSIS ----------

ADER DATA FOR: B:GMTOTBS1 LABEL: Workload and Budgets
MBER OF CASES: 18 NUMBER OF VARIABLES: 3

AWUs and PREDICTED BUDGET (BASED UPON AWUs)

DEX	NAME	MEAN	STD.DEV.
1	AWUs	190.1800	164.6891
2. VAR.:	Pre Bud	12471.5000	10153.5936

PENDENT VARIABLE: Pre Bud

R.	REGRESSION COEFFICIENT	STD. ERROR	T(DF= 16)	PROB.
Js	61.0762	2.1035	29.035	.00000
NSTANT	856.0229			

D. ERROR OF EST. = 1428.3624

r SQUARED = .9814
r = .9906

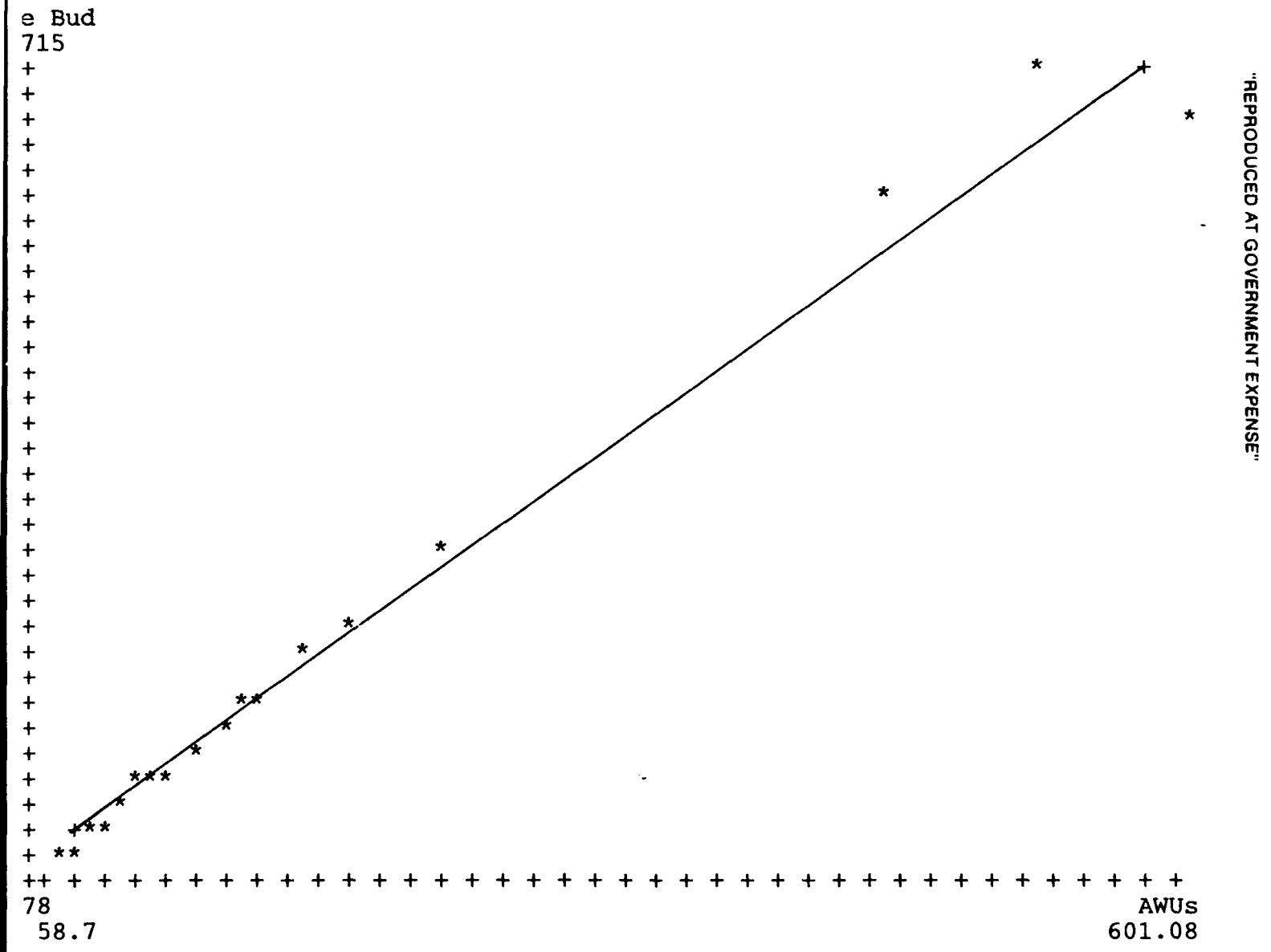
ANALYSIS OF VARIANCE TABLE

OURCE	SUM OF SQUARES	D.F.	MEAN SQUARE	F RATIO	PROB.
GRESSION	1719979358.3512	1	1719979358.3512	843.037	4.000E-14
SIDUAL	32643508.1488	16	2040219.2593		
TAL	1752622866.5000	17			

	OBSERVED	CALCULATED	RESIDUAL	STANDARDIZED RESIDUALS -2.0 0 2.0
1	16556.000	15776.335	779.6653	
2	33223.000	37567.722	-4344.7222	
3	6596.000	6800.572	-204.5722	
4	4791.000	5173.501	-382.5015	
5	13203.000	12754.283	448.7171	
6	9323.000	9258.280	64.7204	
7	12087.000	11748.968	338.0318	
8	4432.000	4849.797	-417.7975	
9	9873.000	9753.608	119.3922	
10	35715.000	33042.584	2672.4155	
11	30930.000	28729.992	2200.0080	
12	7378.000	7504.781	-126.7811	
13	10260.000	10102.353	157.6469	
14	5322.000	5652.339	-330.3391	
15	6798.000	6981.969	-183.9686	
16	5800.000	6082.927	-282.9265	
17	3978.000	4441.197	-463.1975	
18	8222.000	8265.791	-43.7909	

Appendix R

Regression Analysis
AWUs and Predicted Budget



AWUs and PREDICTED BUDGET (BASED UPON AWUs)

ADER DATA FOR: B:GMTOTBS1 LABEL: Workload and Budgets
MBER OF CASES: 18 NUMBER OF VARIABLES: 3

EGRESSION EQUATION (Shown by +'s on scatterplot):

INTERCEPT= 856.022892637 SLOPE= 61.076228348736

r = .9906 r squared = .9814

Appendix R

Regression Analysis
AWUs and Actual Budget

---------- REGRESSION ANALYSIS ----------

ADER DATA FOR: B:GMTOTBS1 LABEL: Workload and Budgets
MBER OF CASES: 18 NUMBER OF VARIABLES: 3

AWUs and ACTUAL BUDGET (BASED UPON MCCUs)

DEX	NAME	MEAN	STD.DEV.
1	Act Bud	12888.8889	22645.3187
P. VAR.:	AWUs	190.1800	164.6891

PENDENT VARIABLE: AWUs

R.	REGRESSION COEFFICIENT	STD. ERROR	T(DF= 16)	PROB.
t Bud	.0058	.0011	5.400	.00006
NSTANT	114.8561			

D. ERROR OF EST. = 101.0386

r SQUARED = .6457
r = .8036

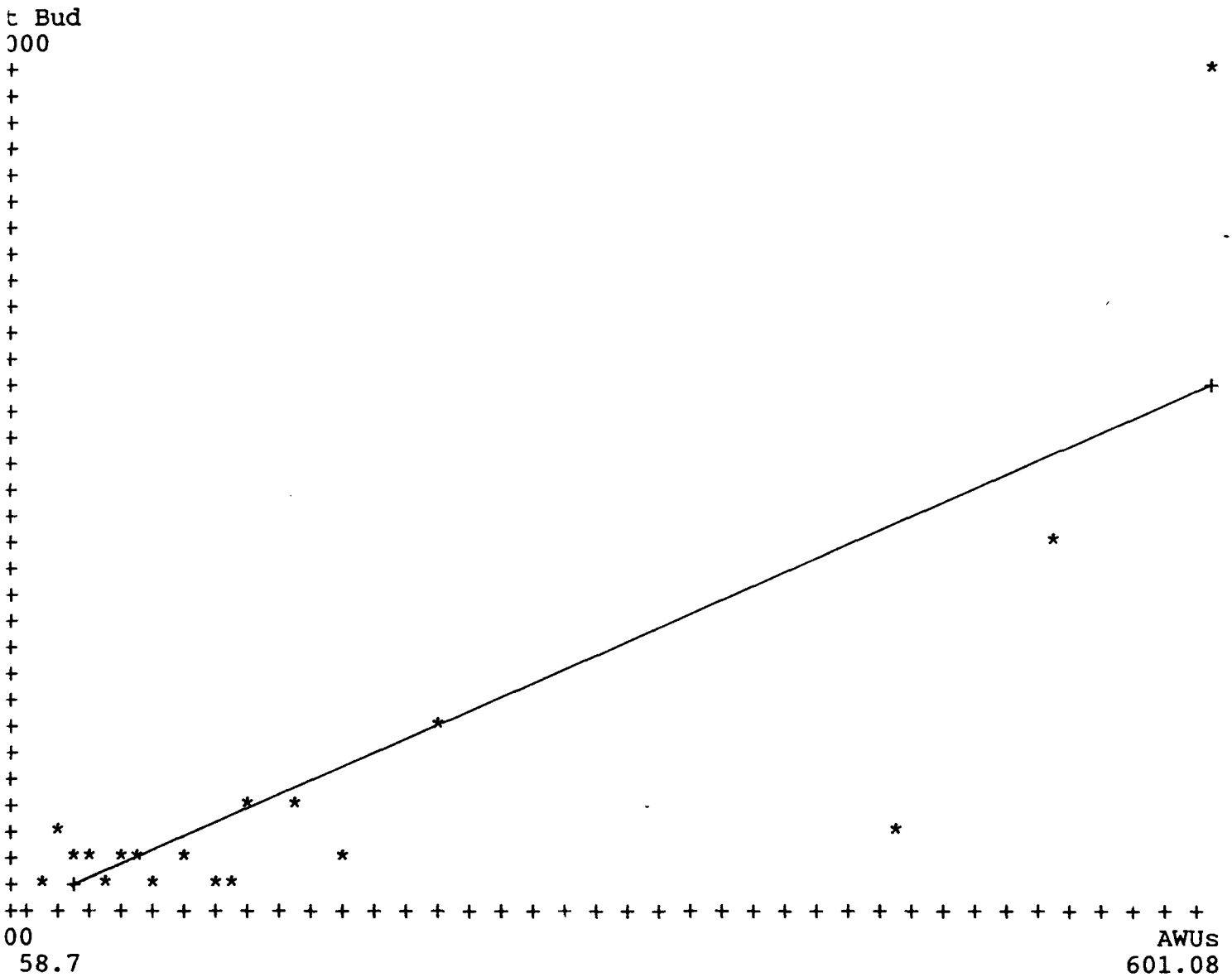
ANALYSIS OF VARIANCE TABLE

OURCE	SUM OF SQUARES	D.F.	MEAN SQUARE	F RATIO	PROB.
GRESSION	297741.9042	1	297741.9042	29.165	5.891E-05
SIDUAL	163340.7820	16	10208.7989		
TAL	461082.6862	17			

	OBSERVED	CALCULATED	RESIDUAL	STANDARDIZED RESIDUALS -2.0 ... 0 ... 2.0
1	244.290	228.816	15.4741	
2	601.080	675.889	-74.8090	
3	97.330	144.077	-46.7466	
4	70.690	144.077	-73.3866	
5	194.810	138.233	56.5775	
6	137.570	123.622	13.9477	
7	178.350	179.141	-.7912	
8	65.390	155.765	-90.3748	
9	145.680	123.622	22.0577	
10	526.990	348.620	178.3702	
11	456.380	155.765	300.6152	
12	108.860	126.544	-17.6843	
13	151.390	173.297	-21.9071	
14	78.530	149.921	-71.3907	
15	100.300	149.921	-49.6207	
16	85.580	129.466	-43.8864	
17	58.700	126.544	-67.8443	
18	121.320	149.921	-28.6007	

Appendix R

Regression Analysis
AWUs and Actual Budget



AWUs and ACTUAL BUDGET (BASED UPON MCCUs)_

ADER DATA FOR: B:GMTOTBS1 LABEL: Workload and Budgets
MBER OF CASES: 18 NUMBER OF VARIABLES: 3

EGRESSION EQUATION (Shown by +'s on scatterplot):

INTERCEPT= -8125.119747724 SLOPE= 110.49536563578

r = .8036 r squared = .6457

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