RUNNING HEAD: Primary Care Re-engineering & Patient Satisfaction

U.S. Army – Baylor University
Graduate Program in Health Care Administration

The Effect Of Primary Care Re-Engineering On Patient Satisfaction at McDonald Army Community Hospital: A Longitudinal Study Of Ex-Post Facto Design

A Graduate Management Project
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Abstract

At the initiation of fiscal year 2000, 1 October 1999, McDonald Army Community Hospital (MACH) at Fort Eustis Virginia transitioned its third floor clinic from a government-owned, contractor-operated (GOCO) primary care source to a government-owned, government-operated (GOGO) primary care source. Implementation of the operational change was intended to be invisible to the supported patient population, but was expected to cause some patient turmoil and frustration nonetheless, with resulting decreased scores on the Department of Defense – Health Affairs (DoD-HA) customer satisfaction survey.

The purpose of the current study was, through univariate analysis of variance (UNIANOVA), to review eight months of DoD-HA survey data, four months prior to and four months post 1 October, to determine if any change in patient satisfaction could be attributed to the operational change. Concurrently, the study analyzed care rendered in MACH's clinics to determine if patient satisfaction differed between primary and specialty care. Three aggregate satisfaction measures: perceived quality of care, satisfaction with care, and satisfaction with clinic, were individually regressed with the other survey elements to identify predictor variables for prioritization of effort and resources.

The results of this study portrayed patients as being much more satisfied with specialty than primary care on all three aggregate measures (quality of care: $F=33.299$, $p<0.000$; satisfaction with care: $F=47.808$, $p<0.000$; satisfaction with clinic: $F=61.521$, $p<0.000$).

Although none of the aggregate satisfaction variables exhibited any change attributable to the 1 October transition, satisfaction with care did demonstrate a significant downward trend over the eight months under analysis ($F=6.546$, $p<0.000$). Regressing overall satisfaction with

care against the other survey elements accounted for 69.8% of the variance ($F=20.049$, $p<0.000$) and yielded 3 statistically significant predictors: staff friendliness and courtesy ($t=3.250$, $p<0.001$), patients' perceptions of providers' personal interest in their problems, ($t=2.364$, $p<0.019$), and the facilities medical record services ($t=-2.029$, $p<0.044$). Recommendations for halting the downward trend in overall patient satisfaction with care include: "hospitality"-type training for primary care and medical records section personnel, and interpersonal skill enhancement for primary care providers.

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INTRODUCTION

Conditions Which Prompted The Study

In fiscal year 1995, the Fleet and Industrial Supply Center (FISC), Norfolk, Virginia issued a contract to Sentara Health System for the operation of several primary care clinics in the Tidewater peninsula area of Virginia. Included was a Government Owned-Contractor Operated (GOCO) primary care clinic established on the third floor of McDonald Army Community Hospital (MACH) at Fort Eustis, Virginia. Per typical GOCO operations, the government provided the facilities, limited supplies, and ancillary services. The contractor provided the medical and support staff, oversaw the day-to-day operation of the clinic, and provided all non-emergent/non-urgent primary care in support of the TRICARE Prime beneficiaries enrolled to the clinic as their primary care manager (PCM).

FISC had until 15 June 1999 to exercise the final option for Sentara to continue clinic operations from 1 October 1999 through 30 September 2000. FISC did not take this option primarily because the GOCO clinics violated a legal ruling concerning the TRICARE Final Rule which adjudicated that there will be no more than one contractor (i.e., the managed care support contractor) at risk in a region (M. Price, Personal Communication, Contracting Officer's Representative, TRICARE Management Region 2, Norfolk VA, December 3, 1999). In TRICARE Region 2, the managed care support contractor is not Sentara Health System but Anthem Alliance Health Insurance Company.

Recognizing this possibility in advance, MACH prepared a business plan in February 1999 to investigate alternatives for re-engineering primary care operations at Fort Eustis. Specifically to ensure compliance with Department of Defense - Health Affairs mandates, as well as the TRICARE final rule, MACH recommended replacing the GOCO clinic with "A

TRICARE Prime outpatient clinic staffed by MTF personnel and supplemented with competitively acquired personnel services contracts for health care providers and support personnel" (MACH, 1999). In June of 1999 the Executive Committee approved this recommendation based on its anticipated advantages:

- It complies with the TRICARE final rule,
- It maintains the scope and intensity of services provided to the 15,500 TRICARE Prime beneficiaries enrolled to the current GOCO clinic,
- It minimizes the impact on those beneficiaries, and
- It results in anticipated cost savings of approximately one million dollars in FY00.

Effective 1 October 1999, this plan became a reality at MACH.

Though unstated in the business plan, throughout this recommended alternative and its analysis was the assumption that not only could the same scope and intensity of services be maintained, but to the same if not better levels of quality and accessibility as perceived by the supported patient population. This would be necessitated to ensure the 15,500 enrolled personnel do not become dissatisfied with the care rendered after 1 October 1999, disenroll, and re-enroll to either the contractor or the three other TRICARE Prime enrollment sites on the Tidewater peninsula. Furthermore, this plan also assumes minimal impact to the 19,000 TRICARE Prime beneficiaries enrolled to the government owned and operated primary care clinics in the rest of the hospital (i.e., the first floor general outpatient and pediatrics clinics). If the direct care rendered to these 19,000 other TRICARE Prime beneficiaries was to be negatively impacted, they too might disenroll and re-enroll elsewhere.

Statement Of The Problem Or Question

As measured by the DoD-HA monthly customer satisfaction survey, what is the effect on patients' satisfaction of the 1 October 1999 operational change from a government owned - contractor operated clinic run by Sentara Health Systems to a government owned–government operated clinic run by McDonald Army Community Hospital? Which survey elements demonstrate advantageous improvement and how does MACH continue to capitalize on them? Conversely, what elements demonstrate deleterious effects and what additional operational interventions must MACH undertake to correct and hone them?

Literature Review - General

With the advent of cost containment methodologies for health care spending by both consumers and insurers over the last two decades, the interest, research, and resulting literature on patient satisfaction has taken on increased importance. As consumers continue voting for health plans with their feet, the level of patient satisfaction potentially has direct impact on revenues generated by the healthcare organization.

Patient satisfaction, however, is no easy characteristic to define. Many studies focus on socio-demographic characteristics that affect patients' quality assessments (Tucker & Munchus, 1998). However, the results of associations between patient satisfaction and socio-demographic variables are inconsistent, sometimes contradictory, and have limited predictive power (Cleary & McNeil, 1988; Tucker & Munchus, 1998). One notable exception is the relatively consistent finding that older patients tend to report higher satisfaction levels than younger patients (Gross, Zyzanski, Borawski, Cebul, & Stange, 1998; Meit, Williams, Mencken, & Yaske, 1997; Willaims & Calnan, 1991; Cleary & McNeil, 1988). More often, different studies find contradictory results for the same socio-demographic variables they purport to measure. For

example, Cooper-Patrick et al. found gender was not significantly related to patient's participatory decision making (PDM) score which in turn was highly associated with patient satisfaction within all race / ethnicity groups (Cooper-Patrick, Gallo, Gonzales, Vu, Powe, Nelson, & Ford, 1999). By contrast, Willaims & Calnan concluded that women tended to be slightly less satisfied than men with general practice and organizational aspects of care (Williams & Calnan, 1991).

Due to the inconsistencies in the literature concerning patient satisfaction variables, the author of the current study endeavored to glean insight from any meta-analyses already conducted. Two provided valuable insight. In 1981, Ware published "How to survey patient satisfaction" in which he described five major dimensions of patient satisfaction: the quality of care received, the accessibility / convenience of care, the cost and financing of care, the availability of care, and the physical environment in which care was rendered (Ware, 1981). Although Ware did not delineate the specific variables related to each dimension, his qualitative descriptions indicated the nature of the variables applicable to each.

Ten years later, Hughes published "Satisfaction with Medical Care: A Review of the Field" in which he postulated thirty-five specific predictors of satisfaction, including the ten Picker Commonwealth sub-components of quality interpersonal care. Like Ware, Hughes grouped these predictors into general categories/dimensions, however Hughes' dimensions were less decisive and included sub-dimensional groupings as well. A crosswalk of Ware's and Hughes' variable groupings is provided at Table 1.

Table 1 – Categorical Grouping Of Patient Satisfaction Variables

Variable Category	Ware (1981)	Variable	Hughes (1991)
Socio-demographic variables		Age	Y
		Gender	Y
		Race	Y
		Education	Y
		Income	Y
Patient's Attitudes & Expectations		Health status evaluation	Y
		Life satisfaction	Y
		Confidence in medical community	Y
Environment of care	Y	Continuity of care, continuous doctor-patient relationship	Y
		Visitation policies (inpatient care only)	Y
		Accessible to relatives' and friends' visitations (inpatient only)	Y
		Physicians' and staff's communication with relatives and friends	Y
		Food service	Y
		Cleanliness & appearance of facility and staff	Y
		Courteous and prompt treatment by admissions, discharge, and billing staff	Y
		Preparation for discharge and post discharge care	Y
Technical quality of care	Y	Physicians' technical skills	Y
		Satisfaction with perceived technical competence of physician	Y
		Nurses and physician extenders' technical skills	Y
		Satisfaction with perceived technical competence of nurses and physician extenders	Y
Interpersonal aspects of care		Satisfaction with physicians' nurses' and staff's interpersonal skills	
		Involvement of patient in decision making	Y
		Education of patient on condition and treatment	Y
		Support for & involvement of family member(s)	Y
		Communication between patients and health professionals	Y
		Emotional support of patient	Y
		Timely attention to patient's physical needs	Y
		Prompt & appropriate pain relief	Y
		Adequate financial information & counseling	Y
		Information regarding surgical procedures (pre and post operative)	Y
Cost of care / billing	Y	Out of pocket costs	Y
		Payment method (bill vs. at site of care vs. via 3rd party, etc.)	Y
Accessibility / convenience	Y	Convenience	Y
		Waiting time for an appointment	Y
		Waiting time in waiting room	Y
Availability of care	Y	Proximity of care	Y

The author acknowledges that two or more variables in the above model may be measuring the same construct. For example, both Hughes and Ware purport that waiting times and convenience of care are two different variables. While the author of the current study acknowledges this and includes both as separate variables, he does not ignore the possibility that waiting times and convenience of care may, in the extreme, be the same thing. Stated another way, if access to care is measured in the length of time to be appointed for care, and convenience of care is measured as the presence or absence of services in proximity to the patient, than a lack of a specific service in a given geographic area could be construed as infinite waiting time for an appointment for that service.

The author's intent in summarizing Ware's and Hughes' research in Table 1 is to provide a synoptic review of patient satisfaction literature in the more global healthcare environment as an introduction to a more detailed literature review focused specifically on patient satisfaction in the military health system. Toward that end, Table 2 identifies civilian studies whose conclusion(s) support the statistical significance of Ware's and Hughes' variable categories.

Table 2 - Variable Categories, Variables, & Studies

Variable Category	**Example Variables**	**Studies Demonstrating Statistical Significance of Variable *Category***
Socio-demographic variables	Age Gender Race Education Income	Willaims & Calnan, (1991) Kurata, Watanabe, McBride, Kawai, & Andersen, (1994) Meit, Williams, Mencken, & Yaske, (1997) Gross, Zyzanski, Borawski, Cebul, & Stange, (1998) Cooper-Patrick, Gallo, Gonzales, Vu, Powe, Nelson, & Ford, (1999) Zemencuk, Hayward, Skarupski, & Katz, (1999)

Table 2 - Variable Categories, Variables, & Studies (Continued)

Variable Category	**Example Variables**	**Studies Demonstrating Statistical Significance of Variable *Category***
Patient's Attitudes & Expectations	Health status evaluation Life satisfaction Confidence in medical community	Williams & Calnan, (1991) Probst, Greenhouse, & Selassie, (1997) Gross, Zyzanski, Borawski, Cebul, & Stange, (1998) Grumbach, Selby, Damberg, Bindman, Quesenberry, Truman, & Uratsu, (1999) Zemencuk, Hayward, Skarupski, & Katz, (1999)
Environment of care	Continuity of care, continuous doctor-patient relationship Visitation policies (inpatient care only) Accessible to relatives' and friends' visitations (inpatient only) Physicians' and staff's communication with relatives and friends Food service Cleanliness & appearance of facility and staff Courteous and prompt treatment by admissions, discharge, and billing staff Preparation for discharge and post discharge care	Willaims & Calnan, (1991) Meit, Williams, Mencken, & Yaske, (1997) Probst, Greenhouse, & Selassie, (1997) Schmittdiel, Selby, Grumbach, & Quesenberry, (1997) Druss, Rosenheck, & Stolar, (1999)
Technical quality of care	Physicians' technical skills Satisfaction with perceived technical competence of physician Nurses and physician extenders' technical skills Satisfaction with perceived technical competence of nurses and physician extenders	Willaims & Calnan, (1991) Kurata, Watanabe, McBride, Kawai, & Andersen, (1994) Froehlich & Welch, (1996) Isenberg & Stewart, (1998) Schultze (1998) Chung, Hamill, Kim, Walters, & Wilkins, (1999) Druss, Rosenheck, & Stolar, (1999)

Table 2 - Variable Categories, Variables, & Studies (Continued)

Variable Category	**Example Variables**	**Studies Demonstrating Statistical Significance of Variable *Category***
	Satisfaction with physicians' nurses' and staff's interpersonal skills Involvement of patient in decision making Education of patient on condition and treatment Support for & involvement of family member(s) Communication between patients and health professionals Emotional support of patient Timely attention to patient's physical needs Prompt & appropriate pain relief Adequate financial information & counseling Information regarding surgical procedures (pre and post operative)	Williams & Calnan, (1991) Kurata, Watanabe, McBride, Kawai, & Andersen, (1994) Thompson, Yarnold, Williams, & Adams, (1995) Froehlich & Welch, (1996) Probst, Greenhouse, & Selassie, (1997) Gross, Zyzanski, Borawski, Cebul, & Stange, (1998) Chung, Hamill, Kim, Walters, & Wilkins, (1999) Cooper-Patrick, Gallo, Gonzales, Vu, Powe, Nelson, & Ford, (1999)
Cost of care / billing	Out of pocket costs Payment method (bill vs. at site of care vs. via 3rd party, etc.)	Probst, Greenhouse, & Selassie, (1997) Cleary & McNeil, (1988)
Accessibility / Convenience	Accessibility Waiting time for an appointment Waiting time in waiting room Convenience	Thompson, Yarnold, Williams, & Adams, (1995) Probst, Greenhouse, & Selassie, (1997) Chung, Hamill, Kim, Walters, & Wilkins, (1999)
Availability Of care	Proximity of care	Williams & Calnan, (1991) Grumbach, Selby, Damberg, Bindman, Quesenberry, Truman, & Uratsu, (1999)

Literature Review – Military Environment

The environment in which care is rendered in the military health system has significant impact upon patients' satisfaction with the care received both at the macro and micro levels. At the macroscopic level, if military healthcare is not conveniently obtainable, patients tend to be less satisfied in general. In 1982, Grant found that the greatest sources of patients' dissatisfaction with military healthcare included waiting times to obtain appointments for care, and waiting

times in clinics for care, pharmaceuticals, and radiological services (Grant, 1982). Ten years later, Mangelsdorff et al. found that of the beneficiaries who did not use a military treatment facility, 22% reported it was too difficult to get an appointment, 18% reported the services they required were unavailable, 11% reported the closest military MTF was too far away, and 8% reported the care was not conveniently located to them (Mangelsdorff, George, Ware, Zucker, & Twist, 1992). Similarly, access to care correlated positively and significantly in both Allan's & McCorquodale 's 1992 studies (Allan, 1992; McCorquodale, 1992).

Access to care appears to be greatly influenced by patients' perceptions of access, regardless of how available care may actually be. In a 1996 study regarding base realignment and closure (BRAC) of military MTFs, the Department Of Healthcare Administration at Fort Sam Houston concluded that closure of military hospitals negatively affected patient satisfaction in the applicable geographic area. This finding resulted even though both the quality and availability of care remained the same; albeit the latter provided via contractual arrangements with non-military MTFs (DHA, 1996).

At the microscopic level, the operational delivery of healthcare services, and patients' involvement in the choice of service delivery, consistently affects patients' aggregate satisfaction levels. For example, patients' ability to choose a provider and the continuity of the patient-provider relationship correlated positively and significantly with satisfaction (Grant, 1982; McCorquodale, 1992). As expected greater provider-patient ratios, especially the nurse-patient ratio on inpatient wards, were associated with higher satisfaction levels (Anderson, Maloney, Beard, 1998; DHA, 1996).

Although one might expect a positive correlation between the staff's job satisfaction and patient satisfaction, several studies to date demonstrate conflicting results. In the 1996 study of

nursing care at a BRAC site, the Department of Healthcare Administration at Fort Sam Houston concluded patient satisfaction was higher on units where nurses were more satisfied (DHA, 1996). Alternatively, Anderson, et al. found no correlation between patient satisfaction and employees perceptions of the work environment (Anderson, Maloney, & Beard, 1998).

Table 3 - Environmental Variable Summary (Military Environment)

Variable	**Studies demonstrating statistical significance**	**Studies demonstrating no statistical significance**
Wait time For Appointment	Grant (1982) Mangelsdorff, George, Ware, Zucker, & Twist (1992)	None
Wait Time In Clinic	Grant (1982)	None
Wait Time For Pharmaceuticals	Grant (1982)	None
Wait Time For Radiological Services	Grant (1982)	None
Convenience Of, Access To, & Proximity Of Care	Mangelsdorff, George, Ware, Zucker, & Twist (1992) Alan (1992) McCorquodale (1992)	None
Hospital Closure	Department of Healthcare Administration, AHS, Ft. Sam Houston, Tx. (1996)	None
Patient Choice Of Provider & Continuity Of Patient-Provider Relationship	Grant (1982) McCorquodale (1992)	None
Provider / Patient Ratio	Anderson, Maloney, & Beard (1998) Department of Healthcare Administration, AHS, Ft. Sam Houston, Tx. (1996)	*None*
Staff's Perception Of Work Environment	Department of Healthcare Administration, AHS, Ft. Sam Houston, Tx. (1996)	Anderson, Maloney, & Beard (1998)

The cost of care is a variable dimension representing a plethora of possible variables. In addition to the total cost of care, finance related variables are further complicated by the multiple financing mechanisms for the healthcare delivered. Cleary, et al. found that related to financing options: the higher the cost the lower the level of patient satisfaction, that patients in prepaid plans tend to be more satisfied with financial arrangements but were mixed on overall

satisfaction compared with fee-for-service (FFS) patients, and that patients in Independent Practice Associations (IPAs) appear to have comparable satisfaction levels as patients with FFS insurance. To further confound the situation, satisfaction with financing arrangements of healthcare delivery may be affected by patient's income levels (Cleary & McNeil, 1988). Although beneficiaries of military health care pay minimal, if any, cost for the care received, compared with their civilian counterparts, this is not to assume military health care is devoid of financial variables related to satisfaction levels. As early as 1982, Grant found respondents more satisfied with military than civilian care even when the cost was the same and that the greatest sources of satisfaction were: the apparent level of skill of the providers, the cost of care received [or lack thereof], and knowing military doctors have no profit motives them (Grant, 1982). Ten years later, Mangelsdorff et al. found higher levels of patient satisfaction reported with CHAMPUS, Private, or other funded programs (Mangelsdorff et al., 1992). This latter result was verified in Mangelsdorff's subsequent study in 1994 where individuals receiving care funded by CHAMPUS, private, or other means were generally more satisfied with their care (Mangelsdorff, 1994). Within the military dental care environment, Chisick concluded that the status of family dental insurance, present versus not, was statistically significant to predicting service members' satisfaction with family dental care (Chisick, 1999). In the aggregate, these studies indicate that the less out-of-pocket costs incurred by patients and the more insulated from the cost of care the patients are, ceterius paribus, the greater the patients' satisfaction with the care provided.

Table 4 - Financial Variable Summary(Military Environment)

Variable	**Studies demonstrating statistical significance**	**Studies demonstrating no statistical significance**
Cost of Care	Grant (1982) Mangelsdorff, George, Ware, Zucker, & Twist (1992) Mangelsdorff (1994) Chisick, (1999)	None

Commensurate with research in the civilian sector, the aspect of care that has received the

greatest analysis related to patient satisfaction is the interpersonal dimension of the healthcare intervention. The most consistent finding is that the characteristics of the provider or organization that make care more "personal" are associated with higher levels of satisfaction (Cleary & McNeil, 1988). Little evidence exists indicating whether patients can or cannot provide useful information about interpersonal aspects of care received, but the assumption they can appears reasonable in all respects (Ware, 1981). This assumption is employed in a variety of research and is generally supported by the result. Physicians' interpersonal skills are consistently found to correlate positively and significantly with patients' satisfaction levels, as are nurses' and the medical and administrative staffs' interpersonal skills (Allan, 1992; McCorquodale, 1992). Specific interpersonal aspects of interventions (reassurance, support, and interest in outcomes) are important to patients (Tucker & Munchus, 1998). Particularly noteworthy are the patients' perception of the empathy, reliability, responsiveness, communication, and caring provided by the staff in general (Tucker & Munchus, 1998), and the patient's perception of the attention, courtesy, concern, and personal interest displayed by the provider in specific (Tucker, 1998). Clearly both the quality and quantity of communication between the patient and medical, nursing, and support staff is paramount to a satisfactory intervention.

Table 5 - Interpersonal Variable Summary(Military Environment)

Variable	**Studies demonstrating statistical significance**	**Studies demonstrating no statistical significance**
Physicians' Interpersonal Skills	Allan (1992) McCorquodale (1992)	None
Nurses' Interpersonal Skills	Allan (1992) McCorquodale (1992)	None
Staff's Interpersonal Skills	Allan (1992) McCorquodale (1992)	None
Reassurance/Support From Provider	Tucker (1998)	None
Empathy, Reliability, Responsiveness, Communication, and Caring	Tucker & Munchus (1998)	None
Provider's Attention, Courtesy, And Concern For The Patient As	Tucker (1998)	None

A Person, And Personal Interest In The Outcome		

Within the military environment different studies found socio-demographic variables to be of varying significance. While Allan found no significant correlation between patient satisfaction and socio-demographic variables at all (Allan, 1992) his results are unusual and not borne out by other research. For example, all other studies specifically investigating patients' age and its relationship with satisfaction consistently find positive correlations (Grant, 1982; Mangelsdorff, 1994; Tucker, 1998; & Tucker & Munchus, 1998; Young, Meterko, & Desai, 2000).

In two separate studies, Mangelsdorff found that individuals who used the military health system were generally satisfied with the care received, particularly the friendliness, courtesy, and general support provided by the doctors and staff (Mangelsdorff, 1990; Mangelsdorff, 1994). This was also supported in Grant's earlier study who concluded that patients who had higher utilization rates were typically older and more satisfied with care received than younger respondents (Grant, 1982). Tucker, on the other hand, noted that utilization of the military health system was negatively correlated with satisfaction (Tucker, 1998).

Analysis of military beneficiary categories has also yielded relatively consistent results. All studies that included the variable of beneficiary category reported significant differences in self-reported satisfaction levels with, in general, retired personnel most and active duty personnel least satisfied (Mangelsdorff, 1990; Oliver, 1990; Mangelsdorff, George, Ware, Zucker, & Twist 1992; Mangelsdorff, 1994; & Tucker & Munchus, 1998). Of significant note, Grant's 1982 study found that while significant differences exist in satisfaction levels between beneficiary categories, no significant difference exists between the sponsor and their family members' satisfaction. This, of course, may be a direct result of the consistent finding that age is positively

associated with patient satisfaction since retirees are typically older than active duty personnel. Among active duty members, one would similarly expect rank to be positively correlated with satisfaction levels because the higher a service members' grade, the older he or she generally is. As expected, the higher a service member's rank, the higher the reported quality of care ratings (Tucker & Munchus, 1998), although since the age continuum exists in both officer and enlisted grades, no statistically significant difference was found between officers' and enlisted satisfaction levels (Grant, 1982).

Six other socio-demographic variables are often investigated in military patient satisfaction studies: gender, marital status, race, self-reported health status, uniformed service affiliation, and geographic location; however the conclusions regarding these attributes vary widely. While Grant found no significant difference of patients' gender on their levels of satisfaction (Grant, 1982), Kressen et al. observed different gender-based characteristics associated with satisfaction between men and women (Kressen, Skinner, Sullivan, Miller, Frayne, Kazis, & Tripp, 1999) and Tucker & Munchus concluded that female patients generally had higher perceptions of the quality of the care they received (Tucker & Munchus, 1998). In this latter study, Tucker and Munchus also found statistically significant differences in marital status, race, self-reported health status, uniformed service affiliation, and geographic location on patients' satisfaction; with married, Caucasian, healthy, Air Force personnel residing overseas reporting the highest aggregate level (Tucker & Munchus, 1998). Within the continental United States, however, assignment to one catchment area versus another had only borderline correlations (Tucker, 1998).

The aforementioned conclusions relating to socio-demographic variables are not unique to military ***medical*** care. Chisik found similar patterns in his analysis of patients' satisfaction

with care rendered in military ***dental*** treatment facilities. Age, rank, gender, uniformed service affiliation, utilization of services, self-reported health status, and (though not included in the aforementioned studies) education level were all positively associated with satisfaction and, as would be expected, access barriers to care were negatively associated. Finally, Chicisk found assignment to combat units to be negatively associated with overall satisfaction, perhaps because the challenges for all quality of life issues in those units are greater (Chicisk, 1994; Chicisk, 1997, Chicisk, 1999).

Table 6 - Socio-demographic Variable Summary(Military Environment)

Variable	**Studies demonstrating statistical significance**	**Studies demonstrating no statistical significance**
Socio-demographic variables in general		Allan, J. (1992)
Age	Grant (1982) Chicisk (1994) Mangelsdorff (1994) Tucker (1998) Tucker & Munchus (1998) Young, Meterko, & Desai (2000)	None
Beneficiary category	Grant (1982) Mangelsdorff (1990) Oliver, Charles (1990) Mangelsdorff, George, Ware, Zucker, & Twist (1992) Mangelsdorff (1994) Tucker & Munchus (1998)	None
Gender	Tucker & Munchus (1998) Chicisck (1999) Kressen, Skinner, Sullivan, Miller, Frayne, Kazis, & Tripp (1999)	Grant (1982)
Overseas Assignment	Tucker & Munchus (1998)	None
Catchment Area	Tucker (1998) (note: borderline)	None
Marital status	Tucker & Munchus (1998)	None
Race	Tucker & Munchus (1998) Young, Meterko, & Desai (2000)	None
Rank	Chicisk (1994) Tucker & Munchus (1998)	None
Enlisted vs. Officer	Grant (1982)	None
Service Affiliation	Tucker & Munchus (1998) Chicisck (1999)	None

Utilization of services	Grant (1982) Mangelsdorff (1990) Chicisk (1994) Mangelsdorff (1994) Chicisk (1997)	Tucker (1998)
Self-Reported Health Status	Chicisk (1994) Tucker & Munchus (1998) Young, Meterko, & Desai (2000)	None

Studies conducted in the civilian sector demonstrate patient satisfaction is predicated upon, among other things, patients' perceptions of the quality of the care received. This is clearly indicated in the military environment as well. As early as 1982, Grant found the apparent skill level of providers to be one of the greatest sources of satisfaction with military health care and that no significant difference existed between patients' assessment of military versus civilian providers' competence (Grant 1982). More recently, military physicians' technical skills, as perceived by the patient, were consistently found to be positively and significantly correlated with patients' overall satisfaction levels, as were nurses' and physician extenders' (Allan, 1992; McCorquodale, 1992). Whether patients' perceptions adequately reflect providers' true technical abilities is as of yet undetermined; however, McCorquodale found the outcome of the intervention, as a proxy for providers' technical abilities, to be significant (McCorquodale, 1992). Of recent interest, Tucker and Munchus found retirees tend to provide higher quality ratings than other beneficiary groups Tucker & Munchus (1998).

Table 7 - Quality Variable Summary(Military Environment)

Variable	**Studies demonstrating statistical significance**	**Studies demonstrating no statistical significance**
Military Versus Civilian Providers' Competence	None	Grant (1982)
Physicians' Technical Skills	Grant (1982) Allan (1992) McCorquodale (1992)	None
Nurses & Physician Extenders' Technical Skills	Allan (1992) McCorquodale (1992)	None
Outcome	McCorquodale (1992)	None
Beneficiary Group	Tucker & Munchus (1998)	None

Despite the wealth of research, significant gaps exist in the current body of literature related to patient satisfaction. Although Ware found a substantial degree of correspondence between reality and patient ratings (Ware, 1981), this may be the exception. Few studies have correlated the relationship of patient satisfaction with independent ratings of the technical quality of care provided (Cleary & McNeil, 1988; Ware, 1981). Similarly, insufficient research exists: comparing the validity of the various satisfaction measurement instruments in use, comparing the reliability of patients' ratings of care received to independent measures of that care, or comparing both the validity and reliability of the different methods of conducting patient satisfaction surveys (Rubin, 1990). In a comprehensive literature review, Rubin also found two studies that suggested non-respondents to patient satisfaction surveys may rate care lower than respondents (Rubin, 1990); a confounding possibility to most of the research results published to date. The potential similarity/dissimilarity between patient and provider's personalities and the relationship with satisfaction offers another area that is prime for research (Cleary & McNeil, 1988). No study has attempted to establish a relationship between level of patient satisfaction and perhaps it's most important determinant, the ultimate outcome of the intervention (Cleary & McNeil, 1988). Additionally, although immense research has been conducted on patient satisfaction, patient dissatisfaction has typically been assumed to be its opposite; a construct yet unvalidated (Coyle & Williams, 1999). Finally and most salient to the current study in question, virtually all research conducted to date has been cross sectional analyses to identify relationships between patient satisfaction and the variables previously discussed. Few, if any, have employed longitudinal analysis of patient satisfaction as a metric to gauge operational changes in the delivery of healthcare services.

Purpose (Variables/Working Hypothesis)

The purpose of the current study is threefold. First, this study will analyze the effect(s) of the 1 October changeover from Sentara Health System to MACH on patients' satisfaction with the care rendered at McDonald Army Community Hospital as measured and reported by the monthly Department of Defense-Health Affairs (DoD-HA) customer satisfaction survey. It is intended to compare patients' pre and post 1 October 1999 satisfaction levels as queried by the elements on the monthly survey instrument, as well as in the aggregate. DoD-HA employs weighted data to replicate the entire beneficiary population in the preparation of their monthly reports (see Appendix A: DOD-HA's Weighting Methodology). Therefore, commensurate with DoD-HA's methodology, this analysis will likewise employ weighted data to determine if changes in patient satisfaction as seen be DoD-HA are attributable to the 1 October operational change.

Secondly, this study will investigate patient satisfaction versus the type of care received. The intent is to determine if a significant difference exists in aggregate satisfaction as a function of whether the patient received primary versus specialty care as reported by DoD-HA. Toward this end, all respondents whose intervention occurred in McDonald Army Community Hospital's Urgent Care Clinic, Pediatric Clinic, or first or third floor general outpatient care clinics are regarded as having received primary care. All respondents receiving care in MACH's other clinics are regarded as having received specialty care. This second analysis will also employ weighted data to mirror DoD-HA's methodology.

Finally, this study will analyze patients' responses to the other, more specific elements on the survey instrument (i.e., questions Q01, Q03a-i, Q6, Q8, Q10a-c, Q11, Q13a-d, and Q17) to determine which are most predictive of patient's aggregate satisfaction levels. The intent is to identify which areas MACH should prioritize for resource expenditures to glean maximum

increases in patient satisfaction. During this analysis, patients' demographics, the purpose of their visit (question Q01), and their self-reported health status (question Q17) will be co-varied out to ensure these differences amongst these variables are not responsible for any observed differences in aggregate satisfaction. This analysis attempts to predict patient satisfaction at the individual respondent level as opposed to the entire beneficiary population supported at McDonald Army Community Hospital. Consequently unweighted data will be employed in this third analysis.

Throughout these analyses, the dependent variables will be the patients' responses to questions Q03j, Q05, and Q12 on the monthly survey instrument (see Appendix B: D OD-HA Monthly Patient Satisfaction Survey Instrument). Question Q03j queries the patients' assessment of the overall quality of the care and service received during their visit; question Q05 queries the patients' overall satisfaction with the medical care rendered; question Q12 queries the patients' satisfaction with the clinic at which they received care. The independent variables will include the date the patient received care and whether that date was pre or post 1 October 1999; whether the intervention occurred in a primary versus specialty care clinic, and the patients' responses to questions Q01, Q03a-i, Q6, Q8, Q10a-c, Q11, Q13a-d, and Q17 on the survey instrument. The null hypotheses are: (H_{OA}) patients' satisfaction levels show no significant difference when compared before and after 1 October 1999, (H_{OB}) there is no difference in patients' satisfaction with the type of care received – primary versus specialty, and (H_{Oc}) there is no difference in predictive power between the other survey instrument elements on aggregate satisfaction. The alternate hypotheses (H_{1A}, H_{1B}, and H_{1c}) are that they do.

The primary results of this analysis are intended to compare pre and post 1 October satisfaction levels to determine if the intended increase was attained or, alternatively, if an

unintended decrease or no change at all is observed. The secondary results of this study are to identify specific areas of decreasing patient satisfaction, postulate additional operational interventions to improve aggregate satisfaction, and identify which clinics should be prioritized for additional resource expenditures.

METHODS AND PROCEDURES

This study is both cross-sectional and longitudinal in nature. It is cross sectional in that the survey was administered to a sample of beneficiaries who received healthcare at MACH during a given month. Concurrently, it is longitudinal in that the survey sample is from the same beneficiary population receiving healthcare services at the same clinics, thereby allowing trend analysis over time.

All trend investigation and hypothesis testing were conducted in a SPSS 8.0 environment. Several statistical procedures were employed during the analysis. First, descriptive statistics and graphs with trend lines of aggregate mean scores for questions Q03j, Q05, and Q12 were produced. Visual inspection of these graphs allowed identification of upward or downward trends in overall satisfaction for the eight months under investigation.

Reports resulting from analysis of the DoD monthly customer satisfaction survey assume reliability and validity of the survey instrument. This may not necessarily be the case. Each of the elements on the survey instrument has undergone reliability and validity testing through an incremental approach. The survey instrument was originally based on the Group Health Association of America's patient satisfaction survey, a known reliable and valid instrument (T. Perry, Personal Communication, Nurse Analyst, Office of the Surgeon General, Falls Church, VA, December 15, 1999). Minor modifications to the survey elements were made to adapt them for DoD's use in a military healthcare environment; modifications themselves based on exhaustive research and literature reviews. The resultant instrument was reviewed and approved in its totality by the subject matter experts at DoD-HA and the TRICARE Management Activity (TMA) prior to implementation (T. Perry, Personal Communication, Nurse Analyst, Office of the Surgeon General, Falls Church, VA, December 15, 1999).

Consequently, although each of the elements on the survey instrument was grounded in reliability and validity testing, the survey instrument as a whole has not been sufficiently validated. The results of the present study's analysis will be applicable only if the analyzed data is a reliable and valid measurement of patients' actual satisfaction with care received. Although the intent of the present study is neither to confirm nor deny the reliability and validity of the instrument itself, inter-element reliability and validity as proxies for instrument reliability and validity must be assessed. Toward this end, Cronbach's coefficient alpha was employed to verify the consistency of the data and observed trends, while factor analysis allowed inference of survey element validity and whether the survey measures what it purports to appraise. Additionally, correlation analyses of the independent and dependent variables, as well as the dependent variables with each other, were produced to explore the homogeneity of the survey instrument elements and the strength of the relationships between the variables.

After completion of data review and assessment through descriptive statistics, Cronbach's Alpha, and factor and correlational analyses, variance analysis was used to test the main hypothesis of this study: whether a statistically significant difference in patient satisfaction exists before and after 1 October 1999. This analysis involved six univariate analyses of variance (UNIANOVAs) to determine if there was a significant change in patients' aggregate overall satisfaction over the eight month period; and, if so, whether it was attributable to the 1 October operational change. In analysis of variance designs, "within-subjects factors are those variables on which the subjects have been repeatedly measured" (Stevens, 1996, page 451). Each within-subjects factor may have multiple observations (dependent variables) for each subject (SPSS, 1994). In each of the UNIANOVAs there is one within-subjects factor the level of respondents'

overall satisfaction with care rendered as measured by questions Q03j, Q05 or Q12 on the survey instrument.

Different between-subjects factors will be employed in each of the UNIANOVAs. "Between subjects-factors are, "simply grouping or classification variables," (Stevens, 1996, page 451) that "subdivide the sample into discreet groups. Each subject has only one value for a between-subjects factor." (SPSS, 1994, page 124). In each UNIANOVA there will be two between-subjects factors. In the first set of three, these factors are the types of care received (primary versus specialty care) and the date of the intervention (yymm). In the second set of three, they are the type of care received (again primary versus specialty care) and whether the care was received pre or post 1 October 1999. The UNIANOVAs and the within and between subject factors are summarized in Table 8

Table 8 – UNIANOVA Summary

Analyses of Variance	Factors	
	Within-subjects	Between-subjects
UNIANOVA 1	Q03j	1 – type of care received (primary versus specialty care) 2 – date of intervention (yymm)
UNIANOVA 2	Q05	1 – type of care received (primary versus specialty care) 2 – date of intervention (yymm)
UNIANOVA 3	Q12	1 – type of care received (primary versus specialty care) 2 – date of intervention (yymm)
UNIANOVA 4	Q03j	1 – type of care received (primary versus specialty care) 2 – pre versus post 1 October
UNIANOVA 5	Q05	1 – type of care received (primary versus specialty care) 2 – pre versus post 1 October
UNIANOVA 6	Q12	1 – type of care received (primary versus specialty care) 2 – pre versus post 1 October

The final statistical technique employed was a series of multiple regressions. The purpose of this analysis was to examine the variables' inter-correlations to isolate the survey elements

and satisfaction dimensions most predictive of questions Q03j, Q05, and Q12 for prioritization of hospital resources and expenditures.

Missing data was treated differently in the statistical procedures addressed above. In the factor analysis, analyses of variance, and regression analyses, cases with data missing for either the dependent variable or the independent variables/factors were excluded listwise. This was done to ensure that results predicated upon the interaction of multiple variables only employed cases with data for all applicable variables. The correlation analysis, by contrast, investigates the interaction between pairs of variables taken two at a time; consequently, cases with missing data were excluded pairwise.

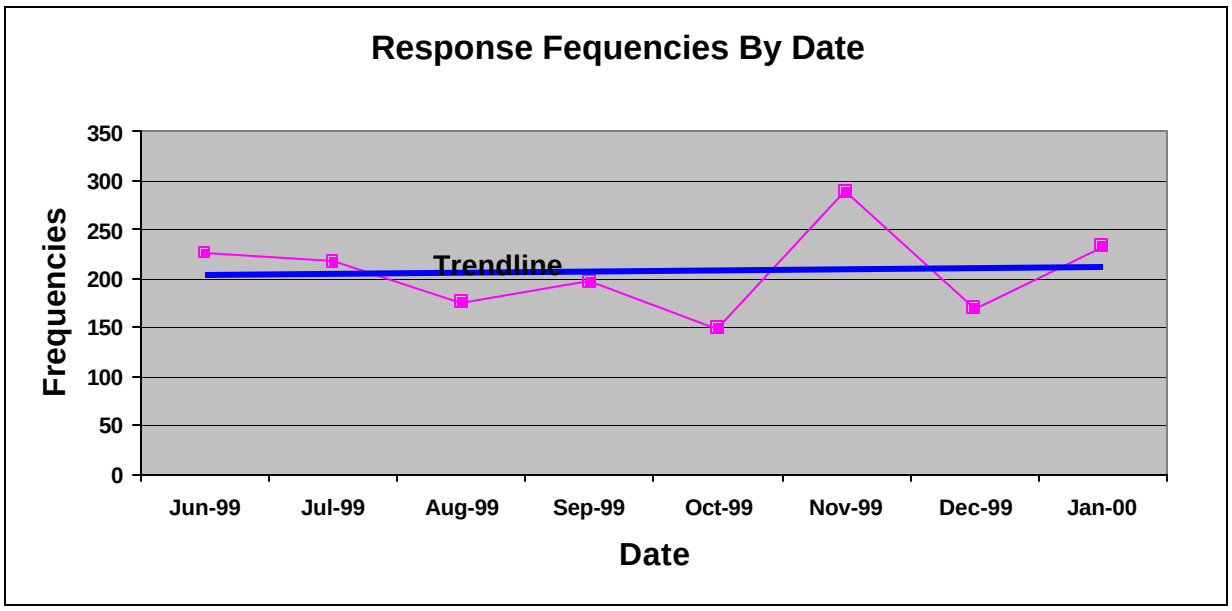
These statistical techniques necessitated the concatenation of all monthly data received on-disk from DoD-HA from June 1997 onward into one dataset for exploratory and statistical analyses. A comprehensive, step-by-step concatenation methodology is delineated in Appendix C.

RESULTS

Part I: Descriptive Statistics & Trend Lines Of Aggregate Mean Overall Satisfaction Levels

Throughout the eight months pursuant to this study, the four months pre and post 1 October 1999, there was no appreciable change in the number of respondents per month (Figure1).

Figure 1 – Response Frequencies By Date



There was, however, a gradual decline in aggregate mean scores of patients' overall satisfaction with the healthcare received at McDonald Army Community Hospital as measured by questions Q03j, Q05, and Q12 (Table 2 and Figures 2, 3, and 4, respectively).

Table 9 – Descriptive Statistics (Q03j, Q05, Q12)

Descriptive Statistics					
	Type Of Care	**Date**	**Mean**	**Std. Deviation**	**N**
Q03J	Primary Care	Jun-99	3.79	1.14	97
		Jul-99	4.14	0.78	59
		Aug-99	3.85	1.11	72
		Sep-99	3.77	1.07	64
		Oct-99	3.40	1.65	70
		Nov-99	3.95	0.85	159
		Dec-99	4.28	1.12	85
		Jan-00	3.82	1.53	83
		Total	3.89	1.18	689
	Specialty Care	Jun-99	4.32	0.98	113
		Jul-99	4.20	0.93	86
		Aug-99	4.10	1.13	94
		Sep-99	4.34	0.87	76
		Oct-99	4.36	0.74	70
		Nov-99	4.40	0.94	109
		Dec-99	3.87	1.29	62
		Jan-00	4.23	0.95	106
		Total	4.24	0.99	716
	Total	Jun-99	4.08	1.08	210
		Jul-99	4.17	0.87	145
		Aug-99	3.99	1.12	166
		Sep-99	4.08	1.00	140
		Oct-99	3.88	1.36	140
		Nov-99	4.13	0.91	268
		Dec-99	4.11	1.21	147
		Jan-00	4.05	1.25	189
		Total	4.07	1.10	1405
Q05	Primary Care	Jun-99	5.36	1.66	97
		Jul-99	6.47	0.50	59
		Aug-99	5.68	1.41	72
		Sep-99	5.58	1.59	64
		Oct-99	4.80	2.45	70
		Nov-99	5.92	0.93	159
		Dec-99	5.65	1.45	85
		Jan-00	5.41	2.34	83
		Total	5.62	1.65	689

Table 9 – Descriptive Statistics (Q03j, Q05, Q12) (Continued)

Q05 (Cont)	Specialty Care	Jun-99	6.17	1.13	113
		Jul-99	6.19	1.10	86
		Aug-99	5.97	1.46	94
		Sep-99	6.36	0.86	76
		Oct-99	6.26	0.97	70
		Nov-99	6.33	1.02	109
		Dec-99	5.60	1.51	62
		Jan-00	6.29	1.05	106
		Total	6.17	1.16	716
	Total	Jun-99	5.80	1.45	210
		Jul-99	6.30	0.92	145
		Aug-99	5.84	1.44	166
		Sep-99	6.00	1.30	140
		Oct-99	5.53	2.00	140
		Nov-99	6.09	0.98	268
		Dec-99	5.63	1.47	147
		Jan-00	5.90	1.79	189
		Total	5.90	1.45	1405
Q12	Primary Care	Jun-99	5.46	1.55	97
		Jul-99	6.00	1.05	59
		Aug-99	5.29	1.16	72
		Sep-99	5.48	1.53	64
		Oct-99	4.89	2.12	70
		Nov-99	5.70	1.28	159
		Dec-99	5.82	1.49	85
		Jan-00	5.49	2.27	83
		Total	5.54	1.61	689
	Specialty Care	Jun-99	6.16	1.06	113
		Jul-99	6.07	1.06	86
		Aug-99	5.95	1.44	94
		Sep-99	6.38	0.82	76
		Oct-99	6.13	0.78	70
		Nov-99	6.06	1.08	109
		Dec-99	5.58	1.33	62
		Jan-00	6.06	1.40	106
		Total	6.06	1.16	716
	Total	Jun-99	5.84	1.35	210
		Jul-99	6.04	1.05	145
		Aug-99	5.66	1.36	166
		Sep-99	5.97	1.27	140
		Oct-99	5.51	1.71	140
		Nov-99	5.85	1.22	268
		Dec-99	5.72	1.42	147
		Jan-00	5.81	1.85	189
		Total	5.80	1.42	1405

Figure 2 – Q03j Response Means

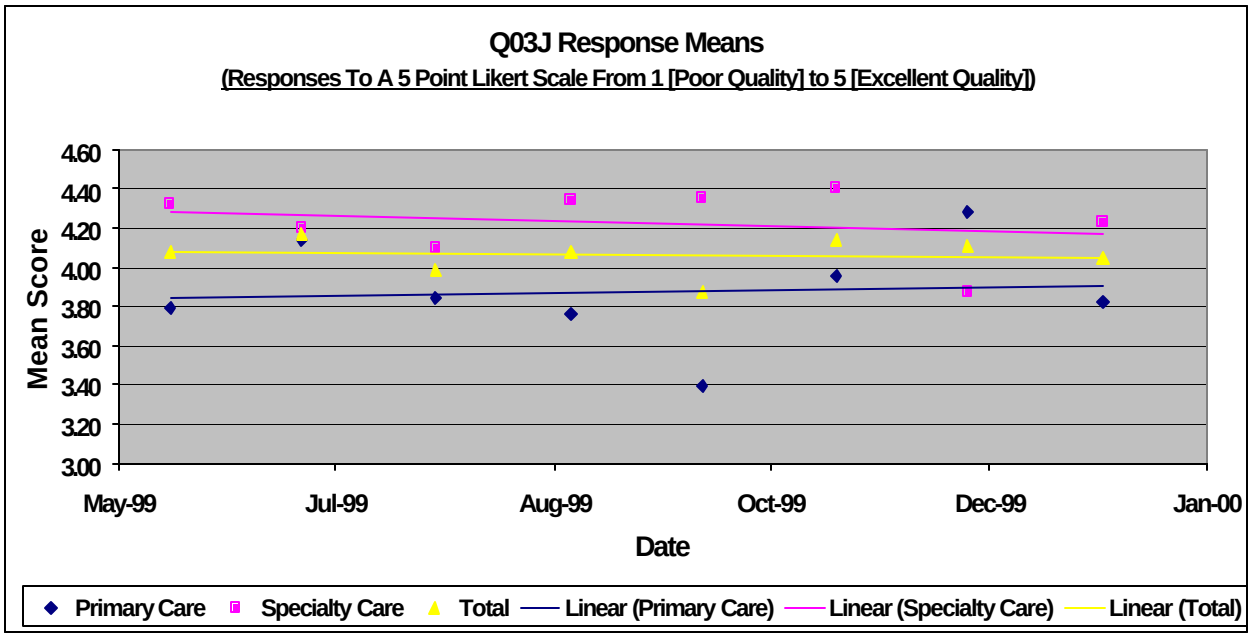


Figure 3 – Q05 Response Means

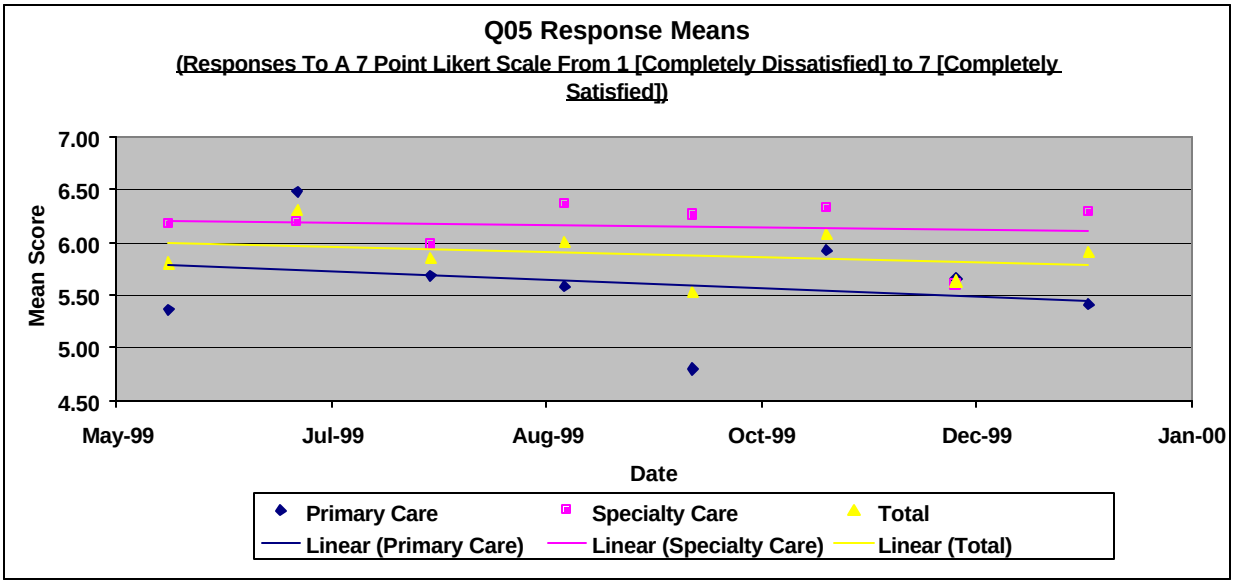
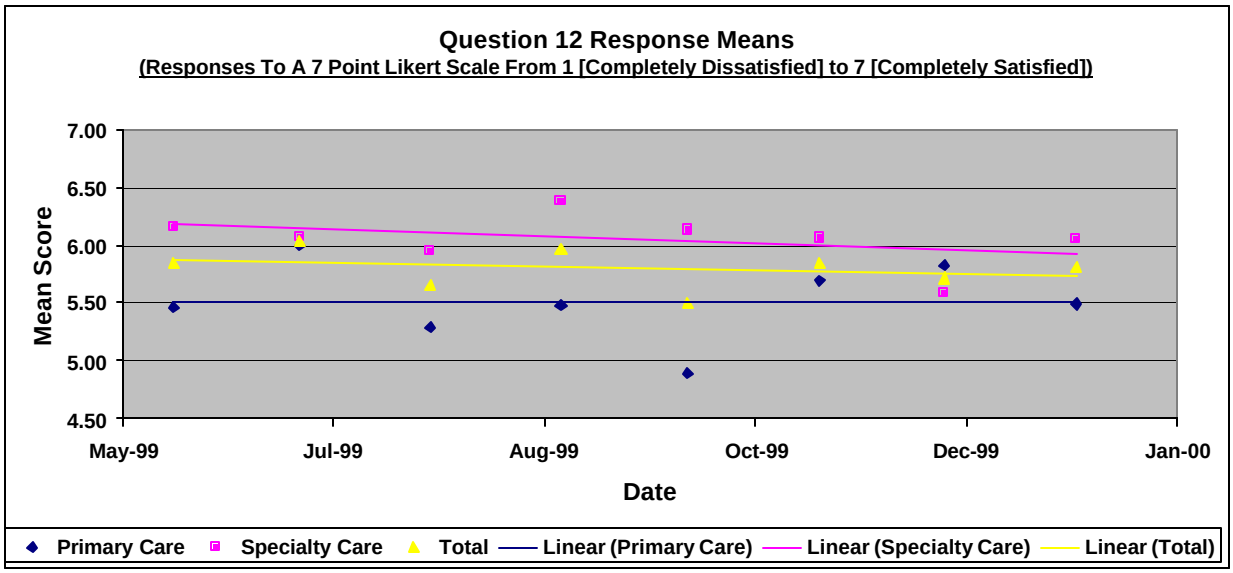


Figure 4 – Q12 Response Means



As clearly indicated, each of the survey instrument elements querying patients' overall satisfaction levels demonstrates a degradation. Whether this decline is statistically significant or not, and whether it is attributable to the 1 October 1999 operational change is yet to be determined.

Part II – Reliability Assessment

Cronbach's coefficient alpha was employed to determine the degree the three survey elements, questions Q03j, Q5, and Q12, provide consistent results. The resulting score of .94 indicates that patients' responses to these three questions have extremely high internal consistency (Table 3). The "alpha if item deleted" column indicates the three questions have higher internal consistency than all potential pairings of these questions taken individually.

Table 10 – Reliability Analysis (Cronbach's Coefficient Alpha)

R E L I A B I L I T Y A N A L Y S I S - S C A L E (A L P H A)

	Mean	Std Dev	Cases
1. Q03J	4.0728	1.0955	1423.0
2. Q05	5.9034	1.4455	1423.0
3. Q12	5.8131	1.4132	1423.0

N of Cases = 1423.0

Item Means	Mean	Minimum	Maximum	Range	Max/Min	Variance
	5.2631	4.0728	5.9034	1.8306	1.4495	1.0647

Item-total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Alpha if Item Deleted
Q03J	11.7165	7.6660	.8830	.7798	.9338
Q05	9.8859	5.8420	.9003	.8106	.9054
Q12	9.9761	6.0015	.8989	.8081	.9037

Reliability Coefficients 3 items

Alpha = .9424 Standardized item alpha = .9494

Part III – Validity Assessment

Although the high Cronbach's coefficient alpha score indicates highly consistent responses for the three questions purporting to measure overall satisfaction, it does not guarantee that these elements in fact measure what they purport to. To analyze the validity of the survey elements, a principal component factor analysis of questions Q03a through Q03j, Q05, and Q12 identified one factor (F = 80.94% cumulative variance). This indicates only one underlying factor is present and identifies it as the source of the majority of the variance in the survey

elements. Visual inspection of the survey instrument intuitively indicates these survey elements measure various dimensions of patients' satisfaction; the results of the factor analysis, through inference, tend to confirm it.

Part IV – Correlation Analysis

The previous discussions of reliability and validity would lead one to assume a direct relationship between each pairing of the three survey item elements. To confirm this assumption and measure the strength of the relationship between the three survey item elements, a correlational analysis was performed. Pearson product correlations ranged from a low of 0.854 to a high of 0.865 indicating extremely strong relationships between each and all pairings of these variables (Table 11). The complete correlation matrix for pairings of all survey instrument elements is available at Appendix E.

Table 11 – Pearson Product Correlations (Q03j, Q05, Q12)

Correlations		Q03J	Q05	Q12
Q03J	Pearson Correlation	1.000	**0.860**	**0.854**
	Sig. (2-tailed)	.	0.000	0.000
	N	1490	1468	1443
Q05	Pearson Correlation	**0.860**	1.000	**0.865**
	Sig. (2-tailed)	0.000	.	0.000
	N	1468	1494	1448
Q12	Pearson Correlation	**0.854**	**0.865**	1.000
	Sig. (2-tailed)	0.000	0.000	.
	N	1443	1448	1494

Given the extremely high Cronbach's coefficient alpha, the factor analysis indicating all survey elements derive from only one underlying construct, visual inspection of the scatterplots and observance of direct relationships between each pairing of variables, and the high Pearson

correlation coefficients between each paring of variables, reliability and validity of the data are here forth reasonably assumed.

Part V – Variance Analysis (UNIANOVAs)

Having attended to the reliability and validity of the survey instrument elements, the study now focuses on its main tenet: to explore the hypothesis that patient satisfaction shows a significant change after 1 October 1999 as a result of the operational change to the third floor clinic. To determine if the change in patients' overall aggregate satisfaction portrayed in the graphs in Figures 2, 3, and 4 was statistically significant or not, six univariate analyses of variance (UNIANOVAs) were constructed. The first three investigated the statistical significance of the changes over time and by type of care, primary or specialty. The second three investigated the statistical significance of the change by type care and whether the care had been rendered before or after 1 October 99. All six UNIANVOAs are two-by-two designs (type care and date of [intervention or pre/post]) in which patients' overall satisfaction is measured by the aggregate mean responses on one of the three within subjects factors – survey items 03j, 05, and 12.

Table 12 depicts the results of each of the six UNIANVOAs. The first set (Table 12a) depicts statistically significant differences in patients' overall satisfaction levels for all three dependent variables based on the type of care received (Q03: $F=33.299$, $p<0.000$; Q05: $F=47.808$, $p<0.000$; Q12: $F=61.521$, $p<0.000$). However only Q05, satisfaction with care received, exhibits a statistically significant change over time (Q05: $F=6.546$, $p<0.000$). Questions Q03j and Q12, quality of care received and satisfaction with clinic in which care was received, respectively, do not exhibit significant changes over time (Q03j: $F=1.948$, $p<0.059$; Q12: $F= 1.966$, $p<0.056$).

In the second set of UNIANOVA results (Table 12b), again all three dependent variables

exhibit statistically significant differences in patients' overall satisfaction based on the type of care received, primary versus specialty (Q03j: F=35.831, p<0.000; Q05: F=48.816, p<0.000; Q12: F=58.945, p<0.000). However, none of the dependent measures exhibit a statistically significant difference pre/post 1 October (Q03j: F=0.532, p<0.466; Q05: F=1.825; p<0.177; Q12: F=0.905, p<0.342). Figure 5 provides plots of the estimated marginal means for both sets of UNIANOVAs. Notably, satisfaction with specialty care, the quality of it, and the clinics in which it is rendered is statistically different and consistently rated higher than primary care; H_{OB} is rejected and H_{1B} is accepted. As notably, there is no statistically significant change in the aggregate mean scores for any of the three dependent variables on the pre/post 1 October marginal means plots (Figure 5b); the null hypothesis (H_{OA}) is confirmed.

Table 12 – UNIANOVA Results

Table 12a: UNIANOVAs Of Questions 03j, Q05, Q12 by Type Care & Time

Tests of Between-Subjects Effects

Dependent Variable: Q03J Overall quality of care & service received

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	82.667[a]	15	5.511	4.618	.000
Intercept	22630.081	1	22630.081	18961.374	.000
NEWDATE	16.275	7	2.325	1.948	.059
TYP_CARE	39.742	1	39.742	33.299	.000
NEWDATE * TYP_CARE	24.551	7	3.507	2.939	.005
Error	1740.098	1458	1.193		
Total	26043.000	1474			
Corrected Total	1822.766	1473			

a. R Squared = .045 (Adjusted R Squared = .036)

Tests of Between-Subjects Effects

Dependent Variable: Q05 Satisfaction with medical care received

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	256.575[a]	15	17.105	8.639	.000
Intercept	47457.560	1	47457.560	23968.719	.000
NEWDATE	90.728	7	12.961	6.546	.000
TYP_CARE	94.660	1	94.660	47.808	.000
NEWDATE * TYP_CARE	71.366	7	10.195	5.149	.000
Error	2892.749	1461	1.980		
Total	54101.000	1477			
Corrected Total	3149.324	1476			

a. R Squared = .081 (Adjusted R Squared = .072)

Tests of Between-Subjects Effects

Dependent Variable: Q12 Overall satisfaction with clinic

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	185.012[a]	15	12.334	6.357	.000
Intercept	46257.010	1	46257.010	23839.340	.000
NEWDATE	26.709	7	3.816	1.966	.056
TYP_CARE	119.373	1	119.373	61.521	.000
NEWDATE * TYP_CARE	40.844	7	5.835	3.007	.004
Error	2830.992	1459	1.940		
Total	52438.000	1475			
Corrected Total	3016.004	1474			

a. R Squared = .061 (Adjusted R Squared = .052)

Table 12b: UNIANOVAs Of Questions Q03j, Q05, Q12 by Type Care & Pre/Post 1 October

Tests of Between-Subjects Effects

Dependent Variable: Q03J Overall quality of care & service received

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	45.579[a]	3	15.193	12.567	.000
Intercept	24058.753	1	24058.753	19900.199	.000
TYP_CARE	43.318	1	43.318	35.831	.000
PREPOST	.643	1	.643	.532	.466
TYP_CARE * PREPOST	.246	1	.246	.204	.652
Error	1777.187	1470	1.209		
Total	26043.000	1474			
Corrected Total	1822.766	1473			

a. R Squared = .025 (Adjusted R Squared = .023)

Tests of Between-Subjects Effects

Dependent Variable: Q05 Satisfaction with medical care received

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	115.091[a]	3	38.364	18.624	.000
Intercept	50432.336	1	50432.336	24482.900	.000
TYP_CARE	100.557	1	100.557	48.816	.000
PREPOST	3.758	1	3.758	1.825	.177
TYP_CARE * PREPOST	4.167	1	4.167	2.023	.155
Error	3034.233	1473	2.060		
Total	54101.000	1477			
Corrected Total	3149.324	1476			

a. R Squared = .037 (Adjusted R Squared = .035)

Tests of Between-Subjects Effects

Dependent Variable: Q12 Overall satisfaction with clinic

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	121.901[a]	3	40.634	20.653	.000
Intercept	48769.195	1	48769.195	24788.157	.000
TYP_CARE	115.972	1	115.972	58.945	.000
PREPOST	1.780	1	1.780	.905	.342
TYP_CARE * PREPOST	1.448	1	1.448	.736	.391
Error	2894.103	1471	1.967		
Total	52438.000	1475			
Corrected Total	3016.004	1474			

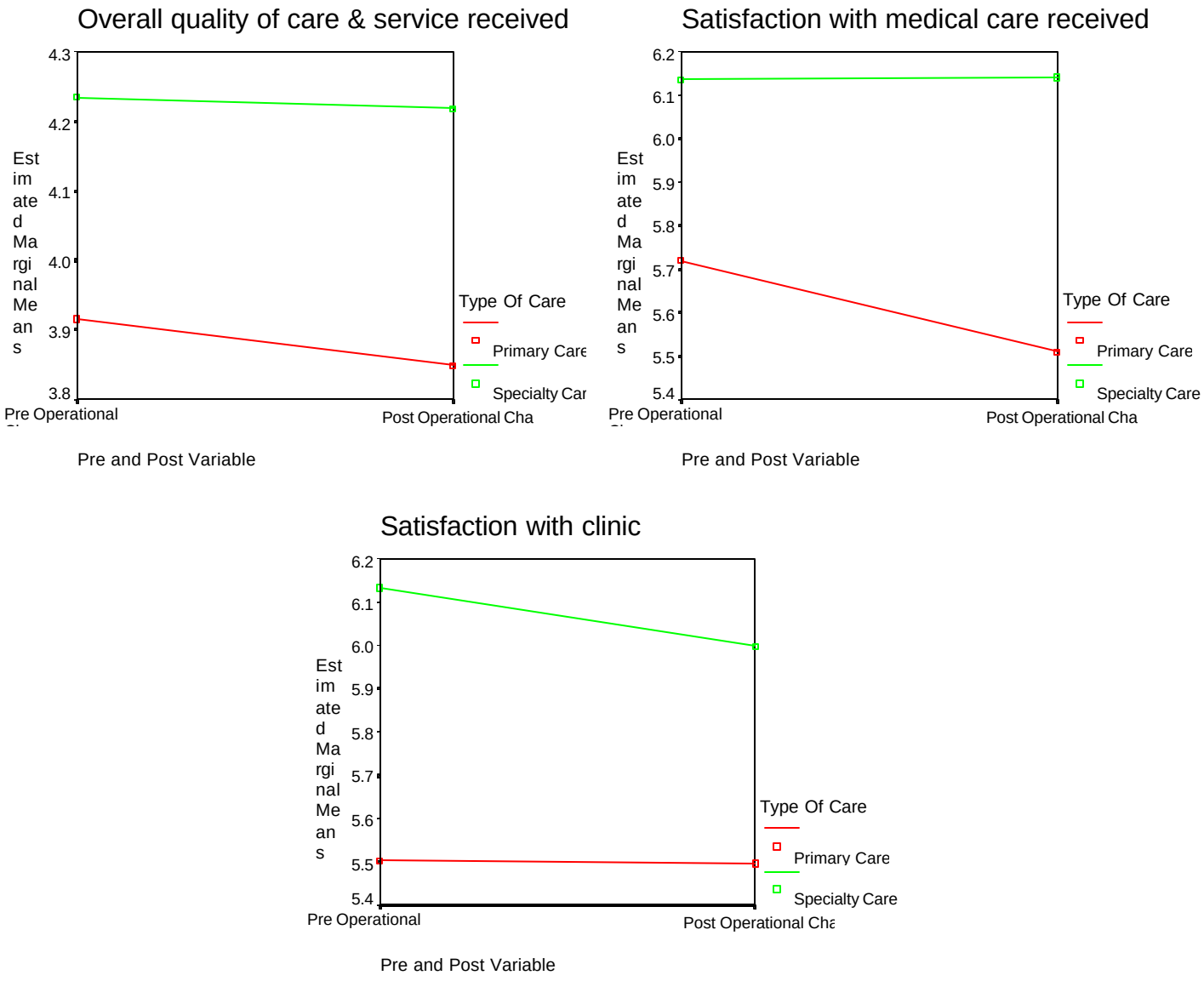
a. R Squared = .040 (Adjusted R Squared = .038)

Figure 5 – UNIANOVA Plots Of Estimated Marginal Means

Figure 5a: Estimated Marginal Means Plots 0f Questions Q03j, Q05, Q12 by Type Care & Time

Figure 5 – UNIANOVA Plots Of Estimated Marginal Means (Continued)

Figure 5b: Estimated Marginal Means Plots 0f Questions Q03j, Q05, Q12 by by Type Care & Pre/Post 1 October



Part VI – Regression Analysis

The final statistical procedure employed on the dataset was a series of three multiple regressions, each of a different dependent variables; questions Q03j, Q05, and Q12. As previously discussed in the methods section, unlike the prior analyses which employed weighted data, the regression analysis employed unweighted data to determine which of the more specific variables queried on the survey instrument were most predictive of satisfaction at the individual level. These analyses endeavor to identify specific areas for prioritization of MACH's resources to maximize patient satisfaction. Each analysis employed twenty-one independent variables: questions Q01, Q03a through Q03i, Q06, Q08, Q10a through Q10c, Q11, 13a through 13d, and Q17.

The results are delineated in Table 13. Regressing Q03j on the twenty-one independent variables explained 92.1% of the variance ($F=100.434$, $p<0.000$) and yielded four statistically significant predictors: Q03a ($t=6.355$, $p<0.000$), Q03b ($t=3.316$, $p<0.001$), Q03I ($t=4.793$, $p<0.000$), and though only barely predictive, Q06 ($t=1.992$, $p<0.048$). Regressing Q05 explained 69.8% of the variance ($F=20.049$, $p<0.000$) and yielded three statistically significant predictors: Q03a ($t=3.250$, $p<0.001$), Q03e ($t=2.364$, $p<0.019$), and Q13d ($t=-2.029$, $p<0.044$). Finally, regressing Q12 explained 74.7% of the variance ($F=25.619$, $p<0.000$) and yielded four statistically significant predictors: Q03a ($t=3.304$, $p<0.001$), Q03c ($t=2.539$, $p<0.012$), Q10b ($t=2.483$, $p<0.014$), and Q13d ($t=-2.869$, $p<0.008$). Interestingly, neither patient expectations (Q01) nor self-reported health status (Q17) were found to be predictive of any of the dependent variables.

Table 13: Regression Analysis

Table 13a: Results Of Regressing Q03j

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.960[a]	.921	.912	.29

a. Predictors: (Constant), Q17, Q13A, Q01, Q08, Q06, Q03E, Q13D, Q10C, Q13C, Q11, Q03A, Q13B, Q03B, Q10B, Q03G, Q03I, Q10A, Q03F, Q03C, Q03H, Q03D

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	178.912	21	8.520	100.434	.000[a]
	Residual	15.354	181	8.483E-02		
	Total	194.266	202			

a. Predictors: (Constant), Q17, Q13A, Q01, Q08, Q06, Q03E, Q13D, Q10C, Q13C, Q11, Q03A, Q13B, Q03B, Q10B, Q03G, Q03I, Q10A, Q03F, Q03C, Q03H, Q03D

b. Dependent Variable: Q03J Overall quality of care & service received

Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	-.163	.185		-.882	.379
	Q01	-5.255E-02	.019	-.062	-2.706	.007
	Q03A	.262	.041	.254	6.355	.000
	Q03B	.147	.044	.140	3.316	.001
	Q03C	.115	.063	.110	1.818	.071
	Q03D	9.175E-03	.067	.009	.138	.891
	Q03E	4.368E-02	.060	.044	.731	.466
	Q03F	6.873E-02	.050	.073	1.363	.175
	Q03G	.103	.050	.103	2.055	.041
	Q03H	3.592E-02	.059	.037	.614	.540
	Q03I	.273	.057	.281	4.793	.000
	Q06	2.858E-02	.014	.049	1.992	.048
	Q08	9.450E-04	.028	.001	.034	.973
	Q10A	9.359E-04	.041	.001	.023	.982
	Q10B	-6.705E-03	.038	-.008	-.179	.858
	Q10C	-1.515E-02	.037	-.017	-.410	.682
	Q11	4.928E-02	.034	.057	1.471	.143
	Q13A	-1.640E-02	.029	-.019	-.561	.576
	Q13B	-1.231E-02	.041	-.012	-.301	.763
	Q13C	5.993E-02	.042	.057	1.424	.156
	Q13D	-4.750E-02	.030	-.052	-1.596	.112
	Q17	-1.378E-02	.021	-.015	-.645	.520

a. Dependent Variable: Q03J Overall quality of care & service received

Table 13b: Results Of Regressing Q05

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.836[a]	.698	.663	.64

a. Predictors: (Constant), Q17, Q01, Q13A, Q08, Q06, Q03E, Q13D, Q11, Q13C, Q10C, Q03A, Q03B, Q13B, Q10B, Q03G, Q03I, Q10A, Q03F, Q03C, Q03H, Q03D

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	170.533	21	8.121	20.049	.000[a]
	Residual	73.717	182	.405		
	Total	244.250	203			

a. Predictors: (Constant), Q17, Q01, Q13A, Q08, Q06, Q03E, Q13D, Q11, Q13C, Q10C, Q03A, Q03B, Q13B, Q10B, Q03G, Q03I, Q10A, Q03F, Q03C, Q03H, Q03D

b. Dependent Variable: Q05 Satisfaction with medical care received

Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	1.776	.399		4.446	.000
	Q01	-2.271E-02	.042	-.024	-.540	.590
	Q03A	.287	.088	.250	3.250	.001
	Q03B	-5.226E-02	.096	-.044	-.546	.586
	Q03C	.168	.138	.143	1.222	.223
	Q03D	-.167	.145	-.146	-1.154	.250
	Q03E	.307	.130	.279	2.364	.019
	Q03F	.140	.109	.133	1.275	.204
	Q03G	.101	.103	.092	.976	.331
	Q03H	.108	.125	.100	.862	.390
	Q03I	6.034E-02	.120	.056	.503	.615
	Q06	2.205E-02	.030	.034	.726	.469
	Q08	9.413E-02	.059	.073	1.584	.115
	Q10A	-3.819E-02	.089	-.041	-.429	.668
	Q10B	.126	.081	.136	1.551	.123
	Q10C	-5.684E-03	.080	-.006	-.071	.943
	Q11	6.116E-02	.073	.063	.839	.402
	Q13A	-1.233E-02	.064	-.013	-.194	.847
	Q13B	2.315E-02	.089	.021	.259	.796
	Q13C	2.804E-02	.091	.024	.307	.759
	Q13D	-.129	.064	-.131	-2.029	.044
	Q17	1.415E-02	.046	.013	.305	.761

a. Dependent Variable: Q05 Satisfaction with medical care received

Table 13: Regression Analysis (Continued)

Table 13c: Results Of Regressing Q12

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.864[a]	.747	.718	.55

a. Predictors: (Constant), Q17, Q13A, Q01, Q08, Q06, Q03E, Q13D, Q11, Q13C, Q10C, Q03A, Q13B, Q03B, Q10B, Q03G, Q03I, Q10A, Q03F, Q03C, Q03H, Q03D

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	165.576	21	7.885	25.619	.000[a]
	Residual	56.012	182	.308		
	Total	221.588	203			

a. Predictors: (Constant), Q17, Q13A, Q01, Q08, Q06, Q03E, Q13D, Q11, Q13C, Q10C, Q03A, Q13B, Q03B, Q10B, Q03G, Q03I, Q10A, Q03F, Q03C, Q03H, Q03D

b. Dependent Variable: Q12 Overall satisfaction with clinic

Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
1	(Constant)	2.376	.349		6.811	.000
	Q01	-3.963E-02	.037	-.044	-1.083	.280
	Q03A	.254	.077	.234	3.304	.001
	Q03B	4.407E-03	.083	.004	.053	.958
	Q03C	.304	.120	.274	2.539	.012
	Q03D	-.197	.126	-.181	-1.561	.120
	Q03E	.147	.113	.140	1.296	.197
	Q03F	5.378E-02	.095	.054	.564	.574
	Q03G	.165	.090	.159	1.842	.067
	Q03H	-3.707E-02	.109	-.036	-.341	.733
	Q03I	7.282E-02	.105	.071	.697	.487
	Q06	1.238E-03	.027	.002	.047	.963
	Q08	-4.521E-02	.052	-.037	-.877	.382
	Q10A	-5.554E-03	.077	-.006	-.072	.943
	Q10B	.175	.071	.200	2.483	.014
	Q10C	2.663E-02	.069	.028	.385	.701
	Q11	9.317E-02	.063	.101	1.470	.143
	Q13A	3.927E-02	.055	.042	.710	.479
	Q13B	-3.220E-02	.078	-.031	-.414	.679
	Q13C	5.666E-02	.080	.051	.711	.478
	Q13D	-.149	.056	-.159	-2.689	.008
	Q17	-1.680E-02	.040	-.017	-.415	.679

a. Dependent Variable: Q12 Overall satisfaction with clinic

DISCUSSION

The main tenet of this study was to analyze the impact of the 1 October transformation in healthcare delivery at McDonald Army Community Hospital (MACH) on patient satisfaction. The results of this study clearly indicate no statistically significant difference exists in patients' overall satisfaction attributable to the operational change. This does not mean, however, that the results have no pragmatic value for McDonald Army Community Hospital (MACH). Since the transition of MACH's third floor from a Government Owned Contractor Operated (GOCO) clinic to a Government Owned Government Operated (GOGO) clinic had no impact on patients' overall satisfaction levels, the transition was perhaps executed more seamlessly and smoothly than anticipated. If so, this may be a success story in and of itself. MACH's clinical and administrative staff endeavored to make the 1 October transition virtually invisible to the supported patient population, nevertheless anticipating patient resentment and a corresponding decrease in satisfaction. This decrease was anticipated because any operational change in healthcare delivery, even when furthering the patients' interests has traditionally been accompanied with resentment and frustration. If MACH executed the 1 October transition with no associated degradation in patient satisfaction, then the procedures used to plan, prepare for, and execute the change should be analyzed and promulgated for future operational changes.

Alternatively, the lack of any statistical significant change in patient satisfaction may be a function of mis-estimation on MACH's part regarding the impact of the operational change. Managers often overestimate the effect of an operational change in the short run but underestimate it in the long run. Consequently, it may be of value to repeat this analysis when the September 2000 DoD-HA Customer Survey Satisfaction data is available. This will allow

twelve months of pre and post 1 October 1999 data to be analyzed to determine if there is a statistically significant effect over a longer period of time.

Although there was no significant change in patient satisfaction due to the 1 October transition, there was a statistically significant change in patient satisfaction over the eight months under analysis for question Q05 – overall satisfaction with care. This too is an area worthy of further analysis. The UNIANOVAs confirm that the trendlines initially depicted in Figures 2, and 4 are merely the result of sampling error and/or variation "noise". However, per the second purpose of this study: to determine if significant differences exist in satisfaction with primary versus specialty care, the trendline in Figure 3 depicts a steady decrease in patient satisfaction with the former, but a homeostatic state with the latter. Clearly this decrease in primary care satisfaction cannot be allowed to continue unabated. Regressing Q05 on the other survey elements explained 69.8% of the variance and yielded 3 statistically significant predictors: Q03a – friendliness and courtesy shown by the clinic staff, Q03e – the [provider's] personal interest in the patient's medical problems, and Q13d – the facility's medical record services. The first two of these predictors, that the interpersonal dimension of the intervention has a large impact on satisfaction, is generally supported in patient satisfaction literature, especially in literature generated in the military environment where patients tend to assume quality and are insulated from costs. Providers are primarily responsible for affecting Q03d and assuring the patient that they, the provider, are genuinely concerned with the patient's well being. However affecting Q03a – friendliness and courtesy shown to the patient, is everyone's responsibility. Notwithstanding the preceding statement, the hospital personnel who routinely interact the most with the patients: the receptionists, telephone operators, and nursing assistants are in a position to affect this area the most.

The third predictor, the facility's medical record services, appears surprising and is not necessarily supported by the literature. However, since the medical records section is the first activity patients encounter when they arrive at the hospital for care (as they draw their medical records in preparation for their appointment), it is necessarily the first activity patients interact with the hospital staff. Consequently, the interpersonal domain of these interactions may "set the tone" for the remainder of the hospital visit. If true, this third predictor does not confound the typical results encountered in patient satisfaction literature but rather, supports it. Additional research is required to test this hypothesis.

The preceding paragraphs discuss the areas that MACH should affect to attain the greatest increase in patients' overall satisfaction as measured by question Q05 on the DoD-HA customer satisfaction survey. If MACH lacks sufficient resources to provide "hospitality"type training to all employees, the personnel working in the primary care clinics: the general outpatient care, the urgent care center, and the pediatric department, should receive priority for such training. Providers in these clinics should be coached in enhancing interpersonal styles that communicate genuine concern and empathetic understanding to the patient. As resources permit, videotaped "fishbowl" exercises in which the providers are presented with a series of personnel role-playing various types of patients may be of benefit for training purposes.

Although Q03j and Q12 – patients' perceptions of the quality of care rendered and their satisfaction with the clinics in which care was rendered, respectively, exhibited no significant change pre/post 1 October nor over time, this does not imply the analyses of these variables produced no salient information. Regressing Q03j yielded four statistically significant predictors: Q03a – staff friendliness and courtesy, Q03b – attention to what the patient had to say, Q03i – how well the care met the patients' needs, and Q06 – the amount of waiting time patients

experienced between being appointed for and receiving care. Regressing Q12 also yielded four: Q03a – staff friendliness and courtesy, Q03c – thoroughness of the treatment received, Q10b – access to medical care when required, and again, Q13d – the facilities' medical records services. While the trendlines for Q03j and Q12 are the result of statistically insignificant "noise", if MACH desires to increase the satisfaction dimensions measured by these questions, MACH should attend to these seven predictors. The significance of Q03a – staff friendliness and courtesy, has been discussed; although its presence as a predictor of all three overall satisfaction measures accentuates its importance in patients' evaluations of care. Likewise, the previous discussion concerning Q13e – the facilities' medical records services, as a predictor of Q05 holds true for its presence as a predictor of Q12; and its repetitive presence lends additional credence to the hypothesis.

The remaining five predictors of Q03j and Q12 are second in importance only to the three predictors of Q05. Of these, Q03b – attention to what the patient had to say, Q03c – the thoroughness of the treatment, and Q03i – how well the care met the patients' needs are most directly affected by providers. Yet again, these highlight the significance of the interpersonal dimension between providers and patients during healthcare interventions. Q06 – the amount of time between being appointed for and receiving care, and Q10b – access to care when required, are systemic variables most directly affected by administrators and mangers. MACH should focus its administrative staff's efforts to ensure appointments are not underutilized and seek efficiencies to increase the time available for appointed care. If MACH elects to maintain the status quo and not attend to these areas, overall patient satisfaction as measured by Q03j and Q12 may not decrease, but likewise is unlikely to improve.

CONCLUSIONS & RECOMMENDATIONS

The 1 October transition of the third floor at McDonald Army Community Hospital (MACH) from a GOCO to GOGO clinic had no effect on patient satisfaction although degradation of patients' overall satisfaction with care did occur for as yet unknown reasons during the same timeframe. Two key areas, provider concern and staff friendliness/courtesy, were identified for additional command emphasis, and if necessary additional resources, to improve overall patient satisfaction with care at MACH.

Recommend all providers, and especially primary care providers, be informed that their efforts to meet patients' perceptions of their medical needs, patients' perceptions of the thoroughness of the care rendered, and interpersonal dimension between providers and patients during interventions all have a direct impact on aggregate patient satisfaction. Also recommend clinical operations promulgate metrics for these areas and include them in all providers' performance appraisals.

Recommend MACH focus the administrative staff on investigating efficiencies for increasing the number of available appointments and ensuring apportioned time is not wasted due to patient no-shows and/or cancellations. Further recommend MACH establish a policy precluding any and all clinical and administrative departments from affecting providers' templates within a five week lock-in of appointed care without Deputy Commander Approval. Further recommend MACH require Hospital Commander approval on any actions affecting providers' templates within two weeks of appointed care.

Recommend the UNIANOVAs be repeated in December 2000 after September 2000's data is made available by DoD-HA. The purpose of reanalyzing the data at that time is to include

12 months of pre and post 1 October data to determine if a statistically significant difference is observed over a longer, more extensive time period.

The Department of Defense – Health Affairs Customer Satisfaction Survey has received increased criticism over the past year. Hospital Commanders, administrators, and medical staffs are often antagonistic of the survey procedures, lead agents and regional medical command staffs are often critical of the information provided, even the Government Accounting Office has recently lambasted several of the survey elements (GAO, 1999). This does not mean, however, that the entire survey and data it produces should be ignored. This study depicts that even in a small hospital with fewer survey respondents, useful information can be gleaned from the data, albeit after significant data extraction, concatenation and manipulation. To ignore everything the survey provides because of several problematic characteristics is "throwing the baby out with the bath water," and foolhardy at best.

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Using the WEIGHT Variable in a Spreadsheet Program

The Customer Satisfaction Survey *reports* that you received have been weighted. When using the Customer Satisfaction Survey *raw data files*, we feel it is essential to utilize the weights provided in the data files to obtain a more accurate and consistent portrayal of the results. Many of you may be unfamiliar with survey results, why weights are necessary, and how those weights are calculated, so an explanation and examples are provided below.

Background:

The purpose of statistics is to infer properties or characteristics about a given population based on a sample of that population. In the case of the Department of Defense, the purpose of the Customer Satisfaction Survey Reports is to provide information regarding all users of the military health system based on the surveys returned from a smaller sample of those users. In order to make the reports accurately reflect the total population of military health system users, however, the survey raw data must be adjusted – or weighted – so that, proportionally, the survey respondents 'look like' the total population of military health system users. This weighting process involves three steps or components.

Demographic Factors: Each month, a portion of the total population of military health system users is selected to receive surveys; this portion is selected scientifically so that the ages and genders of survey recipients are statistically the same as the ages and genders of the total patient population. However, some survey recipients will return the survey, and others will not, and there is no guarantee that the people who choose to return the survey accurately represent the age and gender proportions in the overall patient population. For example, if 50% of health system patrons are 18-25 years of age, but only 15% of the people who return their surveys are in that age group (an example of "non-response bias"), then, without any weighting or adjustment of the raw survey data, the views of 18-25 year olds would be under-represented. The same may occur regarding the gender of all patients in comparison to the gender of all survey respondents. The component of the weighting variable which compensates for the possible differences in ages and gender between the people who *received* surveys, and those people who *returned* surveys, is referred to as the "response bias weight".

Clinic Size: Similarly, an equal number of patients are sampled at most clinics each month to insure statistical validity at each clinic. This is done regardless of the size of the clinic, so that the raw data files contain approximately the same number of responses for each clinic. Therefore, without an adjustment of the raw data, the views of patients of smaller clinics are over-represented at the aggregated levels (such as the MTFs, Intermediate Command, or region) in determining the overall satisfaction rates, and the views of patients of larger clinics are under-represented. The component of the weighting process which compensates for the difference in clinic sizes is referred to as the "clinic weight".

MTF Size: Since the number of patients surveyed is based on a maximum number per clinic, those MTFs with more clinics – regardless of the patient load of those clinics -- will have more patients surveyed. In addition, the number of clinics surveyed within a given MTF may vary from month to month. Without weighting the raw data, the views of patients of those MTFs might also be over-represented in determining overall satisfaction with the military health system. The weighting component which adjusts for the difference in MTF sizes is the "MTF weight".

These three factors – the response-bias weight, the clinic weight, and the MTF weight, are combined to ensure that – statistically speaking – the views of the people who completed and returned surveys accurately reflect the views of the overall patient population.

How the WEIGHT Variable is Calculated:

In order to calculate the WEIGHT variable, you must first calculate its component parts: the response-bias weight, the clinic weight, and the MTF weight. To do so, you need three data files:

-total encounters: this is a file, sent from Ft. Detrick, which lists patients served by the military medical system during the month;

-a listing of all patients who were mailed a survey (the survey recipients); and

-a listing of people who completed and returned surveys (with names and personal information deleted), plus the responses to those surveys (this is the data from which the reports are calculated).

1. **Calculating the Response-bias Weight**: This is done at the region level. First, respondents are divided into five age groups: 0-17, 18-34, 35-44, 45-64, and 65 and over. Next, each of those five groups is further divided according to the gender of the patient. Therefore, in each region, there are potentially 10 age/gender groups. In order to determine the response-bias weight, you first must determine the number of people in each age/gender group in each region, as a percentage of the total number of people in that region, in both the survey recipients and the survey respondents.

For example, suppose that a total of 1,000 people in Region 1 were mailed a survey, and that 100 – or ten percent -- of those people were women aged 65 and over. Suppose that a total of 500 people in Region 1 actually returned a survey, including all 100 of the women aged 65 and over. This means that 20% of the survey respondents in Region 1 were women aged 65 and over – a percentage very different from that in the group receiving surveys. To calculate the response-bias weight for this group (women aged 65 and over), you would divide the percentage of people in that age/gender/region combination in the survey recipients (ten percent) by the percentage that same group represents in the survey respondents (or 20%). So, in this example, the response-bias weight for women aged 65 and over in Region 1 would be 0.5, or 10 percent divided by 20%.

2. Calculating the Clinic Weight: There is a limit of 35 surveys sent to each clinic surveyed in a given month, regardless of the patient load at the clinic. At the extremes, this could mean that the survey responses regarding a clinic servicing only 50 patients per month would carry the same weight as the responses regarding a clinic servicing 500 patients per month, when it came to determining the overall score for that MTF. Continuing this 'extreme' example, suppose the patients at the small clinic were very displeased (answering all '1s') with their clinic's services, and the patients at the large clinic were very pleased (all '5s'). If you do not compensate for the difference in clinic size, and everyone receiving a survey returns one, this MTF's overall score would be 3.00 (averaging 35 '1s' and 35 '5s'). However, if it were possible to survey every patient in these two clinics in this hypothetical MTF, the overall score would be 4.64 (averaging 50 '1s' and 500 '5s').

In this example, of the total number of patients served by this MTF during the past month, the small clinic's patients accounted for 9.1% (50 divided by 550), and the large clinic's patients accounted for 90.9% (500 divided by 550). However, assuming every survey recipient returned a survey, the small clinic's patients accounted for 50% of the returned surveys (35 out of 70). To calculate the clinic weight for respondents from this small clinic, you need to divide the percentage that clinic's patients represent among the total MTF patients (9.1%) by the percentage that clinic's patients represent among the returned survey respondents (50%). In this example, the clinic weight for a respondent from among the small clinic's patients would be 0.18 (9.1% divided by 50%).

3**. Calculating the MTF Weight:** MTFs are sampled at the clinic level; the total sampled for a given MTF therefore depends upon the number of clinics sampled for that MTF in any given month. This can vary widely. Since there can be a maximum of 35 surveys mailed (and returned) per clinic, you can see that this can mean a large variation in an MTF's returns each month, regardless of the size of the MTF.

Continuing the example in the paragraph above, suppose that the 550 patients seen by this MTF in the past month represent one percent of a hypothetical total of 55,000 patients served by the military medical system during the month (550 divided by 55,000). Of the total 55,000 patients served, suppose that 12,000 actually returned surveys. In that case, the 70 surveys returned by our hypothetical MTF's patients represent 0.58% of the total surveys returned (70 divided by 12,000). To calculate the MTF weight for our hypothetical MTF, you must divide the percentage that MTF's patients represent among the total patients served (one percent), by the percentage that MTF's patients represent among all survey respondents (0.58%). Therefore, the MTF weight for a respondent from this MTF would be 1.72 (one divided by 0.58).

Calculating the Overall WEIGHT Variable: The overall WEIGHT variable is a combination of these three components; you must multiply the response-bias weight by both the clinic weight and the MTF weight. A separate overall WEIGHT is calculated for each person who returns a survey. Suppose we want to calculate the overall WEIGHT for a woman, aged 65 or over, who was a patient at the small clinic in our hypothetical MTF, located in Region 1. To do so, we must multiply all the applicable component weights: the response-

bias weight for this person's age/gender/region combination (0.5), the clinic weight for the small clinic in this MTF (0.18), and the MTF weight for this particular MTF (1.72). The overall WEIGHT for this person's survey responses would therefore be 0.1548 (0.5 * 0.18 * 1.72).

Using the Weight Variable in DoD Raw Data Files:

The WEIGHT variable for each survey respondent has been calculated and is included in the DoD raw data files. The WEIGHT variable is multiplied by the raw data (i.e., survey responses) in determining weighted scores which accurately reflect the population of health system patients. If the survey respondents were identical to the total population, then WEIGHT would equal 1; i.e., the raw data would not require adjusting, since no group is under- or over-represented. However, if a survey respondent belongs to a combination of categories which are over-represented (say, a younger patient visiting a small clinic), the WEIGHT variable for that respondent would be less than 1. In that case, multiplying the WEIGHT by the raw survey results from that person would compensate for his/her over-representation. In the same way, groups or categories which are under-represented in the survey respondents would receive a WEIGHT greater than 1.

Using the WEIGHT Variable:

Using a statistical program such as SPSS, you can specify "WEIGHT" as the name of your weighting variable, and then request mean scores for the desired questions.

Using a spreadsheet program such as Excel, you must manually apply the "WEIGHT" variable to obtain weighted mean scores. To better understand how to obtain weighted mean scores, first remember that to obtain *unweighted* mean scores, you must total the values of the responses to a given question and divide by the number of responses to that question, or

$$\text{Unweighted mean score} = \frac{\text{Sum of all R}}{\text{Total number of all responses}}.$$

Where:

R= the value of all responses.

.

To obtain a *weighted* mean score, you must first multiply the value of the responses by the WEIGHT variable, before totaling the responses. Also, instead of dividing by the number of all responses, as above, you'll divide by the total of the WEIGHT values for all responses. (Remember that if the sample exactly mirrored the total population, that all WEIGHT variables would equal 1. In that case, the sum of the weight variables would equal the total number of responses.) In other words,

$$\textit{Weighted mean score} = \frac{\text{Sum of all (R * WEIGHT)}}{\text{Sum of W}}$$

Where:

R = the value of all responses, and

W = the WEIGHT value for respondents who answered the question.

Calculating a Weighted Mean Score Using a Spreadsheet Program:

To calculate the weighted mean score using a spreadsheet program, you need to perform the following steps:

Step 1: Multiply each respondent's answer to a given question by that respondent's WEIGHT variable. In other words, calculate R*WEIGHT. In the raw data files, each line of data represents one person's survey responses. So if you were trying to obtain the weighted mean score for Q1, you would multiply the value in the Q1 column (the applicable response, or "R") by the value in the WEIGHT column on that same line of data. This produces a *weighted score* for each line of data.

Step 2: Add all the weighted scores (produced in Step 1) for the question of interest. To continue the example above, you would be adding all the scores from the Q1 column, after weighting them in Step 1.

Step 3: Add the values of the WEIGHT variable for each line of raw data with a response to the question of interest.

***Note**: some people who return surveys do not answer every question. In that case, there will be a blank in the raw data file in the column for the unanswered question (a "missing value"). When calculating a mean score (either unweighted or weighted), you should <u>ignore</u> those lines of raw data with missing values for that question.*

So if there is a blank in the column for the question you're calculating, do <u>not</u> add the WEIGHT value for that line of data in this step.

Step 4: Calculate the weighted mean score by dividing the total of the weighted scores (produced in Step 2) by the total values of the WEIGHT variables for those who answered the question (produced in Step 3).

Duplicating Customer Satisfaction Survey Report Scores Using Raw Data Files:

Using the steps described above, it is possible to replicate the weighted mean scores shown on the Customer Satisfaction Survey Reports. To do so, however, two important points must be kept in mind:

1. raw data files contain only one month's survey return data, and
2. Customer Satisfaction Survey Report scores are based on three months' survey data.

For example, the raw data files for surveys returned in December will be mailed with the Customer Satisfaction Survey Report for October/November/December. To duplicate the scores on the October/November/December report, you will need to combine the raw data files for October, November, and December.

Example:

The following example will illustrate how to calculate a weighted mean score from raw data files, using the steps described above.

Suppose we want to calculate the weighted mean score for Q03a, "Friendliness and courtesy shown to you by the clinic's staff". The possible responses to this question are 5 ("Excellent"), 4 ("Very Good"), 3 ("Good"), 2 ("Fair"), 1("Poor"), or a blank (indicating that the person did not answer this question).

The following table represents an excerpt of the raw data file for a hypothetical clinic in Excel, showing the columns for DMISID, MEPRS3, Q03a, and WEIGHT. The table contains 19 lines of data; i.e., the responses of 19 people who returned their surveys. For example, the first line of data indicates that that person answered "Poor", or 1, to Q03a. Note, however, that two people did not answer Q03a, indicated by a blank in the Q03a column in the last two lines of data.

Step 1: Calculating R*WEIGHT. For the first line of data (or, for the first returned survey results), this is 1 ("Poor") multiplied by the value of the WEIGHT variable on that line, 0.895675, resulting in a weighted score of 0.895675 for that line of data. Similarly, the weighted score for the second line is 2.860953, or 3 ("Good") times the WEIGHT value 0.953651.

Step 2: Add all the weighted scores you calculated in Step 1. In this example, the total is 49.478377. Note that you ignore the last two lines of data, that have missing values for Q03a.

Step 3: Add the values in the WEIGHT column for those respondents (or, lines of data) that have a response in the Q03a column. This total in the example is 14.071296. (Remember, you are not adding the values in the WEIGHT column for the last two lines of data, since there is no response to Q03a for those lines.)

Step 4: Calculate the weighted mean score by dividing the sum of the weighted scores, 49.478377, by the total of the applicable WEIGHT variables, 14.071296. This results in a weighted mean score of 3.516263.

(In comparison, the *unweighted* mean score for Q03a would be the total of the responses in the Q03a column, divided by the number of people who answered that question. In this case, that would be (1+3+1+1+2+2+4+4+5+5+5+5+5+5+4+4+4)/17, or 3.529411.)

Responses to Q03a, or "R"

DMISID	MEPRS3	Q03a	WEIGHT	R*WEIGHT		
9999	AAA	1	0.895675	0.895675		
9999	AAA	3	0.953651	2.860953		
9999	AAA	1	1.000014	1.000014		
9999	AAA	1	0.999924	0.999924		
9999	AAA	2	0.645238	1.290476		
9999	AAA	2	0.458359	0.916719		
9999	AAA	4	1.001003	4.004010		
9999	AAA	4	1.100154	4.400617		
9999	AAA	5	1.003521	5.017605		
9999	AAA	5	0.725454	3.627270		
9999	AAA	5	0.069525	0.347623		
9999	AAA	5	1.265851	6.329255		
9999	AAA	5	0.976523	4.882615		
9999	AAA	5	1.000005	5.000026		
9999	AAA	4	0.724953	2.899813		
9999	AAA	4	0.526459	2.105834		
9999	AAA	4	0.724987	2.899948		
			14.071296	*49.478377*		
9999	AAA		1.000554			
9999	AAA		0.685923			
					49.478377 / 14.071296=	**3.516263**

Step 1: Calculate R*WEIGHT. The respondent's score for Q03a multiplied by the respondent's weight.

Step 2: Total all R*WEIGHT. The sum of all survey respondents' scores multiplied by the respondents' weights.

Step 3: Calculate the total of the WEIGHT variables. The sum of the weights for the respondents who answered Q03a.

Note: These lines of data are not included in the calculations because there is no value in the Q03a column.

Weighted Mean Score

Step 4: Calculate the weighted mean score. The sum of all (R*WEIGHT), divided by the sum of the respondents weights.

FROM : OTSG IMO-SUPPORT

1. What was the main purpose of your visit on 15 April 1999 to the Internal Medicine Clinic?

2. Did DR. JOHNSON or another p treat you?

FROM : OTSG IMO-SUPPORT

8. How long did you wait for I
past your appointment time
the time you walked in if yo
did not have a specific appo

9 How would you rate the nu
spent waiting for DR. JOHN

10. How would you rate the Int
a. Ease of making this appoint
b. Access to medical care wh
c. The process of obtaining a

11 Thinking about times when

Concatenation Methodology – Part I (ASCII to MS Excel©)

Each month MACH receives two disks from DoD-HA pursuant to patient satisfaction. One disk contains the DoD-HA prepared reports in Adobe Acrobat© format. The other disk contains a self-extracting zip file that, upon execution, yields several files including MACH's raw patient satisfaction data for the month in question and a spreadsheet from DoD-HA indicating the columnar layout of the raw data file. The raw data file is a fixed-width ASCII (American Standard Code for Information Exchange) text file. To enable concatenation, each month the newly received file is imported into Microsoft Excel© through the file-open-files of type "all files" command. Upon being queried for delineation of the columnar structure of the data file, column breaks are established in accordance with the column lengths indicated in DoD-HA's dataset layout file. Similarly, after importation, variable names designated in the dataset layout file are inserted as column headings. The column lengths and variable names are summarized in Figure C-1.

Figure C-1 (OASD-HA, 1999)

VARIABLE NAME	DESCRIPTION	FLAT ASCII TEXT FILE		
		LENGTH	COLUMNS	TYPE
dmisid	Code identifies MTF	4	1-4	alpha
mtfname	MTF name	36	5-40	alpha
clinname	Clinic Name	50	41-90	alpha
meprs3	Code identifies clinic	3	91-93	alpha
apptdate	Appointment date (mm/yyyy)	7	94-100	alpha
gender	Patient Gender	1	101	alpha
agegrp	Patient Age Group	1	102	alpha
rankgrp	Patient Rank Group	1	103	alpha
fmp	Patient Family Member Prefix	2	104-105	alpha
benegrp	Patient Beneficiary Group	4	106-109	alpha
q1	Purpose of visit	1	110	numeric
q2	Appointed provider	1	111	numeric
q3a	Staff friendliness & courtesy	1	112	numeric
q3b	Staff attention	1	113	numeric

q3c	Thoroughness of treatment	1	114	numeric
q3d	Explanations of tests & procedures	1	115	numeric
q3e	Personal interest in patient	1	116	numeric
q3f	Advice received to stay healthy	1	117	numeric
q3g	Time with physician	1	118	numeric
q3h	How much care helped patient	1	119	numeric
q3i	How well care met patient's needs	1	120	numeric
q3j	Overall quality of care	1	121	numeric
q4	Recommend appointed provider to family / friends	1	122	numeric
q5	Overall satisfaction with care	1	123	numeric
q6	Appointment wait time	1	124	numeric
q7	Rating of appointment wait time	1	125	numeric
q8	Clinic wait time	1	126	numeric
q9	Rating of clinic wait time	1	127	numeric
q10a	Ease of making phone appointment	1	128	numeric
q10b	Access to care as needed	1	129	numeric
q10c	Access to specialty care by referrals	1	130	numeric
q11	Rating of callback wait time	1	131	numeric
q12	Overall satisfaction with clinic	1	132	numeric
q13a	Overall satisfaction with pharmacy	1	133	numeric
q13b	Overall satisfaction with radiology	1	134	numeric
q13c	Overall satisfaction with pathology	1	135	numeric
q13d	Overall satisfaction with medical record services	1	136	numeric
q14	Prime enrollment	1	137	numeric
q15	Appointed provider is PCM?	1	138	numeric
q16	Prime enrollment choice	1	139	numeric
q17	Self reported health status	1	140	numeric
weight	Weight	10	141-150	numeric
meprs4		4	151-154	alpha
mtf type		1	155	alpha
prfname	Provider First Name	30	156-185	alpha
prminit	Provider Middle Initial	1	186	alpha
prlname	Provider Last Name	30	187-216	alpha
provrank	Provider Rank	4	217-220	alpha
provtype	Provider Type	10	221-230	alpha
patcat	Patient Category	1	231	alpha

After importation, two data transformations occur in the spreadsheet environment. First, in the column “mtfname”, “McDonald Army Community Hospital” is replaced with “MACH”

for brevity. Second, a new column with the heading "newdate" is inserted between the "apptdate" and "gender" columns. The dates in "mm/yyyy" format in the "apptdate" column are formatted "yymm" in the "newdate" column. This allows creation of an ordinal date variable in lieu of a string variable upon importation into SPSS from Microsoft Excel©. After completing these two data manipulations, a count of the number of spreadsheet rows, not including the header row, is obtained and the file is saved as a Microsoft Excel© version 4.0 file.

Concatenation Methodology – Part II (MS Excel© to SPSS)

The dataset is imported into SPSS version 8.0 from Microsoft Excel© through the file-open command, selecting files of type "Excel (*.xls)". The file is then saved as a SPSS file and given a temporary name in the format of "{name}.sav", SPSS's native dataset file format. The master dataset (the concatenated data set from all previous months) is opened through the "file-open" command in SPSS, the "data-merge files-add cases" command is selected, and the new temporary SPSS file is highlighted in the "merge-files: add cases" dialogue box (scrolling up and down through subdirectories as required). The "open" button is selected and the new monthly data in the temporary data file is concatenated at the bottom of the master data set. A frequency count is run on the variable "newdate" to verify the accuracy of the importation process by ensuring the same number of records have been added to the dataset as there were rows in the Microsoft Excel© spreadsheet. The master data set is saved with its existing name and the temporary SPSS data file is deleted.

Final Preparation of Dataset For Analysis

Several actions are necessary to complete the preparation of the dataset for the analysis. First each record must be weighted by the DoD-HA weight variable to ensure analysis of the dataset parallels DoD's methodology. The rationale for employing weighted variables in this

study is as follows. Each MTFs' immediate and succeeding higher headquarters monitors patient satisfaction based on the reports generated by DoD-HA. If the goal is to increase the patient satisfaction levels depicted on these reports, than to maximize the potential of this effect, the analysis of the dataset must be conducted employing the same weighting methodology. DoD-HA's complete rationale for employing weighted variables to normalize the data based on the supported population's demographic factors, and the sizes of the clinic and MTF at which care was rendered is provided at Appendix B. (OASD-HA, 1997)

Two additional variables must be derived prior to analysis of the dataset. As indicated in the proposed hypotheses, the intent of this study is to compare patient satisfaction levels before and after the 1 October 1999 operational change. Thus a dichotomous variable, "prepost", must be derived from the variable "newdate". All records with a value in "newdate" of less than or equal to 9909 are recoded into "prepost" with a value of "0"; all values greater than or equal to 9910 are recoded into "prepost" with a value of "1".

The second variable that must be derived is related to the size of the sample required for this study. As discussed earlier in this section, ideally this analysis would be conducted with the type of clinic as one of the independent variables. However, this necessitates having sufficient sample sizes for each clinic before and after 1 October 1999. The required sample size is based on three factors: the desired power of the statistical test, the level of significance, and the effect size the test can discern - also known as the sensitivity of the test. Power refers to "the probability of rejecting a false null hypothesis" (Kirk, 1978) and is equal to $(1 - \beta)$. In the current study, failure to reject a false null hypothesis would lead to the conclusion that there was no statistically significant change in patients' pre and post 1 October 1999 satisfaction levels when in fact a significant change exists that would be ignored; a very un-pragmatic situation at best.

Consequently, both power and significance level must be established at relatively high thresholds, and the effect size established to allow statistical sensitivity. For this study the desired power is 0.9, $\alpha = 0.5$, and the author wants the test to be capable of discerning a 10% change, in the pre 1 October 1999 means for questions 03j, 05, and 12. Since the author is interested in detecting a 10% change of mean scores in either direction, positive or negative, this necessitates a two-tailed test where effect size = d = (10%)(mean)/(standard deviation). The descriptive statistics for the three dependent variables are provided in Table 3-2.

Table 3-2

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Q03J Overall quality of care & service received	1490	1	5	4.06	1.11
Q05 Satisfaction with medical care received	1494	1	7	5.88	1.46
Q12 Overall satisfaction with clinic	1494	1	7	5.80	1.42
Valid N (listwise)	1423				

Therefore the effect size for each applicable question is:

Q03j: d = (10%)(4.06)/(1.11) = 0.37

Q05: d = (10%)(5.88)/(1.46) = 0.40

Q12 d = (10%)(5.80)/(1.42) = 0.41

A "distinct advantage of repeated measures design. . .is that far less subjects are required for the study." (Stevens, 1996, p. 451). Consequently, given the aforementioned power, α, and effect sizes, if the sample sizes are sufficiently large to allow a t-test for means, then it is sufficiently large enough for a repeated measures design. Based on interpolation of sample size

tables, the required sample size for a t-test of means for each question is Q03j: n=224; Q05: n=153; Q12: n=128 (Wojcik, 1999).

Therefore, if each clinic has at least 224 measurements both prior to and after 1 October 1999 then this analysis can use clinic name as one of the between subjects factors. As indicated in Table 3-3, in the aggregate for the four months of data pre and post 1 October, only the primary care clinic has more than the 128 responses required for Q12; none have the 224 responses required for Q03j.

Table 3-3

NEWCLIN Clinic Name * PREPOST Pre and Post Variable Crosstabulation

Count

		PREPOST Pre and Post Variable		
		.00 Pre Operational Change	1.00 Post Operational Change	Total
NEWCLIN Clinic Name	Community Health Clinic	33	37	70
	Dermatology Clinic		5	5
	Emergency Medical Clinic	99	5	104
	General Surgery Clinic	17	18	35
	Gynecology Clinic	114	110	224
	Internal Medicine Clinic	67	57	124
	Nutrition Clinic	4		4
	Occupational Health Clin	25	36	61
	Ophthalmology Clinic	4	8	12
	Optometry Clinic	47	36	83
	Orthopedic Clinic	46	48	94
	Pediatric Clinic	101	82	183
	Physical Therapy Clinic	29	23	52
	Podiatry Clinic	29	24	53
	Primary Care Clinic	159	351	510
Total		774	840	1614

This illustrates the necessity of including the second derived variable in the dataset. "Typ_care" is a dichotomous variable in which the responses for care rendered in one of the

three primary care settings (the primary care clinic, the emergency medical clinic, and the pediatric clinic) are assigned a value of "0". Responses pursuant to care rendered in specialty care settings are assigned a value of "1". The sample frequency distribution for this derived variable is delineated in Table 3-4. Note sufficient sample size exists in the 4 months both pre and post 1 October 1999 for both primary and specialty care to meet the 224-response threshold required for Q03j.

Table 3-4

TYP_CARE Type Of Care * PREPOST Pre and Post Variable Crosstabulation

Count

		PREPOST Pre and Post Variable		
		.00 Pre Operational Change	1.00 Post Operational Change	Total
TYP_CARE Type Of Care	.00 Primary Care	359	438	797
	1.00 Specialty Care	416	402	818
Total		775	840	1615

Upon completion of derivative variable "typ_care", dataset preparation is complete and the data is ready for exploration and analysis. Appendix D, dataset layout, provides a comprehensive crosswalk of the dataset structure of the original ASCII file and the final SPSS file.

DATASET LAYOUT

		Flat ASCII Text File			SPSS File After Import					
VARIABLE NAME	DESCRIPTION	LENGTH	COLUMNS	TYPE	TYPE	WIDTH	DECIMALS	COLUMN WIDTH	CODE VALUE	VARIABLE CATEGORY
DMISID	Code identifies MTF	4	1-4	alpha	Numeric	6	0	6		Identification
MTFName	MTF name	36	5-40	alpha	String	8	n/a	8		Identification
ClinName	Clinic Name	50	41-90	alpha	String	26	n/a	16		Identification
MEPRS3	Code identifies clinic	3	91-93	alpha	String	8	n/a	8		Identification
ApptDate	Appointment date	7	94-100	alpha	N/A - NOT IMPORTED INTO SPSS					
NewDate	Appointment date (yymm)	N/A - Derived Variable			Numeric	8	0	8		Identification
Gender	Patient Gender	1	101	alpha	String	8	n/a	8	F = Female M = Male	Sociodemographics
AgeGrp	Patient Age Group	1	102	alpha	String	8	n/a	8	A = 0-4 B = 5-14 C = 15-17 D = 18-24 E = 25-34 F = 35-44 G = 45-64 H = 65 and over X = Unknown	Sociodemographics
RankGrp	Patient Rank Group	1	103	alpha	String	8	n/a	8	A = Officer (01-10, MO) B = Warrant Officer (W1-W4) C = Cadet/Midshipman (CD) D = Senior Enlisted (E5-E9) E = Junior Enlisted (E1-E4) F = Other Military (ME G = Civilian (C3) X = Unknown	Sociodemographics
FMP	Patient Family Member Prefix	2	104-105	alpha	Numeric	3	0	3	00 = Unknown 01-19 = Child of sponsor 20 = Sponsor 30-39 = Spouse of sponsor 40 = Mother, stepmother 45 = Father, stepfather 50 = Mother in law 55 = Father in law 60-69 = Other authorized dependents 70-98 = Unknown 99 = Other	Sociodemographics
BeneGrp	Patient Beneficiary Group	4	106-109	alpha	String	5	n/a	6	ACT = Active Duty RET = Retired GRD = Guard/Reserve DA = Family of Active Duty DR = Family of Retired DS = Survivor OTH = Other UNK = Unknown	Sociodemographics
Q1	Purpose of visit	1	110	numeric	Numeric	4	0	4	1 = Urgent care 2 = Routine /non-urgent care 3 = Preventive care/check- 4 = Specialty care/referral	Patient's Attitudes & Expectations
Q2	Appointed provider	1	111	numeric	Numeric	4	0	4	1 = Dr. ____	Sociodemographics

DATASET LAYOUT

		Flat ASCII Text File			SPSS File After Import					
VARIABLE NAME	DESCRIPTION	LENGTH	COLUMNS	TYPE	TYPE	WIDTH	DECIMALS	COLUMN WIDTH	CODE VALUE	VARIABLE CATEGORY
Q2	Appointed provider	1	111	numeric	Numeric	4	0	4	2 = Other Provider	Sociodemographics
Q3a	Staff friendliness & courtesy	1	112	numeric	Numeric	4	0	4	1 = Poor 2 = Fair 3 = Good 4 = Very Good 5 = Excellent	Interpersonal Aspects of Care
Q3b	Staff attention	1	113	numeric	Numeric	4	0	4	1 = Poor 2 = Fair 3 = Good 4 = Very Good 5 = Excellent	Interpersonal Aspects of Care
Q3c	Thoroughness of treatment	1	114	numeric	Numeric	4	0	4	1 = Poor 2 = Fair 3 = Good 4 = Very Good 5 = Excellent	Quality of Care
Q3d	Explanations of tests & procedures	1	115	numeric	Numeric	4	0	4	1 = Poor 2 = Fair 3 = Good 4 = Very Good 5 = Excellent	Interpersonal Aspects of Care
Q3e	Personal interest in patient	1	116	numeric	Numeric	4	0	4	1 = Poor 2 = Fair 3 = Good 4 = Very Good 5 = Excellent	Interpersonal Aspects of Care
Q3f	Advice received to stay healthy	1	117	numeric	Numeric	4	0	4	1 = Poor 2 = Fair 3 = Good 4 = Very Good 5 = Excellent	Interpersonal Aspects of Care
Q3g	Time with physician	1	118	numeric	Numeric	4	0	4	1 = Poor 2 = Fair 3 = Good 4 = Very Good 5 = Excellent	Interpersonal Aspects of Care
Q3h	How much care helped patient	1	119	numeric	Numeric	4	0	4	1 = Poor 2 = Fair 3 = Good 4 = Very Good 5 = Excellent	Quality of Care
Q3i	How well care met patient's needs	1	120	numeric	Numeric	4	0	4	1 = Poor 2 = Fair 3 = Good 4 = Very Good 5 = Excellent	Patient's Attitudes & Expectations
Q3j	Overall quality of care	1	121	numeric	Numeric	4	0	4	1 = Poor 2 = Fair 3 = Good 4 = Very Good	Quality of Care

DATASET LAYOUT

		Flat ASCII Text File			SPSS File After Import					
VARIABLE NAME	DESCRIPTION	LENGTH	COLUMNS	TYPE	TYPE	WIDTH	DECIMALS	COLUMN WIDTH	CODE VALUE	VARIABLE CATEGORY
									5 = Excellent	
Q4	Recommend appointed provider to family / friends	1	122	numeric	Numeric	4	0	4	1 = Definitely Not 2 = Probably Not 3 = Probably Yes 4 = Definitely Yes	Overall Satisfaction
Q5	Overall satisfaction with care	1	123	numeric	Numeric	4	0	4	1 = Completely dissatisfied 2 = Very dissatisfied 3 = Somewhat dissatisfied 4 = Neither satisfied nor dissatisfied 5 = Somewhat satisfied 6 = Very satisfied 7 = Completely satisfied	Overall Satisfaction
Q6	Appointment wait time	1	124	numeric	Numeric	4	0	4	1 = Same day 2 = 1 day 3 = 2 - 3 days 4 = 4 - 7 days 5 = 8 - 14 days 6 = 15 - 30 days 7 = More than 30 days 8 = I did not have an appointment time; I "walked in" to the clinic. (GO TO Q8)	Accessibility of Care
Q7	Rating of appointment wait time	1	125	numeric	Numeric	4	0	4	1 = Poor 2 = Fair 3 = Good 4 = Very Good 5 = Excellent	Accessibility of Care
Q8	Clinic wait time	1	126	numeric	Numeric	4	0	4	1 = Did not wait 2 = 1 - 15 minutes 3 = 16 - 30 minutes 4 = 31 - 45 minutes 5 = 46 - 60 minutes 6 = More than 60 minutes	Accessibility of Care
Q9	Rating of clinic wait time	1	127	numeric	Numeric	4	0	4	1 = Poor 2 = Fair 3 = Good 4 = Very Good 5 = Excellent	Accessibility of Care
Q10a	Ease of making phone appointment	1	128	numeric	Numeric	4	0	4	1 = Poor 2 = Fair 3 = Good 4 = Very Good 5 = Excellent blank = N/A or no response	Accessibility of Care
Q10b	Access to care as needed	1	129	numeric	Numeric	4	0	4	1 = Poor 2 = Fair 3 = Good 4 = Very Good	Accessibility of Care

DATASET LAYOUT

		Flat ASCII Text File			SPSS File After Import					
VARIABLE NAME	DESCRIPTION	LENGTH	COLUMNS	TYPE	TYPE	WIDTH	DECIMALS	COLUMN WIDTH	CODE VALUE	VARIABLE CATEGORY
									5 = Excellent blank = N/A or no response	
Q10c	Access to specialty care by referrals	1	130	numeric	Numeric	4	0	4	1 = Poor 2 = Fair 3 = Good 4 = Very Good 5 = Excellent blank = N/A or no response	Accessibility of Care
Q11	Rating of callback wait time	1	131	numeric	Numeric	4	0	4	1 = Poor 2 = Fair 3 = Good 4 = Very Good 5 = Excellent blank = N/A or no response	Accessibility of Care
Q12	Overall satisfaction with clinic	1	132	numeric	Numeric	4	0	4	1 = Completely dissatisfied 2 = Very dissatisfied 3 = Somewhat dissatisfied 4 = Neither satisfied nor dissatisfied 5 = Somewhat satisfied 6 = Very satisfied 7 = Completely satisfied	Overall Satisfaction
Q13a	Overall satisfaction with pharmacy	1	133	numeric	Numeric	4	0	4	1 = Poor 2 = Fair 3 = Good 4 = Very Good 5 = Excellent blank = Haven't Used or no response	Overall Satisfaction - Pharmacy
Q13b	Overall satisfaction with radiology	1	134	numeric	Numeric	4	0	4	1 = Poor 2 = Fair 3 = Good 4 = Very Good 5 = Excellent blank = Haven't Used or no response	Overall Satisfaction - Radiology
Q13c	Overall satisfaction with pathology	1	135	numeric	Numeric	4	0	4	1 = Poor 2 = Fair 3 = Good 4 = Very Good 5 = Excellent blank = Haven't Used or no response	Overall Satisfaction - Laboratory
Q13d	Overall satisfaction with medical record services	1	136	numeric	Numeric	4	0	4	1 = Poor 2 = Fair 3 = Good 4 = Very Good 5 = Excellent blank = Haven't Used or no response	Overall Satisfaction - Medical Records

DATASET LAYOUT

		Flat ASCII Text File			SPSS File After Import					
VARIABLE NAME	DESCRIPTION	LENGTH	COLUMNS	TYPE	TYPE	WIDTH	DECIMALS	COLUMN WIDTH	CODE VALUE	VARIABLE CATEGORY
Q14	Prime enrollment	1	137	numeric	Numeric	4	0	4	1 = Yes 2 = No (GO TO Q16) 3 = Not eligible to enroll (GO TO Q16) 4 = Don't know (GO TO Q16)	Sociodemographics
Q15	Appointed provider is PCM?	1	138	numeric	Numeric	4	0	4	1 = Yes 2 = No 3 = Don't know	Sociodemographics
Q16	Prime enrollment choice	1	139	numeric	Numeric	4	0	4	1 = Enroll in TRICARE Prime 2 = Re-enroll in TRICARE Prime 3 = Disenroll from TRICARE Prime 4 = Not enroll in TRICARE Prime 5 = TRICARE Prime is not available in this area	Patient's Attitudes & Expectations
Q17	Self reported health status	1	140	numeric	Numeric	4	0	4	1 = Poor 2 = Fair 3 = Good 4 = Very Good 5 = Excellent	Patient's Attitudes & Expectations
Weight	Weight	10	141-150	numeric	Numeric	8	6	10	Format (f10.6) or 000.000000	Derived Variable
MEPRS4		4	151-154	alpha	String	6	0	6		Identification
MTF Type		1	155	alpha	Numeric	7	0	7	1 (Not used as of 5/13/99) 2 = Hospital 3 = Clinic 4 (Not used as of 5/13/99)	Sociodemographics
PrFName	Provider First Name	30	156-185	alpha	String	28	n/a	16		Identification
PrMInit	Provider Middle Initial	1	186	alpha	String	7	n/a	7		Identification
PrLName	Provider Last Name	30	187-216	alpha	String	22	n/a	16		Identification
ProvRank	Provider Rank	4	217-220	alpha	String	10	n/a	10		Identification
ProvType	Provider Type	10	221-230	alpha	String	13	n/a	13		Identification
PATCAT	Patient Category	1	231	alpha	String	8	n/a	8	A = Army B = NOAA (National Oceanic & Atmospheric Administration) C = Coast Guard F = Air Force K = Civilian M = Marine Corps N = Navy P = Public Health Service R = NATO (North Atlantic Treaty Organization) X = Labor Service Employee	Sociodemographics
PREPOST	When care was received relative to operational change	N/A - Derived Variable			Numeric	8	0	8	0 = Pre Operational Change 1 = Post Operational Change	Identification variable (dichotomous)
TYP_CARE	Type of care received	N/A - Derived Variable			Numeric	8	0	8	0 = Primary Care 1 = Secondary Care	Identification variable (dichotomous)

Appendix E - Correlations (Last eight months - weighted)

Correlations		Q02	Q03A	Q03B	Q03C	Q03D	Q03E	Q03F	Q03G	Q03H	Q03I	Q03J	Q04	Q05	Q07	Q09	Q10A
Q02	Pearson Correlation	1.000	-0.126	-0.143	-0.134	-0.153	-0.114	-0.062	-0.028	0.002	-0.012	-0.085	-0.068	-0.091	-0.039	-0.079	-0.084
	Sig. (2-tailed)	.	0.000	0.000	0.000	0.000	0.000	0.027	0.318	0.940	0.660	0.002	0.015	0.001	0.182	0.007	0.006
	N	1332	1301	1305	1297	1298	1302	1265	1289	1293	1276	1294	1269	1303	1157	1180	1085
Q03A	Pearson Correlation	-0.126	1.000	**0.785**	**0.825**	**0.791**	**0.798**	**0.749**	**0.769**	0.696	**0.704**	**0.792**	**0.700**	**0.772**	0.405	0.583	0.440
	Sig. (2-tailed)	0.000	.	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	N	1301	1481	1461	1455	1453	1458	1424	1441	1457	1428	1460	1436	1454	1267	1325	1204
Q03B	Pearson Correlation	-0.143	**0.785**	1.000	**0.783**	**0.768**	**0.781**	**0.711**	**0.766**	0.653	0.656	**0.780**	0.646	**0.752**	0.452	0.549	0.445
	Sig. (2-tailed)	0.000	0.000	.	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	N	1305	1461	1498	1476	1474	1482	1450	1443	1470	1449	1473	1453	1479	1264	1350	1225
Q03C	Pearson Correlation	-0.134	**0.825**	**0.783**	1.000	**0.893**	**0.876**	**0.818**	**0.817**	**0.808**	**0.814**	**0.862**	**0.769**	**0.822**	0.400	0.597	0.394
	Sig. (2-tailed)	0.000	0.000	0.000	.	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	N	1297	1455	1476	1489	1476	1479	1443	1435	1470	1451	1472	1444	1470	1260	1344	1224
Q03D	Pearson Correlation	-0.153	**0.791**	**0.768**	**0.893**	1.000	**0.884**	**0.833**	**0.805**	**0.771**	**0.779**	**0.845**	**0.760**	**0.787**	0.383	0.599	0.358
	Sig. (2-tailed)	0.000	0.000	0.000	0.000	.	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	N	1298	1453	1474	1476	1486	1477	1445	1431	1467	1450	1470	1443	1468	1255	1342	1218
Q03E	Pearson Correlation	-0.114	**0.798**	**0.781**	**0.876**	**0.884**	1.000	**0.832**	**0.818**	**0.779**	**0.758**	**0.839**	**0.746**	**0.781**	0.423	0.603	0.407
	Sig. (2-tailed)	0.000	0.000	0.000	0.000	0.000	.	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	N	1302	1458	1482	1479	1477	1494	1448	1438	1477	1452	1475	1451	1478	1260	1347	1224
Q03F	Pearson Correlation	-0.062	**0.749**	**0.711**	**0.818**	**0.833**	**0.832**	1.000	**0.774**	**0.761**	**0.756**	**0.786**	**0.726**	**0.770**	0.353	0.558	0.390
	Sig. (2-tailed)	0.027	0.000	0.000	0.000	0.000	0.000	.	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	N	1265	1424	1450	1443	1445	1448	1456	1408	1441	1419	1441	1415	1437	1234	1311	1197
Q03G	Pearson Correlation	-0.028	**0.769**	**0.766**	**0.817**	**0.805**	**0.818**	**0.774**	1.000	**0.774**	**0.771**	**0.840**	**0.705**	**0.784**	0.462	0.611	0.371
	Sig. (2-tailed)	0.318	0.000	0.000	0.000	0.000	0.000	0.000	.	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	N	1289	1441	1443	1435	1431	1438	1408	1454	1430	1415	1432	1411	1437	1254	1310	1190
Q03H	Pearson Correlation	0.002	0.696	0.653	**0.808**	**0.771**	**0.779**	**0.761**	**0.774**	1.000	**0.939**	**0.837**	**0.712**	**0.796**	0.476	0.589	0.397
	Sig. (2-tailed)	0.940	0.000	0.000	0.000	0.000	0.000	0.000	0.000	.	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	N	1293	1457	1470	1470	1467	1477	1441	1430	1488	1453	1476	1446	1467	1255	1336	1214
Q03I	Pearson Correlation	-0.012	**0.704**	0.656	**0.814**	**0.779**	**0.758**	**0.756**	**0.771**	**0.939**	1.000	**0.860**	**0.743**	**0.814**	0.504	0.559	0.352
	Sig. (2-tailed)	0.660	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	.	0.000	0.000	0.000	0.000	0.000	0.000
	N	1276	1428	1449	1451	1450	1452	1419	1415	1453	1460	1447	1418	1446	1232	1318	1195
Q03J	Pearson Correlation	-0.085	**0.792**	**0.780**	**0.862**	**0.845**	**0.839**	**0.786**	**0.840**	**0.837**	**0.860**	1.000	**0.808**	**0.860**	0.488	0.589	0.399
	Sig. (2-tailed)	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	.	0.000	0.000	0.000	0.000	0.000
	N	1294	1460	1473	1472	1470	1475	1441	1432	1476	1447	1490	1448	1468	1261	1341	1218
Q04	Pearson Correlation	-0.068	**0.700**	0.646	**0.769**	**0.760**	**0.746**	**0.726**	**0.705**	**0.712**	**0.743**	**0.808**	1.000	**0.831**	0.387	0.486	0.247
	Sig. (2-tailed)	0.015	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	.	0.000	0.000	0.000	0.000
	N	1269	1436	1453	1444	1443	1451	1415	1411	1446	1418	1448	1470	1453	1263	1332	1208
Q05	Pearson Correlation	-0.091	**0.772**	**0.752**	**0.822**	**0.787**	**0.781**	**0.770**	**0.784**	**0.796**	**0.814**	**0.860**	**0.831**	1.000	0.454	0.588	0.359
	Sig. (2-tailed)	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	.	0.000	0.000	0.000
	N	1303	1454	1479	1470	1468	1478	1437	1437	1467	1446	1468	1453	1494	1264	1346	1228
Q07	Pearson Correlation	-0.039	0.405	0.452	0.400	0.383	0.423	0.353	0.462	0.476	0.504	0.488	0.387	0.454	1.000	0.411	0.457
	Sig. (2-tailed)	0.182	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	.	0.000	0.000
	N	1157	1267	1264	1260	1255	1260	1234	1254	1255	1232	1261	1263	1264	1282	1151	1114

Appendix E - Correlations (Last eight months - weighted)

Correlations		Q02	Q03A	Q03B	Q03C	Q03D	Q03E	Q03F	Q03G	Q03H	Q03I	Q03J	Q04	Q05	Q07	Q09	Q10A
Q09	Pearson Correlation	-0.079	0.583	0.549	0.597	0.599	0.603	0.558	0.611	0.589	0.559	0.589	0.486	0.588	0.411	1.000	0.489
	Sig. (2-tailed)	0.007	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	.	0.000
	N	1180	1325	1350	1344	1342	1347	1311	1310	1336	1318	1341	1332	1346	1151	1372	1131
Q10A	Pearson Correlation	-0.084	0.440	0.445	0.394	0.358	0.407	0.390	0.371	0.397	0.352	0.399	0.247	0.359	0.457	0.489	1.000
	Sig. (2-tailed)	0.006	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	.
	N	1085	1204	1225	1224	1218	1224	1197	1190	1214	1195	1218	1208	1228	1114	1131	1249
Q10B	Pearson Correlation	-0.101	0.513	0.564	0.529	0.508	0.521	0.479	0.523	0.520	0.514	0.583	0.403	0.564	0.573	0.554	**0.767**
	Sig. (2-tailed)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	N	1191	1353	1365	1366	1360	1366	1329	1331	1363	1339	1365	1348	1371	1186	1275	1196
Q10C	Pearson Correlation	-0.021	0.490	0.511	0.496	0.490	0.507	0.477	0.520	0.498	0.460	0.565	0.427	0.506	0.460	0.534	0.630
	Sig. (2-tailed)	0.533	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	N	848	939	938	939	934	941	918	928	932	915	928	928	947	845	887	839
Q11	Pearson Correlation	0.006	0.601	0.674	0.630	0.590	0.604	0.571	0.650	**0.709**	0.698	0.681	0.581	**0.700**	0.583	0.660	0.559
	Sig. (2-tailed)	0.869	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	N	752	827	828	829	824	830	816	818	820	804	823	819	829	750	773	778
Q12	Pearson Correlation	-0.078	**0.719**	**0.717**	**0.762**	**0.763**	**0.753**	**0.724**	**0.759**	**0.757**	**0.756**	**0.854**	**0.748**	**0.865**	0.456	0.645	0.402
	Sig. (2-tailed)	0.005	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	N	1274	1430	1447	1440	1438	1446	1410	1406	1440	1412	1443	1425	1448	1236	1352	1223
Q13A	Pearson Correlation	-0.041	0.357	0.350	0.341	0.315	0.313	0.267	0.298	0.301	0.295	0.316	0.190	0.322	0.271	0.343	0.392
	Sig. (2-tailed)	0.150	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	N	1213	1345	1336	1332	1330	1336	1304	1318	1331	1305	1339	1319	1336	1168	1241	1141
Q13B	Pearson Correlation	-0.043	0.373	0.374	0.407	0.391	0.376	0.334	0.381	0.344	0.374	0.403	0.250	0.345	0.316	0.387	0.296
	Sig. (2-tailed)	0.175	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	N	979	1078	1089	1087	1084	1091	1072	1054	1091	1066	1091	1078	1089	926	1020	930
Q13C	Pearson Correlation	-0.038	0.453	0.444	0.453	0.448	0.488	0.404	0.488	0.445	0.495	0.514	0.370	0.457	0.445	0.470	0.431
	Sig. (2-tailed)	0.220	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	N	1029	1118	1131	1128	1125	1130	1102	1104	1129	1104	1134	1110	1132	1013	1049	993
Q13D	Pearson Correlation	-0.067	0.503	0.482	0.508	0.497	0.477	0.426	0.483	0.469	0.483	0.496	0.392	0.460	0.434	0.472	0.510
	Sig. (2-tailed)	0.031	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	N	1033	1132	1142	1140	1140	1144	1115	1109	1141	1115	1147	1126	1145	970	1074	966
Q17	Pearson Correlation	-0.037	0.138	0.076	0.101	0.072	0.098	0.083	0.127	0.166	0.170	0.149	0.145	0.149	0.147	0.127	0.075
	Sig. (2-tailed)	0.181	0.000	0.004	0.000	0.006	0.000	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.008
	N	1303	1448	1465	1458	1456	1464	1424	1422	1458	1432	1461	1440	1464	1252	1360	1238

Appendix E - Correlations (Last eight months - weighted)

Correlations		Q10B	Q10C	Q11	Q12	Q13A	Q13B	Q13C	Q13D	Q17
Q02	Pearson Correlation	-0.101	-0.021	0.006	-0.078	-0.041	-0.043	-0.038	-0.067	-0.037
	Sig. (2-tailed)	0.000	0.533	0.869	0.005	0.150	0.175	0.220	0.031	0.181
	N	1191	848	752	1274	1213	979	1029	1033	1303
Q03A	Pearson Correlation	0.513	0.490	0.601	**0.719**	0.357	0.373	0.453	0.503	0.138
	Sig. (2-tailed)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	N	1353	939	827	1430	1345	1078	1118	1132	1448
Q03B	Pearson Correlation	0.564	0.511	0.674	**0.717**	0.350	0.374	0.444	0.482	0.076
	Sig. (2-tailed)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.004
	N	1365	938	828	1447	1336	1089	1131	1142	1465
Q03C	Pearson Correlation	0.529	0.496	0.630	**0.762**	0.341	0.407	0.453	0.508	0.101
	Sig. (2-tailed)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	N	1366	939	829	1440	1332	1087	1128	1140	1458
Q03D	Pearson Correlation	0.508	0.490	0.590	**0.763**	0.315	0.391	0.448	0.497	0.072
	Sig. (2-tailed)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.006
	N	1360	934	824	1438	1330	1084	1125	1140	1456
Q03E	Pearson Correlation	0.521	0.507	0.604	**0.753**	0.313	0.376	0.488	0.477	0.098
	Sig. (2-tailed)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	N	1366	941	830	1446	1336	1091	1130	1144	1464
Q03F	Pearson Correlation	0.479	0.477	0.571	**0.724**	0.267	0.334	0.404	0.426	0.083
	Sig. (2-tailed)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002
	N	1329	918	816	1410	1304	1072	1102	1115	1424
Q03G	Pearson Correlation	0.523	0.520	0.650	**0.759**	0.298	0.381	0.488	0.483	0.127
	Sig. (2-tailed)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	N	1331	928	818	1406	1318	1054	1104	1109	1422
Q03H	Pearson Correlation	0.520	0.498	0.709	**0.757**	0.301	0.344	0.445	0.469	0.166
	Sig. (2-tailed)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	N	1363	932	820	1440	1331	1091	1129	1141	1458
Q03I	Pearson Correlation	0.514	0.460	0.698	**0.756**	0.295	0.374	0.495	0.483	0.170
	Sig. (2-tailed)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	N	1339	915	804	1412	1305	1066	1104	1115	1432
Q03J	Pearson Correlation	0.583	0.565	0.681	**0.854**	0.316	0.403	0.514	0.496	0.149
	Sig. (2-tailed)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	N	1365	928	823	1443	1339	1091	1134	1147	1461
Q04	Pearson Correlation	0.403	0.427	0.581	**0.748**	0.190	0.250	0.370	0.392	0.145
	Sig. (2-tailed)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	N	1348	928	819	1425	1319	1078	1110	1126	1440
Q05	Pearson Correlation	0.564	0.506	**0.700**	**0.865**	0.322	0.345	0.457	0.460	0.149
	Sig. (2-tailed)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	N	1371	947	829	1448	1336	1089	1132	1145	1464
Q07	Pearson Correlation	0.573	0.460	0.583	0.456	0.271	0.316	0.445	0.434	0.147
	Sig. (2-tailed)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	N	1186	845	750	1236	1168	926	1013	970	1252

Appendix E - Correlations (Last eight months - weighted)

Correlations		Q10B	Q10C	Q11	Q12	Q13A	Q13B	Q13C	Q13D	Q17
Q09	Pearson Correlation	0.554	0.534	0.660	0.645	0.343	0.387	0.470	0.472	0.127
	Sig. (2-tailed)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	N	1275	887	773	1352	1241	1020	1049	1074	1360
Q10A	Pearson Correlation	**0.767**	0.630	0.559	0.402	0.392	0.296	0.431	0.510	0.075
	Sig. (2-tailed)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.008
	N	1196	839	778	1223	1141	930	993	966	1238
Q10B	Pearson Correlation	1.000	**0.728**	**0.707**	0.581	0.472	0.460	0.487	0.518	0.094
	Sig. (2-tailed)	.	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	N	1408	934	812	1385	1291	1046	1095	1103	1399
Q10C	Pearson Correlation	**0.728**	1.000	0.658	0.564	0.411	0.474	0.460	0.489	0.136
	Sig. (2-tailed)	0.000	.	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	N	934	965	644	951	887	776	768	761	954
Q11	Pearson Correlation	**0.707**	0.658	1.000	0.670	0.403	0.349	0.542	0.610	0.179
	Sig. (2-tailed)	0.000	0.000	.	0.000	0.000	0.000	0.000	0.000	0.000
	N	812	644	861	843	817	702	717	728	851
Q12	Pearson Correlation	0.581	0.564	0.670	1.000	0.318	0.391	0.499	0.493	0.183
	Sig. (2-tailed)	0.000	0.000	0.000	.	0.000	0.000	0.000	0.000	0.000
	N	1385	951	843	1494	1349	1100	1149	1162	1478
Q13A	Pearson Correlation	0.472	0.411	0.403	0.318	1.000	0.692	0.582	0.569	0.100
	Sig. (2-tailed)	0.000	0.000	0.000	0.000	.	0.000	0.000	0.000	0.000
	N	1291	887	817	1349	1391	1082	1130	1149	1381
Q13B	Pearson Correlation	0.460	0.474	0.349	0.391	0.692	1.000	**0.761**	0.620	0.058
	Sig. (2-tailed)	0.000	0.000	0.000	0.000	0.000	.	0.000	0.000	0.050
	N	1046	776	702	1100	1082	1129	975	981	1120
Q13C	Pearson Correlation	0.487	0.460	0.542	0.499	0.582	**0.761**	1.000	**0.713**	0.209
	Sig. (2-tailed)	0.000	0.000	0.000	0.000	0.000	0.000	.	0.000	0.000
	N	1095	768	717	1149	1130	975	1185	1042	1176
Q13D	Pearson Correlation	0.518	0.489	0.610	0.493	0.569	0.620	**0.713**	1.000	0.146
	Sig. (2-tailed)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	.	0.000
	N	1103	761	728	1162	1149	981	1042	1198	1186
Q17	Pearson Correlation	0.094	0.136	0.179	0.183	0.100	0.058	0.209	0.146	1.000
	Sig. (2-tailed)	0.000	0.000	0.000	0.000	0.000	0.050	0.000	0.000	.
	N	1399	954	851	1478	1381	1120	1176	1186	1523

```
* ------------------------------------------------------------------------------------------------------------------------------------------------------.

*  Syntax File    Appendix F - Syntax for analysis of monthly patient satisfaction data.
*  Date                  04 Jun 2000.
*  Author         Maj Jack Zeto.
*  Version        9.72
*  NOTES:         This is the planned syntax for analysis of the monthly patient satisfaction dataset
                  pursuant to my Baylor Graduate Management Project.
* ------------------------------------------------------------------------------------------------------------------------------------------------------.

*  Establish statistical environment for analysis.

   *  Set SPSS Environmental settings.
      SET MXMEMORY = 2000000.
      SET WORKSPACE = 2000000.

   *  Confirm SPSS environmental settings.
      SHOW MXMEMORY.
      SHOW WORKSPACE.

   *  Retrieve applicable file.
      GET FILE='C:\Working Files\Patient Satisfaction\G M P\Monthly Pat Sat Data '+ '(MACH).sav'.
      EXECUTE .

* ------------------------------------------------------------------------------------------------------------------------------------------------------.

*  Weight data by OSD-HA generated weights.
      WEIGHT BY weight.

* ------------------------------------------------------------------------------------------------------------------------------------------------------.

*  Derive required variables from existing dataset.

   *  Create pre and post dichotomous variable (Sep 99 / Oct 99 Split).
      *  NOTE: Insert last and first months delineating "pre and post timeframes", respectively, in 3rd line
         below.
      RECODE
        newdate
          (Lowest thru 9909=0)  (9910 thru Highest=1)  INTO  prepost .
        VARIABLE LABELS prepost 'Pre and Post Variable'.
      EXECUTE .

      *  Labels pre-post variable values.
        VALUE LABELS prepost
          .000000000000000 "Pre Operational Change"
          1.00000000000000 "Post Operational Change".

   *  Create primary and specialty care dichotomous variable.
      RECODE
        clinname
          ('Emergency Medical Clinic'=0)  ('Primary Care Clinic'=0)  ('Pediatric Clinic'=0)  (ELSE=1)  INTO
          typ_care .
        VARIABLE LABELS typ_care 'Type Of Care'.
      EXECUTE .

      *  Labels type care variable values.
```

```
        VALUE LABELS typ_care
          .000000000000000 "Primary Care"
          1.00000000000000 "Specialty Care".

    *  Create subordinate clinic variable to account for Forts Monroe and Story.
      *   COMPUTE newclin=clinname.
        DO IF (prlname = "SAVA" or prlname = "SPEERS" or prlname = "ORDONEZ" or prlname =
           "PRAKALAPAKORN") .
          RECODE
            clinname ('Primary Care Clinic'='FT MONROE')  INTO  newclin .
            END IF .
          EXECUTE .

        DO IF (prlname = "PIANIN") .
          RECODE
            clinname ('Primary Care Clinic'='FT STORY')  INTO  newclin .
            END IF .
          EXECUTE .

* ----------------------------------------------------------------------------------------------------------------------------------.

*  Select subset of data.

    *  Select for the most recent eight months of data (in this case Jun 99 - Jan 00).
      *  NOTE: Purpose of this is to select for the most recent data available.
      *  NOTE: Insert mmyy for first month of desired timeframe into 2nd and 3rd lines below.
        USE ALL.
        COMPUTE filter_$=(newclin <> "FT MONROE" and newclin <> "FT STORY" and newdate  >=
        9906).
        VARIABLE LABEL filter_$ 'newclin <> "FT MONROE" and newclin <> "FT STORY" and newdate
        >= 9906 (FILTER)'.
        VALUE LABELS filter_$  0 'Not Selected' 1 'Selected'.
        FORMAT filter_$ (f1.0).
        FILTER BY filter_$.
      EXECUTE .

* ----------------------------------------------------------------------------------------------------------------------------------.

*  Verify validity and accuracy of recoding and subset selection through crosstabulation analysis.
    CROSSTABS
      /TABLES=newdate  BY prepost
      /FORMAT= AVALUE TABLES
      /CELLS= COUNT .

    CROSSTABS
      /TABLES=clinname  BY typ_care
      /FORMAT= AVALUE TABLES
      /CELLS= COUNT .

    CROSSTABS
      /TABLES=newclin  BY clinname
      /FORMAT= AVALUE TABLES
      /CELLS= COUNT .

* ----------------------------------------------------------------------------------------------------------------------------------.
```

```
* Run descriptives on overall satisfaction variables.
  DESCRIPTIVES
    VARIABLES=q03j q05 q12
   /STATISTICS=MEAN STDDEV MIN MAX .

* ------------------------------------------------------------------------------------------------------------------------------------------------------------------------.

* Run Cronbach's Alpha On Overall Satisfaction Variables To Assess Reliability.
  RELIABILITY
    /VARIABLES=q03j q05 q12
    /FORMAT=NOLABELS
    /SCALE(ALPHA)=ALL/MODEL=ALPHA
    /STATISTICS=DESCRIPTIVE
   /SUMMARY=TOTAL MEANS .

* ------------------------------------------------------------------------------------------------------------------------------------------------------------------------.

*Compute factor analysis.
  FACTOR
    /VARIABLES q03a q03b q03c q03d q03e q03f q03g q03h q03i q03j q05 q12
    /MISSING LISTWISE /ANALYSIS q03a q03b q03c q03d q03e q03f q03g q03h q03i q03j q05 q12
    /PRINT INITIAL EXTRACTION ROTATION
    /CRITERIA MINEIGEN(1) ITERATE(25)
    /EXTRACTION PC
    /CRITERIA ITERATE(25)
    /ROTATION NOROTATE
    /METHOD=CORRELATION.

* ------------------------------------------------------------------------------------------------------------------------------------------------------------------------.

* Statistical analyses.

  * Run correlational analysis of satisfaction variables.
    * NOTE: Pay particular attention to correlation of overall satisfaction variables (q05, q12, q03j).
      CORRELATIONS
        /VARIABLES=q01 q02 q03a q03b q03c q03d q03e q03f q03g q03h q03i q03j q04
          q05 q06 q07 q08 q09 q10a q10b q10c q11 q12 q13a q13b q13c q13d q14 q15 q16 q17
        /PRINT=TWOTAIL NOSIG
       /MISSING=PAIRWISE .

  * Run 2 (Newdate & Type Care / Pre-post & Type Care) Univariate ANOVAs on each dependent
    variable.

    UNIANOVA
      q03j BY newdate typ_care
      /METHOD = SSTYPE(3)
      /INTERCEPT = INCLUDE
      /POSTHOC = typ_care newdate ( BONFERRONI )
      /PLOT = PROFILE( newdate*typ_care )
      /PRINT = DESCRIPTIVE
      /CRITERIA = ALPHA(.05)
      /DESIGN = newdate typ_care newdate*typ_care .

    UNIANOVA
      q05 BY newdate typ_care
      /METHOD = SSTYPE(3)
```

```
    /INTERCEPT = INCLUDE
    /POSTHOC = typ_care newdate ( BONFERRONI )
    /PLOT = PROFILE ( newdate*typ_care )
    /PRINT = DESCRIPTIVE
    /CRITERIA = ALPHA(.05)
    /DESIGN = newdate typ_care newdate*typ_care .

  UNIANOVA
    q12  BY newdate typ_care
    /METHOD = SSTYPE(3)
    /INTERCEPT = INCLUDE
    /POSTHOC = typ_care newdate ( BONFERRONI )
    /PLOT = PROFILE ( newdate*typ_care )
    /PRINT = DESCRIPTIVE
    /CRITERIA = ALPHA(.05)
    /DESIGN = newdate typ_care newdate*typ_care .

  UNIANOVA
    q03j  BY typ_care prepost
    /METHOD = SSTYPE(3)
    /INTERCEPT = INCLUDE
    /PLOT = PROFILE ( prepost*typ_care typ_care*prepost )
    /PRINT = DESCRIPTIVE
    /CRITERIA = ALPHA(.05)
    /DESIGN = typ_care prepost typ_care*prepost .

  UNIANOVA
    q05  BY typ_care prepost
    /METHOD = SSTYPE(3)
    /INTERCEPT = INCLUDE
    /PLOT = PROFILE ( prepost*typ_care typ_care*prepost )
    /PRINT = DESCRIPTIVE
    /CRITERIA = ALPHA(.05)
    /DESIGN = typ_care prepost typ_care*prepost .

  UNIANOVA
    q12  BY typ_care prepost
    /METHOD = SSTYPE(3)
    /INTERCEPT = INCLUDE
    /PLOT = PROFILE ( prepost*typ_care typ_care*prepost )
    /PRINT = DESCRIPTIVE
    /CRITERIA = ALPHA(.05)
    /DESIGN = typ_care prepost typ_care*prepost .

* ------------------------------------------------------------------------------------------------------------------------------------.

*  Un-weight Data In Preparation For Running Regression Analysis To Identify Predictive Variables.
  WEIGHT Off.

* ------------------------------------------------------------------------------------------------------------------------------------.

 *  Regression analysis to predict overall satisfaction.

   *  Run multiple regression of each of overall satisfaction variables to determine which elements as
     measured on survey instrument are most predictive for prioritization of resources..
```

```
    *  Regression of Q03j.
       REGRESSION
          /DESCRIPTIVES MEAN STDDEV CORR SIG N
          /MISSING LISTWISE
          /STATISTICS COEFF OUTS BCOV R ANOVA
          /CRITERIA=PIN(.05) POUT(.10)
          /NOORIGIN
          /DEPENDENT q03j
          /METHOD=ENTER q01 q03a q03b q03c q03d q03e q03f q03g q03h q03i q06
          q08 q10a q10b q10c q11 q13a q13b q13c q13d q17  .

    *  Regression of Q12.
       REGRESSION
          /DESCRIPTIVES MEAN STDDEV CORR SIG N
          /MISSING LISTWISE
          /STATISTICS COEFF OUTS BCOV R ANOVA
          /CRITERIA=PIN(.05) POUT(.10)
          /NOORIGIN
          /DEPENDENT q12
          /METHOD=ENTER q01 q03a q03b q03c q03d q03e q03f q03g q03h q03i q06
          q08 q10a q10b q10c q11 q13a q13b q13c q13d q17  .

    *  Regression of Q05.
       REGRESSION
          /DESCRIPTIVES MEAN STDDEV CORR SIG N
          /MISSING LISTWISE
          /STATISTICS COEFF OUTS BCOV R ANOVA
          /CRITERIA=PIN(.05) POUT(.10)
          /NOORIGIN
          /DEPENDENT q05
          /METHOD=ENTER q01 q03a q03b q03c q03d q03e q03f q03g q03h q03i q06
          q08 q10a q10b q10c q11 q13a q13b q13c q13d q17  .

* ------------------------------------------------------------------------------------------------------------------------------------------------------------------------.

  *  Syntax For RM-ANOVAs (Not Used In This Study).
  * NOTE: REPEATED MEASURES ANALYSIS OF NEWDATE AND PRE-POST MUST BE RUN AS 2
    DISTINCT TESTS.
    *  Repeated measures statistical analysis #1 (tests significance over time).
       GLM
          q03j q05 q12 BY typ_care newdate
             /WSFACTOR = factor1 3 Polynomial
             /METHOD = SSTYPE(3)
             /PLOT = PROFILE( newdate*factor1*typ_care newdate*typ_care*factor1)
             /PRINT = DESCRIPTIVE
             /CRITERIA = ALPHA(.05)
             /WSDESIGN = factor1
             /DESIGN = typ_care newdate typ_care*newdate .

    *  Repeated measures statistical analysis #2 (tests significance pre and post).
       GLM
          q03j q05 q12 BY typ_care prepost
             /WSFACTOR = factor1 3 Polynomial
             /METHOD = SSTYPE(3)
             /PLOT = PROFILE( prepost*factor1*typ_care prepost*typ_care*factor1)
             /PRINT = DESCRIPTIVE
```

```
/CRITERIA = ALPHA(.05)
/WSDESIGN = factor1
/DESIGN = typ_care prepost typ_care*prepost .
```